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Abstract: Meteoritical Bulletin 101 contains 2639 meteorites accepted by the Nomenclature Committee in 2012, including 1 fall (Battle Mountain), with 2308 Ordinary chondrites, 156 Carbonaceous chondrites, 63 HED achondrites, 17 Relict meteorites, 16 Rumuruti chondrites, 15 Enstatite chondrites, 15 Ureilites, 10 Iron meteorites, 9 Lunar meteorites, 9 Primitive achondrites, 8 Ungrouped achondrites, 7 Mesosiderites, 4 Martian meteorites, and 2 Pallasites, and with 1812 from Antarctica, 437 from Asia, 301 from Africa, 43 from South America, 21 from Europe (including Russia), 21 from North America, 3 from Oceania, and 1 from Unknown. Information about approved meteorites can be obtained from the Meteoritical Bulletin Database (MBD) available on line at http://www.lpi.usra.edu/meteor/ .

A complete copy of this Bulletin (136 pages) is available electronically.

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The Meteoritical Bulletin was published on 19 AUG 2015 without the complete listing, it has been corrected.

1. Information on Type Specimen Repositories

The deposit of a type specimen into a repository is a requirement of any new meteorite submission, per Section 7 of the Guidelines for Meteorite Nomenclature. An acceptable Type Specimen Repository is defined as an institution that has a well-curated meteorite collection and a long-standing commitment to curation. The intent of this definition is to minimize the risk that type specimens will be mislocated or lost; in some cases, the type specimen represents the only material readily available for scientific research.

In order to provide clarification on the intent of the definition of a Type Specimen Repository, the Nomenclature Committee has established a set of requirements for an acceptable repository, including: identified personnel responsible for meteorite curation; institutional ownership or permanent custory (and therefore oversight) of the collection to which the type specimens belong; a stated intent that the type specimens be made available to qualified scientific investigators; and a demonstrated long-term commitment toward establishing or maintaining a curated meteorite collection. Most traditional or extant repositories meet these criteria; however, institutions seeking to become repositories should ensure that these criteria are met. Details on the process for establishing a Type Specimen Repository can be found in the Nomenclature Committee's Rules of Procedure.

As part of the process of elaborating on the definition of an acceptable Type Specimen Repository, the Nomenclature Committee gathered updated information on extant repositories – something that had not been done in many years. This information is now available in the list of addresses cited in the Meteoritical Bulletin; those institutions that have been approved as a repository for type specimens are marked on that page with a green checkmark.

2. Alphabetical text entries for non-Antarctic meteorites

Al Huwaysah 010 22°44.921'N, 55°28.331'E
Az Zahirah, Oman
Found: 2010 Jan 2
Classification: Ungrouped achondrite

History: Two stones with a total mass of 1411.79 g were found in Oman during a search for meteorites.
Physical characteristics: The stones are reddish brown and lack fusion crust. Variations in color result from weathering effects.
Petrography: (B. Hofmann, *NMBE*; F. Zurfluh, C. Opitz, N. Greber, *Bern*; E. Gnos, *MHNGE*): The rock shows an equigranular texture, with grain sizes of 0.2-0.5 mm. It consists of ~70 vol% of olivine ($Fa_{16.5}$, molar Fe/Mn=31.8), showing numerous small pyroxene inclusions along grain boundaries, a total of 12 vol% pyroxene, mainly augite ($Fs_{10.8}Wo_{43.7}$) and a minor amount of orthopyroxene ($Fs_{13.9}Wo_{0.7}$), 6 vol% of feldspar ($Ab_{70.3}$), poikilitically enclosing olivine and pyroxene, 5 vol% of chromite and 1 vol% of apatite. Accessory phases are iron (basically Ni free), troilite, fine graphite and Ni-rich iron sulfide (as inclusion in chromite). Terrestrial weathering products include 6 vol% of iron oxides (maghemite), iron hydroxides, traces of gypsum and a Mg-rich weathering phase. The Fe-oxides often occur as tabular phases (up to 0.5 mm in length) along grain boundaries and penetrating the silicate phases. The rock is very weakly shocked (S2). Strong weathering.
Geochemistry: Bulk analysis showed Fe/Mn (wt%) = 65.2, Ni = 435 ppm. Oxygen isotopes (R.C. Greenwood, *OU*, ethanolamine thioglycollate cleaned, mean of two replicates): $\delta^{17}O = 2.31$, $\delta^{18}O = 4.73$, and $\Delta^{17}O = -0.14$ (all per mil).
Classification: Achondrite, ungrouped. The stone is related to brachinites and ungrouped achondrites NWA 1500 and NWA 4042.

Specimens: All at *NMBE*.

Alkali Flat 32°18.360'N, 108°54.228'W
New Mexico, USA
Found: 2011 Mar 7
Classification: Ordinary chondrite (L5)
History: A single stone was found by Ben Fisler on the south alkali salt flat of the Animas Valley.
Physical characteristics: Reddish brown, rough weathered exterior, saw cut reveals fine-grained sulfide and metal set in dark-brown matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished thin section shows olivine, pyroxene, a few equilibrated chondrules, troilite, and kamacite.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{24.7\pm0.4}$, Fe/Mn=50±3, n=10; low-Ca pyroxene $Fs_{21.0\pm0.5}Wo_{1.6\pm0.2}$, Fe/Mn=30±2, n=10.
Classification: Ordinary chondrite (L5), weathering grade W2.
Specimens: 5.6 g including a polished thin section on deposit at *UNM*. Ben Fisler holds the main mass.

Anthony Gap 32°0'21.04"N, 106°33'37.02"W
Dona Ana County, New Mexico, United States
Found: 8 Oct 2011
Classification: Ordinary chondrite (L6)
History: Rik Villareal found this meteorite near Anthony Gap, New Mexico, while he was target shooting with his two sons. The meteorite was partially imbedded in the hill slope that they were using as a backstop.
Physical characteristics: Single stone, exterior covered by approximately 75% dark smooth fusion crust. A saw cut reveals abundant, fine-grained metal/sulfide and some larger grains up to 3 mm, a few faint chondrules, fine weathering veins, groundmass reddish brown to black.
Petrography: (C. Agee, *UNM*) Microprobe examination of a probe mount shows an equilibrated ordinary chondrite texture with a few relict chondrules and relatively coarse plagioclase grains. Approximately 50-70% of the kamacite is oxidized, abundant troilite.
Geochemistry: Mineral compositions: olivine, $Fa_{25.3\pm0.6}$; low-Ca pyroxene, $Fs_{21.1\pm0.6}Wo_{1.5\pm0.2.}$
Classification: Ordinary chondrite (L6), weathering grade W2.
Specimens: 31.43 g including a probe mount on deposit at *UNM*, Rik Villareal holds the main mass.

Aubrey Hills 34°22.838'N, 114°10.023'W
Mohave County, Arizona, United States
Found: 23 Sept 2010
Classification: Ordinary chondrite (H6)
History: The meteorite was found by Myke Steighler while hunting for meteorites on alluvial flats southwest of Standard Wash, Lake Havasu City, Arizona. The meteorite was observed amongst desert-varnished stones.
Physical characteristics: Single, smooth, 560.8 g trapezoidal stone, remant fusion crusted. Interior shows two distinct zones: upper 3/4 is light-colored and shows minor weathering (W1), and bottom quarter (presumably embedded in the ground), heavily weathered (W4). Junction between fresh and weathered portions is sharp.
Petrography: (L. Garvie, *ASU*): The unweathered part is largely recrystallied, vuggy, with a few recognizable chondrules including BO, PP, and RP (mostly <1 mm). The studied section contains one large, 2.5 mm, barred-olivine chondrule, with the bars arranged in a pentagonal shape. The matrix minerals protruding into the vugs are often euhedral. Plagioclase and chromite abundant, to 300 μm. Kamacite (<1 mm) common, with rare plessite grains (<50 μm). Troilite grains untwinned and single crystal. Minor Cl-phosphate grains to 250 μm. Olivines show sharp optical extinction.

Geochemistry: Olivine $Fa_{18.9±0.3}$ (range $Fa_{18.4-19.4}$, n=12), FeO/MnO=39.9±2.7. Low Ca pyroxene $Fs_{16.6±0.1}Wo_{1.4±0.1}$, n=6. Augite $Fs_{6.2-6.3}Wo_{45.3}$, n=2. Feldspar $An_{12.6}Or_{5.0}$, n=1.
Classification: Ordinary chondrite (H6)
Specimens: 26.03 g, one polished section and probe mount at *ASU*. Main mass held by Myke Steighler of Lake Havasu City, AZ.

Battle Mountain 40.66813°N, 117.18913°W
Humboldt County, Nevada, USA
Fell: 2012 Aug 22 06:17 (UTC)
Classification: Ordinary chondrite (L6)
History: The fall was observed in weather radar imagery from the US NEXRAD radar network, operated by the US National Weather Service. The discovery and analysis was done by Dr. Marc Fries, Galactic Analytics LLC. The KLRX radar in Elko, Nevada, is approximately 33 km from the fall site and recorded the fall in eight radar sweeps between 0619.26 UTC and 0621.03 UTC. This time span of 97 s is short compared to other meteorite falls observed by radar. This could be a result of meteorite production by a single, large breakup event, by relatively little fragmentation, or a combination of the two factors. The first stone was found on September 1, 2012, 10:50 AM (PDT) by Robert Verish; it weighs 19.25 g. As of 3 Oct 2012, at least 23 stones with a total mass of ~2.9 kg have been reported.
Physical characteristics: Most stones have a similar appearance, with a blocky shape where corners are not well-rounded; where orientation is exhibited, it is poorly developed. Regmaglypts are smaller than thumb-sized. Fusion-crust is uniformly distributed but thin, and on some sides of several stones displays a brownish patina on an otherwise uniformly black surface.
Petrography: (Alan Rubin, *UCLA*): The stone is recrystallized with 50-µm-size plagioclase grains. Olivine grains exhibit weak mosaicism; many chromite grains are extensively fractured. Troilite grains commonly polycrystalline. There has been localized melting of metal and sulfide. Several grains of metallic Cu occur inside metal at the boundaries of small (apparently melted) irregularly shaped troilite grains.
Geochemistry: Ca-pyroxene $Fs_{7.8}Wo_{43.7}$ (n=2); low-Ca pyroxene $Fs_{19.8±0.2}Wo_{1.3±0.3}$% (n=22)
Classification: Ordinary Chondrite (L6), grains are extensively fractured - moderately shocked (S4), unweathered (W0).
Specimens: An endcut of the 19.25 g stone found Sept. 1 was thin-sectioned and classified by *UCLA*. A slice from this stone of 3.85 g (20%) is held by *UCLA*. Another stone (56.5 g) was found in 3 pieces and is held by the finder, Martin Cunningham, Battle Mountain, Nevada. The finder donated one of the 3 pieces to *UCLA* which makes a total of 46 g type specimen. The second find from this fall (954 g) is held by Robert Ward, who purchased it from the finder. This stone is the largest mass recovered to date.

Blakeman 39°55'N, 101°12'W
Rawlins Co, Kansas, USA
Found: 1983
Classification: Ordinary chondrite (L4)
History: Found by Edgar Skolout, of Atwood, Kansas, at the edge of a field while checking his crops in the Spring of 1983.
Physical characteristics: Exterior ~90% fusion crusted. Interior relatively unweathered showing light and shock-darkended regions.
Petrography: (L Garvie, *ASU*) Aggregate of chondrules and chondrule fragments, with dispersed metal and troilite. Majority of chondrules ~1 mm or less: one RP to 3 mm. Range of chondrule types including BO, PO, POP, GO, and RP. Two ~1 mm chondrules show well-developed dust rims. Troilite polycrystalline and olivines show undulatory extinction and weakly developed planar fractures.
Geochemistry: $Fa_{25.2±0.8}$ (24.2-27.6, n=18), FeO/MnO=52.4±10.6; $Fs_{21.2±1.8}$ (16.8-22.2, n=8).
Classification: Ordinary chondrite, L4, S2, W1-2
Specimens: *ASU* holds the main mass of 105.9 g and two thin sections.

Camel Donga 053 30°19'S, 126°37'E

Western Australia, Australia

Found: 2008

Classification: Ordinary chondrite (LL5-6)

History: A single stone was found lying on the surface within the strewnfield of the Camel Donga eucrite in the Nullarbor Region.

Physical characteristics: The rounded, orientated and almost completely crusted stone has only minor surface weathering.

Petrography: (A. W. R. Bevan, *WAM*) The stone is a brecciated chondrite composed of highly crystalline clasts (up to 1.5 cm) with granular textures, mixed with less recrystallized clasts set in a shocked and comminuted matrix. Olivine shows mosaicism and planar features. The crystalline clasts contain large (>50µm) grains of plagioclase, some converted to maskelynite. Extensive shock veining often along clast boundaries. Metal includes kamacite, taenite and tetrataenite. Accessory minerals include troilite, chromite and chrome spinel.

Geochemistry: (A. W. R. Bevan and P. J. Downes, *WAM*) In crystalline clasts olivine mean $Fa_{31.6}$ (n=24); pyroxene $Fs_{25.7}Wo_{3.3}$, olivine mean $Fa_{26.5}$ (n=5) in one less crystalline clast; low-Ca pyroxene $Fs_{25.6}Wo_{1.9}$; plagioclase $An_{11.2}Ab_{82.2}Or_{6.6}$; kamacite Ni=6.7 Co=2.6 (all wt%); chromite Cr#86.9 #Fe90.5; and chromian spinel containing up to 8wt% Cr.

Classification: Ordinary chondrite (LL5-6); S4; W2. Camel Donga 053 is a breccia of LL5 and LL6 clasts in a comminuted matrix of the same, with some shock veins.

Specimens: Type specimen and two thin sections *WAM*

Catalina 002 25°14'S, 69°43'W

Antofagasta, Chile

Found: 2010 Oct 01

Classification: Ordinary chondrite (LL3)

History: The meteorite was found by E. Christensen in the Atacama desert, Chile.

Physical characteristics: A single brownish stone, 70% of the surface covered by fusion crust.

Petrography: (J. Gattacceca, *CEREGE*) Cut surfaces reveal closely packed chondrules of various textural types. The meteorite is brecciated with darker clasts (up to cm) set in a lighter host lithology. Mean Chondrule diameter is 820 µm (n=39). Dusty olivines are present in the darker clasts.

Geochemistry: Host lithology: olivine $Fa_{19.5}$ ($Fa_{0.5-30.1}$, PMD = 41%, n = 28); orthopyroxene $Fs_{20.7}$ ($Fs_{7.6-30.1}$, PMD = 27%, n = 8) $Wo_{1.6\pm0.8}$; Cr_2O_3 in ferroan olivine is 0.15±0.12 wt.% with a maximum 0.52 wt.% (n = 27). Dark clasts: olivine $Fa_{15.0}$ ($Fa_{0.6-29.2}$, PMD = 67%, n = 13); orthopyroxene $Fs_{12.7}$ ($Fs_{2.9-25.8}$, PMD = 43%, n = 7) $Wo_{1.2\pm1.0}$; Cr_2O_3 in ferroan olivine is 0.11±0.22 wt.% with a maximum 0.73 wt.% (n = 10). Magnetic susceptibility log χ = 3.60.

Classification: Ordinary chondrite breccia (LL3). Estimated sub-types are LL3.3 for the host lithology, LL3.2 for the clasts (all ±0.1). Weathering grade W4.

Specimens: 14 g, a polisehd section, and a thin section at *CEREGE*.

Catalina 003 25°12'16.82"S, 69°49'42.89"W

Antofagasta, Chile

Found: 1999

Classification: Iron meteorite (IVB)

History: A mass of 3180 g was found by Luc Labenne on a gravel surface in 1999 near the mine named Toro, 70 km northeast of Taltal.

Physical characteristics: The 250 × 110 × 35 mm mass has the shape of a wing with a 250 mm long sharp edge. The top is covered by sand-blasted pockmarks with small wide pits and sharp edges at the cusps that are characteristic of irons from the Atacama Desert. On the top, a few deeper depressions may reflect the weathering loss of opaque nodules.

Petrography: Very fresh, unweathered ataxite. A small section (7 × 10 mm) had one small FeS/metal inclusion, which is very fine grained (<10 µm) and has an FeS/metal ratio far below the eutectic value. No other inclusions recognized. Sample may have heat-altered rim.
Geochemistry: Composition: 7.60 mg/g Co, 166.1 mg/g Ni, 0.17 µg/g Ga, <50 µg/g Ge, 0.43 µg/g As, 27.6 µg/g Ir, and 0.070 µg/g Au. Based on the composition and structure, the iron belongs to group IVB. The nearest relative from Chile is Iquique but these are resolvable: the As, Ir and Au contents of Iquique are 0.39, 31.1 and 0.058, well outside 95% confidence limits on the data for Catalina 003.
Classification: Iron (ataxite), IVB
Specimens: 135 g type specimen, *UCLA*; main mass, *Labenne*.

Catalina 004 25°14'S, 69°43'W
Antofagasta, Chile
Found: 2010 Feb 10
Classification: Mesosiderite
History: A single stone was found on a deflation surface in the Atacama desert, Chile, by Rodrigo Hiriart in February 2010.
Physical characteristics: A single stone of 37.5 g
Petrography: (J. Gattacceca, *CEREGE*) Silicates are mainly orthopyroxene and plagioclase. No olivine was observed. A large (> cm) poykilitic pyroxene-plagioclase clast is present. Metal grains typically 100 to 500 µm, up to 1.5 mm. Modal abundances: pyroxene 55%, plagioclase 27%, FeNi metal 13%, troilite 2%, silica (tridymite) 1%, weathering products 2%. Merrillite and chromite are present. Rare rutile. Magnetic susceptibility log χ = 5.62 (χ in 10^{-9} m^3/kg).
Geochemistry: Orthopyroxene $Fs_{35.7\pm1.4}Wo_{3.3\pm0.4}$, FeO/MnO=24.6 (n=13). Plagioclase $An_{92.7}Ab_{6.9}Or_{0.4.}$ Chromite Cr/(Cr+Al)=0.82.
Classification: Mesosiderite (type A). Weathering is moderate.
Specimens: 10 g, one polished section, and one thin section are on deposit at *CEREGE*. Main mass *MMC*.

Cavour 44°13'17.38"N, 98°3'33.09"W
South Dakota, United States
Found: 1938
Classification: Ordinary chondrite (H6)
New information received from Hugh DeVries, 9 Oct 2012. A 4114 g, odd-shaped rock was found by Henry DeVries in a field on his farm in 1938. The rock sat in the farmyard until early 1941, when it was taken by Henry's wife, Grace DeVries, and his son, Hubert, for identification by Mrs. W. J. Lindsey of Rayville, South Dakota. The total mass, eventually recovered as 9 stones, is 26.21 kg. The correct coordinates of the centroid of the finds are given above. Institutional specimens include: 4830 g and 3629 g, *SI*; 3812 g, *UNM*; 3634 g, *SDSMT*; 368.6 g, *TCU*; 283 g, *FMNH*; 119.3 g, *UAb*; 84.3 g, *ASU*; 39.8 g, *NHM*.

Contis-Plage 44°05'N, 1°19'W
Aquitaine, France
Found: around 2000
Classification: Ordinary chondrite (H5)
History: Found on a slightly vegetated dune not far from the beach during a holiday walk.
Physical characteristics: Dark brown, wind-ablated stone lacking fusion crust. Some fractures contain sand grains and efflorescence of halite.
Petrography: Well defined chondrules. Feldspar grain size rarely up to 50 µm. Opaque phases are metal, troilite (polycrystalline), chromite, ilmenite, graphite (inclusion in metal). The analyzed thin section contains a single chromite-plagioclase-chondrule (0.3 mm). Metal is largely altered to maghemite-magnetite and hydroxides, troilite shows only minor alteration.

Geochemistry: Olivine has mean composition of $Fa_{18.7}$, pyroxene $Fs_{16.2}Wo_{1.3}$.
Classification: Ordinary chondrite, H5 S3 W3.
Specimens: Type specimens: 8.98 g plus one polished thin section, *NMBE*; main mass, A. Preiss, Weinfelden, Switzerland.

Dar al Gani 1058 (DaG 1058) 27.375°N, 16.184°E
Al Jufrah, Libya
Found: 1998 Sep 9
Classification: Lunar meteorite (feldspathic breccia)
History: A fairly large stone was found in 1998 September on the Dar al Gani plateau, Libya, near the find site of Dar al Gani 400.
Physical characteristics: Compact, fine grained gray stone (1815 g) with visible whitish to pale gray clasts and partially coated by orange-brown weathering products.
Petrography: (A. Irving and S. Kuehner, *UWS*) Very fine grained melt matrix breccia with larger feldspathic clasts. Minerals are anorthite, olivine, low-Ca pyroxene, more calcic pigeonite, Ti-bearing chromite, ilmenite and troilite.
Geochemistry: Olivine ($Fa_{16.0-33.9}$; FeO/MnO = 90-108), low-Ca pyroxene ($Fs_{29.8-30.3}Wo_{4.8-6.4}$, FeO/MnO = 50-57), pigeonite ($Fs_{33.7}Wo_{10.2}$; $Fs_{43.6}Wo_{7.3}$; FeO/MnO = 59-61). Bulk composition (R. Korotev, *WUSL*): mean values from INAA of subsamples are 3.0 wt.% FeO, 5.1 ppm Sc, 80 ppm Ni, 1.4 ppm La, 0.6 ppm Sm, 0.69 ppm Eu, 0.48 ppm Yb, 0.2 ppm Th.
Classification: Lunar (feldspathic breccia). This specimen was found close to Dar al Gani 400, and similarities in mineralogy and bulk composition indicate that these are likely paired.
Specimens: A total of 25 g of type material is on deposit at *UWS*. The remainder is held by an anonymous collector.

Dar al Gani 1060 (DaG 1060) 26°55.17N, 16°39.42E
Al Jufrah, Libya
Found: 2010
Classification: HED achondrite (Eucrite)
History: Found during an expedition for meteorite recovery.
Physical characteristics: Whole sample with complete crust.
Petrography: (V. Moggi Cecchi, G. Pratesi, S. Caporali, *MSP*); The thin sectin displays a brecciated eucritic texture consisting of medium-grained equigranular clasts, ranging from 1 to 8 mm in length, set in a fine-grained matrix. Medium-grained clasts dominated by plagioclase and clinopyroxene, with minor orthopyroxene. Exsolution lamellae (1 to 3 μm in width) can be distinguished in several pyroxene grains. No olivine grains have been found, while rare silica grains have been observed. Opaque phases are represented by ilmenite and ulvöspinel.
Geochemistry: Low-Ca pyroxene $Fs_{61.43}Wo_{3.0}$; Plagioclase ($An_{87.4}Or_{0.4}$), augite ($Fs_{31.6}En_{31.7}Wo_{37.7}$); pigeonite ($Fs_{53.2}En_{34.6}Wo_{12.3}$); Oxygen isotopes: (I. Franchi, R. Greenwood, *OU*) $\delta^{17}O = 1.85$, $\delta^{18}O = 4.00$, $\Delta^{17}O = 1.023$ per mil
Classification: Achondrite, polymict eucrite
Specimens: A total of 20.15 g and one thin section are on deposit at *MSP* (MSP 5197). The main mass is in deposit at *OAM*.

Dar al Gani 1061 (DaG 1061) 27°13.81N, 16°29.30E
Al Jufrah, Libya
Found: 2010
Classification: Ureilite
History: Found during an expedition for meteorite recovery.
Physical characteristics: Single fragment with partial crust

Petrography: (V. Moggi Cecchi, G. Pratesi, S. Caporali, *MSP*); The thin section displays a coarse-grained texture dominated by consisting of euhedral olivine grains, with subordinate pyroxene. Olivine crystals range up to 1.4 mm in length (mean 1.1). Triple junctions at 120° frequently occur at grain boundaries. Individual olivine and pyroxenes grains are rimmed by carbon-rich material. Opaque phases are rare and consisting of kamacite, mainly as traces at grain boundaries.
Geochemistry: Olivine $Fa_{15.6}$; Pigeonite $Fs_{14.8}Wo_{6.6}$; Cr_2O_3 in Ol = 0.73 wt.%, in Pig = 1.1 wt.%.
Classification: Achondrite (ureilite).
Specimens: A total of 20.3 g and one thin section is on deposit at *MSP* (MSP 5196). The main mass is in deposit at *OAM*.

Deakin 010 30°34.38'S, 128°33.82'E
Western Australia, Australia
Found: Before 1988
Classification: HED achondrite (Eucrite, monomict)
History: A single stone was recovered by an unknown finder at a locality in the Deakin area of the Nullarbor Region. A sample weighing 12 g was sent to the *WAM* by the late A. J. Carlisle.
Physical characteristics: A 438 g, freshly crusted, unweathered stone.
Petrography: (A.W.R. Bevan, *WAM*, and T. Kennedy, *UWA*) Brecciated eucrite comprised of clasts of coarse-grained, cumulate-textured eucrite and finer-grained basaltic textured eucrite in a matrix of comminuted pyroxene and anorthitic plagioclase feldspar. Minor minerals include ilmenite, chromite, troilite and Fe-Ni metal.
Geochemistry: (T. Kennedy, *UWA*) Pyroxene $Fs_{24.1-64.2}Wo_{1.3-46.1}$ and plagioclase $An_{85.9-96.6}Ab_{3.6-11.2}Or_{0-3.25}$.
Classification: Achondrite (Eucrite-mmict)
Specimens: Main mass in possession of the finder; end-piece 12 g and two thin sections, *WAM*.

Deming 32°13'31.72"N, 107°54'16.54"W
Luna County, New Mexico, United States
Found: 2008
Classification: Ordinary chondrite (H5)
History: Found by Marie Perez near Red Mountain on her ranch 8 miles west of Deming, New Mexico. Purchased by Michael Cottingham on April 4, 2009.
Physical characteristics: One stone, with complete weathered brown fusion crust, saw cut reveals many fine metal grains set in a brown matrix, also some larger metal or sulfide grains to 5 mm.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous distinct BO, PO and POP chondrules, 300-1000 µm. Abundant kamacite and troilite, ubiquitous fine-grained plagioclase, some phosphate, fusion crust to 200 µm thick.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{19.5\pm0.6}$, Fe/Mn=39±2, n=41; low Ca-pyroxene $Fs_{17.2\pm0.6}Wo_{1.1\pm0.9}$, Fe/Mn=24±2, n=37.
Classification: Ordinary chondrite (H5), weathering grade W1.
Specimens: 37.8 g full-slice plus a probe mount on deposit at *UNM*, Don Edwards holds the main mass.

Dhofar 1623 (Dho 1623) 18°27.102'N, 54°12.392'E
Zufar, Oman
Found: 2009 May 6
Classification: Ureilite
Geochemistry: (R. Bartoschewitz, *Bart*; P. Appel, B. Mader, *Kiel*) Olivine $Fa_{8.4-22}$, pigeonite $Fs_{17.6-18.1}Wo_{9.1-9.8}$. Kamacite Ni = 0.1-4.3, Co = 0.2-0.5, Si=0.1-3.7, P=0.1-0.8; troilite Cr=2.8-5.0, Mn=0.6 (wt%).
Classification: Ureilite
Specimens: Type specimen 20 g *Kiel*; 10 g *Bart*.

Dhofar 1629 (Dho 1629) 18.460°N, 54.058°E
Zufar, Oman
Found: 2007 Mar 2
Classification: Lunar meteorite (basalt/anorthosite)

History: Found by a prospector on March 2, 2007, and subsequently purchased by Norbert Classen at the Ensisheim Show in June 2011.
Physical characteristics: A single black stone (2.512 g) devoid of fusion crust.
Petrography: (A. Irving and S. Kuehner, *UWS*). Fine regolithic breccia composed of olivine, anorthite, augite, pigeonite, ferropigeonite, hedenbergite (associated with Cr-armalcolite), silica polymorph, fayalite, aluminous chromite, troilite and rare shred-like kamacite grains. Portions of the matrix are glassy and contain tiny trapped bubbles.
Geochemistry: Olivine ($Fa_{38.8-47.7}$, FeO/MnO = 86-106), pigeonite ($Fs_{23.7-24.5}Wo_{10.9-6.4}$, FeO/MnO = 45), ferropigeonite ($Fs_{52.5-56.5}Wo_{24.7-18.9}$, FeO/MnO = 62-64), plagioclase ($An_{93.6-94.8}Or_{0.1}$). Bulk composition (R. Korotev, *WUSL*): mean values from INAA of subsamples are 9.8 wt.% FeO, 24 ppm Sc, 320 ppm Ni, 8.1 ppm La, 3.7 ppm Sm, 0.75 ppm Eu, 3.2 ppm Yb, 1.7 ppm Th.
Classification: Lunar (mingled breccia). Although this stone is similar in bulk composition to Dhofar 925, Dhofar 960 and Dhofar 961, it differs in appearance from those stones and was found over 100 km away.
Specimens: A total of 0.52 g of material is on deposit at *UWB*. *Classen* holds the main mass.

Dhofar 1668 (Dho 1668) 18.322°N, 54.148°E
Zufar, Oman
Found: 2010 Nov
Classification: Martian meteorite (Shergottite)

History: Purchased by Patrick Cavanaugh from an anonymous finder.
Physical characteristics: A single small, brown stone (6.1 g) lacking fusion crust.
Petrography: (A. Irving and S. Kuehner, *UWS*) Small zoned olivine phenocrysts (with some secondary iron hydroxide staining) occur with prismatic grains of zoned pigeonite and maskelynite, together with accessory Fe-Ti oxides (intergrown ilmenite+magnetite), chromite, pyrrhotite, merrilite and chlorapatite. Minor secondary gypsum and calcite present.
Geochemistry: Olivine ($Fa_{41.4-64.1}$, FeO/MnO = 56-59), pigeonite ($Fs_{29.1-40.0}Wo_{9.6-11.5}$, FeO/MnO = 31-34), plagioclase ($An_{57.2-62.8}Or_{0.7-0.2}$).
Classification: Martian (shergottite, olivine-phyric). The find location, texture and mineralogy imply that this stone is paired with Dhofar 019.
Specimens: 1.25 g and one polished thin section are on deposit at *UWB*. Mr. P. Cavanaugh, Boise, Idaho, holds the main mass.

Dhofar 1669 (Dho 1669) 18.425°N, 54.158°E
Zufar, Oman
Found: 2010 Nov 19
Classification: Lunar meteorite (feldspathic breccia)

History: Found by an anonymous prospector on November 19, 2010.
Physical characteristics: A single gray stone (3.3 g) without fusion crust.
Petrography: (A Irving and S. Kuehner, *UWS*) Very fine grained breccia composed of abundant anorthite with olivine, pigeonite, subcalcic augite, Ti-rich chromite, troilite, kamacite and a Cr-Ni-Fe phase.
Geochemistry: Olivine ($Fa_{38.8-39.6}$, FeO/MnO = 106-109), pigeonite ($Fs_{28.8}Wo_{8.1}$, FeO/MnO = 50), subcalcic augite ($Fs_{17.4}Wo_{33.4}$, FeO/MnO = 50), plagioclase ($An_{96.0-97.2}Or_{0.1}$).
Classification: Lunar (feldspathic breccia).
Specimens: A total of 0.66 g of type material is on deposit at *WUSL* (0.53 g) and *UWB* (0.13 g). The main mass is held by an anonymous collector.

Dhofar 1670 (Dho 1670) 18°32'22.5"N, 54°34'24.9"E
Zufar, Oman
Found: January 2011
Classification: Ordinary chondrite (H4)

Petrography: (P. Strickland, *UAb*) Approximately 75 vol% chondrules, 15 vol% matrix, and 10 vol% metals/opaque minerals. Chondrules have an average diameter of 0.8 mm and display radial pyroxene, cryptocrystalline, and porphyritic olivine-pyroxene textures. The cryptocrystalline and radial pyroxene chondrules are well-defined while the porphyritic chondrules appear less readily delineated. Chondrule glass is absent as it has mostly transitioned into secondary feldspars observable up to 25 µm. Matrix is recrystallized and transparent with observable grain sizes. Olivine and pyroxene grains display strong undulatory extinction and also contain abundant irregular and planar fractures. There is also weak mosaic olivine and opaque shock veins, indicating moderate-strong shock (S4). Heavy oxidation of metals and sulfides, abundant Fe-oxide veinlets, and dominant rusty-staining of the specimen indicate moderate weathering (W3).

Geochemistry: (C. Herd and P. Strickland, *UAb*) Olivine $Fa_{19.1\pm1.4}$ (n=52); Low-Ca Pyroxene $Fs_{17.3\pm1.6}$ $Wo_{1.5\pm1.1}$ (n=34); Augite $Fs_{20.1\pm7.8}$ $Wo_{25.0\pm5.5}$ (n=4).

Classification: Ordinary chondrite (H4). Classified based on average and standard deviation of Fa and Fs content in olivine and low-Ca pyroxene respectively.

Specimens: 27.0 g type specimen, including polished thin section, are on deposit at *UAb*. Main mass at *SQU*.

Dhofar 1671 (Dho 1671) 18°52'10.5"N, 54°13'46.4"E
Zufar, Oman
Found: Jan 2011
Classification: Carbonaceous chondrite (CV3)

Petrography: (P. Strickland, *UAb*). Approximately 45 vol% chondrules, 40 vol% matrix, 8 vol% metals/opaques, 5 vol% subhedral-euhedral olivine grains, and 2 vol% CAIs + AOAs. Chondrules (~1 mm average diameter) are dominantly porphyritic but also display barred olivine, cryptocrystalline and radial pyroxene textures. Chondrule mineralogy consists of olivine, orthopyroxene, and Ca-pyroxene; glass appears to be absent or altered. Most chondrules consisting of compositionally zoned olivine grains are surrounded by fine-grained accretionary rims, however there are some that display a multi-layered rim consisting of a fine-grained accretionary rim and a Fe-Ni metal rim. A CAI, found within the forsterite core of a zoned euhedral olivine, is composed of fassaitic pyroxene and plagioclase. Irregular fractures, minor undulatory extinction, and very rare planar fractures indicate weak shock deformation. Very minor rusty staining and the lack of visible oxidation of metals indicates low weathering.

Geochemistry: (C. Herd and P. Strickland, *UAb*) Olivine $Fa_{20.6\pm14.9}$ (n=115); low-Ca pyroxene $Fs_{9.4\pm6.9}Wo_{2.8\pm2.6}$ (n=17); CAI Plagioclase $Ab_{64}An_{34}Or_{2}$; fassaite (all wt%) SiO_2=47.0, TiO_2=1.07, Al_2O_3=13.5, FeO=0.22, MgO=15.0, CaO=22.0.

Classification: Carbonaceous chondrite (CV), Type 3, reduced subgroup. Classified based on petrographic and geochemical data relative to other known CV chondrites.

Specimens: 23.9 g type specimen, including polished thin section, are on deposit at *UAb*. Remainder at *SQU*.

Dhofar 1672 (Dho 1672) 18°43'56.8"N, 54°22'45.7"E
Zufar, Oman
Found: January 2011
Classification: Ordinary chondrite (L4)

Petrography: (P. Strickland, *UAb*) Approximately 80 vol% chondrules, 15 vol% matrix, and <5 vol% metals/opaques. Chondrules have an average diameter of 1 mm and display porphyritic and some radial pyroxene textures. Most chondrules are readily delineated with the exception of a few well-defined radial pyroxenes. Most of the chondrule glass is absent due to the presence of secondary feldspars <45 µm,

however there are still minor amounts of devitrified glass present. Matrix is recrystallized, transparent, and relatively coarse. Olivine and pyroxene grains contain irregular fractures, planar fractures, undulatory extinction, and some melt pockets consisting of multiple FeNi droplets <10 µm. Strongly mosaic olivine is also present. Plagioclase has mostly undergone transition to maskelynite (S5). Dominant rusty staining and abundant oxide veinlets indicate moderate weathering (W3).
Geochemistry: (C. Herd and P. Strickland, *UAb*) Olivine $Fa_{24.9±1.1}$ (n=37); Low-Ca pyroxene $Fs_{22.2±1.9}Wo_{2.2±1.6}$ (n=46); Augite $Fs_{13.9±4.9}Wo_{33.9±12.0}$ (n=11).
Classification: Ordinary chondrite (L4). Classified based on average and standard deviation of Fa and Fs content in olivine and low-Ca pyroxene, respectively.
Specimens: 3.3 g type specimen, including polished thin section, are on deposit at *UAb*. Remainder at *SQU*.

Dhofar 1673 (Dho 1673) 18°42'40.4"N, 54°9'37.1"E
Zufar, Oman
Found: Jan 2011
Classification: Lunar meteorite (feldspathic breccia)
Petrography: (P. Strickland, *UAb*) Dominated by ferroan anorthosite and less frequent gabbroic clasts embedded in two distinct matrices. Olivine is rare and occurs in small amounts as fine grains. Ferroan anorthosite clasts are frequently seen with poikilitic pigeonite and augite, and some gabbro clasts have ophitic textures. The anorthosite clasts are embedded in a devitrified fine-grained matrix and fragment-rich feldspathic glassy impact melt matrix. A preferred orientation of clasts can be seen within these matrices. Clast sizes range from 0.05-1 mm, excluding the crystalline clasts which range up to 1.3mm. Other fragments consist of dark fine-grained impact-melt breccias and microporphyritic impact-melt breccias. High alumina, silica-poor (HASP) glass spherules range from 50 to 500 µm and seem to be mainly associated with the fine-grained matrix. Very few fractures are present, indicating low shock deformation. Minimal presence of calcite veins and oxidation indicate low weathering grade.
Geochemistry: (C. Herd and P. Strickland, *UAb*) Olivine $Fa_{47.3±6.6}$ (n=10); low-Ca pyroxene $Fs_{43.3±4.6}Wo_{31.2±7.7}$ (n=16); augite $Fs_{40.2±11.1}Wo_{31.2±7.7}$ (n=27); plagioclase $An_{96.2±1.2}$ (n=29); Ti-Cr-Spinel (all wt%) TiO_2=21.6, Al_2O_3=3.92, Cr_2O_3=20.0, FeO=50.1, MgO= 1.6; HASP Glass (all wt%) SiO_2=39.9-45.6, Al_2O_3=27.5-34.0.
Classification: Achondrite, Lunar Feldspathic Regolith Breccia. Classified as a regolith breccia rather than a fragmental breccia based on the presence of HASP glass spherules, as was observed in the mature regolith breccia QUE 93069 (Warren et al., 2005).
Specimens: 7.1 g type specimen, including polished thin section, are on deposit at *UAb*. Remainder at *SQU*.

Dhofar 1675 (Dho 1675) 18°15.54'N, 54°1.768'E
Zufar, Oman
Found: 2004
Classification: HED achondrite (Eucrite, polymict)
Physical characteristics: A greenish-brown stone lacking fusion crust was found in 2004 on the desert plain in the Dhofar region.
Petrography: (Ansgar Greshake, *MNB*) The meteorite is dominated by large Ca-rich feldspar (maskelynite) and brownish pyroxene typically showing fine exsolution lamellae. Minor phases are chromite and silica polymorph. Constituent mineral phases display strong shock effects, e.g. feldspar is converted into maskelynite and pyroxene shows undulatory extinction and intense twinning. Shock veins and melt fragments are found throughout the specimen. The meteorite also contains small clasts with basaltic texture. The meteorite has a low degree of weathering.
Geochemistry: Ca-rich pyroxene is $Fs_{22.4-26.1}Wo_{41.1-45.1}$, FeO/MnO=31; Ca-poor pyroxene $Fs_{54.7-57.8}Wo_{1.8-3.4}$, FeO/MnO=32; plagioclase is $An_{82.9-91.2}$.
Classification: HED achondrite (eucrite-pmict)

El Médano 056 24°51'S, 70°32'W
Antofagasta, Chile
Found: 2011 Apr 6
Classification: Carbonaceous chondrite (CK5)
History: A single stone was found on a deflation surface in the Atacama desert, Chile, by Rodrigo Martinez in April 2011.
Physical characteristics: A single stone of 180 g entirely covered by matte fusion crust. The interior has a black color.
Petrography: (J. Gattacceca, *CEREGE*) Recrystallized texture with chondrules. Abundant olivine, pyroxene, plagioclase. Opaque phases are mainly magnetite and sulfides.
Geochemistry: Olivine and pyroxene are equilibrated. Olivine $Fa_{30±1.1}$ has low MnO content (mean FeO/MnO=103). low-Ca pyroxene $Fs_{24.9±0.1}$, $Wo_{0.7±0.1}$, Ca-pyroxene $Fs_{10.8}Wo_{44.4}$. All silicates contain NiO: olivine mean NiO 0.77 wt.%, low Ca-pyroxene mean NiO 0.17 wt.%, Ca-pyroxene mean NiO 0.55 wt.%. Magnetite Cr_2O_3=3.9 wt%, Al_2O_3=0.48wt%, NiO=0.22 wt%. Magnetic susceptibility log χ = 4.51 (χ in 10^{-9} m^3/kg).
Classification: Carbonaceous chondrite (CK5). Low degree of weathering.
Specimens: 20 g and one polished section on deposit at *CEREGE*. Main mass with *MMC*.

Elizabeth 42.318°N, 90.221°W
Illinois, USA
Found: 1950s
Classification: Iron meteorite (IAB, ungrouped)
History: The specimen was purchased by an anonymous collector in August 2010 at an estate sale in Elizabeth, Illinois, with an assortment of other unrelated artifacts. The deceased original owner reportedly found it on his local farm in the 1950s.
Physical characteristics: An irregular mass (732 g) with brown weathering patina on most surfaces, except where some hacksaw cuts had been made to reveal the silvery metallic interior. Acid-etched interior surfaces exhibit an oriented intergrowth texture of silver metal and black cohenite-rich regions.
Petrography: A. Irving and S. Kuehner, *UWS*) Predominantly kamacite with accessory schreibersite and taenite (as "wispy" grains), plus fairly abundant elongate ovoid regions (up to 3 mm long by 1 mm wide) composed of cohenite + low-Ni kamacite + minor low-Ni taenite, which show preferred alignment in several directions. No Widmanstätten pattern was revealed with an iron chloride etch, but the cohenite-rich regions show distinctly as black, partly porous objects.
Geochemistry: Trace elements (G. Chen and C. Herd, *UAb*) Analysis of a 4 gram portion by ICP-MS using North Chile as internal standard gave: Ni=76.0, Co=5.2 (both mg/g); Cr=13, Cu=170, Ga=93.5, Ge=335, As=6.2, Ir=2.1, Pt=6.4, Au=1.44 (µg/g), Sb =370, Re=200 (both ng/g).
Classification: Iron meteorite (IAB, ungrouped). Chemical data comparisons for possible matches to regional and other common irons were inconclusive.
Specimens: A total of 31.5 g of material is reposited with *PSF*. The remaining mass remains with the present owner.

Fairburn 43.603°N, 103.026° W
Custer County, South Dakota, USA
Found: 1907
Classification: Iron meteorite (IAB, ungrouped)
History: Found in 1907 by Otis Roberts in a railroad car transporting gravel for ballast quarried from terrace deposits of Pleistocene age on the west side of the Cheyenne River in Custer County, southeast of Rapid City, South Dakota. The original 445 g mass described by Victor Ziegler was in the collection of the South Dakota School of Mines. In 1982 a 56 g portion was purchased by James M. DuPont, on which studies were conducted from 2004 to 2012.

Physical characteristics: A smooth, rounded ovoid silvery mass (445 g) with thin weathering patina and a specific gravity of 7.306.
Petrography: (G. Jerman, *MSFC*) The specimen is composed mostly of kamacite with some taenite and plessite. Some globular and ribbon-like schreibersite is present, but no silicates, sulfides or carbides were found. Kamacite bandwidth 1.34 mm (range 0.37-1.96, n=18).
Geochemistry: Trace elements (G. Chen and C. Herd, *UAb*) Analysis of a 3.1 g portion by ICP-MS using North Chile as internal standard gave: Ni=78.8, Co=5.3 (both mg/g); Cr=17, Cu=132, Ga=76.5, Ge=255, As=6.1, Ir=2.3; Pt=5.2, Au=1.49 (all µg/g), Sb=420, Re=220 (both ng/g).
Classification: Iron meteorite (IAB, ungrouped). Chemical data comparisons for possible matches to regional and other common irons were inconclusive.
Specimens: A total of 52 g is on deposit as part of the *DuPont* Collection owned by *PSF*.

Frontier Mountain 09008 (FRO 09008) 72°57.181'S, 160°27.583'E
Antarctica, Antarctica
Found: 9 Dec 2009
Classification: Ordinary chondrite (L3)
History: Meteorite recovered by L. Folco and P. Rochette during the XXV PNRA expedition.
Physical characteristics: Abundant inter-chondrule impact melt; average chondrule size 770 ± 350 µm; metal content 4 vol%; mineral chemistry based on EPMA (22 olivine cores and 24 low-Ca pyroxene cores).

Frontier Mountain 09013 (FRO 09013) 72°57.167'S, 160°28.342'E
Antarctica, Antarctica
Found: 9 Dec 2009
Classification: Ordinary chondrite (L3)
History: Meteorite recovered by L. Folco and P. Rochette during the XXV PNRA expedition.
Petrography: Average chondrule size: 600 ± 200 µm; metal content 6 vol%; mineral chemistry based on EPMA (25 olivine cores and 26 low-Ca pyroxene cores)

Hart 34.377182°N, 102.116719°W
Castro County, Texas, USA
Found: 2010 March
Classification: Carbonaceous chondrite (CK3)
History: In March 2010, a field worker found a dense stone beside a road located 0.25 mile from the town of Hart. The specimen was purchased by Jason Phillips in July 2012.
Physical characteristics: A single, large brownish stone weighing 966 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) Separated, medium-sized chondrules and rare, small CAIs occur within a fairly altered, deep reddish-brown matrix. Discrete grains of Cr-magnetite are present in PO chondrules. One CAI (diameter 150 µm) is composed of gehlenite + spinel + perovskite with a rim containing andradite garnet; a separate large grain of gehlenite was found. The matrix contains Cr-magnetite and minor Ni-poor kamacite (some grains rimmed by magnetite), as well as secondary iron hydoxides. Most olivine and pyroxene are very magnesian, but more ferroan grains are present in the matrix.
Geochemistry: Olivine ($Fa_{0.9-50.2}$; Cr_2O_3 = 0.19-0.21 wt.%), orthopyroxene ($Fs_{0.8-16.2}Wo_{0.8-1.2}$), magnesian pigeonite ($Fs_{0.9}Wo_{20.7}$), subcalcic diopside ($Fs_{2.1}Wo_{34.8}$), diopside ($Fs_{0.6}Wo_{44.9}$), Al-Ti-rich diopside ($Fs_{0.4}Wo_{55.1}$; TiO_2 = 1.2 wt.%, Al_2O_3 = 9.6 wt.%).
Classification: Carbonaceous chondrite (CK3, S2, W2/3).
Specimens: A total of 20.96 g of sample and one polished thin section are on deposit at *UWB*. The main mass is held by Mr. J. Phillips.

Ischgl 47°1.58'N, 10°16.40'E

Tirol, Austria
Found: 1976 June
Classification: Ordinary chondrite (LL6)

History: A single black stone was found by Josef Pfefferle on a mountain road near the town of Ischgl, Austria, in June 1976, while he was clearing the remnants of a snow avalanche. According to the finder, the stone had apparently fallen out of the snow and was lying in the middle of the road. He recognized the unusual appearance of the rock and suspected that it might be a meteorite. However, it was not until 2008 that he brought the stone to the University of Innsbruck where its meteoritic nature was confirmed. In 2011, the meteorite was purchased from the finder by the *NHMV*.
Physical characteristics: Single 710 g grayish-black, fresh fusion crusted stone with some well-defined regmaglypts. A broken face (~8 × 5 cm) exhibits a light-gray breccia with few metallic grains.
Petrography: (J. Konzett, *UInns*; F. Brandstätter, *NHMV*). Thin section shows a strongly recrystallized matrix with a few indistinct chondrules. Plagoiclase (50-100 µm in size) shows polysynthetic twinning.
Geochemistry: Olivine $Fa_{28.9\pm0.4}$, n=19; low-Ca pyroxene $Fs_{23.8\pm0.8}Wo_{2.1\pm0.3}$, n=28.
Classification: (LL6), S3, W0
Specimens: The main mass (710 g) is deposited as the type specimen at *NHMV*. One thin section is deposited at *UInns*.

Jiddat al Harasis 619 (JaH 619) 19°19.575'N, 55°21.954'E
Zufar, Oman
Found: 16 Feb 2009
Classification: Carbonaceous chondrite (CO3)

History: A single stone was found during a search for meteorites by U. Eggenberger, E. Gnos, E. Janots, F. Zurfluh.
Physical characteristics: Irregularly shaped stone partially covered by fusion crust, mass of 14.54 g.
Petrography: (B. Hofmann, *NMBE*, F. Zurfluh, E. Gnos, *MHNGE*): Chondrules with a typical size of 0.2 mm in fine-grained matrix containing magnetite. Refractory inclusions (dominantly gehlenite-rich) are common. Petrographic grade as determined by cathodoluminescence colors is 3.2. There is no significant secondary Fe-enrichment of Mg-poor silicates. Shock grade S1.
Geochemistry: Olivine compositions are $Fa_{0.7\text{-}38.6}$, mean $Fa_{12.5}$, median $Fa_{2.9}$ (n=32), pyroxene compositions are $Fs_{0.9\text{-}44.6}Wo_{0.3\text{-}3.2}$, mean $Fs_{8.9}Wo_{1.9}$, median $Fs_{3.5}Wo_{2.0}$ (n=14). Oxygen isotopes (I.A. Franchi and R.C. Greenwood, *OU*): Analyses of a bulk sample yielded $\delta^{17}O$ = -3.13, $\delta^{18}O$ = 1.00, and $\Delta^{17}O$ = -3.66 per mil. These values plot on the CCAM line within the CV and CK fields, but also close to another CO (NWA 5247).
Classification: Based on texture and mineralogy this is a CO3.2 carbonaceous chondrite. The oxygen isotopic composition would more likely indicate CV or CK, but these types can be excluded based small size of chondrules.
Specimens: All at *NMBE*.

Jiddat al Harasis 659 (JaH 659) 19°57'4.3"N, 56°19'36.7"E
Al Wusta, Oman
Found: Jan 2011
Classification: Ordinary chondrite (L3.6)

Petrography: (P. Strickland, *UAb*). Approximately 80 vol% chondrules, 15 vol% matrix, and 5 vol% metals/opaque minerals. Chondrules are well defined with an average diameter of 0.5 mm and display cryptocrystalline, radial pyroxene, barred olivine, and porphyritic olivine-pyroxene textures. The chondrule glass is devitrified and occurs in variable abundances. Olivine and pyroxene grains display irregular fractures, undulatory extinction, planar fractures, clinoenstatite lamellae in low-Ca pyroxene, and weak mosaic olivine indicating moderate shock (S4). Common Fe-oxide veinlets, oxidized metal rims and complete rusty-staining indicate moderate weathering (W3).

Geochemistry: (C. Herd and P. Strickland, *UAb*) Olivine $Fa_{22.9\pm5.8}$ (n=52); low-Ca Pyroxene $Fs_{18.9\pm6.5}Wo_{0.8\pm0.7}$ (n=40); augite $Fs_{11.3\pm2.7}Wo_{32.1\pm8.4}$ (n=4).
Classification: Ordinary chondrite (L3.6). Classified based on average and standard deviation of Fa and Fs content in olivine and low-Ca pyroxene respectively.
Specimens: 29.2 g type specimen, including polished thin section, are on deposit at *UAb*. Main mass at *SQU*.

Karavannoe 57°46.87'N, 47°40.78'E
Russia
Found: 1960s
Classification: Pallasite (Eagle Station group)
History: One stone was found by Sergei Blednykh and Aleksander Blednykh at Karavannoe village (Tuzhinsky region, Kirovsky district, Russia). The stone was known since the 1960s, but was only recognized as a meteorite 28 Sep 2010.
Physical characteristics: The meteorite is a 30-40 cm brown stone of irregular shape covered in an ~1 cm thick oxide shell.
Petrography: (C. A. Lorenz, *Vernad*) Meteorite shows coarse-grained greenish-yellow olivine enclosed in Fe,Ni metal matrix. Olivine grains are fractured, the cracks are filled by weathering products. Olivine contains small grains of chromite, pyroxene, and FeNi metal. Accessory minerals are pyroxene, chromite, troilite, phosphates, and schreibersite.
Geochemistry: (N.N. Kononkova, *Vernad*; S.E. Borisovsky, *IGEM*): Olivine $Fa_{19.7}$ (Fe/Mn=96.8 at%); pyroxene $Fs_{16.8}$ $Wo_{1.4}$ (Fe/Mn=54.1 at%). Bulk Ni content in Fe,Ni metal, measured by XRF, is 14 wt% (I.A. Roshchina, *Vernad*). Oxygen isotopic composition of olivine: (I. A. Franchi, *OU*): $\delta^{17}O$ = -6.25; $\delta^{18}O$ = -2.642, $\Delta^{17}O$ = -4.878 (all per mil).
Classification: Pallasite (Eagle Station grouplet)
Specimens: The type specimens (32.45 kg slab, 0.24 kg piece) and two polished sections are on deposit at *Vernad*. The finder holds the main mass.

Ksar Ghilane 010 (KG 010) 32.806°N, 09.833°E
Quibili, Tunisia
Found: 2012 Apr
Classification: Ordinary chondrite (L5)
Petrography: Found by Pierre-Marie Pele in April 2012. Sparse chondrules and relatively low content of altered metal. Olivine ($Fa_{25.5-26.1}$), orthopyroxene ($Fs_{21.0-21.2}Wo_{1.2-1.5}$), augite ($Fs_{8.4}Wo_{44.1}$). Ordinary chondrite (L5).

Ksar Ghilane 011 (KG 011) 32.891°N, 09.913°E
Quibili, Tunisia
Found: 2012 Apr
Classification: Ordinary chondrite (L4)
Petrography: Found by Pierre-Marie Pele in April 2012. Well-formed chondrules and relatively low content of altered metal. Olivine ($Fa_{25.1-25.4}$), orthopyroxene ($Fs_{21.1-21.2}Wo_{0.7}$), subcalcic augite ($Fs_{12.6}Wo_{29.7}$). Ordinary chondrite (L4).

Kumtag 002 41°30'N, 93°33'E
Xinjiang, China
Found: Nov 2011
Classification: Ordinary chondrite (L4)
History: In November, 2011, a meteorite was found in the Tuzileike Desert when geologist Jianmin Wang was working with the geological survey. Since then Mr. Wang and his colleagues have searched for

meteorites in an ~60 km^2 area. In 2012, other hunters joined in the search collecting more than 270 kg of meteorites.
Physical characteristics: (B. Miao, H. Chen, Z. Xia, L. Xie, *GUT*): A 557 g tortoise-shaped stone (10 × 10 × 4 cm), with a flat side. The sample is dark brown and lacks fusion crust.
Petrography: (B. Miao, H. Chen, Z. Xia, L. Xie, *GUT*): The interior shows chondritic texture and well-developed chondrules, including porphyritic olivine and pyroxene, barred olivine chondrules, and radiating pyroxene types. The matrix is recrystallized. Most metal and troilite grains are weathered. Olivine exhibits undulatory extinction and minerals show irregular fractures.
Geochemistry: Olivine $Fa_{24.3\pm0.8}$, n = 36; low-Ca pyroxene $Fs_{20.4\pm0.7}Wo_{1.1\pm0.6}$, n = 31.
Classification: Ordinary chondrite (L4); S2, W3.
Specimens: One 557 g sample, one thin section are on deposited at *GUT*.

Kumtag 003 41°30'N, 93°33'E
Xinjiang, China
Found: November 2011
Classification: Ordinary chondrite (H5)
History: In November, 2011, a meteorite was found in the Tuzileike Desert when a geologist, Jianmin Wang, was working in the geological survey. Since then on, Mr. Wang and his colleagues have been searched for meteorites in an ~60 km^2 region. In 2012 other hunters have also searched for meteorites, finding more than 270 kg.
Physical characteristics: (S. Hu, *IGGCAS*): 120 g irregular shaped (5 × 4 × 3 cm) rock lacking fusion crust.
Petrography: (S. Hu, *IGGCAS*): Recognizable chondrule types include porphyritic and barred olivine/pyroxene. Matrix recrystallized. Metal and troilite are relatively fresh, sometimes with thin weathering rims.
Geochemistry: Olivine $Fa_{19.2\pm0.9}$, n=5; low-Ca pyroxene $Fs_{16.7\pm0.6}$, n=5.
Classification: Ordinary chondrite (H5), S2, W1.
Specimens: One 120 g piece and one thin section are deposited at *IGGCAS*.

Las Cruces 23°22'59.36"S, 70°35'9.77"W
Antofagasta, Chile
Found: 2001
Classification: Iron, IIIAB
History: A mass of 528 g was found by Jim Labenne in a place named Las Cruces, 16 km east of the Antofagasta Airport.
Physical characteristics: The mass has the average dimension of 100 × 50 × 30 mm. The top is covered by pockmarks, with small wide pits with sharp ridges characteristic of irons from the Atacama Desert. On the top one large depression clearly indicates the former location of a large troilite nodule.
Petrography: Small section 30 × 25 mm examined. Medium octahedrite with bandwidth 0.8 mm. Few inclusions. No FeS recognized. Small schreibersites inside kamacite bands near band intersections, two larger (1-3 mm) outside kamacite. Little weathering but no heat altered zone recognized.
Geochemistry: Composition: 5.32 mg/g Co, 91.5 mg/g Ni, 20.6 µg/g Ga, <50 µg/g Ge, 12.5 µg/g As, 0.177 µg/g Ir, and 1.459 µg/g Au. Based on the composition and structure, the iron belongs to group IIIAB. Las Cruces is resolved from Los Reyes (Ir = 0.128 µg/g) in terms of Ir but cannot be compositionally resolved from the observed fall Juromenha.
Classification: Iron IIIAB.

Lixian 29°51.1'N, 111°35.9'E
Hunan, China
Found: 2005 Apr
Classification: Iron meteorite (IIAB)

History: A farmer discovered a rusted iron mass while plowing his field in Shunquiao village in April 2005. Three years later a specimen was provided to Bartoschewitz for classification.
Physical characteristics: One rusty iron mass of about 43 kg.
Petrography: The meteorite shows a coarse Widmannstätten pattern with bandwidth of 10-25 mm. Contains troilite and troilite-graphite inclusions. Kamacite presents Neumann lines and high density of rhabdite precipitates, while schreibersite often occurs at kamacite boundaries.
Geochemistry: The composition (C. Meyer, H. Becker, *FUB*, by ICP-MS) of the metal is Co = 0.47, Ni = 5.40 (both in weight-%); Cu = 132.3, Ga = 60, W = 1.7, Ir = 0.46, Pt = 14.86 (all in ppm). XRF (R. Bartoschewitz, *Bart*) shows Co = 0.45, Ni = 6.06 Ni (both in wt%).
Classification: Iron (IIAB, coarsest octahedrite).
Specimens: Type specimens 19 g *Kiel* and 1.1 g *FUB*, 5 g *Bart*

Lone Island Lake 50°0.574'N, 95°23.122'W
Manitoba, Canada
Found: 2005
Classification: Iron meteorite (IAB-sLL)
History: The meteorite was found on a gravel bar of the Whiteshell River just before it empties into Lone Island Lake, in the Whiteshell Provincial Park.
Physical characteristics: (S. Kissin, *LHU*) Consists of 14 pieces weighing 4.8 kg. The exterior is smooth and highly weathered with rusty areas occuring along cracks. The interior displays pervasive oxidation.
Petrography: (S. Kissin, *LHU*) Cut and polished surfaces display three prominent lamellae directions at ~60° intersection angles. There is also a fourth direction present as large, irregular kamacite patches. Average kamacite bandwidth is 1.16±0.28 mm (n=15). Kamacite lamellae are polygonalized with a l:w ratio of 15:1 and have developed secondary fracturing in areas of intense oxidation. Neumann bands are present but somewhat obscured by oxidation. Taenite lamellae are narrow and often well preserved. Rhabdites are present within the kamacite, but are not abundant as they seem to have been destroyed by oxidation in some areas. No troilite found.
Geochemistry: (S. Kissin, *LHU*) Ni=76.2, Co=4.25 (both mg/g); As=15.9, Au=1.77, Cr=71, Cu=142, Ga=80, Ge=400, Ir=1.84, Pt=9.3, Sb=0.29, W=0.81 (all μg/g); Re=170 (ng/g). Obtained by neutron activation analyses.
Classification: (S. Kissin, *LHU*) Iron meteorite (IAB-sLL), medium octahedrite near the upper limit of this structural classification.
Specimens: Three specimens totaling 511.5 g at *UAb*, remaining specimens with the finder.

New York
Find location unknown
Purchased: May 2007
Classification: Iron, IIIAB
History: Meteorite was purchased by Labenne from Mark Grubb, who reported that his grandfather purchased the meteorite in about 1965 from the captain of a fishing vessel in New York. The Cape York IIIAB irons have a wide range in compositions (e.g., Ir ranges from 3.0 to 5.7 mg/g) and the composition of this meteorite, with the exception of slightly low As, falls near the high-Ir end of the range. It is possible that this is a Cape York iron, possibly purchased from an Inuit by the ship captain.
Physical characteristics: The mass has the average dimension of 90 × 110 × 80 mm. In the past a large piece was removed and the cut surface polished and etched; a thick patina of rust has developed on this surface.
Petrography: Small section (10 × 12 mm) examined; bandwidth not well defined, 0.90±2 mm. Meteorite weathered on exterior; Widmanstätten pattern is visible in a region 3 mm thick. Plessite mottled, distorted and recrystallized. One small 0.7 × 3.3 mm FeS grain has a metal band crossing it; band has thin FeS stripes oriented parallel to its long axis. No schreibersite was recognized. Meteorite experienced preterrestrial shock followed by annealing and recrystallization.

Geochemistry: Composition: 4.99 mg/g Co, 76.6 mg/g Ni, 18.4 µg/g Ga, <50 µg/g Ge, 3.73 µg/g As, 5.29 µg/g Ir, and 0.594 µg/g Au. Based on the composition and structure, the iron belongs to group IIIAB. The only close relative may be Toubil River. However, only the 20% low As content is inconsistent with it being part of the Cape York compositional trend described by Esbensen et al. (1982); it may be a slightly deviant member of the Cape York shower.

Northwest Africa 1685 (NWA 1685)
(Northwest Africa)
Purchased: 2002
Classification: Ordinary chondrite (LL4)

History: Purchased by D. Bessey in 2002 from Morocco in two lots. Fragments were sold under the name "BL" to a number of collectors.

Physical characteristics: Total known mass >11.56 kg in multiple pieces. Individuals have a characteristic glossy, desert-polished black fusion crust. Broken and cut surfaces often show a breccia with angular igneous clasts to 2 cm set in a chondritic matrix (igneous clasts ~20% of volume). Weathering is minor, limited to Fe-oxides developed in association with the fusion crust and with some Fe,Ni metal blebs. Bulk physical properties: Grain density 3.42 ± 0.03 g/cm3 (n=3 pieces); Bulk density 3.15 ± 0.03 g/cm3 (n=4); calculated porosity 7.9%. Magnetic susceptibility of four pieces averages log χ = 4.10.

Petrography: (P. McCausland, *UWO*) Two polished thin sections with an area of 4 cm^2 show a large (2 cm) and several small (~mm) subangular metal-poor igneous clasts in a matrix of chondrules and chondrule fragments to 2 mm, as well as minor Fe,Ni and troilite grains <1 mm. Igneous clasts have sharp contacts with the chondritic matrix. The clasts consist of 40-50% fresh, subhedral ~0.1 mm olivine grains set in 55-45% symplectic to skeletal low-Ca pyroxene in a feldspathic glass with accessory chromite; also present within clasts are relict mm olivine grains, which retain inclusions of low-Ca pyroxene and troilite and that host ~0.2 mm inclusion-free olivine rims. Clasts have sinuous fractures and irregular patches filled with glass (dark in cross-polarized light). The fractures and associated melt patches sharply offset clast olivine grains and also contain partially resorbed clast olivine and pyroxene-feldspar symplectite; they do not extend beyond the igneous clasts.

Geochemistry: (R. Flemming, P. McCausland *UWO*; UCalgary) Chondritic matrix: olivine ($Fa_{28.4\pm0.6}$ n=25; FeO/MnO = 57.5±5.0); low-Ca pyroxene ($Fs_{23.0\pm0.6}Wo_{2.4\pm0.8}$, n=22; FeO/MnO = 32.7±3.4); high-Ca pyroxene ($Fs_{9.1\pm1.2}Wo_{43.9\pm0.6}$, n=3). Igneous clast: olivine ($Fa_{27.1\pm0.4}$ n=49; FeO/MnO = 53.5±4.7); relict olivine ($Fa_{27.8\pm0.5}$ n=7); low-Ca pyroxene ($Fs_{22.2\pm0.6}Wo_{2.4\pm0.5}$, n=42; FeO/MnO = 31.4±2.6); melt veins of ~pyroxene composition ($Fs_{26.4\pm0.6}Wo_{2.7\pm0.6}$, n=8; with ~5% total Na, K, Al).

Classification: NWA 1685 is a polymict breccia consisting of an LL chondrite matrix and metal-poor igneous clasts, which have experienced variable to significant shock. The similar olivine and pyroxene mineral compositions between the igneous clasts and the host LL chondrite suggest that the clasts are a melt product derived from the LL chondrite host, with selective loss of Fe, Ni, S. A subtle but sharp drop in olivine Fe content visible in BSE images across contacts between matrix and clast olivine implies that the overall bulk meteorite cannot be equilibrated, despite the apparent uniformity of chondrule olivine compositions. The igneous clasts have a similar appearance to those of LL4 Yamato 74442, and to a lesser extent with the igneous clasts in LL chondrites Krähenberg and Bhola.

Specimens: A type specimen (28.64 g) and two polished thin sections are on deposit at *UWO*. Main masses: 1640 g, *Gregory*; 624 g R. Jirasek.

Northwest Africa 2202 (NWA 2202)
(Northwest Africa)
Purchased: 2004
Classification: HED achondrite (Eucrite, polymict)

History: Purchased by D. Gregory in 2004 from D. Bessey, who obtained it from Morocco that year.

Physical characteristics: A 140 g individual with a dark fusion crust covering 2/3 of the meteorite and a grey, brecciated interior. Bulk physical properties (P. McCausland, *UWO*): An 11.2 g slab has a grain density of 3.19 g/cm^3, a bulk density of 2.89 g/cm^3 (giving calculated porosity of 9.5%) and magnetic susceptibility log χ = 3.20.
Petrography: (P. McCausland and R. Flemming, *UWO*). A 2.7 cm^2 polished thin section shows a variety of subangular brecciated lithic and crystalline clasts ranging up to 3 mm diameter, set in a matrix of sub-0.1 mm plagioclase, Ca-rich pyroxene, Ca-poor pyroxene, accessory Fe-sulphide, chromite, ilmenite and interstitial Fe,Ni metal. Pyroxene commonly exhibit planar deformation features and mottled-to-mosaic extinction in crossed polarizers. Lithic clasts have a dark, fine-grained matrix that by SEM-EDX has a similar composition to the host meteorite matrix. The lithic clasts contain low-Ca, Mg-rich pyroxene megacrysts, one of which is mm-sized and zoned to Fe-rich rims. Carbonate weathering veins to 0.1 mm width are common, lying alongside of and often completely enclosing the lithic clasts, separating them from matrix.
Geochemistry: (R. Flemming, J. Renaud, *UWO*) Ca-rich pyroxene ($Fs_{38.4\pm5.4}Wo_{28.4\pm5.8}$, n=19; FeO/MnO = 32.4); Ca-poor pyroxene ($Fs_{53.6\pm1.3}Wo_{6.7\pm2.2}$, n=6; FeO/MnO = 30.8); Ca-poor pyroxene in dark clast ($Fs_{31.3}Wo_{6.2}$, n=2; FeO/MnO = 29.3; Fe-rich rim $Fs_{58.6}Wo_{5.2}$); feldspar in clasts ($An_{89.3\pm2.3}$, n=5); matrix feldspar ($An_{82.5\pm5.4}$, n=12).
Classification: (P. McCausland, *UWO*) Eucrite polymict breccia, moderate shock, low weathering.
Specimens: Type specimens in three fragments totaling 20 g and a polished thin section are on deposit at *UWO*. Main mass: 118 g, *Gregory*

Northwest Africa 3170 (NWA 3170)
(Northwest Africa)
Purchased: 2007 Apr
Classification: Lunar meteorite (gabbro)
History: Purchased from a Moroccan dealer in 2007 by Stefan Ralew.
Physical characteristics: A single 60 g stone consisting of large clasts of yellowish-green gabbro (containing fine, black shock veinlets) in a darker fragmental matrix.
Petrography: (A. Irving and S. Kuehner, *UWS*) Monomict breccia consisting of ferroan gabbro clasts and related debris. Predominantly composed of olivine, clinopyroxenes and anorthite with accessory fayalite, silica, ilmenite and minor K-Ba-feldspar. Symplectitic intergrowths of hedenbergite+fayalite+silica are present. No orthopyroxene found.
Geochemistry: Olivine ($Fa_{29.6-39.9}$, FeO/MnO = 82-116), pigeonite ($Fs_{42.3}Wo_{11.9}$, FeO/MnO = 79), subcalcic augite ($Fs_{28.7}Wo_{26.2}$, FeO/MnO = 57), subcalcic ferroaugite ($Fs_{64.4-78.8}Wo_{26.3-26.2}$, FeO/MnO = 78-93). Bulk composition (R. Korotev, *WUSL*): mean values from INAA of subsamples are 20.7 wt.% FeO, 40 ppm Sc, 56 ppm Co, 110 ppm Ni, 24.3 ppm La, 11.2 ppm Sm, 0.76 ppm Eu, 8.1 ppm Yb, 4.3 ppm Th.
Classification: Lunar (mare gabbro breccia). This stone is very similar in mineralogy and bulk composition to NWA 7007, and both specimens are likely paired with NWA 773.
Specimens: 12.1 g is on deposit at *UWS*. The remaining material is held by *Ralew*.

Northwest Africa 4502 (NWA 4502)
Algeria
Found: Dec 2005
Classification: Carbonaceous chondrite (CV3)
History: Purchased In 2006 by A. Aaronson.
Physical characteristics: More than 100 kg of dark stones with smooth, desert-polished surfaces. The largest piece is 22.75 kg
Petrography: (T. Bunch and J. Wittke, *NAU*) Well-defined chondrules, chondrule fragments, and refractory inclusions set in a slightly weathered matrix. CAIs are represented by Type A (a few are very large, up to 32 mm in diameter) and Type C are common, as are AOAs. Type B CAIs are low in

abundance however, melilite mantled (Type B1) and fosterite bearing type B CAIs are present. Modal analyses (vol. %): chondrules = 48; CAIs and AOAs = 14; matrix = 38.
Geochemistry: (M. S. Sapah, ANU, and A. N. Krot, *UHaw*) The meteorite matrix consists of small crystals of ferroan olivine, sulfides, magnetite, Ni-rich metal, tiny nepheline crystals, and small irregularly shaped regions of Ca,Fe-rich silicates (pyroxenes ± andradite). Matrix olivine has Fa_{48-54} and ferrosillite and wollastonite contents of matrix pyroxenes are 11-19% and 46-49% respectively. Fayalite content of chondrule olivine is Fa_{2-39}, and ferrosillite and wollasonite contents of chondrule pyroxenes are 1-2%.
Classification: (M. S. Sapah and A. N. Krot) Carbonaceous chondrite (CV3). The sample is CV oxidized. The degree of shock is S2 and the weathering degree is W1.
Specimens: >83 kg *Aaronson*, 35 kg Eric Olson, 2.9 kg *ANU*, 284.6 g *ASU*, and 26 g *NAU*.

Northwest Africa 4643 (NWA 4643)
(Northwest Africa)
Purchased: 2006
Classification: Enstatite chondrite (EL6)
History: The meteorite was found by an anonymous finder in northwest Africa and bought by the main mass holder in Erfoud, Morocco.
Physical characteristics: Two brownish fragments without fusion crust weighing together 995.3 g.
Petrography: The meteorite displays a recrystallized texture of dominantly almost pure enstatite; no chondrules found in the section studied. Sulfides and FeNi metal are heavily oxidized.
Geochemistry: Pyroxene, $Fs_{0.1-0.7.}$ The few unweathered FeNi metal shows ~0.5 wt% Si.
Classification: Enstatite chondrite (EL6); low degree of shock, high degree of weathering.
Specimens: 21.4 g plus one polished thin section are on deposit at *MNB*.

Northwest Africa 5356 (NWA 5356)
(Northwest Africa)
Purchased: March 2008
Classification: HED achondrite (Eucrite)
Petrography: (J. Roszjar and A. Bischoff, *IfP*) Specimen is composed of medium- (1-3 mm) and fine-grained areas. Fine-grained areas randomly distributed. Medium-grained areas are ophitic to subophitic and dominated by plagioclase and equilibrated pyroxenes (pigeonite, often with augit lamellae), with minor accessory phases. Fine-grained areas recrystallized and dominated by pyroxene, with minor silica and plagioclase and other accessory phases. SiO_2 laths to 3 mm are found within the fine-grained areas. Accessory minerals include ilmenite, chromite, fresh Ni-poor metal (indicating W0/1), SiO_2, troilite, and rare phosphates and zircon grains.
Geochemistry: Pyroxenes FeO/MnO of 36±3 (N=38). Feldspar composition is in the range of $An_{79-93}Or_{0-1}Ab_{7-20}$ (N=33).

Northwest Africa 5574 (NWA 5574)
(Northwest Africa)
Purchased: 2007
Classification: Ureilite
Petrography: The meteorite is dominated by large olivine clasts and less abundant pigeonite crystals. Both olivine and pigeonite show characteristic reduced rims. The meteorite contains minor amounts of flake-like graphite; diamonds are not present.

Northwest Africa 6423 (NWA 6423)
(Northwest Africa)
Purchased: 2010 Sep
Classification: Carbonaceous chondrite (CV3)

Petrography: Distributed, fairly small amoeboid, granular and some porphyritic chondrules and sparse fine grained CAI in a deep brown, very fine grained matrix (probably diamond and graphite bearing, judging from cutting difficulties and the dark color of cutting coolant water). Some chondrules have reduced rims of almost pure forsterite or enstatite.

Northwest Africa 6436 (NWA 6436)
Morocco
Found: 2009
Classification: Mesosiderite (group B2)
Petrography: Partially recrystallized orthopyroxene breccia with minor pigeonite, plagioclase, SiO_2, metal, and merrilite. Moderate weathering and low shock. Orthopyroxene, $Fs_{27.3}Wo_{2.2}$, Fe/Mn=34; pigeonite, $Fs_{45}Wo_{8}$; plagioclase, $An_{93}Or_{3}$. Mesosiderite B2 (based on the greater amount of orthopyroxene to plagioclase and low degree of recrystallization).

Northwest Africa 6477 (NWA 6477)
(Northwest Africa)
Purchased: 2010 Feb
Classification: HED achondrite (Eucrite, monomict)
Petrography: Fresh specimen with fine-grained ophitic texture. Basaltic eucrite breccia with numerous small ophitic-textured clasts and related debris (plus minor stained metal). Pyroxene compositions consistent with a monomict breccia derived from a single basaltic eucrite protolith.

Northwest Africa 6489 (NWA 6489)
(Northwest Africa)
Purchased: Jun 2010
Classification: HED achondrite (Diogenite)
History: A stone was purchased by Giorgio Tomelleri at Sainte Marie, France.
Physical characteristics: A 3.2 g angular stone with smooth faces. Surface is brown with dark weathered patches.
Petrography: (C. A. Lorenz, *Vernad*) The meteorite has brecciated texture and consists of 0.5-1.5 mm mineral clasts (80 vol%) embedded in a fine-grained clastic matrix (20 vol%). Pyroxene dominant mineral phase; olivine is minor; accessory phases include feldspar, chromite, troilite, and FeNi metal. Locally, large mineral fragments are joined by fine-grained (10 μm) aggregate of pyroxene and feldspar.
Geochemistry: (N. N. Kononkova, *Vernad*) Pyroxene $En_{75.6-81.9}Wo_{0.4-1.0}$ (Fe/Mn=25-30); olivine $Fo_{76.7-89.7}$ (Fe/Mn ranges from 46 to 30); oxygen isotope composition (I. Franchi, R. Greenwood, *OU*, Laser fluorination): $\delta^{17}O$=1.598, $\delta^{18}O$=3.504, $\Delta^{17}O$=-0.226 (all per mil).
Classification: Diogenite
Specimens: A total of 2.95 g main mass sample and one thin polished section are on deposit at *Vernad*.

Northwest Africa 6501 (NWA 6501)
Morocco/Algeria
Purchased: Feb 2009
Classification: Ordinary chondrite (L3)
Petrography: Chondrules average about 600 μm in diameter. Chondrule glass lacking. Many pyroxene grains exhibit polysynthetic twins. Possibly paired with NWA 5205.

Northwest Africa 6504 (NWA 6504)
Morocco/Algeria
Purchased: Feb 2009
Classification: Ordinary chondrite (L3)

Petrography: The rock is less recrystallized and less equilibrated than H3.8 Dhajala. Many of the low-Ca pyroxene grains have polysnthetic twins. Chondrules lack clear transparent glass. Chondrules average about 400 µm in diameter.

Northwest Africa 6508 (NWA 6508)
Morocco
Purchased: Sept 2009
Classification: Enstatite chondrite (EL3)
Petrography: The rock contains some grains of silica. The opaque phases are essentially all weathered, precluding the identification of niningerite or ferroan alabandite. Chondrules average ~500 µm in diameter, consistent with EL3; most are RP and PP types, although a few POP chondrules occur. Low degree of matrix recrystallization consistent with petrologic grade 3.

Northwest Africa 6602 (NWA 6602)
(Northwest Africa)
Purchased: 2010
Classification: HED achondrite (Howardite)
Petrography: Porous and fragile breccia, consisting of eucritic and diogenitic mineral and lithic clasts up to 5 mm, set in a fine-grained clastic matrix. Diogenitic opx clasts up to 5 mm; eucritic pyroxenes with augite exsolution lamellae. Fifteen of 25 randomly chosen low-Ca pyroxenes have Fs values between 23 and 31. The sample consists of 60 vol% diogenitic components. Plagioclase $An_{88.5\pm3.}$

Northwest Africa 6603 (NWA 6603)
(Northwest Africa)
Purchased: 2006
Classification: Carbonaceous chondrite (CV3)
Petrography: Chondrules and small CAIs set in a dark gray matrix. Opaques mostly magnetite; oxidized subgroup.

Northwest Africa 6731 (NWA 6731)
(Northwest Africa)
Purchased: 2007 Feb
Classification: HED achondrite (Eucrite, cumulate)
History: One small stone was purchased in Erfoud in February 2007
Physical characteristics: One partly crusted 13.7 g stone.
Petrography: (R. Bartoschewitz, *Bart*) Monomict breccia of subhedral pyroxene and plagioclase crystals (<1 mm) in a finer grained matrix and melt pockets. Ilmenite occurs as clusters of tiny crystals. Further accessory minerals are olivine, silica and troilite.
Geochemistry: (R. Bartoschewitz, *Bart*; P. Appel, B. Mader, *Kiel*) Ca-poor pyroxene $Fs_{52.7-60.1}Wo_{3.2-4.8}$, Ca-rich pyroxene $Fs_{29.6-60.1}Wo_{43-6.1}$, olivine $Fa_{75.1}$, feldspar $An_{71-92}Or{<}2.8$. Kamacite Ni <0.1 wt%, Co=1.1 wt%, ilmenite, troilite, and silica.
Classification: Cumulate eucrite (fresh)
Specimens: Type specimens 2.75 g *Kiel*; 1.5 g *Bart*.

Northwest Africa 6735 (NWA 6735)
(Northwest Africa)
Purchased: 2010 Apr
Classification: Ordinary chondrite (L/LL4)
Geochemistry: Breccia. $Fs_{19}Wo_{12}$, $An_{10}Or_{2.}$ Chromite Al_2O_3 = 5.2-5.8, TiO_2 = 1.8-3.0, MgO = 2.4-2.9; kamacite Ni=5.5, Co=3.2 (wt%).

Northwest Africa 6946 (NWA 6946)
(Northwest Africa)
Purchased: 2010 May
Classification: Ordinary chondrite (L6)
History: Purchased by F. Kuntz from a Moroccan dealer in May 2010.
Petrography: (A. Irving and S. Kuehner, *UWS*) Mostly recrystallized with a few indistinct chondrules.
Geochemistry: Olivine ($Fa_{24.2-25.0}$), orthopyroxene ($Fs_{20.1\pm0.0}Wo_{1.3-1.5}$), clinopyroxene ($Fs_{7.0-8.3}Wo_{45.8-44.8}$).
Classification: Ordinary chondrite (L6).
Specimens: The main mass is held by *Kuntz*. A total of 15 g of material and one polished thin section are on deposit at *PSF*.

Northwest Africa 6959 (NWA 6959)
(Northwest Africa)
Purchased: 2011 June
Classification: Rumuruti chondrite (R5)
History: Purchased in 2011 June by Greg Hupé from a Moroccan dealer at the St. Marie-aux-Mines Mineral Show.
Petrography: Sparse, small chondrules and mineral fragments set in a fine-grained matrix containing fresh sulfides (pentlandite and pyrrhotite) and chromite. Olivine and clinopyroxene are plentiful, but no orthopyroxene was found.
Geochemistry: Olivine ($Fa_{38.6-38.9}$), clinopyroxene ($Fs_{10.9-11.8}Wo_{45.4-45.2}$; Cr_2O_3 = 0.5-1.2 wt.%). Oxygen isotopes (R. Tanaka, *OkaU*): replicate analyses of acid-washed subsamples by laser fluorination gave, respectively $\delta^{17}O$ = 5.363, 5.384; $\delta^{18}O$ = 4.655, 4.566; $\Delta^{17}O$ = 2.901, 2.968 per mil).
Classification: R5 chondrite. This is an exceptionally fresh, unweathered specimen.

Northwest Africa 6962 (NWA 6962)
(Northwest Africa)
Purchased: 2011 Sep
Classification: Ungrouped achondrite
History: Purchased by Mike Farmer in 2011 September from a Moroccan dealer at the Denver Mineral Show.
Physical characteristics: A single stone (59.8 g) coated by a brown patina. The interior is mostly brownish yellow with tiny, fresh metal grains and only minor secondary staining along grain boundaries.
Petrography: (A. Irving and S. Kuehner, *UWS*) Aggregate of predominantly olivine (as equant grains) and sporadic grains of Ti-poor chromite, sparse kamacite and iron sulfide, plus interstitial regions of intergrown intermediate plagioclase, clinopyroxene and minor merrillite. Olivine grains contain small melt inclusions (composed of Na-bearing glass+chromite+Ni-free metal) and also inclusions of more Ti-rich chromite.
Geochemistry: Olivine ($Fa_{47.1-47.9}$; FeO/MnO = 67-71; CaO = 0.42-0.48 wt.%), clinopyroxene ($Fs_{15.4-20.0}Wo_{44.6-45.2}$; FeO/MnO = 40-52; Cr_2O_3 0.69-0.92 wt.%), plagioclase ($An_{21.1-31.7}Or_{0.5}$). Oxygen isotopes (R. Tanaka, *OkaU*): laser fluorination analyses on acid-washed subsamples gave, respectively $\delta^{17}O$ = 2.190, 2.191; $\delta^{18}O$ = 6.144, 6.130; $\Delta^{17}O$ = -1.041, -1.032 per mil.
Classification: Ungrouped achondrite, brachinite-like. This specimen is much more ferroan than typical brachinites and has a significantly different oxygen isotopic composition.
Specimens: A total of 12.4 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by *Farmer*.

Northwest Africa 6998 (NWA 6998)
(Northwest Africa)
Purchased: 2004
Classification: Ordinary chondrite (H4)

History: The specimen was loaned to the Royal Ontario Museum in 2002.
Physical characteristics: Dark, 85.34 g, partially fusion crusted stone, with patches of rusty brown iron staining. Weathering has exposed a melt vein to the surface. Clasts of a darker color are also visible.
Petrography: (V. Di Cecco, *ROM*) Chondrules well defined and comprise 66.5% of the sample. Matrix contains opaques and chondrule fragments. Chondrules 0.21 to 1.125 mm in diameter with an average size of 0.61 mm. Olivine dominates the sample as well as orthopyroxene. Clinopyroxene is less abundant along with kamacite. Plagioclase is often present in porphyritic chondrules. Troilite is present in lower abundances.
Geochemistry: (V. Di Cecco, *ROM*) Olivine, $Fa_{16.8±5.6}$ (n=26); low-Ca pyroxene, $Fs_{15.6±0.4}Wo_{2.9±0.8}$ (n=6); high-Ca pyroxene, $Fs_{17.6±3.7}Wo_{10.5±6.1}$ (n=7).
Classification: (V. Di Cecco, *ROM*) Ordinary Chondrite (H4, S3, W2)
Specimens: One specimen exists with a total mass of 85.39 g, which has been cut into five pieces. The largest of these pieces weighs 73.60 g. All specimens are at *ROM*.

Northwest Africa 6999 (NWA 6999)
(Northwest Africa)
Purchased: Aug 2000
Classification: Ordinary chondrite (L/LL4)
History: A 7.465 kg meteorite was purchased by David Gregory in August 2000 as part of a collection of NWA 869 strewn field material.
Physical characteristics: The meteorite is composed of heterogeneous ordinary chondrite material with no obvious brecciation. The fusion crust is generally rust-brown and variable in its degree of terrestrial weathering and thickness. Several fractures are visible through the fusion crust and are observed as shock veins. The interior is beige gray, with iron staining proximal to the fusion crust and shock veins/fractures.
Petrography: (K. van Drongelen, *ROM*) Meteorite composed of chondrules (70%), troilite (5%), Ni-Fe metal and oxides (5%) and matrix material. Chondrules show a varied degree of definition from clearly to poorly defined with no obvious preferred spatial distribution and consist of barred olivine, porphyrytic olivine, pyroxene, and olivine-pyroxene; radial pyroxene; and granular chondrules. Chondrules range from 0.5 to 6.5 mm in diameter, with an average of 1.5-2.0 mm, and are generally sub-circular in shape. Troilite and Ni-Fe metal consist of individual grains, grains within chondrules, and shock veins. The matrix (grain size <50-500 μm) ranges from easy to difficult to distinguish from chondrules and chondrule fragments. The meteorite contains shock veins and melt pockets, which are also found as a concentration in the center of the cut face (a macroscopically visible darkened area). Olivine exhibit irregular fractures, undulose extinction, and fine planar fractures.
Geochemistry: (Katrina van Drongelen, *ROM*) Olivine Fa=25.9±2.2 (n=66); low-Ca pyroxene (n=31) $Fs_{23}En_{75}Wo_2$; high-Ca pyroxene (n=15) $Fs_{16}En_{52}Wo_{32}$.
Classification: (Katrina van Drongelen, *ROM*) Ordinary Chondrite (L/LL4), S3, W2.
Specimens: Five thin sections and 7.387 kg are on deposit at the *ROM*.

Northwest Africa 7009 (NWA 7009)
(Northwest Africa)
Purchased: 2011 Oct
Classification: Carbonaceous chondrite (CV3)
History: Purchased by Jack Schrader from a dealer in Agadir, Morocco, in 2011 October.
Petrography: Separated, mostly granular chondrules with multiple concentric dust rims and sparse fine-grained CAIs set in a brown, partly altered matrix (rich in ferroan olivine). Predominant minerals are olivine, orthopyroxene, clinopyroxene and rare troilite.
Geochemistry: Olivine ($Fa_{0.6-31.0}$), orthopyroxene ($Fs_{1.3}Wo_{5.0}$), clinopyroxene ($Fs_{1.3}Wo_{38.8}$; $Fs_{9.6-32.8}Wo_{49.8-50.6}$).
Classification: Carbonaceous chondrite (CV3).

Northwest Africa 7018 (NWA 7018)
(Northwest Africa)
Purchased: 2011 Feb
Classification: Ordinary chondrite (H6)
History: Purchased by Blaine Reed from a Moroccan dealer at the Tucson Gem and Mineral Show in February 2011.
Petrography: (A. Irving and S. Kuehner, *UWS*) Largely recrystallized with rare small chondrules.
Geochemistry: Olivine ($Fa_{19.1-19.2}$), orthopyroxene ($Fs_{16.5-16.9}Wo_{1.4-0.8}$), clinopyroxene ($Fs_{6.1-6.2}Wo_{44.6-43.7}$).
Classification: Ordinary chondrite (H6).
Specimens: The main mass is held by *Reed*. A total of 25.8 g of material and one polished thin section are on deposit at *PSF*.

Northwest Africa 7064 (NWA 7064)
Morocco
Found: 2008
Classification: Ordinary chondrite (L6)
History: One partially crusted stones weighing 115g was found in 2008 and purchased in Erfoud, Morocco, in early 2009. Thomas *Webb* acquired the sample in June of 2011 from a meteorite prospector.
Physical characteristics: Dark brown matte fusion crust covers 80% of cubic stone. Exterior of stone shows minor light weathering.
Petrography: (A. Love, *App*): Sample displays recrystallized chondritic texture with relict BO, RP, POP chondrules and fragments (avg. dia ~1.50 mm). Matrix contains ~ 500 µm anhedral apatite grains.
Geochemistry: A. Love, *App*) Olivine $Fa_{23.53\pm0.88}$, n=32. Orthopyroxene $Fs_{20.21\pm1.41}$, n=32. Plagioclase $An_{14.23\pm1.17}$, n=24.
Specimens: 23.3 g and one thin section on deposit at *App*. Thomas *Webb* holds the main mass.

Northwest Africa 7117 (NWA 7117)
(Northwest Africa)
Purchased: 2011 Nov
Classification: Ordinary chondrite (LL5)
Petrography: Purchased by Adam Aaronson in 2011 November in Temara, Morocco. Sparse chondrules. Minerals are olivine, orthopyroxene, sodic plagioclase, chromite, troilite, taenite and stained kamacite. Olivine ($Fa_{31.9-32.2}$), orthopyroxene ($Fs_{25.7-25.8}Wo_{1.8-2.4}$), clinopyroxene ($Fs_{12.1}Wo_{41.0}$).

Northwest Africa 7120 (NWA 7120)
(Northwest Africa)
Purchased: 2011 Oct
Classification: L3-melt breccia
History: Purchased by Hanno Strufe in 2011 October from a dealer at the Munich Mineral Show.
Physical characteristics: Fresh, fine-grained black specimen (1604 g), with abundant small irregular, fresh metal grains visible.
Petrography: The specimen consists of small unequilibrated chondrite clasts (with well-formed, rounded chondrules) plus shreds of intergrown metal+troilite in a fairly abundant quench-textured matrix. Some chondrules are rimmed by metal+sulfide. Metal consists of kamacite containing tiny taenite blebs. The matrix contains elongate pyroxenes with irregular Mg-rich cores and accessory chromite and chlorapatite.
Geochemistry: Olivine ($Fa_{9.8}$; $Fa_{15.0}$; $Fa_{22.3}$; $Fa_{25.0-25.5}$), orthopyroxene (core $Fs_{3.7}Wo_{0.3}$, rim $Fs_{14.3}Wo_{0.5}$).
Classification: Ordinary chondrite (L3-melt breccia). This specimen exhibits extensive textural and mineralogical disequilibrium between remnant unequilibrated chondrite clasts and the melt-textured matrix.
Specimens: A total of 25.8 g of type material is on deposit at *UWB*. The main mass is held by Strufe.

Northwest Africa 7121 (NWA 7121)
(Northwest Africa)
Purchased: 2011 Oct
Classification: Carbonaceous chondrite (CM2)

History: Purchased by John Higgins from a dealer in Taliouine, Morocco, in 2011 October.
Petrography: Very small, mostly PO chondrules and some angular mineral fragments in an almost opaque matrix (black with some red tones) containing cronstedtite, tochilinite and fine-grained sulfide.
Geochemistry: Olivine ($Fa_{0.3-72.2}$; Cr_2O_3 in ferroan olivine = 0.23-0.30 wt.%), orthopyroxene ($Fs_{1.1-8.5}Wo_{1.1-2.1}$), clinopyroxene ($Fs_{1.8}Wo_{42.8}$; $Fs_{1.3}Wo_{52.2}$).
Classification: Carbonaceous chondrite (CM2).

Northwest Africa 7125 (NWA 7125)
(Northwest Africa)
Purchased: 2011 June
Classification: Ordinary chondrite (LL6)

History: Purchased by F. Kuntz from a Moroccan dealer in June 2011.
Petrography: (A. Irving and S. Kuehner, *UWS*) Fresh breccia composed of highly equilibrated clasts composed of olivine, pyroxenes, sodic plagioclase, kamacite, merrillite and chlorapatite. Some olivine grains have relict more magnesian cores.
Geochemistry: Olivine ($Fa_{29.2-31.7}$; core $Fa_{14.5}$), orthopyroxene ($Fs_{23.6-25.5}Wo_{1.1-1.9}$), augite ($Fs_{10.4}Wo_{42.9}$).
Classification: Ordinary chondrite (LL6).
Specimens: The main mass is held by *Kuntz*. A total of 5.8 g of material is on deposit at *PSF*.

Northwest Africa 7129 (NWA 7129)
(Northwest Africa)
Purchased: 2011 Sep
Classification: Ungrouped achondrite

History: Purchased by Gary Fujihara from a Moroccan dealer in September 2011.
Petrography: (A. Irving and S. Kuehner, *UWS*) Very fresh granular aggregate of very finely exsolved, pinkish-brown pyroxene, polygranular calcic plagioclase, sparse twinned plagioclase laths, ilmenite, minor ferroan olivine, pyrrhotite and Ni-free metal. A blade of baddeleyite was found in one ilmenite grain.
Geochemistry: Olivine ($Fa_{82.2-82.7}$, FeO/MnO = 81-85), low-Ca pyroxene host ($Fs_{63.9}Wo_{6.0}$), FeO/MnO = 63) with high-Ca pyroxene lamellae ($Fs_{35.0}Wo_{38.6}$, FeO/MnO =63), high-Ca pyroxene host ($Fs_{41.1}Wo_{32.1}$, FeO/MnO = 67) with low-Ca pyroxene lamellae ($Fs_{62.3}Wo_{7.9}$, FeO/MnO = 66).
Classification: Achondrite, ungrouped. Paired with NWA 011, NWA 2400, NWA 2976, NWA 4587, NWA 4901 and NWA 5644.
Specimens: 10 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by Mr. G. Fujihara.

Northwest Africa 7131 (NWA 7131)
(Northwest Africa)
Purchased: 2011 Oct
Classification: Carbonaceous chondrite (CM2)

History: Purchased by Gary Fujihara from a Morocco dealer in 2011 October.
Petrography: Small chondrules and angular mineral fragments in an orange-brown matrix containing finely intergrown cronstedtite, tochilinite and tiny sulfide grains.
Geochemistry: Olivine ($Fa_{0.6-50.0}$, Cr_2O_3 in ferroan olivine = 0.25-0.41 wt.%), orthopyroxene ($Fs_{0.8-9.8}Wo_{3.5-0.3}$), clinopyroxene ($Fs_{0.7}Wo_{35.2}$).
Classification: Carbonaceous chondrite (CM2).

Northwest Africa 7182 (NWA 7182)
(Northwest Africa)
Found: 2010
Classification: Martian meteorite (Shergottite)

History: Found by a prospector in the western part of the Sahara in 2010 and purchased from an Austrian dealer by Sam Gafford in May 2011.
Physical characteristics: A single partially fusion crusted stone (17 g). The interior is brownish-gray with some thin cross-cutting black glassy veinlets.
Petrography: (A. Irving and S. Kuehner, *UWS*) Intersertal texture with subequal proportions of zoned clinopyroxene and maskelynite, plus accessory oxides (intergrown ulvospinel and ilmenite), phosphates and pyrrhotite. Melt inclusions within ulvospinel consist of K-Si-rich glass, with marginal daughter crystals (mostly ferroan pigeonite).
Geochemistry: Pigeonite ($Fs_{49.6-61.2}Wo_{13.1-14.1}$, FeO/MnO = 36-38), augite ($Fs_{25.0-25.1}Wo_{33.0-33.2}$, FeO/MnO = 29-30), plagioclase ($An_{53.4-54.7}Or_{0.9-1.2}$).
Classification: Martian (shergottite). This stone is likely paired with NWA 2975 and numerous other such stones, based on similarities in texture and mineralogy (especially the distinctive melt inclusions in ulvospinel).
Specimens: 3.4 g of material and one polished thin section are on deposit at *UWB*. Mr. S. Gafford of Lee, Illinois, holds the main mass.

Northwest Africa 7185 (NWA 7185)
(Northwest Africa)
Purchased: 2009 Oct
Classification: Carbonaceous chondrite (CV3)

History: Purchased by Eric Twelker from a dealer in Agadir, Morocco in 2009 October.
Petrography: Flattened, elliptical to rounded, mostly granular chondrules (some rimmed) plus sparse fine-grained CAIs in a red-brown matrix.
Geochemistry: Olivine ($Fa_{1.1-35.2}$), orthopyroxene ($Fs_{1.0-2.4}Wo_{0.9\pm0.0}$), clinopyroxene ($Fs_{1.0-9.6}Wo_{47.4-49.3}$).
Classification: Carbonaceous chondrite (CV3).

Northwest Africa 7186 (NWA 7186)
(Northwest Africa)
Purchased: 2010
Classification: Carbonaceous chondrite (CV3)

History: Purchased by Eric Twelker from a dealer in Agadir, Morocco, in 2010.
Petrography: Flattened, elliptical to rounded, mostly granular chondrules plus sparse "shred"-like, fine grained CAI in a red-brown matrix.
Geochemistry: Olivine ($Fa_{0.4-39.8}$), orthopyroxene ($Fs_{0.5-4.9}Wo_{1.0-1.3}$), pigeonite ($Fs_{37.0}Wo_{19.5}$), diopside in CAI ($Fs_{0.6}Wo_{50.4}$).
Classification: Carbonaceous chondrite (CV3).

Northwest Africa 7190 (NWA 7190)
(Northwest Africa)
Found: 2011 Aug
Classification: Lunar meteorite (feldspathic breccia)

History: Three small stones found in southern Morocco in 2011 August were purchased from a Moroccan dealer by Norbert Classen.
Physical characteristics: Three very similar dark-colored stones (3.11 g, 1.87 g and 0.296 g) exhibiting small white clasts in a glassy matrix.

Petrography: (A. Irving and S. Kuehner, *UWS*) Vitric breccia composed of small mineral and lithic clasts in a very fine grained, heterogeneous glassy matrix. Minerals are anorthite, olivine, pigeonite, augite, ilmenite, troilite and minor kamacite.
Geochemistry: Olivine ($Fa_{22.4-25.3}$, FeO/MnO = 90-97), orthopyroxene ($Fs_{22.2}Wo_{4.5}$, FeO/MnO = 54), pigeonite ($Fs_{26.4}Wo_{7.7}$, FeO/MnO = 67), augite ($Fs_{11.2-11.3}Wo_{43.8-46.2}$, FeO/MnO = 43-45). Bulk composition (R. Korotev, *WUSL*): mean values from INAA of subsamples are 6.0 wt.% FeO, 9.4 ppm Sc, 470 ppm Ni, 14.5 ppm La, 6.4 ppm Sm, 1.4 ppm Eu, 4.1 ppm Yb, 2.1 ppm Th.
Classification: Lunar (feldspathic breccia). Based on distinctive petrographic and bulk compositional attributes, these stones are likely paired with NWA 4936, NWA 5406, NWA 6221, NWA 6355, NWA 6470 and NWA 6570.
Specimens: 1.1 g is on deposit at *UWB*. *Classen* holds the main masses.

Northwest Africa 7191 (NWA 7191)
(Northwest Africa)
Purchased: 2012 Jan
Classification: Ordinary chondrite (L, melt rock)
History: Purchased by John Higgins in 2012 January from a dealer in Ouarzazate, Morocco.
Petrography: Extremely fine grained, melt-textured specimen composed of tiny prismatic silicate grains and rounded blobs of metal+troilite. No chondrule remnants were observed.
Geochemistry: Olivine ($Fa_{23.6-24.7}$), orthopyroxene ($Fs_{18.8}Wo_{2.3}$; $Fs_{12.7}Wo_{1.4}$), subcalcic augite ($Fs_{17.2-17.7}Wo_{25.0-22.0}$).
Classification: Ordinary chondrite (L-melt rock).

Northwest Africa 7194 (NWA 7194)
(Northwest Africa)
Purchased: 2012 Jan
Classification: Rumuruti chondrite (R4)
History: Purchased in 2012 January by Greg Hupé from a Moroccan dealer at the Tucson Gem and Mineral Show.
Petrography: Separated, well-formed chondrules (mostly PO, with some RP and BO types) in an orange-brown matrix containing minor altered iron metal and barite. The main minerals are olivine, clinopyroxene, sparse orthopyroxene, sodic plagioclase, chromite and pentlandite.
Geochemistry: Olivine ($Fa_{38.2-38.4}$), orthopyroxene ($Fs_{29.8}Wo_{1.4}$; $Fs_{5.8-8.6}Wo_{3.7-4.6}$), clinopyroxene ($Fs_{9.1-10.7}Wo_{46.0-45.3}$, Cr_2O_3 = 0.44-0.70 wt.%).
Classification: R4 chondrite.

Northwest Africa 7213 (NWA 7213)
(Northwest Africa)
Purchased: 14 Aug 2011
Classification: Ordinary chondrite (LL3)
Petrography: The olivine range is $Fa_{0.62-27.1}$; the low-Ca pyroxene range is $Fs_{2.2-25.1.}$ Chondrule types include C, BO, RP, PO, POP, and PP; chondrule diameters average ~600 µm. Low-Ca clinopyroxene with polysynthetic twins are present, but there is no clear chondrule glass. The heterogeneity of the olivine is appreciably greater than that of published values for H3.8 Dhajala, so the pet type is less than 3.8. However, most type 3.5 chondrites have a number of chondrules with clear glass; the lack of clear glass indicates that the rock is higher than 3.5. Because of the olivine and pyroxene heterogeneity, type 3.6 seems most appropriate. Also present in the thin section are two 800-1300 µm chondritic clasts containing chondrule fragments and recrystallized matrix, indicating that the rock is a breccia.

Northwest Africa 7251 (NWA 7251)
(Northwest Africa)

Purchased: 2012
Classification: Ordinary chondrite (L, melt rock)
History: Purchased by Ke Zuokai from a meteorite dealer.
Petrography: Fine-grained euhedral olivine (Fa_{21-25}), clinopyroxene ($Fs_{12-15}Wo_{28-38}$), and orthopyroxene ($Fs_{17-18}Wo_{2-3}$) set in albitic glass (SiO_2 72-74wt%, Na_2O 7.2wt%). Minor phases include taenite, troilite, chromite, and Fe oxide.

Northwest Africa 7260 (NWA 7260)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Rumuruti chondrite (R4)
History: Purchased in 2012 February by Jack Schrader from a Moroccan dealer at the Tucson Gem and Mineral Show.
Petrography: Fragmental breccia composed of angular clasts containing well-formed chondrules in an orange-stained matrix. Minerals are olivine, orthopyroxene, pigeonite, augite, chromite, iron sulfide, pentlandite and rare chalcopyrite. No metal was found.
Geochemistry: Olivine ($Fa_{34.7-39.5}$; sparse magnesian cores $Fa_{3.0}$), orthopyroxene ($Fs_{6.6}Wo_{1.0}$), pigeonite ($Fs_{28.1}Wo_{5.7}$), augite ($Fs_{10.3-10.9}Wo_{45.8-45.4}$; Cr_2O_3 = 0.72 wt.%).
Classification: R4 chondrite.

Northwest Africa 7261 (NWA 7261)
(Northwest Africa)
Purchased: 2010 Oct
Classification: Carbonaceous chondrite (CV3)
History: Purchased in October 2010 by Jack Schrader from a Moroccan dealer.
Petrography: Separated, well-formed chondrules (mostly granular, BO and PO, some with multiple concentric dust rims) and sparse irregularly-shaped, fine-grained CAIs set in a brown, partly altered matrix (rich in ferroan olivine with some stained opaque grains).
Geochemistry: Olivine ($Fa_{0.4-33.6}$), orthopyroxene ($Fs_{2.7-10.5}Wo_{0.8-1.8}$), subcalcic augite ($Fs_{1.5}Wo_{39.9}$), augite ($Fs_{11.2-12.5}Wo_{47.1-48.7}$).
Classification: Carbonaceous chondrite (CV3).

Northwest Africa 7262 (NWA 7262)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Lunar meteorite (feldspathic breccia)
History: Purchased by Adam Aaronson in Temara, Morocco, in 2012 February.
Physical characteristics: A single stone (413 g) broken naturally into five pieces that fit together. Abundant white clasts visible through the pale, translucent fusion crust.
Petrography: (A. Irving and S. Kuehner, *UWS*; A. Greshake, *MNB*). Felsic fragmental breccia composed of feldspar-rich clasts in a very fine grained matrix. Minerals are olivine, orthopyroxene, pigeonite, subcalcic augite, anorthite, silica, fayalite, Ti-chromite, troilite and minor kamacite (as irregular scraps).
Geochemistry: Olivine ($Fa_{6.8-52.6}$, FeO/MnO = 72-127), orthopyroxene ($Fs_{28.6-45.6}Wo_{3.8-4.2}$, FeO/MnO = 53-64), subcalcic augite ($Fs_{25.4}Wo_{34.3}$, FeO/MnO = 50), augite ($Fs_{17.1}Wo_{41.6}$, FeO/MnO = 65), plagioclase ($An_{93.3-96.3}Or_{0.1}$). Bulk composition (R. Korotev, *WUSL*): mean values from INAA of subsamples are 3.1 wt.% FeO, 5.7 ppm Sc, 70 ppm Ni, 1.3 ppm La, 0.58 ppm Sm, 0.77 ppm Eu, 0.47 ppm Yb, 0.22 ppm Th.
Classification: Lunar (feldspathic breccia). This specimen is very similar in appearance, mineralogy and bulk composition to NWA 2998, and it is likely that these are paired.
Specimens: A total of 20.3 g of material and one polished thin section are on deposit at *UWB*. The remaining material is held by *Aaronson*.

Northwest Africa 7267 (NWA 7267)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Ordinary chondrite (L, melt breccia)
History: Purchased by Greg Hupé in 2012 February from a Moroccan dealer at the Tucson Mineral Show.
Petrography: Fresh breccia composed of L4 to L5 chondrite clasts, medium-sized chondrule fragments and related crystal debris in a sparse metal-rich matrix. The interstitial metal forms anastomozing and cuspate zones between the chondrite clasts, which themselves contain moderate amounts of stained kamacite and troilite.
Geochemistry: Olivine ($Fa_{24.0-24.5}$), orthopyroxene ($Fs_{19.9-20.2}Wo_{1.5-2.0}$; sparse magnesian cores $Fs_{12.5}Wo_{3.0}$), clinopyroxene ($Fs_{9.0-10.7}Wo_{43.8-43.5}$).
Classification: Ordinary chondrite (L-melt breccia).

Northwest Africa 7268 (NWA 7268)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Ureilite
History: Purchased by Greg Hupé in February 2012 from a Moroccan dealer at the Tuscon Gem and Mineral Show.
Petrography: (A. Irving and S. Kuehner, *UWS*) Coarse grained, protogranular aggregate of stained olivine and smoky grey pigeonite, with narrow opaque, metal-rich zones along grain boundaries.
Geochemistry: Olivine (cores $Fa_{20.4-20.5}$; rim $Fa_{7.3}$; Cr_2O_3 = 0.65-0.71 wt.%), pigeonite ($Fs_{17.6-17.7}Wo_{5.5-5.2}$).
Classification: Ureilite
Specimens: 20.1 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by *GHupé*.

Northwest Africa 7269 (NWA 7269)
(Northwest Africa)
Purchased: 2012 Feb
Classification: HED achondrite (Eucrite, monomict)
History: Purchased by Greg Hupé in February 2012 from a Moroccan dealer at the Tuscon Gem and Mineral Show.
Petrography: (A. Irving and S. Kuehner, *UWS*) Very fresh breccia composed of large basaltic eucrite clasts with some thin cross-cutting shock veinlets. Constituent minerals are exsolved pigeonite, calcic plagioclase, silica polymorph, ilmenite and troilite.
Geochemistry: Orthopyroxene host ($Fs_{60.3-60.8}Wo_{3.1-2.5}$, FeO/MnO = 31), clinopyroxene exsolution lamellae ($Fs_{26.7-26.8}Wo_{43.1-43.4}$, FeO/MnO = 29-30).
Classification: Eucrite, monomict
Specimens: 20 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by GHupé.

Northwest Africa 7271 (NWA 7271)
(Northwest Africa)
Purchased: 2011 Sep
Classification: Carbonaceous chondrite (CO3)
History: Purchased by Greg Hupé from a Morocco dealer in 2011 September.
Petrography: Well-formed, small chondrules, mineral fragments and rare CAI in a dark brown matrix. Predominant minerals are olivine, orthopyroxene, troilite and altered kamacite.
Geochemistry: Olivine ($Fa_{1.0-60.4}$; Cr_2O_3 in ferroan olivine = 0.04-0.08 wt.%, mean 0.06 wt.%, s.d 0.02 wt.%, N = 7)), orthopyroxene ($Fs_{1.9-5.2}Wo_{0.5-2.0}$), clinopyroxene in CAI ($Fs_{0.4}Wo_{58.5}$).

Classification: Carbonaceous chondrite (CO3).

Northwest Africa 7272 (NWA 7272)
(Northwest Africa)
Purchased: 2012 Mar
Classification: Martian meteorite (Shergottite)
History: Purchased by Greg Hupé from a dealer in Zagora, Morocco, in 2012 March.
Physical characteristics: A single dark brown stone (58.7 g) broken into four pieces that fit together.
Petrography: (A. Irving and S. Kuehner, *UWS*) Microgabbroic texture. Constituent minerals are olivine (exhibiting little compositional zoning), clinopyroxene, shocked plagioclase, pyrrhotite, ilmenite, Ti-chromite and rare merrillite. The plagioclase appears to be clear maskelynite containing sparse vesicles.
Geochemistry: Olivine ($Fa_{41.9-43.8}$, FeO/MnO = 49-54), pigeonite ($Fs_{26.0-33.0}Wo_{18.4-10.1}$, FeO/MnO = 26-32), subcalcic augite ($Fs_{18.6}Wo_{37.3}$, FeO/MnO = 25), plagioclase ($An_{57.3-65.2}Or_{0.5-0.2}$).
Classification: Martian (shergottite). This specimen is essentially identical to NWA 7032 in its microgabbroic texture and mineralogy, implying that these are separate but paired stones.
Specimens: 11.9 g is on deposit at *UWB*. *GHupé* holds the main mass.

Northwest Africa 7274 (NWA 7274)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Lunar meteorite (feldspathic breccia)
History: Purchased by by Darryl Pitt and David Gheesling from a dealer in Zagora, Morocco, in 2012 February.
Physical characteristics: A single stone (372.6 g) lacking fusion crust, exhibiting small feldspathic clasts in a darker matrix. One broadly curved side of the stone is fairly fresh (but with beige weathering products in fractures), whereas the other broken sides are coated with desert varnish.
Petrography: (A. Irving, S. Kuehner & N. Castle, *UWS*; R. Mills, *JSC*). Fine fragmental breccia composed of anorthite, olivine, augite, pigeonite and orthopyroxene with accessory kamacite, ilmenite and troilite.
Geochemistry: Olivine ($Fa_{8.6}$; 25.7; FeO/MnO = 81-101), orthopyroxene ($Fs_{23.3}Wo_{4.6}$, FeO/MnO = 69), pigeonite ($Fs_{44.9}Wo_{9.9}$, FeO/MnO = 54), ferropigeonite ($Fs_{82.2}Wo_{15.8}$, FeO/MnO = 81), subcalcic augite ($Fs_{18.0-32.1}Wo_{34.6-37.8}$, FeO/MnO = 47-58), plagioclase ($An_{95.7-97.0}Or_{0.1}$). Bulk composition (R. Korotev, *WUSL*): mean values from INAA of subsamples are 6.2 wt.% FeO, 11.8 ppm Sc, 310 ppm Ni, 10.5 ppm La, 4.8 ppm Sm, 0.94 ppm Eu, 3.5 ppm Yb, 1.9 ppm Th.
Classification: Lunar (feldspathic breccia).
Specimens: 20 g of material is on deposit at *UWB*. The main mass is owned jointly by D. Pitt and D. Gheesling.

Northwest Africa 7275 (NWA 7275)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Carbonaceous chondrite (CV3)
History: Purchased by Thomas Webb from a dealer in Agadir, Morocco, in 2012 February.
Petrography: Fairly closely-packed, ellipsoidal to irregularly-shaped chondrules and elongated, fine-grained CAIs in a dark brown, very fine grained matrix (~25 vol%). Chondrules have granular textures and some have finer grained rims. Both chondrules and CAI exhibit a preferred orientation of their long axes.
Geochemistry: Olivine ($Fa_{1.1-46.9}$), orthopyroxene ($Fs_{2.1-2.3}Wo_{0.7-1.0}$), clinopyroxene ($Fs_{2.6}Wo_{40.7}$).
Classification: Carbonaceous chondrite (CV3).

Northwest Africa 7276 (NWA 7276)

(Northwest Africa)
Purchased: 2012
Classification: Ureilite

History: Purchased by Derik Bowers in 2012 from a dealer in Alnif, Morocco.
Petrography: (A. Irving and S. Kuehner, *UWS*) Protogranular aggregate composed almost entirely of slightly stained olivine with some preferred grain orientation, rare pigeonite and opaque, metal-rich zones along grain boundaries. Several inclusions of oldhamite were found within olivine, and there is minor secondary calcite in addition to minor iron hydroxide alteration of metal.
Geochemistry: Olivine (cores $Fa_{19.0-19.1}$, rim $Fa_{13.5}$; Cr_2O_3 = 0.8 wt.%), pigeonite $Fs_{16.3-16.7}Wo_{5.9-5.8.}$
Classification: Ureilite (dunitic). This stone is unusual because it is composed predominantly of olivine with almost no pyroxene.
Specimens: 20 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by Mr. D. Bowers.

Northwest Africa 7279 (NWA 7279)
Morocco
Purchased: 2011 May 18
Classification: HED achondrite (Howardite)

Physical characteristics: A single stone partially covered with fresh fusion crust. Cut surfaces show dark and light clasts (<5 mm) in a light-gray matrix.
Petrography: (J. Gattacceca, *CEREGE*) Polymict breccia composed of mineral fragments (pyroxene, plagioclase) and polycrystalline magmatic clasts set in a clastic matrix.
Geochemistry: Eucrite clasts: Orthopyroxene $Fs_{51.9-56.9}Wo_{4.5-3.2}$, Fe/Mn=30.6. Diogenite clasts: Orthopyroxene $Fs_{21.3-32.9}Wo_{4.4-1.9}$, Fe/Mn=28.4. Plagioclase $An_{91.0}Or_{0.4.}$ Magnetic susceptibility log χ = 2.84.
Classification: Achondrite (Howardite). Minimal weathering.
Specimens: 11.4 g, a polished section, and a thin section at *CEREGE*.

Northwest Africa 7280 (NWA 7280)
Morocco
Purchased: 2011 Jul 25
Classification: HED achondrite (Diogenite)

Physical characteristics: Nine fitting fragments from a single stone partially covered with fresh fusion crust. Cut surfaces show dark and light clasts (<4 mm) in a light-gray matrix.
Petrography: (J. Gattacceca, *CEREGE*) Breccia composed of mineral fragments (pyroxene, plagioclase) to 4 mm in a clastic matrix. No eucrite clasts observed. The sample is modally dominated by orthopyroxene.
Geochemistry: Orthopyroxene $Fs_{21.9-41.5}Wo_{3.3-1.8}$, Fe/Mn=32.2. Plagioclase $An_{93.8}Ab_{5.7}Or_{0.5.}$ Magnetic susceptibility log χ = 3.69 is in the very high range of the diogenites.
Classification: Achondrite (Diogenite). Minimal weathering.
Specimens: 23 g, a polished section, and a thin section at *CEREGE*.

Northwest Africa 7281 (NWA 7281)
Morocco
Purchased: 2012 Jan 12
Classification: HED achondrite (Eucrite)

History: Purchased by Sean Tutorow in Morocco, January 12, 2012.
Physical characteristics: Single stone, no fusion crust, saw cut reveals breccia with numerous light-colored clasts or phenocrysts up to 5 mm, set in a light-gray groundmass.

Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 60% pyroxene, 30% plagioclase, ubiquitous silica, ilmenite, and troilite. Many pyroxenes show exsolution lamellae. Silicate shock melt veins and pockets throughout, some cataclastic zones present.
Geochemistry: (C. Agee and N. Wilson, *UNM*) EMPA. Low Ca-pyroxene $Fs_{60.7±0.9}Wo_{3.0±1.0}$, Fe/Mn=32±1 (at.%) n=4; pigeonite $Fs_{50.9±0.6}Wo_{15.3±0.8}$, Fe/Mn=30±2, n=2; augite $Fs_{27.3±1.0}Wo_{43.1±0.9}$, Fe/Mn=31±1, n=6; plagioclase $Or_{0.5±0.1}Ab_{9.9±0.3}An_{89.6±0.4}$, n=4. Silicate melt SiO_2=49.41±0.73, Al_2O_3=18.03±1.32, TiO_2=0.74±0.19, CaO/Al_2O_3=0.68±0.03 FeO/MnO=34±2 (wt%) n=8.
Classification: Equilibrated, brecciated eucrite. Minor weathering.
Specimens: 4.5 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7284 (NWA 7284)
Morocco
Purchased: 2012 Jan 12,
Classification: HED achondrite (Diogenite)
History: Purchased by Sean Tutorow in Morocco, January 12, 2012.
Physical characteristics: Three stones, all complete, smooth, fusion crusted, saw cut reveals fresh, coarse-grained texture, green pyroxene phenocrysts set in a light-yellow groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 90% pyroxene, 5% olivine, 2% plagioclase, minor kamacite. Pyroxenes up to several millimeters, olivine up to 500 µm, significant shock fractures in silicates.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Low Ca-pyroxene $Fs_{25.0±0.4}Wo_{3.4±0.3}$, Fe/Mn=31±1 n=13, olivine $Fa_{26.2±0.5}$, Fe/Mn=48±2, n=6, plagioclase $Or_{0.6±0.1}Ab_{12.8±2.7}An_{86.6±2.8}$ n=7.
Classification: Achondrite (diogenite). Equilibrated, uniform pyroxene and olivine compositions. Minimal weathering.
Specimens: 20.7 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7285 (NWA 7285)
Morocco
Purchased: 2011 Dec 11
Classification: HED achondrite (Eucrite)
History: Purchased by Sean Tutorow in Morocco, December 11, 2011.
Physical characteristics: Single stone, partial dark fusion crust, light-brown exterior from desert weathering, saw cut reveals fresh, light gray, fine-grained phaneritic texture.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 55% pyroxene, 40% plagioclase, minor ilmenite, silica, troilite, and Fe-metal (low Ni). Fine exsolution lamellae in some pyroxenes, plumose pyroxene-plagioclase textures also present.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Mean pyroxene $Fs_{51.5±8.0}Wo_{15.5±9.8}$, Fe/Mn=33±1, n=13; pyroxenes lie on trend from $Fs_{58.2}Wo_{6.4}$ to $Fs_{31.3}Wo_{39.7}$, consistent with equilibrated eucrites. Plagioclase $Or_{1.0±0.3}Ab_{16.4±2.4}An_{82.5±2.6}$, n=5.
Classification: Equilibrated eucrite, minor weathering.
Specimens: 21. 5 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7298 (NWA 7298)
(Northwest Africa)
Purchased: 2005
Classification: Ordinary chondrite (H3.8)
Petrography: (M. Weisberg, *AMNH*) Chondrules and fragments have sharp boundaries with the matrix. Multiple lithic clasts (all H chondrite origin) were identified, including a large (~1 cm) ovoid clast with a higher degree of shock (S3) than the host.
Geochemistry: Average olivine is $Fa_{16.5±4.9}$, range is $Fa_{0.9-23.3}$ based on 27 analyses; Low-Ca pyroxene is $Fs_{14.6±4.8}Wo_{0.9±0.3}$, 22 analyses.

Classification: Based on the texture and the deviation of mean olivine and pyroxene compositions, this is a type 3 chondrite of high petrologic grade, estimated to be H3.8.
Specimens: Entire specimen at *AMNH*.

Northwest Africa 7299 (NWA 7299)
Morocco
Purchased: 2011 Sept
Classification: Primitive achondrite (Brachinite)
Petrography: (P. Strickland, *UAb*). Petrographic microscope examination of a thin section shows 80% olivine, 10% orthopyroxene, 5% augite, 5% opaques and metals, and trace plagioclase. Opaques are dominanted by Fe-sulfides, with minor chromite. Olivine has irregular fractures and some grains display undulatory extinction. Most grains have prominent triple junctions. Consistent rusty-staining and oxidized metals indicate weak to moderate weathering. Medium-coarse grained equigranular matrix.
Geochemistry: (C. Herd and P. Strickland, *UAb*). Olivine $Fa_{29.6\pm0.1}$, Fe/Mn=61.0; Low-Ca pyroxene $Fs_{25.2\pm2.3}$, $Wo_{2.2\pm0.1}$, Fe/Mn=40.5; Augite $Fs_{9.9\pm0.2}$, $Wo_{43.9\pm0.4}$, Fe/Mn=27.2; Chromite Cr#=0.981, Mg#=0.143, TiO_2=1.05±0.09 wt%.
Classification: Brachinite
Specimens: 4.0 g type specimen, including polished thin section, are on deposit at *UAb*.

Northwest Africa 7303 (NWA 7303)
(Northwest Africa)
Purchased: 2011 Dec 1
Classification: Rumuruti chondrite (R3-5)
History: The two halves of the stone were bought on e-bay from Michael Cottingham.
Physical characteristics: An $_{18.3}$ g fully crusted stone.
Petrography: Cut surfaces show a greyish interior with light clasts (up to 1 cm, mostly rounded) and dark clasts (up to 1 cm, more angular) in a gray matrix. Brecciated and heavily fractured. The meteorite is dominated by well-delineated chondrules, chondrules fragments, mineral fragments and sulfides. Olivine is abundant. Minor orthopyroxene and Ca pyroxene. Matrix and chondrules are found in similar proportions. Some clasts are shock darkened.
Geochemistry: Olivine composition is equilibrated at $Fa_{38.3\pm1.4}$ (n=12), but two outliers are $Fa_{5.6}$ and $Fa_{6.4.}$ Olivine Fe/Mn=84. Olivine NiO = 0.17 wt%. Rare orthopyroxene (Fs_{9-16} $Wo_{0.7-1.7}$, n=2) and Ca Pyroxene ($Fs_{7-17}Wo_{38-47}$, n=4). Plagioclase $An_{21}Or_{1.0.}$
Classification: Rumuruti chondrite (R3-5). Minimal weathering.
Specimens: 4 g and a polished section at *CEREGE*

Northwest Africa 7304 (NWA 7304)
(Northwest Africa)
Purchased: Sept 2009
Classification: Ureilite
History: Samples were donated to *Cascadia* by Mr. Fred Olsen in June, 2010.
Physical characteristics: The rock has a blunt nosecone shape. Fusion crust with radial flow lines emanating from the nose covers ~70% of the specimen. The interior is a relatively uniform dark-gray color.
Petrography: (A.Ruzicka and M. Hutson, *Cascadia*) An olivine-rich rock (>75%) with low-Ca pyroxene, graphite laths to 1 mm, and Fe-oxide and hydroxide minerals (hematite, goethite, and common hematite-magnetite mixtures). Ca-sulfate is rarely present in veins. Olivine-rich and pyroxene-rich regions are ~1 mm in diameter. Olivine-rich areas are partly recrystallized (shock stage S6) and have recrystallized domains showing one dominant lineation, but are mainly composed of small (<10 µm diameter) subhedral olivine grains with interstices between olivine (<3 µm wide) filled by low-Ca pyroxene, high-Ca

pyroxene, and chromite. Interstitial regions between millimeter-sized olivine areas are rich in pyroxene, symplectic Fe-oxide and hydroxide phases, and graphite, the latter partly replaced by Fe-oxide minerals.
Geochemistry: (A. Ruzicka and M. Hutson, *Cascadia*) Fine-grained, olivine-rich areas far from graphite contain relatively ferrous olivine ($Fa_{22.3±0.3}$, Fe/Mn = 49±11 at., n=28) and low-Ca pyroxene ($Wo_{4.4±1.5}$ $Fs_{21.2±1.0}$, n=10), whereas closer to graphite, olivine ($Fa_{8.1±2.5}$, Fe/Mn = 17±4 at.%, n=11) and low-Ca pyroxene ($Fs_{12.4±1.8}Wo_{2.8±0.9}$, n=9) are more magnesian.
Classification: Achondrite (ureilite). Partly shock-recrystallized and melted. Metal is largely replaced by Fe-oxide weathering products but silicates were largely unaffected by weathering.
Specimens: 22.5 g, one polished butt, and one thin section are on deposit at *Cascadia*. Mr. McKenzie holds the main mass.

Northwest Africa 7308 (NWA 7308)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Ordinary chondrite (LL3)
History: Purchased by Gary Fujihara in February 2012 from a Moroccan dealer at the Tucson Gem and Mineral Show.
Petrography: Closely-packed, medium to large chondrules with some interstitial altered metal.
Geochemistry: Olivine ($Fa_{19.6-40.1}$; Cr_2O_3 in ferroan examples is 0.03-0.05 wt.%, mean 0.04 wt.%, s.d. 0.01 wt.%, N = 6), orthopyroxene ($Fs_{4.2-22.4}Wo_{0.2-1.0}$), subcalcic augite ($Fs_{17.7-18.2}Wo_{35.3-32.9}$).
Classification: Ordinary chondrite (LL3).

Northwest Africa 7312 (NWA 7312)
(Northwest Africa)
Purchased: 2012 Apr
Classification: Primitive achondrite (Lodranite)
History: Purchased by Adam Aaronson in Temara, Morocco in 2011 August.
Petrography: (A. Irving and S. Kuehner, *UWS*) Coarse-grained protogranular aggregate of olivine and orthopyroxene with minor kamacite along some grain boundaries. Tiny blebs of metal and iron sulfide are present within silicates.
Geochemistry: Olivine ($Fa_{3.2-3.5}$, FeO/MnO = 17, Cr_2O_3 = 0.2 wt.%), orthopyroxene ($Fs_{2.9-3.3}Wo_{1.8}$).
Classification: Lodranite
Specimens: 20 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by *Aaronson*.

Northwest Africa 7313 (NWA 7313)
(Northwest Africa)
Purchased: 2012 Feb
Classification: Ordinary chondrite (LL6)
History: Purchased by F. Kuntz in February 2012 from a dealer in Erfoud, Morocco.
Petrography: Coarse breccia composed predominantly of recrystallized clasts containing some remnants of large chondrules. A large, rounded, finer grained clast is completely recrystallized with triple grain junctions, and contains olivine and orthopyroxene of very similar composition to the respective minerals in the chondrule-bearing clasts.
Geochemistry: Olivine ($Fa_{30.2±0.10}$), orthopyroxene ($Fs_{24.1-24.2}Wo_{1.9-2.4}$), clinopyroxene ($Fs_{9.6-9.8}Wo_{43.3-43.0}$). Recrystallized clast contains olivine ($Fa_{30.0-30.7}$) and orthopyroxene ($Fs_{23.7-24.5}Wo_{1.0-1.6}$).
Classification: Ordinary chondrite (LL6).

Northwest Africa 7314 (NWA 7314)
(Northwest Africa)
Purchased: 2012 Feb

Classification: Ordinary chondrite (LL6)

Petrography: Purchased by F. Kuntz in February 2012 from a dealer in Erfoud, Morocco. Coarse breccia composed predominantly of recrystallized clasts containing some remnants of large chondrules. Olivine ($Fa_{32.2-32.4}$), orthopyroxene ($Fs_{25.0-25.4}Wo_{2.0}$). Ordinary chondrite (LL6). This specimen is very similar in texture and freshness to the dominant lithology in NWA 7313, but the differences in mafic silicate compositions appear to preclude the possibly that it is a paired stone.

Northwest Africa 7315 (NWA 7315)

(Northwest Africa)

Purchased: 2012 Feb

Classification: HED achondrite (Eucrite)

History: Purchased by F. Kuntz in Febraury 2012 from a dealer in Agadir, Morocco.

Petrography: (A. Irving and S. Kuehner, *UWS*) Very fresh monomict eucrite breccia composed of sparse basaltic eucrite clasts in a matrix of related crystal debris. Exsolved pigeonite, calcic plagioclase, silica polymorph, ilmenite, chromite, troilite and rare slightly stained metal.

Geochemistry: Low-Ca pyroxene host ($Fs_{58.3-59.6}Wo_{7.1-6.0}$, FeO/MnO = 31-32), high-Ca pyroxene exsolution lamellae ($Fs_{30.0-30.3}Wo_{41.6-40.5}$, FeO/MnO = 30-31).

Classification: Eucrite, monomict

Specimens: 16.3 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by *Kuntz*.

Northwest Africa 7319 (NWA 7319)

(Northwest Africa)

Purchased: 2012 Apr

Classification: Ordinary chondrite (L5, melt breccia)

History: Purchased by Greg Hupé in April 2012 from a dealer in Erfoud, Morocco.

Physical characteristics: Fresh interior slices show dispersed clasts of chondrule-bearing material within more abundant fine-grained, black material containing ellipsoidal metal+sulfide grains.

Petrography: Some regions contain sparse chondrules with moderate amounts of metal, but the predominant lithology is composed of very fine grained olivine, pyroxene and rounded grains of intergrown kamacite+troilite.

Geochemistry: Olivine ($Fa_{23.7-23.8}$), orthopyroxene ($Fs_{19.7-20.6}Wo_{2.8-1.9}$).

Classification: Ordinary chondrite (L5-melt breccia).

Northwest Africa 7320 (NWA 7320)

(Northwest Africa)

Purchased: 2011 Dec

Classification: Martian meteorite (Shergottite)

History: Purchased by Luc Labenne from a dealer in Zagora, Morocco, in 2011 December.

Physical characteristics: A single elongate, coarse-grained 52 g stone, with clearly visible grains of limpid, glassy maskelynite.

Petrography: (A. Irving and S. Kuehner, *UWS*) Coarse grained with gabbroic texture. The primary minerals are clinopyroxene (as equant grains up to 2.2 mm across) and maskelynite (as laths up to 3 mm long), accompanied by accessory intergrown Ti-magnetite and ilmenite, pyrrhotite, chlorapatite, and merrillite. Pyroxene is complexly zoned from pigeonite and subcalcic augite to ferropigeonite rims, associated with fayalite and intergrowths of hedenbergite+fayalite+silica after former pyroxferroite. Minor terrestrial barite and calcite occur along some grain boundaries.

Geochemistry: Pigeonite ($Fs_{34.5-38.3}Wo_{17.8-11.4}$, FeO/MnO = 28-31), subcalcic augite ($Fs_{26.8}Wo_{31.9}$, FeO/MnO = 29), ferropigeonite rims ($Fs_{74.2-80.9}Wo_{17.1-12.4}$, FeO/MnO = 34-41), plagioclase ($An_{47.9-58.8}Or_{1.8-1.0}$).

Classification: Martian (shergottite). Based upon its very coarse grainsize, this specimen could be designated as a gabbroic shergottite.
Specimens: 10.4 g is on deposit at *UWB*. The main mass is held by *Labenne*.

Northwest Africa 7325 (NWA 7325)
(Northwest Africa)
Purchased: 2012 Apr
Classification: Ungrouped achondrite
History: Purchased by Stefan Ralew in April 2012 from a dealer in Erfoud, Morocco. The material was found reportedly in southern Morocco in early 2012.
Physical characteristics: A group of 35 very fresh, dark greenish stones (total 345 g), several of which have partial remnant chartreuse-colored fusion crust. This material is notable for the characteristic "frosty" luster of the plagioclase and bright green color of the clinopyroxene.
Petrography: (A. Irving and S. Kuehner, *UWS*): The studied specimen has an overall plutonic igneous (possibly cumulate) texture. It is a medium-grained aggregate of Al-Cr-bearing diopside, calcic plagioclase and lobate (possibly resorbed) grains of forsterite, with accessory Cr-bearing iron sulfide (probably troilite), very sparse ferrochromite, kamacite and taenite, and rare eskolaite (associated with Cr-Fe sulfide). In thin section the untwinned plagioclase is birefringent, but the levels of birefringence are less than normal and variable on a fine scale (suggesting the existence of compositional and/or structural microdomains); there also are sparse vesicles (suggesting at least partial melting). The pyroxene exhibits at least two sets of polysynthetic twin lamellae, which resemble those produced by moderately high shock.
Geochemistry: Clinopyroxene ($Fs_{1.1-2.6}Wo_{45.1-44.5}$, FeO/MnO = 12-21, Al_2O_3 = 2.6-2.8 wt.%, Cr_2O_3 = 1.0 wt.%), plagioclase ($An_{88.1-89.2}Or_{0.0}$), olivine ($Fa_{2.7-2.8}$, FeO/MnO = 30-36, CaO = 0.27-0.32 wt.%, Cr_2O_3 = 0.32-0.35 wt.%). Bulk composition (G. Chen, *UAb*): analyses of representative bulk wire-saw cutting dust by ICP-MS gave: (in ppm) La 0.15, Ce 0.34, Nd 0.16, Sm 0.05, Eu 0.58, Gd 0.05, Hf 0.44, Th 0.27. Oxygen isotopes (K. Zeigler, *UNM*): laser fluorination analyses of acid-washed subsamples gave, respectively $\delta^{17}O$ = 3.214, 3.670, 3.249; $\delta^{18}O$ = 7.566, 8.204, 7.957; $\Delta^{17}O$ = -0.781, -0.662, -0.952 per mil [for TFL slope of 0.528].
Classification: Achondrite (ungrouped). The combination of highly magnesian mafic silicates and highly calcic plagioclase with chromium-bearing sulfides is unique among achondrites, and the specimen is highly depleted in most trace elements.
Specimens: A total of 21 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by *Ralew*.

Northwest Africa 7326 (NWA 7326)
(Northwest Africa)
Purchased: 2004
Classification: HED achondrite (Eucrite, monomict)
History: Purchased by Pierre-Marie Pele in 2004 from a Moroccan dealer.
Petrography: (A. Irving and S. Kuehner, *UWS*) Fine-grained monomict breccia composed mainly of unexsolved pyroxene and calcic plagioclase with accessory ilmenite, troilite, silica polymorph, chromite, rare baddeleyite, and larger grains of altered Ni-free metal. Pyroxene is mostly pigeonite with sparse orthopyroxene, and has been recrystallized into aggregates of polygonal grains. Plagioclase has been transformed by shock to aggregates of tiny birefringent grains, and probably underwent complete melting.
Geochemistry: Pigeonite ($Fs_{48.5-50.6}Wo_{15.6-12.7}$, FeO/MnO = 30-33), orthopyroxene ($Fs_{55.7}Wo_{2.5}$, FeO/MnO = 38).
Classification: Eucrite, monomict
Specimens: 13.8 g of type material and one polished thin section are on deposit at *UWB*. The remaining material is held by Mr. P. Pele.

Northwest Africa 7327 (NWA 7327)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (H/L5)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One complete stone, brown weathered fusion crust, saw cut reveals numerous small chondrules and abundant fine-grained metal set in a brown matrix, some weathering veins.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a wide range of POP and BO chondrule sizes 100-1000 μm. Ubiquitous troilite and kamacite, much of the metal is oxidized, minor plagioclase.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{20.5±0.3}$ Fe/Mn=41±1 n=35, low-Ca pyroxene $Fs_{18.4±1.5}$ $Wo_{2.4±2.9}$ Fe/Mn=25±6 n=17.
Classification: Ordinary chondrite (H/L5), weathering grade W3.
Specimens: 25.66 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7328 (NWA 7328)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (H4)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One complete stone, dark reddish brown exterior, saw cut reveals numerous small chondrules and abundant fine-grained metal set in a brown matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a wide range of chondrule sizes and types, 50-1500 μm, BO, POP, PO, making up approximately 75% of the meteorite. Glass and mesostasis in chondrules, ubiquitous troilite and kamacite, some oxidized metal, no plagioclase.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{18.2±0.6}$, Fe/Mn=39±3, n=23; low-Ca pyroxene $Fs_{14.8±6.5}Wo_{0.8±0.5}$, Fe/Mn=33±17, n=19; clinopyroxene $Fs_{18.9±6.1}Wo_{9.7±7.2}$, Fe/Mn=17±6, n=7.
Classification: Ordinary chondrite (H4), weathering grade W2.
Specimens: 27 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7329 (NWA 7329)
Morocco
Purchased: 2012 Mar
Classification: HED achondrite (Howardite)
History: Purchased by Sean Tutorow in Morocco, March 2012.
Physical characteristics: Single stone, dark shiny fusion crust, very fresh appearance, saw cut reveals brecciated texture, dark and light clasts up to several millimeters set in a bluish-gray groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a breccia with 74% cumulate eucrite pyroxenes, 26% diogenite orthopyroxenes, and a minor amount main group eucrite clasts. Accessory silica, chromite, kamacite, and taenite. No troilite or ilmenite detected. Quench melt clasts observed.
Geochemistry: (C. Agee and L. Burkemper, *UNM*) EMPA. Cumulate eucrite low-Ca pyroxene $Fs_{38.2±3.0}Wo_{2.8±1.3}$, Fe/Mn=33±2, n=23; high-Ca pyroxene $Fs_{28.1±10.1}Wo_{27.0±16.3}$, Fe/Mn=28±3, n=3; diogenite orthopyroxene $Fs_{28.7±3.9}Wo_{2.1±0.8}$, Fe/Mn=33±3, n=9; plagioclase $Or_{0.5±0.1}Ab_{7.7±1.7}An_{91.8±1.8}$, n=4; single plagioclase clast: $Or_{2.8}Ab_{22.2}An_{75.1.}$
Classification: Achondrite (howardite). Minimal weathering.
Specimens: 20.4 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7330 (NWA 7330)
Morocco

Purchased: 2012 Mar
Classification: HED achondrite (Eucrite, cumulate)
History: Purchased by Sean Tutorow in Morocco, March 2012.
Physical characteristics: Two individual stones, dark weathered fusion crust, saw cut reveals fresh, fine-grained texture, with small (<1 mm) phenocrysts set in a light tan-colored groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a pyroxene-plagioclase protogranular texture, some pyroxenes >1 mm. Accessory silica, chromite, troilite, and low-Ni iron metal, some of the metal is oxidized.
Geochemistry: (C. Agee and L. Burkemper, *UNM*) EMPA. Low Ca-pyroxene $Fs_{39.3\pm2.4}Wo_{3.7\pm0.2}$, Fe/Mn=31±1, n=34; augite $Fs_{20.7\pm0.3}Wo_{41.3\pm0.3}$, Fe/Mn=26±1, n=6; plagioclase $Or_{0.4\pm0.0}Ab_{7.6\pm1.0}An_{92.0\pm1.0}$, n=2.
Classification: Achondrite, equilibrated cumulate eucrite. Slightly weathered.
Specimens: 21.1 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7331 (NWA 7331)
Morocco
Purchased: 2012 Mar
Classification: HED achondrite (Howardite)
History: Purchased by Sean Tutorow from Morocco, March 2012.
Physical characteristics: Single stone, dark brown, lightly weathered, fusion crusted exterior. Saw cut reveals fresh, brecciated texture, numerous white clasts up to 3 mm set in a medium-gray groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a brecciated to cataclastic texture, with three distinct pyroxene populations 42% diogenitic, 32% main-group eucritic, and 25% cumulate eucritic n=65. Some diogenite pyroxenes are larger than 1 mm and zoned, other domains show fine-grained ophitic pyroxene and plagioclase typical of main group or intergranular pyroxene and plagioclase typical of cumulate eucrites. Accessory silica, olivine, chromite, and troilite. Many plagioclase appear maskelynitized.
Geochemistry: (C. Agee and L. Burkemper, *UNM*) Diogenite low Ca-pyroxene $Fs_{26.4\pm3.1}Wo_{3.1\pm1.4}$, Fe/Mn=30±2, n=27; cumulate eucrite pyroxene $Fs_{38.5\pm3.5}Wo_{5.7\pm4.1}$, Fe/Mn=31±3, n=16; main-group pyroxene $Fs_{54.7\pm8.2}Wo_{11.3\pm9.4}$, Fe/Mn=32±2, n=22 trend from $Fs_{65.1}Wo_{1.4}$ to $Fs_{29.1}Wo_{42.9}$; olivine $Fa_{34.3}$ n=1, plagioclase $Or_{1.1\pm0.2}$ $Ab_{16.0\pm0.7}$ $An_{82.8\pm0.9}$ n=2.
Classification: Achondrite (howardite). Highly shocked (S5) based on the presence of maskelynite, slightly weathered.
Specimens: 14.0 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7332 (NWA 7332)
Morocco
Purchased: May 2012
Classification: Carbonaceous chondrite (CV3)
History: Purchased by Sean Tuturow in Morocco, May 2012.
Physical characteristics: Single stone, black, smooth fusion-crusted exterior, saw cut reveals numerous oval-shaped chondrules up to 3 mm, some reddish in color, set in a black matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous irregularly to oval-shaped POP chondrules (500 µm to 3 mm). At least three populations of olivine and pyroxene, many pyroxenes with high Al-content. Matrix contains olivine, pyroxene, finely dispersed sulfide, spinel, and a few metal grains.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Type I chondrules: olivine $Fa_{3.9\pm2.2}$, Fe/Mn=60±33, n=15; low-Ca pyroxene $Fs_{1.6\pm0.6}Wo_{1.6\pm1.2}$, Fe/Mn=18±12, n=9; aluminous diopside $Fs_{2.6\pm2.8}Wo_{40.4\pm1.2}$, Al_2O_3=3.96±2.06 wt%, n=15. Type II chondrules: olivine $Fa_{18.1\pm10.4}$, Fe/Mn=123±35, n=4; aluminous augite $Fs_{21.2\pm8.1}Wo_{29.6\pm3.8}$, Al_2O_3=6.96±3.84 wt%, n=3. Matrix: olivine $Fa_{53.5\pm4.3}$, Fe/Mn=131±8, n=9;

aluminous pyroxene $Fs_{52.1±9.0}Wo_{4.2±6.5}$, Fe/Mn=128±22, Al_2O_3=2.87±2.04 wt%, n=18; hercynite-rich spinel; and taenite $Ni_{0.60}Fe_{0.40}$.
Classification: Carbonaceous chondrite (CV3), weathering grade W2.
Specimens: 12.95 g including a probe mount on deposit at *UNM*, Sean Tuturow holds the main mass.

Northwest Africa 7333 (NWA 7333)
Morocco
Purchased: 2011
Classification: Ureilite
History: Purchased by Matt Morgan in Morocco, 2011.
Physical characteristics: Single stone with a dark brown, coarse granular exterior. Saw cut reveals a mosaic of black and brown grains and very fine veins of oxidized metal and graphite, some clasts up to several millimeters.
Petrography: (C. Agee, *UNM*) This meteorite consists of approximately 65% olivine and 30% pigeonite. Numerous Fe-metal veins occupy grain boundaries. Most of the veins have been oxidized by desert weathering. The metal veins are commonly haloed by tiny metal blebs grading into adjacent olivine and pyroxene crystals. Graphite is ubiquitous and exceptionally well preserved as elongate lenses up to 1 mm and along olivine and pyroxene grain boundaries. Minor sulfide present.
Geochemistry: (C. Agee and M. Spilde, *UNM*, by EPMA). Olivine $Fa_{18.2±5.3}$, Fe/Mn=39±13, Cr_2O_3=0.56±0.21 wt%, n=13; pigeonite $Fs_{11.3±3.9}Wo_{11.2±7.5}$, Fe/Mn=20±10, Cr_2O_3=1.03±0.22 wt%, n=10; enstatite $Fs_{0.9}Wo_{1.0}$, n=1.
Classification: Achondrite (Ureilite)
Specimens: 18 g including a probe mount on deposit at *UNM*, Calvin Shipbaugh holds the main mass.

Northwest Africa 7334 (NWA 7334)
Morocco
Purchased: May 2012
Classification: HED achondrite (Eucrite)
History: Purchased by Sean Tutorow from Morocco, May 2012.
Physical characteristics: Stone with black shiny fusion crust, saw cut reveals fresh, fine-grained texture, light gray groundmass, some fine melt veins.
Petrography: (C. Agee, *UNM*): Microprobe examination of a polished mount shows a 65% pyroxene-30% plagioclase intersertal texture, some pyroxenes with exsolution lamellae. Accessory silica, troilite, and ilmenite; minor zircon.
Geochemistry: (C. Agee and M. Spilde, *UNM*, by EMPA): Pyroxene $Fs_{49.2±14.2}Wo_{17.9±16.8}$, Fe/Mn=32±1, n=31 with equilibrated trend $Fs_{63.9}Wo_{1.7}$ to $Fs_{27.4}Wo_{43.6}$; plagioclase $Or_{0.6±0.1}Ab_{10.6.1±0.8}An_{88.9±0.8}$, n=3.
Classification: Achondrite (Eucrite). Equilibrated main group eucrite. Minimal weathering.
Specimens: 16.5 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7335 (NWA 7335)
Morocco
Purchased: March 2009
Classification: Iron meteorite (ungrouped)
History: A single specimen was purchased in March 2009 by Andreas Gren from a Moroccan dealer in Rissani.
Physical characteristics: The 4908 g mass is shaped like a loaf of bread, with typical rusty desert weathering. One weathered edge shows Widmanstätten pattern.
Petrography: (P. Strickland and C. Herd, *UAb*) Cut and polished sections display 3 prominent lamellae directions. Two are at 60° intersection angles with a unique 70° intersection angle. The lamellae producing the Widmanstätten pattern have an average bandwidth of 0.6±0.2 mm, indicative of a medium octahedrite. Upon closer examination however, these lamellae are composed of multiple tiny spindles

(<0.2 mm width) that are roughly parallel to each other. The spindles can also be seen in the plessite matrix displaying an octahedrite arrangement on a much finer scale, similar to that of a plessitic octahedrite.
Geochemistry: (C. Herd and G. Chen, *UAb*) Ni=109.8, Co=8.40 (both mg/g); Cr=21, Cu=229, Ga=50.8, Ge=41.2, As=8.66, W=3.67, Ir=12.3, Pt=26.3, Au=1.73 (all µg/g); Sb=210 (ng/g). Obtained by ICP-MS using North Chile as a calibration standard.
Classification: Ungrouped, plessitic octahedrite. Although Ni content is similar to IB, IIC, and IIIAB groups, Ga and Ir concentrations are outside limits for these groups. The texture shows characteristics of both medium and plessitic octahedrites.
Specimens: Two polished and etched specimens (151.1 and 7.7 g) and a 25 g analytical specimen at *UAb*. Remainder with *Gren*.

Northwest Africa 7336 (NWA 7336)
Morocco
Found: 2012
Classification: Ordinary chondrite (L6)
History: One stone weighing 18 kg was found in Morocco in 2012. Blaine Reed acquired the sample from a meteorite dealer at the Tucson Gem and Mineral show in 2012.
Petrography: (A. Love, *App*): Sample displays recrystallized chondritic texture composed of indistinct, chondrules (avg. dia. 1.30 mm) and fragments in a recrystallized matrix with weathered, discrete Fe-Ni and FeS grains. Chondrule and matrix olivine and pyroxenes contains multiple sets of planar fractures with iron-oxides filled veins and display weak mosaic extinction.
Geochemistry: (A.Love, *App*): Olivine $Fa_{25.12-26.74}$ with an average $Fa_{25.61\pm1.23}$, PMD=2.76, n=10; Pyroxene $Fs_{21.59-24.29}$ with an average $Fs_{22.75\pm1.23}$, PMD=5.83, $Wo_{1.40}$, PMD=17.20, n=7.
Specimens: 67.3 g, one polished mount and one thin section on deposit at *App*. *Reed* holds main mass

Northwest Africa 7346 (NWA 7346)
Morocco
Purchased: 2009
Classification: Ordinary chondrite (LL6)
History: Purchased by B. Reed in Tucson, 2009.
Physical characteristics: Single stone, rough, dark weathered exterior, saw cut reveals a heterogeneous texture of light and dark clasts, melt veins, and very finely dispersed metal grains set in a medium gray matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a breccia with a mix of fine-grained, cataclastic zones and larger clasts up to a few mm, scattered remnant chondrules were observed, ubiquitous plagioclase, troilite, and kamacite, metal fresh and unoxidized. The overall texture suggests high shock grade.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{30.7\pm1.0}$, Fe/Mn=62±2, n=19; low-Ca pyroxene $Fs_{25.3\pm0.5}Wo_{2.2\pm0.8}$, Fe/Mn=36±1, n=21; high-Ca pyroxene $Fs_{10.1}Wo_{44.7}$, Fe/Mn=23, n=1; plagioclase $Ab_{80.3\pm5.3}An_{13.9\pm8.1}Or_{6.2\pm3.4}$, n=12.
Classification: Ordinary chondrite (LL6), weathering grade W1.
Specimens: 23.7 g including a probe mount on deposit at *UNM*, *Reed* holds the main mass.

Northwest Africa 7347 (NWA 7347)
Morocco
Purchased: 27 January 2012
Classification: Ordinary chondrite (L6, melt breccia)
History: An unusual looking stone was bought at the Tucson Gem and Mineral Show, and later confirmed to be a meteorite.

Physical characteristics: The stone is brown with a bumpy surface, remnant fusion crust, and caliche. The cut surface is dark gray, showing areas of melt and chondritic material.
Petrography: (A. Rubin, *UCLA*) Interior shows area of melt containing mafic grains, chondrule fragments, and 30-µm-size metal-sulfide assemblages. The unmelted portion shows equilibrated textures, and contains numerous thin sulfide veins, 50-µm-size plagioclase grains, and olivine with strong mosaic extinction.
Classification: L6-melt breccia, W2, S6

Northwest Africa 7349 (NWA 7349)
Morocco
Purchased: May 2012
Classification: Ureilite
History: Purchased by Sean Tutorow from Morocco, May 2012.
Physical characteristics: Single stone with a dark, coarse granular exterior. Saw cut surface reveals a mosaic of dark green and brown grains, a few weathering veins.
Petrography: C. Agee) This meteorite consists of approximately 50% olivine and 50% low-Ca pyroxene, poikiolitic texture with generally smaller (100-300 µm) olivine inclusions in larger host pyroxene. Numerous Fe-metal veins occupying grain boundaries. Many of the veins have been oxidized by desert weathering. The metal veins are commonly haloed by many tiny metal blebs grading into adjacent olivine crystals.
Geochemistry: (C. Agee and N. Wilson, *UNM*, by EMPA). Olivine cores $Fa_{23.2.0±0.9}$, Fe/Mn=50±4, Cr_2O_3=0.27±0.02 wt%, n=21; olivine rim $Fa_{12.6}$, Fe/Mn=23, Cr_2O_3=0.28 wt%, n=1; low-Ca pyroxene $Fs_{19.3±0.0}Wo_{4.3±0.0}$, Fe/Mn=31±0 Cr_2O_3=0.72±0.00 wt%, n=2.
Classification: Achondrite (Ureilite). Low-Ca pyroxene present, pigeonite absent. Moderately weathered.
Specimens: 22 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7350 (NWA 7350)
Morocco
Purchased: May 2012
Classification: Mesosiderite (group B2)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: Single stone, irregular dark exterior with some iron staining, saw cut reveals dark brecciated texture with iron-oxide veins.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 60% silicates and 40% oxidized metal. Silicate mineralogy dominated by pyroxene with ~15% plagioclase, accessory troilite, silica and olivine, remnant kamacite preserved within oxidized metal domains, ~80% of metal oxidized.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Low Ca-pyroxene $Fs_{26.3±9.2}Wo_{1.2±0.5}$, Fe/Mn=29±2, n=16; olivine $Fa_{24.7}$, Fe/Mn=54, n=1; plagioclase $Or_{0.3±0.0}Ab_{8.0±0.1}An_{91.7±0.1}$, n=2
Classification: Mesosiderite, type B2.
Specimens: 8.91 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7367 (NWA 7367)
Morocco
Purchased: May 2012
Classification: HED achondrite (Eucrite, cumulate)
History: Purchased by Sean Tutorow from Morocco, May 2012.
Physical characteristics: Single stone, with black shiny fusion crust, some light desert weathering on exterior, saw cut reveals fresh, medium-grained texture, with white and honey-colored crystals up to 2 mm.

Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a pyroxene-plagioclase protogranular texture, some pyroxenes with exsolution lamellae, a few areas show fine-grained cataclastic texture. Accessory silica, chromite, and troilite.
Geochemistry: (C. Agee and N. Wilson, *UNM*, by EMPA). Low Ca-pyroxene $Fs_{43.3±1.0}Wo_{3.9±1.5}$, Fe/Mn=30±1, n=25; augite $Fs_{17.0±0.3}Wo_{45.3±0.4}$, Fe/Mn=25±1, n=7; plagioclase $Or_{0.2±0.0}Ab_{6.1±0.3}An_{93.7±0.3}$, n=2.
Classification: Achondrite (Eucrite-cm). Equilibrated cumulate eucrite. Slightly weathered.
Specimens: 8.6 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7368 (NWA 7368)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (H4)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One complete stone, exterior partially fusion crusted, saw cut reveals fine-grained metal, but also larger metal fragments up to 5 mm, and small chondrules set in a light-brown matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows primarily PO and POP chondrules 200-800 µm. Abundant kamacite and troilite, with accessory merrillite and plagioclase.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{18.5±0.6}$, Fe/Mn=36±2, n=29; low-Ca pyroxene $Fs_{17.0±2.1}Wo_{1.5±1.3}$, Fe/Mn=23±4, n=20.
Classification: Ordinary chondrite (H4), weathering grade W1.
Specimens: 26.85 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7369 (NWA 7369) ~22°12'N, ~13°09'W
Western Sahara
Found: 2007
Classification: Rumuruti chondrite (R5)
History: Discovered by an anonymous finder near Aghoninit, Western Sahara
Physical characteristics: One complete individual of 650 g covered with fresh black fusion crust.
Petrography: (R. Bartoschewitz, *Bart*) Chondrules (0.3-0.6 mm), larger chondrule fragments (<2 mm), olivine and pyroxene fragments (<0.3 mm) set in a recrystallized matrix. Chromite (<0.2 mm) is distributed throughout the matrix and also inside some chondrules. Feldspar is mostly transformed to maskelynite and dominantly forms assemblages with chromite. Accessory minerals are pentlandite and troilite.
Geochemistry: (R. Bartoschewitz, *Bart*; P. Appel, B. Mader, *Kiel*) Olivine $Fa_{38.4-39.6}$ (n=26); clinopyroxene $Fs_{11.3-16.0}Wo_{40.0-46.1}$ (n=15). Chromite Al_2O_3 = 4, TiO_2 = 5, MgO = 1; pentlandite Ni = 33, Co = 1; troilite Ni = 2.5, Co = 0.2 (all in wt%).
Classification: Rumuruti chondrite (R5), W0

Northwest Africa 7370 (NWA 7370) ~22°50'N, ~6°11'W
Gao, Mali
Found: 2009 May
Classification: HED achondrite (Diogenite, olivine)
History: Four meteorites were discovered by an anonymous finder east of Agaraktem, Mali, in May 2009.
Physical characteristics: Four almost complete individuals totaling 2290 g.
Petrography: (R. Bartoschewitz, *Bart*) Polycrystalline olivine clusters (~50 vol%) of idiomorphic to hypidiomorphic cystals (<1 mm, average about 0.1 mm) distributed in schlieren-like bands within a matrix of xenolithic to hypidiomorphic pyroxene grains (about 1 mm), with rare intergranular feldspar. Chromite and metal occurs dominantly within pyroxene and olivine grains.

Geochemistry: (R. Bartoschewitz, *Bart*; P. Appel, B. Mader, *Kiel*) Pyroxene $Fs_{23.8-25.4}Wo_{2.0-4.4}$, olivine $Fa_{29.3-30.3}$, feldspar $An_{76-83}Ab_{1-5.}$ Chromite Al_2O_3 = 14.4-15.4, TiO_2 = 0.9-1.1, MgO = 4.1-4.8; Kamacite Ni = 0.3-1.1, Co = 0.7-0.9 (all in wt%).
Classification: Olivine diogenite, S1, very fresh
Specimens: Type specimen 20 g *Kiel*; 10 g *Bart*

Northwest Africa 7373 (NWA 7373)
(Northwest Africa)
Found: 2011
Classification: Ordinary chondrite (L~6)
Physical characteristics: nearly complete crusted 193.8 g individual with magnetic suszeptibility of 4.98.
Petrography: Light gray recrystallized matrix with various types of light chondrules up to 3 mm. Metal grains show rusty halos.

Northwest Africa 7381 (NWA 7381)
(Northwest Africa)
Found: 2011
Classification: Ordinary chondrite (H~5)
Physical characteristics: Nearly complete crusted 76.6 g individual.
Petrography: Brown recrystallized matrix with various types of gray chondrules up to 3 mm. Homogenous metal distribution with inclusions up to 4 mm.

Northwest Africa 7382 (NWA 7382)
Morocco
Purchased: Jan 2012
Classification: Ordinary chondrite (LL7)
History: Purchased by Michael Farmer from a Moroccan meteorite dealer in Tucson, January 2012.
Physical characteristics: Single complete stone, minor weathering, dark fusion crust, saw cut reveals many metal grains set in a greenish brown crystalline matrix, some green gemmy crystals up to 2 mm.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished epoxy mount shows olivine and orthopyroxene with protogranular to polygonal textures, some smaller olivines poikilitically enclosed in orthopyroxene, some larger olivines with euhedral shapes. Orthopyroxenes up to 2 mm, olivine up to 1 mm, interstitial plagioclase up to 200 μm. Kamacite, taenite and troilite up to 2 mm. Ubiquitous chromite, Cl-rich apatite detected.
Geochemistry: (C. Agee and M. Spilde, *UNM*) EMPA. Olivine $Fa_{27.0\pm0.3}$, Fe/Mn=56±2, N=20; orthopyroxene $Fs_{22.1\pm0.1}Wo_{3.9\pm0.3}$, Fe/Mn=35±2 N=20; plagioclase $Or_{2.9\pm0.9}Ab_{80.7\pm5.7}An_{16.4\pm6.6}$, n=9; chromite Cr/(Cr+Al)=0.89±0.01, Fe/Mn=45±1, n=4; kamacite 13 wt% Ni; taenite 40 wt% Ni.
Classification: Ordinary chondrite (LL7) texturally equilibrated polygonal crystals with triple junctions, recrystallized texture consistent with highest metamorphic grade for ordinary chondrites: type 7, no chondrules present.
Specimens: 8.32 g including a probe mount on deposit at *UNM*, *Farmer* holds the main mass.

Northwest Africa 7383 (NWA 7383)
Morocco
Purchased: Jan 2012
Classification: HED achondrite (Eucrite)
History: Purchased by Michael Farmer from a Moroccan meteorite dealer in Tucson, January 2012.
Physical characteristics: Single complete stone, smooth black fusion crust, slightly weathered exterior, saw cut reveals fresh, light-gray, fine-grained ground mass.

Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a protogranular texture with approximately 45% pyroxene and 45% plagioclase, grain size 10-100 µm, many pyroxenes with exsolution lamellae. Accessory silica, ilmenite, and troilite.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Pyroxene $Fs_{50.6±14.8}Wo_{15.5±17.6}$, Fe/Mn=34±1, n=30, with equilibrated trend $Fs_{62.7}Wo_{2.5}$ to $Fs_{26.4}Wo_{44.3}$; plagioclase $Or_{0.6±0.1}Ab_{11.9±1.3}An_{87.5±1.2}$, n=6.
Classification: Achondrite (Eucrite), Equilibrated main group eucrite.
Specimens: 20.08 g including a probe mount on deposit at *UNM*; *Farmer* holds the main mass.

Northwest Africa 7384 (NWA 7384)
Morocco
Purchased: Jan 2010
Classification: Primitive achondrite (Acapulcoite)
History: Purchased by Michael Farmer from a Moroccan meteorite dealer in Tucson, January 2010.
Physical characteristics: Single stone, dark fusion crust, moderately weathered exterior, saw cut reveals many small metal grains set in a dark-brown, fine-grained groundmass, some oxide staining.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished epoxy mount shows approximately 15% olivine, 30% orthopyroxene, 30% diopside, and 10% plagioclase. Silicate grains 50-200 µm, polygonal texture with 120° triple-junction grain boundaries. Metal oxide vein permeate the stone occupying many grain boundaries. Numerous taenite grains up 400 µm; scattered, small kamacite blebs as inclusions in pyroxene; troilite also detected.
Geochemistry: C. Agee and M. Spilde, *UNM*) EMPA. Olivine $Fa_{10.6±0.1}$, Fe/Mn=23±1, N=12; orthopyroxene $Fs_{10.2±0.1}Wo_{1.7±0.3}$, Fe/Mn=14±1 N=8; diopside $Fs_{4.5±0.4}Wo_{43.1±1.5}$, Fe/Mn=9±1, Cr_2O_3=1.36±0.14 wt%, N=18; plagioclase $Or_{4.4±0.6}Ab_{81.2±0.7}An_{14.4±0.4}$, n=20.
Classification: Achondrite (Acapulcoite), distinguished from lodranite type by the relatively high modal abundance of plagioclase and the relatively small silicate grain size.
Specimens: 22.12 g including a probe mount on deposit at *UNM*; *Farmer* holds the main mass.

Northwest Africa 7385 (NWA 7385)
Morocco
Purchased: May 2012
Classification: HED achondrite (Eucrite)
History: Purchased by Sean Tutorow from Morocco, May 2012.
Physical characteristics: Single stone, with abraded black fusion crust, saw cut reveals fresh, light-gray, fine-grained texture.
Petrography: C. Agee, *UNM*) Microprobe examination of a polished mount shows a protogranular texture with approximately 50% pyroxene and 45% plagioclase, nearly all pyroxenes with exsolution lamellae, many fractures suggesting high shock. Accessory silica, chromite, ilmenite, troilite, and iron metal with very low nickel content.
Geochemistry: (C. Agee and M. Spilde, *UNM*) EMPA. Pyroxene $Fs_{51.0±13.1}Wo_{14.2±15.6}$, Fe/Mn=31±1, n=32, with equilibrated trend $Fs_{61.3}Wo_{1.7}$ to $Fs_{26.0}Wo_{44.4}$; plagioclase $Or_{0.4±0.2}Ab_{10.4±0.8}An_{89.1±0.6}$, n=6.
Classification: Achondrite (Eucrite). Equilibrated main group eucrite. Slightly weathered.
Specimens: 11.86 g including a probe mount on deposit at *UNM*; Sean Tutorow holds the main mass.

Northwest Africa 7386 (NWA 7386)
(Northwest Africa)
Purchased: 2011 Jul 18
Classification: Mesosiderite
History: The stones were purchased in Erfoud, Morocco, in 2011.
Physical characteristics: Three stones totalling 131 g.
Petrography: (J. Gattacceca, *CEREGE*) The stony part shows a cataclastic texture, with silicate mineral fragments up to several mm in a coarse matrix (>20 µm). Modal abundances: pyroxene 47%, plagioclase

15%, FeNi metal + troilite + weathering products 37%. Chromite, ilmenite, and silica are present. Magnetic suscpetibility log χ = 4.96 (X in 10-9 m3/kg).
Geochemistry: Orthopyroxene $Fs_{30.2}Wo_{2.5}$ (FeO/MnO=25.6). Plagioclase $An_{95.6}Ab_{4.3}Or_{0.1.}$ Chromite Cr/(Cr+Al)= 0.82.
Classification: Mesosiderite. Severe weathering.
Specimens: 23 g and one polished section are on deposit at *CEREGE*. P. Thomas holds the main mass.

Northwest Africa 7389 (NWA 7389)
(Northwest Africa)
Purchased: 2008
Classification: Ordinary chondrite (L6)
Petrography: Purchased by Philip Mani from Greg Hupé. Rare chondrules and relatively low content of altered metal. Olivine ($Fa_{24.6-25.0}$), orthopyroxene ($Fs_{20.4-20.8}Wo_{1.7-1.4}$), clinopyroxene ($Fs_{6.5-8.0}Wo_{45.9-44.2}$). Ordinary chondrite (L6).

Northwest Africa 7390 (NWA 7390)
(Northwest Africa)
Purchased: 2008
Classification: Ordinary chondrite (LL6)
Petrography: Purchased by Philip Mani from Greg Hupé. Rare chondrules and relatively low content of altered metal. Olivine ($Fa_{31.2-31.6}$), orthopyroxene ($Fs_{24.2-24.3}Wo_{1.3}$), clinopyroxene ($Fs_{8.1-9.2}Wo_{45.5-44.5}$). Ordinary chondrite (LL6).

Northwest Africa 7391 (NWA 7391)
(Northwest Africa)
Purchased: 2003
Classification: Ordinary chondrite (L5)
Petrography: Purchased by Philip Mani from Greg Hupé. Sparse chondrules and relatively low content of altered metal. Olivine ($Fa_{25.1-25.5}$), orthopyroxene ($Fs_{20.5-21.7}Wo_{1.6-1.7}$), clinopyroxene ($Fs_{6.9-7.8}Wo_{45.6-44.6}$). Ordinary chondrite (L5).

Northwest Africa 7392 (NWA 7392)
(Northwest Africa)
Purchased: 2002
Classification: Ordinary chondrite (L6)
Petrography: Purchased by Philip Mani from Greg Hupé. Sparse chondrules and relatively low content of altered metal. Olivine ($Fa_{24.8-25.2}$), orthopyroxene ($Fs_{20.0\pm0.0}Wo_{1.4-1.6}$). Ordinary chondrite (L6).

Northwest Africa 7393 (NWA 7393)
(Northwest Africa)
Purchased: 2008
Classification: Ordinary chondrite (L6)
Petrography: Purchased by Philip Mani from Greg Hupé. Sparse chondrules and relatively low content of altered metal. Olivine ($Fa_{24.6-24.9}$), orthopyroxene ($Fs_{19.8-20.0}Wo_{1.1-1.2}$). Ordinary chondrite (L6).

Northwest Africa 7394 (NWA 7394)
(Northwest Africa)
Purchased: 2008
Classification: Ordinary chondrite (LL6)

Petrography: Purchased by Philip Mani from Greg Hupé. Rare chondrules and relatively low content of altered metal. Olivine ($Fa_{27.6-28.4}$), orthopyroxene ($Fs_{22.3-24.9}Wo_{1.7-1.3}$), clinopyroxene ($Fs_{8.9-9.1}Wo_{42.9-42.5}$). Ordinary chondrite (LL6).

Northwest Africa 7395 (NWA 7395)
(Northwest Africa)
Purchased: 2007
Classification: Ordinary chondrite (L6)
Petrography: Purchased by Philip Mani from Greg Hupé. Rare chondrules and relatively low content of altered metal. Olivine ($Fa_{25.0\pm0.0}$), orthopyroxene ($Fs_{20.2-20.4}Wo_{1.5-1.9}$), clinopyroxene ($Fs_{8.5}Wo_{43.4}$). Ordinary chondrite (L6).

Northwest Africa 7401 (NWA 7401)
Morocco
Purchased: May 2012
Classification: Enstatite chondrite (EL6)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: 150 matched stones found together, weathered exterior, saw cut reveals light-gray, very fine grained texture, a few scattered light-colored chondrules, numerous small voids, friable.
Petrography: (C. Agee, *UNM*) SEM examination of a saw cut surface shows a distinct 3 mm radial pyroxene chondrule set in a matrix dominated by orthopyroxene, with accessory plagioclase. Plagioclase to 300 µm. No other chondrules with discernable outlines observed in the section. Matrix pyroxenes to ~100 microns; chondrule pyroxenes mostly elongate prisms to ~1 mm. Ubiquitous daubreelite, Si-bearing kamacite, and taenite. Minor schreibersite and K-rich sulfide (possibly djerfisherite). Some oxide and sulfate weathering products present on grain boundaries.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Enstatite $Fs_{0.6}Wo_{3.4}$; plagioclase $Or_{6.8}Ab_{71.1}An_{22.0}$; kamacite Si=1.16, Ni=5.05 (wt%).
Classification: Enstatite chondrite (EL6), EL based on Si content of kamacite, type 6 based on absence of significant glass or olivine in the single analyzed chondrule and large plagioclase grains. This meteorite shares some textural similarities with Al Haggounia 001, although its plagioclase composition is significantly higher in An.
Specimens: 39.53 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7428 (NWA 7428)
Morocco
Purchased: 2012
Classification: Ordinary chondrite (L6, melt breccia)
History: Purchased by Matt Morgan in Tucson 2012.
Physical characteristics: Single stone, dark, shiny, fusion-crusted exterior, some vesicles, moderate desert oxidation. Saw cut shows dark-colored melt vein up to 5 cm wide containing numerous partially melted, oval shaped, chondrite clasts. Veins bounded by light brown chondrite lithology. Fine grained metal grains evenly distributed throughout the sample.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows two main lithologies: 1) melt zones clogged with numerous rafted and partially melted PO and POP chondrules and chondrite matrix clasts, and suspended fine troilite blebs; 2) an unmelted, equilibrated, protogranular chondrite texture, with olivine, pyroxene, plagioclase, kamacite, troilite, and chromite; no distinct chondrules observed in the unmelted lithology.
Geochemistry: (C. Agee and M. Spilde, *UNM*) EMPA. Olivine $Fa_{25.2\pm0.3}$, Fe/Mn=50±2, n=10; orthopyroxene $Fs_{21.5\pm0.2}Wo_{1.5\pm0.4}$, Fe/Mn=30±1, n=5; plagioclase $Or_{12.2\pm0.3}Ab_{72.4\pm0.1}An_{15.4\pm0.4}$, n=2.
Classification: L6-melt breccia, weathering grade W2.
Specimens: 116 g including a probe mount on deposit at *UNM*. *MtMorgan* holds the main mass.

Northwest Africa 7429 (NWA 7429)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L4)

History: Purchased by Sean Tutorow from Morocco, May 2012.
Physical characteristics: One complete stone, dark brown exterior, saw cut reveals a few chondrules and scattered fine-grained metal set in a brown matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows BO, POP, PO chondrules up to 1500 μm, ubiquitous troilite, kamacite, and feldspathic glass, no stoichiometric plagioclase detected, pervasive weathering veinlets.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{23.8±1.3}$, Fe/Mn=52±4, n=21; low-Ca pyroxene $Fs_{19.2±2.2}Wo_{1.5±0.8}$, Fe/Mn=34±8, n=21.
Classification: Ordinary chondrite (L4), weathering grade W3.
Specimens: 28.84 g including a probe mount on deposit at *UNM*; Sean Tutorow holds the main mass.

Northwest Africa 7447 (NWA 7447)
(Northwest Africa)
Purchased: 2007
Classification: Enstatite chondrite (EL5)

History: Purchased by Romano Serra at the Bologna Mineral Show at the Erfoud market, Morocco.
Physical characteristics: Single fragment without fusion crust.
Petrography: (V. Moggi Cecchi, G. Pratesi, S. Caporali, *MSP*); The thin section displays a few chondrules set in a fine-grained matrix, dominated by pyroxene, with minor plagioclase. Chondrules are still distinguishable and range from 0.5 to 0.9 mm in diameter and are mainly RP type, with minor PP. Opaque phases are mainly kamacite and troilite, almost completely weathered to iron oxides. Accessory phases are daubreelite and rare alabandite spots. The presence of alabandite, An content of plagioclase, Mn content of daubreelite and Si content of kamacite point to a classification as EL chondrite. The presence of distinct chondrules suggests a petrologic type 5.
Geochemistry: Orthopyroxene $Fs_{0.1}Wo_{1.4}$, plagioclase ($An_{15.5}Or_{3.9}$); Si in kamacite = 1.8 wt.%, Mn in Daubreelite = 2.6 wt.%.
Classification: Enstatite chondrite (EL5); S2; W1
Specimens: A total of 20.3 g specimen and one thin section is on deposit at *MSP* (*MSP* 5195). The main mass is in deposit at *OAM*.

Northwest Africa 7449 (NWA 7449) 24°08'N, 13°10'W
Western Sahara
Found: July 2009
Classification: Ordinary chondrite (L6)

History: A single, completely fusion crusted stone was found in July 2009 by a nomad in the Gour Lafkah area, Morocco. The stone was broken into three fragments by the finder and eventually sold to collector R. Lenssen by a Moroccan meteorite dealer. The combined mass of the three fragments was 314 g. After the finder was urged to look for more stones, additionally a 91 g stone was found in September or October 2009. The total known mass is 405 g.
Physical characteristics: The three fragments of the stone that was found first show black fusion crust, next to a fresh, light grey to white interior. The 91 g stone found a few months later shows minor signs of weathering on the fusion crust and on a broken edge. This 91 g stone is covered by a somewhat thicker fusion crust than the first stone.
Petrography: Chondrules are poorly delineated and strongly recrystallized. Plagioclase grains are up to 0.2 mm in size. Troilite shows characteristic twinning lamellae. Besides dispersed grains, chromite and ilmenite form inclusions in iron metal. Cu metal is present at troilite-iron metal contacts.

Geochemistry: Electron microprobe analysis yielded olivine $Fa_{23.3}$ ($Fa_{22.2}$ by XRD), pyroxene $Fs_{20.0}Wo_{1.0}$. Cosmogenic radionuclides: (Patrick Weber, Laboratory for High Energy Physics, University of *Bern*): Gamma-spectroscopy performed in September 2009 showed the presence of the following short-lived radionuclides: ^{46}Sc, ^{54}Mn, ^{57}Co, ^{22}Na, ^{26}Al. The ^{22}Na/^{26}Al activity ratio of 1.3 is in the range of recent falls. By comparison with the mean activities of ^{57}Co, ^{51}Cr, ^{54}Mn and ^{46}Sc at the time of fall of five other recent falls, a terrestrial age of 202±14 days (before Sept. 20, 2009) is estimated, indicating a fall in February or March 2009.
Classification: Ordinary chondrite (L6), shock stage S3, no weathering (W0).
Specimens: 27.8 g and two polished thin sections: *NMBE*. 371 g: R. Lenssen collection.

Northwest Africa 7450 (NWA 7450)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (LL6)
History: Purchased by Sean Tutorow from Morocco in May 2012.
Physical characteristics: Single stone, rough, dark exterior, saw cut reveals a brecciated texture of light clasts bounded by dark colored matrix, with scattered, mostly fine-grained metal/sulfide.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a moderately brecciated texture with scattered indistinct chondrules up to 2 mm, ubiquitous plagioclase, mesostasis, troilite, and kamacite.
Geochemistry: (C. Agee and M.Spilde, *UNM*) Olivine $Fa_{31.4\pm0.7}$, Fe/Mn=61±5, n=8; low-Ca pyroxene $Fs_{25.2\pm0.6}Wo_{1.7\pm0.4}$, Fe/Mn=38±2, n=4.
Classification: Ordinary chondrite (LL6), weathering grade W1.
Specimens: 21 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7463 (NWA 7463)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L6)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One complete stone, brown exterior, saw cut reveals a few small chondrules and fine-grained metal set in a dark gray matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous equilibrated chondrules: BO, PO, POP, PP. Ubiquitous plagioclase. Metal moderately oxidized, with oxidized veinlets throughout the meteorite.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{25.3\pm0.4}$, Fe/Mn=50±3, n=6; low-Ca pyroxene $Fs_{21.2\pm0.4}Wo_{1.6\pm0.2}$, Fe/Mn=32±2, n=4.
Classification: Ordinary chondrite (L6), weathering grade W2.
Specimens: 21.63 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7476 (NWA 7476)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L6)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One complete stone, smooth dark fusion-crusted exterior, saw cut reveals a reddish brown matrix with scattered faint chondrules, and very fine-grained metal throughout.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows indistinct, equilibrated chondrules. Abundant kamacite, ~10% oxidized, with very finely disseminated metal or oxide included within many silicates, ubiquitous plagioclase, accessory chromite and phosphate.

Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{24.5\pm0.3}$, Fe/Mn=51±2, n=4; low-Ca pyroxene $Fs_{20.8\pm0.8}Wo_{2.9\pm0.1}$, Fe/Mn=30±0, n=4.
Classification: Ordinary chondrite (L6), weathering grade W1.
Specimens: 25.2 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7477 (NWA 7477)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L3.9)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One stone, saw cut reveals dark matrix, fine-grained metal and veining, and chondrules.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous PO, POP, and BO chondrules with mesostasis. Scattered, fine-grained, oxidized kamacite and iron-oxide weathering veins throughout. Accessory augite and pentlandite, no plagioclase present.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{24.0\pm2.6}$, Fe/Mn=49±7, n=21; low-Ca pyroxene $Fs_{18.4\pm4.8}Wo_{1.0\pm0.3}$, Fe/Mn=31±18, n=14.
Classification: Ordinary chondrite (L3.9), weathering grade W3.
Specimens: 23.39 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7478 (NWA 7478)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (LL6)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: One complete stone, saw cut reveals a reddish matrix with a few indistinct chondrules.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows relict and equilibrated chondrules. Abundant chromite and oxidized kamacite, ubiquitous troilite, and minor taenite.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{31.0\pm0.0}$, Fe/Mn=65±1, n=3; low-Ca pyroxene $Fs_{25.3\pm0.1}Wo_{1.9\pm0.4}$, Fe/Mn=38±2, n=3.
Classification: Ordinary chondrite (LL6), weathering grade W2.
Specimens: 22.0 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7479 (NWA 7479)
Morocco
Purchased: May 2012
Classification: Carbonaceous chondrite (CV3)
History: Purchased by Sean Tutorow from Morocco, May 2012.
Physical characteristics: Many fragments, black, irregular, shiny, some dull gray.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a numerous irregular to oval to round shaped PO and POP chondrules in a very fine-grained matrix. Numerous CAIs.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Chondrule olivine range: $Fa_{0.4\text{-}43.7.}$ Type I chondrules: olivine $Fa_{6.2\pm3.8}$, Fe/Mn=76±35, n=24; low-Ca pyroxene $Fs_{1.1\pm0.4}Wo_{2.4\pm1.6}$ Fe/Mn=11±9, n=12. Type II chondrules: olivine $Fa_{30.0\pm10.7}$, Fe/Mn=177±69, n=6; Accessory chondrule phases: diopside, fassaite, anorthite, and Ni-Fe sulfide. Matrix phases: Fs-rich pyroxene, troilite, and taenite.
Classification: Carbonaceous chondrite (CV3), weathering grade W1.
Specimens: 21.79 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7484 (NWA 7484)
Morocco

Purchased: Aug 2012
Classification: HED achondrite (Howardite)

History: Purchased by Adam Bates from a meteorite dealer in Morocco, August, 2012.
Physical characteristics: Single stone, dark brown, lightly weathered, and fusion crusted. Saw cut reveals fresh, brecciated texture, numerous white and dark clasts up to 3mm, set in a medium-gray groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a brecciated texture with a wide range of silicate grain sizes, 1-500 µm, with three distinct pyroxene populations: 40% diogenitic, 36% main group eucritic, and 24% cumulate eucritic; n=50. Some pyroxenes show zoning in backscatter electron images, while others display exsolution lamellae. Phase proportions: pyroxene ~70%, plagioclase ~20%, with accessory silica, ilmenite, troilite, and low-Ni iron metal.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Diogenite low Ca-pyroxene $Fs_{26.0\pm2.5}Wo_{2.7\pm1.2}$, Fe/Mn=31±2, n=20; cumulate eucrite low-Ca pyroxene $Fs_{43.4\pm4.0}Wo_{4.3\pm2.9}$, Fe/Mn=33±3, n=11; cumulate eucrite augite $Fs_{21.6}Wo_{41.6}$, Fe/Mn=29; main group pyroxene $Fs_{53.2\pm6.6}Wo_{11.4\pm8.9}$, Fe/Mn=33±4, n=18; plagioclase $Or_{0.4\pm0.1}Ab_{9.2\pm2.4}An_{90.3\pm2.5}$ n=4.
Classification: Achondrite (howardite)
Specimens: 21.09 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7485 (NWA 7485)
Morocco
Purchased: May 2012
Classification: HED achondrite (Eucrite, monomict)

History: Purchased by Sean Tutorow in May 2012 from a Moroccan meteorite dealer.
Physical characteristics: Single stone, dark brown exterior, some weathered fusion crust, saw cut reveals patches of dark-gray and light-gray, slight oxidation.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a brecciated texture with approximately 60% pyroxene and 30% plagioclase, many pyroxenes with exsolution lamellae. Numerous shock melt veins up to 500 µm wide. Accessory silica, ilmenite, chromite, troilite, and low-Ni iron metal.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Pyroxene $Fs_{47.5\pm14.6}Wo_{19.1\pm17.6}$, Fe/Mn=31±1, n=36, with equilibrated trend $Fs_{61.0}Wo_{1.8}$ to $Fs_{27.0}Wo_{43.2}$; plagioclase $Or_{0.5\pm0.4}Ab_{10.3\pm1.6}An_{89.2\pm2.0}$, n=7.
Classification: Achondrite (eucrite, monomict). Equilibrated main group eucrite.
Specimens: 20.41 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7487 (NWA 7487)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (H4)

History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: Single stone, dark brown exterior, saw cut reveals numerous chondrules, some up to 3 mm, set in a reddish brown matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a numerous PO, POP, and some BO chondrules in a fine-grained matrix, some chondrules with mesostasis and some with plagioclase.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{18.0\pm0.2}$, Fe/Mn=38±2, n=21; low-Ca pyroxene $Fs_{15.3\pm1.3}Wo_{1.0\pm0.8}$ Fe/Mn=22±3, n=20; most kamacite is oxidized.
Classification: Ordinary chondrite (H4), weathering grade W3.
Specimens: 21.5 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7488 (NWA 7488)
Morocco

Purchased: August 2012
Classification: HED achondrite (Eucrite)

History: Purchased by Adam Bates in August 2012 from Moroccan meteorite dealer.
Physical characteristics: Single stone, dark gray, irregular exterior. Saw cut reveals breccia with angular clasts up to 1 cm set in a light-gray groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 60% pyroxene and 30% plagioclase, plus accessory silica, ilmenite, troilite, and low-Ni iron metal.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Low Ca-pyroxene $Fs_{50.8\pm2.4}Wo_{12.8\pm3.4}$, Fe/Mn=28±2, n=30; plagioclase $Or_{0.5\pm0.2}Ab_{11.4\pm1.3}An_{88.1\pm1.5}$, n=3.
Classification: Achondrite (eucrite), equilibrated, main group, basaltic eucrite.
Specimens: 21.24 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7490 (NWA 7490)
(Northwest Africa)
Purchased: 2012
Classification: HED achondrite (Diogenite)

Petrography: The meteorite displays a cumulate texture of dominantly large orthopyroxene crystals, subordinate calcic plagioclase, and minor olivine. Accessory minerals include chromite and troilite; no eucrite clasts were found. Orthopyroxene $Fs_{24.1\text{-}26}Wo_{3.4\text{-}4.6}$, FeO/MnO=27-33; olivine $Fa_{27.3}$; plagioclase $An_{82.9}$, range 77.1-91.6.

Northwest Africa 7491 (NWA 7491)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L6)

History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: Two matching fragments, with shiny, smooth fusion crust, saw cut reveals finely disseminated metal/sulfide and many chondrules, some up to 4mm, set in a light gray matrix. Some fine weathering veins.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous equilibrated, recrystallized chondrules. Ubiquitous troilite and kamacite with moderate oxidation, accessory Cl-rich apatite and merrillite.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{24.7\pm0.1}$, Fe/Mn=49±2, n=3; low-Ca pyroxene $Fs_{20.7\pm0.2}Wo_{1.5\pm0.3}$, Fe/Mn=28±1, n=3.
Classification: Ordinary chondrite (L6), weathering grade W2.
Specimens: 20.12 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7492 (NWA 7492)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L6)

History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: Single stone, partially fusion crusted, saw cut reveals finely disseminated metal/sulfide and indistinct chondrules set in a light-gray matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows equilibrated ordinary chondritic texture with indistinct chondrules, also a fine-grained equilibrated clast. Ubiquitous troilite and kamacite, minor taenite and chromite, minimal oxidation of metal.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{24.7\pm0.3}$, Fe/Mn=50±1, n=3; low-Ca pyroxene $Fs_{20.5\pm0.3}Wo_{1.4\pm0.1}$, Fe/Mn=30±2, n=3; high-Ca pyroxene $Fs_{8.3\pm0.0}Wo_{43.5\pm0.1}$, Fe/Mn=21±1, n=2; plagioclase $Or_{9.5\pm0.1}Ab_{78.3\pm0.3}An_{12.3\pm0.2}$, n=4.
Classification: Ordinary chondrite (L6), weathering grade W1.

Specimens: 23.2 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7493 (NWA 7493)
Morocco
Purchased: August 2012
Classification: Lunar meteorite (feldspathic breccia)

History: Found in July 2011, reportedly near Zag, Morocco. Purchased by Jay Piatek and Matt Morgan in August 2012 from a dealer in Ouarzazate.
Physical characteristics: Six matching separate stones (total weight 503 g), consisting of two larger stones (341 g and 146 g) and four smaller pieces (total 16 g). Irregular, desert-weathered exterior with heavy patina in places and visible light and dark patches. Sawn slices exhibit a brecciated texture dominated by medium gray, tan and white lithic clasts plus white feldspar grains (up to 5 mm across) set in a sparse, darker gray matrix. Some thin veins of terrestrial weathering products visible.
Petrography: (C. Agee, *UNM*; A. Irving, *UWS*; R. Mills, *JSC*) Microprobe examination of five polished mounts and a complete slice shows this specimen to be a fragmental breccia composed primarily of quenched melt clasts and calcic plagioclase grains occurring in a wide range of grain sizes. There are numerous scattered olivine and zoned pyroxene grains throughout, rare grains of exsolved pigeonite, ilmenite, Ti-chromite, troilite, silica polymorph and iron metal. Shock melt domains are common containing plagioclase grains set in a matrix of quench crystals. A single "granophyre" clast (100 microns across) composed of intergrown K-feldspar+silica was observed. Secondary barite and iron oxide/hydroxide were detected.
Geochemistry: (C. Agee and M. Spilde, *UNM*; A. Greshake and P. Czaja, *MNB*; A. Irving and S. Kuehner, *UWS*). Olivine $Fa_{39.6±7.8}$, Fe/Mn=94±8, n=49; low-Ca pyroxene $Fs_{37.4±7.0}Wo_{4.7±1.6}$, Fe/Mn=57±8, n=30; pigeonite $Fs_{34.4±9.4}Wo_{12.9±4.0}$, Fe/Mn=60±5, n=15; high-Ca pyroxenes $Fs_{26.9±10.9}Wo_{38.4±4.6}$, Fe/Mn=58±9, n=15; plagioclase $An_{96.6±0.6}Ab_{3.3±0}Or_{0.2±0.15}$, n=17. Bulk composition (R. Korotev, *WUSL*). INAA on 18 subsamples gave the following mean values: Na_2O=0.331, CaO=16.3, FeO=4.52 (all wt%); Sc=8.67, Cr=587, Co=12.48, Ni=81, La=2.09, Nd=3.2, Sm=0.984, Eu=0.772, Lu=0.111, Hf=0.63, Ir=0.0037, Au=0.0021, Th=0.29, U=0.16 (all ppm). Oxygen Isotopes, laser fluorination (K. Ziegler, *UNM*), 12 analyses on 5 acid-washed aliquots gave mean values $\delta^{17}O$=2.963±0.126, $\delta^{18}O$=5.646±0.316, $\Delta^{17}O$=-0.018±0.06 (linearized, all permil).
Classification: Achondrite (lunar, feldspathic breccia)
Specimens: A total of 30 g of material including two probe mounts are on deposit at *UNM*. The remainder is divided between Dr. J. Piatek and Mr. M. Morgan, with Dr. J. Piatek holding the main portion of the largest stone and the other five stones.

Northwest Africa 7494 (NWA 7494)
Morocco
Purchased: Sept. 11, 2012
Classification: Ordinary chondrite (H6)

History: Purchased by *Reed* in Denver, September 11, 2012.
Physical characteristics: Single stone, dark weathered exterior, saw cut reveals very fine-grained metal and sulfide, and faint chondrules, set in a dark gray matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows an equilibrated chondrite texture with a few indistinct chondrules and plagioclase up to 200 microns. Abundant kamacite and troilite, metal is moderately oxidized.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{19.0±0.4}$, Fe/Mn=38±1, n=4; low-Ca pyroxene $Fs_{16.7±0.1}Wo_{1.4±0.2}$, Fe/Mn=22±1.
Classification: Ordinary chondrite (H6), weathering grade W2.
Specimens: 29.7 g including a probe mount on deposit at *UNM*, *Reed* holds the main mass.

Northwest Africa 7495 (NWA 7495)

Morocco
Purchased: May 2012
Classification: Ordinary chondrite (L5)

History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: Two stones, 1454.49 g and 690.18 g, of identical appearance, purchased as a pair, with dark exterior, saw cuts reveal scattered chondrules, some up to 3 mm, and finely disseminated metal/sulfide, some vein-like, set in a dark gray matrix, also some small cavities lined with euhedral crystals.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a numerous PO and POP chondrules in a fine-grained matrix, some chondrules with recrystallized mesostasis and some with plagioclase. Ubiquitous troilite and kamacite, minimal oxidation.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{24.2±0.4}$, Fe/Mn=50±3, n=21; low-Ca pyroxene $Fs_{20.0±0.3}Wo_{2.0±0.7}$ Fe/Mn=28±1, n=20.
Classification: Ordinary chondrite (L5), weathering grade W1.
Specimens: 24.9 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7496 (NWA 7496) 22°56.8687'N, 13°23.1163'W
Rio de Oro, Western Sahara
Found: Jan 2012
Classification: HED achondrite (Eucrite, polymict)

History: Found in Western Sahara in a dune on the bank of an old river called Tiziualtin, January 2012, some 70 km south of Mijek region.
Physical characteristics: A single, 788.4 g, rounded rock, with a ~80% dark-brown fusion crust. The rest of the surface bears an erosion scar that bares a light-gray, fine-grained matrix that encloses angular rock clasts <1 cm in size.
Petrography: Set in a fine, fragmental groundmass, up to 5 mm size clasts have variably coarse, subophitic to protogranular textures of plagioclase and pyroxene with minor quartz and cristobalite domains. Symplectitic portions, 0.2 mm in size, of very fine grained, euhedral augite, ferrosilite, olivine and silica are also observed in these clasts. Aphanitic, clast-rich impact-melt fragments and the variable shock metamorphic deformation of the lithic clasts indicate a polymict nature. Ilmenite is a common minor component, chromite, troilite and baddeleyite are accessories. The stone appears fresh with very little alteration present outside a 0.1 mm thick iron-hydroxide bearing vein. The scarcity of metal or troilite in the thin section may inhibit an evaluation of the extent of alteration.
Geochemistry: (A. Wittmann, *WUSL*): Plagioclase is variable in composition (An_{73-95}, $Or_{0.2-1.7}$), orthopyroxene occurs as zoned grains with magnesian cores (Fs_{29-33}, $Wo_{1.2-4.9}$, FeO/MnO 25-35) and ferroan rims (Fs_{47-59}, $Wo_{1.2-4.9}$, FeO/MnO 30-37) as solitary fragments or in protogranular eucrite clasts. Such clasts also contain pigeonite grains (Fs_{51-58}, Wo_{7-10}, FeO/MnO 29-35) with ~5 µm thick augitic exsolution lamellae, and pigeonite (Fs_{42-50}, Wo_{6-12}) with finer exsolution lamellae. Commonly, these protogranular clasts also contain 0.1 to 0.2 mm size symplectitic domains that are composed of ~10 µm size augite (Fs_{28-40}, Wo_{33-44}, FeO/MnO 33-34), orthopyroxene (Fs_{63}, FeO/MnO 31-32), olivine (Fa_{78-82}, FeO/MnO 41-47), and quartz ± tridymite crystals (Raman spectroscopy resolved the presence of quartz, tridymite, and cristobalite). Pyroxene in subophitic clasts is compositionally variable (Fs_{36-58}, Wo_{6-20}, FeO/MnO 25-35).
Classification: Achondrite (polymict eucrite, components record variable degree of shock metamorphic overprint from unshocked (S0) to whole rock melting; very minor alteration).
Specimens: Type specimen, 21.7 g, *ASU*. The main mass is held by an anonymous person.

Northwest Africa 7497 (NWA 7497)
Morocco
Purchased: Aug 2012
Classification: Ordinary chondrite (H4)

History: Purchased by Adam Bates in Morocco, August 2012.
Physical characteristics: Single stone, dark weathered fusion crust, saw-cut reveals abundant fine-grained metal/sulfide, many small chondrules, but some up to 3mm.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a numerous PO, POP, and PP chondrules, most with mesostasis or glass, some fine grained plagioclase, moderate oxide veining.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{20.1±0.8}$, Fe/Mn=42±3, n=29; low-Ca pyroxene $Fs_{14.2±4.2}Wo_{1.0±0.8}$ Fe/Mn=25±8, n=30; high-Ca pyroxene $Fs_{9.9}Wo_{54.3}$, Fe/Mn=23. Ubiquitous troilite and kamacite, minor Cl-rich apatite.
Classification: Ordinary chondrite (H4), weathering grade W2.
Specimens: 21.4 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7498 (NWA 7498)
Morocco
Purchased: Aug 2012
Classification: Ordinary chondrite (L4)
History: Purchased by Adam Bates in Morocco, August 2012.
Physical characteristics: Single stone, dark, weathered, oxidized crust, saw-cut reveals fine-grained metal/sulfide, numerous chondrules, some up to 2 mm set in gray groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a numerous PO, POP, and PP chondrules, most with mesostasis and fine grained plagioclase, moderate oxidation of metal. Abundant troilite, some decorating chondrule rims, scattered taenite and kamacite, minor Cl-rich apatite and high-Ca pyroxene.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{23.2±0.4}$, Fe/Mn=48±3, n=30; low-Ca pyroxene $Fs_{15.2±4.2}Wo_{1.2±1.1}$, Fe/Mn=32±11, n=28.
Classification: Ordinary chondrite (L4), Fs value is low for L-chondrite, weathering grade W2.
Specimens: 25 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7499 (NWA 7499)
Morocco
Purchased: August 2012
Classification: Primitive achondrite (Brachinite)
History: Purchased by Adam Bates in Morocco, August 2012.
Physical characteristics: Nine matching stones, the largest 162 g. Weathered exterior with mineral grains exposed, broken surface reveals mostly equant honey-colored olivine crystals and a few chromium-green pyroxene crystals, scattered metal/chromite/sulfide grains.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 75% olivine, 20% low-Ca pyroxene, texturally equilibrated with triple junctions, silicate grain size 100-700 µm. Accessory chromite, Fe-Ni metal, Fe-sulfide, with minor Cl-rich apatite and high-Ca pyroxene, no plagioclase detected. About 10-20% of metal is oxidized, many oxidation veinlets on grain boundaries.
Geochemistry: (C. Agee and L. Burkemper, *UNM*) Olivine $Fa_{29.9±0.3}$, Fe/Mn=65±3, n=12; low-Ca pyroxene $Fs_{24.4±0.2}Wo_{2.1±0.1}$, Fe/Mn=40±3, n=11; high-Ca pyroxene $Fs_{10.1}Wo_{43.0}$, Fe/Mn=31±10; metal Fe 86% Ni 14%.
Classification: Primitive achondrite (brachinite)
Specimens: 21.32 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7510 (NWA 7510)
Morocco
Purchased: Aug 2012
Classification: HED achondrite (Howardite)
History: Purchased by Adam Bates in August 2012 from a Moroccan meteorite dealer.

Physical characteristics: Single stone, dark brown, lightly weathered, and fusion-crusted. Saw cut reveals fresh, fine-grained brecciated texture, scattered white and dark clasts set in a light-gray groundmass.
Petrography: C. Agee, *UNM*) Microprobe examination of a polished mount shows two distinct lithologies: 1) diogenite lithology with zoned pyroxene phenocrysts up to 1 mm, and 2) finer-grained cumulate eucrite lithology of ~50% pyroxene and ~40% plagioclase, most pyroxenes with exsolution lamellae. Accessory silica, ilmenite, chromite, troilite, and low-Ni iron metal.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Diogenite low Ca-pyroxene cores $Fs_{23.7±0.9}Wo_{2.5±0.2}$, Fe/Mn=33±2, n=2; cumulate eucrite low-Ca pyroxene $Fs_{46.1±4.6}Wo_{5.0±3.0}$, Fe/Mn=32±2, n=33; cumulate eucrite high-Ca pyroxene $Fs_{27.2±7.7}Wo_{35.2±8.6}$, Fe/Mn=29±2, n=5; plagioclase $Or_{0.3}Ab_{6.4}An_{93.3.}$
Classification: Achondrite (howardite), mix of diogenite and cumulate eucrite lithologies.
Specimens: 21.02 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7513 (NWA 7513)
Morocco
Purchased: Aug 2012
Classification: Ordinary chondrite (L3.8)
History: Purchased by Adam Bates from a meteorite dealer in Morocco, August 2012.
Physical characteristics: Single stone, dark weathered exterior, saw-cut reveals many chondrules and metal/sulfides set in a dark-brown groundmass.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous unequilibrated PO and POP chondrules; iron metal is nearly all oxidized.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{24.9±2.4}$, Fe/Mn=53±4, n=26; low-Ca pyroxene $Fs_{14.9±5.6}Wo_{0.9±0.8}$, Fe/Mn=30±11, n=29; high-Ca pyroxene $Fs_{13.5±3.1}Wo_{28.9±9.3}$, Fe/Mn=13±5, n=2.
Classification: Ordinary chondrite (L3.8), weathering grade W3.
Specimens: 21 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7514 (NWA 7514)
(Northwest Africa)
Found: Sept 2005
Classification: Rumuruti chondrite (R5)
History: Originally thought not to be a meteorite, and was received by the main mass holder as a gift from a meteorite collector in September 2005. Samples were given to *Cascadia* in June 2012 and subsequently recognized to be a meteorite.
Physical characteristics: The specimen contains large facets, regmaglypts, and is largely covered by a translucent fusion crust that appears olive gray. In places slight protrusions <1 mm high and ~1-4 mm across are present and covered by crust. A few small broken faces have a brownish weathering patina. A cut face shows a nearly featureless interior with an overall color more gray than that of the fusion crust.
Petrography: (A. Ruzicka and M. Hutson, *Cascadia*) In thin section the rock shows chondritic texture with a transparent matrix and significant chondrule-matrix integration. Indistinct microporphyritic and barred olivine chondrules are visible; a clast of olivine microporphyry ~4.5 × 3.6 mm across is the largest feature. The rock consists primarily of olivine, with subequal plagioclase and Ca-pyroxene, and accessory chromite, Cl-apatite, pentlandite, and pyrrhotite. Feldspar grain size (length) = 37±18 µm, n=199. Olivine grains show diverse shock characteristics split roughly evenly between stages S2, S3, and S4.
Geochemistry: Phases are generally equilibrated (all values atomic): olivine $Fa_{38.2±0.5}$, n=32; plagioclase $Ab_{84.4±2.0}Or_{5.7±0.9}An_{9.9±1.8}$, n = 20; Ca-pyroxene $Wo_{40.1±2.5}Fs_{15.4±1.9}$, n = 20; chromite [Fe/(Fe+Mg)] = 0.94±0.05, [Cr/(Cr+Al)] = 0.81±0.03, n=14; Ni-rich pentlandite (approximately $Fe_{0.49}Ni_{0.51}S_{1.0}$) and S-rich pyrrhotite (approximately $Fe_{0.81}$ $Ni_{0.01}S_{1.0}$). Oxygen isotope composition: (R. Greenwood, *OU*) $\delta^{17}O$ = 5.74, $\delta^{18}O$ = 5.04, $\Delta^{17}O$ = 3.12 (all per mil).
Classification: Rumuruti chondrite (R5). Mineralogy, mineral chemistry, and O-isotopic composition consistent with R chondrite group.

Specimens: 40.3 g, two thick slices, and one thin section at *Cascadia*. Main mass, *TStout*.

Northwest Africa 7515 (NWA 7515)
Morocco
Purchased: Aug 2012
Classification: HED achondrite (Eucrite)

History: Purchased by Adam Bates from a meteorite dealer in Morocco, August, 2012.
Physical characteristics: Two matching stones, 79 g and 81 g, black shiny fusion crust. Broken surface reveals fine-grained, light-gray, texture; highly friable.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows approximately 60% pyroxene and 35% plagioclase, with subophitic to equigranular texture. Many pyroxene grains show exsolution lamellae. Accessory silica, ilmenite, chromite, and troilite.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Low Ca-pyroxene $Fs_{58.8±1.8}Wo_{3.5±1.6}$, Fe/Mn=32±1, n=19; high Ca-pyroxene $Fs_{34.5±7.2}Wo_{32.3±8.7}$, Fe/Mn=32±2, n=11; plagioclase $Or_{0.5±0.1}Ab_{9.5±1.9}An_{90.0±2.0}$, n=4.
Classification: Achondrite: equilibrated, main group, basaltic eucrite.
Specimens: 21 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7516 (NWA 7516)
Morocco
Purchased: Aug 2012
Classification: HED achondrite (Eucrite)

History: Purchased by Adam Bates from a meteorite dealer in Morocco, August, 2012.
Physical characteristics: Single stone, shiny black fusion crust. Saw cut reveals, fresh, light gray, fine-grained texture; friable.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous zoned pyroxenes, with a minor amount of generally smaller pyroxenes with exsolution lamellae. Ophitic to granular to cataclastic texure, approximately 60% pyroxene and 30% plagioclase. Scattered mesostasis, silica, chromite, ilmenite, troilite, and low-Ni iron metal; some fayalitic olivine on pyroxene grain boundaries.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Pyroxene $Fs_{43.1±7.7}Wo_{8.8±4.7}$, Fe/Mn=32±2, n=32; plagioclase $An_{90.0±11.9}$, n=4.
Classification: Achondrite (eucrite), unequilibrated basaltic eucrite, zoned pyroxenes show a Pasamonte type trend, also a few pyroxenes with exsolution lamellae suggest the presence of a second, equilibrated, eucrite lithology.
Specimens: 15.4 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7517 (NWA 7517)
Morocco
Purchased: August 2012
Classification: Ordinary chondrite (LL5)

History: Purchased by Adam Bates from a meteorite dealer in Morocco, August 2012.
Physical characteristics: Single stone, dark, lightly weathered fusion crust, saw-cut reveals fine-grained metal/sulfide, many faint chondrules, also a few dark clasts up to 4 mm.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows a numerous texturally equilibrated chondrules, most plagioclase <50 μm; minor high-Ca pyroxene. Ubiquitous troilite, kamacite, and taenite; metal has minimal oxidation.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{28.1±0.1}$, Fe/Mn=59±3, n=6; low-Ca pyroxene $Fs_{22.8±0.6}Wo_{2.2±1.6}$, Fe/Mn=33±2, n=6.
Classification: Ordinary chondrite (LL5), weathering grade W1.
Specimens: 21 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7518 (NWA 7518)
Morocco
Purchased: May 2012
Classification: Ordinary chondrite (LL4)
History: Purchased by Sean Tutorow in Morocco, May 2012.
Physical characteristics: Single stone, brown exterior, saw cut reveals numerous chondrules and clasts and scattered fine-grained metal/sulfide, set in a light brown matrix.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous PO and POP chondrules in a fine-grained crystallized matrix, some chondrules with recrystallized mesostasis and some with plagioclase. Also present, some finer-grained domains up to 5 mm with a few relict chondrules, possibly LL6 lithology. Accessory troilite, kamacite, taenite, and chromite.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{29.3±0.5}$, Fe/Mn=60±3, n=14; low-Ca pyroxene $Fs_{22.4±3.1}Wo_{1.5±1.1}$ Fe/Mn=36±3, n=22.
Classification: Ordinary chondrite (LL4), weathering grade W2.
Specimens: 20.8 g including a probe mount on deposit at *UNM*, Sean Tutorow holds the main mass.

Northwest Africa 7531 (NWA 7531)
Morocco
Found: 2009
Classification: Carbonaceous chondrite (CR7 polymict breccia)
History: An anonymous buyer purchased an 868 g stone in Erfoud, Morocco in 2009.
Physical characteristics: The fresh stone has a smooth, dark ablation crust with a coarse network of shrinkage cracks.
Petrography: The interior consists of angular clasts of two lithologies. The dominant lithology comprises ~66 vol%, and is green, consisting of crushed, recrystallized coarse-grained olivine, orthopyroxene poikiloblasts (olivine chadacrysts), plagioclase, minor chromite, taenite, FeS, and Cl-apatite. Modal analyses (vol %): Orthopyroxene, 42; olivine, 37; plagioclase, 14; other, 7. The second lithology is gray, recrystallized, lacking chondrules, with coarse-grained orthopyroxene poikiloblasts (olivine chadacrysts), smaller grained olivine, minor augite, recrystallized troilite with tiny silicate entrainments, metal, merrillite, and chromite. Boundaries between clasts are occupied with a 0.5 to 1.0 mm thick layer of finely granulated, recrystallized "rock flour".
Geochemistry: The green lithology has olivine, $Fa_{30.8}$, FeO/MnO = 90; orthopyroxene, $Fs_{27.4}Wo_{4.2}$, FeO/MnO = 44; plagioclase $An_{14.7}Or_{5.4}$; chromite cr# = 90, taenite Ni = 42 wt %. The LL lithology contains olivine $Fa_{28.6}$, FeO/MnO = 58; orthopyroxene, $Fs_{24.2}Wo_{2.0}$. Oxygen isotopes (D. Rumble, *CIW*): Replicate analyses of acid-washed material by laser fluorination gave, respectively for the greenish lithology $\Delta^{17}O$ = -0.988 and -0.978; $\delta^{17}O$ = 2.899 and 2.729; $\delta^{18}O$ = 7.391 and 7.048. LL lithology $\Delta^{17}O$ = 1.193 and 1.194; $\delta^{17}O$ = 3.903 and 3.851; $\delta^{18}O$ = 5.152 and 5.052 (all per mil). Compositional, petrographic and oxygen isotopic data for the green lithology are consistent with CR7, and LL7 for the gray lithology.
Classification: CR7 polymict breccia with an LL7 clast.
Specimens: A total of 22 g is at *UWB*; main mass holder is anonymous.

Northwest Africa 7533 (NWA 7533)
(Northwest Africa)
Purchased: June 2012
Classification: Ungrouped achondrite
Petrography: (R. Hewins, *MNHNP*) Breccia, largest objects (~1 cm) are flattened, oval or curved fine-grained melt bodies containing crystal fragments, often with melt mantles or coatings. The melt rocks have a fine-grained subophitic to fasciculate texture (grain size 2-5 µm) and are characterized by clots with central oxides (magnetite, chromite or ilmenite) in a mass of pyroxene dendrites embedded in aureoles of plagioclase. Clasts (to ~2 mm) are dominantly crystal clasts of pyroxenes and feldspars, with

magnetite and chlorapatite, small coarse-grained noritic-monzonitic fragments (>1 mm grains) made up of several of these phases, microbasalts with subophitic to granoblastic textures (grain size 1-5 µm) and melt spheres (~100 µm to >3 mm). Pyroxenes include orthopyroxene, inverted pigeonite, pigeonite (in microbasalts), and augite. Feldspars include plagioclase, anorthoclase, orthoclase and perthite. Inverted pigeonite contains 10 µm exsolution lamellae. Olivine occurs as dendrites in one melt sphere. The fine-grained interclast matrix is difficult to discern because clasts have sizes down to ~5 µm; it consists of anhedral µm-sized plagioclase with sub-µm pyroxene surrounding and embedded in it plus magnetite, often symplectitic or lacy. Rare pyrite is replaced by magnetite and hydrated or oxidized magnetite.
Geochemistry: (R. Hewins and B. Zanda, *MNHNP*) Orthopyroxene from $Fs_{21.9}Wo_{1.9}$ to $Fs_{49.4}Wo_{5.0}$, FeO/MnO = 34.6 (n=29), and augite from $Fs_{15.4}Wo_{40.5}$ to $Fs_{30.5}Wo_{39.5}$. Inverted pigeonite from $Fs_{40}Wo_2$ with $Fs_{21}Wo_{44}$ lamellae to $Fs_{48}Wo_6$ with $Fs_{21}Wo_{44}$ lamellae. Plagioclase $An_{41\pm8}Ab_{56\pm7}Or_{3\pm1}$ (n=55), perthite $An_{3\pm2}Ab_{22\pm7}Or_{74\pm9}$ and $An_{4\pm2}Ab_{89\pm3}Or_{7\pm2}$, anorthoclase $An_{5\pm2}Ab_{83\pm13}Or_{12\pm11}$, orthoclase $An_{2\pm0}Ab_{21\pm1}Or_{77\pm1}$, chromite with up to 52.4 wt% Cr_2O_3, magnetite and ilmenite with up to 5.7 wt% MgO, apatite with 1.8 to 5.4 wt% Cl. Maghemite identified by XRD. Oxygen isotopes: (J. Gattacceca, *CEREGE*) IR-laser fluorination/mass spectrometry gave $\delta^{18}O$=5.92, $\delta^{17}O$=3.65, $\Delta^{17}O$= 0.57 (all per mil).
Classification: Achondrite ungrouped. Breccia, probably paired with NWA 7034. The oxygen isotopic values are identical to those of that ungrouped achondrite breccia, and the range of mineral compositions of the two meteorites are very similar. Some of the pyroxene compositions are also very close to those of ALH 84001.
Specimens: 17 g, *MNHNP*, main mass with finder

Northwest Africa 7546 (NWA 7546)
(Northwest Africa)
Purchased: 2012
Classification: HED achondrite (Howardite)
Petrography: Grayish breccia dominated by diogenitic clasts of blocky orthopyroxene, partly showing compositional zoning (i.e., Mg-rich core to Fe-rich rim) and large Ca-rich plagioclase. More rarely small basaltic eucrite clasts composed of exsolved Ca-pyroxene and lath-shaped calcic plagioclase. In both lithologies Ca-rich plagioclase has been partly to completely converted into maskelynite. Minor mineral phases include chromite, ilmenite, troilite, and silica polymorphs.
Geochemistry: Diogenitic orthopyroxene $Fs_{28-41.2}Wo_{1.2-3.4}$, FeO/MnO=31-40; low-Ca pyroxene host $Fs_{42.3-62.8}Wo_{2.2-5.3}$, FeO/MnO=28-32; augite exsolution lamellae $Fs_{15.4-30.5}Wo_{40.7-44.5}$, FeO/MnO=24-32. Calcic plagioclase An_{87}, range 61.5-93

Northwest Africa 7547 (NWA 7547)
Morocco
Purchased: Aug 2012
Classification: HED achondrite (Eucrite, monomict)
History: Purchased by Adam Bates from a meteorite dealer in Morocco, August, 2012.
Physical characteristics: Single stone, weathered green-gray fusion crust. Saw cut reveals, fresh, light gray, fine-grained texture, some small dark clasts.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows two textural domains, a coarser grained host texture, and scattered very fine grained clasts up to 4mm. This is a monomict breccia based on similar pyroxene compositional range in both host and clasts. Pyroxenes show very fine exsolution lamellae, with some faint rim zonation. Ubiquitous silica, ilmenite, troilite, and minor zircon.
Geochemistry: (C. Agee and M. Spilde, *UNM*) EMPA. Pyroxene $Fs_{53.2\pm7.3}Wo_{12.1\pm9.2}$, Fe/Mn=34±2, n=20; plagioclase $An_{90.0\pm4.8}$, n=4.
Classification: Achondrite (Eucrite-mmict), pyroxene compositions display Type 4 pyroxenes.
Specimens: 21.2 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7548 (NWA 7548)
Morocco
Purchased: Aug 2012
Classification: Ordinary chondrite (L4)

History: Purchased by Adam Bates from a Moroccan meteorite dealer, August 2012.
Physical characteristics: Single stone, brown weathered surface, saw-cut reveals fine-grained metal/sulfide, many small chondrules, but some up to 2 mm.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows numerous unequilibrated BO, POP, PO chondrules, most with mesostasis, some chondrules mantled with metal or sulfide. Ubiquitous troilite, kamacite, and taenite; metal has <5% oxidation; minor high-Ca pyroxene.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Olivine $Fa_{25.7\pm0.3}$, Fe/Mn=54±3, n=28; low-Ca pyroxene $Fs_{19.7\pm3.3}Wo_{0.7\pm0.6}$, Fe/Mn=34±7, n=27.
Classification: Ordinary chondrite (L4), weathering grade W1.
Specimens: 24 g including a probe mount on deposit at *UNM*, Adam Bates holds the main mass.

Northwest Africa 7557 (NWA 7557)
(Northwest Africa)
Purchased: 2011
Classification: HED achondrite (Howardite)

Petrography: The meteorite displays a brecciated texture with large mineral and lithic fragments set in a fine-grained cataclastic matrix. Mineral fragments are dominantly large diogenitic orthopyroxenes and calcic plagioclase. Subordinate lithic clasts include fine-grained basaltic eucrite clasts and fewer melt fragments. Pyroxene in eucritic clasts contains sub-µm wide Ca-rich exsolution lamellae. Accessory silica, Fe,Ni-metal, and chromite.
Geochemistry: Diogenitic orthopyroxene $Fs_{25.3-26.3}Wo_{2.1-4.8}$, FeO/MnO=29-33; exsolved Ca-pyroxene $Fs_{41.3-59.7}Wo_{14.6-31.6}$, FeO/MnO=30-32; calcic plagioclase $An_{90.2}$, range 85.4-93.1

Northwest Africa 7570 (NWA 7570)
Morocco
Purchased: Sept 2012
Classification: HED achondrite (Eucrite)

History: Purchased by Adam Bates from a Moroccan meteorite dealer, September, 2012.
Physical characteristics: Single stone, irregular brown exterior with some iron-staining. Saw cut reveals granular texture with white and reddish-brown sub-millimeter crystals.
Petrography: (C. Agee, *UNM*) Microprobe examination of a polished mount shows ophitic to brecciated texture, approximately 50% pyroxene and 40% plagioclase; some pyroxenes show exsolution lamellae. Ubiquitous silica, chromite, ilmenite, troilite, and low-Ni iron metal.
Geochemistry: (C. Agee and M. Spilde, *UNM*) Pyroxene $Fs_{40.6\pm12.1}Wo_{20.5\pm15.9}$, Fe/Mn=25±1, n=22; plagioclase $An_{87.8}$.
Classification: Achondrite (Eucrite), equilibrated eucrite, pyroxene trend is transitional between Pomozdino (cumulate) and Juvinas (basaltic).
Specimens: 21 g including a probe mount on deposit at *UNM*; Adam Bates holds the main mass.

Northwest Africa 7610 (NWA 7610)
Morocco
Purchased: 2009
Classification: Ordinary chondrite (LL5-6)

History: One partially crusted stone weighing 1086 g was purchased in Agadir in 2008. Greg Catterton acquired the sample from a meteorite prospector in 2009.

Physical characteristics: Dark blackish-brown matte fusion crust covers approximately 75% of the stone. The fusion crust covers one side of the cubic-shaped stone and contains several moderately-developed regmaglypts

Petrography: (Anthony Love, *App*): Sample displays brecciated structure containing chondrules and chondrule fragments and light and dark-colored clasts of various petrologic grades set within an oxidized fine-grained fragmental matrix. Clasts display weakly to totally recrystallized chondritic textures and shock-darkened and shock melted textures. Chondritic host rock contains well-defined type IIA, IIB and IIAB chondrules, rare Al-rich chondrules with chrome spinel, poikilitic olivine-pyroxene chondrules and fragments. Host chondrules have an average diameter of 0.7 mm. Porphyritic chondrules display turbid and devitrified mesostasis. Some porphyritic pyroxene chondrules contain clinoenstatite. Some chondrules display rims of FeO (relict FeNi,FeS), making them distinct from matrix.

Geochemistry: (A. Love, *App*) Olivines $Fa_{31.4\pm1.3}$, PMD=2.9 n=24. Pyroxenes $Fs_{24.5}Wo_{2.6}$, PMD-FeO=3.0, PMD-CaO=31.2, n=18. Plagioclase $An_{20.6}$, PMD=63.9 n=13

Classification: LL5-6

Specimens: a total of 57.34 g and 4 thin sections are on deposit at *App*

Oldman Mountain 33°40’20.94"N, 114°17’30.11"W

La Paz County, Arizona, United States

Found: 9 Feb 2008

Classification: Ordinary chondrite (H5)

History: Discovered by Bruce Eistedt near Oldman Mountain, while out prospecting for gold northwest of Quartzite, Arizona.

Physical characteristics: Single rust-colored stone with remnant fusion crust.

Petrography: (L. Garvie, *ASU*) Abundant well-formed chondrules including RP, PP, POP, and BO. Radial pyroxene chondrules to 1 mm. Approximately 20% of the metal is oxidized.

Geochemistry: Olivine $Fa_{19.0\pm0.3}$ (range $Fa_{18.6\text{-}20.0}$, n=13, FeO/MnO=38.4±2.4). Low-Ca pyroxene $Fs_{16.5\pm0.2}Wo_{1.2\pm0.2}$ (range $Fs_{16.1\text{-}16.8}$ $Wo_{1.0\text{-}1.8}$, n=9).

Classification: Ordinary chondrite, H5.

Specimens: 25.51 g and one polished thin section at *ASU*. Finder holds the main mass.

Premier Downs 002 30°41.3’S, 125°30.8’E

Western Australia, Australia

Found: 2008

Classification: Ordinary chondrite (LL5-6)

History: A broken and weathered stone found ~20 km north of the Kinclaven Homestead.

Physical characteristics: (A. W. R. Bevan, *WAM*) The broken fragment, weighing 124.6 g, is iron stained and irregular in shape (7 × 5 × 4 cm). Some fresh fusion crust remains on one face. On broken surfaces the brecciated interior is clearly distinguished by light-colored, crystalline clasts to 1.5 cm set in dark chondritic matrix.

Petrography: (A. W. R. Bevan, *WAM*) Brecciated chondrite with highly crystalline clasts to 1.5 cm, without discernable chondrules set in a dark matrix containing recognizable chondrules, chondritic fagments of lower petrologic type and shock veins. Chondrules are variably discernible in the matrix and chondritic clasts. Metal and troilite grains are locally shock melted. Metal includes kamacite, taenite and tetrataenite. Accessory minerals include troilite and chromite.

Geochemistry: (A. W. R. Bevan and P. J. Downes, *WAM*) Crystalline clast olivine $Fa_{32.1}$; low-Ca pyroxene $Fs_{25.8}Wo_{2.1}$; in chondrules and matrix, olivine $Fa_{28.5}$; low-Ca pyroxene $Fs_{24.8}$ $Wo_{1.1}$; kamacite Ni=5.9 Co=2.0 (all wt.%); chromite Cr# 86.1 Fe# 92.6.

Classification: Ordinary chondrite (LL5-6); S4; W2

Specimens: Type specimen and two thin sections *WAM*

Ragland Hill 34°47’N, 103°40’W

New Mexico, USA
Found: Around 1980
Classification: Ordinary chondrite (H5)
History: A stone was found by a farmer around 1980 and was purchased by R. Reisener in 2010.
Physical characteristics: A single stone of 11800 grams exhibits some thumbprints and abundant metallic grains.
Geochemistry: (R. Jones, *UNM*) Olivine $Fa_{19.0\pm0.6}$; Low-Ca pyroxene $Fs_{16.6\pm0.5}Wo_{0.9\pm0.2}$.
Specimens: 5720 g, R. Reisener, Cave Creek, Arizona; 5000 g, I. Wilson, Portales, New Mexico; 318 g, *UNM*.

Ramlat al Wahibah 045 (RaW 045) 21°22.118'N, 58°23.731'E
Ash Sharqiyah, Oman
Found: 2010 Feb 7
Classification: Ordinary chondrite (H6, melt breccia)
History: A single stone of 85.275 g was found during a search for meteorites.
Physical characteristics: Dark brown stone without fusion crust
Petrography: (B. Hofmann, *NMBE*, F. Zurfluh, *Bern*, E. Gnos, *MHNGE*): The stone consists of ~90 vol% recrystallized melt and ~10% H chondrite fragments (petrologic type 6).
Geochemistry: Silicate compositions in H6 fragments and matrix are virtually identical with $Fa_{16.3}$ and $Fs_{14.8}Wo_{1.1}$
Classification: Based on texture and mineralogy this is an H melt breccia.

Ramlat as Sahmah 287 (RaS 287) 20°28.607'N, 55°31.673'E
Al Wusta, Oman
Found: 21 Jan 2009
Classification: HED achondrite (Diogenite)
History: A large individual of 1958.6 g and one small fragment (3.361 g) were found during a search for meteorites by N. Dalcher, N. Greber, B. Hofmann, S. Lorenzetti and F. Zurfluh.
Physical characteristics: Greenish-grey rock, partly covered with black fusion crust, total mass 1962.0 g.
Petrography: (B. Hofmann, *NMBE*, F. Zurfluh, E. Gnos, *MHNGE*): The rock shows a brecciated texture with large orthopyroxene clasts (2-5 mm) in a fine-grained (0.2-0.4 mm) matrix. Other phases are minor chromite and accessory troilite and Fe metal, forming inclusion trails in orthopyroxene and chromite.
Geochemistry: Pyroxene composition $Fs_{27.6}Wo_{2.2}$. Bulk analysis shows MgO 25.2%, Fe/Mn = 29.1. Oxygen isotopes (I.A. Franchi and R.C. Greenwood, *OU*): Analyses of a bulk sample yielded $\delta^{17}O = 1.53$, $\delta^{18}O = 3.38$, and $\Delta^{17}O = -0.23$ per mil (mean of 2 replicates).
Classification: Based on texture, bulk Fe/Mn, mineralogy and oxygen isotopes this is a diogenite.
Specimens: All at *NMBE*.

Ramlat as Sahmah 309 (RaS 309) 20°45.948'N, 55°26.152'E
Al Wusta, Oman
Found: 17 Feb 2009
Classification: Primitive achondrite (Brachinite)
History: Three stones (1218.4, 181.9, 28.1 g) were found during a search for meteorites by U. Eggenberger, E. Gnos, E. Janots and F. Zurfluh. An additional stone of 7.054 g was found nearby on 11 January 2010 by U. Eggenberger, E. Gnos, N. Greber and F. Zurfluh.
Physical characteristics: The four stones have a combined mass of 1435.43 g. All stones are wind-ablated and show no fusion crust. The largest stone (16 × 7 × 4 cm) of dominantly brown colour has one particularly flat surface (10 × 6 cm) showing an enrichment of green Ca-rich pyroxenes. Additional similar layers are present parallel to the exposed one in the interior of the stone, as seen on the side of the stone and in X-ray tomographic sections.

Petrography: (B. Hofmann, *NMBE*, F. Zurfluh, E. Gnos, *MHNGE*): The rock shows an equigranular texture (mean grain size approx. 0.5 mm) and consists of ~94 vol% olivine, 4 vol% Ca-rich pyroxene ($Fs_{9.1}Wo_{47.4}$) and 1 vol% of chromite. Accessory phases are Ca-poor pyroxene, metal, troilite (both occurring as grains a few mm in size in silicates) and graphite (occurring as inclusions in olivine and chromite). The rock is weakly shocked (S2). Strong weathering, metal is replaced by hydroxides where not completely enclosed in silicates.
Geochemistry: Olivine composition $Fa_{33.1}$, pyroxene composition $Fs_{9.1}Wo_{47.4}$, accessory metal has 30-55 wt% Ni A bulk analysis showed Fe/Mn (wt%) = 74.3, Ni = 510 ppm. Oxygen isotopes (I.A. Franchi and R.C. Greenwood, *OU*): Analyses of a bulk sample (Fe-hydroxides removed with ethanolamine thioglycollate) yielded $\delta^{17}O = 2.09$, $\delta^{18}O = 4.37$, and $\Delta^{17}O = -0.19$ per mil (mean of two replicates).
Classification: Based on texture, mineralogy and oxygen isotopic composition this is a brachinite.
Specimens: All at *NMBE*.

Ramlat as Sahmah 349 (RaS 349) 20°23.164'N, 55°47.419'E
Al Wusta, Oman
Found: 2010 Jan 13
Classification: Ordinary chondrite (H7)
History: A single stone was found during a search for meteorites by U. Eggenberger, E. Gnos, N. Greber, and F. Zurfluh.
Physical characteristics: Dark brown, rounded single stone (2.5 × 2.0 × 1.5 cm) without fusion crust, wind-ablated, mass of 16.97 g.
Petrography: (B. Hofmann, *NMBE*; F. Zurfluh, *Bern*; E. Gnos, *MHNGE*): Equilibrated texture consisting of large silicate crystals (olivine and pyroxenes up to 2 mm, feldspar up to 0.5 mm) with common triple junctions, no recognizable chondrules. Chromite up to 1 mm is common. Metal and troilite are fully oxidized (abundant alteration oxides), only some small inclusions in silicates are preserved.
Geochemistry: Silicates are homogeneous and show the following compositions: olivine $Fa_{17.7}$, orthopyroxene $Fs_{16.2}Wo_{3.7}$, calcic pyroxene $Fs_{51.1}Wo_{7.9}$.
Classification: Based on texture, mineralogy and mineral compositions this is a H7 chondrite. The meteorite is unshocked (S1) and shows strong terrestrial alteration with only traces of metal and troilite preserved (W4).
Specimens: All at *NMBE*.

Ramlat as Sahmah 384 (RaS 384) 20°0.294'N, 56°24.284'E
Al Wusta, Oman
Found: 2010 Jan 23
Classification: Mesosiderite (group C2)
History: This meteorite was found in the RaS 202 mesosiderite strewnfield.
Physical characteristics: Irregularly shaped brown rock without fusion crust, clasts visible at surface.
Petrography: (A. Bretscher, *Bern*, B. Hofmann, *NMBE*, E. Gnos, *MHNGE*): The stone consists of a matrix of pyroxene (70%), plagioclase (7%), olivine (2%) and mostly oxidized metal (21 vol% oxide, originally 13 vol% metal) with abundant mineral and lithic clasts up to several cm in size. Mineral clasts comprise enstatite and olivine, lithic clasts are eucritic to diogenitic.
Geochemistry: Compositions of matrix silicates are $Fa_{31.4}$ (clasts: $Fa_{28.1\text{-}29.6}$) and $Fs_{26.7}Wo_{2.0}$ (clasts: $Fs_{30\text{-}57}Wo_{2.0\text{-}3.6}$), plagioclase $An_{91.1}$. Bulk analyses of clasts show Fe/Mn (wt) 30-42 (matrix 91), Ni bulk is 1.57%. Oxygen isotopes (I. A. Franchi and R. C. Greenwood, *OU*): Analyses of 17 samples of matrix and clasts yielded $\Delta^{17}O = -0.244 \pm 0.010$ ‰.
Classification: Based on mineral compositions, matrix mode and oxygen isotopes this is a mesosiderite of type 2C. All aspects are virtually identical to paired RaS 202.
Specimens: All at *NMBE*.

Ramlat as Sahmah 420 (RaS 420) 20°25.023'N, 56°16.495'E

Al Wusta, Oman
Found: 2010 Feb 5
Classification: Ureilite

History: A single stone of 70.3 g was found during a search for meteorites.
Physical characteristics: Greenish brown, partly wind-abraded stone, fusion crust is partly preserved.
Petrography: (B. Hofmann, *NMBE*, F. Zurfluh, *Bern*, E. Gnos, *MHNGE*): The stone consists of olivine and pyroxene, with characteristic ureilitic texture. Olivine has reduced Fe-poor rims with minute inclusions of Fe metal. Larger metal at grain boundaries is completely weathered. Carbon platelets (to 0.9 mm length) consisting of graphite and diamond are abundant along silicate grain boundaries of. Shock stage is S2 based on (annealed?) silicates.
Geochemistry: Compositional ranges of silicates are $Fa_{4.8-20.8}$ and $Fs_{16.8}$ $Wo_{8.0}$(7.9-8.4) (range $Fs_{16.4-17.2}Wo_{7.9-8.4}$). Bulk Fe/Mn=52.3 wt%, Ni 1010 ppm.
Classification: Based on texture and mineralogy this is a ureilite.
Specimens: All at *NMBE*.

Rio Rancho 35°18 N, 106°38'W
New Mexico, USA
Found: 2011 Sept 16
Classification: Ordinary chondrite (L6)

History: Jansen Lyons, age 13, found this meteorite within the city limits of Rio Rancho, New Mexico, in an area where no other stones were exposed. The coordinates are rounded to nearest minute to protect the homeowner's privacy.
Physical characteristics: Single stone, exterior covered by approximately 75% dark weathered fusion crust, saw cut reveals a partially iron-stained interior with evenly dispersed fine-grained metal/sulfide and faint chondrule outlines.
Petrography: (C. Agee, *UNM*) Microprobe examination of a probe mount shows approximately 50% olivine, 25% orthopyroxene, 10% plagioclase. Accessory clinopyroxene, Cr-spinel, Cl-rich apatite (up to 300 μm), merrillite, ubiquitous kamacite and troilite. Weathering veinlets of iron-oxide and barite are found throughout the meteorite. Recrystallized relict chondrules are present, some with remnant barred-olivine textures.
Geochemistry: (C. Agee and N. Wilson, *UNM*) Olivine $Fa_{25.5\pm0.4}$, Fe/Mn=52±3, n=4; orthopyroxene $Fs_{22.2\pm0.5}Wo_{1.5\pm0.1}$, Fe/Mn=31±2, n=5; clinopyroxene $Fs_{8.6}Wo_{44.9}$, Fe/Mn=25, n=1; plagioclase $Or_{11\pm3}Ab_{69\pm6}An_{21\pm6.}$
Classification: Ordinary chondrite (L6), weathering grade W2.
Specimens: 28 g including a probe mount on deposit at *UNM*, Jansen Lyons holds the main mass.

Sayh al Uhaymir 511 (SaU 511) 20°53.764'N, 56°55.564'E
Al Wusta, Oman
Found: 20 Jan 2009
Classification: Ureilite

History: Two fragments of 226.55 and 39.65 g were found during a search for meteorites by N. Dalcher, N. Greber, B. Hofmann, S. Lorenzetti and F. Zurfluh.
Physical characteristics: Elongated brown stone and smaller fragment without fusion crust, combined mass 266.2 g.
Petrography: (B. Hofmann, *NMBE*, F. Zurfluh IFGBE, E. Gnos, *MHNGE*): The rock shows an equigranular texture with 0.5-2 mm grain size and consists of olivine with subordinate Ca-rich pyroxene (pigeonite). The px/(ol+px)-ratio is ~0.2. Common carbon-platelets (up to 0.2 × 2 mm), showing some parallel orientation, consist of graphite and diamond (2-10 μm in size). Accessory phases are Fe and troilite. Glass inclusions occur in reduced rims of olivine grains. The shock grade of silicates is S2.
Geochemistry: Olivine $Fa_{21.2}$ to nearly pure forsterite in reduced rims; pigeonite $Fs_{17.9}Wo_{10.1.}$ Bulk analysis shows Fe/Mn (wt) = 47.7, Ni = 1380 ppm.

Specimens: All at *NMBE*.

Sayh al Uhaymir 546 (SaU 546) 20°35'58.1"N, 57°8'34.6"E
Al Wusta, Oman
Found: January 2011
Classification: Ordinary chondrite (H5)

Petrography: (P. Strickland, *UAb*) Approximately 80 vol% chondrules, 10 vol% matrix, and 10 vol% metals/opaque minerals. Chondrules have an average diameter of 0.4 mm and display cryptocrystalline, radial pyroxene, and porphyritic olivine-pyroxene textures. Barred olivine chondrules are rare. Some chondrules contain indistinct olivine grains that have a distinct "dusty" texture. Most olivine and pyroxene grains have irregular fractures, planar fractures, undulatory extinction, and clinoenstatite lamellae on low-Ca pyroxene indicating weak-moderate shock (S3). Oxidized metal rims, fractures, and frequent rusty-staining indicates weak weathering (W1).
Geochemistry: (C. Herd and P. Strickland, *UAb*) Olivine $Fa_{18.6\pm0.3}$ (n=83); Low-Ca Pyroxene $Fs_{18.7\pm0.8}Wo_{1.1\pm0.2}$ (n=16).
Classification: Ordinary chondrite (H5). Classified based on average and standard deviation of Fa and Fs content in olivine and low-Ca pyroxene respectively.
Specimens: 56.0 g type specimen, including polished thin section, are on deposit at *UAb*. Main mass at *SQU*.

Shalim 015 18.974°N, 55.089°E
Zufar, Oman
Found: 2011 Mar
Classification: Ordinary chondrite (L6)

Petrography: Found by a prospector in Oman on March 2012. The meteorite is fairly heavily weathered with most primary metal converted to iron hydroxides; terrestrial gypsum and barite are also present in small amounts. Largely recrystallized with rare chondrules. Olivine ($Fa_{25.6\text{-}26.2}$), orthopyroxene ($Fs_{20.7\text{-}21.2}Wo_{1.7\text{-}1.3}$). Ordinary chondrite (L6).

Shişr 176 18°13.207'N, 53°49.258'E
Zufar, Oman
Found: 14 Oct 2010
Classification: Ordinary chondrite (L6)

History: Eleven, fresh, complete meteorites found near Shisr, Oman.
Physical characteristics: Stones mostly covered by black fusion crust, several are oriented.
Petrography: Łukasz Karwowski, *USil*) Olivine in chondrules and small olivine grains outside of chondrules have similar compositions with low Fa. Larger olivine grains are texturally zoned: outer zones are richer with $Fa_{26.45.}$ Low-Ca pyroxene is usually accompanied by Ca pyroxene. Feldspar is recrystalized, sometimes with albitic twinning. No maskelynite was found. Chondrules generally highly recrystalized. Barred chondrule and radial pyroxene chondrules were found. Chondrules to 2 mm. Cl-bearing apatite and merrillite present. Opaque minerals are represented by troilite, kamacite, taenite, and chromite. Tetratenite occurs as separate grains. Small copper grains were found in taenite kamacite and troilite.
Geochemistry: Łukasz Karwowski, *USil*) Olivine $Fa_{24.7\text{-}26.5}$; low-Ca pyroxene $Fs_{21.3\text{-}21.9}Wo_{0.9\text{-}2.1}$: high-Ca pyroxene $Fs_{7.6\text{-}8.5}Wo_{44.5\text{-}46.2}$; feldspar $Ab_{82.0\text{-}86.8}Or_{2.8\text{-}7.6}$; kamacite: 6.3-6.8 at% Ni; 0.66-0.69 at% Co, troilite $Fe_{49.6\text{-}49.4}S_{50.0\text{-}50.2}$; Accessory: chromite, Cl-apatite, merrillite, tetrataenite (separate grains), metallic Cu in taenite, kamacite and troilite.
Classification: Łukasz Karwowski, *USil*) Olivine ($Fa_{24.69\text{-}26.45}$), low-Ca pyroxene ($Fs_{21.27\text{-}21.86}$) identify this stone as an L6. Sparse chondrules with diffuse boundaries further indicate that it is an L6 chondrite. Shock stage S1, weathering grade W0/1

Specimens: 24 g at *USil* (type specimen); main Mass, Tomasz Jakubowski; 7 pieces Woreczko & Wadi Collection

Spruce 001 40.801 N, 114.701 W
Nevada, USA
Found: 2011 Nov 28
Classification: Ordinary chondrite (L5)
History: Found on Spruce Dry Lake by Nola Lighthart
Physical characteristics: A total of 13 pieces of the same brown broken stone, some with relatively fresh fusion crust (combined weight 983 g). The largest individual piece weighs 338 g, and five of the pieces can be reassembled into a 598 g mass.
Petrography: (A. Irving and S. Kuehner, *UWS*) Only a few chondrules visible.
Geochemistry: Olivine ($Fa_{24.9-25.1}$), orthopyroxene ($Fs_{20.3-20.9}Wo_{1.0-1.7}$), clinopyroxene ($Fs_{8.1-9.9}Wo_{45.0-43.4}$)
Classification: Ordinary chondrite (L5)
Specimens: A total of 49 g of sample and one polished thin section are on depsoit at *UWB*. The remaining material is held by Ms. N. Lighthart of Twin Falls, ID.

Spruce 002 40.792 N, 114.708 W
Nevada, USA
Found: 2011 Dec 11
Classification: Ordinary chondrite (L6)
History: Found on Spruce Dry Lake by John Harrison
Physical characteristics: A single small (18 g) reddish brown stone.
Petrography: (A. Irving and S. Kuehner, *UWS*) Breccia composed of small, extensively recrystallized clasts containing rare partial chondrules
Geochemistry: Olivine ($Fa_{24.7-26.7}$), orthopyroxene ($Fs_{21.2-22.3}Wo_{1.4-1.6}$), subcalcic augite ($Fs_{11.6}Wo_{39.1}$; $Fs_{14.5}Wo_{27.2}$), augite ($Fs_{8.6-9.7}Wo_{44.8-43.9}$).
Classification: Ordinary chondrite (L6)
Specimens: A total of 15 g of material and one polished thin sections are on deposit at *UWB*. The main mass is held by Mr. J. Harrison of Keizer, OR.

Sterley 34.21°N, 101.39°W
Texas, USA
Found: 1950
Classification: Pallasite (Main group)
History: A single mass weighing 1724.8 grams, and displaying regmaglypts and some remnant fusion crust, was found ~1950 by a farmer while plowing. Several months later, the finder took the specimen to Texas Tech University where it was classified by a mineralogist Mr. Dennis as a " stony iron siderolite - variety pallasite". Decades later, after watching a television show on meteorites, the son of the finder took the specimen to Dr. Laurence Garvie at the Center for Meteorite Studies, *ASU* for further study. The pallasite was later purchased by Ruben Garcia and Geoff Notkin.
Physical characteristics: Single, fragmental piece with a few patches of remnant fusion crust. Greenish olivine crystals protruding from the surface. Small area of farringtonite visible at the surface. Weathering is minor and restricted primarily to small areas at the edge of the stone.
Petrography: (L. Garvie, *ASU*). A 12 × 6 cm polished and etched slice shows (areal %): swathing kamacite 39.8, plessite 20.0, olivine 36.2, troilite 1.9, schreibersite 1.1, and farringtonite 0.9. Olivine grains are typically well rounded and <1 cm, though some are angular. Swathing kamacite, to 1-mm thick, well developed, some areas showing prominent Neumann bands. Many of the plessite fields show well-developed kamacite laths.
Geochemistry: (J. Wasson, *UCLA*; L. Garvie, *ASU*) Metal composition by INAA (mean of two analyses) Ni 117 mg/g; Co 5.75 mg/g, Cu 316 µg/g, Ga 18.5 µg/g, As 26.5 µg/g, Ir 0.076 µg/g, and Au 2.727

μg/g. EMPA of 13 separate olivine grains gave $Fa_{17.5±0.1}$, FeO/MnO=54.6±4.7, Cr_2O_3=0.03±0.01, n=19. Based on the elemental composition and the high olivine Fa content the meteorite appears to be unpaired with other known pallasites.
Classification: Main-group pallasite.
Specimens: 141 g at *ASU*.

Tin as Sawwan 32°45.630'N, 9°06.012'E
Quibili, Tunisia
Found: 30 Dec. 2011
Classification: Ordinary chondrite (L4-5)
History: A single rock of 1684 g was found west of Medenine in the sandy desert area of "Tine Souane" by a German tourist during a lunch rest.
Petrography: The rock is brown resulting from severe weathering. In thin section the texture is characterized as a well-consolidated breccia, with equilibrated lithologies. Most of them are of petrologic type 4 and highly recrystallized type 5 fragments are less abundant. Based on the mean olivine and low-Ca pyroxene compositions of Fa_{24} and Fs_{20}, respectively, the rock is an L chondrite. It is weakly shocked (S3), as indicated by planar fractures in olivine. The weathering degree is W3.

Tupelo 34.24216°N, 88.77594°W
Mississippi, USA
Found: 30 April 2012
Classification: Enstatite chondrite (EL6)
History: Ms. O'Connell and Mr. Doherty found the meteorite while looking for Indian artifacts in a cultivated field on his family farm, a recorded Archaic site (22Le1064). Ms. O'Connell spotted it and showed it to Mr. Doherty who realized that is was unlike the stone tools that had been found there. Web research then led them to believe that it was a meteorite.
Petrography: (H. McSween, *UTenn*) The meteorite is an enstatite chondrite, composed of abundant chondrules, with significant amounts of Fe/Ni metal and sulfides. The only silicate phase is enstatite (En_{98}, homogeneous, as determined by electron probe), and no olivine has been found. Most of the chondrule outlines are obscured by metamorphic recrystallization. Analyses of Si and Ni in kamacite, partitioning of Ni between phosphide and kamacite, Ti and Cr in troilite, and Mn, Fe, and Mg in alabandite all confirm that the meteorite is an EL6 chondrite (Zhang et al., 1995).
Specimens: 20 g at *AMNH*, 0.2 g at *UTenn*, main mass with finder.

Umm as Samim 024 (UaS 024) 21°7.582'N, 55°31.567'E
Al Wusta, Oman
Found: 2010 Jan 8
Classification: HED achondrite (Eucrite, cumulate)
History: A single, fully crusted stone of 406.81 g was found during a search for meteorites by on a deflated plane between a dune gap.
Physical characteristics: The black fusion crust has a dark, slightly greenish appearance and shows some polygonal shrinkage cracks, small regmalypts and has some small vesicles. The shape of the meteorite and the appearance of the fusion crust features indicate this is an oriented meteorite. Cut surfaces are greenish white.
Petrography: (B. Hofmann, *NMBE*; F. Zurfluh, N. Greber, *Bern*; E. Gnos, *MHNGE*): The rock shows a brecciated texture with clasts ranging <1mm to 1 cm, consisting of granular cpx, plag and tridymite, and a microcrystalline matrix. The mineralogy is dominanted by large (200 μm), mostly idiomorphic and twinned Ca-poor pyroxene crystals with Ca-poor lamellae (4 mm), which also have sub-μm lamellae. The second most abundant phase is plagioclase, followed by tridymite (as determined by EDS and Raman spectroscopy), chromite and ilmenite. Accessory phases are small grains of iron metal and troilite. The

sample is weakly shocked; some of the pyroxenes have planar fractures. Weathering is low, some iron grains are altered to iron hydroxides, resulting in minor local rusty staining.
Geochemistry: Orthopyroxene $Fs_{62.5}Wo_{5.5}$ (range $Fs_{60.1-63.1}Wo_{5-6.2}$), Fe/Mn=32.4; n=23; Ca-rich pyroxene (exolved augite) $Fs_{32.2}Wo_{41.5}$ (range $Fs_{26.6-33.5}Wo_{40.3-42.4}$) Fe/Mn=35.5 (28.2-39.4), n=11; Feldspar (ternary) $An_{86.3}Or_{0.6}$ (range $An_{85.4-87.5}Or_{0.4-0.7}$), ilmenite mg#=3.1, n=11. Bulk analysis by XRF showed CaO = 10.0 wt%, TiO_2 = 0.66 wt%, Fe/Mn (wt) = 36. Oxygen isotopes (I. A. Franchi and R. C. Greenwood, *OU*): Analyses of a bulk sample yielded $\delta^{17}O$ = 1.72±0.06‰, $\delta^{18}O$ = 3.86±0.13‰, and $\Delta^{17}O$ = -0.243 ± 0.004‰ (mean of two replicates).
Classification: Based on texture, mineralogy and oxygen isotopic composition this is a monomict cumulate eucrite.
Specimens: All at *NMBE*.

Watonga 35°50±3'N, 98°24±3'W
Blaine County, Oklahoma, USA
Found: 1950-1960
Classification: Ordinary chondrite (LL3.1)
History: The seller discovered the stone in the weight box of a disk plow used by his father in the 1950s-1960s. He believes his father found the stone while plowing and placed it in the weight box. The stone possesses a nick where it was likely hit by the plow. The stone was unlike others in the weight box, which prompted the seller to save it for several years until finally bringing it forward for identification.
Physical characteristics: A single 21.0 × 17.1 × 10.8 cm mass weighing 5025 g. Black fusion crust up to ~0.7 mm thick covers ~70%. The surface is otherwise smooth, dark brown, rust-marked, and pitted in places where inclusions (not chondrules) weathered out. White inclusions and light beige inclusions up to 2.5 cm are visible on the surface, though none are present in the few cuts made from the stone. The stone is highly oriented, possessing the smooth, ballistic shape of a flattened nose cone, and a sharply flat truncation on the bottom of that shape.
Petrography: (D. London, *UOkla*): PP/CP chondrules are round, sharp in definition, averaging ~0.8 mm in diameter, and comprising ~60-80 vol% of the stone.
Geochemistry: (D. London and G. B. Morgan VI, *UOkla*): Olivine; range (64 analyses) is $Fa_{0.8-42.5}$, average (sd) Cr_2O_3 content (wt. %) of ferroan grains (9 chondrules) is 0.39 (0.15). Average composition (wt.%) of metal in chondrules is: (1) Fe-rich, 95.19±1.19 Fe, 3.72±0.79 Ni, 0.36±0.05 Co, 0.13±0.13 Cr, 0.06±0.12 P, and (2) Ni-rich, 51.37±6.34 Fe, 48.17±5.83 Ni, 0.08±0.06 Co, 0.11±0.12 Cr, 0.02±0.02 P. Average composition of metal in matrix is: (1) Fe-rich, 93.57±2.37 Fe, 4.11±0.46 Ni, 1.93±2.37 Co, 0.06±0.06 Cr, 0.04±0.09 P, and (2) Ni-rich, 52.35±3.95 Ni, 46.13±4.04 Fe, 0.90±0.40 Co, 0.02±0.02 Cr, 0.01±0.01 P.
Classification: (D. London and G. B. Morgan VI, *UOkla*; M. Weisberg, *KCCU*): LL3.1,S2, W2: classification as LL is based on (1) low modal abundance of metal, 0.05 vol%, as measured by threshold (gray-level bin sorting) of a BSE mosaic that covered 35% (~2 × 0.4 cm) of the surface area of the existing sample; and (2) mean chondrule size of ~ 0.8 mm. Petrographic classification is based on Cr content of high-Fa olivines.

Wiltshire 51°8.98'N, 1°48.60'W
England, United Kingdom
Found: Early 20th century
Classification: Ordinary chondrite (H5)
Wiltshire is the formal name for the meteorite described under the separate entry for Lake House. Either name may be used in publications.

Yamato 982881 (Y 982881)
Antarctica
Found: 1998

Classification: Ureilite

Petrography: (A. Yamaguchi, N. Imae, M. Kimura, and H. Kojima, *NIPR*) The PTS shows a coarse-grained (~1-2 mm) granular texture mainly composed of olivine and pyroxene with thin opaque rims along the boundaries between these minerals. Reduction rims are not apparent. Fe-FeS forms fine chains or islands along fractures near the rims. This rock is moderately weathered judging from brown staining along grain boundaries.

Geochemistry: Compositions of olivine and pyroxene are Fa_{8-3} and Fs_{11-17}, respectively.

Classification: This meteorite is a ureilite.

Yamato 983589 (Y 983589)

Antarctica

Found: 1998

Classification: Carbonaceous chondrite (CO3)

Petrography: (A. Yamaguchi, N. Imae, M. Kimura, and H. Kojima, *NIPR*) The PTS is abundant in small chondrules (100-300 µm), and is slightly weathered (A/B). Silicates commonly show sharp optical extinction, thus the degree of the shock is very low. Small opaque droplets (<30 µm in diameter) are abundant in chondrules. Isolated rounded opaques occur in the similar size of chondrules, and their core metals are rimmed with sulfide.

Classification: This meteorite is CO3.

Yamato 983730 (Y 983730)

Antarctica

Found: 1998

Classification: Ordinary chondrite (H4-5)

Petrography: (A. Yamaguchi, N. Imae, M. Kimura, and H. Kojima, *NIPR*) A half of the PTS is type 4 ordinary chondrite which is in contact with type 5 lithology with a sharp boundary. The type 4 area shows a well-defined chondritic texture whereas in the type 5 area the chondrule outline is less clear and the matrix is recrystallized.

Geochemistry: On the basis of the olivine and pyroxene compositions (Fa_{18-21}, Fs_{15-20}), both lithologies belong H group. Thus, this meteorite is a genomict breccia of type 4 and 5 ordinary chondrites.

Yamato 983750 (Y 983750)

Antarctica

Found: 1998

Classification: Ordinary chondrite (LL melt breccia)

Petrography: (A. Yamaguchi, N. Imae, M. Kimura, and H. Kojima, *NIPR*) The PTS is a complex impact melt breccia composed of lithic clasts (up to ~3 mm) and mineral fragments in a melt matrix. The melt matrix is very heterogeneous and shows a gradation from dark to transparent. Dark area is a very-fined grained mixture of silicate and opaque minerals with shock darkened lithic clasts and mineral fragments. Large lithic clasts show an igneous texture.

Geochemistry: On the basis of the abundance of FeNi-FeS and compositions of olivine (Fa_{18-22}) and pyroxene (Fs_{17-22}), this rock is a melt breccia of LL ordinary chondrite.

Yamato 983890 (Y 983890)

Antarctica

Found: 1998

Classification: Ureilite (polymict)

Petrography: (A. Yamaguchi, N. Imae, M. Kimura, and H. Kojima, *NIPR*) This PTS displays a polymict breccia of polycrystalline clasts of pyroxene and olivine, unrecrystallized and recrystallized mineral fragments, sulfides, dark materials (up to ~2 mm) set in a clastic matrix. Finely (a few to several µm) recrystallized clasts contain laths of black phases (graphite?). Most large silicate clasts are texturally

similar to those of normal monomict ureilites. Dark clasts consist of very-fine grained materials with minor amounts of sulfide minerals.
Classification: This meteorite is a polymict ureilite.

Yamato 984119 (Y 984119)
Antarctica
Found: 1998
Classification: HED achondrite (Eucrite, polymict)

Petrography: (A. Yamaguchi, N. Imae, M. Kimura, and H. Kojima, *NIPR*) This PTS mainly consists of basaltic clasts (<~3 mm), fragments of pyroxene and plagioclase, and dark impact melt clasts, set in a clastic matrix. Basaltic clasts show subophitic texture with dark mesostasis, and have chemically zoned pyroxenes.
Geochemistry: Pyroxene compositions are $Fs_{20-70}Wo_{3-37}$ and FeO/MnO ~29, and those of plagioclase, An_{79-94}.
Classification: This meteorite is a polymict eucrite similar to Y-74159 group.

Youxi 26.06° N, 118.01° E
Fujian, China
Found: 2006
Classification: Mesosiderite (group C)

History: The stone was found by Mr. Bicheng Lou at a construction site in Youxi county, Fujian province.
Petrography: The stone is composed of 80% silicates and 20% opaque phases. The major silicate is orthopyroxene, and olivine and plagioclase are minor phases. Opaque phases include taenite, kamacite, troilite, chromite, ilmenite, schreibersite etc. Phosphate is found close to metal grains.
Classification: Mesosiderite - C

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3. Alphabetical listing of all meteorites

Name	abbrev	country	date	mass	class
Acfer 401		Algeria	2002	9.00	L5
Al Huqf 067	AH 067	Oman	28 Jan 2009	61.6	H4
Al Huqf 068	AH 068	Oman	29 Jan 2009	165.4	L3
Al Huqf 069	AH 069	Oman	31 Jan 2009	250.5	H4/5
Al Huqf 070	AH 070	Oman	06 Feb 2009	2632.8	L4
Al Huwaysah 005		Oman	2010 Jan 1	1228.1	L(LL)3.5-3.7
Al Huwaysah 010		Oman	2010 Jan 2	1411.8	Achondrite-ung
Al Huwaysah 013		Oman	2010 Jan 04	55.51	H6
Al Huwaysah 015		Oman	2010 Jan 04	35.3	H6
Alkali Flat		United States	2011 Mar 7	28	L5
Allan Hills 09005	ALH 09005	Antarctica	2009	122.3	L5
Allan Hills 09006	ALH 09006	Antarctica	2009	104.3	H5
Allan Hills 09008	ALH 09008	Antarctica	2009	31.3	H5
Allan Hills 09009	ALH 09009	Antarctica	2009	24.8	L6
Allan Hills 09010	ALH 09010	Antarctica	2009	2.6	L3.4
Allan Hills 09011	ALH 09011	Antarctica	2009	14.2	LL6
Allan Hills 09012	ALH 09012	Antarctica	2009	18.1	L6
Allan Hills 09013	ALH 09013	Antarctica	2009	25.5	L6
Allan Hills 09014	ALH 09014	Antarctica	2009	30.2	L5
Anthony Gap		United States	8 Oct 2011	347.36	L6
Ashuwairif 005		Libya	2010	335.00	H4
Aubrey Hills		United States	23 Sept 2010	560.8	H6
Battle Mountain		United States	2012 Aug	2900	L6
Blakeman		United States	1983	113.7	L4
Camel Donga 053		Australia	2008	579	LL5-6
Catalina 002		Chile	2010 Oct 01	61.1	LL3
Catalina 003		Chile	1999	3180	Iron, IVB
Catalina 004		Chile	2010 Feb 10	37.5	Mesosiderite
Cavour (update)		United States			
Contis-Plage		France	around 2000	44	H5
Dar al Gani 1045	DaG 1045	Libya	2005 Sep	955	L6
Dar al Gani 1058	DaG 1058	Libya	1998 Sep 9	1815	Lunar (feldsp. breccia)
Dar al Gani 1059	DaG 1059	Libya	2010	1470.00	H6
Dar al Gani 1060	DaG 1060	Libya	2010	310.00	Eucrite
Dar al Gani 1061	DaG 1061	Libya	2010	207.00	Ureilite
Deakin 010		Australia	Before 1988	438	Eucrite-mmict
Deming		United States	2008	784	H5
Dhofar 1476	Dho 1476	Oman	21 Feb 2008	28.9	H3
Dhofar 1577	Dho 1577	Oman	Dec 2008	530	H5
Dhofar 1578	Dho 1578	Oman	01 Sep 2009	231.1	H5
Dhofar 1623	Dho 1623	Oman	2009 May 6	890	Ureilite

Dhofar 1629	Dho 1629	Oman	2007 Mar 2	2.51	Lunar (bas/anor)
Dhofar 1665	Dho 1665	Oman	14 Dec 2011	3687	L3
Dhofar 1666	Dho 1666	Oman	14 Dec 2011	1300	L4
Dhofar 1668	Dho 1668	Oman	2010 Nov	6.1	Martian (shergottite)
Dhofar 1669	Dho 1669	Oman	2010 Nov 19	3.3	Lunar (feldsp. breccia)
Dhofar 1670	Dho 1670	Oman	Jan 2011	590.1	H4
Dhofar 1671	Dho 1671	Oman	Jan 2011	40.8	CV3
Dhofar 1672	Dho 1672	Oman	Jan 2011	7.49	L4
Dhofar 1673	Dho 1673	Oman	Jan 2011	15.1	Lunar (feldsp. breccia)
Dhofar 1675	Dho 1675	Oman	2004	168	Eucrite-pmict
Dhofar 1676	Dho 1676	Oman	2011 Jan 27	13.23	H4
Dhofar 1677	Dho 1677	Oman	2011 Jan 27	4388	H5
Dhofar 1678	Dho 1678	Oman	2011 Jan 27	13.02	H6
Dhofar 1679	Dho 1679	Oman	2011 Jan 27	184.3	H4
Dhofar 1680	Dho 1680	Oman	2011 Jan 27	29.2	H4
Dhofar 1681	Dho 1681	Oman	2011 Jan 27	153.0	H5
Dhofar 1682	Dho 1682	Oman	2011 Jan 27	9.22	L6
Dhofar 1683	Dho 1683	Oman	2011 Jan 28	318.6	H5
Dhofar 1684	Dho 1684	Oman	2011 Jan 28	199.9	H5
Dhofar 1685	Dho 1685	Oman	2011 Jan 28	769.3	H5
Dhofar 1686	Dho 1686	Oman	2011 Jan 28	188.6	H4
Dhofar 1687	Dho 1687	Oman	2011 Jan 29	394.6	L6
Dhofar 1688	Dho 1688	Oman	2011 Jan 30	52.5	L5
Dhofar 1689	Dho 1689	Oman	2011 Jan 30	22.3	H5
Dhofar 1690	Dho 1690	Oman	2011 Jan 30	700.5	H5
Dhofar 1691	Dho 1691	Oman	2011 Jan 30	105.5	H5-6
Dhofar 1692	Dho 1692	Oman	2011 Jan 30	1568	L6
Dhofar 1693	Dho 1693	Oman	2011 Jan 30	1049	L4
Dhofar 1694	Dho 1694	Oman	Feb 2010	740	H6
Dhofar 1695	Dho 1695	Oman	Feb 2010	326	H6
Dhofar 1696	Dho 1696	Oman	Feb 2010	936	H6
Dhofar 1697	Dho 1697	Oman	Feb 2010	387	H6
Dhofar 1698	Dho 1698	Oman	Feb 2010	450	H6
Dhofar 1699	Dho 1699	Oman	Feb 2010	172	H4
Dhofar 1700	Dho 1700	Oman	Feb 2010	39000	L6
Dhofar 1701	Dho 1701	Oman	Feb 2010	984	H5
Dhofar 1702	Dho 1702	Oman	Feb 2010	537	H6
Dhofar 1703	Dho 1703	Oman	Feb 2010	193	H6
Dhofar 1704	Dho 1704	Oman	Feb 2010	128	L6
Dhofar 1705	Dho 1705	Oman	Feb 2010	319	L6
Dhofar 1706	Dho 1706	Oman	Feb 2010	589	L6
Dhofar 1707	Dho 1707	Oman	Feb 2010	463	L6
Dhofar 1708	Dho 1708	Oman	Feb 2010	124	H5
Dhofar 1710	Dho 1710	Oman	Feb 2010	800	H6

Dhofar 1711	Dho 1711	Oman	Feb 2010	295	LL6
Dhofar 1712	Dho 1712	Oman	Feb 2010	240	L6
Dhofar 1713	Dho 1713	Oman	Feb 2010	73	L6
Dhofar 1714	Dho 1714	Oman	Feb 2010	562	L6
Dhofar 1715	Dho 1715	Oman	Feb 2010	81	H6
Dhofar 1716	Dho 1716	Oman	Feb 2010	1540	H5
Dhofar 1718	Dho 1718	Oman	Feb 2010	75	H6
Dhofar 1719	Dho 1719	Oman	Feb 2010	461	L6
Dhofar 1720	Dho 1720	Oman	Feb 2010	168	L6
Dhofar 1721	Dho 1721	Oman	Feb 2010	238	H5
Dhofar 1722	Dho 1722	Oman	Feb 2010	25000	H5
Dhofar 1723	Dho 1723	Oman	Feb 2010	536	H6
Dhofar 1724	Dho 1724	Oman	Feb 2010	1768	H4
Dhofar 1726	Dho 1726	Oman	1 Dec 2011	1050	H3
Dhofar 1727	Dho 1727	Oman	02 Dec 2011	453	H6
Dhofar 1728	Dho 1728	Oman	03 Dec 2011	1140	L6
Dhofar 1729	Dho 1729	Oman	03 Dec 2011	482	H6
Dhofar 1730	Dho 1730	Oman	09 Dec 2011	1763	H6
Dhofar 1731	Dho 1731	Oman	10 Dec 2011	2222	H5
Dhofar 1732	Dho 1732	Oman	14 Dec 2011	782	L6
Dhofar 1738	Dho 1738	Oman	Feb/Mar 2011	853	L5
Dhofar 1739	Dho 1739	Oman	Feb/Mar 2011	130	H4
Dhofar 1740	Dho 1740	Oman	Feb/Mar 2011	30.8	L6
Dhofar 1741	Dho 1741	Oman	Feb/Mar 2011	66	H5
Dhofar 1742	Dho 1742	Oman	Feb/Mar 2011	4.4	H5
Dhofar 1743	Dho 1743	Oman	Feb/Mar 2011	84	L4
Dhofar 1744	Dho 1744	Oman	Feb/Mar 2011	1414	H5
Dhofar 1745	Dho 1745	Oman	Feb/Mar 2011	12.1	H5
Dhofar 1746	Dho 1746	Oman	Feb/Mar 2011	19.2	H5
Dhofar 1747	Dho 1747	Oman	Feb/Mar 2011	81	H5
Dhofar 1748	Dho 1748	Oman	Feb/Mar 2011	34.4	H5
Dhofar 1749	Dho 1749	Oman	Feb/Mar 2011	35.3	H5
Dhofar 1750	Dho 1750	Oman	Feb/Mar 2011	123	H5
Dhofar 1751	Dho 1751	Oman	Feb/Mar 2011	20.9	H5
Dhofar 1752	Dho 1752	Oman	Feb/Mar 2011	88	H5
Dominion Range 08017	DOM 08017	Antarctica	2008	1021.1	LL5
Dominion Range 08018	DOM 08018	Antarctica	2008	1447.8	LL6
Dominion Range 08020	DOM 08020	Antarctica	2008	1020.6	LL5
Dominion Range 08022	DOM 08022	Antarctica	2008	825.3	LL5
Dominion Range 08025	DOM 08025	Antarctica	2008	566.1	LL6
Dominion Range 08026	DOM 08026	Antarctica	2008	222.5	LL6
Dominion Range 08032	DOM 08032	Antarctica	2008	212.4	LL5
Dominion Range 08033	DOM 08033	Antarctica	2008	319.7	LL5
Dominion Range 08034	DOM 08034	Antarctica	2008	96.9	L5

Dominion Range 08035	DOM 08035	Antarctica	2008	251.4	LL6
Dominion Range 08037	DOM 08037	Antarctica	2008	172.6	LL5
Dominion Range 08038	DOM 08038	Antarctica	2008	131.3	LL6
Dominion Range 08039	DOM 08039	Antarctica	2008	89.8	LL6
Dominion Range 08040	DOM 08040	Antarctica	2008	106.7	LL6
Dominion Range 08041	DOM 08041	Antarctica	2008	145.8	LL5
Dominion Range 08042	DOM 08042	Antarctica	2008	125.5	LL6
Dominion Range 08043	DOM 08043	Antarctica	2008	83.5	LL5
Dominion Range 08044	DOM 08044	Antarctica	2008	124.4	LL6
Dominion Range 08045	DOM 08045	Antarctica	2008	82.9	LL6
Dominion Range 08046	DOM 08046	Antarctica	2008	122.4	LL5
Dominion Range 08047	DOM 08047	Antarctica	2008	78.8	LL6
Dominion Range 08048	DOM 08048	Antarctica	2008	64.8	LL6
Dominion Range 08049	DOM 08049	Antarctica	2008	70.3	LL5
Dominion Range 08050	DOM 08050	Antarctica	2008	154.2	LL6
Dominion Range 08051	DOM 08051	Antarctica	2008	193.1	LL5
Dominion Range 08052	DOM 08052	Antarctica	2008	88.7	LL5
Dominion Range 08053	DOM 08053	Antarctica	2008	74.6	LL5
Dominion Range 08054	DOM 08054	Antarctica	2008	68.2	L6
Dominion Range 08055	DOM 08055	Antarctica	2008	44.3	LL6
Dominion Range 08056	DOM 08056	Antarctica	2008	65.9	LL6
Dominion Range 08057	DOM 08057	Antarctica	2008	44.2	L6
Dominion Range 08058	DOM 08058	Antarctica	2008	54.2	LL6
Dominion Range 08059	DOM 08059	Antarctica	2008	88.0	LL6
Dominion Range 08061	DOM 08061	Antarctica	2008	48.4	L5
Dominion Range 08062	DOM 08062	Antarctica	2008	51.6	LL6
Dominion Range 08064	DOM 08064	Antarctica	2008	39.3	L5
Dominion Range 08066	DOM 08066	Antarctica	2008	115.6	LL5
Dominion Range 08077	DOM 08077	Antarctica	2008	19.4	LL6
Dominion Range 08080	DOM 08080	Antarctica	2008	149.9	LL5
Dominion Range 08081	DOM 08081	Antarctica	2008	193.5	LL5
Dominion Range 08082	DOM 08082	Antarctica	2008	255.2	LL5
Dominion Range 08083	DOM 08083	Antarctica	2008	220.1	LL6
Dominion Range 08084	DOM 08084	Antarctica	2008	247.9	L5
Dominion Range 08087	DOM 08087	Antarctica	2008	38.2	LL5
Dominion Range 08089	DOM 08089	Antarctica	2008	53.1	LL6
Dominion Range 08090	DOM 08090	Antarctica	2008	33.9	LL6
Dominion Range 08096	DOM 08096	Antarctica	2008	28.1	LL6
Dominion Range 08097	DOM 08097	Antarctica	2008	56.4	LL6
Dominion Range 08103	DOM 08103	Antarctica	2008	14.7	LL5
Dominion Range 08104	DOM 08104	Antarctica	2008	28.8	LL6
Dominion Range 08110	DOM 08110	Antarctica	2008	86.0	L6
Dominion Range 08111	DOM 08111	Antarctica	2008	36.3	L6
Dominion Range 08112	DOM 08112	Antarctica	2008	30.8	LL6

Dominion Range 08113	DOM 08113	Antarctica	2008	58.6	LL6
Dominion Range 08114	DOM 08114	Antarctica	2008	27.0	LL6
Dominion Range 08115	DOM 08115	Antarctica	2008	65.3	H6
Dominion Range 08116	DOM 08116	Antarctica	2008	95.8	LL5
Dominion Range 08117	DOM 08117	Antarctica	2008	43.9	H5
Dominion Range 08118	DOM 08118	Antarctica	2008	102.8	L5
Dominion Range 08119	DOM 08119	Antarctica	2008	54.7	LL5
Dominion Range 08200	DOM 08200	Antarctica	2008	15.9	LL5
Dominion Range 08201	DOM 08201	Antarctica	2008	21.1	LL5
Dominion Range 08202	DOM 08202	Antarctica	2008	21.8	L5
Dominion Range 08203	DOM 08203	Antarctica	2008	33.2	LL5
Dominion Range 08204	DOM 08204	Antarctica	2008	24.1	LL6
Dominion Range 08205	DOM 08205	Antarctica	2008	17.7	LL6
Dominion Range 08206	DOM 08206	Antarctica	2008	39.0	LL6
Dominion Range 08207	DOM 08207	Antarctica	2008	22.6	LL6
Dominion Range 08208	DOM 08208	Antarctica	2008	27.1	LL6
Dominion Range 08209	DOM 08209	Antarctica	2008	25.4	L6
Dominion Range 08210	DOM 08210	Antarctica	2008	15.9	LL6
Dominion Range 08211	DOM 08211	Antarctica	2008	12.6	LL6
Dominion Range 08212	DOM 08212	Antarctica	2008	8.2	H6
Dominion Range 08213	DOM 08213	Antarctica	2008	9.3	LL5
Dominion Range 08214	DOM 08214	Antarctica	2008	9.4	LL5
Dominion Range 08215	DOM 08215	Antarctica	2008	14.6	LL6
Dominion Range 08216	DOM 08216	Antarctica	2008	13.0	L6
Dominion Range 08217	DOM 08217	Antarctica	2008	13.4	LL6
Dominion Range 08218	DOM 08218	Antarctica	2008	18.3	L6
Dominion Range 08219	DOM 08219	Antarctica	2008	21.9	LL6
Dominion Range 08230	DOM 08230	Antarctica	2008	29.6	LL6
Dominion Range 08231	DOM 08231	Antarctica	2008	23.3	LL6
Dominion Range 08232	DOM 08232	Antarctica	2008	20.4	LL6
Dominion Range 08233	DOM 08233	Antarctica	2008	18.9	LL6
Dominion Range 08234	DOM 08234	Antarctica	2008	37.5	LL5
Dominion Range 08235	DOM 08235	Antarctica	2008	25.8	LL6
Dominion Range 08236	DOM 08236	Antarctica	2008	27.6	H6
Dominion Range 08237	DOM 08237	Antarctica	2008	31.3	LL6
Dominion Range 08238	DOM 08238	Antarctica	2008	29.9	LL6
Dominion Range 08239	DOM 08239	Antarctica	2008	24.2	H5
Dominion Range 08240	DOM 08240	Antarctica	2008	37.4	LL6
Dominion Range 08241	DOM 08241	Antarctica	2008	20.6	LL6
Dominion Range 08242	DOM 08242	Antarctica	2008	25.1	H6
Dominion Range 08243	DOM 08243	Antarctica	2008	43.2	LL6
Dominion Range 08244	DOM 08244	Antarctica	2008	45.4	LL6
Dominion Range 08245	DOM 08245	Antarctica	2008	42.2	LL6
Dominion Range 08246	DOM 08246	Antarctica	2008	42.3	LL6

Dominion Range 08247	DOM 08247	Antarctica	2008	61.7	LL6
Dominion Range 08248	DOM 08248	Antarctica	2008	32.9	LL6
Dominion Range 08249	DOM 08249	Antarctica	2008	72.2	LL5
Dominion Range 08306	DOM 08306	Antarctica	2008	13.3	L6
Dominion Range 08312	DOM 08312	Antarctica	2008	12.9	LL6
Dominion Range 08316	DOM 08316	Antarctica	2008	20.3	LL6
Dominion Range 08319	DOM 08319	Antarctica	2008	19.2	LL6
Dominion Range 08321	DOM 08321	Antarctica	2008	14.1	LL6
Dominion Range 08325	DOM 08325	Antarctica	2008	18.9	LL6
Dominion Range 08326	DOM 08326	Antarctica	2008	19.1	LL6
Dominion Range 08327	DOM 08327	Antarctica	2008	3.5	L5
Dominion Range 08328	DOM 08328	Antarctica	2008	19.5	LL6
Dominion Range 08334	DOM 08334	Antarctica	2008	19.8	LL6
Dominion Range 08335	DOM 08335	Antarctica	2008	30.6	L6
Dominion Range 08337	DOM 08337	Antarctica	2008	27.6	L-imp melt
Dominion Range 08343	DOM 08343	Antarctica	2008	1.0	LL6
Dominion Range 08344	DOM 08344	Antarctica	2008	11.4	L6
Dominion Range 08345	DOM 08345	Antarctica	2008	5.7	LL6
Dominion Range 08346	DOM 08346	Antarctica	2008	4.1	LL5
Dominion Range 08347	DOM 08347	Antarctica	2008	10.3	L6
Dominion Range 08348	DOM 08348	Antarctica	2008	3.0	LL6
Dominion Range 08349	DOM 08349	Antarctica	2008	6.2	L6
Dominion Range 08351	DOM 08351	Antarctica	2008	26.3	CO3
Dominion Range 08353	DOM 08353	Antarctica	2008	12.7	L5
Dominion Range 08372	DOM 08372	Antarctica	2008	6.6	Ureilite
Dominion Range 08377	DOM 08377	Antarctica	2008	4.2	H5
Dominion Range 08378	DOM 08378	Antarctica	2008	5.5	H6
Dominion Range 08387	DOM 08387	Antarctica	2008	5.7	LL6
Dominion Range 08390	DOM 08390	Antarctica	2008	83.3	H5
Dominion Range 08392	DOM 08392	Antarctica	2008	79.1	L6
Dominion Range 08397	DOM 08397	Antarctica	2008	68.8	L-imp melt
Dominion Range 08440	DOM 08440	Antarctica	2008	29.7	L5
Dominion Range 08441	DOM 08441	Antarctica	2008	12.7	L6
Dominion Range 08442	DOM 08442	Antarctica	2008	14.2	H5
Dominion Range 08443	DOM 08443	Antarctica	2008	20.1	L5
Dominion Range 08444	DOM 08444	Antarctica	2008	36.8	L5
Dominion Range 08445	DOM 08445	Antarctica	2008	12.3	L6
Dominion Range 08446	DOM 08446	Antarctica	2008	25.8	L5
Dominion Range 08447	DOM 08447	Antarctica	2008	18.6	L6
Dominion Range 08448	DOM 08448	Antarctica	2008	57.6	LL5
Dominion Range 08449	DOM 08449	Antarctica	2008	40.5	LL6
Dominion Range 08450	DOM 08450	Antarctica	2008	20.4	LL5
Dominion Range 08451	DOM 08451	Antarctica	2008	11.6	L6
Dominion Range 08452	DOM 08452	Antarctica	2008	9.6	L6

Dominion Range 08453	DOM 08453	Antarctica	2008	14.9	L6
Dominion Range 08454	DOM 08454	Antarctica	2008	30.4	LL5
Dominion Range 08455	DOM 08455	Antarctica	2008	19.0	H6
Dominion Range 08456	DOM 08456	Antarctica	2008	10.7	H6
Dominion Range 08457	DOM 08457	Antarctica	2008	17.0	LL6
Dominion Range 08458	DOM 08458	Antarctica	2008	19.2	LL6
Dominion Range 08459	DOM 08459	Antarctica	2008	21.3	LL6
Dominion Range 08460	DOM 08460	Antarctica	2008	53.4	LL5
Dominion Range 08461	DOM 08461	Antarctica	2008	122.4	L6
Dominion Range 08462	DOM 08462	Antarctica	2008	133.9	LL5
Dominion Range 08463	DOM 08463	Antarctica	2008	160.9	LL5
Dominion Range 08464	DOM 08464	Antarctica	2008	72.6	L6
Dominion Range 08465	DOM 08465	Antarctica	2008	92.5	L6
Dominion Range 08466	DOM 08466	Antarctica	2008	48.7	LL5
Dominion Range 08467	DOM 08467	Antarctica	2008	82.5	LL5
Dominion Range 08468	DOM 08468	Antarctica	2008	64.8	H3.5
Dominion Range 08469	DOM 08469	Antarctica	2008	148.8	LL5
Dominion Range 08470	DOM 08470	Antarctica	2008	36.3	LL6
Dominion Range 08471	DOM 08471	Antarctica	2008	31.3	LL6
Dominion Range 08472	DOM 08472	Antarctica	2008	18.5	LL5
Dominion Range 08473	DOM 08473	Antarctica	2008	14.9	LL5
Dominion Range 08474	DOM 08474	Antarctica	2008	17.4	LL6
Dominion Range 08475	DOM 08475	Antarctica	2008	17.9	L5
Dominion Range 08476	DOM 08476	Antarctica	2008	25.1	CV3
Dominion Range 08477	DOM 08477	Antarctica	2008	14.5	LL5
Dominion Range 08478	DOM 08478	Antarctica	2008	21.2	LL5
Dominion Range 08479	DOM 08479	Antarctica	2008	11.9	L6
Dominion Range 08480	DOM 08480	Antarctica	2008	14.5	H5
Dominion Range 08481	DOM 08481	Antarctica	2008	9.9	L5
Dominion Range 08482	DOM 08482	Antarctica	2008	21.4	LL6
Dominion Range 08483	DOM 08483	Antarctica	2008	19.2	L6
Dominion Range 08484	DOM 08484	Antarctica	2008	22.4	LL6
Dominion Range 08485	DOM 08485	Antarctica	2008	18.3	LL6
Dominion Range 08486	DOM 08486	Antarctica	2008	23.0	LL6
Dominion Range 08487	DOM 08487	Antarctica	2008	25.2	LL6
Dominion Range 08488	DOM 08488	Antarctica	2008	25.2	LL6
Dominion Range 08489	DOM 08489	Antarctica	2008	12.9	LL5
Dominion Range 08490	DOM 08490	Antarctica	2008	18.5	LL6
Dominion Range 08491	DOM 08491	Antarctica	2008	34.5	L5
Dominion Range 08492	DOM 08492	Antarctica	2008	35.7	LL6
Dominion Range 08493	DOM 08493	Antarctica	2008	22.8	LL5
Dominion Range 08494	DOM 08494	Antarctica	2008	21.2	L6
Dominion Range 08495	DOM 08495	Antarctica	2008	38.1	H6
Dominion Range 08496	DOM 08496	Antarctica	2008	15.5	L6

Dominion Range 08497	DOM 08497	Antarctica	2008	28.7	L6
Dominion Range 08498	DOM 08498	Antarctica	2008	16.9	LL6
Dominion Range 08499	DOM 08499	Antarctica	2008	55.4	LL6
Dominion Range 08500	DOM 08500	Antarctica	2008	65.8	LL6
Dominion Range 08501	DOM 08501	Antarctica	2008	68.7	LL5
Dominion Range 08502	DOM 08502	Antarctica	2008	68.8	LL6
Dominion Range 08503	DOM 08503	Antarctica	2008	15.3	LL6
Dominion Range 08504	DOM 08504	Antarctica	2008	51.2	LL6
Dominion Range 08505	DOM 08505	Antarctica	2008	42.4	L6
Dominion Range 08506	DOM 08506	Antarctica	2008	48.9	LL6
Dominion Range 08507	DOM 08507	Antarctica	2008	37.5	LL6
Dominion Range 08508	DOM 08508	Antarctica	2008	28.5	L6
Dominion Range 08509	DOM 08509	Antarctica	2008	29.3	H5
Dominion Range 08515	DOM 08515	Antarctica	2008	16.2	LL6
Dominion Range 08516	DOM 08516	Antarctica	2008	22.0	LL6
Dominion Range 08517	DOM 08517	Antarctica	2008	28.4	LL6
Dominion Range 08518	DOM 08518	Antarctica	2008	18.9	LL6
Dominion Range 08519	DOM 08519	Antarctica	2008	22.6	H6
Dominion Range 08520	DOM 08520	Antarctica	2008	31.1	LL6
Dominion Range 08521	DOM 08521	Antarctica	2008	16.0	LL6
El Médano 042		Chile	2011 Oct 22	22.6	L6
El Médano 043		Chile	2011 Oct 23	24.8	H4
El Médano 044		Chile	2011 Oct 23	44.4	L6
El Médano 045		Chile	2011 Oct 23	319	H5
El Médano 046		Chile	2011 Oct 23	40.1	H4
El Médano 047		Chile	2011 Oct 23	57.9	H4
El Médano 048		Chile	2011 Oct 23	118	H5
El Médano 049		Chile	2011 Oct 24	138	H4
El Médano 050		Chile	2011 Oct 24	52	H5
El Médano 051		Chile	2011 Oct 21	28.9	L6
El Médano 052		Chile	2011 Oct 22	66.5	H5
El Médano 053		Chile	2011 Oct 24	17.9	H4/5
El Médano 054		Chile	2011 Oct 25	46.5	H5
El Médano 055		Chile	2011 Oct 30	34.3	H6
El Médano 056		Chile	2011 Apr 6	180	CK5
El Médano 057		Chile	2010 Oct 21	10.8	H6
El Médano 058		Chile	2010 Oct 21	11.8	H6
El Médano 059		Chile	2011 Oct 21	27	H4
El Médano 060		Chile	2011 Oct 22	29	H3
El Médano 061		Chile	2011 Oct 22	57	H5
El Médano 062		Chile	2011 Oct 22	22	L6
El Médano 063		Chile	2011 Oct 24	23	H4
El Médano 064		Chile	2011 Oct 24	22	H4
El Médano 065		Chile	2011 Oct 25	11.5	H5

El Médano 066		Chile	2011 Oct 26	15.8	H5
El Médano 067		Chile	2011 Oct 30	20.4	L6
El Médano 068		Chile	2011 Oct 21	125	H4
El Médano 069		Chile	2011 Oct 22	65	H6
El Médano 070		Chile	2011 Oct 22	51	L6
El Médano 071		Chile	2011 Oct 22	163	H5
El Médano 072		Chile	2011 Oct 24	19.9	H4
El Médano 073		Chile	2011 Oct 24	67	LL6
El Médano 074		Chile	2011 Oct 24	42.4	H4
El Médano 075		Chile	2011 Oct 25	186	L4
El Médano 076		Chile	2011 Oct 25	14.1	H5
El Médano 078		Chile	2011 Oct 26	1228	L6
El Médano 079		Chile	2011 Oct 25	230	H5
Elizabeth		United States	1950s	732	Iron, IAB-ung
Fairburn		United States	1907	445	Iron, IAB-ung
Frontier Mountain 09008	FRO 09008	Antarctica	9 Dec 2009	27	L3
Frontier Mountain 09013	FRO 09013	Antarctica	9 Dec 2009	16	L3
Great Sand Sea 041	GSS 041	Egypt	2010	6.50	H5
Hammadah al Hamra 344	HaH 344	Libya	2000 Aug 18	2318.4	H~6
Harper Dry Lake 036	HrDL 036	United States	26 Sep 2010	85.5	L6
Hart		United States	2010 March	966	CK3
Ischgl		Austria	1976 June	724	LL6
Jiddat al Harasis 568	JaH 568	Oman	26 Jan 2009	3249.0	H4-6
Jiddat al Harasis 569	JaH 569	Oman	26 Jan 2009	159.3	H4-6
Jiddat al Harasis 570	JaH 570	Oman	26 Jan 2009	4747.9	H4-6
Jiddat al Harasis 571	JaH 571	Oman	26 Jan 2009	802.6	H4-6
Jiddat al Harasis 572	JaH 572	Oman	26 Jan 2009	417.6	H5-6
Jiddat al Harasis 573	JaH 573	Oman	26 Jan 2009	28.9	H4-6
Jiddat al Harasis 574	JaH 574	Oman	26 Jan 2009	13000	H4-6
Jiddat al Harasis 575	JaH 575	Oman	26 Jan 2009	190.4	H6
Jiddat al Harasis 576	JaH 576	Oman	27 Jan 2009	284.6	H5/6
Jiddat al Harasis 577	JaH 577	Oman	27 Jan 2009	81.6	H4/5
Jiddat al Harasis 578	JaH 578	Oman	27 Jan 2009	1064.3	H6
Jiddat al Harasis 579	JaH 579	Oman	31 Jan 2009	475.1	L4-6
Jiddat al Harasis 580	JaH 580	Oman	01 Feb 2009	1929.0	H5
Jiddat al Harasis 581	JaH 581	Oman	01 Feb 2009	375.1	H5
Jiddat al Harasis 582	JaH 582	Oman	01 Feb 2009	1647.5	L6
Jiddat al Harasis 583	JaH 583	Oman	01 Feb 2009	1272.5	H5
Jiddat al Harasis 584	JaH 584	Oman	01 Feb 2009	715.2	H6
Jiddat al Harasis 585	JaH 585	Oman	05 Feb 2009	408.7	H5
Jiddat al Harasis 586	JaH 586	Oman	05 Feb 2009	3568.5	H5
Jiddat al Harasis 587	JaH 587	Oman	05 Feb 2009	1721.5	H5
Jiddat al Harasis 588	JaH 588	Oman	05 Feb 2009	165.3	L6
Jiddat al Harasis 589	JaH 589	Oman	07 Feb 2009	666.6	H5

Jiddat al Harasis 590	JaH 590	Oman	07 Feb 2009	1044.0	H5
Jiddat al Harasis 591	JaH 591	Oman	07 Feb 2009	103.3	H5
Jiddat al Harasis 592	JaH 592	Oman	07 Feb 2009	423.2	H5
Jiddat al Harasis 593	JaH 593	Oman	07 Feb 2009	1725.1	H5
Jiddat al Harasis 594	JaH 594	Oman	07 Feb 2009	201.3	H5
Jiddat al Harasis 595	JaH 595	Oman	07 Feb 2009	929.1	L5
Jiddat al Harasis 596	JaH 596	Oman	08 Feb 2009	336.4	L3
Jiddat al Harasis 597	JaH 597	Oman	08 Feb 2009	51.3	H4
Jiddat al Harasis 598	JaH 598	Oman	09 Feb 2009	39.2	L6
Jiddat al Harasis 599	JaH 599	Oman	09 Feb 2009	169.7	L6
Jiddat al Harasis 600	JaH 600	Oman	09 Feb 2009	5750.8	L6
Jiddat al Harasis 601	JaH 601	Oman	09 Feb 2009	59.8	L6
Jiddat al Harasis 602	JaH 602	Oman	09 Feb 2009	40.0	H6
Jiddat al Harasis 603	JaH 603	Oman	09 Feb 2009	29.4	H5
Jiddat al Harasis 604	JaH 604	Oman	09 Feb 2009	754.0	H4-6
Jiddat al Harasis 605	JaH 605	Oman	10 Feb 2009	58.5	L6
Jiddat al Harasis 606	JaH 606	Oman	10 Feb 2009	114.7	H5
Jiddat al Harasis 607	JaH 607	Oman	10 Feb 2009	1317.6	L6
Jiddat al Harasis 608	JaH 608	Oman	10 Feb 2009	120.6	H5
Jiddat al Harasis 609	JaH 609	Oman	10 Feb 2009	442.9	L6
Jiddat al Harasis 610	JaH 610	Oman	10 Feb 2009	457.5	H3-5
Jiddat al Harasis 611	JaH 611	Oman	10 Feb 2009	109.5	H4
Jiddat al Harasis 612	JaH 612	Oman	15 Feb 2009	179.7	H6
Jiddat al Harasis 613	JaH 613	Oman	15 Feb 2009	241.0	H4/5
Jiddat al Harasis 614	JaH 614	Oman	15 Feb 2009	3532.9	H4/5
Jiddat al Harasis 615	JaH 615	Oman	16 Feb 2009	111.3	H5
Jiddat al Harasis 616	JaH 616	Oman	16 Feb 2009	360.5	H4
Jiddat al Harasis 617	JaH 617	Oman	16 Feb 2009	128.4	H5
Jiddat al Harasis 618	JaH 618	Oman	16 Feb 2009	42.9	H4
Jiddat al Harasis 619	JaH 619	Oman	16 Feb 2009	14.5	CO3
Jiddat al Harasis 620	JaH 620	Oman	16 Feb 2009	244.6	L6
Jiddat al Harasis 621	JaH 621	Oman	16 Feb 2009	43.4	L6
Jiddat al Harasis 622	JaH 622	Oman	16 Feb 2009	76.5	H5
Jiddat al Harasis 623	JaH 623	Oman	16 Feb 2009	22.1	H4
Jiddat al Harasis 624	JaH 624	Oman	16 Feb 2009	34.2	L6
Jiddat al Harasis 629	JaH 629	Oman	2010	888	L4
Jiddat al Harasis 630	JaH 630	Oman	2010	3036	L5
Jiddat al Harasis 631	JaH 631	Oman	2010	28.32	L4
Jiddat al Harasis 632	JaH 632	Oman	2010	421	LL5
Jiddat al Harasis 633	JaH 633	Oman	2010	51.1	L4
Jiddat al Harasis 634	JaH 634	Oman	2010	206.9	LL4
Jiddat al Harasis 635	JaH 635	Oman	2010	397.8	LL5
Jiddat al Harasis 636	JaH 636	Oman	2010	76.4	LL5
Jiddat al Harasis 637	JaH 637	Oman	2010	165.3	LL5

Jiddat al Harasis 638	JaH 638	Oman	2010	88.2	LL4
Jiddat al Harasis 639	JaH 639	Oman	2010	802	LL5
Jiddat al Harasis 640	JaH 640	Oman	2010	233	LL5
Jiddat al Harasis 642	JaH 642	Oman	2010 Jan 21	219.724	LL3-6
Jiddat al Harasis 651	JaH 651	Oman	2010 Jan 29	207.62	H3.9
Jiddat al Harasis 659	JaH 659	Oman	Jan 2011	2191.4	L3.6
Jiddat al Harasis 660	JaH 660	Oman	2011 Jan 22	390.8	L4
Jiddat al Harasis 661	JaH 661	Oman	2011 Jan 22	516.1	L5
Jiddat al Harasis 662	JaH 662	Oman	2011 Jan 22	548.7	H6
Jiddat al Harasis 663	JaH 663	Oman	2011 Jan 24	1.60	L6
Jiddat al Harasis 664	JaH 664	Oman	2011 Jan 24	12175	H5
Jiddat al Harasis 665	JaH 665	Oman	2011 Jan 24	2637	H5
Jiddat al Harasis 666	JaH 666	Oman	2011 Jan 24	1015	H4-6
Jiddat al Harasis 667	JaH 667	Oman	2011 Jan 24	487.4	H4
Jiddat al Harasis 668	JaH 668	Oman	2011 Jan 24	1979	H5
Jiddat al Harasis 669	JaH 669	Oman	2011 Jan 24	810.6	L6
Jiddat al Harasis 670	JaH 670	Oman	2011 Jan 25	2399	H5
Jiddat al Harasis 671	JaH 671	Oman	2011 Jan 25	1.82	H5
Jiddat al Harasis 672	JaH 672	Oman	2011 Jan 25	4.94	H5
Jiddat al Harasis 673	JaH 673	Oman	2011 Jan 25	1.48	H5
Jiddat al Harasis 674	JaH 674	Oman	2011 Jan 25	22.6	H5
Jiddat al Harasis 675	JaH 675	Oman	2011 Jan 25	19.36	H5
Jiddat al Harasis 676	JaH 676	Oman	2011 Jan 25	22.2	H5
Jiddat al Harasis 677	JaH 677	Oman	2011 Jan 25	27.1	H5
Jiddat al Harasis 678	JaH 678	Oman	2011 Jan 25	16.38	H5
Jiddat al Harasis 679	JaH 679	Oman	2011 Jan 25	198.4	H5
Jiddat al Harasis 680	JaH 680	Oman	2011 Jan 25	84.1	H5
Jiddat al Harasis 681	JaH 681	Oman	2011 Jan 25	26.1	H5
Jiddat al Harasis 682	JaH 682	Oman	2011 Jan 25	293.2	H5
Jiddat al Harasis 683	JaH 683	Oman	2011 Jan 25	35.3	H5
Jiddat al Harasis 684	JaH 684	Oman	2011 Jan 25	30.9	H5
Jiddat al Harasis 685	JaH 685	Oman	2011 Jan 26	1.51	H4
Jiddat al Harasis 686	JaH 686	Oman	2011 Jan 26	148.3	H4
Jiddat al Harasis 687	JaH 687	Oman	2011 Jan 26	0.46	H4
Jiddat al Harasis 688	JaH 688	Oman	2011 Jan 26	24.4	H4
Jiddat al Harasis 689	JaH 689	Oman	2011 Jan 26	11.67	H5
Jiddat al Harasis 690	JaH 690	Oman	2011 Jan 26	632.1	H6
Jiddat al Harasis 691	JaH 691	Oman	2011 Jan 26	27.6	H5
Jiddat al Harasis 692	JaH 692	Oman	2011 Feb 01	387	LL6
Jiddat al Harasis 693	JaH 693	Oman	2011 Feb 01	566	L6
Jiddat al Harasis 694	JaH 694	Oman	2011 Feb 01	515.5	L6
Jiddat al Harasis 695	JaH 695	Oman	2011 Feb 01	87.8	H5
Jiddat al Harasis 696	JaH 696	Oman	2011 Feb 01	317.1	L6
Jiddat al Harasis 697	JaH 697	Oman	2011 Feb 01	93.6	L6

Jiddat al Harasis 698	JaH 698	Oman	2011 Feb 01	1900	H4-5
Jiddat al Harasis 699	JaH 699	Oman	2011 Feb 02	13.70	L6
Jiddat al Harasis 700	JaH 700	Oman	2011 Feb 02	93.2	L6
Jiddat al Harasis 701	JaH 701	Oman	2011 Feb 02	914.2	H6
Jiddat al Harasis 702	JaH 702	Oman	2011 Feb 02	120.1	H5
Jiddat al Harasis 703	JaH 703	Oman	2011 Feb 02	39.4	H5
Jiddat al Harasis 704	JaH 704	Oman	2011 Feb 02	1.36	H4
Jiddat al Harasis 705	JaH 705	Oman	2011 Feb 02	185.0	H5
Jiddat al Harasis 706	JaH 706	Oman	2011 Feb 02	347.6	H5
Jiddat al Harasis 707	JaH 707	Oman	2011 Feb 03	242.9	L5
Jiddat al Harasis 708	JaH 708	Oman	2011 Feb 03	127.2	H4-6
Jiddat al Harasis 709	JaH 709	Oman	2011 Feb 03	92.0	L6
Jiddat al Harasis 710	JaH 710	Oman	2011 Feb 03	278.2	H4-5
Jiddat al Harasis 711	JaH 711	Oman	2011 Feb 03	2222	H5
Jiddat al Harasis 712	JaH 712	Oman	2011 Feb 03	70.7	L5
Jiddat al Harasis 713	JaH 713	Oman	2011 Feb 04	153.1	H6
Jiddat al Harasis 714	JaH 714	Oman	2011 Feb 06	175.3	L6
Jiddat al Harasis 715	JaH 715	Oman	2011 Feb 06	163.5	L5
Jiddat al Harasis 716	JaH 716	Oman	2011 Feb 08	364.2	L5
Jiddat al Harasis 717	JaH 717	Oman	28 Nov 2011	942	L5/6
Jiddat al Harasis 719	JaH 719	Oman	Feb/Mar 2011	2144	L6
Jiddat al Harasis 720	JaH 720	Oman	Feb/Mar 2011	172	H4
Jiddat al Harasis 721	JaH 721	Oman	Feb/Mar 2011	859	H5
Jiddat al Harasis 722	JaH 722	Oman	Feb/Mar 2011	291	H5
Jiddat al Harasis 723	JaH 723	Oman	Feb/Mar 2011	1876	H4
Jiddat al Harasis 724	JaH 724	Oman	Feb/Mar 2011	14.2	L6
Jiddat al Harasis 725	JaH 725	Oman	Feb/Mar 2011	49	L5
Jiddat al Harasis 726	JaH 726	Oman	Feb/Mar 2011	507	L6
Jiddat al Harasis 727	JaH 727	Oman	Feb/Mar 2011	301	L6
Jiddat al Harasis 728	JaH 728	Oman	Feb/Mar 2011	69	H4
Jiddat al Harasis 729	JaH 729	Oman	Feb/Mar 2011	951	L5
Jiddat al Harasis 730	JaH 730	Oman	Feb/Mar 2011	1040	L4
Jiddat al Harasis 731	JaH 731	Oman	Feb/Mar 2011	72.3	H4
Jiddat al Harasis 732	JaH 732	Oman	Feb/Mar 2011	154	L5
Jiddat al Harasis 733	JaH 733	Oman	Feb/Mar 2011	1296	H6
Jiddat al Harasis 734	JaH 734	Oman	Feb/Mar 2011	371	L4
Jiddat al Harasis 735	JaH 735	Oman	Feb/Mar 2011	33.4	H6
Jiddat al Harasis 736	JaH 736	Oman	Feb/Mar 2011	24.7	L4
Jiddat al Harasis 737	JaH 737	Oman	Feb/Mar 2011	1137	L5
Jiddat al Harasis 738	JaH 738	Oman	Feb/Mar 2011	469	H5
Jiddat al Harasis 739	JaH 739	Oman	Feb/Mar 2011	587	L4
Jiddat al Harasis 740	JaH 740	Oman	Feb/Mar 2011	354	L4
Jiddat al Harasis 741	JaH 741	Oman	Feb/Mar 2011	31.6	L4
Jiddat al Harasis 742	JaH 742	Oman	Feb/Mar 2011	1144	L4

Jiddat al Harasis 743	JaH 743	Oman	Feb/Mar 2011	105	L4
Jiddat al Harasis 744	JaH 744	Oman	Feb/Mar 2011	17.3	L4
Jiddat al Harasis 745	JaH 745	Oman	Feb/Mar 2011	30.5	L4
Jiddat al Harasis 746	JaH 746	Oman	Feb/Mar 2011	22.9	L4
Jiddat al Harasis 747	JaH 747	Oman	Feb/Mar 2011	37.9	L5
Jiddat al Harasis 748	JaH 748	Oman	Feb/Mar 2011	18.8	L5
Jiddat al Harasis 749	JaH 749	Oman	Feb/Mar 2011	33	L5
Jiddat al Harasis 750	JaH 750	Oman	Feb/Mar 2011	269	L5
Jiddat al Harasis 751	JaH 751	Oman	Feb/Mar 2011	378	L5
Jiddat al Harasis 752	JaH 752	Oman	Feb/Mar 2011	174	L5
Jiddat al Harasis 753	JaH 753	Oman	Feb/Mar 2011	34.2	L5
Jiddat al Harasis 754	JaH 754	Oman	Feb/Mar 2011	51	L5
Jiddat al Harasis 755	JaH 755	Oman	Feb/Mar 2011	17.5	L5
Jiddat al Harasis 756	JaH 756	Oman	Feb/Mar 2011	74	L5
Jiddat al Harasis 757	JaH 757	Oman	Feb/Mar 2011	178	LL5
Jiddat al Harasis 758	JaH 758	Oman	Feb/Mar 2011	271	L6
Jiddat al Harasis 759	JaH 759	Oman	Feb/Mar 2011	347	L5
Jiddat al Harasis 760	JaH 760	Oman	Feb/Mar 2011	49	H5
Jiddat al Harasis 761	JaH 761	Oman	Feb/Mar 2011	1251	H5
Jiddat al Harasis 762	JaH 762	Oman	Feb/Mar 2011	46	L5
Jiddat al Harasis 763	JaH 763	Oman	Feb/Mar 2011	62	L5
Jiddat al Harasis 764	JaH 764	Oman	Feb/Mar 2011	1236	L5
Jiddat al Harasis 765	JaH 765	Oman	Feb/Mar 2011	45	H4
Jiddat al Harasis 766	JaH 766	Oman	Feb/Mar 2011	73	L4
Jiddat al Harasis 767	JaH 767	Oman	Feb/Mar 2011	91	L4
Jiddat al Harasis 768	JaH 768	Oman	Feb/Mar 2011	64	L4
Jiddat al Harasis 769	JaH 769	Oman	Feb/Mar 2011	36.5	L4
Jiddat al Harasis 770	JaH 770	Oman	Feb/Mar 2011	26	L4
Jiddat al Harasis 771	JaH 771	Oman	Feb/Mar 2011	40.3	L4
Jiddat al Harasis 772	JaH 772	Oman	Feb/Mar 2011	39.6	H4
Jiddat al Harasis 773	JaH 773	Oman	Feb/Mar 2011	19.32	L4
Jiddat al Harasis 774	JaH 774	Oman	Feb/Mar 2011	131	L4
Jiddat al Harasis 775	JaH 775	Oman	Feb/Mar 2011	17.9	L4
Jiddat al Harasis 776	JaH 776	Oman	Feb/Mar 2011	85	L4
Jiddat al Harasis 777	JaH 777	Oman	Feb/Mar 2011	130	L4
Jiddat al Harasis 778	JaH 778	Oman	Feb/Mar 2011	367	L4
Jiddat al Harasis 779	JaH 779	Oman	Feb/Mar 2011	57	L4
Jiddat al Harasis 780	JaH 780	Oman	Feb/Mar 2011	32.5	L4
Jiddat al Harasis 781	JaH 781	Oman	Feb/Mar 2011	169	L4
Jiddat al Harasis 782	JaH 782	Oman	Feb/Mar 2011	532	L4
Jiddat al Harasis 783	JaH 783	Oman	Feb/Mar 2011	553.5	L4
Jiddat al Harasis 784	JaH 784	Oman	Feb/Mar 2011	182	H4
Jiddat al Harasis 785	JaH 785	Oman	Feb/Mar 2011	36.7	L6
Jiddat al Harasis 786	JaH 786	Oman	Feb/Mar 2011	227	L5

Jiddat al Harasis 787	JaH 787	Oman	Feb/Mar 2011	6.8	L6
Jiddat al Harasis 788	JaH 788	Oman	Feb/Mar 2011	108	H4
Jiddat al Harasis 789	JaH 789	Oman	Feb/Mar 2011	227	L6
Jiddat al Harasis 790	JaH 790	Oman	Feb/Mar 2011	868	L6
Jiddat al Harasis 791	JaH 791	Oman	Feb/Mar 2011	1194	L6
Jiddat al Harasis 792	JaH 792	Oman	Feb/Mar 2011	353	H6
Jiddat al Harasis 793	JaH 793	Oman	Feb/Mar 2011	420	L5
Jiddat al Harasis 794	JaH 794	Oman	Feb/Mar 2011	387	L5
Jiddat al Harasis 795	JaH 795	Oman	Feb/Mar 2011	5.3	L4
Jiddat al Harasis 796	JaH 796	Oman	Feb/Mar 2011	22.8	L5
Jiddat al Harasis 797	JaH 797	Oman	Feb/Mar 2011	249	L5
Jiddat Arkad 003	JA 003	Oman	Feb/Mar 2011	148	L5
Johannesburg		United States	2012 Jan 27	63	H4
Karavannoe		Russia	1960s	132000	Pallasite, PES
Ksar Ghilane 010	KG 010	Tunisia	2012 Apr	50.1	L5
Ksar Ghilane 011	KG 011	Tunisia	2012 Apr	25.6	L4
Kumtag 002		China	Nov 2011	557	L4
Kumtag 003		China	November 2011	1260	H5
Las Cruces		Chile	2001	528	IIIAB
Lixian		China	2005 Apr	43000	Iron, IIAB
Lone Island Lake		Canada	2005	4800	Iron, IAB-sLL
Miller Range 07028	MIL 07028	Antarctica	2007	1158.9	EH3
Miller Range 07139	MIL 07139	Antarctica	2007	120.3	EH3
Miller Range 07216	MIL 07216	Antarctica	2007	18.4	L5
Miller Range 07218	MIL 07218	Antarctica	2007	3.1	L-imp melt
Miller Range 07236	MIL 07236	Antarctica	2007	18.3	H4
Miller Range 07259	MIL 07259	Antarctica	2007	3.5	Acapulcoite/lodranite
Miller Range 07310	MIL 07310	Antarctica	2007	2.5	CM1/2
Miller Range 07314	MIL 07314	Antarctica	2007	2.0	H5
Miller Range 07315	MIL 07315	Antarctica	2007	0.5	CO3
Miller Range 07322	MIL 07322	Antarctica	2007	10.3	CO3
Miller Range 07342	MIL 07342	Antarctica	2007	31.4	CO3
Miller Range 07358	MIL 07358	Antarctica	2007	6.6	CO3
Miller Range 07361	MIL 07361	Antarctica	2007	13.9	CO3
Miller Range 07383	MIL 07383	Antarctica	2007	17.8	CO3
Miller Range 07385	MIL 07385	Antarctica	2007	3.8	CV3
Miller Range 07400	MIL 07400	Antarctica	2007	2.1	CO3
Miller Range 07401	MIL 07401	Antarctica	2007	1.6	CO3
Miller Range 07404	MIL 07404	Antarctica	2007	0.8	CB
Miller Range 07408	MIL 07408	Antarctica	2007	0.6	CO3
Miller Range 07417	MIL 07417	Antarctica	2007	2.3	CO3
Miller Range 07418	MIL 07418	Antarctica	2007	0.4	CO3
Miller Range 07420	MIL 07420	Antarctica	2007	4.9	H5
Miller Range 07424	MIL 07424	Antarctica	2007	0.4	Mesosiderite

Miller Range 07425	MIL 07425	Antarctica	2007	0.2	CO3
Miller Range 07439	MIL 07439	Antarctica	2007	4.4	CO3
Miller Range 07440	MIL 07440	Antarctica	2007	118.5	R4
Miller Range 07444	MIL 07444	Antarctica	2007	15.8	CO3
Miller Range 07445	MIL 07445	Antarctica	2007	16.4	CO3
Miller Range 07451	MIL 07451	Antarctica	2007	6.8	R3
Miller Range 07459	MIL 07459	Antarctica	2007	18.3	CO3
Miller Range 07460	MIL 07460	Antarctica	2007	2.1	CM1
Miller Range 07473	MIL 07473	Antarctica	2007	0.3	CO3
Miller Range 07485	MIL 07485	Antarctica	2007	0.4	CO3
Miller Range 07487	MIL 07487	Antarctica	2007	0.6	H6
Miller Range 07490	MIL 07490	Antarctica	2007	0.4	H5
Miller Range 07492	MIL 07492	Antarctica	2007	1.2	H6
Miller Range 07500	MIL 07500	Antarctica	2007	3.5	H6
Miller Range 07501	MIL 07501	Antarctica	2007	7.5	L6
Miller Range 07502	MIL 07502	Antarctica	2007	6.4	H6
Miller Range 07503	MIL 07503	Antarctica	2007	2.1	LL6
Miller Range 07504	MIL 07504	Antarctica	2007	25.3	H6
Miller Range 07507	MIL 07507	Antarctica	2007	7.5	L6
Miller Range 07508	MIL 07508	Antarctica	2007	2.4	LL6
Miller Range 07509	MIL 07509	Antarctica	2007	2.1	LL6
Miller Range 07510	MIL 07510	Antarctica	2007	1.0	LL6
Miller Range 07511	MIL 07511	Antarctica	2007	7.2	LL6
Miller Range 07512	MIL 07512	Antarctica	2007	1.4	H5
Miller Range 07515	MIL 07515	Antarctica	2007	5.7	L6
Miller Range 07516	MIL 07516	Antarctica	2007	2.1	L6
Miller Range 07517	MIL 07517	Antarctica	2007	9.2	H6
Miller Range 07518	MIL 07518	Antarctica	2007	4.3	H6
Miller Range 07519	MIL 07519	Antarctica	2007	9.9	H6
Miller Range 07520	MIL 07520	Antarctica	2007	22.3	L6
Miller Range 07521	MIL 07521	Antarctica	2007	6.8	L5
Miller Range 07522	MIL 07522	Antarctica	2007	3.8	L5
Miller Range 07523	MIL 07523	Antarctica	2007	3.5	H6
Miller Range 07524	MIL 07524	Antarctica	2007	15.6	H5
Miller Range 07525	MIL 07525	Antarctica	2007	12.2	CR3
Miller Range 07526	MIL 07526	Antarctica	2007	23.4	L6
Miller Range 07527	MIL 07527	Antarctica	2007	2.8	H6
Miller Range 07528	MIL 07528	Antarctica	2007	2.0	H5
Miller Range 07529	MIL 07529	Antarctica	2007	26.3	LL6
Miller Range 07544	MIL 07544	Antarctica	2007	3.2	H5
Miller Range 07558	MIL 07558	Antarctica	2007	0.7	CB
Miller Range 07561	MIL 07561	Antarctica	2007	13.5	LL5
Miller Range 07562	MIL 07562	Antarctica	2007	5.7	L5
Miller Range 07563	MIL 07563	Antarctica	2007	8.5	H5

Miller Range 07564	MIL 07564	Antarctica	2007	5.8	L6
Miller Range 07565	MIL 07565	Antarctica	2007	6.5	H5
Miller Range 07566	MIL 07566	Antarctica	2007	2.2	LL6
Miller Range 07567	MIL 07567	Antarctica	2007	2.2	LL6
Miller Range 07568	MIL 07568	Antarctica	2007	2.5	L6
Miller Range 07569	MIL 07569	Antarctica	2007	4.6	H6
Miller Range 07571	MIL 07571	Antarctica	2007	2.5	H6
Miller Range 07572	MIL 07572	Antarctica	2007	2.7	L5
Miller Range 07573	MIL 07573	Antarctica	2007	6.3	L6
Miller Range 07575	MIL 07575	Antarctica	2007	12.2	L6
Miller Range 07576	MIL 07576	Antarctica	2007	1.9	H6
Miller Range 07577	MIL 07577	Antarctica	2007	1.5	H6
Miller Range 07578	MIL 07578	Antarctica	2007	1.8	L6
Miller Range 07579	MIL 07579	Antarctica	2007	9.6	L5
Miller Range 07580	MIL 07580	Antarctica	2007	14.4	L6
Miller Range 07581	MIL 07581	Antarctica	2007	16.7	L6
Miller Range 07583	MIL 07583	Antarctica	2007	4.6	LL6
Miller Range 07584	MIL 07584	Antarctica	2007	6.7	H5
Miller Range 07585	MIL 07585	Antarctica	2007	6.4	L6
Miller Range 07586	MIL 07586	Antarctica	2007	1.6	LL5
Miller Range 07587	MIL 07587	Antarctica	2007	2.6	L5
Miller Range 07589	MIL 07589	Antarctica	2007	1.7	L6
Miller Range 07592	MIL 07592	Antarctica	2007	1.2	L5
Miller Range 07593	MIL 07593	Antarctica	2007	1.8	L6
Miller Range 07594	MIL 07594	Antarctica	2007	1.0	H6
Miller Range 07595	MIL 07595	Antarctica	2007	1.0	LL5
Miller Range 07596	MIL 07596	Antarctica	2007	0.7	H6
Miller Range 07598	MIL 07598	Antarctica	2007	1.4	CB
Miller Range 07599	MIL 07599	Antarctica	2007	1.6	LL6
Miller Range 07600	MIL 07600	Antarctica	2007	0.6	H5
Miller Range 07601	MIL 07601	Antarctica	2007	0.7	L6
Miller Range 07602	MIL 07602	Antarctica	2007	1.2	LL6
Miller Range 07603	MIL 07603	Antarctica	2007	1.5	LL6
Miller Range 07604	MIL 07604	Antarctica	2007	1.2	L6
Miller Range 07605	MIL 07605	Antarctica	2007	1.0	H6
Miller Range 07606	MIL 07606	Antarctica	2007	0.3	H6
Miller Range 07607	MIL 07607	Antarctica	2007	0.2	L6
Miller Range 07608	MIL 07608	Antarctica	2007	0.4	H6
Miller Range 07609	MIL 07609	Antarctica	2007	0.3	L6
Miller Range 07616	MIL 07616	Antarctica	2007	5.4	CO3
Miller Range 07620	MIL 07620	Antarctica	2007	4.8	H5
Miller Range 07621	MIL 07621	Antarctica	2007	5.2	CO3
Miller Range 07622	MIL 07622	Antarctica	2007	7.1	L5
Miller Range 07623	MIL 07623	Antarctica	2007	3.5	H5

Miller Range 07624	MIL 07624	Antarctica	2007	12.3	H6
Miller Range 07625	MIL 07625	Antarctica	2007	6.0	LL6
Miller Range 07626	MIL 07626	Antarctica	2007	7.2	CO3
Miller Range 07627	MIL 07627	Antarctica	2007	7.7	L5
Miller Range 07628	MIL 07628	Antarctica	2007	4.4	CO3
Miller Range 07629	MIL 07629	Antarctica	2007	6.1	CO3
Miller Range 07630	MIL 07630	Antarctica	2007	4.5	LL5
Miller Range 07631	MIL 07631	Antarctica	2007	3.6	CO3
Miller Range 07632	MIL 07632	Antarctica	2007	7.1	H6
Miller Range 07633	MIL 07633	Antarctica	2007	11.1	H6
Miller Range 07635	MIL 07635	Antarctica	2007	14.5	L5
Miller Range 07636	MIL 07636	Antarctica	2007	3.4	L5
Miller Range 07637	MIL 07637	Antarctica	2007	2.3	H6
Miller Range 07638	MIL 07638	Antarctica	2007	13.9	L5
Miller Range 07639	MIL 07639	Antarctica	2007	3.0	H5
Miller Range 07640	MIL 07640	Antarctica	2007	0.9	L6
Miller Range 07641	MIL 07641	Antarctica	2007	1.0	L6
Miller Range 07642	MIL 07642	Antarctica	2007	1.0	L6
Miller Range 07646	MIL 07646	Antarctica	2007	0.8	L5
Miller Range 07647	MIL 07647	Antarctica	2007	3.0	LL6
Miller Range 07648	MIL 07648	Antarctica	2007	0.7	L6
Miller Range 07649	MIL 07649	Antarctica	2007	1.8	H5
Miller Range 07650	MIL 07650	Antarctica	2007	4.3	LL5
Miller Range 07651	MIL 07651	Antarctica	2007	1.3	L6
Miller Range 07652	MIL 07652	Antarctica	2007	4.0	L6
Miller Range 07653	MIL 07653	Antarctica	2007	3.3	H5
Miller Range 07654	MIL 07654	Antarctica	2007	2.0	EH3
Miller Range 07655	MIL 07655	Antarctica	2007	3.4	H5
Miller Range 07656	MIL 07656	Antarctica	2007	5.2	L6
Miller Range 07657	MIL 07657	Antarctica	2007	1.5	H6
Miller Range 07689	MIL 07689	Antarctica	2007	12.2	CM1
Miller Range 090003	MIL 090003	Antarctica	2009	10310.0	L6
Miller Range 090004	MIL 090004	Antarctica	2009	4960.2	L5
Miller Range 090006	MIL 090006	Antarctica	2009	1386.2	LL6
Miller Range 090007	MIL 090007	Antarctica	2009	828.2	LL5
Miller Range 090008	MIL 090008	Antarctica	2009	1209.8	L5
Miller Range 090010	MIL 090010	Antarctica	2009	2487.9	CO3
Miller Range 090011	MIL 090011	Antarctica	2009	3434.2	LL5
Miller Range 090012	MIL 090012	Antarctica	2009	1967.5	LL6
Miller Range 090013	MIL 090013	Antarctica	2009	890.6	L5
Miller Range 090014	MIL 090014	Antarctica	2009	1742.2	L6
Miller Range 090015	MIL 090015	Antarctica	2009	1105.6	L5
Miller Range 090016	MIL 090016	Antarctica	2009	1450.7	LL6
Miller Range 090017	MIL 090017	Antarctica	2009	1330.0	LL6

Miller Range 090020	MIL 090020	Antarctica	2009	864.3	L5
Miller Range 090021	MIL 090021	Antarctica	2009	936.0	L6
Miller Range 090022	MIL 090022	Antarctica	2009	851.4	LL5
Miller Range 090024	MIL 090024	Antarctica	2009	744.7	L5
Miller Range 090025	MIL 090025	Antarctica	2009	1014.0	CO3
Miller Range 090026	MIL 090026	Antarctica	2009	785.6	LL5
Miller Range 090027	MIL 090027	Antarctica	2009	981.2	LL5
Miller Range 090028	MIL 090028	Antarctica	2009	458.7	LL5
Miller Range 090031	MIL 090031	Antarctica	2009	500.1	Ureilite
Miller Range 090033	MIL 090033	Antarctica	2009	807.6	LL5
Miller Range 090035	MIL 090035	Antarctica	2009	826.4	L5
Miller Range 090037	MIL 090037	Antarctica	2009	312.3	LL6
Miller Range 090038	MIL 090038	Antarctica	2009	404.4	CO3
Miller Range 090039	MIL 090039	Antarctica	2009	380.7	LL5
Miller Range 090040	MIL 090040	Antarctica	2009	325.8	L5
Miller Range 090041	MIL 090041	Antarctica	2009	300.7	L5
Miller Range 090042	MIL 090042	Antarctica	2009	242.6	L6
Miller Range 090043	MIL 090043	Antarctica	2009	164.7	L6
Miller Range 090044	MIL 090044	Antarctica	2009	451.8	LL6
Miller Range 090045	MIL 090045	Antarctica	2009	257.4	LL6
Miller Range 090046	MIL 090046	Antarctica	2009	331.7	LL6
Miller Range 090047	MIL 090047	Antarctica	2009	210.0	L6
Miller Range 090048	MIL 090048	Antarctica	2009	233.7	L5
Miller Range 090049	MIL 090049	Antarctica	2009	184.9	L6
Miller Range 090050	MIL 090050	Antarctica	2009	392.1	LL6
Miller Range 090051	MIL 090051	Antarctica	2009	209.2	L6
Miller Range 090052	MIL 090052	Antarctica	2009	126.0	H6
Miller Range 090053	MIL 090053	Antarctica	2009	259.5	L6
Miller Range 090054	MIL 090054	Antarctica	2009	134.2	L6
Miller Range 090055	MIL 090055	Antarctica	2009	415.8	LL5
Miller Range 090056	MIL 090056	Antarctica	2009	527.6	L6
Miller Range 090057	MIL 090057	Antarctica	2009	229.3	LL6
Miller Range 090058	MIL 090058	Antarctica	2009	190.4	L6
Miller Range 090059	MIL 090059	Antarctica	2009	240.5	L6
Miller Range 090060	MIL 090060	Antarctica	2009	614.0	L6
Miller Range 090061	MIL 090061	Antarctica	2009	230.2	L5
Miller Range 090062	MIL 090062	Antarctica	2009	204.4	LL5
Miller Range 090063	MIL 090063	Antarctica	2009	330.7	LL5
Miller Range 090064	MIL 090064	Antarctica	2009	416.9	L5
Miller Range 090065	MIL 090065	Antarctica	2009	280.4	L5
Miller Range 090066	MIL 090066	Antarctica	2009	213.2	L6
Miller Range 090067	MIL 090067	Antarctica	2009	264.3	LL5
Miller Range 090068	MIL 090068	Antarctica	2009	525.0	L6
Miller Range 090069	MIL 090069	Antarctica	2009	798.8	LL6

Miller Range 090071	MIL 090071	Antarctica	2009	118.1	L6
Miller Range 090077	MIL 090077	Antarctica	2009	378.8	LL6
Miller Range 090078	MIL 090078	Antarctica	2009	96.6	LL5
Miller Range 090079	MIL 090079	Antarctica	2009	254.0	L5
Miller Range 090080	MIL 090080	Antarctica	2009	158.8	LL6
Miller Range 090081	MIL 090081	Antarctica	2009	300.8	LL5
Miller Range 090082	MIL 090082	Antarctica	2009	130.6	LL5
Miller Range 090083	MIL 090083	Antarctica	2009	203.4	L6
Miller Range 090084	MIL 090084	Antarctica	2009	166.1	L6
Miller Range 090085	MIL 090085	Antarctica	2009	314.8	L6
Miller Range 090086	MIL 090086	Antarctica	2009	421.5	L6
Miller Range 090087	MIL 090087	Antarctica	2009	374.4	L6
Miller Range 090088	MIL 090088	Antarctica	2009	195.8	L6
Miller Range 090089	MIL 090089	Antarctica	2009	202.8	LL6
Miller Range 090090	MIL 090090	Antarctica	2009	268.2	L6
Miller Range 090091	MIL 090091	Antarctica	2009	284.3	LL5
Miller Range 090092	MIL 090092	Antarctica	2009	402.6	LL6
Miller Range 090093	MIL 090093	Antarctica	2009	226.9	L5
Miller Range 090094	MIL 090094	Antarctica	2009	329.3	L5
Miller Range 090095	MIL 090095	Antarctica	2009	338.7	L5
Miller Range 090096	MIL 090096	Antarctica	2009	411.4	L6
Miller Range 090097	MIL 090097	Antarctica	2009	272.0	LL6
Miller Range 090098	MIL 090098	Antarctica	2009	408.0	L5
Miller Range 090099	MIL 090099	Antarctica	2009	260.6	L5
Miller Range 090100	MIL 090100	Antarctica	2009	496.5	L6
Miller Range 090101	MIL 090101	Antarctica	2009	399.9	L6
Miller Range 090102	MIL 090102	Antarctica	2009	511.4	L6
Miller Range 090104	MIL 090104	Antarctica	2009	51.9	H6
Miller Range 090108	MIL 090108	Antarctica	2009	204.7	L5
Miller Range 090109	MIL 090109	Antarctica	2009	210.2	LL5
Miller Range 090110	MIL 090110	Antarctica	2009	163.4	LL6
Miller Range 090111	MIL 090111	Antarctica	2009	263.6	LL6
Miller Range 090112	MIL 090112	Antarctica	2009	73.6	Diogenite
Miller Range 090113	MIL 090113	Antarctica	2009	399.2	L5
Miller Range 090114	MIL 090114	Antarctica	2009	441.1	L5
Miller Range 090115	MIL 090115	Antarctica	2009	494.1	LL6
Miller Range 090116	MIL 090116	Antarctica	2009	114.6	LL6
Miller Range 090117	MIL 090117	Antarctica	2009	229.0	CO3
Miller Range 090118	MIL 090118	Antarctica	2009	286.9	CO3
Miller Range 090119	MIL 090119	Antarctica	2009	176.4	L6
Miller Range 090120	MIL 090120	Antarctica	2009	218.0	L6
Miller Range 090121	MIL 090121	Antarctica	2009	174.2	L6
Miller Range 090122	MIL 090122	Antarctica	2009	497.8	CO3
Miller Range 090123	MIL 090123	Antarctica	2009	248.4	L5

Miller Range 090124	MIL 090124	Antarctica	2009	301.1	L5
Miller Range 090125	MIL 090125	Antarctica	2009	287.0	LL6
Miller Range 090126	MIL 090126	Antarctica	2009	341.9	LL6
Miller Range 090127	MIL 090127	Antarctica	2009	228.9	LL6
Miller Range 090128	MIL 090128	Antarctica	2009	160.3	CO3
Miller Range 090129	MIL 090129	Antarctica	2009	221.6	H6
Miller Range 090130	MIL 090130	Antarctica	2009	254.1	LL6
Miller Range 090131	MIL 090131	Antarctica	2009	218.4	L6
Miller Range 090132	MIL 090132	Antarctica	2009	132.5	CO3
Miller Range 090133	MIL 090133	Antarctica	2009	133.1	CO3
Miller Range 090134	MIL 090134	Antarctica	2009	161.6	CO3
Miller Range 090135	MIL 090135	Antarctica	2009	199.1	LL6
Miller Range 090137	MIL 090137	Antarctica	2009	265.6	L5
Miller Range 090138	MIL 090138	Antarctica	2009	49.4	CO3
Miller Range 090139	MIL 090139	Antarctica	2009	126.6	CO3
Miller Range 090150	MIL 090150	Antarctica	2009	22.6	LL5
Miller Range 090151	MIL 090151	Antarctica	2009	83.3	L6
Miller Range 090155	MIL 090155	Antarctica	2009	48.1	L6
Miller Range 090156	MIL 090156	Antarctica	2009	76.4	L6
Miller Range 090157	MIL 090157	Antarctica	2009	60.3	H6
Miller Range 090158	MIL 090158	Antarctica	2009	44.7	H5
Miller Range 090160	MIL 090160	Antarctica	2009	8.3	LL6
Miller Range 090161	MIL 090161	Antarctica	2009	1.3	L5
Miller Range 090162	MIL 090162	Antarctica	2009	1.6	LL5
Miller Range 090163	MIL 090163	Antarctica	2009	3.5	L5
Miller Range 090164	MIL 090164	Antarctica	2009	1.2	LL6
Miller Range 090165	MIL 090165	Antarctica	2009	3.2	LL6
Miller Range 090166	MIL 090166	Antarctica	2009	1.0	H6
Miller Range 090167	MIL 090167	Antarctica	2009	3.4	L6
Miller Range 090168	MIL 090168	Antarctica	2009	1.9	H6
Miller Range 090172	MIL 090172	Antarctica	2009	0.6	CV3
Miller Range 090174	MIL 090174	Antarctica	2009	0.8	CV3
Miller Range 090175	MIL 090175	Antarctica	2009	2.4	CV3
Miller Range 090176	MIL 090176	Antarctica	2009	3.6	CV3
Miller Range 090177	MIL 090177	Antarctica	2009	1.1	CV3
Miller Range 090178	MIL 090178	Antarctica	2009	0.7	CV3
Miller Range 090180	MIL 090180	Antarctica	2009	7.0	L-imp melt
Miller Range 090181	MIL 090181	Antarctica	2009	9.4	LL6
Miller Range 090182	MIL 090182	Antarctica	2009	4.1	LL6
Miller Range 090183	MIL 090183	Antarctica	2009	2.8	L6
Miller Range 090184	MIL 090184	Antarctica	2009	0.7	CV3
Miller Range 090185	MIL 090185	Antarctica	2009	2.4	L6
Miller Range 090186	MIL 090186	Antarctica	2009	7.3	L6
Miller Range 090187	MIL 090187	Antarctica	2009	5.7	L6

Miller Range 090188	MIL 090188	Antarctica	2009	8.3	L6
Miller Range 090189	MIL 090189	Antarctica	2009	4.3	L6
Miller Range 090190	MIL 090190	Antarctica	2009	12.0	H5
Miller Range 090191	MIL 090191	Antarctica	2009	19.2	H6
Miller Range 090192	MIL 090192	Antarctica	2009	25.7	L6
Miller Range 090193	MIL 090193	Antarctica	2009	37.9	LL6
Miller Range 090194	MIL 090194	Antarctica	2009	33.3	L6
Miller Range 090195	MIL 090195	Antarctica	2009	15.5	L6
Miller Range 090196	MIL 090196	Antarctica	2009	27.7	H6
Miller Range 090197	MIL 090197	Antarctica	2009	23.6	H6
Miller Range 090198	MIL 090198	Antarctica	2009	19.9	L6
Miller Range 090199	MIL 090199	Antarctica	2009	22.2	L6
Miller Range 090200	MIL 090200	Antarctica	2009	27.5	L5
Miller Range 090201	MIL 090201	Antarctica	2009	28.6	L5
Miller Range 090202	MIL 090202	Antarctica	2009	24.1	L6
Miller Range 090203	MIL 090203	Antarctica	2009	13.1	L6
Miller Range 090204	MIL 090204	Antarctica	2009	21.3	L5
Miller Range 090205	MIL 090205	Antarctica	2009	6.2	L5
Miller Range 090207	MIL 090207	Antarctica	2009	25.1	H6
Miller Range 090208	MIL 090208	Antarctica	2009	30.9	L5
Miller Range 090209	MIL 090209	Antarctica	2009	14.4	L6
Miller Range 090210	MIL 090210	Antarctica	2009	6.7	L6
Miller Range 090211	MIL 090211	Antarctica	2009	14.5	LL6
Miller Range 090212	MIL 090212	Antarctica	2009	3.1	L6
Miller Range 090213	MIL 090213	Antarctica	2009	10.5	L6
Miller Range 090214	MIL 090214	Antarctica	2009	7.1	LL6
Miller Range 090215	MIL 090215	Antarctica	2009	4.3	L6
Miller Range 090216	MIL 090216	Antarctica	2009	3.6	CO3
Miller Range 090217	MIL 090217	Antarctica	2009	2.6	L5
Miller Range 090218	MIL 090218	Antarctica	2009	9.1	L6
Miller Range 090219	MIL 090219	Antarctica	2009	1.4	CO3
Miller Range 090222	MIL 090222	Antarctica	2009	38.7	LL6
Miller Range 090223	MIL 090223	Antarctica	2009	56.0	L5
Miller Range 090224	MIL 090224	Antarctica	2009	75.9	H6
Miller Range 090225	MIL 090225	Antarctica	2009	108.0	H6
Miller Range 090226	MIL 090226	Antarctica	2009	34.0	L6
Miller Range 090228	MIL 090228	Antarctica	2009	67.2	LL6
Miller Range 090229	MIL 090229	Antarctica	2009	38.5	H5
Miller Range 090230	MIL 090230	Antarctica	2009	85.9	CO3
Miller Range 090231	MIL 090231	Antarctica	2009	95.2	CO3
Miller Range 090233	MIL 090233	Antarctica	2009	104.9	CO3
Miller Range 090235	MIL 090235	Antarctica	2009	60.1	CO3
Miller Range 090236	MIL 090236	Antarctica	2009	67.5	CO3
Miller Range 090280	MIL 090280	Antarctica	2009	85.6	L6

Miller Range 090281	MIL 090281	Antarctica	2009	19.8	CM2
Miller Range 090282	MIL 090282	Antarctica	2009	43.3	L6
Miller Range 090283	MIL 090283	Antarctica	2009	6.4	CM2
Miller Range 090284	MIL 090284	Antarctica	2009	60.1	L5
Miller Range 090285	MIL 090285	Antarctica	2009	131.4	L5
Miller Range 090286	MIL 090286	Antarctica	2009	105.7	LL5
Miller Range 090288	MIL 090288	Antarctica	2009	17.4	CM1/2
Miller Range 090289	MIL 090289	Antarctica	2009	83.2	L5
Miller Range 090291	MIL 090291	Antarctica	2009	94.2	Diogenite
Miller Range 090292	MIL 090292	Antarctica	2009	8.9	CR1
Miller Range 090293	MIL 090293	Antarctica	2009	7.1	CO3
Miller Range 090294	MIL 090294	Antarctica	2009	10.0	CK5
Miller Range 090300	MIL 090300	Antarctica	2009	2.0	EH4
Miller Range 090301	MIL 090301	Antarctica	2009	1.1	CO3
Miller Range 090302	MIL 090302	Antarctica	2009	7.9	L6
Miller Range 090303	MIL 090303	Antarctica	2009	2.4	L5
Miller Range 090304	MIL 090304	Antarctica	2009	3.4	L6
Miller Range 090305	MIL 090305	Antarctica	2009	1.1	LL6
Miller Range 090306	MIL 090306	Antarctica	2009	0.9	L6
Miller Range 090307	MIL 090307	Antarctica	2009	1.2	L6
Miller Range 090308	MIL 090308	Antarctica	2009	1.2	CO3
Miller Range 090309	MIL 090309	Antarctica	2009	2.8	L6
Miller Range 090310	MIL 090310	Antarctica	2009	6.7	L6
Miller Range 090311	MIL 090311	Antarctica	2009	10.0	LL5
Miller Range 090312	MIL 090312	Antarctica	2009	3.1	L6
Miller Range 090313	MIL 090313	Antarctica	2009	3.0	L6
Miller Range 090314	MIL 090314	Antarctica	2009	6.0	L6
Miller Range 090315	MIL 090315	Antarctica	2009	13.8	L5
Miller Range 090316	MIL 090316	Antarctica	2009	8.0	L5
Miller Range 090317	MIL 090317	Antarctica	2009	14.9	L6
Miller Range 090318	MIL 090318	Antarctica	2009	7.5	L6
Miller Range 090319	MIL 090319	Antarctica	2009	10.2	L6
Miller Range 090320	MIL 090320	Antarctica	2009	3.6	EL6
Miller Range 090321	MIL 090321	Antarctica	2009	0.5	LL6
Miller Range 090322	MIL 090322	Antarctica	2009	4.0	L6
Miller Range 090323	MIL 090323	Antarctica	2009	3.5	H6
Miller Range 090324	MIL 090324	Antarctica	2009	1.7	L6
Miller Range 090325	MIL 090325	Antarctica	2009	2.1	L5
Miller Range 090326	MIL 090326	Antarctica	2009	1.2	L6
Miller Range 090327	MIL 090327	Antarctica	2009	4.2	CO3
Miller Range 090328	MIL 090328	Antarctica	2009	5.9	L5
Miller Range 090329	MIL 090329	Antarctica	2009	2.7	L6
Miller Range 090330	MIL 090330	Antarctica	2009	2.0	L-imp melt
Miller Range 090331	MIL 090331	Antarctica	2009	3.9	L6

Miller Range 090332	MIL 090332	Antarctica	2009	2.1	L6
Miller Range 090333	MIL 090333	Antarctica	2009	1.7	L6
Miller Range 090334	MIL 090334	Antarctica	2009	3.0	L6
Miller Range 090336	MIL 090336	Antarctica	2009	2.5	LL6
Miller Range 090337	MIL 090337	Antarctica	2009	8.6	L6
Miller Range 090338	MIL 090338	Antarctica	2009	0.5	LL6
Miller Range 090339	MIL 090339	Antarctica	2009	6.5	L5
Miller Range 090340	MIL 090340	Antarctica	2009	4.7	Ureilite
Miller Range 090341	MIL 090341	Antarctica	2009	0.6	LL6
Miller Range 090343	MIL 090343	Antarctica	2009	0.7	CO3
Miller Range 090344	MIL 090344	Antarctica	2009	2.9	H6
Miller Range 090345	MIL 090345	Antarctica	2009	1.2	H6
Miller Range 090346	MIL 090346	Antarctica	2009	2.4	CO3
Miller Range 090347	MIL 090347	Antarctica	2009	8.2	L6
Miller Range 090348	MIL 090348	Antarctica	2009	1.8	L5
Miller Range 090349	MIL 090349	Antarctica	2009	1.4	LL6
Miller Range 090350	MIL 090350	Antarctica	2009	0.9	L6
Miller Range 090351	MIL 090351	Antarctica	2009	1.3	CO3
Miller Range 090352	MIL 090352	Antarctica	2009	6.4	L6
Miller Range 090353	MIL 090353	Antarctica	2009	3.6	L6
Miller Range 090355	MIL 090355	Antarctica	2009	2.5	L6
Miller Range 090356	MIL 090356	Antarctica	2009	3.2	Ureilite
Miller Range 090357	MIL 090357	Antarctica	2009	1.6	L6
Miller Range 090358	MIL 090358	Antarctica	2009	2.9	LL6
Miller Range 090359	MIL 090359	Antarctica	2009	1.6	L6
Miller Range 090405	MIL 090405	Antarctica	2009	58.8	Achondrite-ung
Miller Range 090410	MIL 090410	Antarctica	2009	43.1	L6
Miller Range 090411	MIL 090411	Antarctica	2009	67.6	L6
Miller Range 090412	MIL 090412	Antarctica	2009	33.3	LL5
Miller Range 090413	MIL 090413	Antarctica	2009	55.0	LL6
Miller Range 090414	MIL 090414	Antarctica	2009	79.9	L6
Miller Range 090415	MIL 090415	Antarctica	2009	58.4	L6
Miller Range 090416	MIL 090416	Antarctica	2009	35.9	L4
Miller Range 090417	MIL 090417	Antarctica	2009	8.6	L6
Miller Range 090418	MIL 090418	Antarctica	2009	6.0	L6
Miller Range 090419	MIL 090419	Antarctica	2009	29.4	L6
Miller Range 090451	MIL 090451	Antarctica	2009	38.7	CO3
Miller Range 090453	MIL 090453	Antarctica	2009	33.9	CO3
Miller Range 090454	MIL 090454	Antarctica	2009	43.0	CO3
Miller Range 090457	MIL 090457	Antarctica	2009	32.6	CO3
Miller Range 090458	MIL 090458	Antarctica	2009	81.0	H5
Miller Range 090459	MIL 090459	Antarctica	2009	30.6	CO3
Miller Range 090461	MIL 090461	Antarctica	2009	14.0	CO3
Miller Range 090462	MIL 090462	Antarctica	2009	9.1	CO3

Miller Range 090463	MIL 090463	Antarctica	2009	26.7	CO3
Miller Range 090464	MIL 090464	Antarctica	2009	25.6	CO3
Miller Range 090465	MIL 090465	Antarctica	2009	8.8	CO3
Miller Range 090466	MIL 090466	Antarctica	2009	14.3	CO3
Miller Range 090467	MIL 090467	Antarctica	2009	10.1	CO3
Miller Range 090468	MIL 090468	Antarctica	2009	13.6	CO3
Miller Range 090469	MIL 090469	Antarctica	2009	7.3	CO3
Miller Range 090470	MIL 090470	Antarctica	2009	21.3	CO3
Miller Range 090473	MIL 090473	Antarctica	2009	31.4	CO3
Miller Range 090474	MIL 090474	Antarctica	2009	20.0	CO3
Miller Range 090478	MIL 090478	Antarctica	2009	24.4	CO3
Miller Range 090480	MIL 090480	Antarctica	2009	65.4	CO3
Miller Range 090481	MIL 090481	Antarctica	2009	2.0	LL6
Miller Range 090482	MIL 090482	Antarctica	2009	3.4	CO3
Miller Range 090484	MIL 090484	Antarctica	2009	15.9	LL6
Miller Range 090485	MIL 090485	Antarctica	2009	4.6	CO3
Miller Range 090489	MIL 090489	Antarctica	2009	1.0	CM1-2
Miller Range 090530	MIL 090530	Antarctica	2009	3.1	L5
Miller Range 090531	MIL 090531	Antarctica	2009	61.2	L6
Miller Range 090532	MIL 090532	Antarctica	2009	6.9	CM2
Miller Range 090533	MIL 090533	Antarctica	2009	1.2	L6
Miller Range 090534	MIL 090534	Antarctica	2009	0.9	LL5
Miller Range 090535	MIL 090535	Antarctica	2009	2.3	CO3
Miller Range 090536	MIL 090536	Antarctica	2009	6.3	L5
Miller Range 090537	MIL 090537	Antarctica	2009	95.4	L6
Miller Range 090538	MIL 090538	Antarctica	2009	2.2	L6
Miller Range 090539	MIL 090539	Antarctica	2009	1.9	CO3
Miller Range 090554	MIL 090554	Antarctica	2009	0.5	CO3
Miller Range 090558	MIL 090558	Antarctica	2009	0.3	CO3
Miller Range 090560	MIL 090560	Antarctica	2009	117.8	LL5
Miller Range 090561	MIL 090561	Antarctica	2009	64.5	LL5
Miller Range 090562	MIL 090562	Antarctica	2009	134.4	L5
Miller Range 090563	MIL 090563	Antarctica	2009	93.8	L6
Miller Range 090564	MIL 090564	Antarctica	2009	257.7	Iron, IVA
Miller Range 090565	MIL 090565	Antarctica	2009	81.4	L6
Miller Range 090566	MIL 090566	Antarctica	2009	86.2	L6
Miller Range 090567	MIL 090567	Antarctica	2009	137.8	LL6
Miller Range 090568	MIL 090568	Antarctica	2009	58.8	L5
Miller Range 090569	MIL 090569	Antarctica	2009	26.4	L6
Miller Range 090586	MIL 090586	Antarctica	2009	8.1	CH3
Miller Range 090588	MIL 090588	Antarctica	2009	6.6	CO3
Miller Range 090589	MIL 090589	Antarctica	2009	16.8	LL6
Miller Range 090591	MIL 090591	Antarctica	2009	0.6	CO3
Miller Range 090593	MIL 090593	Antarctica	2009	1.4	CO3

Miller Range 090594	MIL 090594	Antarctica	2009	2.2	CO3
Miller Range 090596	MIL 090596	Antarctica	2009	2.1	CO3
Miller Range 090597	MIL 090597	Antarctica	2009	1.4	CO3
Miller Range 090598	MIL 090598	Antarctica	2009	0.4	CO3
Miller Range 090610	MIL 090610	Antarctica	2009	71.6	L5
Miller Range 090611	MIL 090611	Antarctica	2009	75.4	L6
Miller Range 090612	MIL 090612	Antarctica	2009	41.7	L6
Miller Range 090613	MIL 090613	Antarctica	2009	120.2	LL6
Miller Range 090614	MIL 090614	Antarctica	2009	91.2	L6
Miller Range 090615	MIL 090615	Antarctica	2009	79.4	LL5
Miller Range 090616	MIL 090616	Antarctica	2009	118.4	LL5
Miller Range 090617	MIL 090617	Antarctica	2009	151.2	L6
Miller Range 090618	MIL 090618	Antarctica	2009	89.0	L5
Miller Range 090619	MIL 090619	Antarctica	2009	51.6	LL6
Miller Range 090640	MIL 090640	Antarctica	2009	1.3	Howardite
Miller Range 090641	MIL 090641	Antarctica	2009	5.9	CO3
Miller Range 090644	MIL 090644	Antarctica	2009	2.3	LL6
Miller Range 090645	MIL 090645	Antarctica	2009	2.1	LL6
Miller Range 090646	MIL 090646	Antarctica	2009	11.4	CV3
Miller Range 090648	MIL 090648	Antarctica	2009	32.7	H-melt rock
Miller Range 090649	MIL 090649	Antarctica	2009	0.7	LL6
Miller Range 090650	MIL 090650	Antarctica	2009	92.9	L3.8
Miller Range 090657	MIL 090657	Antarctica	2009	133.1	CR2
Miller Range 090683	MIL 090683	Antarctica	2009	3.2	CO3
Miller Range 090686	MIL 090686	Antarctica	2009	1.3	CO3
Miller Range 090687	MIL 090687	Antarctica	2009	0.8	Eucrite
Miller Range 090688	MIL 090688	Antarctica	2009	16.9	LL6
Miller Range 090691	MIL 090691	Antarctica	2009	73.9	L4
Miller Range 090692	MIL 090692	Antarctica	2009	179.9	CO3
Miller Range 090695	MIL 090695	Antarctica	2009	24.4	L6
Miller Range 090696	MIL 090696	Antarctica	2009	14.2	CO3
Miller Range 090699	MIL 090699	Antarctica	2009	9.1	CO3
Miller Range 090767	MIL 090767	Antarctica	2009	39.0	H5
Miller Range 090781	MIL 090781	Antarctica	2009	60.3	LL6
Miller Range 090782	MIL 090782	Antarctica	2009	38.3	L6
Miller Range 090783	MIL 090783	Antarctica	2009	68.5	L5
Miller Range 090784	MIL 090784	Antarctica	2009	41.3	L5
Miller Range 090785	MIL 090785	Antarctica	2009	90.3	CO3
Miller Range 090786	MIL 090786	Antarctica	2009	110.3	LL6
Miller Range 090787	MIL 090787	Antarctica	2009	53.8	L6
Miller Range 090788	MIL 090788	Antarctica	2009	51.0	L6
Miller Range 090789	MIL 090789	Antarctica	2009	51.3	L6
Miller Range 090799	MIL 090799	Antarctica	2009	28.8	LL-melt rock
Miller Range 090850	MIL 090850	Antarctica	2009	135.6	L5

Miller Range 090851	MIL 090851	Antarctica	2009	117.1	LL5
Miller Range 090852	MIL 090852	Antarctica	2009	76.1	L6
Miller Range 090853	MIL 090853	Antarctica	2009	111.3	L5
Miller Range 090854	MIL 090854	Antarctica	2009	91.7	L5
Miller Range 090855	MIL 090855	Antarctica	2009	90.1	L5
Miller Range 090856	MIL 090856	Antarctica	2009	124.9	LL5
Miller Range 090857	MIL 090857	Antarctica	2009	166.4	L5
Miller Range 090858	MIL 090858	Antarctica	2009	109.3	L5
Miller Range 090859	MIL 090859	Antarctica	2009	70.2	L5
Miller Range 090867	MIL 090867	Antarctica	2009	81.6	L6
Miller Range 090870	MIL 090870	Antarctica	2009	32.8	LL6
Miller Range 090871	MIL 090871	Antarctica	2009	63.5	L6
Miller Range 090872	MIL 090872	Antarctica	2009	37.2	LL6
Miller Range 090873	MIL 090873	Antarctica	2009	47.0	L5
Miller Range 090874	MIL 090874	Antarctica	2009	19.9	L6
Miller Range 090875	MIL 090875	Antarctica	2009	14.6	LL6
Miller Range 090876	MIL 090876	Antarctica	2009	40.0	L5
Miller Range 090877	MIL 090877	Antarctica	2009	38.1	L6
Miller Range 090878	MIL 090878	Antarctica	2009	46.3	L5
Miller Range 090879	MIL 090879	Antarctica	2009	51.2	LL6
Miller Range 090920	MIL 090920	Antarctica	2009	99.4	L6
Miller Range 090921	MIL 090921	Antarctica	2009	61.0	LL6
Miller Range 090922	MIL 090922	Antarctica	2009	71.3	L6
Miller Range 090923	MIL 090923	Antarctica	2009	67.9	L6
Miller Range 090924	MIL 090924	Antarctica	2009	45.5	L6
Miller Range 090925	MIL 090925	Antarctica	2009	106.3	L6
Miller Range 090926	MIL 090926	Antarctica	2009	128.4	LL6
Miller Range 090927	MIL 090927	Antarctica	2009	139.5	LL5
Miller Range 090928	MIL 090928	Antarctica	2009	115.6	LL5
Miller Range 090929	MIL 090929	Antarctica	2009	170.7	L5
Miller Range 090930	MIL 090930	Antarctica	2009	150.0	Iron, IVA
Miller Range 090936	MIL 090936	Antarctica	2009	23.7	LL5
Miller Range 091000	MIL 091000	Antarctica	2009	0.3	L5
Miller Range 091001	MIL 091001	Antarctica	2009	47.0	LL6
Miller Range 091002	MIL 091002	Antarctica	2009	46.9	LL6
Miller Range 091003	MIL 091003	Antarctica	2009	9.3	LL6
Miller Range 091004	MIL 091004	Antarctica	2009	32.5	Lodranite
Miller Range 091005	MIL 091005	Antarctica	2009	31.4	LL6
Miller Range 091006	MIL 091006	Antarctica	2009	25.6	LL6
Miller Range 091007	MIL 091007	Antarctica	2009	5.6	CK5
Miller Range 091008	MIL 091008	Antarctica	2009	9.9	LL6
Miller Range 091009	MIL 091009	Antarctica	2009	35.0	LL6
Miller Range 11040	MIL 11040	Antarctica	2011	6.8	CM2
Miller Range 11100	MIL 11100	Antarctica	2011	130.8	Howardite

Miller Range 11101	MIL 11101	Antarctica	2011	2.8	CO3
Miller Range 11109	MIL 11109	Antarctica	2011	60.8	CO3
Miller Range 11111	MIL 11111	Antarctica	2011	41.9	CM1/2
Miller Range 11198	MIL 11198	Antarctica	2011	29.8	Diogenite
Miller Range 11199	MIL 11199	Antarctica	2011	27.2	Diogenite
Miller Range 11202	MIL 11202	Antarctica	2011	21.5	Diogenite
Miller Range 11203	MIL 11203	Antarctica	2011	10.4	CO3
Miller Range 11204	MIL 11204	Antarctica	2011	16.2	Diogenite
Miller Range 11205	MIL 11205	Antarctica	2011	19.8	Diogenite
Miller Range 11206	MIL 11206	Antarctica	2011	40.0	CV3
Miller Range 11207	MIL 11207	Antarctica	2011	247.3	R6
New York		(unknown)	P May 2008	2950	IIIAB
Northwest Africa 1685	NWA 1685	(Northwest Africa)	P 2002	11560	LL4
Northwest Africa 2202	NWA 2202	(Northwest Africa)	P 2004	140	Eucrite-pmict
Northwest Africa 2600	NWA 2600	(Northwest Africa)	P 2006 May	407	E6
Northwest Africa 2611	NWA 2611	(Northwest Africa)	P 2004	1762	H5
Northwest Africa 3170	NWA 3170	(Northwest Africa)	P 2007 Apr	60	Lunar (gabbro)
Northwest Africa 3317	NWA 3317	(Northwest Africa)	P 2005 Nov	916	L~4
Northwest Africa 4502	NWA 4502	Algeria	Dec 2005	>100000	CV3
Northwest Africa 4626	NWA 4626	(Northwest Africa)	P 2006	25.1	H-melt rock
Northwest Africa 4643	NWA 4643	(Northwest Africa)	P 2006	995.3	EL6
Northwest Africa 5098	NWA 5098	(Northwest Africa)	P 2001	33	L5
Northwest Africa 5101	NWA 5101	(Northwest Africa)	P 2001	22	L5
Northwest Africa 5107	NWA 5107	(Northwest Africa)	P 2001	21	L4
Northwest Africa 5108	NWA 5108	(Northwest Africa)	P 2001	23	L5
Northwest Africa 5115	NWA 5115	(Northwest Africa)	P 2001	19	L4
Northwest Africa 5124	NWA 5124	(Northwest Africa)	P 2001	16	L4
Northwest Africa 5128	NWA 5128	(Northwest Africa)	P 2001	14	L4
Northwest Africa 5241	NWA 5241	(Northwest Africa)	P 2007	119	H5
Northwest Africa 5242	NWA 5242	(Northwest Africa)	P 2007	609	LL6
Northwest Africa 5258	NWA 5258	(Northwest Africa)	P 2005	728	L4/5
Northwest Africa 5260	NWA 5260	(Northwest Africa)	P 2005	562	LL6
Northwest Africa 5264	NWA 5264	(Northwest Africa)	P 2005	80.1	H4/5
Northwest Africa 5265	NWA 5265	(Northwest Africa)	P 2005	853	H5
Northwest Africa 5268	NWA 5268	(Northwest Africa)	P 2006	197	LL6
Northwest Africa 5270	NWA 5270	(Northwest Africa)	P 2006	71.4	H4/5
Northwest Africa 5271	NWA 5271	(Northwest Africa)	P 2006	219	H4/5
Northwest Africa 5272	NWA 5272	(Northwest Africa)	P 2006	106.3	H6
Northwest Africa 5356	NWA 5356	(Northwest Africa)	P March 2008	770	Eucrite
Northwest Africa 5382	NWA 5382	(Northwest Africa)	P 2008	60	LL6
Northwest Africa 5383	NWA 5383	(Northwest Africa)	P 2008	132	CO3
Northwest Africa 5385	NWA 5385	(Northwest Africa)	P 2007	226	H6
Northwest Africa 5386	NWA 5386	(Northwest Africa)	P 2007	276	LL5
Northwest Africa 5387	NWA 5387	(Northwest Africa)	P 2008	477	CV3

Northwest Africa 5388	NWA 5388	(Northwest Africa)	P 2008	161	L3
Northwest Africa 5389	NWA 5389	(Northwest Africa)	P 2006	616	LL6
Northwest Africa 5393	NWA 5393	(Northwest Africa)	P 2007	74.1	H3
Northwest Africa 5397	NWA 5397	(Northwest Africa)	P before 2003	26	CV3
Northwest Africa 5411	NWA 5411	(Northwest Africa)	P June 2008	198	L3
Northwest Africa 5469	NWA 5469	(Northwest Africa)	P 2008	958	R5
Northwest Africa 5553	NWA 5553	(Northwest Africa)	P 2008	60.9	L6
Northwest Africa 5557	NWA 5557	(Northwest Africa)	P 2008	23.5	CK5
Northwest Africa 5574	NWA 5574	(Northwest Africa)	P 2007	20	Ureilite
Northwest Africa 5575	NWA 5575	(Northwest Africa)	P 2007	80	L5-6
Northwest Africa 5579	NWA 5579	(Northwest Africa)	P 2007	90	L3
Northwest Africa 5583	NWA 5583	(Northwest Africa)	P 2008	79	L5
Northwest Africa 5592	NWA 5592	(Northwest Africa)	P 2008	172.4	L6
Northwest Africa 5593	NWA 5593	(Northwest Africa)	P 2008	352.8	L6
Northwest Africa 5594	NWA 5594	(Northwest Africa)	P 2008	1160	L6
Northwest Africa 5598	NWA 5598	(Northwest Africa)	P 2007	212.9	LL6
Northwest Africa 5674	NWA 5674	(Northwest Africa)	P 2008	161.9	LL6
Northwest Africa 5680	NWA 5680	(Northwest Africa)	P 2008	97	L6
Northwest Africa 5682	NWA 5682	(Northwest Africa)	P 2008	372	L6
Northwest Africa 5683	NWA 5683	(Northwest Africa)	P 2008	59	L6
Northwest Africa 5688	NWA 5688	(Northwest Africa)	P 2007	800	H6
Northwest Africa 5692	NWA 5692	(Northwest Africa)	P 2008	62.8	LL6
Northwest Africa 5697	NWA 5697	(Northwest Africa)	P 2008	547	L3
Northwest Africa 5699	NWA 5699	(Northwest Africa)	P 2008	2062	H6
Northwest Africa 5702	NWA 5702	(Northwest Africa)	P 2008	380	LL6
Northwest Africa 5765	NWA 5765	(Northwest Africa)	P 2006	31	L5
Northwest Africa 5770	NWA 5770	(Northwest Africa)	P 2003	338	L4
Northwest Africa 6083	NWA 6083	(Northwest Africa)	P 2007	1100	L4
Northwest Africa 6085	NWA 6085	(Northwest Africa)	P 2007	51	L5
Northwest Africa 6086	NWA 6086	(Northwest Africa)	P 2007	130	L5
Northwest Africa 6088	NWA 6088	(Northwest Africa)	P 2007	80	L4
Northwest Africa 6089	NWA 6089	(Northwest Africa)	P 2007	48	H4
Northwest Africa 6090	NWA 6090	(Northwest Africa)	P 2007	95	H4
Northwest Africa 6091	NWA 6091	(Northwest Africa)	P 2007	360	H4
Northwest Africa 6092	NWA 6092	(Northwest Africa)	P 2007	390	H5
Northwest Africa 6093	NWA 6093	(Northwest Africa)	P 2007	170	L5
Northwest Africa 6094	NWA 6094	(Northwest Africa)	P 2007	160	L5
Northwest Africa 6095	NWA 6095	(Northwest Africa)	P 2007	130	LL6
Northwest Africa 6096	NWA 6096	(Northwest Africa)	P 2009	275	L6
Northwest Africa 6097	NWA 6097	(Northwest Africa)	P 2000	132	H4
Northwest Africa 6099	NWA 6099	(Northwest Africa)	P 2004	230	LL4
Northwest Africa 6100	NWA 6100	(Northwest Africa)	P 2004	330	H5
Northwest Africa 6107	NWA 6107	(Northwest Africa)	P 2004	370	H4
Northwest Africa 6109	NWA 6109	(Northwest Africa)	P 2004	400	L4-5

Northwest Africa 6110	NWA 6110	(Northwest Africa)	P 2004	90	L5
Northwest Africa 6423	NWA 6423	(Northwest Africa)	P 2010 Sep	2010	CV3
Northwest Africa 6436	NWA 6436	Morocco	2009	115.7	Mesosiderite-B2
Northwest Africa 6477	NWA 6477	(Northwest Africa)	P 2010 Feb	385	Eucrite-mmict
Northwest Africa 6489	NWA 6489	(Northwest Africa)	P Jun 2010	3.2	Diogenite
Northwest Africa 6501	NWA 6501	(Northwest Africa)	P Feb 2009	93	L3
Northwest Africa 6504	NWA 6504	(Northwest Africa)	P Feb 2009	45	L3
Northwest Africa 6508	NWA 6508	Morocco	P Sept 2009	146	EL3
Northwest Africa 6602	NWA 6602	(Northwest Africa)	P 2010	1048	Howardite
Northwest Africa 6603	NWA 6603	(Northwest Africa)	P 2006	481	CV3
Northwest Africa 6604	NWA 6604	(Northwest Africa)	P 2006	605	CK4
Northwest Africa 6607	NWA 6607	(Northwest Africa)	P 2010 Oct	94	LL3-6
Northwest Africa 6611	NWA 6611	(Northwest Africa)	P 2010 Dec	45	LL3.8
Northwest Africa 6612	NWA 6612	(Northwest Africa)	P 2010 Nov	194	CV3
Northwest Africa 6615	NWA 6615	(Northwest Africa)	P 2010	187	L3.8
Northwest Africa 6617	NWA 6617	(Northwest Africa)	P 2009 Oct	71	H3.6
Northwest Africa 6618	NWA 6618	(Northwest Africa)	P 2011 Jan	237	Eucrite-mmict
Northwest Africa 6619	NWA 6619	(Northwest Africa)	P 2011 Jan	3367	CV3
Northwest Africa 6620	NWA 6620	(Northwest Africa)	P 2011 Jan	89	Howardite
Northwest Africa 6626	NWA 6626	(Northwest Africa)	P 2011 Feb	3300	L3.9
Northwest Africa 6645	NWA 6645	(Northwest Africa)	P 2011 Feb	375	H3-6
Northwest Africa 6731	NWA 6731	(Northwest Africa)	P 2007 Feb	13.7	Eucrite-cm
Northwest Africa 6735	NWA 6735	(Northwest Africa)	P 2010 Apr	44.0	L/LL4
Northwest Africa 6904	NWA 6904	(Northwest Africa)	P 2011	115	LL6
Northwest Africa 6907	NWA 6907	(Northwest Africa)	P 2006	240	LL5
Northwest Africa 6946	NWA 6946	(Northwest Africa)	P 2010 May	71	L6
Northwest Africa 6959	NWA 6959	(Northwest Africa)	P 2011 June	88.3	R5
Northwest Africa 6962	NWA 6962	(Northwest Africa)	P 2011 Sep	59.8	Achondrite-ung
Northwest Africa 6996	NWA 6996	(Northwest Africa)	P 2000	1533.74	L6
Northwest Africa 6997	NWA 6997	(Northwest Africa)	P 2004	110.5	L4-5
Northwest Africa 6998	NWA 6998	(Northwest Africa)	P 2004	85.34	H4
Northwest Africa 6999	NWA 6999	(Northwest Africa)	P Aug 2000	7465	L/LL4
Northwest Africa 7000	NWA 7000	(Northwest Africa)	P 2002	8880	L4
Northwest Africa 7001	NWA 7001	(Northwest Africa)	P 2000	248.5	H5
Northwest Africa 7009	NWA 7009	(Northwest Africa)	P 2011 Oct	1007	CV3
Northwest Africa 7018	NWA 7018	(Northwest Africa)	P 2011 Feb	443	H6
Northwest Africa 7064	NWA 7064	Morocco	2008	115	L6
Northwest Africa 7117	NWA 7117	(Northwest Africa)	P 2011 Nov	64	LL5
Northwest Africa 7120	NWA 7120	(Northwest Africa)	P 2011 Oct	1604	L3-melt breccia
Northwest Africa 7121	NWA 7121	(Northwest Africa)	P 2011 Oct	16.1	CM2
Northwest Africa 7125	NWA 7125	(Northwest Africa)	P 2011 June	26.6	LL6
Northwest Africa 7129	NWA 7129	(Northwest Africa)	P 2011 Sep	50	Achondrite-ung
Northwest Africa 7131	NWA 7131	(Northwest Africa)	P 2011 Oct	40	CM2
Northwest Africa 7182	NWA 7182	(Northwest Africa)	2010	17	Martian (shergottite)

Northwest Africa 7185	NWA 7185	(Northwest Africa)	P 2009 Oct	1446	CV3
Northwest Africa 7186	NWA 7186	(Northwest Africa)	P 2010	411	CV3
Northwest Africa 7190	NWA 7190	(Northwest Africa)	2011 Aug	5.28	Lunar (feldsp. breccia)
Northwest Africa 7191	NWA 7191	(Northwest Africa)	P 2012 Jan	137	L-melt rock
Northwest Africa 7194	NWA 7194	(Northwest Africa)	P 2012 Jan	141.6	R4
Northwest Africa 7213	NWA 7213	(Northwest Africa)	P 14 Aug 2011	93.2	LL3
Northwest Africa 7243	NWA 7243	(Northwest Africa)	P 2011	32	H5-melt breccia
Northwest Africa 7251	NWA 7251	(Northwest Africa)	P 2012	13000	L-melt rock
Northwest Africa 7260	NWA 7260	(Northwest Africa)	P 2012 Feb	340	R4
Northwest Africa 7261	NWA 7261	(Northwest Africa)	P 2010 Oct	202	CV3
Northwest Africa 7262	NWA 7262	(Northwest Africa)	P 2012 Feb	413	Lunar (feldsp. breccia)
Northwest Africa 7267	NWA 7267	(Northwest Africa)	P 2012 Feb	654	L-melt breccia
Northwest Africa 7268	NWA 7268	(Northwest Africa)	P 2012 Feb	220	Ureilite
Northwest Africa 7269	NWA 7269	(Northwest Africa)	P 2012 Feb	787	Eucrite-mmict
Northwest Africa 7271	NWA 7271	(Northwest Africa)	P 2011 Sep	78	CO3
Northwest Africa 7272	NWA 7272	(Northwest Africa)	P 2012 Mar	58.7	Martian (shergottite)
Northwest Africa 7274	NWA 7274	(Northwest Africa)	P 2012 Feb	372.6	Lunar (feldsp. breccia)
Northwest Africa 7275	NWA 7275	(Northwest Africa)	P 2012 Feb	197	CV3
Northwest Africa 7276	NWA 7276	(Northwest Africa)	P 2012	380	Ureilite
Northwest Africa 7279	NWA 7279	Morocco	P 2011 May 18	50.4	Howardite
Northwest Africa 7280	NWA 7280	Morocco	P 2011 Jul 25	246	Diogenite
Northwest Africa 7281	NWA 7281	Morocco	P 2012 Jan 12	20.04	Eucrite
Northwest Africa 7284	NWA 7284	Morocco	P 2012 Jan 12,	113.42	Diogenite
Northwest Africa 7285	NWA 7285	Morocco	P 2011 Dec 11	220	Eucrite
Northwest Africa 7298	NWA 7298	(Northwest Africa)	P 2005	35.1	H3.8
Northwest Africa 7299	NWA 7299	Morocco	P 2011 Sept	20	Brachinite
Northwest Africa 7303	NWA 7303	(Northwest Africa)	P 2011 Dec 1	18.3	R3-5
Northwest Africa 7304	NWA 7304	(Northwest Africa)	P Sept 2009	272	Ureilite
Northwest Africa 7308	NWA 7308	(Northwest Africa)	P 2012 Feb	264	LL3
Northwest Africa 7312	NWA 7312	(Northwest Africa)	P 2012 Apr	778	Lodranite
Northwest Africa 7313	NWA 7313	(Northwest Africa)	P 2012 Feb	777	LL6
Northwest Africa 7314	NWA 7314	(Northwest Africa)	P 2012 Feb	147	LL6
Northwest Africa 7315	NWA 7315	(Northwest Africa)	P 2012 Feb	80.3	Eucrite
Northwest Africa 7319	NWA 7319	(Northwest Africa)	P 2012 Apr	6414	L5-melt breccia
Northwest Africa 7320	NWA 7320	(Northwest Africa)	P 2011 Dec	52	Martian (shergottite)
Northwest Africa 7325	NWA 7325	(Northwest Africa)	P 2012 Apr	345	Achondrite-ung
Northwest Africa 7326	NWA 7326	(Northwest Africa)	P 2004	60.1	Eucrite-mmict
Northwest Africa 7327	NWA 7327	Morocco	P May 2012	217.44	H/L5
Northwest Africa 7328	NWA 7328	Morocco	P May 2012	493.18	H4
Northwest Africa 7329	NWA 7329	Morocco	P 2012 Mar	145.77	Howardite
Northwest Africa 7330	NWA 7330	Morocco	P 2012 Mar	111.07	Eucrite-cm
Northwest Africa 7331	NWA 7331	Morocco	P 2012 Mar	63.21	Howardite
Northwest Africa 7332	NWA 7332	Morocco	P May 2012	59.30	CV3
Northwest Africa 7333	NWA 7333	Morocco	P 2011	88	Ureilite

Northwest Africa 7334	NWA 7334	Morocco	P May 2012	82.55	Eucrite
Northwest Africa 7335	NWA 7335	Morocco	P March 2009	4908	Iron, ungrouped
Northwest Africa 7336	NWA 7336	Morocco	2012	18000	L6
Northwest Africa 7346	NWA 7346	Morocco	P 2009	269.3	LL6
Northwest Africa 7347	NWA 7347	Morocco	P 27 January 2012	1537	L6-melt breccia
Northwest Africa 7348	NWA 7348	(Northwest Africa)	P 2012	1519	LL6
Northwest Africa 7349	NWA 7349	Morocco	P May 2012	187.12	Ureilite
Northwest Africa 7350	NWA 7350	Morocco	P May 2012	37.48	Mesosiderite-B2
Northwest Africa 7367	NWA 7367	Morocco	P May 2012	35.59	Eucrite-cm
Northwest Africa 7368	NWA 7368	Morocco	P May 2012	1289.39	H4
Northwest Africa 7369	NWA 7369	Western Sahara	2007	650	R5
Northwest Africa 7370	NWA 7370	Mali	2009 May	2290	Diogenite-olivine
Northwest Africa 7371	NWA 7371	Western Sahara	2012	15.5	L~5
Northwest Africa 7372	NWA 7372	(Northwest Africa)	before 2009	18.9	L~6
Northwest Africa 7373	NWA 7373	(Northwest Africa)	2011	193.8	L~6
Northwest Africa 7374	NWA 7374	(Northwest Africa)	before 2009	20.6	L~6
Northwest Africa 7375	NWA 7375	(Northwest Africa)	before 2009	23.4	L~6
Northwest Africa 7376	NWA 7376	(Northwest Africa)	before 2009	27.7	L~6
Northwest Africa 7377	NWA 7377	(Northwest Africa)	before 2009	39.9	LL~6
Northwest Africa 7378	NWA 7378	(Northwest Africa)	before 2009	45	L~4-6
Northwest Africa 7379	NWA 7379	(Northwest Africa)	before 2009	52.4	L~6
Northwest Africa 7380	NWA 7380	(Northwest Africa)	P 2012 Apr	61.7	LL~5
Northwest Africa 7381	NWA 7381	(Northwest Africa)	2011	76.6	H~5
Northwest Africa 7382	NWA 7382	Morocco	P Jan 2012	40.2	LL7
Northwest Africa 7383	NWA 7383	Morocco	P Jan 2012	329	Eucrite
Northwest Africa 7384	NWA 7384	Morocco	P Jan 2010	125	Acapulcoite
Northwest Africa 7385	NWA 7385	Morocco	P May 2012	51.69	Eucrite
Northwest Africa 7386	NWA 7386	(Northwest Africa)	P 2011 Jul 18	131	Mesosiderite
Northwest Africa 7389	NWA 7389	(Northwest Africa)	P 2008	375	L6
Northwest Africa 7390	NWA 7390	(Northwest Africa)	P 2008	28.4	LL6
Northwest Africa 7391	NWA 7391	(Northwest Africa)	P 2003	640	L5
Northwest Africa 7392	NWA 7392	(Northwest Africa)	P 2002	365	L6
Northwest Africa 7393	NWA 7393	(Northwest Africa)	P 2008	2490	L6
Northwest Africa 7394	NWA 7394	(Northwest Africa)	P 2008	14.6	LL6
Northwest Africa 7395	NWA 7395	(Northwest Africa)	P 2007	130.2	L6
Northwest Africa 7401	NWA 7401	Morocco	P May 2012	995.59	EL6
Northwest Africa 7403	NWA 7403	(Northwest Africa)	P Nov 2004	53	LL6
Northwest Africa 7404	NWA 7404	Morocco	P Apr 2005	52.3	H6
Northwest Africa 7407	NWA 7407	Morocco	P Dec 2010	136.2	L5
Northwest Africa 7408	NWA 7408	Morocco	P Dec 2010	89.7	LL6
Northwest Africa 7410	NWA 7410	(Northwest Africa)	P Feb 2011	43.7	L5
Northwest Africa 7412	NWA 7412	Morocco	P Mar 2011	89.624	H4
Northwest Africa 7414	NWA 7414	Morocco	P Mar 2011	168.753	H4
Northwest Africa 7428	NWA 7428	Morocco	P 2012	1830	L6-melt breccia

Northwest Africa 7429	NWA 7429	Morocco	P May 2012	5440	L4
Northwest Africa 7446	NWA 7446	(Northwest Africa)	P 2000	270.00	LL5
Northwest Africa 7447	NWA 7447	(Northwest Africa)	P 2007	170.00	EL5
Northwest Africa 7448	NWA 7448	(Northwest Africa)	P 2003	140.00	L6
Northwest Africa 7449	NWA 7449	Western Sahara	July 2009	405	L6
Northwest Africa 7450	NWA 7450	Morocco	P May 2012	151.17	LL6
Northwest Africa 7463	NWA 7463	Morocco	P May 2012	400.19	L6
Northwest Africa 7476	NWA 7476	Morocco	P May 2012	562.32	L6
Northwest Africa 7477	NWA 7477	Morocco	P May 2012	616.18	L3.9
Northwest Africa 7478	NWA 7478	Morocco	P May 2012	136.35	LL6
Northwest Africa 7479	NWA 7479	Morocco	P May 2012	1004.18	CV3
Northwest Africa 7480	NWA 7480	(Northwest Africa)	P 2009	58	L5
Northwest Africa 7481	NWA 7481	(Northwest Africa)	P 2009	45.5	L6
Northwest Africa 7482	NWA 7482	(Northwest Africa)	P 2009	27.5	H5
Northwest Africa 7483	NWA 7483	(Northwest Africa)	P 2009	58.5	H4
Northwest Africa 7484	NWA 7484	Morocco	P Aug 2012	428	Howardite
Northwest Africa 7485	NWA 7485	Morocco	P May 2012	360.12	Eucrite-mmict
Northwest Africa 7486	NWA 7486	(Northwest Africa)	P Jan 2009	1630	L4
Northwest Africa 7487	NWA 7487	Morocco	P May 2012	404.61	H4
Northwest Africa 7488	NWA 7488	Morocco	P August 2012	259	Eucrite
Northwest Africa 7490	NWA 7490	(Northwest Africa)	P 2012	1050	Diogenite
Northwest Africa 7491	NWA 7491	Morocco	P May 2012	306.46	L6
Northwest Africa 7492	NWA 7492	Morocco	P May 2012	808.77	L6
Northwest Africa 7493	NWA 7493	Morocco	P August 2012	503	Lunar (feldsp. breccia)
Northwest Africa 7494	NWA 7494	Morocco	P Sept. 11, 2012	3553	H6
Northwest Africa 7495	NWA 7495	Morocco	P May 2012	2144.67	L5
Northwest Africa 7496	NWA 7496	Western Sahara	Jan 2012	788.4	Eucrite-pmict
Northwest Africa 7497	NWA 7497	Morocco	P Aug 2012	423	H4
Northwest Africa 7498	NWA 7498	Morocco	P Aug 2012	1101	L4
Northwest Africa 7499	NWA 7499	Morocco	P August 2012	320	Brachinite
Northwest Africa 7510	NWA 7510	Morocco	P Aug 2012	196	Howardite
Northwest Africa 7511	NWA 7511	(Northwest Africa)	P Jan 2012	17.53	LL3
Northwest Africa 7512	NWA 7512	Morocco	P Dec 2011	49.71	R3
Northwest Africa 7513	NWA 7513	Morocco	P Aug 2012	439	L3.8
Northwest Africa 7514	NWA 7514	(Northwest Africa)	Sept 2005	23620	R5
Northwest Africa 7515	NWA 7515	Morocco	P Aug 2012	160	Eucrite
Northwest Africa 7516	NWA 7516	Morocco	P Aug 2012	77	Eucrite
Northwest Africa 7517	NWA 7517	Morocco	P August 2012	374	LL5
Northwest Africa 7518	NWA 7518	Morocco	P May 2012	650.14	LL4
Northwest Africa 7519	NWA 7519	(Northwest Africa)	2011	2028	L4
Northwest Africa 7520	NWA 7520	(Northwest Africa)	P 11 Feb 2012	1550	H4
Northwest Africa 7531	NWA 7531	Morocco	2009	868	CR7
Northwest Africa 7532	NWA 7532	(Northwest Africa)	P 2007	210	Ureilite
Northwest Africa 7533	NWA 7533	(Northwest Africa)	P June 2012	84	Achondrite-ung

Northwest Africa 7546	NWA 7546	(Northwest Africa)	P 2012	128	Howardite
Northwest Africa 7547	NWA 7547	Morocco	P Aug 2012	176	Eucrite-mmict
Northwest Africa 7548	NWA 7548	Morocco	P Aug 2012	1300	L4
Northwest Africa 7557	NWA 7557	(Northwest Africa)	P 2011	270	Howardite
Northwest Africa 7559	NWA 7559	(Northwest Africa)	P 2011	267	L5-6
Northwest Africa 7560	NWA 7560	(Northwest Africa)	P 18 Jun 2011	1302	L6
Northwest Africa 7561	NWA 7561	(Northwest Africa)	P 18 Jun 2011	1063	L4
Northwest Africa 7562	NWA 7562	(Northwest Africa)	P 18 Jun 2011	407	LL6
Northwest Africa 7563	NWA 7563	(Northwest Africa)	P 18 Jun 2011	171	L6
Northwest Africa 7564	NWA 7564	(Northwest Africa)	P 18 Jun 2011	520	L6
Northwest Africa 7565	NWA 7565	(Northwest Africa)	P 2004	316	H5
Northwest Africa 7566	NWA 7566	(Northwest Africa)	P 2012	51	LL3-6
Northwest Africa 7568	NWA 7568	(Northwest Africa)	P 2012	12	CM2
Northwest Africa 7569	NWA 7569	(Northwest Africa)	P 2012	41	CK5
Northwest Africa 7570	NWA 7570	Morocco	P Sept 2012	402	Eucrite
Northwest Africa 7575	NWA 7575	(Northwest Africa)	P 2012	246	LL6
Northwest Africa 7578	NWA 7578	(Northwest Africa)	P 2012	51	LL6
Northwest Africa 7582	NWA 7582	(Northwest Africa)	P 2012	126	L6
Northwest Africa 7584	NWA 7584	(Northwest Africa)	P 2012	195	L6
Northwest Africa 7587	NWA 7587	(Northwest Africa)	P 2012	1877	L6
Northwest Africa 7588	NWA 7588	(Northwest Africa)	P 2012	1963	L6
Northwest Africa 7591	NWA 7591	(Northwest Africa)	P 2012	26	L6
Northwest Africa 7610	NWA 7610	Morocco	P 2009	1086	LL5-6
Northwest Africa 7616	NWA 7616	(Northwest Africa)	P 2011	402	L5
Northwest Africa 7617	NWA 7617	(Northwest Africa)	P 2011	700	H4
Northwest Africa 7618	NWA 7618	(Northwest Africa)	P 2011	140	H4
Northwest Africa 7619	NWA 7619	(Northwest Africa)	P 2011	154	H4
Northwest Africa 7621	NWA 7621	(Northwest Africa)	P 2011	29	H5
Northwest Africa 7623	NWA 7623	(Northwest Africa)	P 2011	46	L5
Northwest Africa 7624	NWA 7624	(Northwest Africa)	P 2011	41.3	H5
Oldman Mountain		United States	9 Feb 2008	198.96	H5
Österplana 048	Öst 048	Sweden			
Österplana 049	Öst 049	Sweden			
Österplana 050	Öst 050	Sweden			
Österplana 051	Öst 051	Sweden			
Österplana 052	Öst 052	Sweden			
Österplana 053	Öst 053	Sweden			
Österplana 054	Öst 054	Sweden			
Österplana 055	Öst 055	Sweden			
Österplana 056	Öst 056	Sweden			
Österplana 057	Öst 057	Sweden			
Österplana 058	Öst 058	Sweden			
Österplana 059	Öst 059	Sweden			
Österplana 060	Öst 060	Sweden			

Österplana 061	Öst 061	Sweden			
Österplana 062	Öst 062	Sweden			
Österplana 063	Öst 063	Sweden			
Österplana 064	Öst 064	Sweden			
Paposo 003		Chile	2011 Apr 23	368	H6
Premier Downs 002		Australia	2008	124.6	LL5-6
Ragland Hill		United States	Around 1980	11800	H5
Ramlat al Wahibah 045	RaW 045	Oman	2010 Feb 7	85.275	H6-melt breccia
Ramlat as Sahmah 281	RaS 281	Oman	16 Jan 2009	203.7	H3-6
Ramlat as Sahmah 282	RaS 282	Oman	16 Jan 2009	132.0	H3-5
Ramlat as Sahmah 283	RaS 283	Oman	17 Jan 2009	447.7	H4
Ramlat as Sahmah 284	RaS 284	Oman	21 Jan 2009	1489.6	LL5
Ramlat as Sahmah 285	RaS 285	Oman	21 Jan 2009	269.3	L6
Ramlat as Sahmah 286	RaS 286	Oman	21 Jan 2009	4445.2	H4-5
Ramlat as Sahmah 287	RaS 287	Oman	21 Jan 2009	1962.0	Diogenite
Ramlat as Sahmah 288	RaS 288	Oman	21 Jan 2009	73.3	L4-6
Ramlat as Sahmah 289	RaS 289	Oman	22 Jan 2009	123.5	H4
Ramlat as Sahmah 290	RaS 290	Oman	22 Jan 2009	446.8	L6
Ramlat as Sahmah 291	RaS 291	Oman	22 Jan 2009	138.2	L4
Ramlat as Sahmah 292	RaS 292	Oman	22 Jan 2009	1991.7	L6
Ramlat as Sahmah 293	RaS 293	Oman	22 Jan 2009	31.0	H5-6
Ramlat as Sahmah 294	RaS 294	Oman	23 Jan 2009	52.9	L6
Ramlat as Sahmah 295	RaS 295	Oman	23 Jan 2009	227.7	H4
Ramlat as Sahmah 296	RaS 296	Oman	23 Jan 2009	49.3	L6
Ramlat as Sahmah 297	RaS 297	Oman	23 Jan 2009	706.9	L6
Ramlat as Sahmah 298	RaS 298	Oman	23 Jan 2009	389.2	L6
Ramlat as Sahmah 299	RaS 299	Oman	23 Jan 2009	53.1	L6
Ramlat as Sahmah 300	RaS 300	Oman	23 Jan 2009	419.9	L6
Ramlat as Sahmah 301	RaS 301	Oman	24 Jan 2009	86.8	L4
Ramlat as Sahmah 302	RaS 302	Oman	24 Jan 2009	161.7	H4
Ramlat as Sahmah 303	RaS 303	Oman	25 Jan 2009	103.0	H4
Ramlat as Sahmah 304	RaS 304	Oman	25 Jan 2009	373.4	H6
Ramlat as Sahmah 305	RaS 305	Oman	25 Jan 2009	130.8	L6
Ramlat as Sahmah 306	RaS 306	Oman	25 Jan 2009	165.2	H6
Ramlat as Sahmah 307	RaS 307	Oman	25 Jan 2009	327.5	H4-6
Ramlat as Sahmah 308	RaS 308	Oman	26 Jan 2009	1352.0	H4
Ramlat as Sahmah 309	RaS 309	Oman	17 Feb 2009	1435.43	Brachinite
Ramlat as Sahmah 310	RaS 310	Oman	17 Feb 2009	1223.2	H3-6
Ramlat as Sahmah 311	RaS 311	Oman	17 Feb 2009	20.3	H4-6
Ramlat as Sahmah 312	RaS 312	Oman	17 Feb 2009	472.7	H6
Ramlat as Sahmah 313	RaS 313	Oman	17 Feb 2009	111.3	H6
Ramlat as Sahmah 314	RaS 314	Oman	17 Feb 2009	219.0	H6
Ramlat as Sahmah 315	RaS 315	Oman	17 Feb 2009	2.9	H6
Ramlat as Sahmah 316	RaS 316	Oman	18 Feb 2009	2706.0	L5

Ramlat as Sahmah 317	RaS 317	Oman	18 Feb 2009	237.2	L5
Ramlat as Sahmah 319	RaS 319	Oman	18 Feb 2009	948.4	H5
Ramlat as Sahmah 320	RaS 320	Oman	18 Feb 2009	1002.3	L6
Ramlat as Sahmah 321	RaS 321	Oman	18 Feb 2009	171.9	H5
Ramlat as Sahmah 322	RaS 322	Oman	18 Feb 2009	264.4	H3
Ramlat as Sahmah 323	RaS 323	Oman	19 Feb 2009	161.8	L3-6
Ramlat as Sahmah 324	RaS 324	Oman	20 Feb 2009	63.2	L6
Ramlat as Sahmah 325	RaS 325	Oman	20 Feb 2009	850.8	L6
Ramlat as Sahmah 326	RaS 326	Oman	21 Feb 2009	65.4	H4
Ramlat as Sahmah 327	RaS 327	Oman	21 Feb 2009	199.0	L6
Ramlat as Sahmah 328	RaS 328	Oman	21 Feb 2009	1732.7	L6
Ramlat as Sahmah 333	RaS 333	Oman	2010 Jan 10	100.683	H3.6
Ramlat as Sahmah 335	RaS 335	Oman	2010 Jan 10	9.794	L3.9
Ramlat as Sahmah 337	RaS 337	Oman	2010 Jan 10	1119.8	H3.6
Ramlat as Sahmah 338	RaS 338	Oman	2010 Jan 11	934.7	H3.6
Ramlat as Sahmah 339	RaS 339	Oman	2010 Jan 11	1035.8	H3.6-6
Ramlat as Sahmah 349	RaS 349	Oman	2010 Jan 13	16.97	H7
Ramlat as Sahmah 357	RaS 357	Oman	2010 Jan 16	2781.2	L6
Ramlat as Sahmah 370	RaS 370	Oman	2010 Jan 17	182.417	LL6
Ramlat as Sahmah 371	RaS 371	Oman	2010 Jan 17	61.029	LL6
Ramlat as Sahmah 374	RaS 374	Oman	2010 Jan 17	156.482	H3.7
Ramlat as Sahmah 375	RaS 375	Oman	2010 Jan 17	31.944	L3.9-5
Ramlat as Sahmah 383	RaS 383	Oman	2010 Jan 18	266.014	H3.6
Ramlat as Sahmah 384	RaS 384	Oman	2010 Jan 23	5026	Mesosiderite-C2
Ramlat as Sahmah 385	RaS 385	Oman	2010 Jan 23	2275	LL3.3
Ramlat as Sahmah 390	RaS 390	Oman	2010 Jan 31	0.686	H3.8-6
Ramlat as Sahmah 401	RaS 401	Oman	2010 Feb 2	473.8	L3.8
Ramlat as Sahmah 420	RaS 420	Oman	2010 Feb 5	70.298	Ureilite
Ramlat as Sahmah 422	RaS 422	Oman	2010 Feb 6	3879	H3.7-5
Ramlat as Sahmah 423	RaS 423	Oman	2010 Feb 6	230.3	H3.4-5
Ramlat as Sahmah 426	RaS 426	Oman	Feb/Mar 2011	92	H4
Ramlat as Sahmah 427	RaS 427	Oman	Feb/Mar 2011	7.6	H5
Ramlat as Sahmah 428	RaS 428	Oman	Feb/Mar 2011	16247	L6
Rencoret 001		Chile	1996	1992	H6
Rio Rancho		United States	2011 Sept 16	1001	L6
Sahara 99534		(Sahara)	1999	470	L5
Sayh al Uhaymir 505	SaU 505	Oman	16 Jan 2009	110.0	L4-5
Sayh al Uhaymir 506	SaU 506	Oman	18 Jan 2009	356.7	H4-5
Sayh al Uhaymir 507	SaU 507	Oman	19 Jan 2009	665.7	L6
Sayh al Uhaymir 508	SaU 508	Oman	19 Jan 2009	373.9	H6
Sayh al Uhaymir 509	SaU 509	Oman	19 Jan 2009	182.7	H5
Sayh al Uhaymir 510	SaU 510	Oman	20 Jan 2009	257.6	L6
Sayh al Uhaymir 511	SaU 511	Oman	20 Jan 2009	266.2	Ureilite
Sayh al Uhaymir 512	SaU 512	Oman	20 Jan 2009	1606.9	H4-5

Sayh al Uhaymir 513	SaU 513	Oman	02 Feb 2009	154.2	H5
Sayh al Uhaymir 514	SaU 514	Oman	03 Feb 2009	1145.1	L5
Sayh al Uhaymir 515	SaU 515	Oman	03 Feb 2009	549.9	H4
Sayh al Uhaymir 516	SaU 516	Oman	20 Feb 2009	115.5	H5
Sayh al Uhaymir 517	SaU 517	Oman	21 Feb 2009	1.7	L4
Sayh al Uhaymir 518	SaU 518	Oman	21 Feb 2009	390.3	L5
Sayh al Uhaymir 519	SaU 519	Oman	21 Feb 2009	403.2	L5
Sayh al Uhaymir 520	SaU 520	Oman	21 Feb 2009	30.2	H5
Sayh al Uhaymir 521	SaU 521	Oman	21 Feb 2009	350.1	H5
Sayh al Uhaymir 522	SaU 522	Oman	21 Feb 2009	977.8	L6
Sayh al Uhaymir 523	SaU 523	Oman	21 Feb 2009	265.2	L6
Sayh al Uhaymir 524	SaU 524	Oman	22 Feb 2009	1485.7	L6
Sayh al Uhaymir 526	SaU 526	Oman	2010	806	LL6
Sayh al Uhaymir 527	SaU 527	Oman	2010	379	LL4
Sayh al Uhaymir 545	SaU 545	Oman	2002 Oct 6	24.5	L~6
Sayh al Uhaymir 546	SaU 546	Oman	January 2011	1031.7	H5
Sayh al Uhaymir 547	SaU 547	Oman	2011 Feb 04	2353	L5
Sayh al Uhaymir 548	SaU 548	Oman	2011 Feb 04	53.8	H4
Sayh al Uhaymir 549	SaU 549	Oman	2011 Feb 05	176.2	H4
Sayh al Uhaymir 550	SaU 550	Oman	2011 Feb 06	130.9	H5
Sayh al Uhaymir 551	SaU 551	Oman	2011 Feb 08	89.7	L6
Sayh al Uhaymir 552	SaU 552	Oman	Feb 2010	1484	L6
Sayh al Uhaymir 553	SaU 553	Oman	Feb 2010	260	L4
Sayh al Uhaymir 554	SaU 554	Oman	Feb 2010	2022	H6
Sayh al Uhaymir 555	SaU 555	Oman	Feb 2010	1324	H4/5
Sayh al Uhaymir 556	SaU 556	Oman	25 Nov 2011	2075	H6
Sayh al Uhaymir 557	SaU 557	Oman	Feb/Mar 2011	3	H4
Shalim 008		Oman	13 Feb 2009	323.5	H5
Shalim 009		Oman	13 Feb 2009	9472.2	L6
Shalim 010		Oman	14 Feb 2009	291.6	L6
Shalim 011		Oman	14 Feb 2009	201.2	H4
Shalim 012		Oman	14 Feb 2009	101.9	H4
Shalim 013		Oman	15 Feb 2009	405.8	H4
Shalim 014		Oman	15 Feb 2009	34.1	L6
Shalim 015		Oman	2011 Mar	184	L6
Shalim 016		Oman	2011 Jan 31	84.4	H5
Shalim 017		Oman	2011 Jan 31	127.1	H5
Shalim 018		Oman	2011 Feb 01	347.8	H4
Shalim 019		Oman	2011 Feb 01	19.21	H4
Shalim 020		Oman	2011 Feb 01	24.9	H4-6
Shişr 175		Oman	2000 Aug 24	852	L~5
Shişr 176		Oman	14 Oct 2010	1170	L6
Spruce 001		United States	2011 Nov 28	983	L5
Spruce 002		United States	2011 Dec 11	18	L6

Sterley		United States	1950	1724.8	Pallasite, PMG
Tieret 008		Tunisia	2010 Apr 3	28	L4
Tieret 009		Tunisia	2010 Apr 4	9	H5/6
Tieret 010		Tunisia	2010 Apr 5	5150	H3
Tieret 011		Tunisia	2010 Apr 6	13.4	H5/6
Tieret 012		Tunisia	2010 Apr 6	0.41	L4
Tieret 013		Tunisia	2010 Apr 6	3.7	L4
Tin as Sawwan		Tunisia	30 Dec. 2011	1684	L4-5
Tupelo		United States	30 Apr 2012	280	EL6
Umm as Samim 008	UaS 008	Oman	17 Jan 2009	290.3	L6
Umm as Samim 009	UaS 009	Oman	17 Jan 2009	3989.0	L6
Umm as Samim 010	UaS 010	Oman	18 Jan 2009	251.7	H4
Umm as Samim 011	UaS 011	Oman	19 Jan 2009	790.5	H4
Umm as Samim 012	UaS 012	Oman	19 Jan 2009	1354.8	H4
Umm as Samim 013	UaS 013	Oman	19 Jan 2009	205.6	L6
Umm as Samim 014	UaS 014	Oman	19 Jan 2009	1713.8	H4
Umm as Samim 017	UaS 017	Oman	2010 Jan 06	61.312	H3-6
Umm as Samim 022	UaS 022	Oman	2010 Jan 7	20.778	H3.9
Umm as Samim 024	UaS 024	Oman	2010 Jan 8	406.8	Eucrite-cm
Umm as Samim 028	UaS 028	Oman	2010 Jan 08	123.64	L6
Umm as Samim 030	UaS 030	Oman	2010 Jan 9	10.063	H3.9-6
Watonga		United States	1950-1960	5025	LL3.1
Wiltshire		United Kingdom			
Yamato 982401	Y-982401	Antarctica	1998	4.885	LL3
Yamato 982403	Y-982403	Antarctica	1998	8.129	L6
Yamato 982405	Y-982405	Antarctica	1998	3.955	CR2
Yamato 982406	Y-982406	Antarctica	1998	8.846	LL6
Yamato 982407	Y-982407	Antarctica	1998	4.175	LL6
Yamato 982409	Y-982409	Antarctica	1998	4.210	H4
Yamato 982416	Y-982416	Antarctica	1998	5.878	H4
Yamato 982417	Y-982417	Antarctica	1998	9.013	H4
Yamato 982418	Y-982418	Antarctica	1998	12.29	LL5
Yamato 982419	Y-982419	Antarctica	1998	5.153	H4
Yamato 982421	Y-982421	Antarctica	1998	8.282	H4
Yamato 982424	Y-982424	Antarctica	1998	7.298	H5
Yamato 982425	Y-982425	Antarctica	1998	21.30	H4
Yamato 982428	Y-982428	Antarctica	1998	8.844	H3-6
Yamato 982430	Y-982430	Antarctica	1998	4.588	H5
Yamato 982435	Y-982435	Antarctica	1998	140.7	H4
Yamato 982436	Y-982436	Antarctica	1998	35.87	H6
Yamato 982441	Y-982441	Antarctica	1998	4.221	H4
Yamato 982443	Y-982443	Antarctica	1998	7.583	H5
Yamato 982446	Y-982446	Antarctica	1998	9.450	H4
Yamato 982447	Y-982447	Antarctica	1998	7.197	H4-6

Yamato 982449	Y-982449	Antarctica	1998	11.286	L6
Yamato 982450	Y-982450	Antarctica	1998	12.76	L6
Yamato 982451	Y-982451	Antarctica	1998	10.46	L6
Yamato 982452	Y-982452	Antarctica	1998	18.22	H4
Yamato 982453	Y-982453	Antarctica	1998	111.22	H4
Yamato 982454	Y-982454	Antarctica	1998	25.26	H4
Yamato 982455	Y-982455	Antarctica	1998	10.07	H4
Yamato 982456	Y-982456	Antarctica	1998	10.114	H4
Yamato 982457	Y-982457	Antarctica	1998	6.431	H4
Yamato 982458	Y-982458	Antarctica	1998	4.060	H4
Yamato 982460	Y-982460	Antarctica	1998	18.11	H4
Yamato 982462	Y-982462	Antarctica	1998	11.960	H4-6
Yamato 982463	Y-982463	Antarctica	1998	17.92	H4
Yamato 982464	Y-982464	Antarctica	1998	5.020	H5
Yamato 982465	Y-982465	Antarctica	1998	14.66	H4
Yamato 982466	Y-982466	Antarctica	1998	10.60	H4
Yamato 982468	Y-982468	Antarctica	1998	45.55	H4
Yamato 982469	Y-982469	Antarctica	1998	6.782	Eucrite-unbr
Yamato 982473	Y-982473	Antarctica	1998	20.63	L6
Yamato 982474	Y-982474	Antarctica	1998	12.84	H4
Yamato 982475	Y-982475	Antarctica	1998	25.06	H4
Yamato 982477	Y-982477	Antarctica	1998	4.955	H5
Yamato 982478	Y-982478	Antarctica	1998	3.199	H4
Yamato 982479	Y-982479	Antarctica	1998	7.685	H4
Yamato 982482	Y-982482	Antarctica	1998	11.40	H4
Yamato 982483	Y-982483	Antarctica	1998	6.831	H5
Yamato 982484	Y-982484	Antarctica	1998	18.53	H5
Yamato 982485	Y-982485	Antarctica	1998	9.330	H4
Yamato 982486	Y-982486	Antarctica	1998	18.52	H4
Yamato 982487	Y-982487	Antarctica	1998	3.534	L3
Yamato 982488	Y-982488	Antarctica	1998	34.61	H5
Yamato 982489	Y-982489	Antarctica	1998	3.759	H5
Yamato 982490	Y-982490	Antarctica	1998	36.09	L6
Yamato 982491	Y-982491	Antarctica	1998	37.19	H5
Yamato 982492	Y-982492	Antarctica	1998	4.299	LL3
Yamato 982505	Y-982505	Antarctica	1998	3.683	H5
Yamato 982515	Y-982515	Antarctica	1998	5.479	H4
Yamato 982516	Y-982516	Antarctica	1998	4.199	H4
Yamato 982522	Y-982522	Antarctica	1998	6.680	LL3
Yamato 982556	Y-982556	Antarctica	1998	898.8	H4
Yamato 982559	Y-982559	Antarctica	1998	69.54	H4
Yamato 982560	Y-982560	Antarctica	1998	9.671	H4
Yamato 982561	Y-982561	Antarctica	1998	4.306	L5
Yamato 982562	Y-982562	Antarctica	1998	6.797	LL5

Yamato 982563	Y-982563	Antarctica	1998	4.490	H5
Yamato 982564	Y-982564	Antarctica	1998	4.490	H4
Yamato 982585	Y-982585	Antarctica	1998	4.163	CM
Yamato 982591	Y-982591	Antarctica	1998	3.239	CM
Yamato 982609	Y-982609	Antarctica	1998	20.11	H5
Yamato 982611	Y-982611	Antarctica	1998	3.595	H5
Yamato 982612	Y-982612	Antarctica	1998	3.367	H6
Yamato 982623	Y-982623	Antarctica	1998	9.061	H4
Yamato 982624	Y-982624	Antarctica	1998	7.436	H5
Yamato 982625	Y-982625	Antarctica	1998	3.836	H4
Yamato 982630	Y-982630	Antarctica	1998	12.78	LL5
Yamato 982635	Y-982635	Antarctica	1998	4.328	LL5
Yamato 982636	Y-982636	Antarctica	1998	4.518	LL5
Yamato 982637	Y-982637	Antarctica	1998	3.934	LL5
Yamato 982638	Y-982638	Antarctica	1998	4.448	LL5
Yamato 982642	Y-982642	Antarctica	1998	3.606	LL5
Yamato 982650	Y-982650	Antarctica	1998	5.578	H6
Yamato 982651	Y-982651	Antarctica	1998	10.04	L6
Yamato 982656	Y-982656	Antarctica	1998	7.720	H6
Yamato 982659	Y-982659	Antarctica	1998	8.978	L4
Yamato 982660	Y-982660	Antarctica	1998	7.049	H4
Yamato 982661	Y-982661	Antarctica	1998	195.3	H5
Yamato 982662	Y-982662	Antarctica	1998	64.60	LL5
Yamato 982663	Y-982663	Antarctica	1998	11.63	LL5
Yamato 982664	Y-982664	Antarctica	1998	11.53	LL5
Yamato 982665	Y-982665	Antarctica	1998	4.340	LL5
Yamato 982666	Y-982666	Antarctica	1998	4.872	LL5
Yamato 982667	Y-982667	Antarctica	1998	5.081	LL5
Yamato 982668	Y-982668	Antarctica	1998	4.652	LL5
Yamato 982669	Y-982669	Antarctica	1998	6.630	LL5
Yamato 982670	Y-982670	Antarctica	1998	4.112	LL5
Yamato 982671	Y-982671	Antarctica	1998	3.243	LL5
Yamato 982683	Y-982683	Antarctica	1998	0.533	L-melt breccia
Yamato 982690	Y-982690	Antarctica	1998	3.928	Eucrite-pmict
Yamato 982695	Y-982695	Antarctica	1998	3.216	H4
Yamato 982701	Y-982701	Antarctica	1998	12.24	H3
Yamato 982702	Y-982702	Antarctica	1998	16.01	L4
Yamato 982703	Y-982703	Antarctica	1998	14.96	LL3
Yamato 982704	Y-982704	Antarctica	1998	13.20	H4
Yamato 982705	Y-982705	Antarctica	1998	9.539	H4
Yamato 982709	Y-982709	Antarctica	1998	3.649	H5
Yamato 982713	Y-982713	Antarctica	1998	9.653	H6
Yamato 982716	Y-982716	Antarctica	1998	5.383	H6
Yamato 982718	Y-982718	Antarctica	1998	466.0	L5

Yamato 982719	Y-982719	Antarctica	1998	3.890	L6
Yamato 982729	Y-982729	Antarctica	1998	327.7	L5
Yamato 982730	Y-982730	Antarctica	1998	14.81	H4
Yamato 982731	Y-982731	Antarctica	1998	3.562	H5
Yamato 982740	Y-982740	Antarctica	1998	6.918	H3
Yamato 982741	Y-982741	Antarctica	1998	23.97	H6
Yamato 982742	Y-982742	Antarctica	1998	13.12	H4
Yamato 982743	Y-982743	Antarctica	1998	3.805	H6
Yamato 982746	Y-982746	Antarctica	1998	157.5	H6
Yamato 982747	Y-982747	Antarctica	1998	90.38	H5
Yamato 982748	Y-982748	Antarctica	1998	102.9	H5
Yamato 982749	Y-982749	Antarctica	1998	25.10	H5
Yamato 982750	Y-982750	Antarctica	1998	31.81	H5
Yamato 982751	Y-982751	Antarctica	1998	34.04	H5
Yamato 982752	Y-982752	Antarctica	1998	27.19	H5
Yamato 982753	Y-982753	Antarctica	1998	15.35	H5
Yamato 982754	Y-982754	Antarctica	1998	18.16	H5
Yamato 982755	Y-982755	Antarctica	1998	14.00	H5
Yamato 982756	Y-982756	Antarctica	1998	17.48	H5
Yamato 982757	Y-982757	Antarctica	1998	16.15	H5
Yamato 982758	Y-982758	Antarctica	1998	15.33	H5
Yamato 982759	Y-982759	Antarctica	1998	13.75	H5
Yamato 982760	Y-982760	Antarctica	1998	13.73	H5
Yamato 982761	Y-982761	Antarctica	1998	9.525	H5
Yamato 982762	Y-982762	Antarctica	1998	12.24	H5
Yamato 982763	Y-982763	Antarctica	1998	11.74	H5
Yamato 982764	Y-982764	Antarctica	1998	9.359	H5
Yamato 982765	Y-982765	Antarctica	1998	9.375	H5
Yamato 982766	Y-982766	Antarctica	1998	8.411	H5
Yamato 982767	Y-982767	Antarctica	1998	8.351	H5
Yamato 982768	Y-982768	Antarctica	1998	10.90	H5
Yamato 982769	Y-982769	Antarctica	1998	8.969	H5
Yamato 982770	Y-982770	Antarctica	1998	8.603	H5
Yamato 982771	Y-982771	Antarctica	1998	9.657	H5
Yamato 982772	Y-982772	Antarctica	1998	7.432	H5
Yamato 982773	Y-982773	Antarctica	1998	6.962	H5
Yamato 982774	Y-982774	Antarctica	1998	7.754	H5
Yamato 982776	Y-982776	Antarctica	1998	5.615	H4
Yamato 982777	Y-982777	Antarctica	1998	5.164	H4
Yamato 982778	Y-982778	Antarctica	1998	5.883	H4
Yamato 982779	Y-982779	Antarctica	1998	6.818	H4
Yamato 982780	Y-982780	Antarctica	1998	6.380	H4
Yamato 982781	Y-982781	Antarctica	1998	6.755	H3
Yamato 982782	Y-982782	Antarctica	1998	5.124	H4

Yamato 982783	Y-982783	Antarctica	1998	5.505	H3
Yamato 982784	Y-982784	Antarctica	1998	6.244	H4
Yamato 982785	Y-982785	Antarctica	1998	6.005	H4
Yamato 982786	Y-982786	Antarctica	1998	4.226	H4
Yamato 982787	Y-982787	Antarctica	1998	5.486	H4
Yamato 982788	Y-982788	Antarctica	1998	4.434	H4
Yamato 982789	Y-982789	Antarctica	1998	4.881	H4
Yamato 982790	Y-982790	Antarctica	1998	5.921	H4
Yamato 982791	Y-982791	Antarctica	1998	4.440	H4
Yamato 982793	Y-982793	Antarctica	1998	3.636	L6
Yamato 982794	Y-982794	Antarctica	1998	3.259	H4
Yamato 982795	Y-982795	Antarctica	1998	3.580	H4
Yamato 982797	Y-982797	Antarctica	1998	3.482	H4
Yamato 982798	Y-982798	Antarctica	1998	3.719	H4
Yamato 982799	Y-982799	Antarctica	1998	3.065	H4
Yamato 982800	Y-982800	Antarctica	1998	3.128	H4
Yamato 982802	Y-982802	Antarctica	1998	4.268	H4
Yamato 982803	Y-982803	Antarctica	1998	4.090	H4
Yamato 982804	Y-982804	Antarctica	1998	3.086	H4
Yamato 982809	Y-982809	Antarctica	1998	3.002	H4
Yamato 982851	Y-982851	Antarctica	1998	4.963	L3
Yamato 982852	Y-982852	Antarctica	1998	4.577	L6
Yamato 982853	Y-982853	Antarctica	1998	75.67	H5
Yamato 982854	Y-982854	Antarctica	1998	30.25	H5
Yamato 982855	Y-982855	Antarctica	1998	7.947	L5
Yamato 982858	Y-982858	Antarctica	1998	3.450	H5
Yamato 982859	Y-982859	Antarctica	1998	520.0	H4
Yamato 982861	Y-982861	Antarctica	1998	3.905	L6
Yamato 982873	Y-982873	Antarctica	1998	4.425	H3
Yamato 982875	Y-982875	Antarctica	1998	4.707	H3
Yamato 982876	Y-982876	Antarctica	1998	3.788	H4
Yamato 982877	Y-982877	Antarctica	1998	3.116	H4
Yamato 982878	Y-982878	Antarctica	1998	3.897	L3
Yamato 982881	Y-982881	Antarctica	1998	3.031	Ureilite
Yamato 982883	Y-982883	Antarctica	1998	4.814	H5
Yamato 982889	Y-982889	Antarctica	1998	3.804	H4
Yamato 982892	Y-982892	Antarctica	1998	3.618	L6
Yamato 982893	Y-982893	Antarctica	1998	5.124	L6
Yamato 982895	Y-982895	Antarctica	1998	6.452	H4
Yamato 982896	Y-982896	Antarctica	1998	7.407	L3
Yamato 982897	Y-982897	Antarctica	1998	12.19	L3
Yamato 982898	Y-982898	Antarctica	1998	7.500	L3
Yamato 982900	Y-982900	Antarctica	1998	6.128	L3
Yamato 982901	Y-982901	Antarctica	1998	6.308	L3

Yamato 982902	Y-982902	Antarctica	1998	5.308	L3
Yamato 982903	Y-982903	Antarctica	1998	4.755	L3
Yamato 982904	Y-982904	Antarctica	1998	5.398	L3
Yamato 982905	Y-982905	Antarctica	1998	3.679	L3
Yamato 982907	Y-982907	Antarctica	1998	3.526	L3
Yamato 982913	Y-982913	Antarctica	1998	3.433	L5
Yamato 982914	Y-982914	Antarctica	1998	97.21	H4
Yamato 982917	Y-982917	Antarctica	1998	6.843	H4
Yamato 982922	Y-982922	Antarctica	1998	4.680	H5
Yamato 982923	Y-982923	Antarctica	1998	265.8	L5
Yamato 982925	Y-982925	Antarctica	1998	4.940	H5
Yamato 982926	Y-982926	Antarctica	1998	3.351	H5
Yamato 982929	Y-982929	Antarctica	1998	3.318	H4
Yamato 982932	Y-982932	Antarctica	1998	66.65	H5
Yamato 982934	Y-982934	Antarctica	1998	4.617	H5
Yamato 982936	Y-982936	Antarctica	1998	11.28	H5
Yamato 982937	Y-982937	Antarctica	1998	6.825	H5
Yamato 982938	Y-982938	Antarctica	1998	4.319	H4
Yamato 982939	Y-982939	Antarctica	1998	8.580	L5
Yamato 982948	Y-982948	Antarctica	1998	586.9	L6
Yamato 982952	Y-982952	Antarctica	1998	4.287	H5
Yamato 982959	Y-982959	Antarctica	1998	3.367	L5
Yamato 982960	Y-982960	Antarctica	1998	14.70	H5
Yamato 982965	Y-982965	Antarctica	1998	38.31	H4
Yamato 982967	Y-982967	Antarctica	1998	6.741	H4
Yamato 982968	Y-982968	Antarctica	1998	4.781	H4
Yamato 982970	Y-982970	Antarctica	1998	4.015	H4
Yamato 982975	Y-982975	Antarctica	1998	20.69	H5
Yamato 982977	Y-982977	Antarctica	1998	186.1	H5
Yamato 982978	Y-982978	Antarctica	1998	72.16	H5
Yamato 982979	Y-982979	Antarctica	1998	46.03	H5
Yamato 982980	Y-982980	Antarctica	1998	14.55	H5
Yamato 982981	Y-982981	Antarctica	1998	9.864	H5
Yamato 982982	Y-982982	Antarctica	1998	10.97	H5
Yamato 982983	Y-982983	Antarctica	1998	8.375	H5
Yamato 982984	Y-982984	Antarctica	1998	8.522	H5
Yamato 982985	Y-982985	Antarctica	1998	8.063	H5
Yamato 982986	Y-982986	Antarctica	1998	7.393	H5
Yamato 982987	Y-982987	Antarctica	1998	5.825	H5
Yamato 982988	Y-982988	Antarctica	1998	3.797	H5
Yamato 982989	Y-982989	Antarctica	1998	4.882	H5
Yamato 982990	Y-982990	Antarctica	1998	3.502	H5
Yamato 982991	Y-982991	Antarctica	1998	4.894	H5
Yamato 982992	Y-982992	Antarctica	1998	3.198	H5

Yamato 982993	Y-982993	Antarctica	1998	3.339	H5
Yamato 982996	Y-982996	Antarctica	1998	3.105	H5
Yamato 983012	Y-983012	Antarctica	1998	26.29	H5
Yamato 983014	Y-983014	Antarctica	1998	31.66	H5
Yamato 983016	Y-983016	Antarctica	1998	17.53	H4
Yamato 983018	Y-983018	Antarctica	1998	5.602	H5
Yamato 983019	Y-983019	Antarctica	1998	3.274	H5
Yamato 983020	Y-983020	Antarctica	1998	4.370	H5
Yamato 983023	Y-983023	Antarctica	1998	3.729	LL6
Yamato 983025	Y-983025	Antarctica	1998	3.465	H5
Yamato 983027	Y-983027	Antarctica	1998	4.839	LL3
Yamato 983028	Y-983028	Antarctica	1998	201.3	L6
Yamato 983029	Y-983029	Antarctica	1998	144.5	L6
Yamato 983034	Y-983034	Antarctica	1998	4.488	H5
Yamato 983035	Y-983035	Antarctica	1998	3.523	H5
Yamato 983036	Y-983036	Antarctica	1998	45.45	H5
Yamato 983037	Y-983037	Antarctica	1998	579.7	L6
Yamato 983041	Y-983041	Antarctica	1998	3.213	H6
Yamato 983044	Y-983044	Antarctica	1998	12.78	H5
Yamato 983047	Y-983047	Antarctica	1998	8.143	H5
Yamato 983048	Y-983048	Antarctica	1998	6.107	H6
Yamato 983049	Y-983049	Antarctica	1998	4.064	H6
Yamato 983051	Y-983051	Antarctica	1998	17.58	H5
Yamato 983052	Y-983052	Antarctica	1998	16.80	H6
Yamato 983054	Y-983054	Antarctica	1998	233.5	H6
Yamato 983055	Y-983055	Antarctica	1998	4.147	H5
Yamato 983056	Y-983056	Antarctica	1998	362.4	H5
Yamato 983063	Y-983063	Antarctica	1998	3.382	LL3
Yamato 983064	Y-983064	Antarctica	1998	40.94	L6
Yamato 983066	Y-983066	Antarctica	1998	7.022	H6
Yamato 983067	Y-983067	Antarctica	1998	4.907	H6
Yamato 983068	Y-983068	Antarctica	1998	3.428	H6
Yamato 983069	Y-983069	Antarctica	1998	18.72	H6
Yamato 983071	Y-983071	Antarctica	1998	5.877	H6
Yamato 983072	Y-983072	Antarctica	1998	5.825	H4
Yamato 983073	Y-983073	Antarctica	1998	112.9	L6
Yamato 983075	Y-983075	Antarctica	1998	3.687	L6
Yamato 983077	Y-983077	Antarctica	1998	4.802	L6
Yamato 983084	Y-983084	Antarctica	1998	604.1	H5
Yamato 983088	Y-983088	Antarctica	1998	5.620	H3
Yamato 983090	Y-983090	Antarctica	1998	6.815	H4
Yamato 983093	Y-983093	Antarctica	1998	308.6	H5
Yamato 983094	Y-983094	Antarctica	1998	4.338	H4
Yamato 983095	Y-983095	Antarctica	1998	3.252	H4

Yamato 983097	Y-983097	Antarctica	1998	18.04	R5
Yamato 983098	Y-983098	Antarctica	1998	4.423	H5
Yamato 983099	Y-983099	Antarctica	1998	310.0	H6
Yamato 983101	Y-983101	Antarctica	1998	72.75	H6
Yamato 983102	Y-983102	Antarctica	1998	24.24	Diogenite
Yamato 983104	Y-983104	Antarctica	1998	5.051	L3
Yamato 983105	Y-983105	Antarctica	1998	7.105	L6
Yamato 983106	Y-983106	Antarctica	1998	18.60	H5
Yamato 983109	Y-983109	Antarctica	1998	7.164	H5
Yamato 983111	Y-983111	Antarctica	1998	3.760	H3
Yamato 983112	Y-983112	Antarctica	1998	6.553	H3
Yamato 983113	Y-983113	Antarctica	1998	88.62	L6
Yamato 983114	Y-983114	Antarctica	1998	20.55	L3
Yamato 983118	Y-983118	Antarctica	1998	8.382	H5
Yamato 983119	Y-983119	Antarctica	1998	52.55	Lodranite
Yamato 983121	Y-983121	Antarctica	1998	3.667	H4
Yamato 983122	Y-983122	Antarctica	1998	41.28	H5
Yamato 983123	Y-983123	Antarctica	1998	12.26	H3
Yamato 983125	Y-983125	Antarctica	1998	358.0	H6
Yamato 983126	Y-983126	Antarctica	1998	63.37	L6
Yamato 983127	Y-983127	Antarctica	1998	55.95	H5
Yamato 983128	Y-983128	Antarctica	1998	43.59	L6
Yamato 983129	Y-983129	Antarctica	1998	5.387	L6
Yamato 983132	Y-983132	Antarctica	1998	129.6	L6
Yamato 983133	Y-983133	Antarctica	1998	366.6	H6
Yamato 983137	Y-983137	Antarctica	1998	69.89	H6
Yamato 983139	Y-983139	Antarctica	1998	16.90	H6
Yamato 983140	Y-983140	Antarctica	1998	14.28	H6
Yamato 983141	Y-983141	Antarctica	1998	15.35	H5
Yamato 983142	Y-983142	Antarctica	1998	15.79	H6
Yamato 983143	Y-983143	Antarctica	1998	7.163	H6
Yamato 983144	Y-983144	Antarctica	1998	12.95	H6
Yamato 983145	Y-983145	Antarctica	1998	7.084	H6
Yamato 983146	Y-983146	Antarctica	1998	7.436	L5
Yamato 983147	Y-983147	Antarctica	1998	6.127	H6
Yamato 983148	Y-983148	Antarctica	1998	5.106	H6
Yamato 983149	Y-983149	Antarctica	1998	4.632	H6
Yamato 983150	Y-983150	Antarctica	1998	4.172	H6
Yamato 983151	Y-983151	Antarctica	1998	3.621	H5
Yamato 983152	Y-983152	Antarctica	1998	3.207	H5
Yamato 983159	Y-983159	Antarctica	1998	5.587	H6
Yamato 983162	Y-983162	Antarctica	1998	5.064	H6
Yamato 983163	Y-983163	Antarctica	1998	3.179	H6
Yamato 983164	Y-983164	Antarctica	1998	11.64	H6

Yamato 983166	Y-983166	Antarctica	1998	3.426	R4
Yamato 983167	Y-983167	Antarctica	1998	27.84	L6
Yamato 983168	Y-983168	Antarctica	1998	15.29	H6
Yamato 983169	Y-983169	Antarctica	1998	7.602	H6
Yamato 983170	Y-983170	Antarctica	1998	4.362	H6
Yamato 983173	Y-983173	Antarctica	1998	20.24	H6
Yamato 983174	Y-983174	Antarctica	1998	8.367	H6
Yamato 983175	Y-983175	Antarctica	1998	7.194	H6
Yamato 983176	Y-983176	Antarctica	1998	5.799	H6
Yamato 983178	Y-983178	Antarctica	1998	6.180	H6
Yamato 983179	Y-983179	Antarctica	1998	6.617	H6
Yamato 983180	Y-983180	Antarctica	1998	7.273	H5
Yamato 983181	Y-983181	Antarctica	1998	17.37	H5
Yamato 983182	Y-983182	Antarctica	1998	20.72	L5
Yamato 983183	Y-983183	Antarctica	1998	142.9	LL3
Yamato 983184	Y-983184	Antarctica	1998	18.16	H4
Yamato 983185	Y-983185	Antarctica	1998	11.09	H4
Yamato 983186	Y-983186	Antarctica	1998	39.89	L6
Yamato 983187	Y-983187	Antarctica	1998	50.30	H4
Yamato 983188	Y-983188	Antarctica	1998	17.96	L6
Yamato 983189	Y-983189	Antarctica	1998	14.73	H5
Yamato 983190	Y-983190	Antarctica	1998	13.99	L-melt breccia
Yamato 983191	Y-983191	Antarctica	1998	6.687	H4
Yamato 983192	Y-983192	Antarctica	1998	3.810	H
Yamato 983194	Y-983194	Antarctica	1998	10.61	H
Yamato 983196	Y-983196	Antarctica	1998	29.61	H4
Yamato 983197	Y-983197	Antarctica	1998	34.78	L6
Yamato 983198	Y-983198	Antarctica	1998	4.089	L6
Yamato 983199	Y-983199	Antarctica	1998	19.32	L6
Yamato 983200	Y-983200	Antarctica	1998	6.231	H5
Yamato 983201	Y-983201	Antarctica	1998	67.36	H6
Yamato 983202	Y-983202	Antarctica	1998	17.32	H5
Yamato 983203	Y-983203	Antarctica	1998	17.34	H5
Yamato 983204	Y-983204	Antarctica	1998	12.90	H5
Yamato 983205	Y-983205	Antarctica	1998	12.02	H5
Yamato 983206	Y-983206	Antarctica	1998	10.53	H5
Yamato 983207	Y-983207	Antarctica	1998	10.42	H5
Yamato 983208	Y-983208	Antarctica	1998	7.559	H5
Yamato 983209	Y-983209	Antarctica	1998	7.267	H5
Yamato 983211	Y-983211	Antarctica	1998	9.388	H4
Yamato 983212	Y-983212	Antarctica	1998	9.784	H
Yamato 983213	Y-983213	Antarctica	1998	5.479	LL-melt breccia
Yamato 983215	Y-983215	Antarctica	1998	70.84	H5
Yamato 983217	Y-983217	Antarctica	1998	9.936	H5

Yamato 983219	Y-983219	Antarctica	1998	12.35	H5
Yamato 983220	Y-983220	Antarctica	1998	232.1	L-melt breccia
Yamato 983221	Y-983221	Antarctica	1998	40.41	L5
Yamato 983222	Y-983222	Antarctica	1998	5.765	H6
Yamato 983223	Y-983223	Antarctica	1998	12.17	LL6
Yamato 983224	Y-983224	Antarctica	1998	53.06	H5
Yamato 983225	Y-983225	Antarctica	1998	46.47	H5
Yamato 983226	Y-983226	Antarctica	1998	26.71	L6
Yamato 983228	Y-983228	Antarctica	1998	3.282	H5
Yamato 983231	Y-983231	Antarctica	1998	60.92	H5
Yamato 983233	Y-983233	Antarctica	1998	16.44	H5
Yamato 983234	Y-983234	Antarctica	1998	27.15	H5
Yamato 983235	Y-983235	Antarctica	1998	3.498	R4
Yamato 983236	Y-983236	Antarctica	1998	47.71	H5
Yamato 983238	Y-983238	Antarctica	1998	4.303	L6
Yamato 983245	Y-983245	Antarctica	1998	9.150	H5
Yamato 983247	Y-983247	Antarctica	1998	208.8	H5
Yamato 983249	Y-983249	Antarctica	1998	26.34	H6
Yamato 983250	Y-983250	Antarctica	1998	509.7	LL-melt breccia
Yamato 983251	Y-983251	Antarctica	1998	3.864	L5
Yamato 983252	Y-983252	Antarctica	1998	17.23	H6
Yamato 983253	Y-983253	Antarctica	1998	83.49	L5
Yamato 983257	Y-983257	Antarctica	1998	12.01	L6
Yamato 983259	Y-983259	Antarctica	1998	15.23	H4
Yamato 983261	Y-983261	Antarctica	1998	9.487	H6
Yamato 983262	Y-983262	Antarctica	1998	83.21	H6
Yamato 983263	Y-983263	Antarctica	1998	515.1	H4
Yamato 983265	Y-983265	Antarctica	1998	10.82	H6
Yamato 983266	Y-983266	Antarctica	1998	20.54	H6
Yamato 983267	Y-983267	Antarctica	1998	27.03	LL6
Yamato 983268	Y-983268	Antarctica	1998	11.44	H4
Yamato 983269	Y-983269	Antarctica	1998	109.9	L6
Yamato 983270	Y-983270	Antarctica	1998	26.40	R4
Yamato 983271	Y-983271	Antarctica	1998	16.63	L6
Yamato 983272	Y-983272	Antarctica	1998	109.7	LL-melt breccia
Yamato 983273	Y-983273	Antarctica	1998	189.8	H6
Yamato 983274	Y-983274	Antarctica	1998	42.74	H6
Yamato 983275	Y-983275	Antarctica	1998	23.74	L6
Yamato 983276	Y-983276	Antarctica	1998	110.9	H3
Yamato 983277	Y-983277	Antarctica	1998	146.0	L6
Yamato 983278	Y-983278	Antarctica	1998	39.54	LL3
Yamato 983279	Y-983279	Antarctica	1998	252.9	H6
Yamato 983280	Y-983280	Antarctica	1998	133.6	L5
Yamato 983281	Y-983281	Antarctica	1998	14.58	L6

Yamato 983282	Y-983282	Antarctica	1998	28.15	H4
Yamato 983283	Y-983283	Antarctica	1998	54.65	L6
Yamato 983284	Y-983284	Antarctica	1998	18.82	H6
Yamato 983285	Y-983285	Antarctica	1998	7.775	L4
Yamato 983286	Y-983286	Antarctica	1998	309.0	LL6
Yamato 983288	Y-983288	Antarctica	1998	4.518	LL6
Yamato 983289	Y-983289	Antarctica	1998	210.4	L4
Yamato 983290	Y-983290	Antarctica	1998	5.874	H5
Yamato 983291	Y-983291	Antarctica	1998	101.1	H5
Yamato 983292	Y-983292	Antarctica	1998	29.24	H5
Yamato 983293	Y-983293	Antarctica	1998	14.10	Eucrite-pmict
Yamato 983301	Y-983301	Antarctica	1998	37.33	H5
Yamato 983302	Y-983302	Antarctica	1998	31.33	H6
Yamato 983305	Y-983305	Antarctica	1998	34.76	H4-6
Yamato 983307	Y-983307	Antarctica	1998	38.04	H6
Yamato 983309	Y-983309	Antarctica	1998	3.376	H6
Yamato 983311	Y-983311	Antarctica	1998	4.402	H4
Yamato 983312	Y-983312	Antarctica	1998	42.60	L/LL3
Yamato 983313	Y-983313	Antarctica	1998	3.595	H4
Yamato 983314	Y-983314	Antarctica	1998	42.95	LL
Yamato 983315	Y-983315	Antarctica	1998	29.44	L6
Yamato 983316	Y-983316	Antarctica	1998	5.342	H6
Yamato 983317	Y-983317	Antarctica	1998	19.94	H6
Yamato 983319	Y-983319	Antarctica	1998	14.40	H5
Yamato 983320	Y-983320	Antarctica	1998	81.35	H3
Yamato 983321	Y-983321	Antarctica	1998	9.161	H5
Yamato 983322	Y-983322	Antarctica	1998	37.42	H4
Yamato 983323	Y-983323	Antarctica	1998	9.914	H4
Yamato 983324	Y-983324	Antarctica	1998	18.09	H3
Yamato 983325	Y-983325	Antarctica	1998	5.210	L6
Yamato 983327	Y-983327	Antarctica	1998	5.931	Winonaite
Yamato 983328	Y-983328	Antarctica	1998	5.902	H5
Yamato 983329	Y-983329	Antarctica	1998	20.35	H5
Yamato 983330	Y-983330	Antarctica	1998	4.240	H4
Yamato 983334	Y-983334	Antarctica	1998	3.455	L4
Yamato 983336	Y-983336	Antarctica	1998	13.35	H/L5
Yamato 983338	Y-983338	Antarctica	1998	398.0	L4
Yamato 983339	Y-983339	Antarctica	1998	36.96	H5
Yamato 983340	Y-983340	Antarctica	1998	5.693	LL6
Yamato 983341	Y-983341	Antarctica	1998	23.11	H4
Yamato 983342	Y-983342	Antarctica	1998	185.5	H4
Yamato 983343	Y-983343	Antarctica	1998	6.924	H4
Yamato 983344	Y-983344	Antarctica	1998	9.510	H4
Yamato 983348	Y-983348	Antarctica	1998	10.94	L5

Yamato 983349	Y-983349	Antarctica	1998	98.29	H4
Yamato 983350	Y-983350	Antarctica	1998	45.33	H4
Yamato 983351	Y-983351	Antarctica	1998	7.795	H4
Yamato 983352	Y-983352	Antarctica	1998	47.80	Eucrite-br
Yamato 983354	Y-983354	Antarctica	1998	14.50	L6
Yamato 983356	Y-983356	Antarctica	1998	3.359	H6
Yamato 983360	Y-983360	Antarctica	1998	5.663	H6
Yamato 983363	Y-983363	Antarctica	1998	5.389	H5
Yamato 983364	Y-983364	Antarctica	1998	28.46	L4
Yamato 983365	Y-983365	Antarctica	1998	12.12	H5
Yamato 983366	Y-983366	Antarctica	1998	138.9	Eucrite-unbr
Yamato 983367	Y-983367	Antarctica	1998	418.3	LL3
Yamato 983368	Y-983368	Antarctica	1998	24.20	L6
Yamato 983369	Y-983369	Antarctica	1998	8.002	L6
Yamato 983375	Y-983375	Antarctica	1998	15.91	L6
Yamato 983376	Y-983376	Antarctica	1998	5.506	L6
Yamato 983377	Y-983377	Antarctica	1998	4.173	H6
Yamato 983378	Y-983378	Antarctica	1998	11.91	H4
Yamato 983380	Y-983380	Antarctica	1998	20.71	L4
Yamato 983381	Y-983381	Antarctica	1998	12.45	H5
Yamato 983382	Y-983382	Antarctica	1998	3.636	L6
Yamato 983384	Y-983384	Antarctica	1998	4.907	H4
Yamato 983388	Y-983388	Antarctica	1998	5.357	H/L6
Yamato 983389	Y-983389	Antarctica	1998	14.96	H4
Yamato 983390	Y-983390	Antarctica	1998	13.18	LL6
Yamato 983393	Y-983393	Antarctica	1998	9.243	LL-melt breccia
Yamato 983394	Y-983394	Antarctica	1998	43.18	LL6
Yamato 983396	Y-983396	Antarctica	1998	80.64	LL3
Yamato 983397	Y-983397	Antarctica	1998	31.90	L5
Yamato 983399	Y-983399	Antarctica	1998	4.787	H6
Yamato 983402	Y-983402	Antarctica	1998	5.603	LL6
Yamato 983404	Y-983404	Antarctica	1998	9.207	L6
Yamato 983405	Y-983405	Antarctica	1998	66.23	H3
Yamato 983406	Y-983406	Antarctica	1998	34.42	LL-melt breccia
Yamato 983407	Y-983407	Antarctica	1998	4.546	H4
Yamato 983408	Y-983408	Antarctica	1998	15.60	H-melt breccia
Yamato 983409	Y-983409	Antarctica	1998	99.98	H5
Yamato 983410	Y-983410	Antarctica	1998	16.55	H4
Yamato 983411	Y-983411	Antarctica	1998	5.645	H4
Yamato 983413	Y-983413	Antarctica	1998	5.514	H5
Yamato 983415	Y-983415	Antarctica	1998	5.485	H6
Yamato 983416	Y-983416	Antarctica	1998	7.563	LL6
Yamato 983417	Y-983417	Antarctica	1998	5.310	LL-melt breccia
Yamato 983418	Y-983418	Antarctica	1998	42.39	H6

Yamato 983419	Y-983419	Antarctica	1998	29.47	H6
Yamato 983420	Y-983420	Antarctica	1998	68.04	H3
Yamato 983421	Y-983421	Antarctica	1998	4.958	LL-melt breccia
Yamato 983422	Y-983422	Antarctica	1998	11.51	H4
Yamato 983423	Y-983423	Antarctica	1998	22.89	L5
Yamato 983425	Y-983425	Antarctica	1998	23.87	H6
Yamato 983426	Y-983426	Antarctica	1998	13.26	H6
Yamato 983427	Y-983427	Antarctica	1998	23.28	H4
Yamato 983428	Y-983428	Antarctica	1998	26.51	H5
Yamato 983430	Y-983430	Antarctica	1998	3.240	H/L5
Yamato 983432	Y-983432	Antarctica	1998	4.212	H5
Yamato 983434	Y-983434	Antarctica	1998	25.84	H5
Yamato 983437	Y-983437	Antarctica	1998	40.43	H5
Yamato 983438	Y-983438	Antarctica	1998	19.14	H6
Yamato 983439	Y-983439	Antarctica	1998	4.101	H4
Yamato 983442	Y-983442	Antarctica	1998	23.53	H6
Yamato 983443	Y-983443	Antarctica	1998	3.039	H6
Yamato 983445	Y-983445	Antarctica	1998	7.467	H6
Yamato 983446	Y-983446	Antarctica	1998	5.581	H6
Yamato 983447	Y-983447	Antarctica	1998	3.072	H6
Yamato 983448	Y-983448	Antarctica	1998	33.43	L5
Yamato 983449	Y-983449	Antarctica	1998	4.950	H6
Yamato 983450	Y-983450	Antarctica	1998	11.03	H6
Yamato 983451	Y-983451	Antarctica	1998	6.409	H6
Yamato 983452	Y-983452	Antarctica	1998	4.888	H6
Yamato 983453	Y-983453	Antarctica	1998	4.446	H6
Yamato 983455	Y-983455	Antarctica	1998	3.328	H6
Yamato 983457	Y-983457	Antarctica	1998	31.15	H4
Yamato 983458	Y-983458	Antarctica	1998	3.343	H5
Yamato 983459	Y-983459	Antarctica	1998	9.417	L6
Yamato 983460	Y-983460	Antarctica	1998	4.883	LL5
Yamato 983461	Y-983461	Antarctica	1998	7.622	L6
Yamato 983462	Y-983462	Antarctica	1998	3.573	H4
Yamato 983463	Y-983463	Antarctica	1998	13.06	LL6
Yamato 983465	Y-983465	Antarctica	1998	8.586	L6
Yamato 983466	Y-983466	Antarctica	1998	16.65	L6
Yamato 983467	Y-983467	Antarctica	1998	5.398	H6
Yamato 983470	Y-983470	Antarctica	1998	11.19	H6
Yamato 983472	Y-983472	Antarctica	1998	11.38	H5
Yamato 983473	Y-983473	Antarctica	1998	9.813	H4
Yamato 983474	Y-983474	Antarctica	1998	3.613	H5
Yamato 983475	Y-983475	Antarctica	1998	4.306	H5
Yamato 983476	Y-983476	Antarctica	1998	16.91	H4
Yamato 983478	Y-983478	Antarctica	1998	10.40	L5

Yamato 983481	Y-983481	Antarctica	1998	168.2	H5
Yamato 983482	Y-983482	Antarctica	1998	223.7	H5
Yamato 983484	Y-983484	Antarctica	1998	110.8	LL5
Yamato 983485	Y-983485	Antarctica	1998	9.453	H5
Yamato 983486	Y-983486	Antarctica	1998	8.412	H5
Yamato 983487	Y-983487	Antarctica	1998	9.307	H5
Yamato 983488	Y-983488	Antarctica	1998	84.86	L5
Yamato 983489	Y-983489	Antarctica	1998	7.058	H4
Yamato 983490	Y-983490	Antarctica	1998	4.544	H6
Yamato 983491	Y-983491	Antarctica	1998	53.39	L5
Yamato 983492	Y-983492	Antarctica	1998	31.39	L5
Yamato 983493	Y-983493	Antarctica	1998	28.13	L5
Yamato 983494	Y-983494	Antarctica	1998	32.01	H5
Yamato 983495	Y-983495	Antarctica	1998	8.283	L5
Yamato 983497	Y-983497	Antarctica	1998	4.003	L5
Yamato 983498	Y-983498	Antarctica	1998	7.489	L5
Yamato 983499	Y-983499	Antarctica	1998	40.94	L/LL3
Yamato 983500	Y-983500	Antarctica	1998	232.7	L5
Yamato 983501	Y-983501	Antarctica	1998	12.68	H6
Yamato 983502	Y-983502	Antarctica	1998	3.170	L6
Yamato 983504	Y-983504	Antarctica	1998	40.77	H5
Yamato 983505	Y-983505	Antarctica	1998	42.53	H4
Yamato 983506	Y-983506	Antarctica	1998	96.02	H5
Yamato 983507	Y-983507	Antarctica	1998	65.24	H5
Yamato 983508	Y-983508	Antarctica	1998	4.866	LL
Yamato 983509	Y-983509	Antarctica	1998	30.75	H5
Yamato 983510	Y-983510	Antarctica	1998	6.696	H4
Yamato 983512	Y-983512	Antarctica	1998	12.70	H4
Yamato 983513	Y-983513	Antarctica	1998	4.658	H4
Yamato 983514	Y-983514	Antarctica	1998	26.65	H4
Yamato 983515	Y-983515	Antarctica	1998	20.65	H5
Yamato 983516	Y-983516	Antarctica	1998	4.097	H4
Yamato 983518	Y-983518	Antarctica	1998	38.57	H4
Yamato 983519	Y-983519	Antarctica	1998	51.25	H4
Yamato 983520	Y-983520	Antarctica	1998	6.272	L6
Yamato 983522	Y-983522	Antarctica	1998	57.37	H5
Yamato 983523	Y-983523	Antarctica	1998	26.06	H5
Yamato 983524	Y-983524	Antarctica	1998	8.105	H4
Yamato 983525	Y-983525	Antarctica	1998	7.780	H4
Yamato 983526	Y-983526	Antarctica	1998	29.17	H4
Yamato 983527	Y-983527	Antarctica	1998	24.78	H4
Yamato 983528	Y-983528	Antarctica	1998	3.274	L6
Yamato 983530	Y-983530	Antarctica	1998	39.71	H4
Yamato 983531	Y-983531	Antarctica	1998	62.61	H4

Yamato 983532	Y-983532	Antarctica	1998	3.664	LL-melt breccia
Yamato 983533	Y-983533	Antarctica	1998	16.87	LL-melt breccia
Yamato 983534	Y-983534	Antarctica	1998	13.61	Eucrite-br
Yamato 983535	Y-983535	Antarctica	1998	52.21	H3
Yamato 983537	Y-983537	Antarctica	1998	197.2	H4
Yamato 983539	Y-983539	Antarctica	1998	3.247	H4
Yamato 983540	Y-983540	Antarctica	1998	91.70	H4
Yamato 983541	Y-983541	Antarctica	1998	60.63	H5
Yamato 983543	Y-983543	Antarctica	1998	11.25	H6
Yamato 983544	Y-983544	Antarctica	1998	6.871	H5
Yamato 983545	Y-983545	Antarctica	1998	9.976	H5
Yamato 983548	Y-983548	Antarctica	1998	15.92	H5
Yamato 983551	Y-983551	Antarctica	1998	6.906	H/L6
Yamato 983552	Y-983552	Antarctica	1998	9.977	L6
Yamato 983555	Y-983555	Antarctica	1998	7.095	H6
Yamato 983556	Y-983556	Antarctica	1998	4.063	H5
Yamato 983557	Y-983557	Antarctica	1998	89.13	H6
Yamato 983558	Y-983558	Antarctica	1998	5.191	H6
Yamato 983559	Y-983559	Antarctica	1998	4.401	H5
Yamato 983561	Y-983561	Antarctica	1998	25.88	H5
Yamato 983562	Y-983562	Antarctica	1998	24.26	H5
Yamato 983563	Y-983563	Antarctica	1998	34.54	H5
Yamato 983564	Y-983564	Antarctica	1998	5.013	LL6
Yamato 983565	Y-983565	Antarctica	1998	6.980	H5
Yamato 983567	Y-983567	Antarctica	1998	4.983	H6
Yamato 983569	Y-983569	Antarctica	1998	190.5	H5
Yamato 983572	Y-983572	Antarctica	1998	8.188	H5
Yamato 983573	Y-983573	Antarctica	1998	10.71	H4
Yamato 983574	Y-983574	Antarctica	1998	7.402	H5
Yamato 983577	Y-983577	Antarctica	1998	3.467	H3
Yamato 983578	Y-983578	Antarctica	1998	9.981	H3
Yamato 983579	Y-983579	Antarctica	1998	11.08	H4
Yamato 983580	Y-983580	Antarctica	1998	31.25	L6
Yamato 983581	Y-983581	Antarctica	1998	29.28	L6
Yamato 983583	Y-983583	Antarctica	1998	4.498	H5
Yamato 983584	Y-983584	Antarctica	1998	11.39	L6
Yamato 983585	Y-983585	Antarctica	1998	41.83	L5
Yamato 983586	Y-983586	Antarctica	1998	3.470	L6
Yamato 983587	Y-983587	Antarctica	1998	20.38	H6
Yamato 983588	Y-983588	Antarctica	1998	13.88	H6
Yamato 983589	Y-983589	Antarctica	1998	35.16	CO3
Yamato 983591	Y-983591	Antarctica	1998	12.46	LL4
Yamato 983592	Y-983592	Antarctica	1998	76.83	H4
Yamato 983593	Y-983593	Antarctica	1998	26.34	L5

Yamato 983594	Y-983594	Antarctica	1998	5.822	LL-melt breccia
Yamato 983595	Y-983595	Antarctica	1998	8.386	L-melt breccia
Yamato 983596	Y-983596	Antarctica	1998	29.98	H5
Yamato 983597	Y-983597	Antarctica	1998	30.86	H5
Yamato 983598	Y-983598	Antarctica	1998	8.805	L5/6
Yamato 983599	Y-983599	Antarctica	1998	57.28	H5
Yamato 983600	Y-983600	Antarctica	1998	26.33	H5
Yamato 983601	Y-983601	Antarctica	1998	43.17	H6
Yamato 983602	Y-983602	Antarctica	1998	11.91	H6
Yamato 983603	Y-983603	Antarctica	1998	14.18	H6
Yamato 983604	Y-983604	Antarctica	1998	12.38	H4
Yamato 983606	Y-983606	Antarctica	1998	86.63	H4
Yamato 983607	Y-983607	Antarctica	1998	12.24	H4
Yamato 983608	Y-983608	Antarctica	1998	10.13	H4
Yamato 983609	Y-983609	Antarctica	1998	7.337	LL-melt breccia
Yamato 983610	Y-983610	Antarctica	1998	11.54	L6
Yamato 983611	Y-983611	Antarctica	1998	41.42	H4
Yamato 983612	Y-983612	Antarctica	1998	12.33	H4
Yamato 983618	Y-983618	Antarctica	1998	4.757	H6
Yamato 983619	Y-983619	Antarctica	1998	12.09	H6
Yamato 983620	Y-983620	Antarctica	1998	141.5	L6
Yamato 983621	Y-983621	Antarctica	1998	9.048	H6
Yamato 983622	Y-983622	Antarctica	1998	8.539	H5
Yamato 983623	Y-983623	Antarctica	1998	9.916	H5
Yamato 983624	Y-983624	Antarctica	1998	13.32	H6
Yamato 983626	Y-983626	Antarctica	1998	15.69	L6
Yamato 983627	Y-983627	Antarctica	1998	10.80	H5
Yamato 983628	Y-983628	Antarctica	1998	21.91	H6
Yamato 983629	Y-983629	Antarctica	1998	4.455	H/L6
Yamato 983630	Y-983630	Antarctica	1998	22.77	H6
Yamato 983632	Y-983632	Antarctica	1998	3.338	LL-melt breccia
Yamato 983634	Y-983634	Antarctica	1998	14.69	LL-melt breccia
Yamato 983635	Y-983635	Antarctica	1998	11.67	LL-melt breccia
Yamato 983636	Y-983636	Antarctica	1998	8.992	LL-melt breccia
Yamato 983637	Y-983637	Antarctica	1998	6.899	LL-melt breccia
Yamato 983638	Y-983638	Antarctica	1998	41.52	LL-melt breccia
Yamato 983639	Y-983639	Antarctica	1998	8.588	LL-melt breccia
Yamato 983640	Y-983640	Antarctica	1998	8.442	LL-melt breccia
Yamato 983642	Y-983642	Antarctica	1998	7.504	LL-melt breccia
Yamato 983643	Y-983643	Antarctica	1998	4.614	LL-melt breccia
Yamato 983644	Y-983644	Antarctica	1998	14.95	H5
Yamato 983645	Y-983645	Antarctica	1998	164.9	H5
Yamato 983646	Y-983646	Antarctica	1998	7.272	H6
Yamato 983647	Y-983647	Antarctica	1998	15.06	H4

Yamato 983648	Y-983648	Antarctica	1998	12.57	H5
Yamato 983649	Y-983649	Antarctica	1998	94.35	L6
Yamato 983650	Y-983650	Antarctica	1998	3.347	H4
Yamato 983651	Y-983651	Antarctica	1998	7.127	H6
Yamato 983652	Y-983652	Antarctica	1998	17.32	H6
Yamato 983653	Y-983653	Antarctica	1998	8.884	H6
Yamato 983654	Y-983654	Antarctica	1998	14.01	L6
Yamato 983655	Y-983655	Antarctica	1998	4.647	H5
Yamato 983658	Y-983658	Antarctica	1998	7.207	LL6
Yamato 983659	Y-983659	Antarctica	1998	29.79	H4
Yamato 983660	Y-983660	Antarctica	1998	28.88	H4
Yamato 983662	Y-983662	Antarctica	1998	8.247	H4
Yamato 983663	Y-983663	Antarctica	1998	9.600	LL-melt breccia
Yamato 983664	Y-983664	Antarctica	1998	3.452	L-melt breccia
Yamato 983665	Y-983665	Antarctica	1998	6.080	H5
Yamato 983666	Y-983666	Antarctica	1998	8.355	LL-melt breccia
Yamato 983667	Y-983667	Antarctica	1998	7.425	LL-melt breccia
Yamato 983668	Y-983668	Antarctica	1998	7.746	LL-melt breccia
Yamato 983673	Y-983673	Antarctica	1998	11.84	LL-melt breccia
Yamato 983674	Y-983674	Antarctica	1998	8.207	LL-melt breccia
Yamato 983675	Y-983675	Antarctica	1998	5.368	LL-melt breccia
Yamato 983676	Y-983676	Antarctica	1998	3.700	LL-melt breccia
Yamato 983677	Y-983677	Antarctica	1998	4.216	LL-melt breccia
Yamato 983678	Y-983678	Antarctica	1998	5.647	LL-melt breccia
Yamato 983679	Y-983679	Antarctica	1998	3.953	LL-melt breccia
Yamato 983680	Y-983680	Antarctica	1998	4.065	LL-melt breccia
Yamato 983681	Y-983681	Antarctica	1998	3.732	LL-melt breccia
Yamato 983682	Y-983682	Antarctica	1998	3.730	LL-melt breccia
Yamato 983686	Y-983686	Antarctica	1998	4.682	LL-melt breccia
Yamato 983687	Y-983687	Antarctica	1998	61.54	LL-melt breccia
Yamato 983688	Y-983688	Antarctica	1998	40.32	LL-melt breccia
Yamato 983689	Y-983689	Antarctica	1998	36.72	LL-melt breccia
Yamato 983690	Y-983690	Antarctica	1998	7.851	LL-melt breccia
Yamato 983691	Y-983691	Antarctica	1998	3.707	LL-melt breccia
Yamato 983692	Y-983692	Antarctica	1998	5.399	LL-melt breccia
Yamato 983693	Y-983693	Antarctica	1998	8.748	LL-melt breccia
Yamato 983694	Y-983694	Antarctica	1998	29.24	LL-melt breccia
Yamato 983695	Y-983695	Antarctica	1998	9.599	LL-melt breccia
Yamato 983696	Y-983696	Antarctica	1998	3.877	LL-melt breccia
Yamato 983700	Y-983700	Antarctica	1998	21.71	LL5
Yamato 983701	Y-983701	Antarctica	1998	5.278	LL5
Yamato 983702	Y-983702	Antarctica	1998	65.12	H4
Yamato 983703	Y-983703	Antarctica	1998	13.77	H4
Yamato 983704	Y-983704	Antarctica	1998	6.231	H4

Yamato 983705	Y-983705	Antarctica	1998	80.71	H5
Yamato 983706	Y-983706	Antarctica	1998	36.90	H3-6
Yamato 983707	Y-983707	Antarctica	1998	5.298	H4
Yamato 983708	Y-983708	Antarctica	1998	3.500	H4
Yamato 983709	Y-983709	Antarctica	1998	3.552	H4
Yamato 983715	Y-983715	Antarctica	1998	103.1	H4
Yamato 983716	Y-983716	Antarctica	1998	116.2	H4
Yamato 983719	Y-983719	Antarctica	1998	5.617	L6
Yamato 983720	Y-983720	Antarctica	1998	13.89	R4
Yamato 983722	Y-983722	Antarctica	1998	18.90	H4
Yamato 983723	Y-983723	Antarctica	1998	127.1	H4
Yamato 983724	Y-983724	Antarctica	1998	4.646	H4
Yamato 983726	Y-983726	Antarctica	1998	12.38	H4
Yamato 983727	Y-983727	Antarctica	1998	9.795	H4
Yamato 983728	Y-983728	Antarctica	1998	5.994	H4
Yamato 983729	Y-983729	Antarctica	1998	4.044	L-melt breccia
Yamato 983730	Y-983730	Antarctica	1998	26.49	H4-5
Yamato 983731	Y-983731	Antarctica	1998	15.73	H4
Yamato 983732	Y-983732	Antarctica	1998	28.76	H4
Yamato 983733	Y-983733	Antarctica	1998	13.95	H4
Yamato 983734	Y-983734	Antarctica	1998	3.107	H4
Yamato 983735	Y-983735	Antarctica	1998	3.525	LL-melt breccia
Yamato 983736	Y-983736	Antarctica	1998	15.71	L-melt breccia
Yamato 983738	Y-983738	Antarctica	1998	5.530	LL-melt breccia
Yamato 983742	Y-983742	Antarctica	1998	9.562	LL
Yamato 983745	Y-983745	Antarctica	1998	5.872	LL-melt breccia
Yamato 983746	Y-983746	Antarctica	1998	16.83	LL-melt breccia
Yamato 983747	Y-983747	Antarctica	1998	6.321	H4
Yamato 983748	Y-983748	Antarctica	1998	301.0	L6
Yamato 983749	Y-983749	Antarctica	1998	64.20	H4
Yamato 983750	Y-983750	Antarctica	1998	18.92	LL-melt breccia
Yamato 983752	Y-983752	Antarctica	1998	4.231	L6
Yamato 983753	Y-983753	Antarctica	1998	5.986	H6
Yamato 983754	Y-983754	Antarctica	1998	6.856	H4
Yamato 983755	Y-983755	Antarctica	1998	7.861	L6
Yamato 983756	Y-983756	Antarctica	1998	79.02	L6
Yamato 983757	Y-983757	Antarctica	1998	68.24	L6
Yamato 983758	Y-983758	Antarctica	1998	20.38	L6
Yamato 983759	Y-983759	Antarctica	1998	13.00	L6
Yamato 983761	Y-983761	Antarctica	1998	13.91	H4
Yamato 983762	Y-983762	Antarctica	1998	15.51	H5
Yamato 983764	Y-983764	Antarctica	1998	3.570	H6
Yamato 983766	Y-983766	Antarctica	1998	20.69	L6
Yamato 983767	Y-983767	Antarctica	1998	7.770	H4

Yamato 983768	Y-983768	Antarctica	1998	18.98	L6
Yamato 983769	Y-983769	Antarctica	1998	5.740	L6
Yamato 983770	Y-983770	Antarctica	1998	6.565	L6
Yamato 983771	Y-983771	Antarctica	1998	355.0	L6
Yamato 983772	Y-983772	Antarctica	1998	176.7	L6
Yamato 983773	Y-983773	Antarctica	1998	18.99	L6
Yamato 983774	Y-983774	Antarctica	1998	11.54	H5
Yamato 983775	Y-983775	Antarctica	1998	6.965	H5
Yamato 983776	Y-983776	Antarctica	1998	7.312	H5
Yamato 983777	Y-983777	Antarctica	1998	7.734	H6
Yamato 983778	Y-983778	Antarctica	1998	9.146	H5
Yamato 983779	Y-983779	Antarctica	1998	7.909	H5
Yamato 983780	Y-983780	Antarctica	1998	6.703	H5
Yamato 983781	Y-983781	Antarctica	1998	7.492	H6
Yamato 983782	Y-983782	Antarctica	1998	7.431	H6
Yamato 983783	Y-983783	Antarctica	1998	6.278	H5
Yamato 983784	Y-983784	Antarctica	1998	5.930	H5
Yamato 983785	Y-983785	Antarctica	1998	5.927	H5
Yamato 983786	Y-983786	Antarctica	1998	4.924	H5
Yamato 983787	Y-983787	Antarctica	1998	4.744	H5
Yamato 983788	Y-983788	Antarctica	1998	6.518	H4
Yamato 983789	Y-983789	Antarctica	1998	4.934	H4
Yamato 983790	Y-983790	Antarctica	1998	4.604	H4
Yamato 983791	Y-983791	Antarctica	1998	4.654	H5
Yamato 983792	Y-983792	Antarctica	1998	5.924	H4
Yamato 983793	Y-983793	Antarctica	1998	4.320	H5
Yamato 983794	Y-983794	Antarctica	1998	5.237	H5
Yamato 983795	Y-983795	Antarctica	1998	4.978	H4
Yamato 983796	Y-983796	Antarctica	1998	3.760	H5
Yamato 983797	Y-983797	Antarctica	1998	3.968	H5
Yamato 983798	Y-983798	Antarctica	1998	4.703	H5
Yamato 983799	Y-983799	Antarctica	1998	3.184	H5
Yamato 983800	Y-983800	Antarctica	1998	3.127	H5
Yamato 983801	Y-983801	Antarctica	1998	3.258	H5
Yamato 983806	Y-983806	Antarctica	1998	4.834	H5
Yamato 983807	Y-983807	Antarctica	1998	17.36	Diogenite
Yamato 983809	Y-983809	Antarctica	1998	52.91	H5
Yamato 983810	Y-983810	Antarctica	1998	17.89	H5
Yamato 983811	Y-983811	Antarctica	1998	13.74	H6
Yamato 983812	Y-983812	Antarctica	1998	15.10	H4
Yamato 983813	Y-983813	Antarctica	1998	14.65	H4
Yamato 983814	Y-983814	Antarctica	1998	11.70	H4
Yamato 983815	Y-983815	Antarctica	1998	12.81	H4
Yamato 983816	Y-983816	Antarctica	1998	9.964	H4

Yamato 983817	Y-983817	Antarctica	1998	8.700	H4
Yamato 983818	Y-983818	Antarctica	1998	7.557	H4
Yamato 983819	Y-983819	Antarctica	1998	6.252	H4
Yamato 983820	Y 983820	Antarctica	1998	7.221	H4
Yamato 983821	Y-983821	Antarctica	1998	3.055	H4
Yamato 983822	Y-983822	Antarctica	1998	3.792	H4
Yamato 983824	Y-983824	Antarctica	1998	4.038	H4
Yamato 983825	Y-983825	Antarctica	1998	5.534	H4
Yamato 983827	Y-983827	Antarctica	1998	3.405	H4
Yamato 983828	Y-983828	Antarctica	1998	81.56	H5
Yamato 983829	Y-983829	Antarctica	1998	55.79	H4
Yamato 983830	Y-983830	Antarctica	1998	50.58	H4
Yamato 983831	Y-983831	Antarctica	1998	42.90	H4
Yamato 983832	Y-983832	Antarctica	1998	29.95	H4
Yamato 983833	Y-983833	Antarctica	1998	31.47	H4
Yamato 983834	Y-983834	Antarctica	1998	29.84	H4
Yamato 983835	Y-983835	Antarctica	1998	16.69	H4
Yamato 983836	Y-983836	Antarctica	1998	20.28	H4
Yamato 983837	Y-983837	Antarctica	1998	57.03	H4
Yamato 983838	Y-983838	Antarctica	1998	41.15	H4
Yamato 983839	Y-983839	Antarctica	1998	19.04	H4
Yamato 983840	Y-983840	Antarctica	1998	15.54	H4
Yamato 983841	Y-983841	Antarctica	1998	12.16	H4
Yamato 983842	Y-983842	Antarctica	1998	10.39	H4
Yamato 983843	Y-983843	Antarctica	1998	12.50	H4
Yamato 983844	Y-983844	Antarctica	1998	9.219	H4
Yamato 983845	Y-983845	Antarctica	1998	8.558	H4
Yamato 983846	Y-983846	Antarctica	1998	44.17	H4
Yamato 983847	Y-983847	Antarctica	1998	33.75	H4
Yamato 983848	Y-983848	Antarctica	1998	18.30	H4
Yamato 983849	Y-983849	Antarctica	1998	4.195	H4
Yamato 983850	Y-983850	Antarctica	1998	32.16	L5
Yamato 983851	Y-983851	Antarctica	1998	29.86	L6
Yamato 983852	Y-983852	Antarctica	1998	70.64	H4
Yamato 983853	Y-983853	Antarctica	1998	6.011	H4
Yamato 983854	Y-983854	Antarctica	1998	4.247	H4
Yamato 983856	Y-983856	Antarctica	1998	7.438	LL6
Yamato 983857	Y-983857	Antarctica	1998	6.727	H4
Yamato 983858	Y-983858	Antarctica	1998	8.140	H5
Yamato 983859	Y-983859	Antarctica	1998	97.09	L5
Yamato 983860	Y-983860	Antarctica	1998	18.44	H4
Yamato 983861	Y-983861	Antarctica	1998	139.3	H5
Yamato 983862	Y-983862	Antarctica	1998	5.672	H4
Yamato 983863	Y-983863	Antarctica	1998	7.252	H4

Yamato 983864	Y-983864	Antarctica	1998	3.866	H4
Yamato 983865	Y-983865	Antarctica	1998	4.266	H4
Yamato 983867	Y-983867	Antarctica	1998	16.32	L6
Yamato 983868	Y-983868	Antarctica	1998	4.523	L6
Yamato 983869	Y-983869	Antarctica	1998	29.37	H6
Yamato 983870	Y-983870	Antarctica	1998	4.068	H4
Yamato 983871	Y-983871	Antarctica	1998	81.77	H-melt breccia
Yamato 983872	Y-983872	Antarctica	1998	7.169	H4
Yamato 983873	Y-983873	Antarctica	1998	4.527	H4
Yamato 983874	Y-983874	Antarctica	1998	34.61	L5
Yamato 983875	Y-983875	Antarctica	1998	12.84	H4
Yamato 983876	Y-983876	Antarctica	1998	5.247	L4
Yamato 983877	Y-983877	Antarctica	1998	3.598	H4
Yamato 983878	Y-983878	Antarctica	1998	3.413	H5
Yamato 983879	Y-983879	Antarctica	1998	81.50	L6
Yamato 983881	Y-983881	Antarctica	1998	5.723	H5
Yamato 983882	Y-983882	Antarctica	1998	5.814	H4
Yamato 983883	Y-983883	Antarctica	1998	38.95	L6
Yamato 983884	Y-983884	Antarctica	1998	8.102	L6
Yamato 983886	Y-983886	Antarctica	1998	27.39	H5
Yamato 983887	Y-983887	Antarctica	1998	25.80	H4
Yamato 983889	Y-983889	Antarctica	1998	7.005	H4
Yamato 983890	Y-983890	Antarctica	1998	10.79	Ureilite-pmict
Yamato 983896	Y-983896	Antarctica	1998	10.26	EH3
Yamato 983897	Y-983897	Antarctica	1998	154.9	H5
Yamato 983900	Y-983900	Antarctica	1998	522.4	LL-melt breccia
Yamato 983902	Y-983902	Antarctica	1998	199.2	LL-melt breccia
Yamato 983906	Y-983906	Antarctica	1998	21.76	H5
Yamato 983907	Y-983907	Antarctica	1998	15.30	H4
Yamato 983908	Y-983908	Antarctica	1998	7.218	H4
Yamato 983910	Y-983910	Antarctica	1998	20.16	H6
Yamato 983911	Y-983911	Antarctica	1998	133.5	H5
Yamato 983912	Y-983912	Antarctica	1998	42.11	H5
Yamato 983914	Y-983914	Antarctica	1998	107.6	H3
Yamato 983915	Y-983915	Antarctica	1998	27.69	H5
Yamato 983917	Y-983917	Antarctica	1998	15.98	H5
Yamato 983918	Y-983918	Antarctica	1998	295.7	L6
Yamato 983920	Y-983920	Antarctica	1998	632.7	H5
Yamato 983921	Y-983921	Antarctica	1998	10.70	H5
Yamato 983922	Y-983922	Antarctica	1998	7.759	H5
Yamato 983923	Y-983923	Antarctica	1998	7.695	H5
Yamato 983924	Y-983924	Antarctica	1998	6.593	H5
Yamato 983925	Y-983925	Antarctica	1998	4.535	H5
Yamato 983926	Y-983926	Antarctica	1998	4.496	H5

Yamato 983929	Y-983929	Antarctica	1998	101.1	H6
Yamato 983930	Y-983930	Antarctica	1998	18.87	H6
Yamato 983931	Y-983931	Antarctica	1998	8.123	H/L4
Yamato 983932	Y-983932	Antarctica	1998	9.844	H5
Yamato 983933	Y-983933	Antarctica	1998	7.054	H5
Yamato 983935	Y-983935	Antarctica	1998	295.0	H5
Yamato 983936	Y-983936	Antarctica	1998	162.4	H5
Yamato 983937	Y-983937	Antarctica	1998	19.76	H5
Yamato 983938	Y-983938	Antarctica	1998	20.65	H4
Yamato 983940	Y-983940	Antarctica	1998	8.477	H6
Yamato 983941	Y-983941	Antarctica	1998	46.38	H6
Yamato 983942	Y-983942	Antarctica	1998	4.466	H5
Yamato 983944	Y-983944	Antarctica	1998	11.93	H6
Yamato 983945	Y-983945	Antarctica	1998	3.894	H6
Yamato 983946	Y-983946	Antarctica	1998	7.942	H5
Yamato 983947	Y-983947	Antarctica	1998	3.346	L6
Yamato 983948	Y-983948	Antarctica	1998	4.645	H5
Yamato 983950	Y-983950	Antarctica	1998	21.87	H5
Yamato 983951	Y-983951	Antarctica	1998	7.023	H5
Yamato 983955	Y-983955	Antarctica	1998	184.3	H5
Yamato 983956	Y-983956	Antarctica	1998	14.24	H5
Yamato 983957	Y-983957	Antarctica	1998	7.098	H5
Yamato 983960	Y-983960	Antarctica	1998	6.754	H6
Yamato 983964	Y-983964	Antarctica	1998	4.250	LL5
Yamato 983965	Y-983965	Antarctica	1998	94.74	H5
Yamato 983966	Y-983966	Antarctica	1998	40.36	H4
Yamato 983967	Y-983967	Antarctica	1998	27.71	H3
Yamato 983970	Y-983970	Antarctica	1998	75.73	L6
Yamato 983971	Y-983971	Antarctica	1998	16.81	L4
Yamato 983975	Y-983975	Antarctica	1998	15.11	L4
Yamato 983979	Y-983979	Antarctica	1998	194.5	H4
Yamato 983980	Y-983980	Antarctica	1998	77.31	H4
Yamato 983981	Y-983981	Antarctica	1998	60.53	H4
Yamato 983982	Y-983982	Antarctica	1998	22.42	H4
Yamato 983983	Y-983983	Antarctica	1998	13.70	H4
Yamato 983984	Y-983984	Antarctica	1998	17.21	H4
Yamato 983985	Y-983985	Antarctica	1998	8.015	H4
Yamato 983986	Y-983986	Antarctica	1998	7.478	H4
Yamato 983987	Y-983987	Antarctica	1998	9.181	H4
Yamato 983988	Y-983988	Antarctica	1998	6.192	H4
Yamato 983989	Y-983989	Antarctica	1998	4.981	H4
Yamato 983990	Y-983990	Antarctica	1998	3.475	H4
Yamato 983991	Y-983991	Antarctica	1998	35.09	H4
Yamato 983992	Y-983992	Antarctica	1998	82.19	H4

Yamato 983995	Y-983995	Antarctica	1998	6.673	H4
Yamato 983999	Y-983999	Antarctica	1998	6.332	H5
Yamato 984000	Y-984000	Antarctica	1998	5.929	L6
Yamato 984002	Y-984002	Antarctica	1998	21.23	L6
Yamato 984003	Y-984003	Antarctica	1998	6.085	L6
Yamato 984004	Y-984004	Antarctica	1998	12.36	L6
Yamato 984005	Y-984005	Antarctica	1998	8.822	H6
Yamato 984006	Y-984006	Antarctica	1998	6.950	H4
Yamato 984007	Y-984007	Antarctica	1998	12.36	L6
Yamato 984008	Y-984008	Antarctica	1998	41.23	L6
Yamato 984009	Y-984009	Antarctica	1998	9.480	H4
Yamato 984017	Y-984017	Antarctica	1998	41.29	H4
Yamato 984018	Y-984018	Antarctica	1998	15.99	H4
Yamato 984019	Y-984019	Antarctica	1998	4.691	H4
Yamato 984021	Y-984021	Antarctica	1998	49.16	H4
Yamato 984022	Y-984022	Antarctica	1998	3.562	H4
Yamato 984025	Y-984025	Antarctica	1998	6.564	H4
Yamato 984026	Y-984026	Antarctica	1998	10.06	H4
Yamato 984027	Y-984027	Antarctica	1998	13.93	H5
Yamato 984029	Y-984029	Antarctica	1998	54.92	L4
Yamato 984030	Y-984030	Antarctica	1998	16.66	H4
Yamato 984031	Y-984031	Antarctica	1998	12.08	L4
Yamato 984032	Y-984032	Antarctica	1998	8.104	L4
Yamato 984034	Y-984034	Antarctica	1998	24.89	L4
Yamato 984035	Y-984035	Antarctica	1998	13.65	L4
Yamato 984036	Y-984036	Antarctica	1998	10.07	L4
Yamato 984039	Y-984039	Antarctica	1998	39.17	H4
Yamato 984040	Y-984040	Antarctica	1998	7.360	L4
Yamato 984041	Y-984041	Antarctica	1998	9.030	H4-6
Yamato 984043	Y-984043	Antarctica	1998	21.69	H5
Yamato 984044	Y-984044	Antarctica	1998	62.16	CM
Yamato 984045	Y-984045	Antarctica	1998	15.21	L3
Yamato 984046	Y-984046	Antarctica	1998	3.173	H4
Yamato 984047	Y-984047	Antarctica	1998	19.28	H4
Yamato 984048	Y-984048	Antarctica	1998	14.22	H4
Yamato 984049	Y-984049	Antarctica	1998	5.296	H4
Yamato 984051	Y-984051	Antarctica	1998	216.2	H4
Yamato 984052	Y-984052	Antarctica	1998	126.5	H4
Yamato 984053	Y-984053	Antarctica	1998	49.89	H4
Yamato 984054	Y-984054	Antarctica	1998	22.96	H4
Yamato 984055	Y-984055	Antarctica	1998	21.56	H4
Yamato 984057	Y-984057	Antarctica	1998	6.820	EL6
Yamato 984058	Y-984058	Antarctica	1998	3.337	EL6
Yamato 984062	Y-984062	Antarctica	1998	62.66	H6

Yamato 984063	Y-984063	Antarctica	1998	12.89	H4
Yamato 984064	Y-984064	Antarctica	1998	4.947	L6
Yamato 984065	Y-984065	Antarctica	1998	7.019	H5
Yamato 984068	Y-984068	Antarctica	1998	57.40	L6
Yamato 984069	Y-984069	Antarctica	1998	5.045	H6
Yamato 984072	Y-984072	Antarctica	1998	6.803	H5
Yamato 984074	Y-984074	Antarctica	1998	10.34	L6
Yamato 984075	Y-984075	Antarctica	1998	9.833	H5
Yamato 984077	Y-984077	Antarctica	1998	53.05	L6
Yamato 984079	Y-984079	Antarctica	1998	7.909	Howardite
Yamato 984082	Y-984082	Antarctica	1998	3.320	LL5
Yamato 984083	Y-984083	Antarctica	1998	10.18	L5
Yamato 984085	Y-984085	Antarctica	1998	82.55	L6
Yamato 984086	Y-984086	Antarctica	1998	38.67	Diogenite
Yamato 984090	Y-984090	Antarctica	1998	3.944	H5
Yamato 984092	Y-984092	Antarctica	1998	7.890	H6
Yamato 984094	Y-984094	Antarctica	1998	15.42	H5
Yamato 984096	Y-984096	Antarctica	1998	26.96	L4
Yamato 984098	Y-984098	Antarctica	1998	3.108	L6
Yamato 984099	Y-984099	Antarctica	1998	6.810	L5
Yamato 984100	Y-984100	Antarctica	1998	5.048	H5
Yamato 984102	Y-984102	Antarctica	1998	7.198	H5
Yamato 984103	Y-984103	Antarctica	1998	6.921	H5
Yamato 984105	Y-984105	Antarctica	1998	11.72	H5
Yamato 984107	Y-984107	Antarctica	1998	11.92	L5
Yamato 984110	Y-984110	Antarctica	1998	3.719	CO3
Yamato 984111	Y-984111	Antarctica	1998	6.062	EH3
Yamato 984113	Y-984113	Antarctica	1998	3.636	H6
Yamato 984114	Y-984114	Antarctica	1998	8.846	L6
Yamato 984119	Y-984119	Antarctica	1998	18.16	Eucrite-pmict
Yamato 984127	Y-984127	Antarctica	1998	36.17	L6
Yamato 984129	Y-984129	Antarctica	1998	3.420	L6
Yamato 984131	Y-984131	Antarctica	1998	8.230	H3
Yamato 984132	Y-984132	Antarctica	1998	11.38	H3
Yamato 984133	Y-984133	Antarctica	1998	8.889	L4
Yamato 984134	Y-984134	Antarctica	1998	47.67	H3
Yamato 984135	Y-984135	Antarctica	1998	28.74	L5
Yamato 984136	Y-984136	Antarctica	1998	11.47	Eucrite-pmict
Yamato 984140	Y-984140	Antarctica	1998	15.72	L6
Yamato 984141	Y-984141	Antarctica	1998	5.451	L5
Yamato 984144	Y-984144	Antarctica	1998	37.44	H6
Yamato 984145	Y-984145	Antarctica	1998	54.80	L6
Yamato 984146	Y-984146	Antarctica	1998	19.32	H3
Yamato 984147	Y-984147	Antarctica	1998	118.9	LL6

Yamato 984148	Y-984148	Antarctica	1998	4.594	L5
Youxi		China	2006	218000	Mesosiderite-C

4. Corrected entries

Name	abbrev	reason
Bagdad		Revised coordinates and date
LaPaz Icefield 03834	LAP 03834	Reclassified in AMN 36(1)
LaPaz Icefield 03923	LAP 03923	Reclassified in AMN 36(1)
Miller Range 090206	MIL 090206	Reclassified in AMN 35(2)
Miller Range 090805	MIL 090805	Reclassified in AMN 35(2)
Miller Range 090937	MIL 090937	Reclassified in AMN 35(2)
Miller Range 090982	MIL 090982	Reclassified in AMN 36(1)
Northwest Africa 7034	NWA 7034	Updated classification and info
Queen Alexandra Range 99038	QUE 99038	Reclassified in AMN 36(1)
San Juan 003	SJ 003	True coordinates supplied by J. Gattacceca
San Juan 004	SJ 004	True coordinates supplied by J. Gattacceca
San Juan 005	SJ 005	True coordinates supplied by J. Gattacceca
San Juan 006	SJ 006	True coordinates supplied by J. Gattacceca
San Juan 007	SJ 007	True coordinates supplied by J. Gattacceca
San Juan 008	SJ 008	True coordinates supplied by J. Gattacceca
San Juan 009	SJ 009	True coordinates supplied by J. Gattacceca
San Juan 010	SJ 010	True coordinates supplied by J. Gattacceca
San Juan 011	SJ 011	True coordinates supplied by J. Gattacceca
San Juan 012	SJ 012	True coordinates supplied by J. Gattacceca
San Juan 013	SJ 013	True coordinates supplied by J. Gattacceca
San Juan 014	SJ 014	True coordinates supplied by J. Gattacceca
San Juan 015	SJ 015	True coordinates supplied by J. Gattacceca
San Juan 016	SJ 016	True coordinates supplied by J. Gattacceca
San Juan 017	SJ 017	True coordinates supplied by J. Gattacceca
San Juan 018	SJ 018	True coordinates supplied by J. Gattacceca
San Juan 019	SJ 019	True coordinates supplied by J. Gattacceca
San Juan 020	SJ 020	True coordinates supplied by J. Gattacceca
San Juan 021	SJ 021	True coordinates supplied by J. Gattacceca
San Juan 022	SJ 022	True coordinates supplied by J. Gattacceca
San Juan 023	SJ 023	True coordinates supplied by J. Gattacceca
San Juan 024	SJ 024	True coordinates supplied by J. Gattacceca
San Juan 025	SJ 025	True coordinates supplied by J. Gattacceca
San Juan 026	SJ 026	True coordinates supplied by J. Gattacceca
San Juan 027	SJ 027	True coordinates supplied by J. Gattacceca
San Juan 028	SJ 028	True coordinates supplied by J. Gattacceca
San Juan 029	SJ 029	True coordinates supplied by J. Gattacceca
San Juan 030	SJ 030	True coordinates supplied by J. Gattacceca
San Juan 031	SJ 031	True coordinates supplied by J. Gattacceca

San Juan 032	SJ 032	True coordinates supplied by J. Gattacceca
San Juan 033	SJ 033	True coordinates supplied by J. Gattacceca
San Juan 034	SJ 034	True coordinates supplied by J. Gattacceca
San Juan 035	SJ 035	True coordinates supplied by J. Gattacceca
San Juan 036	SJ 036	True coordinates supplied by J. Gattacceca
San Juan 037	SJ 037	True coordinates supplied by J. Gattacceca
San Juan 038	SJ 038	True coordinates supplied by J. Gattacceca
San Juan 039	SJ 039	True coordinates supplied by J. Gattacceca
San Juan 040	SJ 040	True coordinates supplied by J. Gattacceca
San Juan 041	SJ 041	True coordinates supplied by J. Gattacceca
San Juan 042	SJ 042	True coordinates supplied by J. Gattacceca
San Juan 043	SJ 043	True coordinates supplied by J. Gattacceca
San Juan 044	SJ 044	True coordinates supplied by J. Gattacceca
San Juan 045	SJ 045	True coordinates supplied by J. Gattacceca
San Juan 046	SJ 046	True coordinates supplied by J. Gattacceca
San Juan 047	SJ 047	True coordinates supplied by J. Gattacceca
San Juan 048	SJ 048	True coordinates supplied by J. Gattacceca
San Juan 049	SJ 049	True coordinates supplied by J. Gattacceca
San Juan 050	SJ 050	True coordinates supplied by J. Gattacceca
San Juan 051	SJ 051	True coordinates supplied by J. Gattacceca
San Juan 052	SJ 052	True coordinates supplied by J. Gattacceca
Sutter's Mill		Updated mass and number of pieces
Whetstone Mountains		Released coordinates

5. Listing of institutions and collections

Abbrev	Address
Aaronson:	Sahara Overland Ltd., Harhora, Temara, 12000, Morocco
AMNH:	Department of Earth and Planetary Sciences, American Museum of Natural History, Central Park West, New York, NY 10024, United States
ANU:	Research School of Earth Sciences, Australian National University, ACT 0200 Canberra, Australia
App:	Department of Geology, 572 Rivers St., Appalachian State University, Boone, NC 28608, United States
ASU:	Center for Meteorite Studies, Arizona State University, Tempe, Arizona 85287-1404, United States
Bart:	Bartoschewitz Meteorite Laboratory, Lehmweg 53, D-38518 Gifhorn, Germany
Bern:	University of Bern, University of Bern, Hochschulstrasse 4, CH-3012 Bern, Switzerland
Beroud:	F. Beroud, Chatel-Guyon, France
Bessey:	Dean Bessey ,P.O. Box 40810, Glenfield, Auckland 1310 , New Zealand

Cascadia:	Cascadia Meteorite Laboratory, Portland State University, Department of Geology, Room 17 Cramer Hall, 1721 SW Broadway, Portland, OR 97201, United States
CEREGE:	CEREGE BP 80 Avenue Philibert, Europole de l'Arbois 13545 Aix-en-Provence Cedex 4 France, France
CIW:	Carnegie Insitution Washington, Geophysical Laboratory, 5251 Broad Branch Rd., NW, Washington DC 20015, United States
Classen:	Norbert Classen, Am Lindenplatz 1, 79356 Eichstetten, Germany
DST-PI:	Dipartimento di Scienze della Terra, Università di Pisa, Via S. Maria 53, 56126 Pisa, Italy
DuPont:	James M. DuPont Meteorite Collection, Deposited at FMNH in 2008., United States
Farmer:	Michael Farmer, P.O. Box 86059, Tucson, AZ 85754-6059, United States
FMNH:	Department of Geology The Field Museum of Natural History 1400 South Lake Shore Drive Chicago, IL 60605-2496, USA, United States
FordU:	Fordham University, 441 East Fordham Road, Bronx, NY 10458, United States
FUB:	Freie Universität Berlin, Inst. für Geologische Wissenschaften, Malteserstrasse 74-100, D-12249 Berlin, Germany, Germany
GHupé:	Gregory M. Hupé, 9003 Placid Lakes Blvd., Lake Placid, FL 33852, United States
Gregory:	David Gregory, 230 First Avenue, Suite 108, St. Thomas, Ontario N5R 4P5, Canada
Gren:	Andreas Gren, Hamburg, Germany
GUT:	College of Earth Sciences, Guilin University of Technology, 12 Jiangan Road, Guilin 541004, China
Hmani:	A. Hmani Moroccan Imports, 13 rue Jules Hardouin Mansart, 92600 Asnières, France
IfP:	Institut für Planetologie, Wilhelm-Klemm-Str. 10, 48149 Münster, Germany
IGEM:	Institute of Geology of Ore Deposits, Petrography, Mineralogy, and Geochemistry, Russian Academy of Sciences, Staromonetny Per., 35, Moscow, 119017 , Russia
IGGCAS:	Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing 100029, China
JSC:	Mailcode KT, 2101 NASA Parkway, NASA Johnson Space Center, Houston, TX 77058, United States
JUtas:	Jason Utas, United States
KCCU:	Kingsborough College of the City University of New York, Brooklyn, NY 11235, United States
Kessell:	Kevin Kessell, 785 Railroad Bed Pike, Summertown, TN 38483, United States
Kiel:	Geologisches und Mineralogisches Museum, Institut für Geowissenschaften, Christian-Albrechts-Universität Kiel, Ludewig-Mayn-Str. 10, D-24118 Kiel, Germany, Germany
Kuntz:	Fabien Kuntz, France
Kurz:	M. Kurz, Schillerstrasse 7, D-34626 Neukirchen, Germany
Labenne:	23, rue de Esperance, 75013 Paris, France
LHU:	Department of Geology, Lakehead University, 955 Oliver Road, Thunder Bay,

	Ontario P7B 5E1, Canada
MHNGE:	Muséum d'histoire naturelle, Route de Malagnou 1, CH-1211 Genève 6 , Switzerland
MMC:	Museo del Meteorito, Tocopilla 401, San Pedro de Atacama, Chile. or Alonso de Ercilla 1250, La Herradura, Coquimbo, Chile, Chile
MNA-SI:	Museo Nazionale dell'Antartide, Università di Siena, Via Laterina 8, I-53100 Siena, Italy
MNB	Museum für Naturkunde, Invalidenstrasse 43, D-10115 Berlin, Germany
MNHNP:	Museum National d'Histoire Naturelle, 61 Rue Buffon, LMCM-CP52, 75005 Paris, France, France
MSFC:	NASA/George C. Marshall Space Flight Center, Huntsville, AL 35812, United States
MSP:	Museo di Scienze Planetarie, Via Galcianese 20/H, 59100 Prato, Italy, Italy
MtMorgan:	Matt Morgan, Mile High Meteorites, P.O. Box 151293, Lakewood, CO 80215-9293, United States
NAU:	Geology, Bldg 12 Knoles Dr Northern Arizona University, Flagstaff, AZ 86011, United States
NHM:	Department of Mineralogy, The Natural History Museum, Cromwell Road, London SW7 5BD, United Kingdom
NHMV:	Naturhistorisches Museum, Burgring 7, 1010 Wien, Austria, Austria
NIPR:	Antarctic Meteorite Research Center, National Institute of Polar Research, 10-3 Midori-cho, Tachikawa, Tokyo 190-8518, Japan
NMBE:	Natural History Museum Bern Bernastrasse 15 CH-3005 Bern Switzerland, Switzerland
OAM:	Museo del Cielo e della Terra Vicolo Baciadonne 1 40017 San Giovanni in Persiceto (BO) Italy Osservatorio Astronomico e Museo "Giorgio Abetti", San Giovanni Persiceto, Bologna, Italy
OkaU:	Institute for Study of the Earth's Interior, Okayama University, Misasa Tottori 682-0193, Japan
Olsen:	Unknown person
OU:	Planetary and Space Sciences Department of Physical Sciences The Open University Walton Hall Milton Keynes MK7 6AA United Kingdom, United Kingdom
PMO:	Purple Mountain Observatory, Nanjing, China
PSF:	Planetary Studies Foundation,10 Winterwood Lane, Unit B, Galena, Illinois 61036-9283, United States
Ralew:	Stefan Ralew, Kunibertstraße 29, 12524 Berlin, Germany
Reed:	Blaine Reed, P.O. Box 1141, Delta, CO 81416, United States
ROM:	Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6, Canada
SAM:	Department of Mineralogy, South Australian Museum, North Terrace, Adelaide, South Australia 5000, Australia

SBuhl:	Meteorite Recon (Mr. S Buhl), Muehlendamm 86, 22087 Hamburg, Germany
SDSMT:	South Dakota School of Mines & Technology, 501 East Saint Joseph Street, Rapid City, SD 57701, United States
SECC:	Science Education Center of California, 3001 Chapel Hill Road, Orange, CA 92867, United States
SI:	Department of Mineral Sciences, NHB-119, National Museum of Natural History, Smithsonian Institution, Washington, DC 20560, United States
SQU:	Sultan Qaboos University, College of Science, Earth Sciences Department, P.O. Box 36 Code 123 AlKhoud, Oman
Stehlik:	Harald Stehlik, 1220 Wien, Austria
TCU:	Oscar E. Monnig Collection, Department of Geology, Texas Christian University, Ft. Worth, TX 76129, United States
Tobin:	J. Tobin, The Meteorite Exchange, PMB #455, P.O. Box 7000, Redondo Beach, CA 90277, United States
TStout:	Tim Stout, P.O. Box 181, Hillsboro, Oregon 97123, United States
Tunis:	Départment du Géologie, Faculté de Sciences de Tunis, Université de Tunis El Manar, Campus Universitaire El Manar, 2092 Tunis, Tunisia, Tunisia
Twelker:	Eric Twelker, P.O. Box 844, Port Townsend, WA 98368, United States
UAb:	1-26 Earth Sciences Building, University of Alberta, Edmonton, AB, T6G 2E3, Canada, Canada
UCLA:	Institute of Geophysics and Planetary Physics, University of California, Los Angeles, CA 90095-1567, United States
UHaw	Hawai'i Institute of Geophysics and Planetology, School of Ocean and Earth Science and Technology, University of Hawai'i, 2525 Correa Road, Honolulu, HI 96822, United States
UInns:	Institute of Mineralogy and Petrography, University of Innsbruck, A-6020 Innsbruck, Austria
UNM:	Institute of Meteoritics MSC03 2050 University of New Mexico Albuquerque NM 87131-1126 USA, United States
UOkla:	ConocoPhillips School of Geology and Geophysics, University of Oklahoma, Sarkeys Energy Center, Suite 710, 100 E. Boyd St., Norman, OK 73019, United States
UPVI:	Université Pierre et Marie Curie (Paris VI),Case 110, 4 Place Jussieu, 75005 Paris, France
URoma:	Museo di Mineralogia, Dipartimento di Scienze della Terra, Università di Roma "La Sapienza," Piazzale Aldo Moro,5 I-00185 ROMA, Italy
USil:	Faculty of Earth Sciences, University of Silesia, Bedzinska 60, 41-200 Sosnowiec, Poland
UTenn:	Planetary Geosciences Institute, Department of Earth and Planetary Sciences, University of Tennessee, 1412 Circle Drive, Knoxville, TN 37996-1410, United States
UWA:	University of Western Australia, 35 Hackett Drive, Crawley, Western Australia

	6009, Australia
UWB:	University of Washington, Box 353010 Seattle, WA 98195, United States
UWO:	Department of Earth Sciences, University of Western Ontario, 1151 Richmond St., London, Ontario, Canada N6A 5B7, Canada
UWS:	University of Washington, Department of Earth and Space Sciences, 70 Johnson Hall, Seattle, WA 98195, United States
Verish:	Robert Verish, Meteorite-Recovery Lab, P.O. Box 463084, Escondido, CA 92046, United States
Vernad:	Vernadsky Institute of Geochemistry and Analytical Chemistry, Russia
WAM:	Department of Earth & Planetary Sciences, Western Australian Museum. Locked Bag 49, Welshpool DC, Western Australia 6986, Australia
Ward:	No contact information provided.
Webb:	No contact information provided., United States
WUSL:	Washington Univ., One Brookings Drive, St. Louis, MO 63130, United States

6. Acknowledgments

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