The Meteoritical Society

Meteoritics & Planetary Science 42, Nr 3, 413–466 (2007)
http://meteoritics.org

The Meteoritical Bulletin, No. 91, 2007 March

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(Received 21 February 2007)

AFRICA

Algeria

Ilizi **26°45′N, 08°53′E**
Ilizi, Algeria
Find: 1991
Ordinary chondrite (H4)

History: U. Messerli of Hermringen, Switzerland, found this single stone in the Ilizi area of Algeria in 1991. The sample was submitted to *NMBE* for classification in 2003. The stone was found among many terrestrial rocks. The terrestrial rocks show evidence that early humans may have used them as tools. It is suspected that the meteorite, due to one surface being very flat and smooth, may also have been used a tool during the Neolithic.

Physical characteristics: Dark brown rounded stone without fusion crust, 5.5 × 5 × 4 cm in size, 185 g mass. One side displays a very flat and smooth surface (~4 × 4 cm). The interior shows chondrules up to 5 mm in diameter.

Petrography: (E. Gnos, *UBE*; B. Hofmann, *NMBE*) Average olivine ($Fa_{18.6}$), average orthopyroxene ($Fs_{17.5}Wo_{1.25}$).

Classification: Ordinary chondrite (H4); S2, W4.

Type specimen: A 21.5 g type specimen and 1 polished thin section are on deposit at *NMBE*. *U. Messerli* holds the main mass.

Egypt

Minqar Abd el Nabi **29°54 32″N, 29°54 30″E**
Minqar Abd el Nabi, Egypt
Find: November 1992
Ordinary chondrite (H6)

History: Found under the foot of Minqar Abd el Nabi escarpment in November 1992.

Physical characteristics: A single, complete stone of irregular shape ~7.2 × 5.4 × 3.5 cm with a mass of 362 g and minimal, weathered fusion crust.

Petrography: Visible relict chondrules (0.2–1.4 mm) embedded in a recrystallized, fine-grained groundmass of olivine, pyroxene, and opaque phases.

Mineral compositions and geochemistry: (A. Barakat, *EMRA*) Olivine ($Fa_{19\pm2}$), orthopyroxene ($Fs_{17\pm2}$).

Classification: Ordinary chondrite (H6); moderate weathering.

Type specimen: A total of 340 g is on deposit at *EMRA*.

Libya

Dar al Gani 1042 **27°10.92′N, 16°18.01′E**
Dar al Gani region, Al Jufrah, Libya
Find: 1999
Achondrite (lunar, feldspathic regolith breccia)

History and physical characteristics: A single stone of 801 g with partial fusion crust was found in 1999.
Petrography and mineral compositions: (T. Arai, *NIPR*) Feldspathic regolith breccia with typical lunar highland breccia clasts (e.g., feldspathic crystalline melt breccias, granulitic lithologies, cataclastic anorthosites, etc.) embedded in a well-lithified matrix. Granulitic clasts consist of dominant plagioclase ($An_{95.4–96.7}$) with orthopyroxene ($Wo_3Fs_{19}En_{78}$, Fe# = 0.19), clinopyroxene ($Wo_{8–12}Fs_{26–28}En_{62–64}$, Fe# = 0.28–0.30; $Wo_{44}Fs_9En_{47}$, Fe# = 0.15–0.16), olivine ($Fo_{65–69,81–84}$), ilmenite, and Ti-rich chromite ($Chr_{45}Hc_{19}Usp_{36}$). Isolated mineral fragments are plagioclase, co-existing augite and pigeonite, and olivine with ranges of compositions similar to those in the above clasts. Anorthositic impact glasses occur both as glass veins and spherules. The FeO/MnO value of olivines (90 ± 20) supports a lunar origin. Terrestrial calcites pervasively occur along cracks.
Classification: Achondrite (lunar feldspathic regolith breccia); moderate weathering.
Type specimen: One specimen of 37 g is on deposit at *JAXA*. One 6.1 g sample and thin sections are on deposit at *NIPR*. An anonymous finder holds the main mass.

Nigeria

Katagum **11°20′N, 10°5′E**
Katagum, Bauchi State, Nigeria
Fall: 1999, first week of September, ~15:00 GMT
Ordinary chondrite (L6)
History: A stone was recovered near the village of Gadai, a few kilometers due northwest of Katagum, Bauchi State, Nigeria, by the chief of the village. The stone fell during a rainy day on a grazing ground. The fall was accompanied by a thunderous noise. According to Ohene Boansi Apea (*BUK*), who provided this report, another stone from this fall was found, but the information about it has been lost.
Physical characteristics: A 1500 g fusion-crusted stone.
Mineral compositions: (Ohene Boansi Apea, *BUK*; T. McCoy, *SI*) $Fa_{23.6±0.2}$, $Fs_{19.9±0.3}$.
Classification: Ordinary chondrite (L6); S2.
Type specimen: A 20 g sample is on deposit at *BUK*. *Zaki* holds the main mass.

Tunisia

Hezma **33°15′N, 10°28′E**
Hezma, Tunisia
Find: 31 March 2002
Ordinary chondrite (L5/6)
History and physical characteristics: A single rock of 62 g was found ~10 km south of Medenine in the Hezma area.
Petrography and mineral compositions: (T. Jording and A. Bischoff, *Mün*) Fa_{24} and $Fs_{20.5}$.
Classification: Ordinary chondrite (L5/6); S3, W1–2.
Type specimen: 12 g and one polished thin section are on deposit at *Mün*. An anonymous finder, who is Tunisian, holds the main mass.

Metameur 001 **33°21′24N, 10°24′32″E**
Metameur, Tunisia
Find: 4 December 2005
Ordinary chondrite (LL6)
History and physical characteristics: A single stone of 748 g was found ~6 km west of the city of Medenine in the district of the small town of Metameur.
Petrography and geochemistry: (T. Jording and A. Bischoff, *Mün*): Fa_{32} and Fs_{26}.
Classification: Ordinary chondrite (LL6); S5, W1.
Type specimen: A 30 g sample and one polished thin section are on deposit at *Mün*. An anonymous finder, who is Tunisian, holds the main mass.

Metameur 002 **33°21′09N, 10°26′01″E**
Metameur, Tunisia
Find: 25 December 2005
Ordinary chondrite (H4)
History and physical characteristics: A small single stone of 17 g was found in the district of the small town of Metameur.
Petrography and geochemistry: (T. Jording and A. Bischoff, *Mün*) $Fa_{18.5}$ and Fs_{16}.
Classification: Ordinary chondrite (H4); S2, W3–4.
Type specimen: A 5 g sample and one polished thin section are on deposit in *Mün*. An anonymous finder, who is Tunisian, holds the main mass.

Metameur 003 **33°24.2′N, 10°27.5′E**
Metameur, Tunisia
Find: 25 February 2005
Ordinary chondrite (L4)
History and physical characteristics: A single rock of 126 g was found in the district of the small town of Metameur.
Petrography and geochemistry: (T. Jording and A. Bischoff, *Mün*) Fa_{26} and $Fs_{19.5±3.2}$ (pyroxene is still slightly unequilibrated).
Classification: Ordinary chondrite (L4); S3,W3.
Type specimen: 22 g and one polished thin section are on deposit at *Mün*. An anonymous finder, who is Tunisian, holds the main mass.

Uganda

Hoima **1°20′42.0″N, 31°28′22.0″E**
Hoima, Uganda
Fall: 30 March 2003, 13:00 (local time)
Ordinary chondrite (H6 breccia)
History: Several meteor fragments were seen to fall in the Hoima district near Butema along the Hoima-Kampala road in Uganda on 30 March 2003 around 13:00 local time. Originally two fragments were recovered, but one was

subsequently lost. The remaining 167.7 g stone is partly covered with fusion crust.
Petrography: (A. Greshake, *MNB*) The stone has an overall recrystallized texture, and a few poorly defined chondrules were observed.
Mineral chemistry: Olivine ($Fa_{17.4}$), pyroxene ($Fs_{15.4}$).
Classification: Ordinary chondrite (H6, breccia); S2, W0.
Type specimen: A total of 20.8 g, plus one polished thin section, are on deposit at *MNB*. *GMEU* holds the main mass.

Specific Regions within Africa

Sahara 03505
Sahara
Find: 2003
Iron (ungrouped)
History: A single mass was found in the desert in 2003. The find location is undisclosed.
Physical characteristics: The meteorite weighs 65 g and has no fusion crust.
Petrography: (L. Folco, *MNA-SI*; M. D'Orazio, *DST-PI*; P. Rochette, *CEREGE*) The meteorite consists of cellular/dendritic Fe,Ni-rich metal crystals set in a matrix dominated by troilite. Fe,Ni-rich metal and troilite occur approximately in a 1:1 volumetric ratio. The primary dendrite arms are up to >1.6 cm long and about 100 μm wide, while the spacing of the secondary arms, perpendicular to the primary, is ~100–150 μm. Abundant spherical droplets (5–100 μm) of anhydrous Fe-, Fe-Na-, and Fe-Mn-Na-K-phosphates are scattered within the troilite. Skeletal crystals of nearly endmember chromite, up to 2.5 mm in maximum length, complete the primary mineral assemblage. Fe,Ni metal is ataxitic and is made of a fine (1–5 μm) aggregate of Ni-rich metal (up to 39.3 wt% Ni), kamacite, and subordinate schreibersite. Veinlets of terrestrial oxidation phases cross-cut the primary minerals and are more abundant toward the external surface.
Geochemistry: Bulk composition: (Analysis by *ICP-MS*) Co = 4.14, Ni = 90.2 (both mg/g); Cu = 341, Ga = 21.2, Ge = 32.5, Ir = 3.6, Pt = 7.8 (all μg/g).
Classification: Iron (ungrouped). It is troilite-rich and similar in petrography, mineralogy, and bulk chemistry to the Mount Howe (HOW) 88403 ungrouped iron.
Type specimen: A 13 g specimen is on deposit at *MNA-SI*. *Caillou Noir* holds the main mass.

A list of all meteorites recognized from countries and regions within Africa is provided in Table 1.

Northwest Africa

Northwest Africa 960
Morocco
Find: December 2001
Ordinary chondrite (type 3)
History: Purchased in December 2001 by A. and G. Hupé from a Moroccan dealer in Erfoud, Morocco.
Physical characteristics: A single dark brown stone weighing 997 g.
Petrography: (A. Irving and S. Kuehner, *UWS*; M. Zolensky, *JSC*) Very chondrule-rich (~80 vol%), with a brown oxidized matrix. Most chondrules (up to 3 mm in diameter, though most below 1 mm) are olivine-rich but some contain low-Ca pyroxenes. Minor magnetite, troilite, pentlandite, chromite, and glass are also present. No metal was observed.
Mineral compositions and geochemistry: Olivine ($Fa_{2–29}$; peak at $Fa_{2–3}$, average $Fa_{9.63}$), low-Ca pyroxene ($Fs_{2–34}$; peak at $Fs_{2–3}$, average $Fs_{10.46}$). Oxygen isotopes: (D. Rumble, *CIW*) Laser fluorination of whole rock samples (all reported as ‰); $\delta^{18}O$ = 6.03, 6.04, 6.18; $\delta^{17}O$ = 3.74, 3.78, 3,83; $\Delta^{17}O$ = +0.559, +0.592, +0.567.
Classification: Ordinary chondrite (type 3); S1, W1–2. Although the $\Delta^{17}O$ values are near those for H chondrites, the $\delta^{18}O$ values are much higher and the mineral composition suggests this specimen is very different from H chondrites.
Type specimen: A total of 23 g of sample and one polished thin section are on deposit at *UWS*. *G. Hupé* holds the main mass.

Northwest Africa 1807
Northwest Africa
Find: 2002
Carbonaceous chondrite (CV3)
History: M. Chinellato purchased a single stone of 274 g in Erfoud, Morocco.
Physical characteristics: The main mass of 54.5 g has no fusion crust. A cut surface on the type specimen shows rather large chondrules and some small white spots.
Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) In thin section, many chondrules of various kinds (BO, PO, POP), accounting for ~50 vol% and ranging in size from 500 to 1200 μm in apparent diameter are visible (mean value 950 μm), set in a dark brown matrix. The chondrule margins are clear and defined. Chondrules contain variable amounts of clear glass. The matrix is composed of olivine and orthopyroxene, with rare clinopyroxene. Fe,Ni-rich metal and troilite are uncommon (less than 5 vol%). CAIs and rare apatite grains are observed.
Mineral compositions and geochemistry: Chondrule olivine ($Fo_{95–99}$), matrix olivine (Fo_{50}), orthopyroxene ($En_{98.14}Fs_{0.8}Wo_{1.06}$), clinopyroxene ($Fs_{15.54–28.61}En_{25.12–36.97}Wo_{46.12–47.49}$). Chondrule glass is anorthitic (An_{85}). Oxygen isotopes: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O$ = –1.64, $\delta^{18}O$ = 2.52, $\Delta^{17}O$ = –2.96 (all ‰).
Classification: Carbonaceous chondrite (CV3); S1, minor weathering.
Type specimen: A total of 20.5 g and one thin section are on deposit at *MSP*. *Chin* holds the main mass.

Northwest Africa 1808
Northwest Africa
Find: 2002
Ordinary chondrite (H5), impact-melt breccia
History: M. Chinellato purchased this dark brown stone in Erfoud, Morocco.
Physical characteristics: The 684 g mass has no fusion crust and a large metal vein on the surface. A cut surface on the type specimen displays areas with a marked difference in the amount of metal and seems to be composed of two different portions: a fine-grained one and a coarse-grained one.
Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) In thin section, the fine-grained part shows a recrystallization texture with a few grains of residual metal and olivine in a matrix of feldspathic glass containing very fine-grained olivine and pyroxene crystals. Abundant dark portions, numerous cracks, and microfaults are also present. The coarse-grained portion presents a typical chondritic texture: major phases are olivine and orthopyroxene, metal and troilite.
Mineral composition and geochemistry: Olivine (Fa_{19}), low-Ca pyroxene ($Fs_{16.3}En_{82.0}Wo_{1.7}$), feldspathic glass ($An_{17.6}Ab_{77.5}Or_{4.9}$).
Classification: Ordinary chondrite (H5), impact-melt breccia; S3, W0.
Type specimen: A total of 20.1 g and one thin section are on deposit at *MSP* (inventory number MSP 2334). *Chin* holds the main mass.

Northwest Africa 2041
Morocco or Algeria
Find: June 2003
Ordinary Chondrite (type 3)
History: Purchased in June 2003 from a Moroccan dealer in Erfoud for D. Gregory.
Physical characteristics: Several stones weighing a total of 4.5 kg.
Petrography: (A. Irving and S. Kuehner, *UWS*) The samples contain abundant, fairly well-defined chondrules. Olivine, orthopyroxene, and small grains of troilite are present. Metal is absent.
Mineral compositions and geochemistry: Olivine ($Fa_{5–25}$), orthopyroxene ($Fs_{0–3}$). Oxygen isotopes: (D. Rumble, *CIW*) Laser fluorination of two whole rock samples (all reported as ‰); $\delta^{18}O$ = 4.85, 4.875; $\delta^{17}O$ = 3.00, 3.03; $\Delta^{17}O$ = 0.449, 0.466.
Classification: Ordinary chondrite (type 3); S1, W2.
Type specimens: A total of 25.6 g of sample and one polished thin section are on deposit at *UWS*. *Gregory* holds the main mass.

Northwest Africa 2048
Morocco
Find: 2003
Achondrite (diogenite, monomict)
History: A single stone was found in Morocco and purchased in Rissani, Morocco, in September 2003.
Physical characteristics: The 44.5 g, buff-colored stone is partially fusion-crusted, with moderate desert etching/weathering.
Petrography: (J. Wittke and T. Bunch, *NAU*) Monomict breccia with ~2 mm size orthopyroxene porphyroclasts that are surrounded by recrystallized matrix. Very small (<0.05 mm) olivine, chromite, troilite, plagioclase, and ilmenite grains are scattered throughout the orthopyroxene matrix.
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{25}Wo_2$; FeO/MnO = 34.6, narrow distribution around this value), with minor olivine ($Fa_{28.7}$; FeO/MnO = 51), plagioclase (An_{83}), and chromite (cr# = 68).
Classification: Achondrite (diogenite, monomict breccia); minimal shock, moderate weathering.
Type specimen: A 9.71 g sample is on deposit at *NAU*. *Farmer* holds the main mass.

Northwest Africa 2177
Northwest Africa
Find: 2003
Achondrite (eucrite)
History: Several stones were found by an anonymous finder in the western part of the Sahara and purchased by M. Chinellato in Erfoud, Morocco, in 2003.
Physical characteristics: The total mass is 74.8 g. The largest mass, weighing 21 g, has no fusion crust and appears dark gray on its surface.
Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) A polymict breccia consisting of basaltic and mineral clasts set into a fine-grained matrix of exsolved Ca pyroxene and plagioclase. The large clasts are predominantly plagioclase and exsolved low-Ca pyroxene. Minor phases include silica and Al chromite. Exsolution lamellae in pyroxene are generally very fine.
Mineral compositions and geochemistry: Plagioclase (An_{89}), orthopyroxene ($Fs_{53}En_{44}Wo_2$), pigeonite ($Fs_{37}En_{33}Wo_{28}$), pigeonite lamellae ($Fs_{51}En_{37}Wo_{12}$). Oxygen isotopes: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O$ = 1.89, $\delta^{18}O$ = 4.06, $\Delta^{17}O$ = –0.22 (all ‰).
Classification: Achondrite (eucrite); moderate shock, minimal weathering.
Type specimen: A total of 15.4 g and one thin section are on deposit at *MSP*. *Chin* holds the main mass.

Northwest Africa 2180
Northwest Africa, purchased Erfoud
Find: 2002
Carbonaceous chondrite (CV3)
History: A number of stones were bought in Erfoud, Morocco, by an anonymous buyer, who owns the main mass.
Physical characteristics: The total mass is 369.3 g. The main

mass weighs 51.4 g and has very small portions of a dark brown fusion crust. A cut surface on the type specimen shows rather large chondrules and some small white spots.

Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) In thin section, several chondrules of various kinds (BO, PO, POP) accounting for ~50 vol% and ranging from 500 to 600 μm in size are visible, set in a fine intergrowth within phyllosilicates. The chondrule margins are clear and defined. Chondrules contain variable amounts of clear glass. The matrix is represented by olivine and orthopyroxene, with rare clinopyroxenes. Fe,Ni metal and troilite are uncommon (<5 vol%). CAIs and rare apatite grains are also observed.

Mineral compositions and geochemistry: Chondrule olivine ($Fo_{91–99}$), matrix olivine ($Fo_{31–56}$), orthopyroxene ($En_{98.1}Wo_{1.1}$), clinopyroxene ($Fs_{0.5–0.9}En_{59.4–93.2}Wo_{6.3–39.6}$). Chondrule glass is anorthitic (An_{90}). Oxygen isotopes: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O$ = –0.718, $\delta^{18}O$ = 4.032, $\Delta^{17}O$ = –2.815 (all ‰).

Classification: Carbonaceous chondrite (CV3); S1, minor weathering

Type specimen: A total of 20.7 g and one thin section are on deposit at *MSP*. An anonymous buyer holds the main mass.

Northwest Africa 2339

Northwest Africa
Find: May 2004
Achondrite (eucrite, monomict melt breccia)

History and physical characteristics: A. Spreeman purchased an 11.9 g fragment with little fusion crust from a Moroccan dealer in Zagora, Morocco, in 2004. This small stone was handed over to Rainer Bartoschewitz for investigation during the International Meteorite Fair in Gifhorn. Magnetic susceptibility: (*Bart*) log χ = 2.94 × 10^{-9} m^3/kg.

Petrography: (R. Bartoschewitz, *Bart*) Breccia dominated by orthopyroxene fragments (<1 mm), some pigeonite with exsolution lamellae (<0.3 mm), small plagioclase fragments and accessory ilmenite, chromite, SiO_2, and troilite in a fine-grained, mainly recrystallized melt matrix. Lithic fragments were not observed.

Mineral compositions and geochemistry: (R. Bartoschewitz, *Bart*; P. Appel and B. Mader, *Kiel*) Pigeonite ($En_{28.5–58.4}Wo_{18.0–5.6}$), hypersthene ($Fs_{40.0–41.6}$ $Wo_{2.0–4.3}$), bytownite ($An_{81–92}Or_{<1}$), chromite (Al_2O_3 = 7.8, TiO_2 = 6, no MgO), troilite (Co = 0.09) (all in wt%). Oxygen isotopes: (M. Kusakabe, *OkU*) $\delta^{17}O$ =1.65, $\delta^{18}O$ =3.66 (both ‰).

Classification: Achondrite (eucrite, monomict melt breccia).

Type specimen: A total of 2.3 g of sample on deposit at *MKBraun*. *Bart* holds 2.3 g and one thin section, and *Spreemann* holds the main mass.

Northwest Africa 2340

Northwest Africa
Find: May 2004
Carbonaceous chondrite (CR2)

History and physical characteristics: H. Grundmann purchased a 4.6 g fragment from a Moroccan dealer in Zagora, Morocco, in May 2004. Magnetic susceptibility: (*Bart*) log χ = 4.91 × 10^{-9} m^3/kg.

Petrography: (R. Bartoschewitz, *Bart*) Well-defined metal-bearing chondrules from 0.5 to 2 mm, chondrule fragments, and metal grains up to 1 mm are embedded in a fine-grained dark matrix. The chondrule/matrix ratio is about 3:1.

Mineral compositions and geochemistry: Oxygen isotopes: (M. Kusakabe, *OkaU*) $\delta^{17}O$ =1.77, $\delta^{18}O$ =5.37 (both ‰).

Type specimen: A total of 0.9 g is on deposit at *Vern*. *Bart* holds 0.9 g and *Grund* holds the main mass.

Northwest Africa 2570

Northwest Africa
Find: November 2004
Carbonaceous chondrite (CV3)

History and physical characteristics: H. Strufe purchased three gray-black fragments for a total mass of 12.4 g in Erfoud, Morocco, in November 2004. One face is smooth from desert polishing while the others are rough and broken.

Petrography: (R. Bartoschewitz, *Bart*) Well-defined chondrules 0.2–1.0 mm in diameter (average ~0.6 mm; abundance ~30 vol%), dominated by PO chondrules, are embedded in a fine-grained matrix together with CAIs, mineral and chondrule fragments. Minor phases are kamacite, taenite, troilite, perovskite, hercynite, and chromite.

Mineral compositions and geochemistry: (R. Bartoschewitz, *Bart*; P. Appel and B. Mader, *Kiel*) Olivine ($Fa_{15.6}$, range $Fa_{0.3–47.4}$; n = 19), orthopyroxene ($Fs_{0.6–4.8}$ $Wo_{0.5–3.4}$; Al_2O_3 = 0.3–1.6, n = 9), pigeonite ($Fs_{14.7}Wo_{10.9}$; Al_2O_3 = 3.3), augite ($Fs_{0.5}Wo_{42.9}$; Al_2O_3 = 3.9, n = 2), kamacite (Ni = 4.2–6.1, Co = 0.5–1.5), taenite (Ni = 40.6–42.3, Co = 0.3), chromite (Al_2O_3 = 4.5, TiO_2 = 1.2, MgO = 1.3) (all values in wt%). Oxygen isotopes: (R. C. Greenwood, *OU*) $\delta^{17}O$ = –2.601, $\delta^{18}O$ =1.378 (both ‰). Magnetic susceptibility: (*Bart*) log χ = 3.99 × 10^{-9} m^3/kg.

Classification: Carbonaceous chondrite (CV3); S1, minimal weathering.

Type specimen: A total of 2.5 g is on deposit at *Vern*. *Bart* holds 1.7 g and one thin section, and *HSSH* holds main mass.

Northwest Africa 2651

Northwest Africa
Find: 2003
Achondrite (ureilite)

History and physical characteristics: An 89 g partial stone was purchased in Erfoud, Morocco, in May 2004.

Petrography: (J. Wittke and T. Bunch, *NAU*) Bi-modal ureilite that contains scarce, large pigeonite grains (up to 8 mm in diameter) heterogeneously distributed throughout an equigranular, fine-grained (<0.9 mm) matrix of olivine and compositionally similar low-Ca pyroxene. Olivine is highly fractured with closely spaced, subparallel fractures normal to

[001]. Grain edges have a saw-tooth appearance of alternating, more-reduced rims together with deposits of carbonaceous-metal-silicate-masses that permeated fractures and less-reduced rims that are between fractures, similar to NWA 2624.

Mineral compositions and geochemistry: Olivine (cores = $Fa_{18.6}$, rims = $Fa_{10.7–14.3}$), small pigeonite ($Fs_{16.8}Wo_{2.9–3.8}$), large pigeonite ($Fs_{15.1}Wo_{3.3}$), metal (Ni = <0.63 wt%).

Classification: Achondrite (ureilite); S2, minimal weathering. This sample is potentially paired with NWA 2624.

Type specimen: A total of 22.6 g and one thin section are on deposit at *NAU*. *Reed* holds the main mass.

Northwest Africa 2748

Northwest Africa
Find: February 2002
Ordinary chondrite (LL3.4)

History: A single stone was purchased in February 2002 from a trader in Erfoud, Morocco, by R. Elliott.

Physical characteristics: The 57 g stone is partly covered in dark brown fusion crust. Patches of limonitic surface coating are present, from which irregular veins penetrate the interior. Abundant large chondrules are visible to the unaided eye.

Petrography: (R. Hutchison and A. Kearsley, *NHM*; P. Sipiera, *Harper*) Chondrules constitute >80% of the stone and range up to >4 mm in size. The mean apparent size of 183 chondrules is 0.89 ± 0.48 mm. The chondrules have sharply defined margins and many are mutually indented, resembling compound chondrules. PO and POP chondrules dominate. A 1.3 mm spinel-pyroxene CAI was identified. Zoning is common at chondrule margins. Little metal has survived terrestrial alteration but some kamacite and taenite are present.

Mineral compositions and geochemistry: In chondrules, the minimum range of olivine cores is $Fo_{99–65}$. One analysis of matrix yielded Mg/(Mg + Fe) = 32. A 4 mm PO chondrule fragment has zoned olivines whose cores are Fo_{85} with Ni = 0.74 wt%. A type IA PO chondrule has olivines ($Fo_{99–97}$) with CaO = 0.6–0.9 wt%. Oxygen isotopes: (R. C. Greenwood, *OU*) $\delta^{17}O = 4.870, 4.914$; $\delta^{18}O = 7.176, 7.242$; $\Delta^{17}O = +1.138, +1.148$ (all ‰, the second values are replicates).

Classification: Ordinary chondrite (LL3.4 ± 0.2).

Type specimen: A 10.86 g part-slice (BM 2004, M.6) and one thin section are in *NHM*. A 3 g sample and one thin section are held by *DuPont*. A 5.15 g slice is with R. Hutchison, *NHM*. *Fernlea* holds the main mass.

Northwest Africa 2775

Algeria
Find: 2005
Achondrite (acapulcoite)

History and physical characteristics: A dark brown, 222 g, partially crusted stone was purchased in Erfoud, Morocco, in November 2005.

Petrography: (J. Wittke and T. Bunch, *NAU*; A. Irving, *UWS*) Recrystallized homogeneous, polygonal to subhedral grains <0.8 mm in size.

Mineral compositions and geochemistry: Olivine ($Fa_{14.5±0.2}$; FeO/MnO = 30.5, MnO > 0.02 wt%), orthopyroxene ($Fs_{13.3±0.2}Wo_{3.0}$; FeO/MnO = 17), diopside ($Fs_{6.8}Wo_{41.9}$; FeO/MnO = 12), plagioclase ($An_{17.4}$), Fe,Ni rich metal (Ni = 22.5 wt%). FeS is also observed. Oxygen isotopes: (D. Rumble, *CIW*) Multiple analyses of different samples of the rock by laser fluorination are $\delta^{17}O = +0.78$ and +0.97, $\delta^{18}O = +2.94$ and +3.25, $\Delta^{17}O = –0.764$ and –0.743 (all ‰).

Classification: Achondrite (acapulcoite).

Type specimen: A 20.1 g sample is on deposit at *NAU*. *Turecki* and *Reed* hold the main mass.

Northwest Africa 2791

Algeria
Find: 2004
Ordinary chondrite (LL3–4)

History: This partial stone was found in 2004 and purchased in Erfoud, Morocco, in May 2005.

Physical characteristics: The 383 g stone is partially covered with a black, lightly weathered fusion crust.

Petrography: (T. Bunch and J. Wittke, *NAU*) A polymict breccia that represents many different lithologies. These include LL3.6 and LL4 chondrites, an unknown carbonaceous chondrite, shock-melted clasts and several of unknown petrologic lineage set in a matrix of plentiful chondrules and fragmental material.

Mineral compositions and geochemistry: LL3.6 chondrite clasts: olivine ($Fa_{23–34}$; FeO/MnO = 50–55, Cr_2O_3 = 0.0–0.12 wt%). LL4 chondrite clasts: olivine (Fa_{30}; FeO/MnO = 55–60). Carbonaceous chondrite clasts: olivine ($Fa_{43.7–54.4}$; FeO/MnO = 82–93), orthopyroxene ($Fs_{33–41.5}Wo_{1.3–2.0}$), spinel (fe# = 72), FeS (Cr = 0.82 wt%).

Classification: LL3–4 (polymict breccia); S2–5, W2.

Type specimen: A total of 23.4 g and one thin section are on deposit at *NAU*. *Webb* holds the main mass.

Northwest Africa 2806

Northwest Africa
Find: 2005
Ordinary chondrite (L6, impact-melt breccia)

History: M. Chinellato purchased a dark brown stone in Erfoud, Morocco.

Physical characteristics: The 148.4 g mass has a dark brown crust and some metal veins on its surface. A cut surface on the type specimen displays a rather homogeneous fine-grained texture, with sparse black metal veins.

Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) In thin section, the sample shows a recrystallization texture with a few grains of residual metal in a matrix of feldspathic glass containing medium-grained olivine and pyroxene crystals. Abundant dark portions, numerous cracks and microfaults, as well as metal veins, are also present.

Mineral composition and geochemistry: Olivine ($Fa_{24.3}$; n = 13), low-Ca pyroxene ($Fs_{20.6}En_{75.6}Wo_{0.2}$; n = 11), augite ($Fs_{9.0}En_{47.0}Wo_{43.9}$), feldspathic glass ($An_{27.9}Ab_{67.7}Or_{4.4}$).
Classification: Ordinary chondrite (L6), impact-melt breccia; S3, W1.
Type specimen: A total of 21.22 g and one thin section are on deposit at *MSP* (inventory number MSP 5033). *Chin* holds the main mass.

Northwest Africa 2828
Mauritania or Algeria
Find: December 2005
Achondrite (aubrite)
History: Purchased in December 2005 by Greg Hupé from a Moroccan dealer in Tagounite.
Physical characteristics: Thirty-six pale gray to whitish stones lacking fusion crust with a total weight of 8672 g. Several stones have exterior light orange staining, and two stones contain one or two dark brown cross-cutting veins (1–2 mm wide) of magnetic, fine-grained iron oxide and hydroxide minerals.
Petrography: (A. Irving and S. Kuehner, *UWS*) Monomict microbreccia, which is mostly fairly uniform but contains sporadic small, rounded clasts (up to 4 mm across). Relatively fine but variable grain slize (0.3–1.5 mm), and composed predominantly of bladed grains of essentially pure enstatite (exhibiting lamellar twinning) with ~15 vol% oligoclase, accessory altered troilite with fresh, subparallel exsolution blades of daubreelite, and sporadic rounded to ellipsoidal grains of graphite (up to 1.2 mm across). Small (<0.2 mm) lobate cavities partly filled with fine-grained calcite, silica, and an Fe-bearing mineral are present in the interior of even the freshest stones, and may represent former oldhamite grains. Small grains found as inclusions within enstatite are fresh Ti-free troilite, pure Mn-alabandite, daubreelite, fresh oldhamite (some Mn-bearing), schreibersite, and very rare specks of kamacite and taenite. Minor barite and calcite are present, probably the products of terrestrial weathering.
Mineral compositions and geochemistry: Pyroxene ($En_{99.8}Wo_{1.4}$; Al_2O_3 = 0.21 wt%), plagioclase ($An_{13.5–15.3}Or_{3.0–4.4}$). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two whole-rock fragments by laser fluorination gave, respectively, $\delta^{18}O$ = 5.50, 5.56; $\delta^{17}O$ = 2.89, 2.90; $\Delta^{17}O$ = +0.001, –0.026 (all ‰).
Classification: Achondrite (aubrite). Weathering effects in most stones are limited to alteration of interior troilite and probable oldhamite, and minor orange staining and dissolution on exterior surfaces. This aubrite appears to be completely different in appearance and texture from more metal-rich enstatite-rich meteorites NWA 002, NWA 1067, NWA 2736, and NWA 2965.
Type specimen: A total of 20.1 g and two polished thin sections are on deposit at *UWS*. *G. Hupé* holds the main mass.

Northwest Africa 2907
Northwest Africa
Find: 2005
Achondrite (ungrouped)
History: A large number of pieces were collected within a small strewn field of ~15 m in diameter in Algeria and sold in Erfoud, Morocco.
Physical characteristics: Most of the fragments composing the 586 g mass are without fusion crust, dark brown in color, and show extensive surface weathering.
Petrography: (T. Bunch and J. Wittke, *NAU*) Partially recrystallized polymict breccia that contains at least two distinct lithologies: a) medium-grained clasts (<2 mm) of untwinned orthopyroxene without discernible exsolution lamellae and a roughly equal amount of complex, polysynthetically twinned plagioclase partially converted to maskelynite; and b) medium-grained, partially recrystallized pigeonite with minor development of exsolution lamellae and twinning with inclusions of simple, albite-twinned plagioclase together with a fine-grained assemblages (<0.1 mm) of tridymite, metal, and plagioclase at recrystallization boundaries. Both lithologies are set in a fine-grained, partially recrystallized matrix of pyroxenes and plagioclase compositionally similar to lithologies (a) and (b). Minor minerals include Al-rich chromite, a sulfide phase, tridymite, phosphate, and metal.
Mineral compositions and geochemistry: Lithology (a): orthopyroxene (cores = $Fs_{22.0–25.3}Wo_{2.5}$; FeO/MnO = 24–27 with grain margins of $Fs_{33.8}Wo_{7.2}$ that in turn have exsolved Ca-rich pyroxene), plagioclase ($An_{99.5}Or_{0.5}$). Lithology (b): pigeonite ($Fs_{38.1}Wo_{11.1}$), plagioclase ($An_{94.8}Or_{5.6}$).
Classification: Achondrite (ungrouped); S3, moderate weathering. Overall characteristics of this meteorite are similar to clast material in some mesosiderites and may represent a large, separated mesosiderite clast.
Type specimen: A total of 23 g is on deposit at *NAU*. *Reed* holds the main mass.

Northwest Africa 2957
Morocco
Find: 1997
Pallasite (main group)
History: A complete stone was found in Morocco in 1997 and purchased by S. Hamani in 1999. The stone was cut in 2003 and the pieces were sold to various dealers and collectors.
Physical characteristics: Lightly weathered fusion crust with a dull to shiny luster covers the 362 g stone. Many olivine grains are cleanly exposed at the surface. Vague ablation-melt features are still visible on the metal surface.
Petrography: (T. Bunch and J. Wittke, *NAU*) Olivine grains up to 1.8 cm are randomly dispersed throughout the metal host. Schreibersite and merrillite typically occur adjacent to olivine. Olivine is only slightly zoned from core to rim. Metal structure shows large taenite centers with kamacite margins and rare plessitic cores. Small pockets of brecciated olivine,

schreibersite, and troilite are commonly observed between large olivine grains.

Mineral compositions and geochemistry: Olivine (cores = $Fa_{11.8}$, rims = $Fa_{12.5}$; FeO/MnO = 41–44), taenite (Ni = 19.8 wt%), kamacite (Ni = 6.4 wt%), schreibersite (Ni = 30.5 wt%).

Classification: Pallasite (main group); minimal shock and weathering.

Type specimen: A 21 g sample is on deposit at *NAU*. *Herrmann* holds the main mass of 170 g.

Northwest Africa 2965

Algeria
Find: August 2004
Enstatite chondrite (EL6/7)

History and physical characteristics: Hundreds of fragments that weigh >100 kg were collected in the Algerian desert in 2004. Small fragments (~100 g) are commonly weathered to a dark brown with very dark weathering veins. Large pieces may retain portions of weathered fusion crust with only moderate to lightly weathered interiors.

Petrography: (T. Bunch and J. Wittke, *NAU*) A completely recrystallized enstatite chondrite with polygonal to irregular grain outlines. The grain size varies from 0.02 to 0.7 mm. Round, curved, blocky objects contain coarser-grained orthopyroxene than in the matrix. No relict chondrules were observed in ~32 cm^2 that were analyzed. Metal, daubreelite, and tiny, vermicular grains of graphite are also present and constitute <3 vol%.

Mineral compositions: Orthopyroxene ($Fs_{98.4\pm0.02}$), plagioclase ($An_{17.8}Or_{4.4}$), troilite with Ti = 0.91, Cr = 1.10, Zn = 0.6 (all wt%).

Classification: Enstatite chondrite (EL6/7); minimal shock, variable weathering (W2–W5). It has absolutely no evidence of chondrules.

Type specimen: A 24 g sample is on deposit at *NAU*. *Turecki* and *Reed* hold the main mass.

Northwest Africa 2968

Northwest Africa
Find: 2004
Achondrite (ungrouped)

History and physical characteristics: A bag of rectangular to blocky, dark brown meteorite fragments, with a total mass of 268 g and collected by nomads in 2004, was purchased in Erfoud, Morocco, in November 2005.

Petrography: (T. Bunch and J. Wittke, *NAU*; A. Irving, *UWS*) A massive olivine-rich rock of very large grain size (17 to >25 mm; maximum size is unknown because of the tendency to fracture on cutting). Curved to linear compression and shear fractures are subparallel to one of the extinction directions in olivine and are responsible for the common rectangular/blocky habit. Twenty-three pieces (1.8 to 20.1 g) were surveyed. Olivine accounts for >95 vol% with small amounts of tiny grains (<0.03 mm) of orthopyroxene, metal, troilite, and pyrrhotite commonly found within fractures and as rare inclusions in olivine. Large domain offset, isolated mosaicism, and undulatory extinction are prevalent in olivine.

Fig. 1. Polished cut surface of NWA 2965. The rock is ~8 cm in width.

Mineral compositions and geochemistry: Equilibrated olivine ($Fa_{7.5\pm0.2}$; FeO/MnO = 48; Cr_2O_3 and NiO < 0.03 wt%), orthopyroxene ($Fs_{6.7}Wo_{1.5}$; FeO/MnO = 26), kamacite (Ni = 4.7–6.8 wt%), taenite (Ni = 39.1–50.7 wt%), troilite (Ni = 0.36 wt%), pyrrhotite (Ni = 1.7–4.7 wt%). Oxygen isotopes: (D. Rumble, *CIW*) Analysis of two cleaned and metal-free samples by laser fluorination yielded $\delta^{17}O$ = 1.44, 1.46; $\delta^{18}O$ = 3.08, 3.64 and $\Delta^{17}O$ = –0.178, –0.212 (all ‰).

Classification: Achondrite (ungrouped).

Type specimen: A 22 g sample is on deposit at *NAU*. *Reed* holds the main mass.

Northwest Africa 2969

Northwest Africa
Find: August 2005
Achondrite (Martian olivine-phyric shergottite)

History and physical characteristics: A total mass of 11.7 g of several dozen very small stones <15 mm in the longest dimension were collected in the general area where shergottites NWA 1068/1110/2373 were found.

Petrography: (T. Bunch and J. Wittke, *NAU*) Subangular to subrounded complete to partial stones with little or no fusion crust. Olivine phenocrysts (<1.5 mm in longest dimension) set in a fine-grained groundmass of pigeonite, maskelynite, chromite, Ti-magnetite, augite, chlorapatite, and sulfide. Minor phases include Zn-rich troilite, silica, pentlandite, and Cr-ulvöspinel.

Geochemistry: Olivine is zoned from cores of $Fa_{31.7}$ (FeO/MnO = 50–54.5) to rims of $Fa_{50.3}$ (FeO/MnO = 54–57). Pigeonite is zoned from cores of $Fs_{36.3}Wo_{8.1}$ to rims $Fs_{44}Wo_{12.7}$ (FeO/MnO = 26). Augite ($Fs_{22.5}Wo_{28.4}$), maskelynite ($An_{53.1}Or_{2.2}$), chromite (Cr/(Cr+Al) = 0.87; Fe/(Fe+Mg) = 0.90).
Classification: Achondrite (Martian olivine-phyric shergottite). The overall texture, mineral content and compositions, together with the find site location, strongly suggest that these stones are paired with NWA 1068/1110/2373.
Type specimen: A 4.3 g sample is on deposit at *NAU*. *Birdsell* holds the main mass.

Northwest Africa 2976
Northwest Africa
Find: 2005
Achondrite (ungrouped)
History and physical characteristics: A complete 219 g stone with no crust was purchased in Erfoud, Morocco, in November 2005.
Petrography: (T. Bunch and J. Wittke, *NAU*) Contains millimeter-size pigeonite with exsolved augite lamellae surrounded by recrystallized plagioclase and minor amounts of relict plagioclase of similar composition.
Mineral composition: Pigeonite ($Fs_{64.8}Wo_{6.1}$), FeO/MnO = 64; augite ($Fs_{44.2}Wo_{27.3}$); plagioclase ($An_{84.0–86.8}$). Abundant chromite is observed. The sample also contains minor amounts of Zn-bearing FeS, Cr-ulvöspinel, silica, and phosphate.
Classification: Achondrite (ungrouped); minimal shock and weathering. This meteorite is paired with NWA 2400 and NWA 011. Although no oxygen isotopic data have yet been obtained, the petrography is essentially identical to these two meteorites.
Type specimen: A 23.2 g sample is on deposit at *NAU*. *Farmer* and *Strope* hold the main mass.

Fig. 2. The polished cut surface of a hand sample of NWA 2976, with the longest axis ~4 cm.

Northwest Africa 2979
Algeria
Find: 2005
Ordinary chondrite (LL/L impact melt rock)
History and physical characteristics: A completely crusted and very fresh 23.2 g stone was purchased in Erfoud, Morocco, in November 2005.
Petrography: (T. Bunch and J. Wittke, *NAU*) Small (<0.5 mm) euhedral to subhedral olivine crystals are set in a mesostasis of dark glass, skeletal augite, and tiny (<0.03 mm) spheres of Ni, Fe-rich metal and sulfides. Submillimeter clusters of fine-grained, subhedral olivine with scarce mesostasis are scattered throughout.
Mineral compositions and geochemistry: Mean composition of unzoned olivine ($Fa_{26.8±13.7}$; FeO/MnO = 36–54, Cr_2O_3 = 0.35–0.78 wt%), augite ($Fs_{39.4}Wo_{25.8}$), quartzo-feldspathic glass phase that contains FeO = 4.6, MgO =1.75, Cr_2O_3 = 0.39 (all wt%), chromite (Cr/(Cr+Al) = 0.83), kamacite (Ni = 5.3 wt%), taenite (Ni = 20.1 wt%). Oxygen isotopes: (D. Rumble, *CIW*) Replicate analyses by laser fluorination technique are $\delta^{17}O$ = 3.61, 3.64, $\delta^{18}O$ = 4.66, 4.69, $\Delta^{17}O$ = 1.164, 1.178 (all ‰).
Classification: Ordinary chondrite (impact melt rock with a LL/L composition).
Type specimen: A 4.8 g specimen is on deposit at *NAU*. *Farmer* and *Strope* hold the main mass.

Northwest Africa 2981
Algeria
Find: August 2005
Ordinary chondrite (L impact melt rock)
History and physical characteristics: A 19 g, lightly weathered and partially crusted stone was purchased in Erfoud, Morocco, in August 2005.
Petrography: (J. Wittke and T. Bunch, *NAU*) Consists of mostly small (<0.5 mm) euhedral to subhedral olivine crystals set in a dark, MgO-, FeO-bearing feldspathic glass together with clusters of fine-grained (<0.1 mm) anhedral olivine with scarce glass are scattered throughout as well as millimeter-size clumps of Ni-Fe metal cores with sulfide rims. Mesostasis glass contains a connected network of skeletal augite and tiny, round to irregular-shaped metal and sulfide grains.
Mineral compositions and geochemistry: Mean compositions are: olivine ($Fa_{22.6}$; FeO/MnO = 46), rare orthopyroxene ($Fs_{19.1±7.1}$), diopside ($Fs_{12}Wo_{43.4}$), pigeonite ($Fs_{17.4–28.6}Wo_{12–5.8}$), kamacite (Ni = 6.8 wt%), glass with SiO_2 = 67, Al_2O_3 =10.2, CaO = 5.7, Na_2O = 2.17, K_2O = 2.13, MgO = 5.9, FeO = 3.0 (all as wt%).
Classification: Ordinary chondrite (impact melt rock with L composition).
Type specimen: A 4.1 g sample is on deposit at *NAU*. *G. Hupé* holds the main mass.

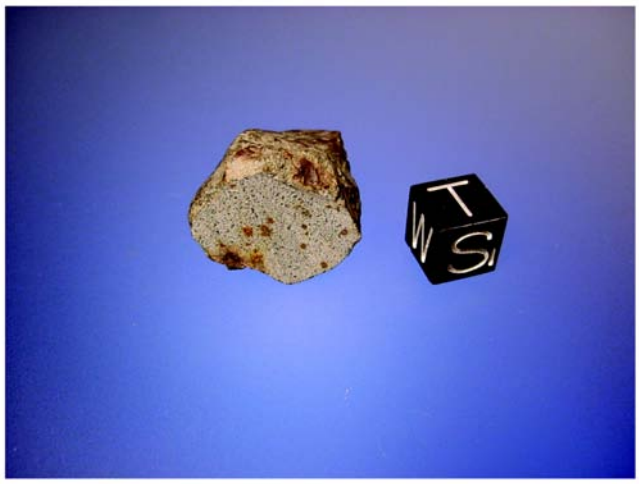

Fig. 3. Cut surface displayed of NWA 2981. Cube is 1 cm^3.

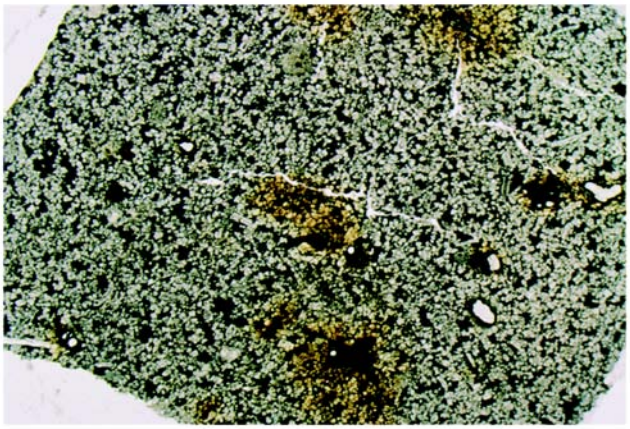

Fig. 4. A PPL image of a thin section of NWA 2981. Field of view = 9 mm.

Northwest Africa 2988

Algeria
Find: 2006
Achondrite (eucrite)

History: The main mass holders purchased the stone in Erfoud, Morocco, in September 2006.

Physical characteristics: A single, complete stone of 4602 g with partial, moderately weathered fusion crust.

Petrography: (T. Bunch and J. Wittke, *NAU*) Microgranular (pyroxenes < 0.05 mm; plagioclase < 0.1 mm) with rare pyroxene splays and rare megacrysts of plagioclase and pyroxene (up to 0.6 mm in longest dimension). At least two brecciation episodes (breccia-in-breccia) are cross-cut by shock melt injection veins. These melt veins have bulk major and minor elemental compositions consistent with typical eucrite bulk compositions. The stone contains orthopyroxene, augite, plagioclase, chromite, and troilite.

Mineral compositions and geochemistry: Orthopyroxene ($Fs_{61}Wo_{2.1}$), augite ($Fs_{42.3}Wo_{37.8}$), chromite (cr# = 81), plagioclase ($An_{92.3}$). EMP broad beam analysis of the shock melt glass is: Si = 22.75, Al = 8.7, Ca = 9.45, Ti = 0.45, Cr = 0.21, Fe = 12.4, Mg = 3.1, Mn = 0.3 (all wt%).

Classification: Achondrite (eucrite); S5, minimal weathering.

Type specimens: A total of 20.1 g and one thin section are on deposit at *NAU*. *Farmer* and *Strope* hold the main mass.

Northwest Africa 2993

Algeria
Find: 2006
Achondrite (ungrouped)

History and physical characteristics: A fully crusted, complete stone of 625 g was recovered from the lower Algerian desert in June 2006 and purchased in Erfoud in August 2006 by A. Aaronson.

Petrography: (T. Bunch and J. Wittke, *NAU*; A. Irving, *UWS*) Protogranular texture with a grain size range of 0.3–3.4 mm (mean = 1.35 mm) for silicates and 0.3–5 mm for metal (mean = 2.4 mm). Modal analyses (6.4 cm^2; vol%): orthopyroxene, 37; olivine, 32; metal, 30; sulfide, 1. Several metal grains have taenite cores mantled by kamacite. Taenite grain shape is roughly similar to the outline of the entire metal grain; embryonic plessite is evident in a few taenite cores. No directional fabric was recognized. Fusion crust is lightly to moderately altered and weathering is limited to minor oxidation of kamacite with the presence of minor oxide veining.

Mineral compositions and geochemistry: Olivine ($Fa_{12.3\pm0.2}$; FeO/MnO=32), orthopyroxene ($Fs_{11.2\pm0.02}Wo_{1.2}$; FeO/MnO = 19), kamacite (Ni = 4.6 wt%). Oxygen isotopes: (D. Rumble, *CIW*) A cleaned and metal-free sample was analyzed by laser fluorination. Replicate analyses are respectively, $\delta^{17}O$ = 1.129, 1.220; $\delta^{18}O$ = 2.527, 2.661; $\Delta^{17}O$ = –0.2006, –0.1802 (all ‰).

Classification: Achondrite (ungrouped). Petrography and geochemistry are consistent with lodranites; oxygen isotopes are inconsistent with lodranites/acapulcoites and are closest to the IAB irons and winonaite trend.

Type specimen: 20.3 g and one polished thin section are on deposit at *NAU*. The main mass holder is anonymous.

Northwest Africa 2997

Algeria
Find: 2006
Achondrite (diogenite, unbrecciated)

History: A complete stone was purchased in Erfoud, Morocco, in July 2006 and sold to an anonymous buyer in September 2006.

Physical characteristics: A brownish 43 g stone with no remnant fusion crust.

Petrography: (T. Bunch and J. Wittke, *NAU*) Unbrecciated, cumulate-textured diogenite with well-developed preferred orientation of orthopyroxene grains. Large orthopyroxene oikocrysts (up to 12 mm in longest dimension) surround smaller orthopyroxene grains of similar composition that

have long axis deviations from the oikocryst orientation axis. Grain boundaries of all orthopyroxene grains are scalloped to serrated. Sparse, large chromite crystals (up to 2.5 mm) are surrounded in "necklace" fashion by small olivine grains (<0.2 mm) and contain tiny inclusions (<0.03 mm) of aluminous orthopyroxene, diopside, a silica phase, pigeonite, K-feldspar, plagioclase, metal, and FeS. With the exception of feldspars, all of these phases are also found as very small inclusions in host orthopyroxenes.

Mineral compositions and geochemistry: Orthopyroxene ($Fs_{22.1–24.3}Wo_{3.0}$; FeO/MnO = 29–32); chromite (cr# = 78), "necklace" olivine ($Fa_{21.2–24.5}$; FeO/MnO = 45–56). Inclusion phases: diopside ($Fs_{10.5}Wo_{41.4}$), pigeonite ($Fs_{20}Wo_{11.5}$), K-feldspar ($An_{10.4}Or_{42}$), plagioclase ($An_{77.6}$) and metal (Ni = 0.56 wt%).

Classification: Achondrite (unbrecciated cumulate diogenite); minimal shock, minimal weathering. This meteorite is very similar to NWA 4215 in many characteristics, but differs greatly in orthopyroxene grain size.

Type specimen: A 10 g sample and one thin section are on deposit at *NAU*. The main mass holder is anonymous.

Northwest Africa 2998

Algeria
Find: 2006
Achondrite (lunar, anorthositic breccia)

History: Found in the southern Algerian desert in May 2006. Purchased by A. Aaronson in Morocco, June 2006.

Physical characteristics: Medium brown, oriented, nearly complete 163 g stone. The fusion crust is fresh, with very prominent flow lines.

Petrography: (T. Bunch and J. Wittke, *NAU*) Breccia-in-breccia structure; breccia clasts are granulated or cataclastized with fine-grained to melt matrix. Vesiculated shock-melt veins and isolated glass clumps are common. Consists of partially maskelynitized plagioclase fragments (47 vol%), shock-melt anorthositic clasts (38 vol%), dark glasses (7 vol%), norites and troctolites (6 vol%), and olivine and pyroxene fragments (2 vol%). No mare components were observed.

Mineral compositions and geochemistry: Plagioclase ($An_{93.6–99}$; FeO = 0.15–0.35 wt%), olivine ($Fa_{21.7–34.6}$; FeO/MnO = 79–87), orthopyroxene ($Fs_{22.5–29.5}Wo_{2.1–3.2}$; FeO/MnO = 53–59), pigeonite ($Fs_{49.3}Wo_{5.2}$; FeO/MnO = 53), augite exsolution lamellae in pigeonite ($Fs_{27.4}Wo_{43.1}$), ferroaugite ($Fs_{45.8}Wo_{38.9}$; FeO/MnO = 28). Bulk composition: (R. Korotev, *WUSL*, INAA of 224 mg sample) FeO = 2.7 wt%; Ni =60, Sm = 0.42, and Th = 0.13 (all ppm).

Classification: Achondrite (lunar, anorthositic breccia).

Type specimen: A total of 20.4 g and one thin section are on deposit at *NAU*. The main mass holder is anonymous.

Northwest Africa 3152

Morocco
Find: 2005
Achondrite (eucrite)

History: Purchased in April 2005 by Greg Hupé from a Moroccan dealer in Tagounite.

Physical characteristics: A partly crusted, pale tan stone weighing 1496 g.

Petrography: (A. Irving and S. Kuehner, *UWS*) Equilibrated with a very fine-grained texture. Exsolved pigeonite and plagioclase with accessory silica polymorph, orthopyroxene, ilmenite, and Ti-chromite.

Geochemistry: Plagioclase ($An_{91.0–93.1}Or_{0.4}$); pyroxene grains consist of prominent exsolution lamellae of augite ($Fs_{26.9}Wo_{42.8}$; FeO/MnO = 32.3) within orthopyroxene ($Fs_{57.7}Wo_{4.3}$; FeO/MnO = 32.6).

Classification: Achondrite (basaltic eucrite, type 7).

Type specimen: A total of 21.7 g of sample and one polished thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 3155

Morocco
Find: August 2004
Carbonaceous chondrite (CK5)

History: Purchased in August 2004 by Greg Hupé from a Moroccan dealer in Tagounite.

Physical characteristics: A complete brownish stone with thin fusion crust weighing 878 g.

Petrography: (A. Irving and S. Kuehner, *UWS*) Dispersed but relatively well-formed, recrystallized chondrules in a fine-grained matrix. Abundant olivine, plagioclase, clinopyroxene, and euhedral to subhedral magnetite.

Geochemistry: Olivine ($Fa_{30–32}$), plagioclase ($An_{27.6–35.5}$ $Or_{6.8–4.5}$), clinopyroxene (Mg/(Mg+Fe) ~0.75), Cr-rich magnetite (Cr_2O_3 = 5.4–5.7 wt%). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two different whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O$ = –0.41, –0.46; $\delta^{17}O$ = –4.59, –4.54; $\Delta^{17}O$ = –4.376, –4.299 (all ‰).

Classification: Carbonaceous chondrite (CK5); low shock with moderate weathering.

Type specimen: A total of 20 g of sample and one polished thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 3156

Morocco
Find: 2004
Achondrite (ureilite)

History: Purchased in August 2004 by Greg Hupé from a Moroccan dealer in Tagounite.

Physical characteristics: A complete stone with thin fusion crust weighing 138 g.

Petrography: (A. Irving and S. Kuehner, *UWS*) Larger grains of pigeonite and olivine with reduced rims in a dominant matrix pigeonite, augite, orthopyroxene, sparse olivine, troilite, and kamacite. Geochemistry: pigeonite ($Fs_{18.4–18.6}Wo_{5.9–6.0}$; FeO/MnO = 27.8–33.3; Cr_2O_3 = 1.08–1.11 wt%),

olivine ($Fa_{6.7–7.1}$; FeO/MnO = 13.2–14.0, Cr_2O_3 = 0.55, CaO = 0.25 [all as wt%]). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two acid-washed whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O = 7.69, 7.76$; $\delta^{17}O = 3.24, 3.32$; $\Delta^{17}O = –0.798, –0.763$ (all ‰).
Classification: Achondrite (ureilite).
Type specimen: A total of 20 g of sample and one polished thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 3159
Morocco or Algeria
Find: August 2005
Achondrite (eucrite)
History: Purchased in August 2005 by Greg Hupé from a Moroccan dealer in Rissani.
Physical characteristics: Seven stones with a total weight of 397 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) Monomict breccia composed of rock and mineral clasts. Plagioclase, exsolved pigeonite, silica polymorph, troilite, chromite, and ilmenite (one grain with a very tiny zircon inclusion).
Mineral compositions and geochemistry: Plagioclase ($An_{87.5–89.0}Or_{0.4}$); pyroxene grains consist of host orthopyroxene ($Fs_{61.1–62.0}Wo_{2.0–2.1}$; FeO/MnO = 30.9–34.1) with exsolution lamellae of clinopyroxene ($Fs_{25.8–26.8}Wo_{43.0–43.9}$; FeO/MnO = 28.4–34.4).
Classification: Achondrite (eucrite breccia).
Type specimens: A total of 20.14 g of sample and one polished thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 3161
Morocco or Algeria
Find: August 2005
Ordinary chondrite (type 3)
History: Purchased in August 2005 by Greg Hupé from a Moroccan dealer in Ouarzazate.
Physical characteristics: Seventeen stones with black fusion crust weighing a total of 1815 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) Complex specimen consisting of well-formed olivine and orthopyroxene-bearing chondrules with rare altered metal and troilite.
Mineral compositions and geochemistry: There is a very wide range in mafic silicate compositions with olivine (Fa_0–Fa_{35}), orthopyroxene (Fs_1–Fs_{22}). Silicate glass within chondrules ranges in composition from Ca-Al-rich to Na-Al-rich. Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two acid-washed whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O = 5.49, 5.34$; $\delta^{17}O = 4.01, 3.93$; $\Delta^{17}O = 1.119, 1.118$ (all ‰). Although oxygen isotope compositions are similar to those of LL chondrites, this specimen contains so little metal that it does not appear to be a typical ordinary chondrite.
Classification: Ordinary chondrite (type 3); S1, W1.
Type specimens: A total of 21.1 g of sample and one polished thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 3162
Morocco or Algeria
Find: August 2005
Achondrite (eucrite)
History: Purchased in August 2005 by Greg Hupé from a Moroccan dealer in Ouarzazate.
Physical characteristics: A complete 60 g sample with fresh, thin, black fusion crust.
Petrography: (A. Irving and S. Kuehner, *UWS*) Unbrecciated, ophitic-textured assemblage of exsolved pigeonite, plagioclase, silica polymorph, ilmenite, troilite, and metal (with very minor rusting).
Mineral compositions: Plagioclase ($An_{87.8–88.1}$); pyroxene grains consist of augite ($Fs_{35.6}Wo_{30.6}$: FeO/MnO = 31.3), with exsolution lamellae of orthopyroxene ($Fs_{56.6}Wo_{4.8}$; FeO/MnO = 31.0); metal is Ni-free.
Classification: Achondrite (basaltic eucrite).
Type specimens: A total of 12.2 g of sample and one polished thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 3164
Algeria
Find: 2004
Achondrite (angrite)
History: A. Aaronson purchased a bag of stones in Rabat, Morocco, in August 2004. T. Boswell then purchased these stones in Denver, Colorado, in September 2005.
Physical characteristics: A total of 48 stones with a combined mass of 928 g are all dark brown in color and without fusion crust.
Petrography (T. Bunch and J. Wittke, *NAU*; A. Irving and S. Kuehner, *UWS*) All stones have irregularly distributed larger yellowish plagioclase grains exhibiting a schiller luster. The major minerals are Ca-rich olivine, diopside, Cr-bearing pleonaste spinel with subordinate anorthite and spinel and accessory kamacite and troilite. No kirschsteinite or orthopyroxene was found. Primary metal is partly replaced by limonite, which also occurs along grain boundaries. The overall texture is protogranular, but there are large porphyroclasts of anorthite, spinel, and polygranular olivine. There are clinopyroxene-spinel symplectites around anorthite porphyroclasts in contact with olivine, and anorthite also occurs as narrow (10–20 μm wide) coronas around spinel grains adjacent to clinopyroxene (Kuehner et al. 2006).
Mineral compositions and geochemistry: Ca-rich olivine ($Fa_{39.1–41.2}$; FeO/MnO = 62–84, CaO = 1.2–1.8 wt%), Al-Ti-bearing diopside ($Fs_{10.3}Wo_{52}$; FeO/MnO=130–142, Al_2O_3 = 6–7, TiO_2 = 1–1.6 [both wt%]), Cr-bearing pleonaste spinel

(Mg/[Mg + Fe] = 45.7, Al_2O_3=59.7, Cr_2O_3=4.7 [both wt%]).
Classification: Achondrite (angrite). The characteristic textures and mineral compositions indicate that this material is likely paired with NWA 2999.
Type specimens: A total of 21 g and one polished thin section are on deposit at *NAU. Boswell* holds the main mass.

Northwest Africa 3213
Northwest Africa
Find: 2005
Mesosiderite
History: A complete stone was purchased in Erfoud by a Moroccan dealer for M. Chinellato.
Physical characteristics: The sample is a single stone of 147 g, partially covered with black fusion crust.
Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) Fine-grained (<0.5 mm) matrix consisting of a relatively homogeneous assemblage of orthopyroxene (42%), plagioclase (18%), metal (20%), troilite (15%), chromite (5%), and accessory merrillite set in a unbrecciated texture. Metal grains are formed by taenite-kamacite aggregates.
Mineral compositions and geochemistry: Orthopyroxene is pigeonitic ($Fs_{30,1}En_{66,8}Wo_{3,1}$; FeO/MnO = 26.2–29.8). Plagioclase is anorthitic ($An_{92,1}$). Oxygen isotopes: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O = 2.13$, $\delta^{18}O = 4.55$, $\Delta^{17}O = -0.26$ (all ‰).
Classification: Mesosiderite (B class); minimal shock, minimal weathering.
Type specimen: A total of 21.3 g of sample and one thin section are on deposit at *MSP. Chin* holds the main mass.

Northwest Africa 3214
Northwest Africa
Find: 2005
Carbonaceous chondrite (CV3)
History: M. Chinellato purchased a single stone in Erfoud, Morocco, in 2005.
Physical characteristics: The original stone weighed 435.2 g. A cut surface on the type specimen shows a very dark gray color with rather large chondrules and some small white spots and no fusion crust.
Petrography: (V. Moggi Cecchi and G. Pratesi, *MSP*) In thin section many chondrules of various kinds (BO, PO, POP) are visible, accounting for ~50 vol% and ranging in size from 550 to 1150 μm in apparent diameter (mean value 930 μm) and are set in a dark brown matrix. The chondrule margins are clear and defined. Chondrules contain variable amounts of clear glass. The matrix is represented by olivine and orthopyroxene, with rare clinopyroxenes. Fe,Ni metal and troilite are uncommon (<5 vol%). CAIs are also present.
Mineral compositions and geochemistry: Olivine in the chondrules is Fo-rich ($Fo_{91–94}$, mean Fo_{92}). Olivine in the matrix is less Fo-rich ($Fo_{81–88}$, mean Fo_{86}). Orthopyroxene is enstatitic ($En_{98.36}Fs_{0.72}Wo_{0.92}$). An augitic pyroxene with variable composition is also present ($Fs_{17.54–30.61}$, $En_{24.12–35.97}Wo_{47.12–48.49}$). Oxygen isotope: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O = -1.84$; $\delta^{18}O = 2.67$; $\Delta^{17}O = -3.23$ (all ‰).
Classification: Carbonaceous chondrite (CV3); S1, minimal weathering.
Type specimen: A total of 20 g and one thin section are on deposit at *MSP. Chin* holds the main mass of 32.5 g.

Northwest Africa 3329
Morocco or Algeria
Find: 2005
Achondrite (diogenite)
History: Purchased in 2005 by Fabien Kuntz from a Moroccan dealer in Er-Rachidia.
Physical characteristics: Multiple fragments of a single stone weighing 252 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) Mostly orthopyroxene with interstitial plagioclase, silica polymorph, merrillite, and trace amounts of kamacite and troilite.
Mineral compositions: Orthopyroxene ($Fs_{29.3–29.5}Wo2_{.4–2.5}$; FeO/MnO = 26.6–28.6), plagioclase ($An_{88.5–90.1}Or_{0.2–0.3}$).
Classification: Achondrite (diogenite).
Type specimen: A total of 22.5 g is on deposit at *Harper*, and one polished thin section is on deposit at *UWS. Kuntz* holds the main mass.

Northwest Africa 4024
Northwest Africa
Find: August 2005
Achondrite (winonaite)
History: The meteorite was found by an anonymous finder in the western part of the Sahara and bought by the main mass holder in Erfoud, Morocco.
Physical characteristics: A single stone of 38.1 g was recovered.
Petrography: (A. Greshake, *MNB*) The meteorite exhibits an equilibrium texture of low-Ca pyroxene, Ca-pyroxene, olivine, plagioclase, Fe,Ni-rich metal, and troilite with low-Ca pyroxene being the dominant silicate phase. Fe,Ni metal and troilite are dominant in several regions and no relict chondrules were found.
Mineral compositions and geochemistry: Olivine ($Fa_{4.2}$), low-Ca pyroxene ($Fs_{6.1}$), plagioclase (An_{11}), determined by EMP. Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O = 3.01$, $\delta^{18}O = 6.60$, $\Delta^{17}O = -0.42$ (mean of 2; all ‰).
Classification: Primitive achondrite (winonaite); minimal shock, minimal weathering.
Type specimen: A total of 8 g plus one polished thin section are on deposit at *MNB. HSSH* holds the main mass.

Northwest Africa 4025
Morocco

Find: August 2005
Carbonaceous chondrite (CB)

History: A total of 69 fragments were purchased in August 2005 from a dealer in Erfoud, Morocco.

Physical characteristics: The small, mostly angular fragments, totaling 745.5 g, display a rusty brown surface; fusion crust is almost absent.

Petrography: (A. Greshake, *MNB*) The meteorite is characterized by a high modal metal abundance of about 60–80 vol%. The silicate portion contains abundant, large (up to several millimeters) and clearly defined chondrules of different textural types including cryptocrystalline, BO, PO, and POP chondrules.

Mineral compositions and geochemistry: Olivine ($Fa_{1.7–4.4}$), low-Ca pyroxene ($Fs_{1.5–3.9}$), determined by EMP. Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O = 0.22$, $\delta^{18}O = 3.73$, $\Delta^{17}O = –1.72$ (mean of 2, all ‰). Nitrogen isotopes: (I. A. Franchi and A. Verchovsky, *OU*) 89.8 ppm N with a bulk $\delta^{15}N = 601$‰ and a peak at 1000 °C of 1169‰.

Classification: Carbonaceous chondrite (CB); S3, moderate weathering. The meteorite is a Bencubbin-like carbonaceous chondrite (CB) based on petrography and metal/silicate ratio while O-isotopes suggest a close relation to CH chondrites.

Type specimen: A total of 20 g plus one polished thin section are at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4026

Northwest Africa
Find: August 2005
Carbonaceous chondrite (CK4/5)

History: The meteorite was found by an anonymous finder in the western part of the Sahara and bought by the main mass holder in Erfoud, Morocco.

Physical characteristics: Two stones weighing a total of 265.6 g were recovered.

Petrography: (A. Greshake, *MNB*) The meteorite contains large 500–1200 μm size and mostly well-discernable chondrules that are embedded into a fine-grained partly recrystallized matrix. The silicates are completely equilibrated and feldspar is present in the matrix. The meteorite contains Cr-rich magnetite and minor augite.

Mineral compositions and geochemistry: Olivine ($Fa_{30.1}$), low-Ca pyroxene ($Fs_{25.7}$), determined by EMP. Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O = –4.29$, $\delta^{18}O = –0.14$, $\Delta^{17}O = –4.22$ (mean of 2, all ‰).

Classification: Carbonaceous chondrite (CK4/5); minimal shock, moderate weathering.

Type specimen: A total of 22.5 g plus one polished thin section are on deposit at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4051

Kem Kem Basin, Algeria
Find: April 2004
Achondrite (eucrite)

History: A stone with brownish-black fusion crust was purchased by a member of Moussa Minerals & Fossils, England, in 2004 from a Moroccan dealer.

Physical characteristics: The 828 g meteorite is almost entirely covered in a fusion crust. Terrestrial weathering is present in terms of charred fusion crust and calcite veins occurring throughout the rock.

Petrography: (M. Anand, *NHM* and *OU*) The rock consists of large mineral (up to 3 mm) and lithic clasts (up to 6 mm). Pyroxene and plagioclase grains dominate (usually about 100–500 μm), in a highly immature matrix of the same texture and mineral composition but smaller grain size (<100 μm). Plagioclase occurs as subangular to lath-shaped crystals. Minor phases include chromite, ilmenite, silica, iron sulfide, and Fe,Ni-rich metal.

Mineral compositions and geochemistry: EMP analysis, conducted at the *NHM*, of mineral phases: pigeonite ($En_{50}Wo_{5.2}$–$En_{38}Wo_{17.5}$), which is the dominant pyroxene phase containing exsolution lamellae of orthopyroxene ($En_{47}Wo_{2.3}$–$En_{41}Wo_5$) and in some cases of subcalcic augite = $En_{35}Wo_{26}$–$En_{35}Wo_{20.5}$. The Fe/Mn ratio in pyroxenes varies from 27 to 38. The anorthite content of plagioclase varies from An_{85} to An_{93}. Chromite grains contain Al_2O_3 = 7–14 and TiO_2 = 2–5.6 (both wt%). Ilmenite contains MgO = 0.6–1.3 and MnO = 0.8–1 (both wt%). Oxygen isotopes: (R. C. Greenwood and I. A. Franchi, *OU*) $\delta^{17}O = 1.861$, $\delta^{18}O = 3.994$, $\Delta^{17}O = –0.216$ (all as ‰).

Classification: Achondrite (brecciated basaltic eucrite).

Type specimen: A total of 20 g is on deposit at the *NHM*. Moussa holds the main mass.

Northwest Africa 4138

Northwest Africa
Find: 2004
Achondrite (polymict eucrite)

History: The meteorite was found by an anonymous person in Northwest Africa and bought by C. Anger in Erfoud, Morocco.

Physical characteristics: A single stone of 55.5 g was recovered.

Petrography: (A. Greshake and M. Kurz *MNB*) The meteorite is a polymict breccia consisting of impact melt, basaltic, and mineral clasts set in a fine-grained recrystallized groundmass. Mineral fragments are mostly large plagioclase and Ca pyroxene with very fine exsolution lamellae. Minor phases include silica, ilmenite, Al-rich chromite, and troilite.

Mineral compositions and geochemistry: Plagioclase ($An_{86.6–94.3}$), pyroxene ($Fs_{28.2–53.7}Wo_{4.6–41.1}$).

Classification: Achondrite (polymict eucrite); moderate shock, moderate weathering.

Type specimen: A total of 11.8 g plus one polished thin section are on deposit at *MNB*. *Anger* holds the main mass.

Northwest Africa 4233
Morocco
Find: 2004
Iron (IAB complex)
History: A single iron mass was purchased at the Hamburg Mineral Fair, Germany, from a Moroccan dealer in 2004.
Physical characteristics: The 444 g mass has an angular shape. One side reflects the Widmanstätten structure, because rust veins follow those structure elements.
Petrography: (J. Schlüter, *Ham*) The bandwidth of kamacite lamellae is 0.5 mm. Rare inclusions of schreibersite.
Geochemistry: (B. Spettel, *Mainz*) Composition of the metal (INAA) is Co = 4.82, Ni = 123 (both mg/g); Ga = 26.8, Ge = 45.0, As = 13.5, Ir = 1.38, Au = 1.74 (all as μg/g).
Classification: Iron meteorite (IAB), fine octahedrite.
Type specimen: A total of 22.4 g sample is on deposit at *Hamb. Gren* holds the main mass.

Northwest Africa 4235
Northwest Africa
Find: 2004
Achondrite (mesosiderite)
History: Twelve small pieces were purchased at the Hamburg Mineral Fair, Germany, from a Moroccan dealer in 2004. An anonymous finder recovered the meteorites from the western part of the Sahara.
Physical characteristics: The small angular fragments, with a total weight of 59 g, are without fusion crust. Large orthopyroxene crystals (up to 5 mm) are visible in the stony portions.
Petrography: (J. Schlüter, *Ham*) The stony portion with orthopyroxene and clinopyroxene, rich in plagioclase, shows a cataclastic texture with large mineral fragments (300–900 μm) in a coarse matrix (>10 μm). Apatite and chromite grains are also observed.
Mineral compositions: Orthopyroxene ($Fs_{26.5}Wo_{3.0}$; range: $Fs_{25.4–27.4}Wo_{2.1–4.9}$; n = 16), plagioclase ($An_{91.3}Or_{0.4}$; range: $An_{89.7–94.4}Or_{0.3–0.5}$; n = 12), kamacite (Ni = 5.98 wt%), taenite (Ni = 46.3 wt%), fluorapatite (MgO = 3.69 wt%).
Classification: Achondrite (mesosiderite); minimal shock and weathering.
Type specimen: A total of 11.8 g sample is on deposit at *Hamb. Herkstroeter* holds the main mass.

Northwest Africa 4236
Northwest Africa
Find: 2004
Achondrite (acapulcoite)
History: A small piece was purchased at the Hamburg Mineral Fair, Germany, from a Moroccan dealer in 2004. An anonymous finder recovered the meteorites from the western part of the Sahara.
Physical characteristics: A 24 g angular fragment with some fusion crust.
Petrography: (J. Schlüter, *Ham*) Olivine, orthopyroxene, and kamacite are the main components. Rich in troilite and plagioclase with rare chromite grains. Large olivine and orthopyroxene grains (up to 900 μm) are set in a fine-grained matrix. Several relict chondrules (orthopyroxene and rare olivine) up to 2 mm in size are present. Tiny metal inclusions within the relict chondrules are also present. Most metal grains are 100–500 μm.
Mineral compositions and geochemistry: Olivine ($Fa_{19.19}$), (range: n = 15, $Fa_{18.56–19.62}$); orthopyroxene ($Fs_{16.99}$), (range: n = 10, $Fs_{16.70–17.14}$); plagioclase ($Ab_{81.81}Or_{5.6}$), (n = 2); kamacite with Ni = 6.40 wt%; taenite with Ni = 39.43 wt%; chromite = $(Fe_{0.81}Mg_{0.17}Mn_{0.02})$ $(Cr_{1.59}Al_{0.28}Fe_{0.07},Ti_{0.06})O_4$ (n = 4).
Classification: Achondrite (acapulcoite); minimal shock and weathering.
Type specimen: A total of 4.9 g is on deposit at *Hamb. Herkstroeter* holds the main mass.

Northwest Africa 4240
Northwest Africa
Find: 2004
Achondrite (ureilite)
History: A small piece was purchased at the Munich Mineral Fair, Germany, from a Moroccan dealer in 2004. An anonymous finder recovered the meteorites from the western part of the Sarhara.
Physical characteristics: A 45 g, angular brown fragment without fusion crust and with a granular, sand-blasted surface.
Petrography: (J. Schlüter, *Hamb*) Coarse-grained granoblastic ureilite texture with olivine and pigeonite. High degree of weathering; metal inclusions in the reduced olivine rims are nearly completely weathered. Intergranular graphite laths (up to 2.5 mm).
Mineral compositions and geochemistry: Olivine ($Fa_{21.3}$; range: $Fa_{19.1–22.1}$; n = 5); pigeonite ($Fs_{18.2}Wo_{10.5}$; range: $Fs_{17.5–18.9}$, $Wo_{9.6–12.1}$; n = 6) with Cr_2O_3 = 1.22 wt%.
Classification: Achondrite (ureilite)
Specimens: A total of 10.7 g is on deposit at *Hamb. Koblitz* holds the main mass.

Northwest Africa 4246
Northwest Africa
Find: 2004
Achondrite (ureilite)
History: A tiny piece was purchased at the Munich Mineral Fair, Germany, from a Moroccan dealer in 2004. An anonymous finder recovered the meteorites from the western part of the Sahara.
Physical characteristics: A 4 g, angular, dark brown fragment with a granular sand blasted surface.
Petrography: (J. Schlüter, *Hamb*) Coarse-grained granoblastic ureilite texture with olivine, pigeonite, and some plagioclase. Reduced olivine rims show tiny metal inclusions. Intergranular graphite laths observed.
Mineral compositions and geochemistry: Olivine (core

$Fa_{22.0}$; range: $Fa_{21.5–22.3}$; $n = 5$), (rim $Fa_{15.9}$; range: $Fa_{13.3–19.7}$; $n = 3$), pigeonite ($Fs_{18.3}En_{74.0}Wo_{7.7}$; $Cr_2O_3 = 0.96$ wt%; $n = 2$) Intergranular metal with Ni = 4.17 wt%.
Classification: Achondrite (ureilite); minimal weathering.
Type specimen: A total of 1.3 g is on deposit at *Hamb. Wuthenau* holds the main mass.

Northwest Africa 4283
Algeria
Find: 2005
Achondrite (diogenite)
History: The stone was found in the southern desert of Algeria and sold in Erfoud, Morocco, in December 2005.
Physical characteristics: A light blue-gray stone, with a mass of 254 g, no remnant fusion crust, and a highly irregular outer surface.
Petrography: (J. Wittke and T. Bunch, *NAU*) Contains orthopyroxene crystals up to 2.7 cm in longest dimension. Large euhedral chromite crystals (~1–3 mm) extend outward from the surface. In addition to the large chromite crystals, orthopyroxene contains stringers of tiny subhedral chromites together with FeS grains and rare metal that is mantled by light Fe oxide staining. The stone is mostly orthopyroxene (96.2 vol%) with chromite, FeS, and metal (3.8 vol%).
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{23.4}Wo_{2.4}$; FeO/MnO = 26), chromite (cr# = 85), metal (Ni = 0.46 wt%).
Classification: Achondrite (diogenite); minimal shock and weathering.
Type specimen: A total of 28 g and one thin section are on deposit at *NAU. Thompson* is the main mass holder.

Northwest Africa 4285
Algeria
Find: 2005
Achondrite (diogenite)
History and physical characteristics: A 48 g buff-colored stone with fresh, black fusion crust was purchased in Erfoud, Morocco, in December 2005.
Petrography: (J. Wittke and T. Bunch, *NAU*) Coarse-grained breccia of fragments up to 1.8 cm with interstitial cataclastite. Mineral modes in vol% are: orthopyroxene = 88, olivine = 5, chromite = 3, plagioclase = 2, and FeS + metal = 2.
Mineral composition and geochemistry: Orthopyroxene ($Fs_{24.5}Wo_{3.7}$; FeO/MnO = 26); olivine ($Fa_{29.1}$; FeO/MnO = 54), plagioclase (An_{88}), chromite (Cr/(Cr+Al) = 0.68), troilite (Cr = 2.2 wt%), and metal (Ni = 1.15 wt%).
Classification: Achondrite (diogenite, olivine, and plagioclase-bearing); S3, minimal weathering.
Type specimen: A total of 10 g and one thin section are on deposit at *NAU. Thompson* is the main mass holder.

Northwest Africa 4286
Algeria
Find: 2005
Ordinary chondrite (L melt rock)
History: A stone was found in southern Algeria in 2005 and sold in Erfoud in November 2005.
Physical characteristics: A 71 g partial stone with no residual crust is reddish brown in color with raised, small (<1 mm) bumps of lightly oxidized metal and sulfide.
Petrography: (T. Bunch and J. Wittke, *NAU*) Very dark interior that is mostly shock-melted with three distinct grain sizes: 1) shocked and unmelted olivine and orthopyroxene fragments (<0.3 mm), 2) melt-crystallized olivine > orthopyroxene > plagioclase > augite (<0.05 mm), and 3) very fine grained matrix (<0.01 mm) that consists of olivine, orthopyroxene, SiO_2-rich feldspathic glass, and tiny metal melt spheres. Large oblate to rounded melt-formed taenite is commonly mantled by sulfide and is <3 mm in size. No metal-sulfide eutectic structures were noted. There is a strong directional flow orientation of the metal-sulfide complexes. No residual kamacite and taenite is partially oxidized.
Mineral compositions and geochemistry: Olivine megacrysts ($Fa_{23.6}$; FeO/MnO = 50), midsize olivine ($Fa_{20.2–27.6}$; FeO/MnO = 44–54). Orthopyroxene megacrysts ($Fs_{19.6}Wo_{2.6}$; FeO/MnO = 33), augite ($Fs_{15.6}Wo_{30.4}$). Taenite (Ni = 15.2 wt%) and chromite fragments (Cr/[Cr+Al] = 0.84).
Classification: Ordinary chondrite (L melt rock); S5, moderate weathering. This sample is similar to NWA 2085, but lacks metal-sulfide eutectic structures.
Type specimen: A total of 14.6 g and one thin section are on deposit at *NAU. Thompson* is holder of the main mass.

Northwest Africa 4287
Algeria
Find: 2005
Achondrite (eucrite, monomict breccia)
History: A stone was found in southern Algeria and purchased in Erfoud, Morocco, in November 2005.
Physical characteristics: A 364 g stone partially covered with fusion crust.
Petrography: (J. Wittke and T. Bunch, *NAU*) Monomict breccia with subrounded, centimeter-size clasts of subophitic basalt set in a cataclastic matrix. Thin bladed plagioclase up to 5 mm in length encloses granular anhedral pyroxenes, chromite, and ilmenite. Sparse areas of ophitic-textured basalt also occur.
Mineral compositions: Orthopyroxene ($Fs_{59–63.7}Wo_{3.3–4.1}$; FeO/MnO = 26–40), augite exsolution lamellae ($Fs_{26.1–28.9}$ $Wo_{44.2}$), plagioclase (An_{87}) and chromite (Cr/(Cr+Al) = 0.83–0.88).
Classification: Achondrite (eucrite monomict breccia); minimal shock, minimal weathering.
Type specimen: A total of 30 g and one thin section are on deposit at *NAU. Thompson* holds the main mass.

Northwest Africa 4289
Algeria
Find: 2005

Achondrite (howardite)
History: A stone was found in Algeria in 2005 and purchased in Erfoud, Morocco, in November 2005.
Physical characteristics: Relatively fresh fusion crust covers the entire 14.7 g stone with the exception of tiny impact spallation areas.
Physical characteristics: Fine-grained breccia, clast size <4 mm, composed of eucrite basalts, diogenite, and impact melt clasts.
Mineral compositions: (J. Wittke and T. Bunch, *NAU*) Subophitic basalt host pigeonite ($Fs_{57.6}Wo_{7.1}$; FeO/MnO = 34), exsolved augite ($Fs_{21.7}Wo_{41}$), plagioclase (An_{92}). The diogenite pyroxenes ($Fs_{21.7–26.8}Wo_{1.6–4.1}$; FeO/MnO = 28–30).
Classification: Achondrite (howardite).
Type specimen: A total of 3.7 g and one thin section are on deposit at *NAU. Thompson* is the main mass holder.

Northwest Africa 4290
Morocco
Find: 2004
Ordinary chondrite (LL3.10)
History: Collected in March 2004 by the *Caillou Noir* team.
Physical characteristics: One crusted individual of 1101 g with some regmaglypts. Flow lines are visible on the part of the surface that was buried in the ground.
Petrography: (M. Messaoudi, *USTHB*; M. Denise, *MNHNP*; B. Devouard, *UBP*) Sharply defined chondrules from 0.1 to 3 mm, with a few up to 10 mm. Fine-grained dark rims outline most chondrules. Matrix is scarce. Type II chondrules are dominant (~60 vol%) and larger than type I chondrules. Chondrule mesostasis is vitreous. Metal is rare and mostly altered by terrestrial weathering. Magnetite is associated with metal in the larger opaque lumps.
Mineral compositions and geochemistry: Olivine ($Fa_{0.4}$–Fa_{40}; average Fa_9 [n = 235]). No zonation was observed in the olivines of type I chondrules. Low-Ca pyroxene ($Fs_{0.7}$–Fs_{35}; average $Fs_{8.2}$ [n = 80]). Analyses of Cr_2O_3 in olivines from type II chondrules yield an average of 0.39 ± 0.22 wt% (n = 164). Magnetic susceptibility: (P. Rochette, *CEREGE*) log χ (10^{-9} m^3/kg) = 3.91.
Classification: Unequilibrated ordinary chondrite (LL3.10); S3, W3.
Type specimen: A total of 20.45 g is on deposit at *MNHNP. Caillou Noir* holds the main mass.

Northwest Africa 4301
Mauritania or Algeria
Find: April 2006
Enstatite achondrite (ungrouped)
History: Purchased in April 2006 by G. Hupé from a Moroccan dealer in Rabat.
Physical characteristics: A single 685 g stone with some reddish external weathering.
Petrography: (A. Irving and S. Kuehner, *UWS*) Subequigranular igneous cumulate texture with relatively coarse-grained (0.2–0.8 mm) silicate, metal, and sulfide grains. Composed mainly of polysynthetically twinned pure enstatite = 70 vol% and kamacite = 15 vol%, with subordinate interstitial plagioclase = 10 vol% and troilite = 5 vol%. Micrometer-size blades and blebs of kamacite and rare daubreelite also occur as inclusions within enstatite.
Mineral composition: Plagioclase ($An_{30.7–37.6}Or_{1.8–1.3}$).
Classification: Enstatite achondrite (ungrouped). Terrestrial weathering has produced some limonite along grain boundaries. This specimen is very similar in texture and mineral compositions to Zakłodzie.
Type specimen: A total of 22.9 g, one polished thin section and one polished mount, are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 4466
Northwest Africa
Find: 2006
Carbonaceous chondrite (CV3)
History: Devin Schrader purchased the sample at the Tucson Gem and Mineral Show on 29 January 2006 from a Moroccan meteorite dealer.
Physical characteristics: The total mass of the meteorite before cutting was 71.25 g. It is composed of three pieces: one large piece with two small fragments (1.105 and 2.886 g) that fit back onto the main piece. The meteorite has weathered fusion crust on about 10% of its surface. The color of the meteorite is gray, with visible chondrules and a CAI on the surface.
Petrography: (D. Schrader, *UAz*; H. Connolly, *KCCU*) The meteorite contains olivine, pyroxene, plagioclase, Fe,Ni metal, chondrules, and CAIs. The meteorite is dominated by large chondrules (~1 mm) and fine-grained matrix. Some veins of apparent alteration material cross-cut the rock. The rock contains two lithologies. 1) The host lithology contains abundant, well-defined chondrules and some chondrule fragments. The textural types of chondrules observed are BO, PP, PO, and GO with an overall size range for the chondrules of 0.29–2.05 mm. The section contains one highly altered type A CAI. 2) A small clast lithology (~0.4 × 0.7 cm) that contains smaller, closely packed chondrules in contact with a large type B CAI (~0.4 × 0.8 cm). The textural types of chondrules are BO, C, PO, and a Ca-Al-rich chondrule with an overall size range for the chondrules of 0.25–0.63 mm.
Mineral compositions and geochemistry: (D. Schrader, K. Domanik, and D. Hill, *UAz*) Lithologies: 1) chondrules contain $Fa_{0.39–9.24}$ (average = $Fa_{2.70±2.42}$), $Fs_{0.71–3.59}$ (average = $Fs_{1.83±0.97}$), and $Wo_{0.40–6.93}$ (average = $Wo_{2.29±1.87}$). 2) Chondrules contain $Fa_{16.26–42.01}$ (average = $Fa_{22.04±9.30}$), $Fs_{26.60–28.58}$ (average = $Fs_{27.71±0.92}$), and $Wo_{0.20–3.23}$ (average = $Wo_{1.06±1.45}$).
Classification: Carbonaceous chondrite (CV3).

Type specimen: A total of 14.483 g is on deposit at *KCCU. D. Schrader* holds the main mass of 54.767 g in four pieces.

Northwest Africa 4468
Northwest Africa
Find: Summer 2006
Achondrite (Martian, basaltic shergottite)

History: Found in the western part of the Sahara in summer 2006 and purchased in Laâyoune by G. Hupé in July 2006.

Physical characteristics: A single 675 g ellipsoidal stone, mostly coated by shiny black fusion crust, and broken at one end revealing the pale yellow-green interior.

Petrography: (A. Irving and S. Kuehner, *UWS*) Large ovoid pyroxene oikocrysts (2–10 mm across) enclosing chadacrysts of Ti-poor chromite and olivine are set in an interstitial matrix of 35% olivine, 30% clinopyroxene, 25% maskelynite (all vol%), Ti-chromite, ilmenite, merrillite, Cl-apatite (as prisms up to 0.8 mm long), and pyrrhotite. Inclusions (up to 300 μm across) surrounded by radial shock relaxation fractures occur within matrix olivine grains; some are quenched melt inclusions and others consist mainly of maskelynite. The specimen is cross-cut by sporadic, thin, dark, glassy shock veins (Irving et al. 2007).

Mineral compositions and geochemistry: Pyroxene oikocrysts are zoned from orthopyroxene cores ($Fs_{24.5}Wo_{4.4}$; FeO/MnO = 35.4) with mantles of pigeonite ($Fs_{26.3}Wo_{6.3}$; FeO/MnO = 29.4) to augite rims ($Fs_{17.9}Wo_{33.6}$; FeO/MnO = 24.9). Olivine chadacrysts (as magnesian as $Fa_{28.8}$) typically become progressively more ferroan from pyroxene core to rim (up to $Fa_{39.9}$). Matrix olivine ($Fa_{40.7}$; FeO/MnO = 50.2), matrix clinopyroxene ($Fs_{31.3}Wo_{8.1}$, $Fs_{19.6}Wo_{31.3}$), matrix maskelynite ($An_{38.7–54}Or_{3.9–2.3}$); maskelynite in inclusions within olivine is inhomogeneous and K-Na-rich ($Or_{52.6}Ab_{40.7}An_{6.7}$).

Classification: Achondrite (Martian, basaltic shergottite).

Type specimen: A total of 20.2 g and one large 3.8 × 2.8 cm thin section are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 4472
Algeria
Find: July 2006
Achondrite (lunar, KREEP-rich breccia)

History: G. Hupé purchased the sample July 2006 from a dealer in Tagounite, Morocco.

Physical characteristics: A single 64.3 g stone with visible pale gray to whitish clasts in a dark gray matrix. Fusion crust is not evident, but the exterior has fractures and thin coatings of desert varnish on exposed surfaces.

Petrography: (A. Irving and S. Kuehner, *UWS*) Lithic clasts (up to 0.65 cm) are predominantly various types of ophitic to quench-textured basalts (composed of pyroxene(s), plagioclase, olivine, ilmenite, and rare baddeleyite). Granophyre clasts (consisting of "ribbon-like" subparallel intergrowths of silica and K-feldspar with accessory baddeleyite and rare tranquillityite) are present as a minor component, as well as clasts composed mainly of fayalite (with associated glass, silica, K-feldspar, and merrillite) and spherical to ellipsoidal glass objects (up to 60 μm across). Mineral clasts include pyroxenes, olivine, plagioclase, silica, zircon, baddeleyite, merrillite, Ti-chromite, fayalite, ilmenite (with baddeleyite inclusions), metal (both kamacite and taenite), troilite, and schreibersite (Kuehner et al. 2007).

Mineral compositions and geochemistry: Olivine ($Fa_{56.6–64.6}$; FeO/MnO = 91–101), plagioclase ($An_{86.9–97.5}Or_{0.2–0.6}$), orthopyroxene ($Fs_{26.9–29.3}Wo_{3.8–4.1}$; FeO/MnO = 51–62), subcalcic augite ($Fs_{52.6}Wo_{30.5}$; FeO/MnO = 72), Al-Cr-rich pigeonite ($Fs_{27.0}Wo_{17.1}$; FeO/MnO = 51.1, Al = 3.10 wt%, Cr = 1.01 wt%), fayalite ($Fa_{90.3}$; FeO/MnO = 92), barian K-feldspar intergrown with silica ($Or_{80.9–55.6}Ab_{15.3–30.2}Cn_{0.6–6.3}$). Bulk composition: (R. Korotev, *WUSL*) INAA on nine ~30 mg subsamples gave a mean composition of: Na = 0.448, Fe = 7.14 (both wt%), Sc = 20.9, La = 44.7, Sm = 19.51, Eu = 1.50, Yb = 13.4, Zr = 438, Hf = 11.1, Ba = 601, Th = 7.49 (all ppm). Although it is possible that there is a minor mare basalt component, this specimen is dominated by materials with KREEP-like compositions and is essentially identical in bulk composition and petrologic characteristics to Northwest Africa 4472.

Classification: Achondrite (lunar, KREEP-rich breccia).

Type specimen: A total of 12.87 g and 3 polished thick slices are on deposit at *UWS. G. Hupé* holds the main mass.

Northwest Africa 4476
Northwest Africa
Find: October 2005
Carbonaceous chondrite (CV3)

History: The sample was purchased from a meteorite dealer in Erfoud, Morocco, by M. Farmer in October 2005.

Physical characteristics: The total mass of the meteorite before cutting was 533 g. It was composed of one piece with remnant fusion crust over the entire surface. The color of the meteorite was a greenish gray, with visible chondrules and CAIs on the surface.

Petrography: (D. Schrader, *UAz*; H. Connolly, *KCCU*) The meteorite contains olivine, pyroxene, Fe,Ni metal, sulfides, chondrules, and CAIs. The meteorite is dominated by large chondrules (0.12–1.1 mm) and a fine-grained matrix. The majority of the chondrules are sharply defined. The textural types of chondrule observed are C, GO, POP, PO, and one BO. The BO chondrule has a Ca-Al rich mesostases. The section contains several type A CAIs (both compact and fluffy).

Mineral compositions and geochemistry: (D. Schrader, D. Lauretta, M. Kilgore, K. Domanik, and D. Hill, *UAz*) (EMP at *UAz*) The chondrules contain $Fa_{0.3–8.5}$ (average = $Fa_{2.8±2.4}$), $Fs_{1.1–1.8}$ (average = $Fs_{1.3±0.3}$) and $Wo_{0.8–1.3}$ (average = $Wo_{0.95±0.2}$). Matrix olivine = $Fa_{57.4}$.

Classification: Carbonaceous chondrite (CV3).
Type specimen: A total of 25.3 g is on deposit at *UAz*. *KCCU* holds the main mass.

Northwest Africa 4477
Northwest Africa
Find: 2 February 2006
Ordinary chondrite (L3–7; genomict breccia)
History: Devin Schrader purchased the sample at the Tucson Gem and Mineral Show on 2 February 2006 from a Moroccan dealer.
Physical characteristics: The total mass of the meteorite before cutting was 122.25 g (two pieces, 32.50 g and 89.75 g). The color was reddish black containing lighter tan clasts.
Petrography: (D. Schrader, D. Lauretta, M. Kilgore, *UAz*; H. Connolly, *KCCU*). The meteorite contains olivine, pyroxene, plagioclase, kamacite, taenite, troilite, and Ca phosphate. In thin section there are at least four different chondritic components, including several types of clasts showing a range of grain sizes and without chondrules (~30 vol%). The main chondritic component displays brecciation representing four metamorphic grades.
Mineral compositions and geochemistry: (D. Schrader, D. Lauretta, M. Killgore, K. Domanik, and D. Hill, *UAz*) (EMP at *UAz*) The main chondritic component has olivine ($Fa_{1.0–25.6}$, average = $Fa_{20.2±7.1}$), pyroxene ($Fs_{2.1–27.0}$, average = $Fs_{17.5±5.7}$; $Wo_{0.01–0.42}$, average = $Wo_{0.04±0.09}$), and kamacite (average Ni = 5.4 ± 2.01, range 2.26–9.33; average Co = 0.72 ± 0.10, range 0.39–0.89, all wt%).
Classification: Ordinary chondrite (L3–7; genomict breccia); S3, W1.
Type specimen: A total of 21.33 g (in three pieces and two thin sections) is on deposit at *UAz* (UA2031). *D. Schrader* holds the main mass of 100.92 g in five pieces.

Northwest Africa 4485
Algeria
Find: September 2006
Achondrite (lunar, KREEP-rich breccia)
History: Stefan Ralew purchased the whole stone in September 2006 from a dealer in Ouarzazate, Morocco.
Physical characteristics: A single 188 g spheroidal stone with a brown weathered exterior. The interior consists of pale gray to whitish clasts in a dark gray matrix, and has visible thin veins of terrestrial carbonate.
Petrography: (A. Irving and S. Kuehner, *UWS*) Lithic clasts (up to 0.5 cm) are predominantly various types of ophitic to quench-textured basalts (composed of pyroxene(s), plagioclase, olivine, ilmenite, and rare baddeleyite). Granophyre clasts (consisting of subparallel to symplectitic intergrowths of silica and K-feldspar with accessory baddeleyite) are present as a minor component, as well as very fine-grained, quench-textured clasts composed of glass and fine plagioclase microlites. Mineral clasts include pyroxenes, olivine, plagioclase, silica, zircon, baddeleyite, merrillite, Ti-chromite, fayalite, ilmenite, metal (both kamacite and taenite), and troilite (Kuehner et al. 2007).
Mineral compositions and geochemistry: Olivine ($Fa_{26.3–63.6}$; FeO/MnO = 99–121), plagioclase ($An_{88.9–89.7}$ $Or_{0.3–0.6}$), orthopyroxene ($Fs_{18.9–19.7}Wo_{4.6–3.7}$; FeO/MnO = 87–89), pigeonite ($Fs_{37.0}Wo_{10.1}$; FeO/MnO = 62), subcalcic augite ($Fs_{48.9–49.2}Wo_{26.7–39}$, FeO/MnO = 59–67), fayalite ($Fa_{90.1}$, FeO/MnO = 80). Bulk composition: (R. Korotev, *WUSL*) INAA on eight ~30 mg subsamples gave a mean composition of: Na = 0.441, Fe = 7.27 (both wt%), Sc = 21.7, La = 31.6, Sm = 14.12, Eu = 1.46, Yb = 11.0, Zr = 443, Hf = 11.4, Ba = 375, Th = 6.37 (all ppm). Although it is possible that there is a minor mare basalt component, this specimen is dominated by materials with KREEP-like compositions, and is essentially identical in bulk composition and petrologic characteristics to Northwest Africa 4472.
Classification: Achondrite (lunar, KREEP-rich breccia).
Type specimen: A total of 20 g and one polished mount are on deposit at *UWS*. *Ralew* holds the main mass.

Northwest Africa 4496
Morocco
Find: 2006
Achondrite (eucrite, cumulate)
History: A stone was found by an individual while tending to a goatherd and purchased in Rissani in July 2006.
Physical characteristics: A complete and elongated 19 g stone with fresh fusion crust.
Petrography: (J. Wittke and T. Bunch, *NAU*) Fine- to medium-grain-size, monomict cumulate eucrite with plastic flow features. Clusters of interpenetrating plagioclase crystals that display prominent albite twinning, enclose pyroxenes.
Mineral compositions: Orthopyroxene ($Fs_{59.7–61}Wo_{3.8}$; FeO/MnO = 31–33, *n* = 15), pigeonite ($Fs_{52.1–55}Wo_{6.9–11.2}$), ferroaugite ($Fs_{47.8}Wo_{27.2}$), plagioclase ($An_{89–92}$), chromite (Cr/Cr+Al = 69).
Classification: Achondrite, (eucrite, cumulate, monomict breccia); minimal shock and weathering.
Type specimen: A total of 4.1 g and one thin section are on deposit at *NAU*. The main mass holder is anonymous.

Northwest Africa 4518
Morocco
Find: 2003
Achondrite (ungrouped)
History: B. Horst purchased the sample in Morocco during 2003.
Physical characteristics: The single piece weighing 167 g is black and covered with shiny black fusion crust.
Petrography: (C Lorenz, *Vernad*; F. Brandstaetter, *NHMV*) The rock has an achondritic, fine- to medium-grained, equigranular texture displaying triple junctions. It consists of olivine (80 vol%) and pyroxene (20 vol%). Minor phases are

Fe,Ni metal (2 vol%); chromite, troilite, Cl-apatite, and merrillite are rare. Pyroxene megacrysts (up to 1 cm in size) containing poikilitic inclusions of olivine, chromite, and Fe,Ni metal also occur in the rock. Troilite and Fe,Ni-rich metal form thin veinlets running through the rock. The olivine grains are replaced by fine-grained intergrowths of pyroxene and troilite along the grain boundaries.

Mineral compositions and geochemistry: Olivine ($Fo_{68.0}$; Fe/Mn = 35.6, CaO = 0.06, Cr_2O_3 = 0.04 [both wt%]), pyroxene ($En_{77.7}Wo_{1.2}$; Fe/Mn = 42, CaO = 0.59, Cr_2O_3 = 0.12 (both wt%) and $En_{44.7}Wo_{42.3}$; Fe/Mn = 29.4), Fe,Ni metal (Ni/Co = 9.1; Ni = 5.7 wt%). Oxygen isotopic compositions: (I. A Franchi and R. C Greenwood, *OU*) By laser fluorination, $\delta^{17}O$ = 2.66, $\delta^{18}O$ = 5.47, $\Delta^{17}O$ = 0.66 (all ‰).

Classification: Achondrite (ungrouped); S1, minor weathering.

Type specimen: A total of 21.3 g and two thin sections are on deposit at *Vernad. Horst* holds the main mass.

Northwest Africa 4520

Northwest Africa
Find: 2000
Achondrite (ureilite)

History: Purchased in Alnif in 2000.

Physical characteristics: A total mass of 23.2 g comprises a single stone that is a flat ellipsoid with the longest axis of 3.5 cm. The external color is dark brown, covered with moderately weathered fusion crust and some partly broken edges.

Petrography: (H. Takeda, *Chiba*; A. Yamaguchi, *NIPR*) The sample contains olivine only, observed in two polished thin sections made 2 cm apart. One section shows a typical ureilite texture with carbonaceous veins, in which Fe-metal, silica, and rare Na-K-rich aluminous silicate are present. Olivine ranges in size from ~1.5 × 0.9 mm to 0.6 × 0.3 mm. A large part of the other thin section consists of large olivine crystals up to 3.2 × 2.7 mm in size, with thin grain boundaries essentially without opaque materials. Small olivine grains (0.2 × 0.1 mm) with carbonaceous veins are present around the large olivine part. Olivine crystals have minor cracks, but shock effects are minor. Some grain boundaries are filled with Ca carbonate from interaction with the terrestrial environment.

Mineral compositions and geochemistry: Olivine (cores = $Fo_{79–82}$, rims = Fo_{90}). Oxygen isotopes: (M. Kusakabe, *OkaU*) $\delta^{17}O$ = 3.32, $\delta^{18}O$ = 8.07 (both ‰).

Classification: Achondrite (olivine-rich ureilite), minor weathering.

Type specimen: A total of 6 g and two thin sections are on deposit at *NIPR*. *Fectay* hold the main mass.

A list of all meteorites recognized from Northwest Africa is provided in Table 2.

THE AMERICAS

North America

United States of America

Crow Peak **44°28.64′N, 103°58.32′W**

Lawrence County, South Dakota, USA
Find: July 1958
Iron (IIAB, hexahedrite)

History: R. Meink recovered a single specimen while clearing a hay field. The specimen went to R. Meink's nephews, W. and D. Copas, upon his passing. W. Copas sent a sample of the specimen to the Center for Meteorite Studies for classification. The Center purchased the main mass after verifying its classification.

Physical characteristics: The meteorite weighed 6320 g when found. Its fusion crust has weathered to a brown color.

Petrography: (L. Bleacher, *ASU*) The meteorite appears to be composed exclusively of kamacite and exhibits at least 3 sets of Neumann lines.

Geochemistry: (J. Wasson, *UCLA*) The composition (by INAA) of the metal is Co = 4.5, Ni = 57.2 (both mg/g); Cu=138, Ga = 57.8, As = 3.72, W = 3.4, Ir = 36.5, Au = 0.515 (all µg/g).

Classification: Iron (IIAB, hexahedrite).

Type specimen: A total of 6272 g is on deposit at *ASU*.

South America

Argentina

Río Cuarto 001 **32°52.3″S, 64°13.4′W**

Río Cuarto, Cordoba Province, Argentina
Find: 11 October 2000
Achondrite (eucrite, polymict basaltic)

History: A single stone was found in a deflation hollow (formed within a parabolic dune) during an expedition to the Pampean Plain of Argentina by P. A. Bland (*ICL*), C. R. de Souza Filho (*UEdeC*), and J. Coniglio (*UNdeRC*).

Physical characteristics: The 62.7 g meteorite is largely covered with a matte black, slightly weathered fusion crust. Broken surfaces and thin sections are bright gray in color with clasts clearly visible.

Petrography: (J. Levine, *UChi*; P. A. Bland, *ICL*) The meteorite consists of larger (up to 1 mm) mineral and lithic clasts set in a fine-grained matrix composed of 10–50 µm size plagioclase and pyroxene fragments. Polycrystalline clasts occur from a variety of sources, reflected in the large range of pyroxene compositions. Areas with fine-grained recrystallized melt are commonly seen. Pigeonite clasts with augite exsolution lamellae are observed. Larger fragments include plagioclase, Ca pyroxene, and basaltic clasts; plagioclase contains pigeonite and troilite inclusions. Accessory minerals, including olivine, troilite, spinel (mostly chromite), ilmenite, metal, and a silica polymorph, have been observed.

Mineral compositions and geochemistry: Plagioclase ($An_{92.9}$; range $An_{89.7–96.6}$), orthopyroxene ($Fs_{37.2–77.1}Wo_{0.3–4.8}$), pigeonite ($Fs_{62.6–85.8}Wo_{5.3–16.6}$), and augite ($Fs_{35.4–72.6}Wo_{21.3–43.5}$).
Classification: Achondrite (polymict basaltic eucrite).
Type specimen: 50.67 g is on deposit at *UNdeRC*. A 5.09 g specimen and polished thin section are on deposit at *ICL*. Fragments totaling 1.79 g, a polished thin section, and polished epoxy mount are on deposit at *UChi*.

Brazil
Santa Vitoria do Palmar 33°30′56″S, 53°24′65″W
Santa Vitoria do Palmar, Brazil
Find: 2003
Ordinary chondrite (L3)
History: Three stones were recovered in March 2003 near the city of Santa Vitoria do Palmar by Mr. Roberto Maciel while collecting Indian arrows. Later in February 2004, Mr. Lautaro Côrreira found a fourth stone weighing 10.450 kg in the same area.
Physical characteristics: All three stones, weighing about 34 kg, 4.34 kg, and 1.57 kg, respectively, are at least partly covered with fusion crust.
Petrography: (A. Greshake, *MNB*) The sample is an unbrecciated chondrite with unequilibrated olivine and pyroxene, and Fe,Ni-rich metal. The chondrules are well defined and of large variation in the textural types including BO, BP, PO, POP, and PP.
Mineral compositions: Olivine ($Fa_{0.5–35.2}$), pyroxene ($Fs_{0.5–31.6}$).
Classification: Ordinary chondrite (L3); S4, W2.
Type specimen: A 20 g sample plus one polished thin section are on deposit at *MNB*. 5910 g is on exhibition in the *MNB*. *Côrreira* holds the main mass.

A list of all meteorites recognized from countries within the Americas is provided in Table 3.

ANTARCTICA

Table 4 lists meteorites recovered from Antarctica by the Antarctic Search for Meteorites (ANSMET) program during the 2003 and 2004 seasons. For more information on these meteorites please visit the curation home page of the Johnson Space Center, National Aeronautic and Space Agency, at http://curator.jsc.nasa.gov.

ASIA

India
Bhawad 26°30′30″N 73°06′55″E
Rajasthan, India
Fall: 6 June 2002, 18:00 local time
Ordinary chondrite (LL6)
History: A woman witnessed a single stone fall near Bhawad village, Rajasthan, India. No fireball was seen.
Physical characteristics: The crusted 11 × 6 × 7 cm stone weighs 678 g, and shows well-developed regmaglypts. Fusion crust is thinner over an irregular surface at one end, suggesting the stone broke up during passage through the atmosphere.
Petrography: (N. Bhandari, *PRL*) Chondrules are poorly preserved with ill-defined rims. Overall, the texture indicates a high degree of recrystallization.
Mineral compositions and geochemistry: (N. Bhandari, *PRL*) Olivine (Fa_{28}), pyroxene (Fs_{23}). Cosmogenic nuclides indicate the meteoroid had a pre-atmospheric radius of ~7.5 cm. Cosmic-ray exposure age, 16.3 ± 2.5 Ma.
Type specimen: The stone is located at the *PRL*.

Oman
Dhofar 1180 18°54′52″′N, 54°20′42″E
Dhofar, Oman
Find: January 2005
Achondrite (lunar)
History: M. Farmer recovered a specimen in the Dhofar region of Oman.
Physical characteristics: The 115.2 g meteorite has an odd external shape akin to a thick-bladed talon.
Petrography: (T. Bunch and J. Wittke, *NAU*) The sample is a feldspathic fragmental breccia that contains a variety of lithologies set in matrix of similar materials with a preferred orientation of fragments and clasts. Mostly ferroan anorthosites with clasts of gabbroic anorthosites, anorthositic gabbros and norites, troctolites, olivine gabbros, microporphyritic and fine-grained impact-melt breccias, and rare, ophitic/subophitic basalts and symplectites of unknown provenance.
Mineral compositions and geochemistry: Anorthositic plagioclase ($An_{94.5–98}$; FeO = 0.28–0.78 wt%); olivines (FeO/MnO = 82–110), ferroan anorthosite (Fa_{38}), norite (Fa_{18}), olivine gabbro ($Fa_{36.8}$); orthopyroxenes (FeO/MnO = 50–73), ferroan anorthosite ($Fs_{38.6}Wo_{2.1}$), olivine gabbro ($Fs_{33.4}Wo_{4.3}$), ophitic basalt core ($Fs_{40}Wo_{11.8}$) and rim ($Fs_{69.1}Wo_{15.8}$).
Classification: Achondrite (lunar, feldspathic fragmental breccia). Minimal weathering.
Type specimen: A 20.6 g sample is on deposit at *NAU*. *Farmer* and *Strope* hold the main mass.

Dhofar 1428 18°53.44′N, 54°20.36′E
Dhofar, Oman
Find: March 2006
Achondrite (lunar anorthositic breccia)
History and physical characteristics: A 213 g dark gray stone with little remaining fusion crust found within the desert of the Dhofar regions of Oman.
Petrography: (T. Bunch and J. Wittke, *NAU*) Clast-rich

impact-melt breccia (mingled) that consists mostly of light to dark gray clasts of previously formed, plagioclase-rich breccias and white lithic and mineral clasts of anorthositic rocks and plagioclase. Minor amounts of norites, anorthositic gabbros, troctolites, and ophitic/subophitic basalts were also observed. Groundmass is composed of quench-textured silicate melt (plagioclase, pyroxenes, opaque minerals and glass) and isolated pockets of vesicular glassy melt.
Mineral compositions and geochemistry: Anorthositic clast plagioclase ($An_{93.8–98}$); norite olivine (Fa_{36}, FeO/MnO = 104), plagioclase ($An_{96.4}$), orthopyroxene ($Fs_{28.4}Wo_{4.1}$; FeO/MnO = 51); troctolite plagioclase ($An_{95.5}$), olivine ($Fa_{25.8}$, FeO/MnO = 89); subophitic basalts that contain highly zoned pyroxenes ($Fs_{14.9}Wo_{5.1}$ to rims of $Fs_{41.2}Wo_{15.2}$).
Classification: Achondrite (lunar anorthositic breccia); component's shock levels range from moderate to completely melted; minimal weathering.
Type specimen: A 20.7 g sample is on deposit at *NAU. Ward* holds the main mass.

Ramlat as Sahmah 247 20°18.685′N, 56°13.519′E
Oman
Find: 17 February 2005
Achondrite (ureilite)
History: S. Bartels, J. Bühler, B. Hofmann, I. Leya, and S. Lorenzetti recovered a single stone was during a systematic search for meteorites. A small fragment (0.16 g) of Fe-hydroxide with troilite inclusions found a few meters away and is probably derived from this meteorite as well.
Physical characteristics: Rounded, dark brown single stone with a mass of 579.0 g; no fusion crust preserved.
Petrography: (E. Gnos, *UBE*; B. Hofmann, *NMBE*; A. Al-Kathiri, *UBE*) The stone contains 16 vol% of 0.5–1.8 mm size carbon plates consisting of graphite and diamond (confirmed by XRD). Carbon plates occur along grain boundaries of olivine (30 vol%) and pyroxene (54 vol%). The carbon plates show a preferred orientation parallel to the elongated silicate grains. Pyroxene grains are cloudy due to tiny inclusions and metal exsolution occurs in olivine at the contact with carbon, and along discrete zones within grains.
Mineral compositions and geochemistry: Mean compositions are olivine ($Fa_{19.6}$) and pyroxene ($Fs_{17.4}Wo_{11.2}$). Reduced olivine grains near carbon plates reach composition of $Fa_{1.0}$. Metal and troilite are partially oxidized.
Classification: Achondrite (ureilite); S2.
Type specimen: The meteorite is on deposit at *NMBE*.

Ramlat as Sahmah 251 20°01.883′N, 56°27.354′E
Oman
Found 26 February 2005
Carbonaceous chondrite (CV3)
History: J. Bühler, M. Eggimann, E. Gnos, and R. Wieler recovered a single stone during a systematic search for meteorites.
Physical characteristics: Irregularly shaped stone of a olive-gray color, no fusion crust preserved, with a mass of 97.3 g.
Petrography and mineral compositions: (E. Gnos, *UBE*; B. Hofmann, *NMBE*; A. Al-Kathiri, *UBE*) The meteorite consists of up to 3.3 mm size olivine-pyroxene-dominated chondrules (32.3 vol%), fine-grained convoluted CAIs (0.25–2.6 mm; 8.3 vol%), and dark matrix containing few mineral grains (59.3 vol%). Mean olivine ($Fa_{14.2}$; range $Fa_{3.5–34.5}$) and mean pyroxene ($Fs_{1.5}Wo_{1.8}$; range $Fs_{0.6–2.6}En_{194.5–98.5}$ $Fs_{0.9–3.3}$). Fe-sulfides are partially weathered.
Classification: Carbonaceous chondrite (CV3); S1.
Type specimen: The specimen is on deposit at *NMBE*.

Sayh al Uhaymir 300 21°00′23.6″N, 57°20′03.9″E
Al Wusta, Oman
Find: 21 February 2004
Achondrite (lunar feldspathic regolith)
History and physical characteristics: One gray-green individual of 152.6 g without fusion crust was discovered by Th. and P. Kurtz of Bartoschewitz natural science expedition team on a gravel plateau about 42 km SSE of Al Ghaba Resthouse (Adam County).
Petrography: (R. Bartoschewitz, *Bart*; P. Appel and B. Mader, *Kiel*; W. Hsu, *PMtOb*) Polymict breccias (anorthosite, troctolitic anorthosite, noritic gabbro, and anorthositic gabbro), mineral fragments (anorthite, olivine, and pyroxenes), and glass veins are set in a fine-grained matrix of anorthositic olivine-gabbro composition. Accessoric minerals are kamacite, troilite, chromite, ulvöspinel, spinel, armalcolite, and ilmenite.
Mineral compositions and geochemistry: (R. Bartoschewitz, *Bart*; P. Appel and B. Mader, *Kiel*; U. Krähenbühl, *Bern*; R. Niedergesaess, R. Pepelnik, and U. Reus, *GKSS*) Olivine ($Fa_{26.8±5.2}$; mg# = 16.2–41.0), pyroxene ($Fs_{25.6±4.7}Wo_{11.0±5.6}$; mg# = 57–82), plagioclase ($An_{95.8±0.6}$), metal (Ni = 39–116, Co = 11–5 [both mg/g]). Bulk Al_2O_3 = 20.4 wt%; FeO + MgO = 16.7 wt%; Th = 0.46; Sm = 1.1 ppm. The bulk FeO/MnO = 70.8, while the ratio in olivine and pyroxene are 83 and 49, respectively. Noble gas isotopes: (J. Park and K. Nagao, *UTokE*; R. Okazaki, *KyuU*) No solar gases, and low concentration of radiogenic isotope ^{4}He. Magnetic susceptibility: (R. Bartoschewitz, *Bart*) $\log \chi = 3.54 \times 10^{-9}$ m^3/kg.
Classification: Achondrite (lunar feldspathic regolith breccia).
Type specimen: A total of 20 g of sample is on deposit at *Kiel*. Th. and P. Kurtz hold the main mass. R. Bartoschewitz holds 5.3 g and a thin section.

Sayh al Uhaymir 406 20°03.848′N, 56°32.034′E
Oman
Find: 10 February 2005
Achondrite (eucrite)
History: S. Bartels, J. Bühler, B. Hofmann, I. Leya, and

S. Lorenzetti recovered a single sample during a systematic search for meteorites.

Physical characteristics: Platy rounded stone with minor remnants of fusion crust, 30.917 g.

Petrography: (E. Gnos, *UBE*; B. Hofmann, *NMBE*; A. Al-Kathiri, *UBE*) The rock contains up to 4 mm size rock fragments. It consists of (in vol%): angular volcanic clasts = 8.0; plutonic clasts = 6.6, 7.0% breccia clasts; mineral clasts (predominantly orthopyroxene, pigeonite and augite, minor plagioclase ($An_{78.7–93.7}Or_{0.3–1.6}$), silica, chromite, troilite, Fe,Ni metal, and ilmenite) = 53.6; myrmekitic orthopyroxene-troilite clasts = 3.3; fine-grained matrix = 16.3. Metal and troilite show minor weathering only.

Mineral compositions and geochemistry: Orthopyroxenes ($Fs_{12.8–31.5}En_{64.1–86.8}Wo_{0.4–4.4}$), pigeonites ($Fs_{32.4–55.0}En_{37.5–61.1}Wo_{6.5–14.9}$), and augites ($Fs_{27.4–41.5}En_{36.1–44.7}Wo_{20.9–33.2}$). Bulk composition: MgO = 13.75, CaO = 7.94 (both wt%); Fe/Mn= 34.1, Sc = 22, Sm = 1.08 (both ppm).

Classification: Achondrite (eucrite, polymict); S4.

Type specimen: The sample is on deposit at *NMBE*.

United Arab Emirates

United Arab Emirates 001

United Arab Emirates
Find: 18 January 2005
Achondrite (ureilite)

History and physical characteristics: H. Kallwiet found a single dark stone of 155 g completely covered by fusion crust in a parking site during an archeological field trip.

Petrography: (D. C. Hezel, *Köln*) Monomict ureilite with typical and equigranular texture. Olivines occur as ~1–4 and pyroxenes as ~1–2 mm large, anhedral crystals. Olivine grains meet in 120° triple junctions. Modal abundance: olivine ~90, pyroxene = ~10 (vol%). Fe-hydroxide fills veins and cracks between and within crystals. Abundant, up to 100 μm size diamonds occur interstitial to silicates, usually associated with graphite. Metal, sulfide, or plagioclase was not observed.

Mineral compositions and geochemistry: Olivines and pigeonites have homogeneous cores with olivines ($Fo_{79.8–81.8}$, mean = $Fo_{80.4}$; MnO = 0.43, Cr_2O_3 = 0.71, and CaO = 0.38 (all wt%). Olivine rims ($Fo_{96.1–96.8}$, mean of $Fo_{96.6}$). Tiny, Ni-poor and Fe-rich, weathered droplets occur poikilitically in these rims. Pigeonite ($En_{73.9–75.2}Fs_{15.5–16.9}Wo_{8.8–9.5}$; MnO = 0.41, Cr_2O_3 = 1.10 (all wt%). Pigeonite rim compositions are similar to cores.

Classification: Achondrite (ureilite); extensive weathering.

Type specimen: A total of 20 g and one thin section are on deposit at *Köln*. The main mass and one thin section are located at *ABDIS*.

A list of all meteorites recognized from countries within Asia is provided in Table 5.

EUROPE

Norway

Moss **~59°26′N, ~10°42′E**

Østfold, Norway
Fall: July 14, 2006, ~10:20 hr local daylight time (UT+2)
Carbonaceous chondrite (CO3.6)

History and physical characteristics: (G. Raade and K. Ødegaard, *UOslo*; M. Bilet, *NorAS*) At about 10:20 A.M. on July 14, 2006, a bright fireball traveling SSE-NNW was witnessed by many people and a loud explosion and a rumbling sound was heard in the air above Moss and Rygge in south Norway, on the east side of the Oslofjord. Shortly after, an object was apparently heard to land on an aluminum sheet, which upon investigation was determined to be a meteorite. Extensive searches in the area have resulted in the recovery of a total of 5 stones (Table 6). Note that light rainfall occurred in the area on July 29, 30, and 31.

Petrography: (J. Grossman, *USGS*; G. MacPherson, *SI*; L. Chizmadia, *UHaw*; A. Rubin, *UCLA*) Contains abundant small chondrules (most <200 μm), small (<1 mm) amoeboid olivine aggregates (AOAs) and refractory inclusions, and isolated grains of olivine, troilite, and kamacite set in a gray matrix. Chondrule types are dominated by type I PO, with other varieties of type I and II chondrules plus RP, C, and BO all present. All type I chondrules show diffusional entry of FeO around edges and along cracks of forsterite grains. Olivine histogram is flat, resembling that of Ornans (range $Fa_{0.3–42}$, average $Fa_{19.9}$, σ = 65%, n = 60) and the Cr_2O_3 content of fayalitic olivine is low (0.09 ± 0.09 wt%). Image analysis gives 2.2 metal and 2.4 FeS (both vol%). Refractory inclusions contain spinel, calcic pyroxene, and abundant nepheline that replaces melilite and other primary phases. Some perovskite has been transformed to ilmenite. Some AOAs contain relict cores of forsterite, but most of the olivine has been converted to more fayalitic compositions. The degree of oxidation of AOAs is similar to type 3.6 CO chondrites such as ALH 77003. Matrix is mildly recrystallized and sulfur-poor and matrix olivine has similar composition to olivine in fine-grained chondrules and inclusions.

Geochemistry: Magnetic susceptibility: (R. Bartoschewitz) log χ (10^{-9} m^3/kg) = 4.68. Oxygen isotopes: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O$ = 5.90, $\delta^{18}O$ = 2.21, $\Delta^{17}O$ = 4.75 (all ‰; average of two replicates).

Classification: Carbonaceous chondrite (CO3.6, scheme of Chizmadia et al. 2002); S2.

Type specimen: A type specimen of 20 g (stone 4) and 2 g (stone 3) are on deposit at *SI*. The main masses are held by those listed above.

A list of all stones recovered from the Moss fall is provided in Table 6.

Russia

Krasnodar **45°00′20.5″N, 39°12′18.7″E**
Krasnodar, Russia
Find: 16 September 2006
Ordinary chondrite (L5)

History: One stone of the meteorite was found by K. I. Koval, 20 km east of Krasnodar city at the bottom of the Krasnodar water reservoir, when it was exposed during seasonal low water. The meteorite broke into three pieces during excavation. One sample of the meteorite was given to the meteorite collection of the Russian Academy of Sciences by the Russian Society of Meteoritical Admires.

Physical characteristics: The meteorite weighing 2040 g is covered in approximately 25% black and shiny fusion crust. Another surface was covered by iron hydroxides and terrestrial carbonates.

Petrography: (M. A. Ivanova, *Vernad*) The meteorite has a chondritic texture and contains about 80% BO, PO, POP, and PP chondrules ranging in size from 0.02 to 1.0 mm in apparent diameter with poorly defined boundaries. The meteorite contains olivine, pyroxene, Fe,Ni metal, and sulfides.

Mineral compositions and geochemistry: (M. A. Ivanova, *Vernad*) Olivine ($Fa_{25.4}$), orthopyroxene ($Fs_{23.1}Wo_{1.2}$).

Classification: Ordinary chondrite (L5); S3, W1.

Type specimen: A total of 246 g and one thin section are on deposit at *Vernad*. K. I. Koval holds the main mass.

Switzerland

Twannberg **47°05.73′N, 7°09.45′E**
Twannberg, Canton of Berne, Switzerland
Find: 1984
Iron (IIG)

History: Two additional masses of Twannberg were recovered in 2000 and 2005, in both cases in non-natural settings indicating earlier collection. Mass II (2246 g) was found in August 2000 in the attic of an old house (Dorfgasse 7) in the village of Twann by Marc Jost. Mass III (2533 g) was identified in September 2005 in a rock and mineral collection deposited at *NMBE* as a permanent loan from the Museum Schwab, Biel, Switzerland, where the sample was originally labelled as "hematite," probably around 1932. Both secondary find places are in the vicinity (3.5 and 5 km distance) of the original find locality.

Physical characteristics: (B. Hofmann, *NMBE*) Both newly recovered masses are of irregular elongated shape, and are covered by an oxide rind several millimeters thick, with abundant incorporated terrestrial silicate sand grains corresponding to local glacial till deposits of the Rhône Glacier. Similar sand grains were also observed in the oxide rind of the first mass.

Petrography: Both new masses show a texture identical to the first mass. Large schreibersite crystals (up to 4 cm in length) are enclosed in kamacite. Fracturing follows thin (10–20 μm) plates of rhabdite present in up to 10 different orientations.

Mineral compositions and geochemistry: (J. Wasson, *UCLA*) Analysis of mass II (INAA data) yielded values very similar to those reported for the first mass: Ni = 46.7, Co = 5.17 (both mg/g); Ga = 37.3, As 18.0, Ir 0.101, Pt 1.0, Au 1.406 (all g/g).

Classification: Iron (IIG). Pairing of the two new masses with Twannberg is supported by identical mineralogy and texture, oxide rind petrography including nonmeteoritic silicate grains and bulk chemistry.

Type specimen: The majority of the original mass (10,536 of 15,915 g) and both newly recovered masses are located at *NMBE*. The total known mass of Twannberg now is 20,694 g.

United Kingdom

Hambleton **54°14′25″N, 1°11′56″W**
Hambleton, North Yorkshire, England, United Kingdom
Find: August 2005
Pallasite (main group)

History: A mass was found beside a forest track by R. and I. Elliott while they were hunting for meteorites, ~2 km south of Hambleton, North Yorkshire, England.

Physical characteristics: One 17.6 kg piece was found. It has a highly weathered exterior with centimeter-size patches of blue weathering products. No fusion crust is present.

Petrography and mineral compositions: (D. Johnson and M. M. Grady, *OU*; R. Hutchison and C. Kirk, *NHM*) The meteorite is brittle and easily fragments. It contains ~60 vol% olivine ($Fo_{88.3}$), ~25 vol% metal, and ~15 vol% sulfide (all irregularly distributed). Olivine ranges in size from ~10 mm in fractured, rounded grains that form mosaics in olivine-rich regions, to angular fragments <0.1 mm set in metal or sulfide where these opaques are dominant. The olivine mosaics have metal and/or sulfide veins along grain boundaries or filling fractures. Metal is largely kamacite, commonly as plessitic intergrowths with taenite, which also forms thin rims with Ni <60 wt%. Sulfides are abnormally abundant for a pallasite and some regions (<5 cm across) are composed almost exclusively of troilite, enclosing minor fragmented olivines. Within olivine and metal, sulfides occur as veins, commonly with Ni-poor centers and Ni-rich rims. Chromite and schreibersite are accessory phases. The outer 1 cm of the mass is terrestrially weathered, with veins of Fe-oxides and patches of a blue phosphate mineral.

Geochemistry: Oxygen isotopic: (I. A. Franchi, *PSSRI, OU*) $\delta^{17}O = +1.383$, $\delta^{18}O = +3.029$, $\Delta^{17}O = -0.187$ (all ‰).

Classification: Pallasite (main group).

Type specimen: A 1 kg type specimen, 3 slices, and 1 thin section are on deposit at *OU*. R. Elliott of *Fernlea* holds the main mass.

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ABBREVIATIONS

Classifiers, Type Specimen Locations, Finders, and Holders of Main Masses

A key to abbreviations for addresses used in the Meteoritical Bulletin is found at our web site, http://tin.er.usgs.gov/meteor/MetBullAddresses.php.

Listed throughout most of the tables within the Info column are relevant data on who classified the samples, where the type specimen is located, etc. Below is a key to the abbreviations used within this edition.

ABDIS: Abu Dhabi Islands Archaeological Survey, ADIAS, P. O. Box 45553, Abu Dhabi, United Arab Emirates.

ASU-1: Classified: L. Bleacher, *ASU*. Type specimen: *ASU*. Finder: R. McColly. Main mass: *R. McColly.*

ASU-2: Classified: L. Bleacher, *ASU*. Type specimen: *ASU*. Finder: S. Clary. Main mass: *S. Clary.*

ASU-3: Classified: L. Bleacher, *ASU*. Type specimen: *ASU*. Finder: C. Anghel. Main mass: *ASU*.

ASU-4: Classified: L. Bleacher, *ASU*. Type specimen: *ASU*. Finder: K. Semanko. Main mass: K. Semanko.

ASU-5: Classified: G. Huss, *ASU/UH*. Type specimen: *ASU*. Finder: A. Brauer. Main mass: *Denver.*

ASU-6: Classified: L. Bleacher, *ASU*. Type specimen: *ASU*. Finder: A. Sims. Main mass: A. Sims.

ASU-7: Classified: L. Bleacher, *ASU*. Type specimen: *ASU*. Finder: J. Pringle. Main mass: *J. Pringle.*

Barto-1: Classified: R. Bartoschewitz, *Bart*. Type Specimen: *Kiel*. Finder: M. Scholz and Th. Kurtz. Main mass: *M. Scholz* and *Th. Kurtz.*

Barto-2: Classified: R. Bartoschewitz, *Bart,* and Appel, *Kiel*. Type specimen: *Vernad*. Main mass: *Bart*.

Barto-3: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Finder: R. Bartoschewitz, *Bart*. Main mass: *Baro* and Appel, *Kiel*.

Barto-4: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Finder: C. Bartoschewitz, *Bart*. Main mass: Bartoschewitz, *Bart,* and Appel, *Kiel*.

Barto-5: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Kiel*.

Barto-6: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Finder: R. Bartoschewitz, *Bart*. Main mass: *Bart*.

Barto-7: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Kiel*. Finder: C. Bartoschewitz.

Barto-8: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Main mass: *Bart*.

Barto-9: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Finder: M. Scholz and Th. Kurtz. Main mass: *M. Scholz* and *Th. Kurtz.*

Barto-10: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Finder: Th. Kurtz. Main mass: *Th.* and *P. Kurtz.*

Barto-11: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Finder: Pacer. Main mass: Pacer.

Barto-12: Analysis and classification by R. Bartoschewitz, *Bart*; microprobe-support by P. Appel and B. Mader, *Kiel*. Purchased: U. Eger. Type specimen: *Vernad*. Main mass: U. Eger.

Barto-13: Analysis and classification by R. Bartoschewitz, *Bart*; microprobe-support by P. Appel and B. Mader, *Kiel*. Purchased: *Neu*. Type specimen: *Vernad*. Main mass: *Neu*.

Barto-14: Analysis and classification by R. Bartoschewitz, *Bart*, microprobe-support by P. Appel and B. Mader, *Kiel*. Purchased by *Fectay.* Type specimen: *Vernad*. Main mass: *Bart*.

Barto-15: Classified: R. Bartoschewitz, microprobe-support by P. Appel and B. Mader, *Kiel*. Type specimen: *Vernad*. Main mass: *Bart*.

Barto-16: Classified: R. Bartoschewitz, *Bart*; microprobe-support by P. Appel and B. Mader, *Kiel*.

Barto-17: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Main mass: *Bart*.

Barto-18: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Main mass: O. Gabel.

Barto-19: Classified: R. Bartoschewitz, *Bart*. Type specimen: *Vernad*. Main mass: *H. Grundmann*.

Barto-20: Classified: R. Bartoschewitz, Bart. Type specimen: Vernad. Main mass: *HSSH*.

Barto-21: Classified: R. Bartoschewitz, *Bart*. Type specimen: *MKBraun.* Main mass: *Spreeman*.

Bern1: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, E. Gnos, B. Hofmann.

Bern2: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, M. Eggimann, E. Gnos, S. Lorenzetti.

Bern3: Classified: A. Al-Kathiri, E. Gnos, Institute of

Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, M. Eggimann, S. Lorenzetti.

Bern4: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, M. Eggimann.

Bern5: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, M. Eggimann, B. Hofmann, U. Krähenbühl.

Bern6: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: S. Bartels, J. Bühler, I. Leya, B. Hofmann, S. Lorenzetti.

Bern7: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: J. Bühler, M. Eggimann, E. Gnos, B. Hofmann.

Bern8: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: J. Bühler, M. Eggimann, E. Gnos, R. Wieler.

Bern9: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, J. Bühler, M. Eggimann, E. Gnos.

Bern10: Classified: A. Al-Kathiri, E. Gnos, Institute of Geological Sciences, *Bern*; B. Hofmann, Natural History Museum *Bern*; Analyst E. Gnos, *Bern*. Type specimen: *Bern*. Finder: A. Al-Kathiri, J. Bühler.

Beroud: F. Beroud, Chatel-Guyon, France.

Boucher: C. Boucher, Lyon, France.

BUK: Bayero University Kano, Nigeria; www.kanoonline.com/buk.

BUK-1: Classified: Ohene Boansi Apea, *BUK*, and T. McCoy, *SI*. Type specimen: *BUK*. Main mass: *Zaki*.

CML-1: Classified: M. Hutson, *Cascadia*. Type specimen: *Cascadia*. Finder: J. Smaller. Main mass: *L. Sloan*.

CML-2: Classified: M. Hutson, *Cascadia*. Type specimen: *Cascadia*. Finder: J. Wolfe. Main mass: *L. Sloan.*

CML-3: Classified: M. Hutson, *Cascadia*. Type specimen: *Cascadia*. Finder: D. Asher. Main mass: D. Asher.

Dran-1: Classified: E. Dransart, *EMTT*. Type specimen: *MNHNP*. Finder: G. Moreau. Main mass: *Gi-Po*.

DST-PI: Dipartimento di Scienze della Terra, Università di Pisa, Via S. Maria 53, 56126 Pisa, Italy; http://www.dst.unipi.it.

EMRA: Egyptian Mineral Resource Authority, 3 Salah Salem Road, Abbassiya, Cairo, Arab Republic of Egypt.

EMRA-1: Classified: A. A. Barakat, *EMRA*. Type specimen: *EMRA*. Main mass: Anonymous.

ENSL-1: Classified: E. Chamorro, K. Pistre, P. Beck, P. Grandjean, *ENSL*. Type specimen: *ESNL*. Finder: *Boucher* and *Beroud*. Main mass: C. Boucher, Lyon, France, and F. Beroud, *Chaterl-Guyon, France.*

FSAC-1: Classified: H. Chennaoui Aoudjehane, *FSAC*; M. Denise, *MNHNP*; A. Jambon, *UPVI*. Type specimen: *FASC*. Main mass: *L. Baidder.*

Gi-Po: Gi-Po Meteorites, C. Giessler, Hardtallee 7, 35398 Giessen, Germany; c-giessler@gi-po.de; www.gi-po.de.

GKSS: GKSS Forschungszentrum, Inst. für Küstenforschung, Max-Planck-Str., D-21502 Geesthacht.

GMEU: The Geological Museum at Entebbe, Uganda.

Gren: Andreas Gren, Hamburg, Germany.

Grund: H. Grundmann, Berlin, Germany.

HAM-1: Classified: J. Schluter, *Ham*. Type specimen: *HAM*. Finder: E. Abu Aghreb. Main mass: *Ind. Research Center, Tripoli.*

Herkstroeter: Ingo Herkstroeter, Hamburg, Germany.

Horst: Burkard Horst of Germany.

HSSH: Hanno Strufe, Langenbergstr. 32, 66954 Pirmasens, Germany.

ICL: Imperial College London.

ICL-1: Classified: J. Levine, *UChi*; P. A. Bland, *ICL*. Type specimen: *UNdeRC, ICL,* and *UChi.* Main mass: U. Messerli.

IfP-1: Classified: A. Bischoff, *IfP*. Type specimen: *IfP*. Main mass: Private collector.

IfP-2: Classified: A. Bischoff, *IfP*. Type specimen: *IfP*. Main mass: Anonymous, Tunisian, collector.

KCCU: Department of Physical Sciences, Kingsborough Community College of the City University of New York, 2001 Oriental Boulevard, Brooklyn, New York 11235, USA.

Koblitz: Jörn Koblitz, Benquestrasse 27, D-28209 Bremen, Germany; www.metbase.de/contactus.html.

Köln-1: Classified: D. C. Hezel, *Köln*. Type specimen: *Köln*. Main mass: *ABDIS.*

MKBraun: Mineralien Kabinett, TU Braunschweig, Bienroder Weg 85, D-38106 Braunschweig.

MNA-SI-1: Classified: L. Folco, *MNA-SI*; M. D'Orazio, *DST-PI*; P. Rochette, *CEREGE*. Type specimen: *MNA-SI*. Finder: M. Franco, Caillou Noir. Main mass: *Caillou Noir.*

MNHN-1: Classified: A. Seddiki, Ud'OEA, and *UJMS-E*; B. Moine, J. Y. Cottin, *UJMS-E*; M. Denis, V. Sautter, J. P. Lorand, *MNHNP*, France. Type specimen: *MNHN*. Main mass: Anonymous finders.

MNHN-2: Classified: A. Seddiki, Ud'OEA, and *UJMS-E*; B. Moine, J. Y. Cottin, *UJMS-E*; M. Denis, V. Sautter, J. P. Lorand, *MNHNP*. Type specimen: *MNHN* and *Toulouse.* Main mass: Bernard Mougenot.

MNHN-3: Classified: M. Messaoudi, *USTB*; M. Denise *MNHNP*; B. Devouard, *UBP*. Type specimen: *MNHNP*. Finder: *Caillou Noir* Team. Main mass: *Caillou Noir.*

MNA-1: Classified: L. Folco, *MNA-SI*; M. D'Orazio, *DST-PI*; P. Rochette, *CEREGE*. Type specimen: *MNA-SI*. Main mass: *Caillou Noir.*

MMH-1: Classified: J. Schlüter, *Ham*. Type specimen: *Ham*. Main mass: I. Herkstroeter, Hamburg.
MMH-2: Classified: J. Schlüter, *Ham*. Type specimen: *Ham*. Main mass: *Koblitz*.
MMH-3: Classified: J. Schlüter, *Ham*. Type specimen: *Ham*. Main mass: Kasper von Wuthenau, Techin.
MMH-4: Classified: J. Schlüter, *Ham*. Type specimen: *Ham*. Main mass: *Gren*.
MNB-1: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: *HSSH*.
MNB-2: Classified: A. Greshake and M. Kurz, *MNB*. Type specimen: *MNB*. Main mass: *Anger.*
MNB-3: Classified: A. Greshake and M. Kurz, *MNB*. Type specimen: *MNB*. Main mass: *Stehlik*.
MNB-4: Classified: A. Greshake and M. Kurz, *MNB*. Type specimen: *MNB*. Main mass: *Ralew.*
MNB-5: Classified: A. Greshake and M. Kurz, *MNB*. Type specimen: *MNB*.
MNB-6: Classified: A. Greshake, *MNB* and M. Kurz. Type specimen: *MNB*. Main mass: *Strope*.
MNB-7: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: *GMEU*.
MNB-8: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: *Côrreira*.
NMBE-1: Classified: E. Gnos and A. Al-Kathiri, *UBE*; B. Hofmann, *NMBE*. Type specimen: *NMBE*. Finder: Anonymous. Main mass: Anonymous.
MSP-1: Classified: G. Pratesi and V. Cecchi Moggi, *MSP*. Type specimen: *MSP*. Finder: L. Matassoni and C. Silenzi, *MSP*. Main mass: *MSP*.
MSP-2: Classified: V. Moggi Cecchi and G. Pratesi, *MSP*. Type specimen: *MSP*. Main mass: *Chin*.
MSP-3: Classified: V. Moggi Cecchi and G. Pratesi, *MSP*. Type specimen: *MSP*. Main mass: Anonymous.
NAU-1: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Hall*.
NAU-2: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: Turecki and *Reed*.
NAU-3: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *G. Hupé.*
NAU-4: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Davis.*
NAU-5: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Ward.*
NAU-6: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Reed.*
NAU-7: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Aaronson*.
NAU-8: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Oakes*.
NAU-9: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Boswell*.
NAU-10: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Turecki*.
NAU-11: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Birdsell*.
NAU-12: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Farmer.*
NAU-13: Classified: T. Bunch, *NAU*. Type specimen: *DuPont*. Main mass: *Fabien Kuntz.*
NAU-14: Classified: T. Bunch, *NAU*. Type specimen: *DuPont*. Main mass: *DuPont*.
NAU-15: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Webb.*
NAU-16: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Herrmann.*
NAU-17: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Farmer* and *Strope.*
NAU-18: Classified: T. Bunch and J. Wittke, *NAU* and A. Irving, *UWS*. Type specimen: *NAU*. Main mass: Anonymous.
NAU-19: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: Anonymous.
NAU-20: Classified: T. Bunch and J. Wittke, *NAU*; A. Irving, *UWS*. Type specimen: *NAU*. Main mass: *Boswell*.
NAU-21: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Thompson*.
NAU-22: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Main mass: *A. Pani*.
NAU-23: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Finder. D. Schrader. Main mass: *D. Schrader.*
NAU-24: Classified: T. Bunch and J. Wittke, *NAU*. Type specimen: *NAU*. Finder: M. Farmer. Main mass: *Farmer* and *Strope.*
NHM-1: Classified: Anand, NHM, OU. Type specimen: NHM. Main mass: *Moussa*.
NHM-2: Classified: R. Hutchison and A. Kearsley, *NHM*. Type specimen: *NHM*. Main mass: *Fernla*.
NHMV-1: Classified: F. Brandstätter, *NHMV*. Type specimen: *NHMV*. Main mass: Anonymous.
NIPR-1: Classified: T. Arai, *NIPR*. Type specimen: *NIPR*. Main mass: Anonymous.
NorAS: Norwegian Astronomical Society.
OAM-1: Classified: L. Folco, *MNA-SI*. Type specimen: *OAM*. Finder: F. Ercolani of Italy. Main mass: *OAM*.
PMtOb: Purple Mountain Observator, 2 West Beijing Road, Nanjing, 210008 China.
PRL-1: Classified: N. Bhandari, *PRL*. Type specimen: *PRL*. Main mass: *PRL*.
PSF-1: Classified: P. Sipiera, *PSF*. Type specimen: *DuPont*. Main mass: *DuPont*.
Scharder: Devin Scharder, Lunar and Planetary Laboratory, The University of Arizona, Tucson, Arizona 85721, USA.
Spreemann: A. Spreemann, Wörthsee, Germany.
UAriz-1: Classified: D. H. Hill, J. J. Lowe, *UAriz*. Type specimen: *UAriz*. Finder: E. Melchiorre. Main mass: E. Melchiorre.
UAriz-2: Classified: D. Schrader, *UAz*; H. Connolly, *KCCU*.

Type specimen: *KCCU*. Main mass: *D. Schrader.*
UAriz-3: Classified: D. Schrader, *UAz*; H. Connolly, *KCCU*. Type specimen: *KCCU*. Main mass: *Connolly.*
UAriz-4: Classified: D. Schrader, D. Lauretta, M. Killgore, *UAz*; H. Connolly, *KCCU*. Type specimen: *KCCU*. Main mass: *D. Schrader.*
UBE-1: Classified: E. Gnos, *UBE*; B. Hofmann, *NMBE*. Type specimen: *NMBE*. Main mass: U. Messerli.
UCLA-1: Classified: A. Rubin, *UCLA*. Type specimen: *UCLA*. Main mass: *ROM*.
UCLA-2: Classified: A. Rubin, *UCLA*. Type specimen: *UCLA*. Finder: T. Besedin. Main mass: *T. Besedin*.
UCLA-3: Classified: A. Rubin, *UCLA*. Type specimen: *UCLA*. Finder: G. Stanley. Main mass: *G. Stanley.*
UCLA-4: Classified: A. Rubin, *UCLA*. Type specimen: *UCLA*. Finder: D. Schrader. Main mass: *D. Schrader.*
UCLA-5: Classified: A. Rubin, *UCLA*. Type specimen: *UCLA*.
UEdeC: Universidade Estadual de Campina, Argentina.
UJO: Université Jean Monnet, Saint-Etienne, France.
UO: Université d'Oran Es-senia, Algeria; http://www.univ-oran.dz.
UOslo: Natural Science Museum, University of Oslo.
USTB: Université des Sciences et de la Technologie Houari Boumediene, Algers, Algeria;www.usthb.dz.
UWS-1: Classified: A. Irving and S. Kuehner, *UWS*. Type specimen: *UWS*. Main mass: *G. Hupé.*
UWS-2: Classified: A. Irving and S. Kuehner, *UWS*. Type specimen: *UWS*. Main mass: *G. Hupé.*
UWS-3: Classified: A. Irving and S. Kuehner, *UWS*. Type specimen: *UWS*. Main mass: *Ralew.*
Vernad-1: Classified: Ivanova, *Vernad*. Type specimen: *Vernad*. Main mass: Anonymous.
Vernad-2: Classified: C. Lorenz, *Vernad*; F. Brandstaetter, *NHMV*. Type specimen: *Vernad*. Main mass: *C. Lorenz*.
Zaki: Zaki Local Government Area, Bauchi State, Nigeria.

Additional Abbreviations Used within the Text

For chondrule textural types: C = cryptocrystalline, BO = barred olivine, GO = granular olivine, PO = porphyritic olivine, POP = porphyritic olivine pyroxene, PP = porphyritic pyroxene.

Table 1. Officially recognized meteorites from countries and regions within Africa.

Name	Date of recovery	Place of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type specimen (g)	No. of pieces	Class	Shock	WG[a]	Fa (mol%)	Fs (mol%)	Info	Comments
Algeria														
Ilizi	1991	Algeria	26°45′	8°53′	185	21.5	1	H4	S2	W4	18.6	17.5	UBE-1	See separate entry
Acfer 378	2003	Algeria	27°24′	3°45′	1320	1320	1	LL6	S4	W2	29	24	OAM-1	Breccia
Acfer 379	18-Jan-2004	Algeria	27°24.684′	3°42.280′	14,764	2910	1	H4	S2	W1	19	16.6	MSP-1	
Acfer 380	14-Nov-2002	Algeria	27°46′	4°25′	849	24.13	6	H5	S2	W1	18.1	16.1	ENSL-1	
Acfer 381	15-Nov-2002	Algeria	27°42′	4°27′	292	21	1	L6	S3	W2	25.8	22	ENSL-1	
Acfer 382	17-Nov-2002	Algeria	27°38′	3°56′	101	24	1	H5	S1	W3	19.2	17.3	ENSL-1	
Tanezrouft														
Tnz 88	22-Nov-2002	Algeria	25°22′	1°05′	660	30.42	3	H5	S1/2	W2	19.9	18.8	ENSL-1	
Tnz 89	27-Nov-2002	Algeria	25°14′	0°9′	581	23	1	L6	S1/2	W2	24.2	20.3	ENSL-1	
Egypt														
Al Alamayn	2005	Egypt	30°42.571′	28°58.188′	13.308	3	1	H5	S2	W3	18.2	15.9	NMBE -1	
Minqar Abd el Nabi	Nov-1992	Egypt	29°54′32″	29°54′30″	362	340	1	H6			19.2	17.2	EMRA-1	See separate entry
Libya														
Dar al Gani														
DaG 1042	1999	Dar al Gani region, Al Jufrah, Libya	27°10.92′	16°18.01′	801	37 + 6.1	1	Lunar, feldspathic regolith breccia					NIPR-1	See separate entry
Hammadah al Hamra														
HaH 338	08-Oct-2003	Libya	30°32′42″	13°34′55″	753	55.10	Several	H5	S3	W3	19.16		HAM-1	
HaH 339	08-Oct-2003	Libya	29°25′11″	13°15′18″	263	34.90	1	L6	S3	W3	25.23		HAM-1	
Niger														
Adrar Chiriet	03-Oct-2003	Niger	19°38.405′	9°21.327′	926	45.4	1	L6	S5	W2	24.8	21.3	Dran-1	
Nigeria														
Katagum	First week of Sept-1999; ~15:00GMT	Nigeria	11°02′	10°05′	~1500	20	1	L6	S2		23.6 ± 0.2	19.9 ± 0.3	BUK-1	See separate entry
Uganda														
Hoima	Nov-1992	Hoima District	1°20′42.00″	31°28′22.00″	167.7	20.8	1	H6 (breccia)	S2	W0	17.4	15.4	MNB-7	See separate entry
The Sahara														
Sahara 03505	2003	Sahara	Undisclosed	Undisclosed	65	13	1	Iron (ungrouped)					MNA-1	See separate entry
Tunisia														
Hezma	31-Mar-02	Hezma, Tunisia	33°15′	10°28′	62	12	1	L5/6	S3	W1–2	24	20.5	IfP-2	See separate entry
Metameur 001	04-Dec-2005	Metameur, Tunisia	33°21′24	10°24′32	748	30	1	LL6	S5	W1	32	26	IfP-2	See separate entry
Metameur 002	25-Dec-2005	Metameur, Tunisia	33°21′09	10°26′01	17	5	1	H4	S2	W3–4	18.5	16	IfP-2	See separate entry
Metameur 003	25-Feb-05	Metameur, Tunisia	33°24.2′	10°27.5′	126	22	1	L4	S3	W3	26	19.5 ± 3.2	IfP-2	See separate entry

[a]WG = weathering grade.

Table 2. Officially recognized meteorites from Northwest Africa.

Name	Date of recovery or purchase	Place of purchase[a]	Total known mass (g)	No. of pieces	Type specimen mass (g)	Class[b]	Shock stage[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments[e]
Northwest Africa														
NWA 873	2001	Erfoud, Morocco	62.0	1	12.6	H4	S2	W2	19.7	17.1	1.2		MSP-2	
NWA 874	2001	Erfoud, Morocco	22.0	1	5.3	L5	S2	W2	25.0	21.3	1.6		MSP-2	
NWA 875	2001	Erfoud, Morocco	22.0	1	5.4	L6	S3	W1	25.0	22.9	1.9		MSP-2	
NWA 876	2001	Erfoud, Morocco	48.0	1	10.1	H5	S4	W3	18.7	17.1	0.9		MSP-2	
NWA 877	2001	Erfoud, Morocco	28.0	1	5.8	L5	S2	W1	25.7	20.6	1.8		MSP-2	
NWA 878	2001	Erfoud, Morocco	20.0	1	4	L4	S1	W2	26.0	22.1	1.4		MSP-2	
NWA 879	2001	Erfoud, Morocco	80.0	1	16.4	LL5	S3	W3	26.9	22.6	1.8		MSP-2	
NWA 880	2001	Erfoud, Morocco	182.0	1	21.6	H3.9	S1	W3	19.9	17.9	1.1		MSP-2	Var.Fa > 5% mean (min 19.38, max 21.60 std. dev. 1.16)
NWA 881	2001	Erfoud, Morocco	424.0	1	80	H4	S1	W2	18.6	18.0	1.6		MSP-2	
NWA 882	2001	Erfoud, Morocco	512.0	1	20.7	L5	S1	W1	25.2	21.4	1.3		MSP-2	
NWA 883	2001	Erfoud, Morocco	61.2	1	12.2	LL6	S3	W3	26.3	23.7	1.7		MSP-2	
NWA 884	2001	Erfoud, Morocco	110.0	1	20	H4	S3	W0	18.9	17.3	1.4		MSP-2	
NWA 885	2001	Erfoud, Morocco	106.0	1	20	L5	S2	W2	25.6	21.7	1.8		MSP-2	
NWA 886	2001	Erfoud, Morocco	24.4	1	5.3	L5	S2	W1	25.1	24.6	1.5		MSP-2	
NWA 887	2001	Erfoud, Morocco	17.5	1	4.3	H4–6	S1	W4	18.5	13.8	2.3		MSP-2	Breccia
NWA 888	2001	Erfoud, Morocco	74.6	1	16.7	H4	S2	W2	19.6	17.2	1.5		MSP-2	
NWA 889	2001	Erfoud, Morocco	70.6	1	15.1	L5	S2	W3	25.7	21.3	1.6		MSP-2	
NWA 890	2001	Erfoud, Morocco	56.8	1	11.9	LL6	S2	W4	28.4	25.0	1.8		MSP-2	
NWA 891	2001	Erfoud, Morocco	70.8	1	14.2	H4	S1	W1	16.6	14.6	0.9		MSP-2	
NWA 892	2001	Erfoud, Morocco	54.6	1	10.9	H5	S1	W4	19.2	16.5	1.3		MSP-2	
NWA 893	2001	Erfoud, Morocco	50.8	1	11.6	L6	S2	W1	25.8	22.2	1.6		MSP-2	
NWA 894	2001	Erfoud, Morocco	45.8	1	9.3	L6	S3	W2	26.7	21.8	1.4		MSP-2	
NWA 895	2001	Erfoud, Morocco	54.0	1	12.2	H5	S2	W2	19.8	17.4	1.5		MSP-2	
NWA 896	2001	Erfoud, Morocco	39.7	1	7.8	L6	S4	W1	25.5	20.9	1.7		MSP-2	
NWA 897	2001	Erfoud, Morocco	176.0	1	20.4	L6	S2	W4	25.5	21.2	1.5		MSP-2	
NWA 898	2001	Erfoud, Morocco	95.8	1	19.6	L6	S3	W2	25.9	22.7	1.5		MSP-2	
NWA 899	2001	Erfoud, Morocco	74.6	1	15.8	LL6	S4	W1	26.5	23.9	1.5		MSP-2	
NWA 902	2001	Erfoud, Morocco	158.0	1	20.4	H4	S1	W2	18.5	17.4	0.7		MSP-2	
NWA 960	2001	Erfoud, Morocco	997.0	1	23	OC type 3	S1	W1–2	2–29	2–34			UW-2	See separate entry
NWA 975	2001	Erfoud, Morocco	1100.0	1	56.2	L4	S2	W2	24.4	20.9	1.5		MSP-2	
NWA 976	2001	Erfoud, Morocco	170.0	1	25.1	L5	S3	W2	25.8	22.7	1.6		MSP-2	
NWA 977	2001	Erfoud, Morocco	600.0	1	28.5	L5	S3	W1	24.7	22.8	1.5		MSP-2	
NWA 1051	2001	Erfoud, Morocco	88.0	1	17.7	L5	S2	W0	25.3	21.4	1.3		MSP-2	
NWA 1055	2001	Erfoud, Morocco	132.0	1	21.8	L4	S3	W0	25.7	20.2	1.8		MSP-2	
NWA 1056	2001	Erfoud, Morocco	188.0	1	20.4	H5	S1	W2	18.2	16.3	1.4		MSP-2	
NWA 1057	2001	Erfoud, Morocco	124.0	1	20.2	H4	S1	W1	18.0	15.8	1.5		MSP-2	
NWA 1059	2001	Erfoud, Morocco	110.0	1	20.1	L5	S3	W1	24.8	20.3	2.0		MSP-2	
NWA 1060	2001	Erfoud, Morocco	112.0	1	20	LL5	S2	W2	26.3	23.1	1.7		MSP-2	
NWA 1061	2001	Erfoud, Morocco	112.0	1	20.3	L6	S1	W3	22.0	19.7	1.3		MSP-2	
NWA 1063	2001	Erfoud, Morocco	78.0	1	15.6	H4	S1	W4	19.0	16.4	1.2		MSP-2	
NWA 1064	2001	Erfoud, Morocco	84.0	1	16.8	H5	S1	W3	20.1	17.8	1.5		MSP-2	
NWA 1065	2001	Erfoud, Morocco	56.0	1	11.2	LL5	S3	W3	26.0	22.2	1.3		MSP-2	
NWA 1066	2001	Erfoud, Morocco	132.0	1	24.6	H5	S1	W3	18.7	16.4	1.4		MSP-2	
NWA 1506	Oct-2001	Munich, Germany	548	1	20.3	L5		W2	25.0	21.1	1.7		Barto-12	

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

Name	Date of recovery or purchase	Place of purchase[a]	Total known mass (g)	No. of pieces	Type specimen mass (g)	Class[b]	Shock stage[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments[e]
NWA 1509	Oct-2001	Munich, Germany	443	1	19	H4/5		W1	16.6	15.2	1.7		Barto-12	
NWA 1518	Oct-2001	Munich, Germany	340	1	22.46	H/L3		W2	21.0	18.3	1.7		Barto-12	
NWA 1519	Oct-2001	Munich, Germany	267	1	19.95	L6		W3	24.8	20.6	1.7		Barto-12	
NWA 1523	Oct-2001	Munich, Germany	409	1	21.40	H5		W1	18.4	16.2	0.9		Barto-12	
NWA 1524	Oct-2001	Munich, Germany	191	1	20.80	L3/4		W3	24.4	20.0	1.1		Barto-12	
NWA 1526	Oct-2001	Munich, Germany	198	1	20.30	L5		W2	24.9	20.4	1.2		Barto-12	
NWA 1527	Aug-2001	Cologne, Germany	128	1	19.5	L4		W1	25.3	20.4	1.7		Barto-13	Melt veins
NWA 1528	Aug-2001	Cologne, Germany	215	1	24.0	L4		W1	24.5	20.1	1.0		Barto-13	Melt clasts
NWA 1529	Aug-2001	Cologne, Germany	79	1	18.4	L4		W1	24.7	19.2	1.1		Barto-13	
NWA 1530	Aug-2001	Cologne, Germany	34	1	7.3	L5/6		W1	25.3	21.3	1.8		Barto-13	
NWA 1531	Aug-2001	Cologne, Germany	24	1	5.8	L4		W1	25.0	21.5	1.4		Barto-13	
NWA 1532	Aug-2001	Cologne, Germany	205	1	20.4	L6		W1	24.8	20.7	1.8		Barto-13	
NWA 1533	Aug-2001	Cologne, Germany	14	1	2.7	L5		W1	25.1	21.9	1.6		Barto-13	
NWA 1534	Aug-2001	Cologne, Germany	11	1	2.2	H/L4		W2	20.5	17.6	1.1		Barto-13	
NWA 1544	2000	Zagor, Morocco	28.7	1	7.91	H4		W4	18.8	15.3	0.8		Barto-14	
NWA 1546	2000	Zagor, Morocco	500	1	22.1	L5		W1	25.0	21.4	1.6		Barto-14	
NWA 1808	2002	Erfoud, Morocco	684.0	1	20.1	H5 (IMB)	S3	W0	19	16.31			MSP-2	See separate entry
NWA 1993		eBay	1670	1	29.0	H6		W0	19.1	16.9	1.5	5.47	Barto-16	
NWA 2010	2003	Find: Boudnib, Morocco	145.4	1	22.6	H5		W0	19.0	16.7	1.4	5.40	Barto-15	
NWA 2018	2001	Gifhorn, Germany	400	1	27.6	H4/5		W0/1				5.36	Barto-17	
NWA 2041	2003	Erfoud, Morocco	4500.0	Many	25.6	Type 3	S1	W2	5–25	0–3				See separate entry
NWA 2048	2003	Rissani, Morocco	44.5	1	9.7	Dio							NAU-12	See separate entry
NWA 2163	2003	Elnif, Morocco	289.0	1	20.0	LL5	S2	W4	26.4	21.9			FSAC-1	
NWA 2166	2003	Elnif, Morocco	92.1	1	9.71	LL3.8	S3	W3	27.6	24.2			FASC-1	
NWA 2177	2003		74.8	Many	15.4	Euc							MSP-2	See separate entry
NWA 2180	2002		369.3	Many	20.7	CV3	S1	Min	1–9	1.9			MSP-3	See separate entry
NWA 2212		Toronto, Canada	322	1	20.3	EL6	S2	W1		0.29 ± 0.15			UCLA-1	$Wo_{1.2\pm0.3}$ (n = 11)
NWA 2213		Toronto, Canada	125	1	20.4	EL6	S2	W2		0.41 ± 0.17			UCLA-1	$Wo_{1.4\pm0.1,}$ Diopside-$Fs_{0.46\pm0.25}$,$Wo_{46.2\pm0.1}$
NWA 2214		Denver, Colorado, USA	340	1	21.0	CO3	S1	W3	21.7 ± 19.2				UCLA-1	Oriented, low-Ca pyx $Fs_{1.6}Wo_{0.65}$
NWA 2215		Denver, Colorado, USA	289	1	20.1	L6	S3	W3	24.4 ± 0.3	20.4	1.4		UCLA-1	Low-Ca pyx
NWA 2216		Denver, Colorado, USA	345	1	20.5	Ure	S1	W3	12.3 ± 4.5	18.5 ± 0.2			UCLA-1	Pigeonite $Fs_{18.5\pm0.2}$, $Wo_{10.3\pm0.1}$
NWA 2217		Tuscon, Arizona, USA	5656	1	20.1	H4	S1	W5	18.0 ± 0.6				UCLA-1	Low-Ca Pyx $Fs_{14,8\pm1.9}$, $Wo_{0.61\pm0.34}$
NWA 2319	2002	Munich, Germany	22.4	1	5.2	H5		W2				5.09	Barto-18	
NWA 2320	2002	Munich, Germany	15.5	1	3.8	L6		W2				4.75	Barto-18	
NWA 2321	2002	Munich, Germany	54.2	1	11	L6		W3				4.77	Barto-18	
NWA 2322	2002	Munich, Germany	23.6	1	5.8	L6		W2				4.63	Barto-18	
NWA 2323	2002	Munich, Germany	17.4	1	3.3	L5		W1/2				4.67	Barto-18	
NWA 2324	2002	Munich, Germany	14.4	1	3.1	L4		W1				4.83	Barto-18	
NWA 2325	2002	Munich, Germany	28.7	1	6.5	LL4		W2				4.08	Barto-18	
NWA 2326	2002	Munich, Germany	3.7	1	0.9	L5		W2				4.50	Barto-18	
NWA 2327	2002	Munich, Germany	23.8	1	4.4	LL4/5		W2				4.38	Barto-18	
NWA 2328	2002	Munich, Germany	27.9	1	5.5	L6		W1				4.63	Barto-18	

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

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NWA 2329	2003	eBay	766	1	36.3	L6		W1				4.81	Barto-17	
NWA 2330	2003	Erfoud, Morocco	719	1	31.4	L4		W1/2				4.52	Barto-17	
NWA 2331	2003	eBay	331	1	23.0	L(LL)4		W2				4.12	Barto-17	
NWA 2332	2004	Erfoud, Morocco	126.7	1	26.4	H5		W0/1				5.41	Barto-17	
NWA 2333	2004	Lehrte, Germany	12.5	1	3.1	LL/L6		W0/1				4.47	Barto-17	
NWA 2339	2004	Zagora, Morocco	11.9	1	2.3	Euc				31.63	40.0–41.6	2.94	Barto-21	See separate entry
NWA 2340	2004	Zagora, Morocco	4.6	1	0.9	CR2		W1				4.91	Barto-19	See separate entry
NWA 2341	2004	Zagora, Morocco	196.1	1	20.5	H5		W2/3				4.82	Barto-19	
NWA 2342	2004	Zagora, Morocco	64.5	1	20.4	L5		W1/2				4.56	Barto-19	
NWA 2343	2004	Zagora, Morocco	144.9	1	19.8	L6		W1				4.92	Barto-19	
NWA 2344	2004	Zagora, Morocco	29.5	1	6.4	L4		W3				4.58	Barto-19	
NWA 2345	2004	Zagora, Morocco	40.4	1	8.9	H6		W1				5.21	Barto-19	
NWA 2346	2004	Zagora, Morocco	23.4	1	6.1	L5		W2/3				4.56	Barto-19	
NWA 2347	2004	Zagora, Morocco	38.1	1	9.0	H6		W2/3				4.95	Barto-19	
NWA 2430	2004	eBay	50	1	11.4	H5	S2	W2	17.6	15.6			NAU-1	
NWA 2432	2004	eBay	28.6	1	5.9	LL5	S2	W1	27.7	22.8			NAU-1	
NWA 2570	2004	Efround, Morocco	12.4	3	2.5	CV3		W1/2				3.99	Barto-20	See separate entry
NWA 2571	2004	Efround, Morocco	255.5	1	20.8	H6		W3				4.85	Barto-20	
NWA 2572	2004	St. Marie aux Mine, France	440.6	1	22.1	H5		W1/2				4.94	Barto-20	
NWA 2576	2004	St. Marie aux Mine, France	402.3	1	26.7	L6		W1				4.92	Barto-20	
NWA 2578	2004	Erfoud, Morocco	76.6	1	14.8	L4		W1/2				4.70	Barto-20	
NWA 2579	2004	Erfoud, Morocco	51.3	1	10.4	L6		W1				4.94	Barto-20	
NWA 2582	2004	Erfoud, Morocco	312.5	1	27.9	H5		W4				4.58	Barto-20	
NWA 2584	2004	St. Marie aux Mine, France	1050.7	1	22.4	H4		W0/1				5.57	Barto-20	
NWA 2651	2003	Erfoud, Morocco	89.0	1	22.6	Ure	S2	Min					NAU-6	See separate entry
NWA 2748	Jun-2004	Erfoud, Morocco	57	1	13.86	L3.4 ± 0.2	S2	W3	1–35				NHM-2	See separate entry
NWA 2750	Before 2004	Morocco	63.5	1	13.0	LL4	S2	W3	28.14	12.5			PSF-1	
NWA 2775	2005	Erfoud, Morocco	222	1	20.1	Acp							NAU-2	See separate entry
NWA 2791	2004	Erfoud, Morocco	383.0	1	23	LL3–4	S2	W2					NAU-15	See separate entry
NWA 2806	2005		148.4	1	21	L6 (IMB)	S3	W1	24.3	20.6			MSP-2	See separate entry
NWA 2828	Dec-05	Tagounite, Morocco	8672.0	6	20	Aub							NAU-6	See separate entry
NWA 2907	2005	Erfoud, Morocco	586.0	Many	23	Aung	S3	Mod					NAU-6	See separate entry
NWA 2944	2005	Erfoud, Morocco	797	1	27.0	H4	S6	W2	17.6	15.8			NAU-4	
NWA 2945	2005	Erfoud, Morocco	214	1	21	L4	S2	W2	23.3	20.1			NAU-5	
NWA 2946	2005	Erfoud, Morocco	149	1	24	H3.8	S2	W2	17.2 ± 3.8	15.4			NAU-4	
NWA 2947	2005	Erfoud, Morocco	1545	1	24	L5	S2	W2	24.2	20.6			NAU-4	
NWA 2948	2005	Erfoud, Morocco	1195	1	41	L5	S2	W2	24	20.3			NAU-4	$Fs_{41–50.9}Wo_{2.0–5.2}$ fine-grained breccia
NWA 2950	2005	Erfoud, Morocco	946	1	24	H4	S2	W3	18.4	16.4			NAU-4	
NWA 2954	2004	Erfoud, Morocco	145	1	25	H4	S2	W2	18.8	17			NAU-6	Olv (FeO/MnO = 39), Pyx (FeO/MnO = 26)
NWA 2955	2005	Erfoud, Morocco	231	1	21	H4	S2	W2	16.3	14.8			NAU-7	
NWA 2957	1997	Morocco	362.0	1	21.1	Pal	Min	Min	11.8				NAU-16	See separate entry
NWA 2958	2005	Find: Algeria	540	1	22.8	L6	S1	W1	24.6	20.9			NAU-7	

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NWA 2960	2005	Erfoud, Morocco	433	1	21.1	L3.4	S2	W2	8.2–44				NAU-8	Olv (Cr_2O_3 = 0.12 ± 0.05)
NWA 2961	2005	Erfoud, Morocco	459	1	23	L3.6	S1	W2	12.1–30.3				NAU-8	Olv (Cr_2O_3 = 0.06 ± 0.04)
NWA 2962	2005	Erfoud, Morocco	230	1	21.3	LL3.3	S2	W2	12.3–47.6				NAU-8	Olv (Cr_2O_3 = 0.28 ± 0.17)
NWA 2963	2005	Erfoud, Morocco	354	1	23	Ure	Mod	Min	10.4 (core)				NAU-9	Olv (FeO/MnO = 29) $Fs_{9.2}Wo_{7.7}$
NWA 2964	2005	Erfoud, Morocco	207	1	20.1	Ure	Min	Min	19.6 (core)				NAU-10	Olv (FeO/MnO = 44) $Fs_{17.5}Wo_{17.5}$
NWA 2965	2005	Erfoud, Morocco	>100 kg	1	24	EL6/7							NAU-10	See separate entry
NWA 2967	2005	Erfoud, Morocco	72	1	15.4	Dio	Min	Mod					NAU-6	$Fs_{29.4}$, FeO/MnO = 28 chromite, Cr/(Cr+Al) = 0.79
NWA 2968	2005	Erfoud, Morocco	268	Many	22.0	Aung			7.5 ± 0.2	6.7	1.5		NAU-6	See separate entry
NWA 2969	2005	Erfoud, Morocco	11.7	Many	4.3	Martian							NAU-11	See separate entry
NWA 2970	2005		108	12	22.0	H6	S2-3	W3	18.2	16.7			NAU-6	
NWA 2973	2005		156	Many	23.0	CO3.2	S2	W3					NAU-7	$Fa_{13.8}$; FeO/MnO = 128, Cr_2O_3 = 0.21 ± 0.1 wt%
NWA 2974	2005		668	1	22.0	CO3.1	S2	W2					NAU-7	$Fa_{1–48}$;FeO/MnO = 115, Cr_2O_3 = 0.11–0.53 wt%
NWA 2976	2005	Erfoud, Morocco	219	1	23.2	Aung	S1	Min					NAU-12	See separate entry
NWA 2979	2005	Erfoud, Morocco	23.2	1	4.8	L/LL (IMP)		Min	26.8 ± 13.7				NAU-17	See separate entry
NWA 2981	2005	Erfoud, Morocco	19	1	4.1	L (IMP)		Min	22.6	19.7 ± 7.1			NAU-3	See separate entry
NWA 2988	2006	Erfoud, Morocco	4602	1	20.1	Euc	S5	Min		61			NAU-17	See separate entry
NWA 2993	2006	Erfoud, Morocco	625.0	1	20.3	Aung		Min	12.3 ± 0.2				NAU-18	See separate entry
NWA 2997	2006	Erfoud, Morocco	43.0	1	10	Dio	Min	Min		22.1–24.3			NAU-19	See separate entry
NWA 2998	2006	Erfoud, Morocco	163.0	1	20.4	Lunar		Min					NAU-19	See separate entry
NWA 3152	Apr 2005	Tagounite, Morocco	1496	1	20.3	Euc							UWS-1	See separate entry
NWA 3153	Apr 2005		442	1	10	L6		W2–3	23–25				UWS-1	Opx, Cpx Na-K-Ca feldspar, troilite, kamacite, taenite, and merrillite
NWA 3155	Aug 2004	Tagounite, Morocco	878	1	20	CK5	S1	W2–3					UWS-1	See separate entry
NWA 3156	Aug 2004	Tagounite, Morocco	138	1	20	Ure							UWS-1	See separate entry
NWA 3159	Aug 2005	Rissani, Morocco	397	1	20.14	Euc							UWS-1	See separate entry
NWA 3161	Aug 2005		1815	17	21.10	OC type 3	S1	W1					UWS-1	See separate entry
NWA 3162	Aug 2005		60	1	12.20	Euc		Min					UWS-1	See separate entry
NWA 3213	May 2005	Erfoud, Morocco	147.0	1	21.30	Mes	Min	Min		30.11			MSP-2	See separate entry
NWA 3214	2005	Erfoud, Morocco	435.2	1	20	CV3	S1	Min	6–9	0.72			MSP-2	See separate entry
NWA 3326	Before 2004	Erfoud, Morocco	23	1	5.14	LL5	S2	W1	27.4	24			NAU-13	
NWA 3327	Before 2003	Erfoud, Morocco	171	1	36.7	H6	S2	W2	18.5	16.1			NAU-13	
NWA 3328	Before 2005	Zeida, Morocco	57	1	12.1	H6/7	S2	W2	18.4	16.3			NAU-13	
NWA 3329	2005	Er-Rachidia, Morocco	252	1	22.5	Dio				29.3–29.5			UWS	See separate entry
NWA 3330	Before 2005	Erfoud, Morocco	45	1	9.3	H/L5	S2	W3	21.8	18.8			NAU-13	
NWA 3331	Before 2005	Midelt, Morocco	20	1	4.4	LL4	S3	W3	27.4	21.8			NAU-13	
NWA 3336	Before 2005	Rissani, Morocco	320	1	20.2	L4	S4	W1	24.3	20.8			NAU-13	

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

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NWA 3337	Before 2005	Rissani, Morocco	530	1	27.7	LL4	S2	W3	29.4	24.3			NAU-13	
NWA 3338	Before 2001	Morocco	62.6	1	13	H3.8	S2	W1	17.5 ± 2.3	16.3 ± 2			NAU-13	
NWA 4024	Aug 2005	Erfoud, Morocco	38.1	1	8	Win	Min	Ext	4.2	6.1			MNB-1	See separate entry
NWA 4025	Aug 2005	Erfoud, Morocco	745.5	1	20	CB-like	S3	Mod	1.7–4.4	1.5–3.9			MNB-1	See separate entry
NWA 4026	Aug 2005	Erfoud, Morocco	265.6	1	8	CK4/5	Min	Mod	30.1	25.7			MNB-1	See separate entry
NWA 4051	Apr 2004	Ken Kem Basir, Morocco	828	1	22.5	Euc							NHM-1	See separate entry
NWA 4059	2004	Erfoud, Morocco	386	1	23.6	L6	S6	W1	24.2	20.1			MNB-2	
NWA 4071	2004	Erfoud, Morocco	600	1	25.4	L6	S4	W2	23.7	20.3			MNB-2	
NWA 4075	2004	Erfoud, Morocco	168	1	21.8	L6	S4	W1	25.2	21.4			MNB-2	
NWA 4081	2004	Erfoud, Morocco	65.7	1	14.6	H6	S2	W3	18.1	15.6			MNB-2	
NWA 4082	2004	Erfoud, Morocco	23	1	5.2	H3	S3	W2/3	2.7–31.4	2.9–10.3			MNB-2	
NWA 4086	2004	Erfoud, Morocco	38.1	1	10.2	L6	S2	W1	24.5	21.1			MNB-2	
NWA 4088	2004	Erfoud, Morocco	53	1	12.2	H3	S2	W2/3	0.4–28.1	2.5–19.2			MNB-2	
NWA 4091	2004	Erfoud, Morocco	34.6	1	7.8	EL3/4	Min	Ext		0.2–2			MNB-2	Metal (Si = 0.2 wt%)
NWA 4093	2004	Erfoud, Morocco	92.5	1	20	L6	S3	W2	25.4	21.3			MNB-2	
NWA 4095	2004	Erfoud, Morocco	82.5	1	23.6	L6	S3	W1	26	20.6			MNB-2	
NWA 4096	2004	Erfoud, Morocco	55	1	12.0	L6	S3	W1	25	19.3			MNB-2	
NWA 4099	2004	Erfoud, Morocco	361	1	21.2	H4/5	S2	W2	18.6	12.6–16.8			MNB-2	
NWA 4105	2004	Erfoud, Morocco	216	1	27.2	L6	S4	W2	25	21.1			MNB-2	
NWA 4106	2004	Erfoud, Morocco	54.5	1	14.6	L5/6	S3	W2	24.9	20.6			MNB-2	
NWA 4108	2004	Erfoud, Morocco	31.7	1	7	H4–6	S3	W2	15.2–25.9	21			MNB-2	
NWA 4111	2004	Erfoud, Morocco	85.2	1	19.0	H3	S3	W2	6.7–23.9	13.4–16.1			MNB-2	
NWA 4118	2004	Erfoud, Morocco	34.7	1	8.2	L6	S4	W2	25.3	21			MNB-2	
NWA 4119	2004	Erfoud, Morocco	59.9	1	12.8	H5	S3	W1	18.4	16.2			MNB-2	
NWA 4122	2004	Erfoud, Morocco	681	1	31.4	H6	S2	W3	20.4	18.1			MNB-2	
NWA 4126	2004	Erfoud, Morocco	112.3	1	20.9	L6	S3	W3	24.7	20			MNB-2	
NWA 4128	2004	Erfoud, Morocco	27	1	6	H6	S2	W2/3	19.1	16.6			MNB-2	
NWA 4130	2004	Erfoud, Morocco	254	1	23.6	L4	S2	W0/1	23.3	9.8–21.3			MNB-2	
NWA 4131	2004	Erfoud, Morocco	74.3	1	16.0	L5/6	S4	W1	24.4	20.8			MNB-2	
NWA 4132	2004	Erfoud, Morocco	106.1	1	21.0	H4/5	S2	W3/4	18	16.1			MNB-2	
NWA 4133	2004	Erfoud, Morocco	100	1	21.0	LL6	S3	W1	29.4	24.7			MNB-2	
NWA 4134	2004	Erfoud, Morocco	333.2	4	24.8	L6	S3	W2	25	21.5			MNB-2	
NWA 4138	2004	Erfoud, Morocco	55.5	1	11.8	Euc							MNB-2	See separate entry
NWA 4147	2004	Erfoud, Morocco	38.6	1	8.6	H3	S2	W2/3	0.6–24.7	1.2–16.9			MNB-2	
NWA 4148	2004	Erfoud, Morocco	401.8	2	23.2	L6	S4	W1	24	20.5			MNB-2	
NWA 4149	2004	Erfoud, Morocco	400	1	33.2	L3	S3	W1	0.9–24.4	5–23.2			MNB-2	
NWA 4151	2004	Erfoud, Morocco	248	1	20	H5	S2	W2	16.4	14.8			MNB-2	
NWA 4160	Before 2002	Morocco	581	1	20	LL4	S2	W2	28.26	26.53			PSF-1	
NWA 4161	Before 2002	Morocco	575	1	20	H6	S2	W2	18.5	16.1			NAU-14	
NWA 4182	Before 2002	Morocco	221.5	1	20	L4	S1	W2	25.1	20			NAU-14	
NWA 4183	Before 2002	Morocco	177.5	1	20	L4	S2	W2	25.3	20.4			NAU-14	
NWA 4185	Before 2002	Morocco	159	1	20	L4	S2	W2	24	20.1			NAU-14	
NWA 4188	Before 2002	Morocco	120	1	20	L3–4	S2	W1	20.4–27.5	19–22			NAU-14	Polymict breccia
NWA 4189	Before 2002	Morocco	110	1	20	L5	S2	W2	23.8	20.1			NAU-14	
NWA 4190	Before 2002	Morocco	105.5	1	20	L5	S2	W1	24.5	20.2			NAU-14	
NWA 4191	Before 2002	Morocco	102	1	20	L4	S2	W2	23.6	20.1			NAU-14	

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

Name	Date of recovery or purchase	Place of purchase[a]	Total known mass (g)	No. of pieces	Type specimen mass (g)	Class[b]	Shock stage[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments[e]
NWA 4192	Before 2002	Morocco	96	1	20	L5	S3	W2	24.3	20.6			NAU-14	
NWA 4193	Before 2002	Morocco	50.2	1	20	L4	S3	W1	24.9	21			NAU-14	
NWA 4195	27-Oct-2005	Munich, Germany	270	1	20	L3–6	S3	W2–3	26 ± 1.7	16 ± 4			IfP-1	Br, Sv
NWA 4196	27-Oct-2005	Munich, Germany	376	1	20	H4	S1	W3	17.5	15.5			IfP-1	
NWA 4198	27-Oct-2005	Munich, Germany	259	1	20	H6	S2	W3	19	17			IfP-1	
NWA 4199	09-Dec-2005	Hamburg, Germany	95	1	24	L6	S3	W3	24.5	21.5			IfP-1	IMC, Calc. v.
NWA 4200	09-Dec-2005	Hamburg, Germany	1176	1	20	H6	S1	W1	20	17.5			IfP-1	
NWA 4201	09-Dec-2005	Hamburg, Germany	95	1	18	L3	S4	W1	25.5 ± 1.5	16.6 ± 5			IfP-1	
NWA 4202	09-Dec-2005	Hamburg, Germany	84	1	18	LL3	S4	W1	31 ± 3.5	11.5 ± 7.5			IfP-1	Sv
NWA 4203	09-Dec-2005	Hamburg, Germany	264	1	17	H4/5	S2	W1	19	16.5			IfP-1	Sv
NWA 4204	09-Dec-2005	Hamburg, Germany	335	1	18	H6	S3	W3	19.5	17.5			IfP-1	Sv, Calc. v.
NWA 4205	06-Nov-2004	Dortmund, Germany	2137	1	26	H5/6	S3	W1	19	16.5			IfP-1	Sv
NWA 4206	25-Jun-2003	St. Marie aux Mine, France	69	1	22	L3–6	S2	W1	24 ± 1.5	21 ± 3			IfP-1	Br, Sv, IMC
NWA 4207	25-Jun-2003	St. Marie aux Mine, France	592	1	20	L3–6	S3	W2–3	25.5 ± 1.5	19 ± 3			IfP-1	Br
NWA 4208	25-Jun-2003	St. Marie aux Mine, France	423	1	14	L4/5	S3	W2–3	25	21			IfP-1	Sv
NWA 4209	2004	Morocco	10,100	1	23	H5/6	S3	W3	19.5	17			IfP-1	
NWA 4210	2004	Morocco	2450	1	20	H5/6	S2	W3	19.5	17.5			IfP-1	
NWA 4211	2004	Morocco	3050	1	20	H3–6	S2	W1	18.5 ± 1.5	14.5 ± 3			IfP-1	Br, Sv
NWA 4212	2004	Morocco	2450	1	20	L4–6	S3	W2–3	25	21			IfP-1	Br, Sv
NWA 4213	Dec 2005	Dortmund, Germany	130	1	22	L6	S5	W2–3	24.5	21.5			IfP-1	Sv
NWA 4214	2005	Munich, Germany	410	1	21	H4/5	S1	W4	18	16			IfP-1	
NWA 4218	2005	St. Marie aux Mine, France	5700	1	120	L (IMP)	SkM	W3	23	21			NHMV-1	Fa and Fs for relict olv and pyx. Shock- melted.
NWA 4219	2004		2750	1	20.1	L6	S5	W1	23.8	20			Vernad-1	Ca-rich pyx (Wo_{42} $Fs_{7.7}$). Shock melt, veins ringwoodite
NWA 4220	2004	St. Marie aux Mine, France	18,200	1	167.0	H4	S1	W3	18	16.8			NHMV-1	
NWA 4233	2004		444	1	22.4	IAB							NMH-4	See separate entry
NWA 4234	2003	Hamburg, Germany	145	12	23.4	LL4	S2	W2/3	28.1	17.8			MMH-1	Breccia, Carb. veins
NWA 4235	2004		59	12	11.8	Mes	Min	Min		25.4–27-4			NMH-1	See separate entry
NWA 4236	2003	Hamburg, Germany	24	1	4.9	Acp	Min	Min	19.2	17.0			MMH-1	See separate entry
NWA 4237	2003	Munich, Germany	138	1	36.8	H6	S2	W3	18.4	16.4			MMH-2	
NWA 4238	2003	Munich, Germany	97	1	19.5	L5	S3	W1	24.8				MMH-2	Breccia
NWA 4239	2003	Munich, Germany	55	1	11.8	H3.7	S2	W4	20.5	12.6			MMH-2	Probably paired with NWA 869
NWA 4240	2003	Munich, Germany	45	1	10.7	Ure	S3	Ext	21.3	18.2			MMH-2	See separate entry
NWA 4242	2003	Munich, Germany	95	1	23.1	L5	S3	W1	24.9	21.7			MMH-3	
NWA 4243	2003	Munich, Germany	371	1	25.4	LL6	S3	W3	30.6				MMH-3	Breccia
NWA 4244	2003	Munich, Germany	178	1	29.5	L6	S3	W3	25.1				MMH-3	
NWA 4246	2003	Munich, Germany	4	1	1.3	Ure	S3	Mod	22.0	18.3			MHN-3	See separate entry
NWA 4247	2003	Hamburg, Germany	391	1	22	L5/6	S3	W1	25.0				MMH-2	
NWA 4248	2003	Hamburg, Germany	596	1	21.1	L6	S3	W2	25.3				MMH-2	
NWA 4249	2003	Hamburg, Germany	186	1	20.5	L6	S3	W2	24.9				MMH-2	
NWA 4250	2003	Hamburg, Germany	316	1	21.7	L5	S2	W3	24.0	20.3			MMH-2	

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

Name	Date of recovery or purchase	Place of purchase[a]	Total known mass (g)	No. of pieces	Type specimen mass (g)	Class[b]	Shock stage[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments[e]
NWA 4251	2003	Hamburg, Germany	97	1	21.5	H4	S2	W3	19.5				MMH-2	Breccia
NWA 4252	2003	Hamburg, Germany	216	1	22.6	LL4–5	S3	W1	24.0				MMH-4	Breccia
NWA 4253	2003	Hamburg, Germany	2260	1	23.6	L5–6	S3	W1	24.2	19.4			MMH-4	Breccia
NWA 4254	2003	Hamburg, Germany	227	1	24.4	H5	S2	W4	19.0	16.9			MMH-4	
NWA 4256	Oct-2002		25	1	15.5	L6	S2	W3/4	21	20			MNHN-1	
NWA 4257	Nov-2002		43	1	20.7	H3.9	S2	W3	18 ± 05	16 ± 10			MNHN-1	
NWA 4258	Nov-2002		15	1	10.3	H5	S2	W1	18.5	17.5			MNHN-1	
NWA 4259	Feb-2003		480	1	21.5	LL4–6	S2-3	W4	29 ± 01	25 ± 04			MNHN-1	
NWA 4260	Feb-2003		245	1	20.8	L6	S3	W2	25.5	23			MNHN-1	
NWA 4261	Feb-2003		201	1	22.3	L4–6	S4	W3	25 ± 02	23 ± 04			MNHN-1	
NWA 4262	Feb-2003		550	1	23.4	L4–5	S4	W2	25 ± 01	20 ± 02			MNHN-1	
NWA 4263	Apr-2003		200	1	20.2	L3.9–6	S3	W2	26 ± 06	21 ± 10			MNHN-1	
NWA 4264	Apr-2003		85	1	21	H3.9	S3	W2	17.5 ± 04	15.5 ± 08			MNHN-1	
NWA 4265	Apr-2003		62	1	20.4	L6	S5	W3	24.50	21.50			MNHN-1	
NWA 4266	Apr-2003		50	1	21.2	L3.9	S3	W3	25 ± 3	21 ± 06			MNHN-1	
NWA 4267	June-2003		40	1	19.6	L5	S5	W4	24 ± 02	20 ± 3			MNHN-1	
NWA 4268	June-2003		143	1	20.6	L5	S6	W2	24.5	22.5			MNHN-1	
NWA 4270	Sept-2004		22	1	15.3	L4	S3	W2	24.7	20.2			MNHN-1	
NWA 4273	2005		426	1	21	H5	S4	W4	18	16.5			MNHN-2	
NWA 4274	2005		132	1	20.5	L4–5	S3	W3	24.5	20.5			MNHN-2	
NWA 4275	2005		72	1	19.5	H5	S2	W3	19	17			MNHN-2	
NWA 4276	2005		592	1	20.5	L6	S5	W2	24	20			MNHN-2	
NWA 4277	2005		463	1	20	H5	S2	W3	18.5	16.5			MNHN-2	
NWA 4278	2005		270	1	20.5	L6	S2	W2	25	21			MNHN-2	
NWA 4279	2005		131	1	20	L6	S2	W3	25.5	21.5			MNHN-2	
NWA 4282	2006	Rissani, Morocco	2000	2	218	EL6	S2	W5					NHMV-1	Metal (Si = 1.2 wt%) enstatite ($Fs_{<0.1}Wo_{1.4}$), plag ($An_{15}Or_3$), recrystallized texture, relict chondrules
NWA 4283	2005	Rissani, Morocco	254	1	28	Dio				23.4			NAU-21	See separate entry
NWA 4285	2005	Erfoud, Morocco	48	1	10	Dio	S3	Min		24.5			NAU-21	See separate entry
NWA 4286	2005	Erfoud, Morocco	71	1	14.6	OC (L melt)	S5	Mod	23.6	19.6			NAU-21	See separate entry
NWA 4287	2005	Erfoud, Morocco	364	1	30	Euc	Min	Min		59–63.7			NAU-21	See separate entry
NWA 4289	2005	Erfoud, Morocco	14.7	1	3.7	How							NUA-21	See separate entry
NWA 4290	Mar-2005	Morroco	1101	1	20.45	LL3.10	S3	W3	0.4–40 Av. = 9	0.7–35 Av. = 8.2		3.91	MNHN-3	See separate entry
NWA 4301	Apr-2006	Rabat, Morocco	685	1	22.9	Aung		Mod					UWS-1	See separate entry
NWA 4303	2003	Munich, Germany	1010	1	22.9	L6	S4	W3	25.8	21.7			MNB-2	
NWA 4305	2004	Baden, Austria	157.7	2	22.5	L5	S2	W2	24.1	21.1			MNB-2	
NWA 4306	2004	Baden, Austria	255	1	23.3	H4	S3	W1	18.3	16.7			MNB-2	
NWA 4307	2004	Baden, Austria	309	1	37.7	H4	S2	W3	16.5	6.2–13.8			MNB-2	
NWA 4309	2004	Baden, Austria	102.7	1	23.3	L6	S4	W2/3	24.5	21			MNB-2	
NWA 4310	2004	Baden, Austria	101.7	1	23.5	H5	S3	W2/3	18.4	16.5			MNB-2	
NWA 4311	2004	Baden, Austria	2128	1	34.5	L6	S3	W2	24	20.3			MNB-2	
NWA 4314	2004	Zagorra, Morocco	135	1	23.0	L6	S4	W1	25.3	21.8			MNB-3	Shock veins
NWA 4315	2004	Zagorra, Morocco	141	1	20.6	L6	S4	W3	24.1	21			MNB-3	Shock veins

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

Name	Date of recovery or purchase	Place of purchase[a]	Total known mass (g)	No. of pieces	Type specimen mass (g)	Class[b]	Shock stage[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments[e]
NWA 4316	2004	Zagorra, Morocco	335	1	23.2	L6	S3	W2/3	24.1	21.1			MNB-3	Shock veins
NWA 4317	2004	Zagorra, Morocco	516	1	20.8	L6	S3	W1	23.9	20.5			MNB-3	
NWA 4318	2004	Zagorra, Morocco	215	1	22.1	L6	S6	W2	24.6	20.8			MNB-3	Shock veins and ringwoodite
NWA 4321	2004	Zagorra, Morocco	280	3	22.0	L6	S6	W2/3	24	20.7			MNB-3	Breccia, shock veins, and ringwoodite
NWA 4322	2004	Zagorra, Morocco	257	2	21.4	L6	S6	W3	25.7	22.1			MNB-3	Shock veins and ringwoodite
NWA 4324	2004	Zagorra, Morocco	85	1	18.6	L6	S4	W3	24.9	20.8			MNB-3	Shock veins
NWA 4326	2004	Zagorra, Morocco	170	2	22.0	L6	S4	W1	24.3	21.1			MNB-3	Shock veins
NWA 4327	2004	Zagorra, Morocco	160	1	22.4	H6	S3	W3	18.4	16.4			MNB-3	Shock veins
NWA 4330	2004	Zagorra, Morocco	50	1	12.2	H5	S2	W3	17.1	15.3			MNB-3	
NWA 4332	2004	Zagorra, Morocco	23	1	6	H6	S2	W2	17.8	16			MNB-3	
NWA 4333	2004	Zagorra, Morocco	90	1	19	H6	S2	W1	19	16.8			MNB-3	
NWA 4335	2002	Zagorra, Morocco	380	1	21	H6	S2	W3/4	18.9	16.5			MNB-3	
NWA 4336	2002	Zagorra, Morocco	890	1	21	L6	S4	W1/2	24	20.8			MNB-3	
NWA 4340	2002	Zagorra, Morocco	35	1	8	L6	S2	W2	24.6	20.9			MNB-3	
NWA 4341	2002	Zagorra, Morocco	40	1	8.8	H6	S2	W2	19	16.8			MNB-3	
NWA 4342	2002	Zagorra, Morocco	122	1	21.0	L5	S2	W2/3	24.4	20.4			MNB-3	
NWA 4344	2002	Zagorra, Morocco	4727	1	21.4	L5/6	S3	W2	24.4	21.1			MNB-3	
NWA 4345	2003	Zagorra, Morocco	80	1	17.2	LL4	S2	W2	29.1	23.4			MNB-3	
NWA 4346	2003	Zagorra, Morocco	75	1	15.8	LL5	S4	W1	28.2	23.5			MNB-3	
NWA 4347	2001	Zagorra, Morocco	75	1	16.2	L5	S6	W3/4	23.7	20.4			MNB-3	Shock veins and ringwoodite
NWA 4348	2001	Zagorra, Morocco	90	1	18.6	L6	S6	W2	24.8	21.1			MNB-3	Shock veins and ringwoodite
NWA 4349	2001	Zagorra, Morocco	45	1	9.8	L6	S4	W2	24.7	21.1			MNB-3	
NWA 4350	2002	Zagorra, Morocco	80	1	16.8	L5	S4	W3	23.3	20.7			MNB-3	
NWA 4352	2002	Efround, Morocco	5500	1	21.6	L4/5	S3	W1	23.5	14.5–21.8			MNB-5	
NWA 4355	2004	Taouz, Morocco	962	1	21.9	L6	S4	W2	24.9	21.2			MNB-5	
NWA 4356	2005	Pirmasens, Germany	198.2	1	20.4	L3	S4	W2	14.9–38.1	1.7–27.7			MNB-1	
NWA 4358	2005	Efround, Morocco	40.1	1	8.8	H5	S2	W2/3	18.3	16.1			MNB-1	
NWA 4359	2005	Efround, Morocco	64.1	1	14.5	L5	S2	W1	24.1	20.8			MNB-1	
NWA 4361	2005	Efround, Morocco	254.5	1	23.1	H3	S2	W4	0.2–22.8	7.4–13.2			MNB-1	
NWA 4368	2005	Munich, Germany	388.7	1	21.3	H5	S2	W3	18.2	16.3			MNB-1	
NWA 4369	2005	Munich, Germany	372.6	1	30.4	H6	S2	W0	18.6	16.6			MNB-1	
NWA 4370	2005	Munich, Germany	306.3	1	22.1	H5	S2	W2	18.1	16.1			MNB-1	
NWA 4376	2005	Stuttgart, Germany	437.3	1	39.8	L6	S4	W3	23.4	19.5			MNB-1	
NWA 4381	2004/2005	Toronto, Canada	157	1	25.6	L5	S3	W2	23.8	19.3			MNB-1	
NWA 4382	2004/2005	Toronto, Canada	577	1	46.6	H6	S4	W3	18.4	16.4			MNB-1	
NWA 4383	2004/2005	Toronto, Canada	649	1	24.2	LL6	S4	W1	31.1	25.7			MNB-1	
NWA 4384	2004/2005	Toronto, Canada	132	1	25.9	L5	S3	W1	24.2	20.4			MNB-1	
NWA 4385	2004/2005	Toronto, Canada	637	1	20.4	H5	S4	W3	18.6	17.1			MNB-1	
NWA 4386	2004/2005	Toronto, Canada	626	1	42.9	H5/6	S4	W2	18.7	16.3			MNB-1	
NWA 4387	2004/2005	Toronto, Canada	245	1	72.1	L6	S4	W2	24	20.3			MNB-1	
NWA 4388	2004/2005	Toronto, Canada	642	1	42.8	H6	S3	W3	19.6	17.2			MNB-1	
NWA 4390	2005	Midelt, Morocco	1170	1	22.1	L4	S2	W3	24.1	10.6–22.7			MNB-4	
NWA 4393	2005	Erfoud, Morocco	28	1	7.3	H5/6	S2	W3	19.9	16.7			MNB-4	

Table 2. *Continued.* Officially recognized meteorites from Northwest Africa.

Name	Date of recovery or purchase	Place of purchase[a]	Total known mass (g)	No. of pieces	Type specimen mass (g)	Class[b]	Shock stage[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments[e]
NWA 4394	2004	Tagounite, Morocco	701	1	20	L3	S2	W3	7.8–29.5	2.5–23.6			MNB-4	
NWA 4461	Feb-2005	Eastern Morocco	111.1	1	20.6	L6	S3	W3	22.6 ± 0.3				UCLA-5	Samples purchased from D. Bessey Feb 2005
NWA 4462	Feb-2006	Eastern Morocco	206.16	1	26.6	L6	S2	W2	24.2 ± 0.2				UCLA-5	Samples purchased from D. Bessey Feb 2006
NWA 4463	03-Dec-2005	Dortmund, Germany	152	1	21	H6	S3	W3	20	18			IfP-1	Breccia, clast IMB
NWA 4466	29-Jan-2006	Tucson, Arizona, USA	71.25	3	14.5	CV3		Min					UAriz-2	See separate entry
NWA 4468	2006	Laâyoune, Morocco	675	1	20.2	Martian		Min					UWS-1	See separate entry
NWA 4472	Jul-2006	Tagounite, Morocco	64.3	1	12.87	Lunar							UWS-1	See separate entry
NWA 4476	Oct-2005	Erfoud, Morocco	533	1	25.3	CV3							UAriz-3	See separate entry
NWA 4477	02-Feb-2006	Tucson, Arizona, USA	122.25	2	21.3	L3–7	S3	W1					UAriz-4	See separate entry
NWA 4485	Sept-2006	Quarzazate, Morocco	188	1	20.0	Lunar							UWS-3	See separate entry
NWA 4487	2005	Erfoud, Morocco	29,000	1	23	H5	S2	W3	18.4	16.4			NAU-22	
NWA 4488	2005	Erfoud, Morocco	19,740	Many	40.5	L4	S3	W2	16.7–28.5				NAU-6	
NWA 4489	2005	Erfoud, Morocco	84	2	14	H4	S2	W2	19.3	16.4			NAU-6	
NWA 4492	2005	Rissani, Morocco	27,000	Many	31.7	L4	S4	W2	25.1	21.1			NAU-1	Maskelynite-bearing
NWA 4493	2005	Rissani, Morocco	56,000	3	45.2	LL5	S3	W2	28.5	23.5			NAU-6	
NWA 4496	2006	Rissani, Morocco	19	1	4.1	Euc		Min		59.7–61.0			NAU-19	See separate entry
NWA 4497	2005	Erfoud, Morocco	483	1	23	LL3.2	S2	W2	7.1–35	15.4–34.2			NAU-22	
NWA 4518	2003	Morocco	167	1	21.3	Aung	S1	Min	32				Vernad-2	See separate entry

[a]For place of purchase: if nothing is listed, no information was provided by submitter.

[b]For class (which refers to classification): Acp = acapulcoite; Ang = angrite; Aung = achondrite, ungrouped; Bra = brachinite; Dio = diogenite; Euc = eucrite; How = howardite; Imr = impact-melt rock; Mes = mesosiderite; Pra = primitive achondrite; Ure = ureilite.

[c]Shock stage: Min = minimal; Mod = moderate; Ext = extensive.

[d]For WG (which refers to weathering grade): Min = minimal; Mod = moderate; Ext = extensive.

[e]For comments: Br = brecciated; Calc. = calcite; Calc. v. = calcite veins; IMG = impact melt clast; Skm = shock melt; Sv = shock veins.
All meteorites are find and purchased unless otherwise stated.

Table 3. Officially recognized meteorites from countries within the Americas.

Name	Abbre-viation	Location of recovery	Date of recovery	Country	Latitude	Longitude	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Info	Comments or other measurements made
North America																	
USA																	
Bouse		Desert wash	20-Mar-2004	USA	33°58′N	114°04′W	147.4	20.0	3	L4–6	S1–4	W1	22.1 ± 5.0	17.1 ± 4.6	0.8 ± 0.6	ASU-1	Genomict breccia
Buck Mountains 003	BM 003	Upland pediment	25-Oct-2005	USA	34°44.07′N	114°13.03′W	34,200.0	40.5	1	L6	S4	W3	25.0 ± 0.7	21.2	1.2	CML-3	
Chicago Valley		Desert pavement	27-Dec-2004	USA	36°00.13′N	116°11.78′W	26.0	5.2	1	L5	S1	W3	24.8 ± 0.3	20.9 ± 0.3	1.5 ± 0.2	ASU-2	
Cordes		Desert wash	02-Jan-1998	USA	34°18.2′N	112°9.97′W	54.5	45.8	1	H4	S1–3	W1	18.4 ± 0.3	16.2 ± 0.3	1.2 ± 0.1	ASU-3	
Coyote Spring		Ablation surface	08-Aug-2005	USA	36°59.62′N	114°59.62′W	240.0	38.5	1	H5	S3	W1	19.2 ± 0.2	17.0 ± 0.3	1.6 ± 0.1	ASU-2	
Crow Peak		Field	July-1958	USA	44°28.64′N	103°58.32′W	6320.0	6272.0	1	Iron (IIAB)							See separate entry
Diablo Pass		Desert ridge	20-Dec-2004	USA	33°39.809′N	114°17.524′W	246.6	20.9	16	L6	S3	W3	25.0 ± 0.2	20.5 ± 0.4	1.5 ± 0.2	ASU-4	
Lorenzo		Field	1941	USA	41°02′N	102°53′W	611.9	581.1	1	L5	S1	W3	24.6 ± 0.2	20.8 ± 0.4		ASU-5	
Lucerne Valley 051	LV 051	Dry lake	15-Nov-2003	USA	34°31.5′N	116°57.2′W	6.0	2.8	1	L5	S2	W5	24.7 ± 0.3			UCLA-2	Possibly paired to LV 013, 014, 016
Octave Mine		Desert ridge	25-Dec-2004	USA	34°07.937′N	112°42.135′W	1304.2	22.3	3	H5	S1	W3	18.4 ± 0.2	15.9 ± 0.4	1.4 ± 0.2	ASU-6	
Paymaster Mine		Desert, base of hill	10-Oct-2004	USA	33°11.2′N	114°55.07′W	159.0	21.5	5	L5	S4	W2	25.0 ± 0.6	21.0 ± 0.6	1.6 ± 0.2	ASU-7	
Quartzsite		Desert wash	01-Jan-2002	USA	33°40.851′N	114°11.748′W	69.7	16.1	1	L4	S4	W2	24.3 ± 0.7	20.4 ± 0.6	1.1 ± 0.1	ASU-4	
Randsburg		Silty sand	02-Jan-2005	USA	35°24.03′N	117°39.97′W	112.9	23.6	1	L5	S2	W1	25.3 ± 0.8	22.0 ± 1.8	1.6 ± 0.3	UAriz-1	
Starvation Flat		Desert pavement	04-Apr-2002	USA	36°47.07′N	114°56.98′W	1250.0	22.1	4	L5	S3	W2	25.0 ± 0.4	21.0 ± 0.4	1.5 ± 0.2	ASU-2	
Superior Valley 026	SuV 026	Dry lake	27-May-2006	USA	35°14.175′N	117°2.783′W	15.8	3.9	1	L4	S2	W3	24.5 ± 0.2	20.7	1.8	UCLA-3	
Tungsten Mountain 113	TM 113	Dry lake	08-Aug-2004	USA	39°40.75′N	117°37.605′W	4.5	0.9	1	H4/5	S2	W1/2	19.3 ± 0.3	16.8 ± 0.8	1.2 ± 0.1	Barto-1	
South America																	
Argentina																	
Río Cuarto 001				Argen-tina	32°52.3″S	64°13.4″WW	62.7	50.7	1	Euc						ICL-1	See separate entry
Brazil																	
Santa Vitorio do Palmar			2003	Brazil	33°30′56″S	53°24′65″W	5910.0	20.0	2	L3							

[a]For class (which refers to classification): Euc = eucrite.

Table 4. A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
Cumulus Hills					
CMS 04001	L5	406.2	C		
CMS 04002	LL6	219.7	A		
CMS 04003	LL6	461.3	B		
CMS 04006	LL5	185.4	B		
CMS 04007	LL5	100.5	B		
CMS 04008	LL5	167.4	A/B		
CMS 04009	L5	183.3	B/C		
CMS 04010	LL5	184.5	B		
CMS 04011	LL5	118.7	A/B		
CMS 04012	LL5	145.9	A/B		
CMS 04013	L5	203.6	C		
CMS 04014	LL5	138.2	B		
CMS 04015	LL5	121.5	A/B		
CMS 04016	L3	162.1	C	1–26	5–12
CMS 04017	LL5	56.5	B		
CMS 04018	LL5	167.4	B		
CMS 04019	H6	134.9	C		
CMS 04021	Meso	61.3	A/B		28–32
CMS 04040	L5	30.4	C		
CMS 04041	LL5	20.7	B		
CMS 04042	LL5	14.6	A		
CMS 04043	L6	28.6	C		
CMS 04044	Ure	20.2	CE	10–23	19
CMS 04045	L6	31.6	C		
CMS 04046	L5	9	C		
CMS 04047	LL5	49.5	A/B	31	25
CMS 04048	Ure	30.3	C	3–23	19
CMS 04049	Euc (unbrecciated)	90.2	B		28–59
CMS 04058	LL6	1006.1	A	30	25
CMS 04061	Pal	8465	B/C		
CMS 04062	Pal	15,315	B/C		
CMS 04063	Pal	6188.3	B/C		
CMS 04064	Pal	19,195	B/C		
CMS 04065	Pal	5738	B/C		
CMS 04066	Pal	5877	B/C		
CMS 04067	Pal	7561.9	B/C		
CMS 04068	Pal	20,425	B/C		
CMS 04069	Pal	44,700	B/C		
CMS 04070	Pal	3515.8	B/C		
CMS 04071	Pal	2110.1	B/C	12	
CMS 04072	Pal	2312.9	B/C		
CMS 04073	Pal	928.2	B/C		
CMS 04074	Pal	325.7	B/C		
CMS 04075	Pal	9.6	B/C		
CMS 04076	Pal	8.3	B/C		
CMS 04077	Pal	9625	B/C		
CMS 04078	Pal	5695.2	B/C		
CMS 04079	Pal	12,550	B/C		
Dominion Range					
DOM 03180	H5	219.9	C		
DOM 03181	L3	5363.9	B/C	1–37	1–5
DOM 03185	LL5	928	A/B		
DOM 03186	L5	1494.2	B/C		
DOM 03187	LL5	845.6	B/C		
DOM 03188	L5	701.4	C		
DOM 03189	L5	1005.4	C		
DOM 03190	L5	504	C		
DOM 03191	H5	594.4	C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
DOM 03192	L5	227.4	B/C		
DOM 03193	H5	298.7	C		
DOM 03194	LL5	213.1	A		
DOM 03195	LL6	225.9	A		
DOM 03196	LL6	142.3	A		
DOM 03197	LL5	188.6	A		
DOM 03198	LL5	261.8	B		
DOM 03199	H5	143.9	B		
DOM 03200	L5	147.8	C		
DOM 03201	L3	114.6	C	2–31	3–27
DOM 03202	L5	116.3	B/C		
DOM 03203	L5	116.2	B/C		
DOM 03204	L5	93.2	C		
DOM 03205	H5	67.6	C		
DOM 03206	H4	70.2	C		
DOM 03207	H5	65.7	C		
DOM 03208	LL5	110.5	A		
DOM 03209	H5	78.8	C		
DOM 03210	L5	45.8	B/C		
DOM 03211	L5	79.9	B/C		
DOM 03212	L5	47	B/C		
DOM 03213	LL5	50.3	A/B		
DOM 03214	H5	44.4	C		
DOM 03215	H5	17.3	C		
DOM 03216	H5	15.5	C		
DOM 03217	LL5	28.8	A/B	29	24
DOM 03218	H5	25.1	C		
DOM 03219	H3	36.7	B	8–35	8–19
DOM 03220	H6	45.1	B		
DOM 03221	H5	53.9	C		
DOM 03222	H6	26.4	C		
DOM 03223	LL4	7.8	C		
DOM 03224	L5	8.1	A/B		
DOM 03225	L5	11.6	B		
DOM 03226	L5	4.2	A/B		
DOM 03227	LL5	3.7	B	31	26
DOM 03228	LL5	5	A/B		
DOM 03229	L5	3.1	A/B		
DOM 03230	LL5	3.3	B	31	25
DOM 03231	LL6	3.8	A		
DOM 03232	L4	5.9	C		
DOM 03233	L5	4.6	C		
DOM 03234	L5	17	B		
DOM 03235	H4	28.7	C		
DOM 03236	H5	21	C		
DOM 03237	H6	83.1	C		
DOM 03238	CO3	54.2	B	1–55	1
DOM 03239	L6	69.5	B/C		
DOM 03240	LL5	290.9	A		
DOM 03241	LL6	95	B/C		
DOM 03242	H5	67.2	C		
DOM 03243	H5	136.9	C		
DOM 03244	LL5	91.3	B		
DOM 03245	LL5	262.4	B/C		
DOM 03246	L5	73.1	B/C		
DOM 03247	H5	104.6	C		
DOM 03248	LL5	90	A		
DOM 03249	LL5	20.5	A/B		
DOM 03250	LL5	604.3	A		
DOM 03251	LL5	674.8	B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
DOM 03252	H6	404.4	B	19	16
DOM 03253	H5	1201.4	C		
DOM 03254	LL5	548.4	A		
DOM 03255	L5	433.9	B		
DOM 03256	L5	323.6	C		
DOM 03257	LL5	341	A/B		
DOM 03258	LL5	393.8	B		
DOM 03259	LL6	395.9	A/B		
DOM 03263	LL6	95.3	A/B		
DOM 03264	L5	83.3	B		
DOM 03265	LL5	72.2	A/B		
DOM 03266	L5	72.1	A/B		
DOM 03267	LL5	72.5	A/B		
DOM 03268	LL5	49.6	B		
DOM 03269	LL5	61.8	A/B		
DOM 03290	L5	13.1	A/B		
DOM 03291	L5	42.6	C		
DOM 03292	H5	52.2	C		
DOM 03293	LL5	34.1	B		
DOM 03294	L5	31.3	B/C		
DOM 03295	L5	20.6	B/C		
DOM 03296	L5	42.8	B		
DOM 03297	LL6	11	B		
DOM 03298	L6	9.9	C		
DOM 03299	L5	18.2	C		
DOM 03300	L5	21.4	B		
DOM 03301	L5	15.7	B		
DOM 03302	L5	13.1	B/C		
DOM 03303	LL5	21.3	B		
DOM 03304	L5	13	B		
DOM 03305	LL5	26.4	C		
DOM 03306	H4	21	B/C		
DOM 03307	L5	14.5	B/C		
DOM 03308	LL5	37.6	B		
DOM 03309	H5	38.2	C		
DOM 03318	H5	2964.7	B/CE		
DOM 03319	L5	3449.7	B/C		
DOM 03320	L5	2176.7	B/C		
Grosvenor Mountains					
GRO 03001	L5	29,000	C		
GRO 03002	L5	28,000	C		
GRO 03007	L5	3850	CE		
GRO 03013	L5	1035	C		
GRO 03014	L5	1110	C		
GRO 03015	L3	480	BE	1–29	3–29
GRO 03016	L5	955	CE		
GRO 03017	LL5	310	BE		
GRO 03019	L5	1243	C		
GRO 03020	L5	555	C		
GRO 03021	L5	607.9	B/C		
GRO 03022	H5	653.5	B/C		
GRO 03023	L5	882	B/C		
GRO 03024	L5	642.7	B/CE		
GRO 03025	L5	595	C		
GRO 03027	L5	585	C		
GRO 03028	L5	475	C		
GRO 03029	L5	520.2	B/CE		
GRO 03031	L5	772.8	B/C		
GRO 03032	H5	389.1	B/C		
GRO 03033	L5	334.1	B/C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
GRO 03035	L5	358.4	B/C		
GRO 03036	L5	338.7	B/C		
GRO 03037	L5	532.1	B		
GRO 03038	L5	391.9	B/C		
GRO 03039	L5	386.9	B/CE		
GRO 03050	L5	275	C		
GRO 03051	H5	182	C		
GRO 03052	LL5	295	B		
GRO 03053	H5	280	C		
GRO 03054	LL5	340	B		
GRO 03060	L5	520	C		
GRO 03061	L3	455	B	1–29	3–21
GRO 03062	L5	440	C		
GRO 03063	L4	245	A/B		
GRO 03070	LL5	353	A/B		
GRO 03071	L5	261.9	B/C		
GRO 03072	L5	158.6	B/C		
GRO 03073	L5	146.3	B/C		
GRO 03074	LL5	268.5	A/B		
GRO 03080	L5	177.7	B/C		
GRO 03081	L5	212.2	B/C		
GRO 03082	L5	174.5	B/C		
GRO 03083	LL5	131.4	B/C		
GRO 03084	L4	184.7	B		
GRO 03085	LL5	155.1	A/B		
GRO 03086	H4	131.7	A/B	20	7–17
GRO 03087	L4	135.8	B/C		
GRO 03088	L5	139.4	B		
GRO 03089	H5	189.5	B/C		
GRO 03090	L5	177.6	B/C		
GRO 03091	L5	238.6	B/C		
GRO 03092	L5	139.2	B/C		
GRO 03093	L5	183.7	B/C		
GRO 03094	LL5	128	B/C		
GRO 03095	H6	140.3	C		
GRO 03096	L5	135.9	C		
GRO 03097	L5	123	C		
GRO 03098	L5	117.1	C		
GRO 03099	H5	245.1	C		
GRO 03100	L5	91.6	B/C		
GRO 03101	L5	95.2	B/C		
GRO 03102	L5	113.8	B/C		
GRO 03103	H5	207.6	B/CE		
GRO 03104	H5	142.2	B/CE		
GRO 03105	LL6	122.7	C		
GRO 03106	L5	142.4	C		
GRO 03107	LL6	73.8	C		
GRO 03108	L4	61	B		
GRO 03109	L5	78.6	C		
GRO 03111	L5	88	B/C		
GRO 03112	L5	103.2	B/C		
GRO 03113	LL5	100.9	C		
GRO 03114	H5	93	C		
GRO 03120	H5	102.7	B/C		
GRO 03121	H5	82.9	B/C		
GRO 03122	L5	48.9	B/C		
GRO 03123	L5	86.3	B/C		
GRO 03124	L5	84.1	A/B		
GRO 03125	L5	69.6	A/B		
GRO 03126	L5	55.9	A/B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
GRO 03127	L5	64.1	A/B		
GRO 03128	H5	70.9	B/C		
GRO 03129	L5	52.2	B/C		
GRO 03130	L5	74.2	A		
GRO 03131	LL5	67.5	A/B		
GRO 03132	L5	69.5	A/B		
GRO 03133	LL5	114.8	A/B		
GRO 03134	LL5	69.4	B		
GRO 03135	LL5	49.6	A		
GRO 03136	LL5	65.4	B		
GRO 03137	LL6	45.6	A		
GRO 03138	L5	61	C		
GRO 03139	LL5	49	B/C		
GRO 03140	LL5	37.6	A/B		
GRO 03141	LL5	26.6	B		
GRO 03142	LL5	26.3	B		
GRO 03143	LL6	20	B		
GRO 03144	LL5	6.3	B		
GRO 03145	L5	5	B		
GRO 03146	LL6	5.3	B		
GRO 03147	LL5	26.6	B		
GRO 03148	L4	0.9	A/B		
GRO 03149	LL5	14.5	B		
GRO 03150	LL4	40.7	A		
GRO 03151	LL5	32	A/B		
GRO 03152	LL5	37.9	B		
GRO 03153	L5	10.8	B/C		
GRO 03154	LL5	21.1	B		
GRO 03155	LL5	9.7	B		
GRO 03156	LL5	21.4	B		
GRO 03157	LL4	3.1	B		
GRO 03158	LL5	32.9	B		
GRO 03159	LL5	10	B/C		
GRO 03160	L5	23.7	B/C		
GRO 03161	LL5	0.8	B/C		
GRO 03162	L5	14.7	B/C		
GRO 03163	L5	5.7	B/C		
GRO 03164	LL5	13	A		
GRO 03165	L5	31.9	C		
GRO 03166	L5	6.4	B/C		
GRO 03167	LL6	32.5	A/B		
GRO 03168	L5	16.8	B/C		
GRO 03169	LL6	1.3	B/C		
GRO 03170	LL5	1.1	B		
LaPaz Icefield					
LAP 03550	L5	16,000	B		
LAP 03553	H4	6422.7	B	24	10–18
LAP 03787	LL5	71.4	BE		
LAP 03788	L (IM)	8.3	A/BE	23	19
LAP 03800	LL5	1.3	B/C		
LAP 03801	H5	0.5	A/B		
LAP 03802	H5	3.5	C		
LAP 03803	L5	12.3	B		
LAP 03804	LL5	9.5	B		
LAP 03805	H6	1.8	C		
LAP 03806	H5	1.5	B/C		
LAP 03807	L5	2.5	C		
LAP 03808	H6	4.2	C		
LAP 03809	L5	5	CE		
LAP 03810	LL6	2.9	A/B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 03811	L5	1.5	B/C		
LAP 03812	L5	2	C		
LAP 03813	LL5	4.4	B/C		
LAP 03814	L5	3.3	C		
LAP 03815	LL6	3.9	B/C		
LAP 03816	H5	8	C		
LAP 03817	L5	6.4	C		
LAP 03818	L5	8.5	C		
LAP 03819	LL5	6.2	B/C		
LAP 03820	H5	1.6	C		
LAP 03821	L5	6.4	C		
LAP 03823	LL5	0.5	C		
LAP 03825	LL6	6.4	B		
LAP 03826	L5	3.2	A/B		
LAP 03827	LL6	2.1	A/B		
LAP 03828	LL5	1.1	B		
LAP 03829	L5	1.5	C		
LAP 03830	LL5	11.7	A/B		
LAP 03831	H6	21.1	B/C		
LAP 03832	H6	18.9	B/C		
LAP 03833	LL5	28.5	B/C		
LAP 03834	CK3	5.8	B/C	4–42	11–20
LAP 03835	H5	17.5	B/C		
LAP 03836	LL5	32	A/B		
LAP 03837	LL5	7.2	A/B		
LAP 03838	H6	23.7	B/C		
LAP 03839	H6	6.8	B/C		
LAP 03840	LL6	5.9	B		
LAP 03841	LL6	9.7	B		
LAP 03842	L5	9	B/C		
LAP 03843	LL6	19.9	B		
LAP 03844	L5	35.6	B		
LAP 03845	H5	10.2	C		
LAP 03846	LL5	14	B		
LAP 03847	LL5	13.4	B		
LAP 03848	LL5	14.3	B		
LAP 03849	LL5	13.2	B		
LAP 03850	L5	0.4	B		
LAP 03851	LL6	0.4	B	30	24
LAP 03852	LL5	0.4	B		
LAP 03853	LL5	1.2	B		
LAP 03854	LL5	2.4	C		
LAP 03855	H5	0.8	B		
LAP 03856	LL5	1.9	A/B		
LAP 03857	H6	0.5	B		
LAP 03858	H5	1.6	B/C		
LAP 03859	LL5	6.5	B/C		
LAP 03860	LL4	6.3	B		
LAP 03861	LL5	6.4	B		
LAP 03862	LL5	9.6	A/B		
LAP 03863	LL5	6.4	C		
LAP 03864	L5	8	C		
LAP 03865	CM2	19.2	C	0–54	
LAP 03866	LL5	10.2	B		
LAP 03867	LL5	23	A/B		
LAP 03868	LL5	24.9	A		
LAP 03869	LL5	15.3	B/C		
LAP 03870	L5	15.7	C		
LAP 03871	LL5	11.9	B/C		
LAP 03872	L5	16.2	C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 03873	LL5	38.4	B/C		
LAP 03874	LL5	14.3	C		
LAP 03875	LL6	13.3	B/C		
LAP 03876	LL5	5	B/C		
LAP 03877	H6	15.5	C		
LAP 03878	LL5	17.6	A		
LAP 03879	LL5	23.1	B		
LAP 03880	LL6	4.1	B/C		
LAP 03881	H5	6.3	C		
LAP 03882	H5	0.8	C		
LAP 03883	L5	0.9	B/C		
LAP 03884	L5	3.7	B		
LAP 03885	H5	0.2	C		
LAP 03886	L5	3.8	B/C		
LAP 03887	L5	1.2	B/C		
LAP 03888	H5	2.6	C		
LAP 03889	LL5	0.8	B/C		
LAP 03890	L6	1.6	C		
LAP 03891	H6	1.3	C		
LAP 03892	LL5	4.1	C		
LAP 03893	LL5	4.2	C		
LAP 03894	H6	3.5	C		
LAP 03895	H5	3.6	C		
LAP 03896	LL6	0.7	A/B		
LAP 03897	LL5	7.1	C		
LAP 03898	LL5	6.4	C		
LAP 03899	H6	4.2	C		
LAP 03910	L5	4.1	B/C		
LAP 03911	L5	5.9	B/C		
LAP 03912	L5	0.8	B		
LAP 03913	L5	4.8	C		
LAP 03914	LL6	5	A		
LAP 03915	LL5	4.4	C		
LAP 03916	Iron (ungr.)	0.6	B		
LAP 03917	L5	9.3	C		
LAP 03918	L5	6.1	C		
LAP 03919	L5	4.2	C		
LAP 03920	H5	17.6	B		
LAP 03921	H5	25.5	C		
LAP 03922	H (IM)	16	C	19	17
LAP 03923	CK5	20.6	A/B	31	25
LAP 03924	LL5	12.4	A/B		
LAP 03925	L5	13.7	B		
LAP 03926	LL5	17.9	B		
LAP 03927	L5	9.3	C		
LAP 03928	LL5	23.3	A/B		
LAP 03929	LL5	33.2	B		
LAP 03930	EL3	8.8	B/C		0–17
LAP 03931	LL6	4.2	A/B		
LAP 03932	L5	1	B/C		
LAP 03933	L5	9.4	B/C		
LAP 03934	H6	0.8	B/C		
LAP 03935	L5	4	B/C		
LAP 03936	LL6	10.4	A/B		
LAP 03937	L5	3.5	B/C		
LAP 03938	L5	4.3	B/C		
LAP 03939	LL5	2	A/B		
LAP 03940	LL6	22.5	B		
LAP 03941	L5	0.3	B/C		
LAP 03942	L5	8.6	B/C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 03943	H5	11.4	CE		
LAP 03944	LL5	5.1	BE		
LAP 03945	LL6	6.1	B		
LAP 03946	LL5	11.2	B		
LAP 03947	H5	3.3	A/B		
LAP 03948	LL6	12.5	A/B		
LAP 03949	L5	3.7	C		
LAP 03951	LL6	7.4	C	30	25
LAP 03952	H5	9.1	C		
LAP 03953	LL5	22.6	A		
LAP 03954	H5	37.1	C	19	17
LAP 03955	H5	6	C		
LAP 03956	LL6	3	B		
LAP 03957	LL5	4.4	A		
LAP 03958	LL5	5.6	C		
LAP 03959	LL5	3.7	C		
LAP 03960	LL5	20.9	B/C		
LAP 03961	LL5	19.4	A/B		
LAP 03962	L5	36.7	B		
LAP 03963	LL5	22.8	B		
LAP 03964	LL5	22.4	A/B		
LAP 03965	H4	17.6	B/C	19	7–21
LAP 03966	LL5	9.8	B/C		
LAP 03967	LL5	1	B/C		
LAP 03968	LL5	7.2	B/C		
LAP 03969	LL5	0.2	B/C		
LAP 03970	L5	24.3	B/C		
LAP 03971	L5	5.1	A/B		
LAP 03972	L5	0.6	A/B		
LAP 03973	H5	4.8	B/C		
LAP 03974	L5	5.7	B/C		
LAP 03975	LL5	3.1	A/B		
LAP 03976	L5	6.5	B/C		
LAP 03977	L5	4.2	B/C		
LAP 03978	LL5	12.9	A/B		
LAP 03980	LL6	16.1	B/C		
LAP 03981	L6	45.4	B/C		
LAP 03982	H5	24.5	C		
LAP 03983	H5	25.5	C		
LAP 03984	H5	7.4	C		
LAP 03985	L5	0.8	B/C		
LAP 03986	LL5	4.1	B		
LAP 03987	H5	4.2	C		
LAP 03988	H5	4.5	C		
LAP 03989	L5	8.9	B/C		
LAP 03990	L5	18.7	C		
LAP 03992	L5	32.3	C		
LAP 03993	LL6	13.4	B		
LAP 03994	LL4	26.5	B		
LAP 03995	LL6	27.5	B		
LAP 03996	L5	14.1	C		
LAP 03997	H5	38.4	C		
LAP 03998	LL5	12.3	B		
LAP 03999	LL5	8.1	B		
LAP 031001	LL6	37.5	B		
LAP 031002	LL5	4.4	A		
LAP 031003	LL5	9.6	A		
LAP 031004	H6	6.5	C		
LAP 031005	L5	8.6	B/C		
LAP 031006	LL5	19	A/B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 031007	H5	8	C		
LAP 031008	LL6	5.2	B		
LAP 031009	LL6	31.7	B		
LAP 031010	LL5	11.5	B		
LAP 031011	L5	25.2	B/C		
LAP 031012	L5	18.6	B/C		
LAP 031013	LL5	7.8	B		
LAP 031014	L5	7.6	B		
LAP 031015	LL5	10.4	B/C		
LAP 031016	L5	14.7	B		
LAP 031017	H4	3.1	C	18	16
LAP 031018	L5	5.7	B		
LAP 031019	LL6	2.3	B		
LAP 031020	LL5	5	B		
LAP 031021	LL5	8.5	A/B		
LAP 031022	CM2	4.2	B	1–12	1
LAP 031023	L5	11	B/C		
LAP 031024	L5	3.8	C		
LAP 031025	LL5	11.2	B/C		
LAP 031026	LL5	5.2	B/C		
LAP 031027	LL5	1.8	B		
LAP 031028	L5	3.8	C		
LAP 031029	L5	6.9	C		
LAP 031030	L6	6.2	B		
LAP 031031	L5	1.8	C		
LAP 031032	H5	2.7	C		
LAP 031033	H5	3.8	C		
LAP 031034	LL5	0.4	A/B		
LAP 031035	H6	1.2	B		
LAP 031036	H5	1.6	C		
LAP 031038	LL5	0.5	A/B		
LAP 031039	L5	2.7	B		
LAP 031040	H5	21.3	C		
LAP 031041	L5	28.2	C		
LAP 031042	LL5	3.9	A		
LAP 031044	L5	4.9	C		
LAP 031045	LL5	16.6	B		
LAP 031048	LL5	5.3	A/B		
LAP 031049	LL5	7.8	B/C		
LAP 031050	H6	30.5	B/C		
LAP 031051	LL5	5.2	A/B		
LAP 031052	LL5	16.6	A/B		
LAP 031053	L5	5.9	A/B		
LAP 031054	L5	9.5	B/C		
LAP 031055	LL5	3.5	B/C		
LAP 031056	LL5	4.4	A/B		
LAP 031057	H6	7.6	B/C		
LAP 031058	LL5	16.9	B/C		
LAP 031059	LL5	16.9	B/C		
LAP 031060	H5	16.1	C		
LAP 031061	L5	15.8	C		
LAP 031063	LL5	14.5	C		
LAP 031064	LL6	21.7	C	30	25
LAP 031065	L5	4.3	C		
LAP 031066	LL6	9.3	C		
LAP 031067	LL5	21.6	B		
LAP 031068	LL5	4.3	C		
LAP 031069	L5	4.8	B		
LAP 031070	L5	0.1	B		
LAP 031071	LL5	2.2	C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 031072	H6	0.8	B/C		
LAP 031073	LL6	2.8	A/B		
LAP 031074	L5	0.8	B		
LAP 031075	L5	5.4	C		
LAP 031076	L5	7.3	C		
LAP 031077	L5	1.5	A/B		
LAP 031078	L5	4	B/C	25	21
LAP 031080	LL5	2.2	B		
LAP 031081	LL6	1.4	A/B		
LAP 031082	LL6	2	A		
LAP 031083	LL5	1.3	B		
LAP 031084	L5	2.9	B		
LAP 031085	LL5	4.4	B		
LAP 031086	L5	1.7	C		
LAP 031087	LL5	0.3	B		
LAP 031088	L5	6.3	B/C		
LAP 031089	LL5	0.3	A/B		
LAP 031090	L5	0.8	B/C		
LAP 031091	H5	1.6	C		
LAP 031092	H5	1.9	C		
LAP 031093	LL6	6.7	C		
LAP 031094	H5	4.7	C		
LAP 031095	L5	5	C		
LAP 031096	LL4	1.7	A/B		
LAP 031097	H3	2.1	B	6–37	8–22
LAP 031098	H5	1.5	B/C		
LAP 031099	LL6	3.1	B/C		
LAP 031100	LL5	18.2	B/C		
LAP 031101	H5	15.5	C		
LAP 031102	LL5	17.8	B/C		
LAP 031103	LL5	21	B/C		
LAP 031104	L5	3.3	B/C		
LAP 031105	LL5	14	B		
LAP 031106	L6	17.8	C		
LAP 031107	L5	28.5	B/C		
LAP 031108	L5	8.9	B/C		
LAP 031110	H6	0.8	B		
LAP 031111	L5	1.9	B/C		
LAP 031112	L5	5.8	B/C		
LAP 031114	LL5	2.6	A		
LAP 031115	H5	9.3	B/C		
LAP 031116	L5	3.2	B/C		
LAP 031118	LL6	1.4	A/B		
LAP 031119	L5	5.5	B/C		
LAP 031130	H5	0.9	B/C		
LAP 031131	L5	4.2	C		
LAP 031132	L5	3.8	C		
LAP 031133	L5	4.3	C		
LAP 031134	L5	3.5	C		
LAP 031135	R	2.7	A	40	21–30
LAP 031136	L5	2.2	C		
LAP 031137	L5	9.1	C		
LAP 031138	H5	5.8	C		
LAP 031139	L5	3.4	C		
LAP 031141	H5	0.3	B		
LAP 031143	LL5	0.2	B		
LAP 031145	LL5	1	B		
LAP 031150	LL5	0.8	A		
LAP 031151	LL5	2.6	A		
LAP 031152	L5	35.7	B/C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 031153	L5	11.6	B/C		
LAP 031154	H5	2.2	C		
LAP 031155	LL5	21.8	C		
LAP 031156	R	14.7	B	38	31
LAP 031157	H5	2.2	A/B		
LAP 031158	CK5	4.4	B	27	
LAP 031159	LL5	8.5	A/B		
LAP 031170	H5	3.2	C		
LAP 031171	LL6	1.8	B/C		
LAP 031172	LL6	1.6	B/C		
LAP 031173	H (IM)	1.4	C	19	17
LAP 031174	H5	1.9	C		
LAP 031175	L5	2.2	C		
LAP 031176	LL5	1.5	B		
LAP 031177	H5	2.8	C		
LAP 031178	LL5	3	C		
LAP 031179	L5	6.2	C		
LAP 031180	L5	5.2	B/C		
LAP 031181	L5	11.2	B/C		
LAP 031182	L5	7.2	C		
LAP 031183	L5	10.3	C		
LAP 031184	LL5	1.7	A/B		
LAP 031185	LL5	3.5	B/C		
LAP 031186	LL5	15.2	B/C		
LAP 031187	LL5	3	C		
LAP 031188	H5	8.4	C		
LAP 031189	LL5	11.2	C		
LAP 031210	LL5	16.9	A/B		
LAP 031211	H5	6	B/C		
LAP 031212	L5	21.9	B/C		
LAP 031213	LL5	28.3	A/B		
LAP 031214	CM1/2	9.5	B	1–41	
LAP 031215	L5	10.4	B		
LAP 031216	LL5	6.3	B		
LAP 031217	L4	16.3	B/C		
LAP 031218	LL6	10.1	A		
LAP 031219	H5	10.2	C		
LAP 031240	H5	1.5	BE		
LAP 031241	LL5	3.7	B		
LAP 031242	H5	10.9	C		
LAP 031243	L5	9.5	B		
LAP 031244	LL6	10.8	A/B		
LAP 031245	L6	3.3	B		
LAP 031246	L5	4.6	C		
LAP 031247	L5	2.6	C		
LAP 031248	H4	7.4	C	19	3–18
LAP 031249	H5	7.1	C		
LAP 031251	L5	0.2	B		
LAP 031255	LL5	0.3	B		
LAP 031256	H5	0.5	B		
LAP 031279	H5	0.5	B		
LAP 031280	Euc (brecciated)	17.8	B		60
LAP 031281	LL5	13	A/B		
LAP 031282	LL5	7.2	A/B		
LAP 031283	H5	2.3	C		
LAP 031284	H5	6.2	C		
LAP 031285	L5	22.8	B/C		
LAP 031286	LL6	2.6	A/B		
LAP 031287	LL5	0.4	A/B		
LAP 031288	L5	2.8	C		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
LAP 031289	LL6	2	A/B		
LAP 031320	L5	0.3	C		
LAP 031322	H5	4.7	C		
LAP 031323	Acap	3.1	C	13	12
LAP 031324	L5	2.4	C		
LAP 031325	L6	0.3	B/C		
LAP 031326	L5	2.5	C		
LAP 031327	LL5	2.6	A		
LAP 031328	L5	1	C		
LAP 031329	L5	1	C		
LAP 031390	L5	1.8	B		
LAP 031396	H5	1.1	B		
LAP 031397	H5	0.2	B		
LAP 04531	Fusion crust	0	B		
LAP 04532	H6	0.1	B		
LAP 04533	H5	0.5	B		
LAP 04534	L5	0.1	B		
LAP 04535	H5	0.6	B		
LAP 04536	H5	1.2	B		
LAP 04537	H5	0.6	B		
LAP 04538	L5	0.4	B		
LAP 04539	LL5	0.6	B		
LAP 04640	L5	0.9	B		
LAP 04641	L5	0.8	B		
LAP 04642	H (IM)	1.2	B	19	17
LAP 04643	L5	0.7	B		
LAP 04644	Fusion crust	0.6	B		
LAP 04645	LL5	0.3	B		
LAP 04646	H6	0.6	B		
LAP 04647	L5	0.4	B		
LAP 04648	H6	1.4	B		
LAP 04649	L5	0.3	B		
LAP 04840	R	50.4	A/B	38	30
LAP 04842	LL6	59.7	B	30	25
LAP 04843	CV3	108.6	B/CE	1–46	1
LAP 04844	Dio	6.8	B		23
Larkman Nunatak					
LAR 04315	Ure (anomalous)	1164.8	B/C	2–19	
LAR 04316	Aub	1163	A	2	0–2
LAR 04317	CK4	10.4	B	31–32	
LAR 04318	CK4	53.3	A/B	29–30	
LAR 04319	CM2	1.7	A/B	0–27	
MacAlpine Hills					
MAC 04862	L5	0.7	B		
MAC 04863	L5	1	B		
MAC 04864	L5	0.4	B		
MAC 04865	H4	0.5	B	20	18
MAC 04866	L5	1.2	B		
MAC 04867	L5	0.6	B		
MAC 04868	L5	0.4	B		
MAC 04870	H5	0.6	B		
MAC 04871	H4	0.7	B	20	16–24
MAC 04872	L5	0.3	B		
MAC 04874	L5	0.2	B		
MAC 04876	H5	0.2	B	19	16
MAC 04877	L5	0.4	B		
MAC 04880	H5	0.9	B		
MAC 04881	L5	1.4	B		
MAC 04882	L4	2	B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
MAC 04883	L5	1.1	B		
MAC 04884	L4	0.3	B		
MAC 04885	L5	0.5	B		
MAC 04886	L4	0.6	B		
MAC 04887	LL5	1.9	B		
MAC 04888	H5	1.1	B		
MAC 04889	H5	0.5	B		
MAC 04900	LL6	17.7	B	30	25
MAC 04903	L5	0.4	B		
MAC 04904	L5	1	B		
MAC 04905	L5	0.2	B		
MAC 04906	L4	0.5	B		
MAC 04907	L5	0.7	B		
MAC 04908	L5	0.2	B		
MAC 04909	L5	0.3	B		
MAC 04911	H5	0.8	B		
MAC 04912	H5	1.3	B		
MAC 04915	H5	0.4	B		
MAC 04918	L5	0.8	B		
MAC 04919	L5	0.4	B		
MAC 04930	H3	0.9	B	2–24	3–12
MAC 04931	H5	0.3	B		
MAC 04932	L5	0.2	B		
MAC 04933	L5	0.3	B		
MAC 04934	L5	0.4	B		
MAC 04935	L5	0.4	B		
MAC 04936	L5	0.7	B		
MAC 04937	L5	0.8	B		
MAC 04938	H5	1.5	B		
MAC 04939	H5	0.7	B		
MAC 04940	H4	0.7	B		
MAC 04941	H5	0.4	B		
MAC 04946	L5	0.7	B		
MAC 04947	L5	0.2	B		
MAC 04948	L4	0.6	B		
MAC 04955	H4	0.4	B		
MAC 04956	H5	0.6	B		
MAC 04957	H5	0.3	B		
MAC 04958	H5	0.7	B		
MAC 04959	H5	0.5	B		
MAC 04960	H5	0.3	B		
MAC 04961	H	0.1	B		
MAC 04962	H5	0.2	B		
MAC 04963	H5	0.6	B		
MAC 04964	H5	0.6	B		
MAC 04965	L5	0.9	B		
MAC 04966	L5	1.3	B		
MAC 04968	H6	0.5	B		
MAC 04970	L5	0.6	B		
MAC 04972	H5	0.3	B		
MAC 04973	L5	0.7	B		
MAC 04974	L5	0.2	B		
MAC 04977	L5	1.1	B		
MAC 04978	L5	0.2	B		
MAC 04979	L5	0.4	B		
MAC 04980	H5	0.6	B		
MAC 04981	H5	0.2	B		
MAC 04982	L5	1.4	B		
MAC 04983	LL5	0.2	B		
MAC 04984	H5	0.1	B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
MAC 04985	L5	0.8	B		
MAC 04986	H5	0.2	B		
MAC 04987	L5	0.6	B		
MAC 04988	H5	0.2	B		
MAC 04989	L5	0.6	B		
MAC 041027	L5	0.6	B		
MAC 041030	H5	0.3	B		
MAC 041031	L5	0.6	B		
MAC 041032	L5	0.6	B		
MAC 041033	L5	0.5	B		
MAC 041034	L5	0.4	B		
MAC 041035	L5	0.9	B		
MAC 041036	L5	0.7	B		
MAC 041037	H5	0.6	B		
MAC 041038	L5	1.3	B		
MAC 041039	H5	1.1	B		
MAC 041075	H5	0.6	B		
MAC 041076	L5	1.3	B		
MAC 041077	L5	1.2	B		
MAC 041078	H5	0.7	B		
MAC 041079	L5	0.9	B		
MAC 041080	L5	0.7	B		
MAC 041081	L5	1.3	B		
MAC 041082	L5	0.7	B		
MAC 041083	L5	1.1	B		
MAC 041084	L5	1.2	B		
MAC 041097	L5	1.3	B		
MAC 041100	L5	0.9	B		
MAC 041101	H5	0.6	B		
MAC 041102	L5	0.7	B		
MAC 041103	H5	0.7	B		
MAC 041104	L5	1	B		
MAC 041105	L5	0.2	B		
MAC 041106	L5	0.7	B		
MAC 041107	L5	0.6	B		
MAC 041108	L5	0.5	B		
MAC 041109	L5	0.4	B		
MAC 041110	L5	0.7	B		
MAC 041111	L5	0.9	B		
MAC 041112	L5	0.6	B		
MAC 041113	L5	0.2	B		
MAC 041114	L5	1	B		
MAC 041115	L5	1.3	B		
MAC 041116	L5	1.3	B		
MAC 041117	LL5	0.5	B		
MAC 041118	L5	0.3	B		
MAC 041119	H5	0.5	B		
MAC 041164	L5	1.2	B		
MAC 041169	Euc (unbrecciated)	3.2	B		57–64
MAC 041269	How	4.5	B		56
Miller Range					
MIL 03330	L5	8709.8	C		
MIL 03360	L5	517.6	B/C		
MIL 03361	H5	424.1	C		
MIL 03362	LL5	400.2	BE		
MIL 03363	H5	565.7	C		
MIL 03364	LL5	277.6	A/B		
MIL 03400	LL5	3.2	B		

Table 4. *Continued.* A list of meteorites recovered from the 2003 and 2004 ANSMET expeditions.

Sample no.	Class[a]	Mass (g)	WG[b]	Fa (mol%)	Fs (mol%)
MIL 03401	LL6	5.5	B		
MIL 03402	H5	5.2	C		
MIL 03403	LL5	11.7	A		
MIL 03404	LL6	30.4	B		
MIL 03405	LL6	4.9	B		
MIL 03406	LL5	16	B		
MIL 03407	LL6	8	A/B		
MIL 03408	L5	1.4	C		
MIL 03409	L5	5.9	BE		
MIL 03410	H5	24.6	C		
MIL 03411	H5	14.6	C		
MIL 03412	H5	26.5	C		
MIL 03413	L4	4	CE		
MIL 03414	H5	58.5	C		
MIL 03415	H6	3.5	C		
MIL 03416	LL6	3.5	B		
MIL 03417	LL5	3.5	B		
MIL 03418	LL5	24.3	B		
MIL 03419	LL6	15.1	A/B		
Sandford Cliffs					
SAN 03451	H5	2863.9	C		
SAN 03452	LL5	1026.5	A/B		
SAN 03453	LL5	2400	CE		
SAN 03455	L5	1242.1	B		
SAN 03456	L5	1373.7	B		
SAN 03458	LL6	780.7	B		
SAN 03459	LL6	701.9	B		
SAN 03460	LL5	488.7	B		
SAN 03461	L6	328.8	C		
SAN 03462	L5	321.2	B/CE		
SAN 03463	LL5	464.7	B		
SAN 03468	LL5	192.3	C		
SAN 03469	LL5	214.9	C		
SAN 03490	L5	52.6	B/C		
SAN 03491	L5	165.8	B/CE		
SAN 03492	L5	60.5	A/B		
SAN 03493	LL6	64.2	A/B		
SAN 03494	H5	167.4	B/C		
SAN 03495	L5	114.5	B/C		
SAN 03496	LL5	93.3	A/B		
SAN 03497	LL5	108.3	B/C		
SAN 03498	H5	64.4	B/C		
SAN 03499	LL5	152.2	BE	29	24

[a]For class (which refers to classification): Acp = acapulcoite; Ang = angrite; Aung = achondrite, ungrouped; Bra = brachinite; Dio = diogenite; Euc = eucrite; Fusion crust = fusion crust chondrite; How = howardite; Im = impact melt; Imr = impact-melt rock; Mes = mesosiderite; Pal = pallasite; Pra = primitive achondrite; Ure = ureilite.

[b]WG = weathering grade.

Table 5. Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
India																
Bhawad	Rajasthan, India	06-June-2002	26°30′30″	73°06′55″	678	678	1	LL6							PRL-1	See separate entry
Mongolia																
Baruun Urt	Baruun Urt, Mongolia	2002	46°42.00′	113°17.00′	25.9	5.2	1	H5	S2	W2	17.9	16.1			MNB-4	
Oman																
Al Huqf																
AH 050		23-Dec-2002	19°36.185′	57°01.999′	1066.2	1066.2	1	H4	S1/2	W2	18.6	17.3	1.4		Bern2	
AH 051		13-Jan-2003	19°48.151′	57°19.282′	402.8	402.8	14	L6	S4	W4	25.7	22.8	1.5		Bern5	
Dhofar																
Dho 962		05-Jan-2000	19°09′19.7″	54°33′19.8″	63.5	14.75	1	H4	S2	W5	18.7				NAU-23	
Dho 969		06-Jan-2000	19°18′00.8″	54°51′30.4″	737.4	24.33	1	H5	S3	W3	18.6 ± 0.2				UCLA-4	
Dho 971		06-Jan-2000	19°22′10.1″	54°50′17.8″	108.3	22.8	2	L4	S3	W4	22.9				NAU-23	
Dho 973		06-Jan-2000	19°16′05.9″	54°50′49.0″	423.5	26.4	1	H4	S2	W3	17.8 ± 0.3				UCLA-4	
Dho 975		06-Jan-2000	19°13′09.8″	54°55′06.9″	4230	32.56	5	L4	S2	W5	25.2 ± 0.3				UCLA-4	
Dho 985		09-Jan-2000	19°13′29.2″	54°55′23.4″	153.9	23.89	1	LL6	S3	W3	27.8				NAU-23	Breccia
Dho 987		10-Jan-2000	19°13′53.0″	54°55′24.0″	69.3	15.53	1	H4	S2	W4	17.8 ± 0.2				UCLA-4	
Dho 995		19-Feb-2003	19°8.412′	54°40.885′	243.2	19.9	1	H5		W4	18.4–18.8	16.1–17.3			Barto-2	
Dho 1086		17-Feb-2004	19°19.834′	54°47.543′	4.7	1.3	1	L6	S2	W1/2	24.9–25.5	21.0–21.4		4.64	Barto-3	
Dho 1087		17-Feb-2004	19°19.959′	54°47.624′	3.4	0.7	1	L5		W4				4.66	Barto-4	
Dho 1088		20-Feb-2004	18°09.218′	54°06.337′	470	21.0	6	L6		W4				4.56	Barto-3	
Dho 1180		01-Jan-2005	18°54′52″	54°20′42″	115.2	20.6	1	Lunar							NAU-24	See separate entry
Dho 1400		24-Nov-1999	19°11.700′	54°35.756′	315.5	20.5	1	L6	S3	W2	25.2	21			MNB-6	
Dho 1401		16-Jan-2001	19°11.481′	54°39.327′	42.03	8.4	1	LL6		W1–2				4.12	Barto-5	
Dho 1402		18-Jan-2001	19°4.938′	54°46.702′	8.94	1.8	1	L6		W2				4.42	Barto-5	Melt rock
Dho 1403		12-Jan-2001	19°8.617′	54°52.986′	93.05	18.6	1	L 5		W4				4.43	Barto-5	Prob. paired w/ Dho 612
Dho 1404		15-Jan-2001	10°12.183′	54°47.097′	67.48	13.9	1	L6		W4–5				4.48	Barto-5	
Dho 1405		18-Jan-2001	19°4.291′	54°46.403′	11.53	2.3	1	L6		W4–5				4.57	Barto-5	
Dho 1406		14-Jan-2001	19°9.327′	54°42.835′	42.46	8.5	1	L6		W4				4.62	Barto-5	
Dho 1407		18-Jan-2001	19°4.027′	54°46.726′	27.64	5.5	1	L6		W2–3				4.66	Barto-5	Melt rock
Dho 1408		12-Jan-2001	19°8.532′	54°52.834′	81.93	16.4	1	L5		W4–5				4.66	Barto-5	Prob. paired w/ Dho 612
Dho 1409		12-Jan-2001	19°8.487′	54°52.728′	128.96	20.0	1	L5		W3–4				4.67	Barto-5	Prob. paired w/ Dho 612
Dho 1410		14-Jan-2001	19°9.537′	54°42.298′	30.45	6.1	1	L6		W4				4.67	Barto-5	
Dho 1411		18-Jan-2001	19°4.371′	54°46.661′	12.09	2.4	1	L5		W4–5				4.68	Barto-5	
Dho 1412		17-Jan-2001	19°6.825′	54°49.347′	38.13	7.6	1	L6		W4–5				4.68	Barto-5	
Dho 1413		20-Jan-2001	19°8.441′	54°40.469′	40.2	8.0	1	L6		W4–5				4.69	Barto-5	
Dho 1414		16-Jan-2001	19°11.686′	54°39.427′	45.59	9.1	1	L6		W4–5				4.71	Barto-5	
Dho 1415		16-Jan-2001	19°11.384′	54°39.108′	61.4	12.3	1	L5		W2–3				4.72	Barto-5	Melt pools
Dho 1416		18-Jan-2001	19°6.672′	54°36.914′	49.74	10.0	1	L6		W4				4.73	Barto-5	Prob. paired w/ Dho 634
Dho 1417		18-Jan-2001	19°6.441′	54°36.776′	5.52	1.1	1	L5		W4–5				4.73	Barto-5	Prob. paired w/ Dho 634
Dho 1418		12-Jan-2001	19°8.329′	54°52.791′	78.44	15.7	1	L6		W3–4				4.74	Barto-5	
Dho 1419		20-Jan-2001	19°8.292′	54°40.469′	47.14	9.4	1	L6		W3				4.78	Barto-5	
Dho 1420		13-Jan-2001	19°9.321′	54°42.835′	81.81	16.4	1	L5		W3				4.79	Barto-5	
Dho 1421		14-Jan-2001	19°9.435′	54°42.991′	110.8	20.0	4	H5		W3				4.81	Barto-5	
Dho 1422		19-Jan-2001	19°11.764′	54°52.817′	35.22	7.0	1	H5		W2–3				4.82	Barto-5	
Dho 1423		16-Jan-2001	19°11.824′	54°40.218′	53.58	10.7	2	L6		W4–5				4.83	Barto-5	
Dho 1424		16-Jan-2001	19°11.601′	54°39.837′	53.39	10.7	1	H6		W3				4.89	Barto-5	
Dho 1425		15-Jan-2001	19°12.046′	54°47.102′	106.63	20.0	1	H6		W2–3				5.01	Barto-5	

Table 5. *Continued.* Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
Dho 1426		14-Jan-2001	19°10.38′	54°42.244′	42,850	20.0	1	H5		W2				5.16	Barto-5	Melt veins
Dho 1428		Mar-2006	18°53.44′	54°20.36′	213	20.7	1	Lunar							NAU-5	See separate entry
Jiddat al Harasis																
JaH 074		07-Jan-2004	19°14′38.9″	55°02′09.5″	118.1	25.86	2	LL4	S3	W1	27.4 ± 0.4				UCLA-4	
JaH 110		15-Feb-2004	19°45.424′	56°40.072′	263	21.5	1	L5		W3				4.59	Barto-6	
JaH 111		11-Nov-2004	19°39.624′	56°57.703′	4235	29.8	151	L/LL 4		W4	25.0–26.8	20.8–21.4		4.31	Barto-2	$En_{43.646.6}Wo_{40.6–45.5}$ / $An_{10.7–10.9}Or_{5.3–7.2}$
JaH 112		21-Feb-2004	19°38.848′	55°44.998′	38.5	8.0	1	L 5		W4				4.59	Barto-3	
JaH 113		19-Feb-2004	19°40.396′	55°44.533′	411	21.9	1	H/L4		W2				4.90	Barto-7	Impact-melt rich
JaH 114		16-Feb-2004	19°46.051′	55°42.35′	112.8	24.3	1	H 4		W4				4.83	Barto-3	
JaH 115		20-Feb-2004	19°44.527′	55°43.192′	442	20.1	1	L6		W2				4.58	Barto-6	Impact melt
JaH 116		21-Feb-2004	19°38.927′	55°45.315′	32.5	8.2	1	L6		W4				4.55	Barto-7	
JaH 117		16-Feb-2004	19°38.764′	55°45.675′	10.8	2.1	1	H5		W4				4.72	Barto-7	
JaH 118		26-Jun-1905	19°47.83′	56°43.17′	1802	34.1	3	LL6		W3/4				4.02	Barto-8	
JaH 119		15-Feb-2004	19°46.473′	56°43.445′	1000	20.1	1	L6		W4				4.52	Barto-11	
JaH 200		23-Dec-2002	19°58.714′	56°29.274′	175.5	175.5	1	L6	S4	W4	25.4	21.3	1.5		Bern2	
JaH 201		24-Dec-2002	19°57.944′	56°26.534′	929.4	929.4	1	L4	S1	W3	24.7	19.3	1.9		Bern3	
JaH 202		24-Dec-2002	19°59.052′	56°25.624′	355.1	355.1	1	Meso	S1						Bern3	Paired with JaH 203
JaH 204		25-Dec-2002	19°59.152′	56°24.485′	155.9	155.9	1	Meso	S1						Bern3	Paired with JaH 203
JaH 205		27-Dec-2002	19°59.197′	56°25.037′	502.2	502.2	3	Meso	S1						Bern4	Paired with JaH 203
JaH 206		27-Dec-2002	19°59.229′	56°25.062′	1185.5	1185.5	8	Meso	S1						Bern4	Paired with JaH 203
JaH 207		27-Dec-2002	19°59.250′	56°25.003′	19.4	19.4	1	Meso	S1						Bern4	Paired with JaH 203
JaH 208		27-Dec-2002	19°59.202′	56°25.114′	492.3	492.3	1	Meso	S1						Bern4	Paired with JaH 203
JaH 209		27-Dec-2002	19°59.197′	56°25.106′	98.4	98.4	1	Meso	S1						Bern4	Paired with JaH 203
JaH 210		27-Dec-2002	19°58.884′	56°25.095′	368.8	368.8	1	Meso	S1						Bern4	Paired with JaH 203
JaH 211		27-Dec-2002	19°57.666′	56°25.724′	325.3	325.3	1	H4	S2	W3	18.7	16.8	1.0; cpx		Bern4	Cpx
JaH 212		13-Jan-2003	19°51.474′	56°59.984′	2711.0	2711.0	1	L4	S2	W3	22.4	18.9	1.5		Bern5	
JaH 213		13-Jan-2003	19°45.044′	56°57.991′	3563.0	3563.0	1	L6	S2	W3	25.5	23.5	1.6		Bern5	
JaH 214		09-Feb-2005	19°57.958′	56°26.819′	459.1	459.1	1	H5	S3	W1–2	19.0	17.2	1.5		Bern6	
JaH 215		09-Feb-2005	19°56.306′	56°25.345′	121.3	121.3	1	H5	S2	W3	17.8	16.1	1.7		Bern6	
JaH 216		09-Feb-2005	19°56.375′	56°24.884′	5.50	5.50	1	L5–6	S3	W2	24.6	20.5	1.7		Bern6	
JaH 217		09-Feb-2005	19°57.782′	56°28.700′	9.36	9.36	1	H4	S3	W4	18.6	16.8	1.1		Bern6	
JaH 218		10-Feb-2005	19°42.204′	56°38.548′	2927.0	2927.0	1	L5	S2	W3	24.8	20.7	1.8		Bern6	
JaH 219		10-Feb-2005	19°42.263′	56°38.546′	376.9	376.9	1	L4–5	S2	W3	24.9	20.6	1.9		Bern6	Paired with JaH 218
JaH 220		10-Feb-2005	19°42.269′	56°38.568′	1350.6	1350.6	1	L4–5	S2	W3	24.9	20.6	1.7		Bern6	Paired with JaH 218
JaH 221		10-Feb-2005	19°45.386′	56°33.123′	4012	4012	1	L5	S2	W3	24.8	20.8	1.7		Bern6	
JaH 222		10-Feb-2005	19°45.787′	56°33.484′	314.6	314.6	1	L4–5	S2	W4	24.9	20.9	1.8		Bern6	Paired with JaH 218
JaH 223		10-Feb-2005	19°49.354′	56°39.541′	1691.5	1691.5	1	H5	S4	W3	19.2	17.1	1.3		Bern6	
JaH 224		10-Feb-2005	19°49.540′	56°39.929′	487.7	487.7	1	H5	S4	W3	19.9	17.8	1.3		Bern6	Paired with JaH 223
JaH 225		13-Feb-2005	19°58.547′	56°25.382′	64.7	64.7	1	Meso	S1	–	–	–			Bern6	Paired with JaH 203
JaH 226		13-Feb-2005	19°58.496′	56°25.614′	308.7	308.7	1	Meso	S1	–	–	–			Bern6	Paired with JaH 203
JaH 227		14-Feb-2005	19°37.524′	56°53.319′	640.8	640.8	1	H4	S1	W3–4	17.9	16.1	1.1		Bern6	
JaH 228		13-Feb-2005	19°58.802′	56°23.076′	4.97	4.97	1	H4–5	S3	W3	17.9	15.9	1.0		Bern6	
JaH 229		14-Feb-2005	19°42.348′	56°36.465′	5135	5135	1	L5	S1	W3	25.0	20.6	1.9		Bern6	Paired with JaH 091
JaH 230		14-Feb-2005	19°42.762′	56°34.966′	77,000	77,000	42	L5	S1	W4	25.2	20.8	1.8		Bern6	Paired with JaH 091
JaH 231		18-Feb-2005	19°56.222′	56°21.481′	14.3	14.3	1	L4	S3	W4	26.9	20.8	1.6		Bern6	Pigeonite
JaH 232		22-Feb-2005	19°59.205′	56°23.386′	17.5	17.5	1	L6	S1	W3	24.1	20.4	1.6		Bern6	
JaH 233		18-Feb-2005	19°59.993′	56°24.899′	735.8	735.8	1	Meso	–	–	–	–			Bern6	Paired with JaH 203
JaH 234		18-Feb-2005	19°59.835′	56°23.434′	116.6	116.6	1	R5	S4	–	37.7	–			Bern6	Cpx, paired w/ RaS 201
JaH 235		22-Feb-2005	19°58.269′	56°23.884′	13.1	13.1	1	H4	S2	W2	17.6	16.0	1.2		Bern8	
JaH 236		22-Feb-2005	19°58.217′	56°23.895′	0.54	0.54	1	R5	S4	–	38.8	–			Bern8	Cpx, paired w/ RaS 201

Table 5. *Continued.* Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
JaH 237		22-Feb-2005	19°58.822′	56°25.047′	3.89	3.89	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 238		22-Feb-2005	19°58.784′	56°24.843′	298	298	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 240		22-Feb-2005	19°59.131′	56°24.926′	603.9	603.9	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 241		22-Feb-2005	19°59.128′	56°25.039′	38.7	38.7	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 242		22-Feb-2005	19°57.697′	56°25.428′	225.3	225.3	1	H4	S1	W2	18.0	15.9	1.1		Bern8	
JaH 243		22-Feb-2005	19°57.571′	56°25.318′	61	61	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 244		23-Feb-2005	19°58.420′	56°25.896′	63.5	63.5	1	H4	S3	W2	18.0	16.6	1.3		Bern8	
JaH 245		23-Feb-2005	19°58.573′	56°25.600′	16.2	16.2	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 246		23-Feb-2005	19°58.605′	56°25.573′	234.1	234.1	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 247		23-Feb-2005	19°58.625′	56°25.544′	42.9	42.9	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 248		23-Feb-2005	19°58.458′	56°25.241′	5.02	5.02	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 250		23-Feb-2005	19°58.602′	56°25.208′	106.1	106.1	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 251		23-Feb-2005	19°58.622′	56°25.191′	60.5	60.5	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 252		23-Feb-2005	19°58.724′	56°25.062′	56.5	56.5	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 253		23-Feb-2005	19°58.871′	56°24.995′	106.6	106.6	1	Meso	–	–	–	–			Bern8	Paired with JaH 203
JaH 254		24-Feb-2005	19°59.488′	56°20.712′	1918.0	1918.0	57	H5	S2	W3	19.0	17.4	1.6		Bern8	
JaH 255		25-Feb-2005	19°59.005′	56°19.447′	140.2	140.2	1	H5	S2	W4	17.6	15.8	1.6		Bern8	
JaH 256		25-Feb-2005	19°59.458′	56°20.581′	3040.5	3040.5	2	H5	S2	W3	19.1	16.4	1.4		Bern8	
JaH 257		25-Feb-2005	19°59.461′	56°28.837′	331.9	331.9	2	H4–5	S2	W3	17.4	16.1	1.0; br		Bern8	Br
JaH 258		25-Feb-2005	19°59.458′	56°29.000′	421.9	421.9	6	H4–5	S2	W2	17.7	16.1	1.2		Bern8	
JaH 259		25-Feb-2005	19°59.328′	56°28.654′	20.3	20.3	1	H4	S2	W4–5	19.0	16.7	1.1		Bern8	
JaH 260		26-Feb-2005	19°59.430′	56°24.038′	175.0	175.0	1	H5	S2	W4	18.3	17.0	1.4		Bern8	
JaH 261		26-Feb-2005	19°59.840′	56°32.112′	81.1	81.1	1	H6	S3	W3	19.9	17.5	2.2; cpx		Bern8	Cpx
JaH 262		26-Feb-2005	19°59.792′	56°31.566′	410.31	410.31	1	H5	S2	W2	17.9	15.9	1.4		Bern8	Prob. paired w/ JaH 260
JaH 263		26-Feb-2005	19°59.821′	56°30.727′	1212.5	1212.5	1	H5	S1	W3	18.0	15.8	1.1		Bern8	Prob. paired w/ JaH 260
JaH 264		27-Feb-2005	19°58.839′	56°28.119′	419.8	419.8	2	H4–5	S1	W3	17.5	14.9	0.6		Bern8	
JaH 265		28-Feb-2005	19°58.059′	56°28.779′	886.3	886.3	2	L6	S2	W3	25.4	21.5	2.3		Bern8	
JaH 266		28-Feb-2005	19°58.417′	56°25.180′	150.1	150.1	2	Meso	S1	–	–	–			Bern8	Paired with JaH 203
JaH 267		04-Mar-2005	19°59.982′	56°24.665′	16,006	16,006	200	Meso	S1	–	–	26.2			Bern8	Plg $An_{90.2}Or_{0.04}$, paired with JaH 203
JaH 268		05-Mar-2005	19°58.808′	56°21.482′	26.0	26.0	1	L6	S4	W4	25.2	20.7	1.6		Bern8	
JaH 269		05-Mar-2005	19°58.963′	56°24.409′	62.7	62.7	1	H4	S2	W2	17.9	15.9	1.1		Bern8	
JaH 270		05-Mar-2005	19°58.161′	56°34.970′	69.5	69.5	4	H5	S1	W4	18.2	16.0	1.7		Bern8	
JaH 271		05-Mar-2005	19°59.950′	56°24.592′	25.9	25.9	1	H5	S3	W3	18.6	17.4	1.7		Bern8	
JaH 272		06-Mar-2005	19°55.839′	56°05.032′	942.1	942.1	1	H4	S2	W3	17.2	15.6	1.6		Bern8	
JaH 273		06-Mar-2005	19°56.918′	56°01.890′	199.0	199.0	1	L6	S4	W3	24.4	21.0	1.5		Bern8	
JaH 274		06-Mar-2005	19°58.567′	55°57.290′	2738.5	2738.5	5	H4/6	S3/4	W3	18.9	17.5	1.1; br		Bern8	
JaH 275		06-Mar-2005	19°58.510′	55°57.241′	304.9	304.9	14	H4–5	S3	W4	18.8	16.3	1.4		Bern8	Paired with JaH 274
JaH 276		06-Mar-2005	19°58.760′	55°57.304′	1798.9	1798.9	4	H4/6	S3	W3	18.0	16.9	1.4		Bern8	Paired with JaH 274
JaH 277		06-Mar-2005	19°58.791′	55°57.392′	58.8	58.8	2	H4/6	S3	W4	19.0	17.3	1.2		Bern8	Paired with JaH 274
JaH 278		06-Mar-2005	19°58.780′	55°57.387′	707.4	707.4	1	H4/6	S2	W3	18.4	16.7	1.4		Bern8	Br, paired with JaH 274
JaH 279		06-Mar-2005	19°58.382′	55°57.168′	7494.2	7494.2	20	L6	S3	W3	24.8	20.6	1.3		Bern8	
JaH 280		06-Mar-2005	19°58.487′	55°57.235′	533.3	533.3	31	H4	S2	W4	18.3	16.8	1.2		Bern8	
JaH 281		07-Mar-2005	19°44.261′	56°06.652′	97.5	97.5	3	H5–6	S2	W3	19.2	16.9	1.3		Bern9	
JaH 282		07-Mar-2005	19°38.830′	56°13.070′	54.5	54.5	4	H4/6	S2	W4	18.9	17.4	1.4		Bern9	
JaH 283		07-Mar-2005	19°41.103′	56°08.769′	627.1	627.1	1	L5	S3	W2	24.0	21.5	1.4		Bern9	
JaH 283		07-Mar-2005	19°41.277′	56°08.634′	696.8	696.8	1	L5	S3	W2					Bern9	Paired with JaH 283 (fitting piece)
JaH 284		15-Mar-2005	19°44.914′	56°40.783′	5448.4	5448.4	3	H4	S1	W4	17.0	15.3	1.1		Bern10	
JaH 285		15-Mar-2005	19°35.259′	56°27.286′	235.5	235.5	1	H4–5	S2	W4	17.8	16.1	1.3		Bern10	
JaH 286		15-Mar-2005	19°42.718′	56°28.050′	551.4	551.4	1	H4–5	S2	W3	18.9	16.9	1.1		Bern10	

Table 5. *Continued.* Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
JaH 287		15-Mar-2005	19°46.869′	56°28.586′	192.8	192.8	1	L5	S2	W3	24.4	20.3	1.8		Bern10	
JaH 288		15-Mar-2005	19°46.926′	56°28.591′	2623.0	2623.0	1	L5	S2	W3	24.6	20.6	1.9		Bern10	Paired with JaH 091
JaH 289		15-Mar-2005	19°54.382′	56°29.616′	2519.3	2519.3	1	L6	S2	W2	24.6	20.7	1.4		Bern10	
JaH 290		15-Mar-2005	19°47.866′	56°28.561′	671.2	671.2	1	L5	S2	W4	24.9	20.7	1.8		Bern10	Paired with JaH 091
JaH 291		15-Mar-2005	19°47.052′	56°28.727′	923.0	923.0	1	L5	S2	W2–3	24.9	20.9	2.0		Bern10	Paired with JaH 091
JaH 292		15-Mar-2005	19°47.351′	56°28.814′	985.2	985.2	1	L5	S2	W2–3	24.9	20.5	1.8		Bern10	Paired with JaH 091
JaH 293		16-Mar-2005	19°47.618′	56°28.756′	8420.0	8420.0	1	L5	S2	W4	24.9	20.3	1.8		Bern10	Paired with JaH 091
JaH 294		16-Mar-2005	19°47.751′	56°28.660′	504.0	504.0	1	L5	S2	W3	25.2	21.2	1.8		Bern10	Paired with JaH 091
JaH 295		16-Mar-2005	19°48.090′	56°28.057′	4820.0	4820.0	6	L5	S2	W4	25.3	20.7	1.7		Bern10	Paired with JaH 091
JaH 296		16-Mar-2005	19°47.990′	56°28.030′	294.4	294.4	1	L5	S2	W3	24.6	20.4	1.8		Bern10	Paired with JaH 091
JaH 297		16-Mar-2005	19°48.115′	56°27.738′	643.3	643.3	1	L5	S2–3	W4	24.9	20.9	1.7		Bern10	Paired with JaH 091
JaH 298		16-Mar-2005	19°48.115′	56°27.730′	313.1	313.1	36	L5	S2	W4	24.9	20.8	1.7		Bern10	Paired with JaH 091
JaH 299		16-Mar-2005	19°48.878′	56°26.911′	159.6	159.6	1	L5	S2	W3	24.4	20.8	1.9		Bern10	Paired with JaH 091
JaH 300		16-Mar-2005	19°49.193′	56°26.746′	208.3	208.3	1	L5	S2	W2–3	24.5	20.7	1.8		Bern10	Paired with JaH 091
JaH 301		16-Mar-2005	19°49.197′	56°26.777′	181.6	181.6	1	L5	S2	W4	24.6	21.0	1.7		Bern10	Paired with JaH 091
JaH 302		16-Mar-2005	19°49.703′	56°26.546′	288.5	288.5	1	L5	S2	W3	24.6	20.9	1.8		Bern10	Paired with JaH 091
JaH 303		16-Mar-2005	19°53.801′	56°19.861′	60.2	60.2	1	L5	S2	W3	25.1	20.6	1.7		Bern10	Paired with JaH 091
JaH 304		16-Mar-2005	19°53.475′	56°19.855′	39.5	39.5	1	L5	S2	W3	25.0	20.8	1.8		Bern10	Paired with JaH 091
JaH 305		16-Mar-2005	19°53.021′	56°20.380′	47.0	47.0	1	L5	S2	W3	25.0	21.3	1.8		Bern10	Paired with JaH 091
JaH 306		16-Mar-2005	19°53.512′	56°19.828′	49.8	49.8	1	L5	S2	W4	24.7	20.2	1.7		Bern10	Paired with JaH 091
JaH 307		17-Mar-2005	19°53.491′	56°19.712′	220.3	220.3	1	L5	S2	W2	19.6	17.3	1.6		Bern10	Paired with JaH 091
JaH 308		18-Mar-2005	19°40.030′	55°43.260′	620.9	620.9	1	L6	S4	W2	25.1	23.0	1.6		Bern10	Paired with JaH 073
JaH 309		19-Mar-2005	19°40.399′	55°42.487′	43.9	43.9	4	L6	S4	W3	25.0	21.4	1.8		Bern10	Cpx, paired with JaH 073
JaH 310		19-Mar-2005	19°42.657′	55°42.884′	3034.5	3034.5	2	L6	S4	W3	24.0	21.0	1.7		Bern10	Paired with JaH 073
JaH 311		19-Mar-2005	19°44.545′	55°42.054′	378.7	378.7	1	H4	S1	W4	18.3	16.4	1.4		Bern10	
JaH 312		19-Mar-2005	19°43.141′	55°42.255′	3489.0	3489.0	1	L6	S4	W2	23.9	19.9	1.5		Bern10	Paired with JaH 073
JaH 313		19-Mar-2005	19°43.296′	55°42.471′	1899.7	1899.7	1	L6	S2	W4	24.3	20.7	1.6		Bern10	Paired with JaH 073
JaH 314		19-Mar-2005	19°43.296′	55°42.471′	80.8	80.8	1	H5	S1	W3	17.6	16.1	1.6		Bern10	
JaH 315		19-Mar-2005	19°39.189′	55°41.627′	209.7	209.7	1	H5	S3	W3	18.7	16.3	1.6		Bern10	
Qarat al Milh																
Qarat al Milh 001		20-Feb-2005	21°22.209′	57°43.746′	7269	7269	1	LL4–6	S2	W3	26.5	22.2	2.7		Bern7	
Ramlat as Sahmah																
RaS 200		24-Dec-2002	20°00.306′	56°24.716′	487.3	487.3	3	Meso	S1	–					Bern3	Paired with JaH 203
RaS 202		25-Dec-2002	20°00.331′	56°24.977′	18,250.0	274.2	Many	Meso	S1	–					Bern3	Paired with JaH 203
RaS 203		25-Dec-2002	20°00.275′	56°25.272′	4194.0	4194.0	1	Meso	S1	–					Bern3	Paired with JaH 203
RaS 204		15-Jan-2003	20°37.692′	56°11.519′	10,248.8	1198.8	Many	L6	S4	W4	25.8	22.4	1.4		Bern5	Paired with RaS 206(?), RaS 207
RaS 205		15-Jan-2003	20°37.784′	56°10.147′	742.8	742.8	2	L6	S5	W2	24.9	22.4	1.4		Bern5	Paired with RaS 207
RaS 206		15-Jan-2003	20°37.230′	56°08.714′	251.0	251.0	6	L3.4	S2	W3	17.5–27.6	15.8–21.9	0.7–1.7		Bern5	–1.7 Cpx
RaS 207		15-Jan-2003	20°37.932′	56°05.270′	202.0	202.0	1	L6	S4	W4	25.1	21.7	1.7		Bern5	
RaS 208		15-Jan-2003	20°35.141′	56°02.856′	50.1	50.1	3	H3.8/3.9	S1	W3	15.7–18.9	10.5–17.8	0.2–1.3		Bern5	–1.3
RaS 209		15-Jan-2003	20°35.045′	55°51.172′	100.5	100.5	1	H5	S2	W4	18.3	16.7	1.5		Bern5	
RaS 210		15-Jan-2003	20°34.619′	55°56.862′	58.9	58.9	4	H5	S2	W4	18.1	16.5	1.6		Bern5	
RaS 212		16-Jan-2003	20°35.647′	55°50.155′	22.5	22.5	1	H5	S2–3	W4	19.2	17.3	1.2		Bern5	
RaS 213		16-Jan-2003	20°35.347′	55°52.221′	4.99	4.99	1	H5	S1	W3	16.4	14.7	1.1		Bern5	
RaS 214		16-Jan-2003	20°34.783′	55°52.538′	240.3	240.3	1	H5	S2	W2	19.3	17.2	1.3		Bern5	Friable
RaS 215		16-Jan-2003	20°33.767′	55°53.339′	15.3	15.3	1	H3/4	S2	W4	7.0–31.9	15.9–24.1	0.4–1.4		Bern5	
RaS 216		16-Jan-2003	20°34.467′	55°59.159′	584.9	584.9	4	L6	S4	W4	25.3	22.6	1.4		Bern5	
RaS 217		19-Jan-2003	20°27.475′	55°54.106′	184.6	184.6	1	H5	S1	W2–3	19.8	17.2	1.6		Bern5	
RaS 218		19-Jan-2003	20°33.414′	55°50.933′	13.6	13.6	1	H3.9	S1	W4	18.0–21.5	10.3–16.3	0.4–4.1		Bern5	Cpx

Table 5. *Continued.* Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
RaS 219		19-Jan-2003	20°28.540′	55°47.872′	470.2	470.2	1	L4	S1	W3	24.2	17.7	0.8		Bern5	Paired RaS 220, RaS 227
RaS 220		19-Jan-2003	20°28.496′	55°48.255′	247.6	247.6	1	L4	S1	W2	23.5	17.2	1.6		Bern5	Paired RaS 219, RaS 227
RaS 222		19-Jan-2003	20°31.928′	56°02.979′	62.7	62.7	1	L6	S3	W3	25.6	21.3	1.5		Bern5	Paired with RaS 224
RaS 223		19-Jan-2003	20°32.510′	56°04.201′	31.9	31.9	1	H4	S2	W3	18.7	18.1	1.5		Bern5	
RaS 224		19-Jan-2003	20°32.705′	56°04.273′	231.7	231.7	1	L6	S4	W3	24.8	21.8	1.6		Bern5	Paired with RaS 222
RaS 225		20-Jan-2003	20°34.188′	56°06.212′	452.2	452.2	3	H5	S2	W3	19.4	17.7	1.4		Bern5	
RaS 226		20-Jan-2003	20°33.750′	56°05.023′	632.4	632.4	1	L6	S2	W4	24.9	21.3	1.7		Bern5	
RaS 227		20-Jan-2003	20°33.651′	56°04.941′	1226.2	1226.2	1	L4	S1	W3	23.9	21.8	0.8		Bern5	
RaS 228		20-Jan-2003	20°33.613′	55°58.357′	417.4	417.4	5	L5	S2	W4	24.4	21.0	1.6		Bern5	
RaS 229		20-Jan-2003	20°35.858′	55°52.092′	78.5	78.5	1	H4	S1	W2–3	18.4	16.4	1.2		Bern5	
RaS 230		20-Jan-2003	20°33.345′	55°55.275′	154.5	154.5	6	H5	S3	W4	19.3	17.5	1.5		Bern5	Paired with RaS 231, RaS 232, RaS 233
RaS 231		20-Jan-2003	20°33.244′	55°55.307′	202.5	202.5	7	H5	S3	W4	19.8	18.6	1.5		Bern5	Paired with RaS 230, RaS 232, RaS 233
RaS 232		20-Jan-2003	20°33.129′	55°55.378′	350.3	350.3	5	H5	S3	W4	19.2	17.6	1.4		Bern5	Paired with RaS 230, RaS 231, RaS 233
RaS 233		20-Jan-2003	20°33.006′	55°55.649′	121.7	121.7	1	H5	S2/3	W3	20.5	18.4	1.4		Bern5	Paired with RaS 230, RaS 231, RaS 232
RaS 234		13-Feb-2005	20°01.087′	56°25.303′	988.4	988.4	1	L5–6	S1	W2–3	25.1	20.6	1.5		Bern6	Paired with SaU 411
RaS 235		15-Feb-2005	20°28.436′	55°56.020′	111.5	111.5	1	H4	S1	W4	17.7	16.2	0.9		Bern6	
RaS 236		16-Feb-2005	20°33.922′	56°09.877′	43.2	43.2	2	H4	S2	W4	18.6	16.2	0.9		Bern6	Paired with RaS 235
RaS 237		16-Feb-2005	20°35.751′	56°09.218′	85.2	85.2	1	H4	S1–2	W4	19.7	17.0	1.2		Bern6	Paired with RaS 235
RaS 238		16-Feb-2005	20°35.803′	56°09.179′	205.4	205.4	1	H4	S1–2	W4	18.8	16.4	1.4		Bern6	Paired with RaS 235
RaS 239		16-Feb-2005	20°35.711′	56°09.306′	120.1	120.1	1	L5	S4	W3	24.7	20.9	1.3		Bern6	
RaS 240		16-Feb-2005	20°43.067′	56°21.364′	85.2	85.2	1	H4	S2	W4	16.4	10.3	0.7		Bern6	Paired with RaS 235
RaS 241		16-Feb-2005	20°46.065′	56°24.908′	77.2	77.2	3	L5	S3–4	W4	22.7	19.3	1.6		Bern6	
RaS 242		13-Feb-2005	20°01.079′	56°25.079′	96.6	96.6	1	LL4	S3	W2	27.7	22.7	1.1		Bern6	
RaS 243		15-Feb-2005	20°35.933′	56°08.980′	77.7	77.7	1	L5	S3	W3	24.8	20.6	1.7		Bern6	
RaS 244		15-Feb-2005	20°35.108′	56°08.840′	43.1	43.1	1	H4	S3	W3	18.4	16.3	1.0		Bern6	
RaS 245		16-Feb-2005	20°33.793′	56°11.684′	21.6	21.6	1	H4	S3	W3	–	–			Bern6	Paired with RaS 244
RaS 246		17-Feb-2005	20°50.358′	56°24.920′	2841	2841	1	H5	S1	W4	16.9	15.4	1.2		Bern6	
RaS 248		17-Feb-2005	20°18.407′	56°14.842′	23.5	23.5	1	L4	S4	W4	19.9	17.6	1.4		Bern6	
RaS 249		22-Feb-2005	20°00.142′	56°23.084′	167.7	167.7	1	R5	S4	W1	38.2	–			Bern8	Paired with RaS 201
RaS 250		23-Feb-2005	20°00.946′	56°28.672′	31.1	31.1	1	H4	S2	W4	18.9	15.0	1.0		Bern8	
RaS 251		26-Feb-2005	20°01.883′	56°27.354′	97.3	97.3	1	CV3	S1	–	14.2	1.5			Bern8	See separate entry
RaS 252		26-Feb-2005	20°03.204′	56°27.967′	7171.0	7171.0	1	L4	S3	W3	24.2	16.4	0.6		Bern8	
RaS 253		26-Feb-2005	20°02.887′	56°28.995′	522.0	522.0	1	H4	S0	W3	20.6	18.5	0.8		Bern8	Cpx
RaS 254		27-Feb-2005	20°00.332′	56°22.890′	184.0	184.0	1	R5	S3	–	38.3	–			Bern8	Paired with RaS 201
RaS 255		27-Feb-2005	20°01.408′	56°27.827′	107.8	107.8	8	H5	S1	W4	17.5	15.6	1.4		Bern8	Prob. paired w/ JaH 260
RaS 256		28-Feb-2005	20°02.843′	56°29.196′	34.3	34.3	1	L4	S2	W3	23.5	19.4	1.4		Bern8	
RaS 257		28-Feb-2005	20°02.273′	56°28.446′	58.4	58.4	1	H6	S1	W3	18.1	16.3	1.4		Bern8	
RaS 258		3-Mar-2005	20°02.782′	56°19.843′	97.6	97.6	1	H5	S2	W4	18.1	16.1	1.4		Bern8	
RaS 259		3-Mar-2005	20°13.134′	56°27.700′	243.4	243.4	11	L6	S1	W3	19.1	16.5	1.4		Bern8	
RaS 260		01-Nov-2004	20°0.108′	56°29.532′	102.4	21.1	1	H6		W3				4.84	Barto-8	$Wo_{1.3}$
RaS 261		02-Nov-2004	20°3.008′	56°1.378′	259.7	20.1	1	L6		W3/4				4.44	Barto-8	
Sayh al Uhaymir																
SaU 154		09-Oct-2002	21°03.103′	57°14.277′	19.34	5.4	1	H4	S2	W4	18.5–20.1	15.1–18.7			Barto-2	
SaU 155		10-Oct-2002	20°59.923′	57°19.5′	217	20.3	6	H4	S3	W3	17.5–18.8	15.0–18.8			Barto-2	
SaU 156		10-Oct-2002	21°04.05′	57°16.332′	16.6	3.3	1	L6	S2	W2	25.1–25.3	21.0–21.6			Barto-2	
SaU 157		10-Oct-2002	21°03.943′	57°15.815′	8.88	1.9	1	L (IM)		W1				4.87	Barto-6	
SaU 182		23-Feb-2003	20°43.267′	57°7.614′	1320	20.1	11	L4		W4				4.45	Barto-9	

Table 5. *Continued.* Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
SaU 282		10-Feb-2004	20°59.547′	57°19.398′	9.6	2.0	1	L6		W2/3				4.66	Barto-6	Impact melt
SaU 283		10-Feb-2004	21°02.852′	57°19.058′	70.5	14.5	1	H5		W2				4.82	Barto-6	Impact melt
SaU 285		5-Nov-2004	21°04.134′	57°18.796′	9.3	2.3	1	H5	S3	W0/1	18.4–19.8	16.3–16.7		4.95	Barto-2	
SaU 287		14-Nov-2004	20°31.616′	57°08.06′	373	22.6	2	H5	S3	W2	18.4–18.8	16.3–16.7		4.77	Barto-2	
SaU 288		14-Nov-2004	20°31.644′	57°08.11′	201.1	21.9	1	L5		W2				4.69	Barto-2	
SaU 289		16-Nov-2004	21°00.229′	57°15.832′	3	0.8	1	H4/5	S1/2	W3	19.1–19.5	16.7–18.9		4.91	Barto-2	
SaU 291		14-Nov-2004	20°36.024′	57°09.837′	259	23.7	1	L4	S3–4	W1/2	24.5–25.5	9.3–20.9		4.86	Barto-2	Impact melt
SaU 292		14-Nov-2004	20°36.205′	57°09.856′	387	20.3	1	H5	S2–4	W1/2	18.3–18.7	16.0–16.4		4.73	Barto-2	
SaU 293		14-Nov-2004	20°36.502′	57°09.604′	613	21.5	1	H5	S1	W1/2	18.4–18.8	16.0–16.6		4.71	Barto-2	Impact melt
SaU 294		07-Nov-2004	21°02.637′	56°57.9′	168.5	20.5	2	H4/5	S1	W3	18.4–19.2	15.8–19.0		4.72	Barto-2	Tetrataenite
SaU 295		07-Nov-2004	21°00.592′	57°02.317′	4780	20.1	1	L5	S4/5	W2	25.0–26.2	21.1–21.7		4.64	Barto-2	Impact melt veins
SaU 296		21-Feb-2004	20°47.62′	57°10.425′	190.5	19.8	1	L5		W2				4.61	Barto-8	Impact melt
SaU 300		20-Feb-2000	21°00′23.6″	57°20′03.9″	152.6	20.0	1	Lunar								See separate entry
SaU 299		06-Nov-2004	21°04.115′	57°18.079′	191.1	20.5	1	L5	S5	W0/1	24.9–25.5	21.0–21.6		4.75	Barto-2	
SaU 302		16-Nov-2004	21°03.576′	57°17.006′	15.7	4.7	1	L6	S6	W1	25.8–26.0	21.6–22.0		4.84	Barto-4	
SaU 303		16-Nov-2004	21°03.745′	57°16.548′	10.2	2.1	1	L4/5	S3/4	W1	25.0–26.0	21.6–24.2		4.76	Barto-4	Impact melt
SaU 304		16-Nov-2004	21°04.191′	57°15.836′	20.2	4.1	1	L6	S3	W1	25.4–25.8	21.2–21.8		4.73	Barto-2	
SaU 305		14-Nov-2004	20°35.9′	57°09.794′	51.1	10.5	3	L5	S5/6	W2/3	25.2–26.2	24.2–24.8		4.38	Barto-2	
SaU 306		23-Feb-2004	21°0.495′	57°19.962′	3.8	0.8	1	LL ~5		W3				4.37	Barto-10	
SaU 307		21-Feb-2004	21°0.177′	57°19.643′	1.2	0.2	1	L ~6		W3				4.43	Barto-10	
SaU 308		06-Nov-2004	21°03.85′	57°17.932′	313	24.7	1	L5	S4	W3	24.8–25.4	21.0–21.6		4.37	Barto-2	
SaU 400		03-Jan-2004	20°32.147′	56°40.254′	45.59	10.12	1	L6	S2	W3	23.3				NAU-23	
SaU 401		04-Jan-2004	20°32.574′	56°38.285′	24.5	5.59	2	L4	S2	W5	24.3				NAU-23	
SaU 403		29-Nov-2003	20°31.685′	56°40.518′	182.4	21.4	1	L5	S2	W3	24.6	20.9			MNB-1	
SaU 404		14-Jan-2003	20°02.146′	57°13.223′	97.3	97.3	1	L6	S3	W3	25.4	21.2	1.5		Bern5	
SaU 405		14-Jan-2003	20°11.691′	57°12.132′	76.0	76.0	1	H4–5	S1	W4	19.5	17.4	1.2		Bern5	
SaU 407		11-Feb-2005	21°00.207′	57°09.221′	720.2	720.2	1	H4	S3	W3	18.8	17.6	1.2		Bern6	Cpx
SaU 408		12-Feb-2005	20°54.613′	56°54.137′	369.1	369.1	1	L5	S3	W3	24.3	21.0	1.4		Bern6	
SaU 409		12-Feb-2005	20°54.853′	56°53.166′	120.8	120.8	1	H5	S1	W3	18.6	16.3	1.2		Bern6	
SaU 410		12-Feb-2005	20°54.727′	56°50.818′	455.7	455.7	1	L4	S1	W4	23.4	16.3	1.1		Bern6	
SaU 411		12-Feb-2005	21°00.343′	57°01.911′	42.9	42.9	1	L5–6	S1	W1	24.3	20.4	1.7		Bern6	Paired with RaS 234
SaU 412		24-Feb-2005	20°00.558′	56°30.440′	212.3	212.3	1	L5	S3	W3	24.7	20.8	1.7		Bern8	
SaU 413		26-Feb-2005	19°59.840′	56°32.112′	81.1	81.1	1	H6	S3	W3	19.9	17.5	2.2		Bern8	Cpx
SaU 414		26-Feb-2005	19°59.792′	56°31.566′	410.31	410.31	1	H5	S2	W2	17.9	15.9	1.4		Bern8	Prob. paired w/ JaH 260
SaU 415		26-Feb-2005	19°59.821′	56°30.727′	1212.5	1212.5	1	H5	S1	W3	18.0	15.8	1.1		Bern8	Prob. paired w/ JaH 260
SaU 416		27-Feb-2005	20°02.582′	56°34.673′	293.6	293.6	3	H4	S2	W3	18.6	16.2	1.0		Bern8	
SaU 417		03-Mar-2005	20°16.777′	56°30.507′	19.5	19.5	1	H5	S2	W4	17.9	16.2	1.6		Bern8	
SaU 418		03-Mar-2005	20°15.905′	56°30.180′	59.8	59.8	1	L5	S2	W1	23.8	20.1	1.6		Bern8	
SaU 419		08-Mar-2005	20°53.040′	56°59.626′	75.9	75.9	1	H5–6	S3	W3	18.9	17.4	1.6		Bern9	
SaU 420		08-Mar-2005	20°55.346′	56°53.211′	188.8	188.8	2	LL6	S2	W3	28.3	24.1	3.6		Bern9	
SaU 421		09-Mar-2005	20°52.131′	56°39.881′	81.4	81.4	1	H5	S4	W3–4	–	18.5	1.4		Bern9	
SaU 422		09-Mar-2005	20°50.951′	56°56.941′	506.3	506.3	4	H5	S3	W3	17.5	15.9	1.1		Bern9	
SaU 423		09-Mar-2005	21°00.799′	57°05.504′	8507.7	8507.7	5	H6	S2	W3	19.1	16.7	1.6		Bern9	
SaU 424		11-Mar-2005	21°16.111′	57°18.969′	23.2	23.2	1	L6	S3	W0–1	24.1	20.4	1.6		Bern9	
SaU 425		12-Mar-2005	20°55.809′	57°08.703′	10,006.7	10,006.7	116	L5–6	S3	W2	23.6	19.8	1.9		Bern10	
SaU 426		12-Mar-2005	20°55.535′	57°07.335′	112.4	112.4	1	H4–5	S2	W3	18.6	16.2	1.3		Bern10	
Shişr																
Shişr 100		08-Jan-2002	18°12.213′	53°48.667′	10.1	10.1	1	H4–5	S3	W4	17.3	16.0	1.4		Bern1	
Shişr 101		19-Dec-2002	18°37.571′	53°54.950′	1400	437.2	3	L6	S3–5	W4	24.7	21.6	1.8		Bern2	
Shişr 102		19-Dec-2002	18°37.572′	53°54.936′	3600	991.2	6	L6	S3–5	W4	25.6	22.2	1.7		Bern2	Paired with Shişr 101

Table 5. *Continued.* Officially recognized meteorites from countries within Asia.

Name	Location ofrecovery	Date of recovery	Latitude (N)	Longitude (E)	Mass (g)	Type spec (g)	No. of pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus.	Info	Comments
Shişr 103		19-Dec-2002	18°31.304′	53°48.235′	842.5	842.5	1	H4	S1	W2	18.1	15.6	0.9		Bern2	
Shişr 104		21-Dec-2002	18°33.111′	53°54.547′	550	138.4	4	L5	S2	W4	26.5	20.5	1.8		Bern2	
Shişr 105		21-Dec-2002	18°32.612′	53°58.581′	490.5	490.5	3	L5	S2	W3	24.4	20.3	1.5		Bern2	Paired with Shişr 104
Shişr 106		25-Jan-2001	18°11.491′	53°48.774′	379.59	20.0	1	LL5		W1–2				3.93	Barto-5	Breccia
Shişr 107		25-Jan-2001	18°11.417′	53°48.497′	106.61	20.0	1	L6		W4–5				4.42	Barto-6	
Shişr 108		25-Jan-2001	18°11.539′	53°48.221′	35.41	7.1	1	L5		W4–5				4.70	Barto-7	
Shişr 109		25-Jan-2001	18°39.249′	53°55.708′	114.04	20.0	1	L6		W4				4.75	Barto-8	
Shişr 110		25-Jan-2001	18°11.339′	53°48.291′	853	20.0	1	H4		W4				4.98	Barto-9	
Shişr 111		25-Jan-2001	18°39.128′	53°55.629′	762.7	20.0	1	H5		W2				5.02	Barto-10	
United Arab Emirates																
UAE 001		17-Jan-2001			155	20	1	Ure							Köln-1	See separate entry

[a]For class (which refers to classification): Ang = angrite; Aung = achondrite, ungrouped; Bra = brachinite; Dio = diogenite; Acp = acapulcoite; Euc = eucrite; How = howardite; Imr = impact-melt rock; Mes = mesosiderite; Pra = primitive achondrite; Ure = ureilite. [b]WG = weathering grade.

Table 6. Stones recovered from the Moss fall.

Sample number	Date	Latitude (N)	Longitude (E)	Mass (g)	Owner
1	14 July 2006	59°24.463′	10°45.548′	36.7	K. J. Røed Ødegaard
2	17 July 2006	59°25.908′	10°41.778′	752	UOslo
3	23 July 2006	~59°26′	~10°42′	~1500	M-S-T
4	30 July 2006	59°27.005′	10°41.482′	~800	Farmer, M. Bilet
5	03 Aug 2006	59°26.394′	10°42.032′	676	UOslo

Sample #1 = complete stone + some fragments; #2 = complete, hit tree, landed in grass, angular shape; #3 = half stone + fragments, hit fence and shattered; #4 = many pieces, hit concrete in industrial area; #5 = complete stone, penetrated roof of building, angular shape. M-S-T = mass divided between Michael Mazur, Bjørn Sørheim, and Eric Twelker.