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Abstract–In this edition of The Meteoritical Bulletin, 1394 recognized meteorites are reported, 27 from specific locations within Africa, 133 from Northwest Africa, 1227 from Antarctica (from ANSMET, PNRA, and PRIC expeditions), and 7 from Asia. The Meteoritical Bulletin announces the approval of four new names series by the Nomenclature Committee of the Meteoritical Society, two from Africa and one from Asia, including Al Haggounia, from Al Haggounia, Morocco, which is projected to be on the order of 3 metric tons of material related to enstatite chondrites and aubrites. Approved are two falls from Africa, Bassikounou (Mauritania) and Gashua (Nigeria). Approved from areas other than Antarctica are one lunar, two Martian, 32 other achondrites, three mesosiderites, two pallasites, one CM, two CK, one CR2, two CV3, one CR2, and four R chondrites. The Nomenclature Committee of the Meteoritical Society announces 48 newly approved relict meteorites from two new name series, Österplana and Gullhögen (both from Sweden).

AFRICA

Libya

Dar al Gani 1048 **27°12.10′N, 16°18.67′E**
Libya
Find: June 28, 2001
Achondrite (lunar, feldspathic breccia)

History: A tiny complete individual stone was recovered by an anonymous finder in June 2001 and purchased by N. Classen in 2003 in Vienna, Austria.

Physical characteristics: A single 0.801 g medium gray stone with some diffuse whitish clasts. About 70% of the stone is covered by fusion crust.

Petrography: (A. Irving and S. Kuehner, *UWS*) Predominantly very fine-grained mineral debris with some larger lithic clasts (up to 0.3 mm) and vesicular glassy matrix and veins. Minerals identified include pyroxene, plagioclase, olivine, ilmenite, kamacite, and troilite. Lithic clasts include gabbro (composed of plagioclase and pigeonite) and very fine grained, ophitic-textured basalt (composed of plagioclase and olivine with accessory orthopyroxene, troilite, metal, and rutile). Several glassy spheres were found.

Geochemistry: Olivine ($Fa_{19.6–49.6}$, FeO/MnO = 93–98), pigeonite ($Fs_{20.2–61.9}Wo_{5.3–7.2}$, FeO/MnO = 54.8–66.5), and plagioclase ($An_{97–98}Or_{0}$).

Classification: Achondrite (lunar, feldspathic breccia). This stone is likely paired with Dar al Gani 262 and Dar al Gani 996.

Type specimens: A total of 0.33 g of sample is on deposit at *UWS. Classen* holds the main mass.

Mauritania

Bassikounou **15°47′N, 5°54′W**

Bassikounou, Hodh Ech Chargui, Mauritania
Fall: 16 October 2006, 04:00 UTC
Ordinary chondrite (H5)

History: A fireball was witnessed in the area, but no records of the direction of movement were recorded. A single stone of 3165 g was found by A. Salem El Moichine, a local resident, on the same day at 13:00 h local time, 11 km SE of Bassikounou. The sample for classification was provided to *NMBE* by M. Ould Mounir, Nouakchott, who obtained it from his cousin who recovered the meteorite. According to S. Buhl (Hamburg, Germany), more than 20 specimens were later recovered by locals and meteorite finders. These finds define an 8 km long strewn field. The total recovered mass is 46.00 kg.

Physical characteristics: The 3165 g specimen is largely covered by black fusion crust. The interior is light gray. On the surface of the fusion crust there is some adherent soil material, some of which is bright red. Shortly after recovery, the stone was cut into two pieces of 1200 and 1950 g. The larger piece has a rectangular shape and shows indications of flow lines in the fusion crust.

Petrography: (E. Gnos, *MHNGE*; B. Hofmann, *NMBE*, M. Eggimann, *Bern/NMBE*): Mean chondrule size 0.35 mm (n = 53). Metal abundance is 8 vol%, troilite 6.6 vol%. Mean plagioclase grain size is ~20 μm. Troilite is polycrystalline, rich in silicate inclusions, and shows diffuse boundaries to metal. Metal is partly rich in silicate and troilite inclusions. Rare metallic Cu (10 μm) occurs at kamacite-taenite boundaries and in troilite. Some shock veins and no weathering products were observed.

Mineral compositions: Olivine ($Fa_{18.6}$), pyroxene ($Fs_{16.3}Wo_{1.1}$), and plagioclase ($An_{13.7}$).

Cosmogenic radionuclides: (P. Weber, *PPGUN*) Gamma-spectroscopy performed in December 2006 and January 2007 showed the presence of the following radionuclides: ^{48}V, ^{46}Sc, ^{56}Co, ^{54}Mn, ^{58}Co, ^{7}Be, ^{51}Cr, ^{57}Co, ^{22}Na, ^{26}Al, and ^{60}Co. Recalculated to 12 October 2006 ^{22}Na was 38.0 ± 2.2 and ^{26}Al 31.5 ± 2.1 (both dpm/kg), the activity ratio of 1.21 is fully consistent with a fall on that date.

Classification: Ordinary chondrite (H5); S2, W0.

Type specimens: A total of 115 g are on deposit at *NMBE*. *Boudreaux* holds the main mass.

Morocco

The Meteoritical Bulletin announces a new name series approved by the Nomenclature Committee of the Meteoritical Society from a dense collection area near Al Haggounia, Morocco (Chennaoui et al. 2007), comprising approximately 3 tons of material. It should be noted that the classification of samples potentially from this area varies, ranging from EL3 chondrite to aubrite.

Al Haggounia 001 **27°30′N, 12°30′W**

Al Haggounia, Morocco
Find: 2006
Achondrite (aubrite)

History: Several tons of this material have been found on the ground or by digging near Al Haggounia, Morocco (see Chennaoui et al. 2007 for description of the strewn field), and sold to several dealers. The coordinates are given for the center of the strewn field, which extends ~40 km.

Physical characteristics: It is impossible to precisely assess the amount of material already (and to be) recovered, but according to dealers, collectors, and Jambon, it is about 3 metric tons composing many samples of varied sizes (from a few g to 50 kg). The largest stones were recovered after excavating them from the ground. The outer surface is rusty brown due to severe alteration and looks like a sedimentary breccia cemented by iron oxide and carbonate. Color changes from bluish gray to rusty brown closest to the fractures are observed. Yellow patches of sulfur (alteration) are widespread. The rocks are significantly porous, with pore sizes from several centimeters to hundreds of microns.

Petrography: (A. Jambon, O. Boudouma, and D. Badia. *UPVI*) Dominated by enstatite and plagioclase. Troilite, graphite daubreelite, oldhamite, kamacite rich in Si, and schreibersite are present.

Mineral compositions: Enstatite ($En_{98}Fs_1Wo_1$) and plagioclase ($Ab_{78}An_{16}Or_5$).

Classification: Achondrite (aubrite); extensive weathering. Similar to and likely paired with NWA 002, 1067, 2736, 2828, 2965.

Type specimens: A total of 50 g of sample and three polished sections are on deposit at *UPVI*.

Main masses: *Beroud*, 3886 g (26 pieces from 1185 g to 5.8 g); *P. Thomas*, 4497 g (33 pieces from 11 to 1507 g); *Hmani*, about 500 kg; *Ouzrou*, about 500 kg.

The Meteoritical Bulletin announces a new name series approved by the Nomenclature Committee of the Meteoritical Society, Istifane, located in the Istifane region of Morocco.

Istifane 001 **31°29.911′N, 5°43.045′W**

Morocco
Find: 24 July 2005
Ordinary chondrite (H4)

Physical characteristics: It consists of three separate pieces of 68.0, 51.8, and 11.8 g, with a total mass of 131.6 g. The three pieces fit together documenting that they are fragments of a single stone.

Petrography: (A. Ibhi and H. Nachit *IZU*, H. Chennaoui Aoudjehane *UHAC*) It is severely weathered with a dark orange-brown color. Metallic Fe-Ni and/or troilite grains are frequently replaced by iron oxide. Plagioclase grains are up to 100 μm in size.
Mineral compositions: Olivine ($Fa_{18.4–19.2}$), orthopyroxene ($Fs_{16.2–17.5}$).
Classification: Ordinary chondrite (H4); S3, W4.
Type specimens: Three polished thin sections and three fragments totalling 104 g are on deposit at *IZU*.

Istifane 002 **31°29.909′N, 5°43.044′W**
Morocco
Find: 17 August 2005
Ordinary chondrite (H5)
Physical characteristics: One 40 g stone, brownish in color.
Mineral compositions: (A. Ibhi and H. Nachit *IZU*, H. Chennaoui Aoudjehane *UHAC*) Olivine ($Fa_{15.5±0.5}$) and low-Ca pyroxene ($Fs_{16.8±0.6}$).
Classification: Ordinary chondrite (H5); S5, W3.
Type specimens: One thin section and the main mass are on deposit at *IZU*.

Istifane 003 **31°29.150′N, 5°43.027′W**
Morocco
Find: 17 August 2005
Ordinary chondrite (L5)
Physical characteristics: It is an 18.5 g stone partly covered by dark-brown fusion crust.
Mineral compositions: (A. Ibhi and H. Nachit *IZU*, H. Chennaoui Aoudjehane *UHAC*) Olivine ($Fa_{24.9±0.7}$), orthopyroxene ($Fs_{21.4±0.6}$), feldspar ($An_{11}Or_6$), high-Ca pyroxene ($Fs_{10.6}Wo_{41}$).
Classification: Ordinary chondrite (L5); S3, W2.
Type specimens: Three thin sections and three fragments totaling 10.4 g are on deposit at *IZU*.

Istifane 004 **31°30.165′N, 5°42.916′W**
Morocco
Find: 19 May 2006
Ordinary chondrite (H5)
History: A. Ibhi and M. El Mansouri found this meteorite while prospecting with a metal detector.
Physical characteristics: It is a 10.8 g stone.
Petrography: (A. Ibhi and H. Nachit *IZU*, H. Chennaoui Aoudjehane *UHAC*) The meteorite is dominated by olivine and low-Ca pyroxene. Plagioclase, troilite, and metallic Fe-Ni are also noted as major and minor minerals.
Mineral compositions: Olivine ($Fa_{19.1±0.5}$), low-Ca pyroxene ($Fs_{15.4±0.9}$), feldspar ($An_{2.5±0.3}$).
Classification: Ordinary chondrite (H5); S2, W2.
Type specimens: One thin section and the main mass are on deposit at *IZU*.

Nigeria

Gashua **12°51′N, 11°02′E**
Dapchi, Nigeria
Fall: April 1984
Ordinary chondrite (L6)
History: The meteorite fall was reported by anonymous eyewitnesses to have occurred around April 1984 (about the time of the nearby Gujba fall) near the tiny desert settlement Kolomari close to the town of Gashua, Dapchi district, Nigeria.
Physical characteristics: A single stone of 4162 g was recovered and broken by villagers into many pieces at the place of the fall. The pieces were stored by villagers until they were collected in 2005 and sent to E. Twelker.
Petrography: (A. Greshake, *NHB*) The meteorite is a weakly weathered ordinary chondrite with recrystallized texture and few poorly defined chondrules. Opaque and often interconnecting shock veins are present.
Mineral compositions: Olivine ($Fa_{23.8}$) and pyroxene (Fs_{20}).
Classification: Ordinary chondrite (L6); S4, W1.
Type specimens: A total of 40.4 g plus one polished thin section are on deposit at *MNB*. *Twelker* holds the main mass.

A list of all meteorites recognized from countries and regions in Africa other than the northeast and the northwest is provided in Table 1.

Northwest Africa

Northwest Africa 801
Morocco
Find: 2001
Carbonaceous chondrite (CR2)
History: M. Farmer and G. Hupé recovered a total of approximately 5 kg of many individuals and fragments from Zagora, Morocco. Many whole and sliced specimens have been sold over the last several years.
Physical characteristics: Many whole stones and fragments, all with desert varnish and brown/orange color. Numerous chondrules, many on the order of ~1 mm in apparent diameter, are visible.
Petrography: (G. Benedix and C. Smith, *NHM*) The thin section studied is dominated by millimeter-sized type I PO and POP chondrules, which are often rimmed with and/or contain metallic Fe-Ni blebs. Metallic Fe-Ni also occurs as rounded, millimeter-sized grains within the matrix. Interstitial to chondrules and metal is a fine-grained matrix rich in phyllosilicate. Two type II chondrules were also observed. Pervasive veins of rust occur throughout.
Mineral compositions: Type 1 chondrule olivine ($Fo_{98.2±1.3}$), low-Ca pyroxene ($En_{96.2±0.9}Wo_{2.0±2.2}$), and high-Ca pyroxene ($En_{45.7±11.5}Wo_{35.9±4.7}$). Type II chondrule olivine ($Fo_{77.4±7.7}$) and low-Ca pyroxene ($En_{73.8±1.8}Wo_{2.1±2.4}$).

Classification: Carbonaceous chondrite (CR2); moderate to extensive weathering.
Type specimens: A total of 77.4 g of sample and two sections are on deposit at *NHM*. Farmer holds several grams, *KCCU* holds approximately 10 g, and *AMNH* holds several grams.

Northwest Africa 1461
Algeria or Morocco
Find: March 2002
Achondrite (diogenite)
History: D. Gregory purchased the 252 g stone in Erfoud, Morocco, in March 2002.
Physical characteristics: A single pale gray-green, broken stone.
Petrography: (A. Irving and S. Kuehner, *UWS*): Coarse-grained (clasts up to 7 mm) with a partly cataclastic texture. Predominantly orthopyroxene (with diffuse grain boundaries) and accessory chromite. Minor calcite is present along some grain boundaries.
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{13.5–13.7}Wo_{0.7–0.9}$; FeO/MnO = 32.0–33.8). This specimen is distinctive in the magnesian pyroxene it exhibits. Oxygen isotopes: (D. Rumble, *CIW*) Replicate analyses by laser fluorination yielded $\delta^{18}O$ = 3.177, 3.584; $\delta^{17}O$ = 1.410, 1.634; $\Delta^{17}O$ = –0.2609, –0.2505 (all ‰).
Classification: Achondrite (diogenite).
Type specimens: A total of 23 g of sample is on deposit at *UCLA*. One polished thin section and 1.3 g are on deposit at *UWS*. *Gregory* holds the main mass.

Northwest Africa 1924
Morocco or Algeria
Find: January 2001
Carbonaceous chondrite (CV3)
History: Purchased in January 2001 in Erfoud, Morocco for D. Gregory.
Physical characteristics: A single stone weighing 255 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) Separated olivine-rich chondrules (mostly micro-porphyritic) and sparse CAI (containing Al-Ti-rich clinopyroxene, Fe-rich spinel, and anorthite) in a dark, relatively magnetite-rich matrix. Olivine, Cr-bearing magnetite, ilmenite, intermediate plagioclase, orthopyroxene, clinopyroxene, and pentlandite.
Geochemistry: Olivine ($Fa_{29.1}$), Ti-rich pyroxene ($Wo_{70.3}Fs_{0.05}$) with TiO_2 = 16.2, Al_2O_3 = 17.8 (both wt%). Oxygen isotopes: (D. Rumble, *CIW*) Laser fluorination analyses of two samples (all ‰) $\delta^{18}O$ = –3.01, –3.61; $\delta^{17}O$ = –6.46, –7.04; $\Delta^{17}O$ = –4.879, –5.139.
Classification: Carbonaceous chondrite (CV3); S1, minimal weathering.
Specimens: A total of 20.4 g of sample and one polished thin section are on deposit at *UWS*. *Gregory* holds the main mass.

Northwest Africa 2044
Morocco or Algeria
Find: August 2003
Carbonaceous chondrite (CV3)
History: Purchased in 2003 August in Erfoud, Morocco, for D. Gregory.
Physical characteristics: A single stone weighing 661 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) Sparse, well-formed ovoid chondrules in a black matrix. Olivine, orthopyroxene, clinopyroxene with accessory troilite and metal. Sparse CAI consisting mainly of Mg-Al spinel, gehlenite and perovskite, with rims of Al-Ti-rich clinopyroxene. Veins of anorthite present.
Geochemistry: Mafic silicates are very Mg-rich (mg > 97), metal (5 wt% Ni). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two whole rock fragments by laser fluorination gave $\delta^{18}O$ = –1.12, –2.71; $\delta^{17}O$ = –4.45, –6.36; $\Delta^{17}O$ = –3.860, –4.934 (all ‰).
Classification: Carbonaceous chondrite (CV3); S1, minimal weathering.
Specimens: A total of 22.4 g of sample and one polished thin section are on deposit at *UWS*. *Gregory* holds the main mass.

Northwest Africa 3157
Morocco or Algeria
Find: September 2004
Ordinary chondrite (Type 3)
History: Purchased from a Moroccan dealer at the Denver Mineral Show by A. Hupé in September 2004.
Physical characteristics: A single 51.7 g light brown stone lacking fusion crust and with abundant, large chondrules.
Petrography: (A. Irving and S. Kuehner, *UWS*) Closely packed PO and POP chondrules (mean diameter 1.0 mm); some are ovoid. The matrix is a "lacework" of porous olivine and pyroxene with accessory kamacite, taenite and troilite. The content of metal (+minor Fe hydroxide) is very low (mode determined by BSE imaging of a whole thin section is 1 vol%).
Geochemistry: Olivine ($Fa_{0–60}$); orthopyroxene ($Fs_{0.5–30}Wo_{1.5}$). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two acid-washed whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O$ = 5.30, 4.85; $\delta^{17}O$ = 3.48, 3.29; $\Delta^{17}O$ = 0.693, 0.742 (all ‰). Although these $\Delta^{17}O$ values are within the range for H chondrites, this specimen is poorer in metal than typical H chondrites.
Classification: Ordinary chondrite (Type 3); S2, W1/2.
Specimens: A total of 10.6 g of sample and one polished thin section are on deposit at *UWS*. *G. Hupé* holds the main mass.

Northwest Africa 3221
Morocco
Find: 2002
Achondrite (ureilite, polymict)
History: B. Fectay purchased a single stone of 38.5 g in Rissani, Morocco, in 2002.

Physical characteristics: A fragment with 45% fresh black fusion crust with a typical polymict ureilite texture.
Petrography: (H. Takeda, Chiba and A. Yamaguchi, *NIPR*). The sample is a fragmental breccia with lithic clasts and subrounded mineral fragments embedded in a cataclastic matrix of predominantly ureilitic material. One large clast is a fine-grained carbonaceous chondrite 2.3 × 1.5 mm in size and another is very heavily shocked ureilite. Mineral fragments include olivine up to 1.8 × 1.2 mm, pyroxene, Na-rich plagioclase, rare K, Na-rich glassy grain.
Mineral compositions: Pyroxene (Fs_8Wo_8-$Fs_{44}Wo_{10}$-$Fs_{13}Wo_{34}$; Cr_2O_3 of pigeonite = 0.8–1.2 wt%; augite = 1.8 = 2.0 wt%), olivine ($Fo_{74–90}$; CaO = 0.25–0.47 wt%; Cr_2O_3 = 0.42–0.83 wt% [cores]) and plagioclase ($An_{6–60}$). High K, Na-rich glassy materials (SiO_2 = 66.5, Al_2O_3 = 11.3, FeO = 8.5, Na_2O = 4.2, K_2O = 2.1 [all wt%] observed). Coexistence of unshocked olivine and a very heavily shocked ureilite clast 4.4 × 3.2 mm in size (PTS 090,8) as in Dar al Gani 1023 with granoblastic texture. Clast olivines ($Fo_{70–78}$ [cores]).
Classification: Achondrite (ureilite, polymict).
Type specimen: A total of 7.7 g of sample and a thin section are on deposit at *NIPR*. *Fectay* hold the main mass.

Northwest Africa 3222
Morocco
Find: 2000
Achondrite (ureilite, monomict)
History: An anonymous finder recovered 79 g.
Physical characteristics: A flattened individual stone with sandblasted crust on 80% of the surface.
Petrography and mineral compositions: (H. Takeda, Chiba and A. Yamaguchi, *NIPR*). The texture shows slightly rounded angular fragments (up to 2.5 × 1.2 mm) of olivine ($Fo_{87–89}$ [cores]; $Fo_{92–96}$[rims]) in a comminuted matrix. Small rounded to oval orthopyroxene ($Fs_{11.2}Wo_{4.8}$) and augite (Fs_7Wo_{37}) grains are poikilitically enclosed in olivine crystals. Carbonaceous material with iron oxide-hydroxide occur as narrower, intergranular veins in a crystalline clast (4 × 4 mm). The olivine grains in this clast show mosaicism with tilt boundaries, but the olivine fragments in the breccia matrix are not shocked. This meteorite contains mostly olivine with minor inclusions of orthopyroxene and augite. Many olivine fragments in the matrix do not contain carbonaceous veins.
Classification: Achondrite (ureilite, monomict); S2, moderate weathering.
Type specimen: A total of 15.8 g of sample and one thin section are on deposit at *NIPR*. *Fectay* hold the main mass.

Northwest Africa 3223
Morocco
Find: 2002
Achondrite (ureilite, polymict)
History: An anonymous finder recovered a single stone of 51 g.
Physical characteristics: The sample is a subrounded stone with 60% fusion crust and soft when cut.
Petrography and mineral compositions: (H. Takeda, Chiba and A. Yamaguchi, *NIPR*). It is composed of medium to coarse (up to 1.6 × 1.2 mm in size) olivine ($Fo_{77–80}$, CaO = 0.3–0.4; Cr_2O_3 = 0.65–0.9 [both wt%; cores]) and pigeonite grains ($Fs_{18.0}Wo_{7.5}$; Cr_2O_3 = 1.1–1.3 wt%). Carbonaceous veins typical of ureilites are observed at parts of the thin section and dusty patches of fine-grained opaque minerals decorate the rims of grains.
Classification: Achondrite (ureilite, polymict); minimal shock with rare mosaicism in olivine.
Type specimen: A total of 9.8 g of sample and one thin section are on deposit at *NIPR*. *Fectay* hold the main mass.

Northwest Africa 3340
Algeria or Morocco
Find: April 2006
Carbonaceous chondrite (CM2, anomalous)
History: Purchased by F. Kuntz in April 2006 in Erfoud, Morocco, and subsequently acquired for the DuPont Collection at *PSF*.
Physical characteristics: Two pieces from a very fresh, broken, black, porous stone (total weight 12.7 g) with shiny fusion crust on one side.
Petrography: (A. Irving and S. Kuehner, *UWS*; T. Bunch, *NAU*) Sparse mineral grains, carbon-rich objects, dust-armored chondrules and rare refractory inclusion occur in a heterogeneous, very fine grained, porous matrix composed mainly of bladed phyllosilicates with some pentlandite and calcite (clearly visible under incident UV light). Olivine grains (up to 2 mm across) are commonly armored by fine, polycrystalline "dust" and contain inclusions of Ni-rich troilite, chromite, millerite, kamacite and taenite. Both pentlandite and magnesian olivine occur as separate smaller, angular grains. The carbon-rich objects (up to 50 μm across) consist of either pure graphite or a chlorine-rich organic phase. Chondrules consist of PO and POP olivine, many having a fine-grained polycrystalline "dust" rims. One small refractory inclusion is composed of Mg-Al spinel with inclusions of perovskite.
Mineral compositions and geochemistry: Larger zoned olivine grains (e.g., $Fa_{17.9-33.9}$, $Fa_{39.9–66}$); smaller homogeneous olivine grains (e.g. $Fa_{1.5}$, $Fa_{19.9}$); pentlandite (Ni = 26.2 wt%). Matrix phyllosilicate material could not be analyzed quantitatively, but has very consistent proportions of Mg, Fe, Si and S. The chlorine-rich organic phase contains ~17 wt% Cl and ~32 wt% C, but no detectable N and minor O. Oxygen isotopes: (D. Rumble, *CIW*) Replicate analyses by laser fluorination gave, respectively, $\delta^{18}O$ = 0.494, 1.166; $\delta^{17}O$ = 6.224, 7.049; $\Delta^{17}O$ = –2.780, –2.542 (all ‰).
Classification: Carbonaceous chondrite (CM2, anomalous); minimal weathering. The presence of chlorine-rich carbon compounds, which may be enigmatic chlorinated

hydrocarbons, makes this specimen potentially unique among CM chondrites.
Specimens: A total of 2.7 g of sample is on deposit at *UWS* and the remainder of the mass (10 g) is at *PSF*.

Northwest Africa 4223
Algeria
Find: December 2005
Achondrite (diogenite, olivine-bearing)
History: G. Hupé purchased the stones in December 2005 in Tagounite, Morocco.
Physical characteristics: The meteorite comprises two dense, dark brown and partly fusion crusted stones with a total weight of 329 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) The meteorite is coarse-grained (≤4 mm) with a primarily protogranular texture, and some areas of cataclasis. Olivine (50 vol%) and orthopyroxene (45 vol%) are the dominant minerals with accessory chromite, troilite and metal (kamacite). Some veinlets of terrestrial calcite crosscut the specimen.
Mineral compositions and geochemistry: Olivine ($Fa_{30.0–31.2}$; FeO/MnO = 44.8–48.2), orthopyroxene ($Fs_{24.2–25.2}Wo_{2.8–3.2}$; FeO/MnO = 28.8), chromite (Cr/[Cr + Al] = 0.703–0.715; Fe/[Fe+Mg] = 0.69–0.73, mean TiO_2 = 1.02 wt%). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two aliquots by laser fluorination gave, respectively, $\delta^{18}O$ = 3.08, 3.22; $\delta^{17}O$ = 1.44, 1.48; $\Delta^{17}O$ = –0.180, –0.214 (all ‰).
Classification: Achondrite (diogenite, olivine-bearing).
Type specimens: A total of 20.4 g of sample, one polished thin section and a polished mount are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4230
Algeria
Find: December 2005
Mesosiderite
History: G. Hupé purchased this stone in December 2005 in Rissani, Morocco.
Physical characteristics: The meteorite is a single 134 g stone containing abundant metal.
Petrography: (A. Irving and S. Kuehner, *UWS*) In thin section, the meteorite is texturally heterogeneous, mostly fragmental with variable grain size (0.5–4 mm), but some regions have triple junctions among silicate grains. Abundant metal (kamacite with taenite), orthopyroxene, plagioclase (some with included grains of silica polymorph and clinopyroxene), schreibersite, merrillite, and troilite. One rounded clot composed of clinopyroxene, merrillite and kamacite was observed.
Mineral compositions: Orthopyroxene ($Fs_{30.9}Wo_{2.7–2.9}$, FeO/MnO = $_{23.9–26.2}$), plagioclase ($An_{89.5–94.8}Or_{0.2}$), kamacite (Ni = 5.4–5.9 wt%), and taenite (Ni = 36–49 wt%).
Classification: Mesosiderite.
Specimens: A total of 20.1 g of sample, one polished thin section and a polished mount are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4232
Northwest Africa
Find: December 2005
Enstatite chondrite (EL3)
History: G. Hupé purchased the specimens in December 2005 in Tagounite, Morocco.
Physical characteristics: The meteorite consists of two dark brown stones weighing 105 and 19 g. Cut surfaces have sparse grains of fresh metal, and there are multiple subparallel and anastomosing thin veinlets filled with iron oxides/hydroxides and some calcite from terrestrial weathering.
Petrography: (A. Irving and S. Kuehner, *UWS*) Predominantly granular texture with mostly equant and some bladed grains (0.5 to 1.5 mm). Composed mainly of pure enstatite with subordinate altered kamacite, altered troilite, plagioclase and accessory schreibersite and daubreelite (as blades in altered troilite). Sparse RP chondrules (0.2–0.8 mm in diameter) composed of radiating (and some subparallel) enstatite grain clusters.
Mineral compositions: Enstatite ($En_{97.9–98.4}Wo_{1.3–1.4}$) and plagioclase ($An_{15.2–16.0}Or_{4.3–4.4}$).
Classification: Enstatite chondrite (EL3); S1, W4/5. This specimen is similar to NWA 002, NWA 1067, NWA 2736, NWA 2965, and NWA 4295. It may also be related to Al Haggounia 001.
Specimens: A total of 20 g of sample and one polished thin section are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4255 27°51′00″N, 7°48′00″W
Hamada du Draa, southwest Algeria
Find: September 2002
Achondrite (diogenite)
History: Nomads found the meteorite in September 2002 in Hamada du Draa, southwest Algeria.
Physical characteristics: The total mass is 6000 g and is fragmented into hundreds of pieces, some of which are partly covered with fusion crust.
Petrography: (A. Seddiki, *Ud'OEA* and *UJM*; B. Moine, J. Y. Cottin, *UJM*; M. Denise, V. Sautter, J. P. Lorand, *MNHNP*). Predominantly composed orthopyroxene with scarce inclusions of troilite, ilmenite, spinel, olivine, and metallic Fe-Ni.
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{25.3}Wo_{1.5}$; Fe/Mn = 23–28 [atomic]), spinel (Cr = 0.92 wt%), olivine (Fa_{30}), Fe, Ni-rich metal (NiO = <1 wt%). Oxygen isotopes: $\delta^{18}O$ = 3.25, $\delta^{17}O$ = 1.31, $\Delta^{17}O$ = –0.38 (all ‰).
Classification: Achondrite (diogenite); S2, minor weathering.
Type specimens: A total of 21 g of sample is on deposit at

MNHNP. Two thin sections are on deposit at *UJM*. An anonymous finder holds the main mass.

Northwest Africa 4269 27°59′N, 7°35′W

Hamada du Draa, southwest Algeria
Find: September 2004
Achondrite (eucrite, monomict)

History: Nomads found a complete stone in September 2004 in Hamada du Draa (southwest Algeria).

Physical characteristics: The complete stone is fusion crusted and weighs 54 g.

Petrography: (A. Seddiki, *Ud'OEA* and *UJM*; B. Moine, J. Y. Cottin, *UJM*; M. Denise, V. Sautter, J. P. Lorand, *MNHNP*). The rock is compact, fine-grained and contains mm-sized metal grains. A heterogeneous granulitic matrix with plagioclase and recrystallized pyroxene, associated with silica, fayalite, Ca phosphate, iron metal (Ni% <0.1), sulfide, spinel, and ilmenite is observed. Some clasts display residual ophitic texture (lath plagioclase with granular exsolved pigeonite). Pyroxenes occur as ferro-pigeonites exsolved in ferro-augite and ferro-hypersthene. Individual augite grains are also observed in the matrix.

Mineral compositions and geochemistry: Augite ($En_{26–27}$ $Wo_{34–41}$), hypersthene ($En_{29–30}Wo_{6–5}$), and matrix augite grains ($En_{26}Wo_{40}$). Pyroxene Fe/Mn (27 to 42 [atomic]), spinel (Fe-rich chromite, cr# = 0.91). Oxygen isotopes: (R. Greenwood, *OU*) $\delta^{17}O$ = 1.718, $\delta^{18}O$ = 3.762, $\Delta^{17}O$ = 0.238 (all ‰).

Classification: Achondrite (eucrite, monomict); S3, minor weathering.

Type specimens: A total of 19.2 g of sample is on deposit at *MNHNP*. Two inclusions and one powder aliquot (1.690 g) are on deposit at *UJM*. An anonymous finder holds the main mass.

Northwest Africa 4271 27°57′N, 7°50′W

Hamada du Draa, southwest Algeria
Find: February 2003
Achondrite (eucrite, polymict)

History: The meteorite found by nomads in Hamada du Draa, southwest Algeria.

Physical characteristics: The stone displays a fine fusion crust and weighs 6 g.

Petrography: (A. Seddiki, *Ud'OEA* and *UJM*; B. Moine, J. Y. Cottin, *UJM*; M. Denise, V. Sautter, J. P. Lorand, *MNHNP*). The stone has a fine- to medium-grained, brecciated texture containing mineral fragments of plagioclase, diogenitic pyroxenes, spinel, olivine, and silica. The rock also contains some basaltic fragments displaying both ophitic and subophitic textures, formed by plagioclase and pigeonite; some pigeonite grains also display augite exsolution lamellae. Diogenitic fragments are low in abundance (<10%).

Mineral compositions and geochemistry: Mineral fragments: plagioclase ($An_{88.4}$), diogenitic pyroxenes ($En_{67.4–75.9}$, $Wo_{2.0–3.0}$), spinel (cr# = 0.89), olivine ($Fa_{67–80}$). Basaltic fragments: plagioclase ($An_{85.8–93.6}$), pigeonite ($En_{37.2}$,$Wo_{7.7}$), pigeonite with augite lamellae ($En_{39.6}$,$Wo_{41.4}$). Oxygen isotopes: (R. Greenwood, *OU*) $\delta^{18}O$ = 3.34 and $\delta^{17}O$ = 1.25, $\Delta^{17}O$ = –0.48 (all ‰).

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

Type specimens: A total of 2.55 g of sample is on deposit at *MNHNP*. One thin section, one inclusion and a powder aliquot (430 mg) are on deposit at *UJM*. An anonymous finder holds the main mass.

Northwest Africa 4272

Northwest Africa
Find: December 2003
Achondrite (diogenite)

History: An anonymous collector recovered a single, complete stone in the western part of the Sahara in December 2003.

Physical characteristics: The individual is 6768 g and displays a partial fusion crust and regmaglypts.

Petrography: (A. Seddiki, *Ud'OEA* and *UJM*; M. Messaoudi, *USTHB*, Algeria; B. Moine, J. Y. Cottin, *UJM*; B. Devouard, *UBP*; M. Denise, V. Sautter, J. P. Lorand, *MNHNP*). The sample is composed of Ca-poor pyroxene containing small opaque inclusions of spinel, troilite, and metallic Fe-Ni (Ni 0.3 wt%). Specimen is crosscut by thin veins (50 μm) of plagioclase and displays small concentrations of Ca-rich pyroxene.

Mineral compositions: Ca-poor pyroxene ($Fs_{21.6–22.2}$ $Wo_{1.6–2.9}$), spinel inclusions (cr# = 0.85). Vein material: plagioclase ($An_{81.5–86.3}$), Ca-rich pyroxene ($Fs_{7.75–8.1}$, $Wo_{45.3–4537}$). Pyroxenes (Fe/Mn = 24.7 to 31.9 [atomic]). Oxygen isotopes: (R. Greenwood, *OU*) $\delta^{18}O$ = 3.78 and $\delta^{17}O$ = 1.50, $\Delta^{17}O$ = –0.46 (all ‰).

Classification: Achondrite (diogenite); minor shock and weathering.

Type specimens: A total of 20 g of sample is on deposit at *MNHNP*. One thin section is on deposit at *UBP*. An anonymous finder holds the main mass.

Northwest Africa 4294

Morocco or Algeria
Find: February 2006
Ordinary chondrite (type 3)

History: Purchased from a Moroccan dealer at the Tucson Gem and Mineral Show by A. Hupé in February 2006.

Physical characteristics: A single 84.2 g light brown stone lacking fusion crust and with abundant, large chondrules.

Petrography: (A. Irving and S. Kuehner, *UWS*) Closely packed PO and POP chondrules with a mean diameter of 1.2 mm. Chondrules contain accessory phases including Cr-bearing clinopyroxene, chromite, partially altered kamacite,

taenite, troilite, and terrestrial barite. The content of metal (+minor Fe hydroxide) is very low (mode determined by BSE imaging of a whole thin section is 3 vol%).
Geochemistry: Olivine (mostly $Fa_{2–25}$, with rim compositions up to Fa_{95}) Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two acid-washed whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O$ = 5.38, 5.31; $\delta^{17}O$ = 3.34, 3.23; $\Delta^{17}O$ = 0.508, 0.443 (all ‰). These oxygen isotopic compositions are closer to the TFL than to those of H chondrites and far removed from those of LL chondrites.
Classification: Ordinary chondrite (type 3); S1, W2.
Specimens: A total of 22 g of sample and one polished thin section are on deposit at *UWS*. *AHupé* holds the main mass.

Northwest Africa 4298
Morocco or Algeria
Find: September 2005
Ordinary chondrite (type 3)
History: Purchased from a Moroccan dealer in Erfoud by A. Hupé in September 2005.
Physical characteristics: A single 18 g light brown stone lacking fusion crust and with abundant, large chondrules.
Petrography: (A. Irving and S. Kuehner, *UWS*): Very well formed and closely packed chondrules (mean diameter 1.5 mm). Chondrules (PO and POP) contain euhedral olivine or orthopyroxene crystals with Fe-enriched rims enclosed in glassy groundmass. Accessory kamacite (some as spherical grains in chondrules), taenite and troilite. The content of metal (+minor Fe hydroxide) is very low (mode determined by BSE imaging of a whole thin section is 2 vol%). Geochemistry: Olivine ($Fa_{0–46}$) Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two acid-washed whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O$ = 5.96, 5.57; $\delta^{17}O$ = 3.78, 3.51; $\Delta^{17}O$ = 0.639, 0.573 (all ‰). Although these $\Delta^{17}O$ values are within the range for H chondrites, this specimen is much too poor in metal to be an H chondrite.
Classification: Ordinary chondrite (type 3); S1, W1/2.
Specimens: A total of 4 g of sample and one polished thin section are on deposit at *UWS*. *AHupé* holds the main mass.

Northwest Africa 4302
Algeria
Find: December 2005
Achondrite (diogenite)
History: G. Hupé purchased the meteorite in December 2005 in Tagounite, Morocco.
Physical characteristics: The sample is composed of two very fresh, yellowish-green, partly crusted stones (36 g and 10.2 g) containing visible metal in cut slices.
Petrography: (A. Irving and S. Kuehner, *UWS*) The meteorite is coarse-grained and has a partly cataclastic texture. It is composed mostly of orthopyroxene with minor olivine, plagioclase, troilite, and kamacite.
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{25.2–25.4}Wo_{3.4–3.7}$; FeO/MnO = 30.4–33.5), olivine ($Fa_{29.7}$, FeO/MnO = 48.1), and plagioclase ($An_{89.8}Or_{0.4}$).
Classification: Achondrite (diogenite).
Type specimens: A total of 9.3 g of sample and one polished thin section are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4304
Northwest Africa
Find: 2004
Achondrite (ureilite, polymict)
History: An anonymous finder recovered the specimen in the western part of the Sahara. C. Anger purchased the meteorite in Baden, Austria, in 2004.
Physical characteristics: Eighteen small fragments totaling 22.97 g were recovered.
Petrography: (A. Greshake, *MNB* and M. Kurz, *Kurz*) The meteorite is a polymict breccia with lithic and mineral clasts set into a ureilitic matrix dominated by large olivine and pigeonite crystals. Lithic clasts include ureilite material and chondritic lithologies with recognizable chondrule fragments. The meteorite contains diamonds.
Mineral compositions and geochemistry: Ureilite material: Olivine ($Fa_{1.1–22.4}$), pyroxene ($Fs_{17.8}Wo_{5.3}$). Chondritic lithologies: Olivine ($Fa_{13.6–20.4}$), pyroxene ($Fs_{12.9–14.4}$).
Classification: Achondrite (ureilite, polymict); extensive shocked, moderate weathering.
Type specimens: A total of 4.6 g plus one polished thin section are on deposit at *MNB*. *Anger* holds the main mass.

Northwest Africa 4360
Northwest Africa
Find: 2005
Rumuruti chondrite (R3.6)
History: The meteorite was recovered by an anonymous finder in the western part of the Sahara and purchased by the main mass holder in Erfoud, Morocco, in 2005.
Physical characteristics: Approximately 100 fragments totaling 308.5 g were found.
Petrography: (A. Greshake, *MNB*) Clearly defined chondrules and chondrule and mineral fragments, all embedded into a fine-grained matrix. In thin section the meteorite appears unbrecciated.
Mineral compositions: Olivine ($Fa_{34±11}$; range $Fa_{0.3–39.8}$), low-Ca pyroxene ($Fs_{16.1±5.6}$; range $Fs_{9.3–24.7}$), augite ($Fs_{9.2}Wo_{46.7}$).
Classification: Rumuruti chondrite (R3.6); S4, moderate weathering.
Type specimens: A total of 23.2 g plus one polished thin section are on deposit at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4362

Morocco
Find: 2005
Carbonaceous chondrite (CK5/6)

History: An anonymous finder collected the meteorite in the western part of the Sahara. The main mass holder purchased the sample in 2005 in Erfoud, Morocco.

Physical characteristics: One oriented stone of 60.1 g covered with fresh fusion crust was recovered.

Petrography: (A. Greshake, *MNB*) The meteorite shows a fine-grained texture with recrystallized matrix dominating over rare and mostly poorly defined chondrules and mineral fragments. Feldspar is abundant in the matrix and minor phases include Cr-rich magnetite and Ca pyroxene.

Mineral compositions and geochemistry: Olivine ($Fa_{29.9}$), low-Ca pyroxene ($Fs_{25.5}$). Oxygen isotopes (I. A. Franchi and R. C. Greenwood, *OU*): $\delta^{17}O = -4.72$, $\delta^{18}O = -0.63$, $\Delta^{17}O = -4.39$ (all ‰).

Classification: Carbonaceous chondrite (CK5/6); minimal shock, moderate to extensive weathering.

Type specimens: A total of 14.4 g plus one polished thin section are on deposit at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4372

Northwest Africa
Find: 2005
Carbonaceous chondrite (CK4)

History: An anonymous finder recovered the meteorite in the western part of the Sahara. The main mass holder purchased the sample at a mineral fair in Munich, Germany, in 2005.

Physical characteristics: One stone of 64.8 g was recovered.

Petrography: (A. Greshake, *MNB*). The meteorite consists of sharply defined chondrules, mineral fragments, and large CAIs set into a fine-grained matrix. Minor phases include feldspar, Cr-rich magnetite, and Ca-pyroxene.

Mineral compositions: Olivine ($Fa_{24.6–28.8}$); low-Ca pyroxene ($Fs_{1.2–24.1}$). Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, OU) $\delta^{17}O = -3.26$, $\delta^{18}O = 0.40$, $\Delta^{17}O = -3.46$ (all ‰).

Classification: Carbonaceous chondrite (CK4); minimal shock, extensive weathering.

Type specimens: A total of 13.5 g plus one polished thin section are on deposit at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4375

Northwest Africa
Find: 2005
Primitive achondrite (winonaite)

History: An anonymous finder collected the meteorite in the western part of the Sahara. The main mass holder purchased the sample at a mineral fair in Munich, Germany, in 2005.

Physical characteristics: A small oval stone of 12.2 g was recovered.

Petrography: (A. Greshake, *MNB*). The meteorite consists of low-Ca pyroxene, Ca-pyroxene, olivine, plagioclase, metallic Fe-Ni, and troilite. Silicate grains are often euhedral and display an equigranular texture with abundant triple junctions.

Mineral compositions and geochemistry: Olivine ($Fa_{4.4}$), low-Ca pyroxene ($Fs_5Wo_{1.5}$), Ca-pyroxene, ($Fs_{2.3}Wo_{46.2}$). Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, *OU*) Mean of two replicates $\delta^{17}O = 2.74$, $\delta^{18}O = 5.88$, $\Delta^{17}O = -0.31$ (all ‰).

Classification: Primitive achondrite (winonaite); minimal shock, moderate weathering.

Type specimens: A total of 3.9 g of sample plus one polished thin section are on deposit at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4380

Northwest Africa
Find: 2006
Achondrite (diogenite)

History: An anonymous finder recovered the meteorite in the western part of the Sahara. The main mass holder acquired the sample in Erfoud, Morocco, in 2006.

Physical characteristics: A total of 42 small fragments with a combined mass of 211.2 g were recovered.

Petrography: (A. Greshake, *MNB*). The meteorite is composed of large blocky orthopyroxene crystals. Minor phases include FeS and Mg-Al-chromite.

Mineral compositions: Low-Ca pyroxene ($Fs_{22.9}Wo_{1.5}$).

Classification: Achondrite (diogenite); moderate shock, moderate to extensive weathering.

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

Northwest Africa 4391

Northwest Africa
Find: 2005
Achondrite (eucrite, polymict)

History: An anonymous finder recovered the meteorite in northwest Africa. The main mass holder acquired the specimen in 2005 in Midelt, Morocco.

Physical characteristics: A single stone weighing 54.8 g with a grayish color and little fusion crust present was recovered.

Petrography: (A. Greshake, *MNB*). The meteorite is a polymict breccia consisting of coarse basaltic and mineral clasts set into an abundant fine-grained groundmass. Mineral fragments are dominantly large plagioclase and exsolved low-Ca pyroxene. Minor phases include silica, ilmenite, and Al,Ti-rich chromite.

Mineral compositions: Plagioclase ($An_{85.5–95.9}$) and pyroxene ($Fs_{41.7–54}Wo_{2.6–20.1}$).

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

Type specimens: A total of 11.4 g of sample plus one polished thin section are on deposit at *MNB*. *Ralew* holds the main mass.

Northwest Africa 4396
Northwest Africa
Find: 2006
Achondrite (eucrite, polymict)
History: An anonymous finder recovered the meteorite in northwest Africa. The main mass holder purchased the sample in Tagounite, Morocco.
Physical characteristics: A single stone of 680 g, partly covered with fusion crust, was recovered.
Petrography: (A. Greshake, *MNB*). The meteorite is a polymict breccia consisting of coarse- and fine-grained basaltic and mineral clasts set in a fine-grained clastic groundmass. Mineral fragments are mostly large plagioclase and exsolved low-Ca pyroxene. Minor phases include silica, ilmenite, and troilite.
Mineral compositions: Plagioclase ($An_{58.9–92.7}$) and pyroxene ($Fs_{26.8–59.3}Wo_{2.4–42.6}$).
Classification: Achondrite (eucrite, polymict); minimal shock, moderate to extensive weathering.
Type specimens: A total of 20 g of sample plus one polished thin section are on deposit at *MNB*. *Ralew* holds the main mass.

Northwest Africa 4397
Northwest Africa
Find: 2006
Achondrite (eucrite, polymict)
History: The meteorite was recovered by an anonymous finder in northwest Africa and purchased by the main mass holder in Tagounite, Morocco.
Physical characteristics: A single stone of 34 g was recovered.
Petrography: (A. Greshake, *MNB*) The meteorite consists of coarse- and fine-grained basaltic and mineral clasts embedded in a fine-grained clastic matrix. Mineral fragments are mostly plagioclase and exsolved Ca-pyroxene. Minor phases include silica, ilmenite, and troilite.
Mineral compositions: Plagioclase ($An_{68.1–92.7}$) and pyroxene ($Fs_{36.7–58.8}Wo_{8–28}$).
Classification: Achondrite (eucrite, polymict); minimum shock, moderate to extensive weathering.
Type specimens: A total of 6.8 g of sample plus one polished thin section are on deposit at *MNB*. *Ralew* holds the main mass.

Northwest Africa 4398
Morocco
Find: 2005
Achondrite (eucrite, monomict)
History: The meteorite was recovered by an anonymous finder in northwest Africa and purchased by the main mass holder in Midelt, Morocco.
Physical characteristics: A single stone of 228 g was recovered.
Petrography: (A. Greshake, *MNB*). The meteorite displays a largely unbrecciated basaltic texture with calcic plagioclase and exsolved low-Ca pyroxene being the major phases. Minor phases include silica, ilmenite, and Al,Ti-rich chromite.
Mineral compositions: Plagioclase ($An_{78.2–87.2}$) and pyroxene ($Fs_{31.2–61.1}Wo_{4.6–40.5}$).
Classification: Achondrite (eucrite, monomict); moderate shock, minimal weathering.
Type specimens: A total of 20.3 g of sample plus one polished thin section are on deposit at *MNB*. *Ralew* holds the main mass.

Northwest Africa 4399
Northwest Africa
Find: 2005
Achondrite (acapulcoite)
History: The meteorite was recovered in northwest Africa by an anonymous finder and purchased by Stefan Ralew in Midelt, Morocco, in 2005.
Physical characteristics: Many small fragments totaling 210 g were recovered.
Petrography: (A. Greshake, *MNB*) The meteorite consists dominantly of low-Ca pyroxene, olivine, augite, troilite, metallic Fe-Ni and plagioclase; minor phases include chromite and phosphates. It displays a completely recrystallized texture with abundant 120° triple junctions.
Mineral compositions: Olivine ($Fa_{7.3}$; range $Fa_{6.5–7.8}$), low-Ca pyroxene ($Fs_{8.7–9.2}Wo_{2.2–3.2}$), augite, ($Fs_{3.7–4.4}Wo_{41.3–44.3}$; up to Cr_2O_3 = 1.7 wt%). Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = 1.61, $\delta^{18}O$ = 4.87, $\Delta^{17}O$ = –0.92 (all ‰).
Classification: Achondrite (acapulcoite); minimal shock, extensive weathering. The sample may be paired with NWA 2627.
Type specimens: A total of 20.3 g of sample plus one polished thin section are on deposit at *MNB*. *Ralew* holds the main mass.

Northwest Africa 4470
Algeria
Find: July 2006
Achondrite (eucrite, basaltic, anomalous)
History: G. Hupé purchased the specimen in July 2006 in Rissani, Morocco.
Physical characteristics: The sample is made up of a total of 48 broken gray stones with a combined weight of 631 g.
Petrography: (A. Irving and S. Kuehner, *UWS*) The meteorite is composed mainly of large, distinctively zoned low-Ca pyroxene grains (≤0.8 mm) and interstitial

plagioclase, with minor silica (associated with blebby troilite), augite, chromite, and ilmenite. No metal was observed. Many pigeonite grains consist of multiple subgrains, with narrow zones of ferroan olivine along their boundaries.

Mineral compositions and geochemistry: Orthopyroxene cores ($Fs_{31.3–33.9}Wo_{4.6–5.2}$, FeO/MnO = 26.8–27.4) have sharply defined boundaries against wider, much more Fe-rich mantles of exsolved pigeonite (host orthopyroxene $Fs_{59.1–60.3}Wo_{2.9–3.9}$, FeO/MnO = 31.9–33.9); olivine along subgrain boundaries in pyroxene ($Fa_{81.7}$, FeO/MnO = 42.3); plagioclase ($An_{88.9}Or_{0.3}$).

Classification: Achondrite (eucrite, basaltic, anomalous). The ferroan olivine along grain boundaries and the gap in pyroxene compositions requires that this sample be classified as anomalous.

Type specimens: A total of 20.1 g of sample and one polished thin section are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4473

Northwest Africa
Find: July 2006
Achondrite (diogenite)

History: G. Hupé purchased a total of 32 dark stones in July 2006 in Laâyoune, Morocco.

Physical characteristics: Cut-surfaces of the stones show pale yellowish-green angular clasts (see Fig. 1) and have a combined weight of 7020 g. No fusion crust was noted for any of the specimens.

Petrography: (A. Irving and S. Kuehner, *UWS*) Breccia composed of polycrystalline clasts (≤2 cm) set in a matrix derived from several different diogenite precursors. No basaltic eucrite clasts were observed. The sample is modally dominated by orthopyroxene with subordinate olivine, augite, chromite, silica polymorph, rare calcic plagioclase, troilite, pyrrhotite, and kamacite.

Mineral compositions: Orthopyroxene compositions fall into at least three distinct populations (median compositions) $Fs_{17.2}Wo_{1.0}$, FeO/MnO = 34.4; $Fs_{21.6}Wo_{2.1}$, FeO/MnO = 29.3; $Fs_{37.2}Wo_{3.5}$, FeO/MnO = 32.6). Olivine ($Fa_{24.5}$, FeO/MnO = 50.2).

Classification: Achondrite (diogenite).

Specimens: A total of 20.1 g of sample and one polished mount are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4478

Algeria
Find: September 2006
Achondrite (lodranite)

History: G. Hupé purchased the sample in September 2006 in Zagora, Morocco.

Physical characteristics: Two dense, brown stones (298 g and 146 g) lacking fusion crust.

Fig. 1. An image of a handsample of Northwest Africa 4473.

Petrography: (A. Irving and S. Kuehner, *UWS*) This specimen is composed of large mineral and polycrystalline lithologies (up to 8 mm across) with interstitial fine-grained material of the same phases. The large minerals consist of either olivine or orthopyroxene (with clinopyroxene exsolution lamellae associated with blebs of Ni-free iron metal). The polycrystalline lithology consists mainly of interlocking olivine grains (up to 3 mm across) and sparse large chromite grains with interstitial clinopyroxene, orthopyroxene, kamacite, pyrrhotite, pentlandite, and troilite. The modal abundance of metal (+limonite after primary metal) is 5 vol%. Plagioclase is absent. Olivine grains contain numerous blebby to worm-like polycrystalline inclusions, and clinopyroxene grains contain similar inclusions; some examples exhibit symplectitic intergrowths of these various phases. Some olivine grains contain multiple blade-like lamellae of olivine of a different composition. Narrow elongate zones or discontinuous veinlets of metal are present within clinopyroxene, and adjacent to such metal the pyroxene has a more magnesian composition.

Mineral compositions and geochemistry: Olivine ($Fa_{10.6–10.9}$; FeO/MnO = 22.1–23.9), clinopyroxene ($Fs_{3.9}Wo_{41.9}$; FeO/MnO = 10.2), orthopyroxene lamella in clinopyroxene ($Fs_{9.1}Wo_{1.3}$; FeO/MnO = 11.9) and chromite (Cr/[Cr + Al] = 0.822–0.825; Mg/[Mg + Fe] = 0.506–0.520, TiO_2 = 0.31–0.37 wt%). Oxygen isotopes: (D. Rumble, *CIW*) Quadruplicate analyses by laser fluorination gave, respectively, $\delta^{18}O$ = 2.23, 2.43, 2.23, 2.40; $\delta^{17}O$ = 0.14, 0.30, 0.07, 0.11; $\Delta^{17}O$ = –1.034, –0.984, –1.107, –1.147 (all ‰).

Classification: Achondrite (lodranite).

Type specimens: A total of 20.1 g of sample and one polished thin section are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4480

Algeria
Find: Summer 2006
Achondrite (Martian, basaltic shergottite)

History: The sample was recovered in Algeria in the summer

of 2006. G. Hupé purchased it in Tagounite, Morocco, in September 2006.

Physical characteristics: The meteorite is a single, very fresh 13 g ellipsoidal stone, mostly coated by dark brown fusion crust. Maskelynite, yellow-green olivine and tan-colored pyroxene are visible on cut face.

Petrography: (A. Irving and S. Kuehner, *UWS*) The stone is mostly a relatively fine-grained (mean grain size 0.15 mm) basaltic rock, but with several coarser grained, glomerocrystic regions. The dominant matrix consists of plagioclase laths (maskelynite), olivine and complexly zoned clinopyroxene with accessory Ti-chromite, ilmenite, Mg-Fe–bearing merrillite and rare Si-rich glass or silica polymorph. Glomerocryst regions are composed of coarser (0.5–0.8 mm) plagioclase (maskelynite) and olivine with interstitial pigeonite and ilmenite.

Mineral compositions and geochemistry: Matrix-clinopyroxene is patchily zoned from augite cores ($Fs_{24.9–31.2}Wo_{35.3–31.1}$, FeO/MnO = 30–32) to pigeonite rims ($Fs_{55.4–56.4}Wo_{17.5–15.4}$, FeO/MnO = 36); olivine ($Fa_{67.9–79.2}$, FeO/MnO = 49–52); plagioclase ($An_{58.40–61.0}$ $Or_{1.6}$). Plagioclase in glomerocryst regions is consistently more calcic ($An_{66.3–68.5}Or_{0.3}$). Bulk composition (R. Korotev, *WUSL*): INAA of two ~37 mg whole fragments of matrix gave Na 1.40 wt%, Fe 15.8 wt%, and (in ppm) Sc 39.7, Cr 1027, Ni <60, La 1.85, Sm 2.69, Eu 0.86, Tb 1.05, Yb 4.16, Hf 3.16, Th 0.24; the REE pattern shows moderate light REE depletion, elevated heavy REE abundances and a negative Eu anomaly.

Classification: Achondrite (Martian, basaltic shergottite).

Type specimens: A total of 2.6 g of sample is on deposit at *UWS*. *PSF* holds the main mass (6.63 g).

Northwest Africa 4482

Algeria
Find: August 2006
Pallasite (main group)

History: G. Hupé purchased the sample in August 2006 in Tagounite, Morocco.

Physical characteristics: The meteorite consists of a total of 30 dark, magnetic fragments containing yellowish-green silicate in a dark brown matrix. The fragments have a combined weight of 5816 g.

Petrography: (A. Irving and S. Kuehner, *UWS*) Large olivine grains (up to 8 mm across) with interstitial, porous, banded iron hydroxides enclosing sparse angular grains of terrestrial quartz, and accessory chromite, schreibersite and fresh metal (both kamacite and taenite).

Mineral compositions and geochemistry: Olivine ($Fa_{12.2–13.0}$, FeO/MnO = 41.1–42.5). Oxygen isotopes: (D. Rumble, *CIW*) analysis of acid-washed handpicked olivine by laser fluorination gave $\delta^{18}O = 3.65$, $\delta^{17}O = 1.72$, $\Delta^{17}O = –0.198$ (all in ‰).

Classification: Pallasite (main group). The original metal in this specimen is almost entirely weathered to iron hydroxides.

Specimens: A total of 20.1 g of sample, one polished thin section and one polished mount are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4484

Algeria
Find: June 2006
Achondrite (eucrite, basaltic)

History: S. Ralew purchased the specimens in June 2006 in Rissani, Morocco.

Physical characteristics: The meteorite consists of seven broken fragments of a dark gray stone with a combined weight of 140 g.

Petrography: (A. Irving and S. Kuehner, *UWS*) The thin section studied shows an ophitic texture, with large (≤1.3 mm) pyroxene grains (composed of orthopyroxene with fine augite exsolution lamellae or patchy intergrowths of orthopyroxene with augite) and distinctive, thin plagioclase laths (commonly in radiating clusters). Interstitial mesostasis regions contain silica, ilmenite, troilite, and minor Ni-free kamacite (partly altered to brown iron hydroxides).

Mineral compositions and geochemistry: Augite ($Fs_{32.4–32.8}Wo_{41.2–41.3}$; FeO/MnO = 32.7–36.7), orthopyroxene ($Fs_{64.9}Wo_{2.9}$; FeO/MnO = 32.2) and plagioclase ($An_{86.0–90.5}Or_{0.2–0.5}$).

Classification: Achondrite (eucrite, basaltic).

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

Northwest Africa 4486

Morocco or Algeria
Find: September 2005
Ordinary chondrite (type 3)

History: Purchased at the Denver Mineral Show by A. Hupé in September 2004.

Physical characteristics: A single 21.3 g light brown stone lacking fusion crust and with abundant, small chondrules.

Petrography: (A. Irving and S. Kuehner, *UWS*): Closely packed, round PO and POP chondrules (mean diameter 0.8 mm) with accessory, partially altered kamacite, troilite and pentlandite. The content of metal (+minor Fe hydroxide) is very low (mode determined by BSE imaging of a whole thin section is 2 vol%).

Geochemistry: Olivine ($Fa_{5–29}$), orthopyroxene ($Fs_{0.5–30}Wo_{1.6}$). Oxygen isotopes: (D. Rumble, *CIW*) analyses of two acid-washed whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O = 5.11$, 5.51; $\delta^{17}O = 3.15$, 3.29; $\Delta^{17}O = 0.465$, 0.400 (all ‰). These oxygen isotopic compositions are closer to the TFL than those of H chondrites and far removed from those of LL chondrites.

Classification: Ordinary chondrite (type 3); S1, W1/2.

Specimens: A total of 4.6 g of sample and one polished thin section are on deposit at *UWS*. *AHupé* holds the main mass.

Northwest Africa 4506

Northwest Africa
Find: October 2006
Pallasite (main group)

History: Michael Farmer purchased the sample in Denver, Colorado, in October 2006.

Physical characteristics: The meteorite was a fragment with a total mass of 23.12 g. The exterior color of the meteorite was orange and contains numerous by dark veins, as it was mainly olivine with veins of oxidized metallic Fe-Ni.

Petrography: (D. Schrader, M. Killgore, and D. Lauretta, *UAz*) The meteorite contains olivine, Fe, Ni-rich metal, chromite, sulfide, and FeO. The olivine (2.2–3.2 mm) grains are surrounded by weathered remnant metal veins.

Mineral compositions and geochemistry: (D. Schrader, M. Killgore, D. Lauretta, K. Domanik, and D. Hill at *UAz*) Olivine ($Fo_{86.3–86.8}$; average = $Fo_{86.5±0.2}$), kamacite (average Ni = 4.96 ± 1.60 [3.47 to 7.76] and average Co = 0.86 ± 0.04 [0.81–0.92] all wt%) and one taenite analysis (Ni = 20.75 and Co = 0.54 [both wt%]). Reliable analyses on chromite and troilite were not possible due to weathering.

Classification: Pallasite (main group).

Type specimens: A total of 8.17 g of sample is on deposit at *UAz* (UA2059). *Farmer* holds the main mass.

Northwest Africa 4507

Morocco
Find: 2005
Achondrite (ureilite)

History: Purchased in 2006 at the Tucson Gem and Mineral Show.

Physical characteristics: Total mass, 85.0 g, a deformed parallel piped piece with smaller top surface, 68 × 24 × 24 mm in size, external color is dark brown and no fusion crust is apparent.

Petrography: (H. Takeda, *Chiba*). The sample consists of olivine (up to 2.3 × 1.7 mm in size) and pyroxene. One PTS shows a typical ureilite texture with carbonaceous veins, in which Fe metal and sulfide are present. Approximately one-third of mafic silicates are pigeonite. A part of carbonaceous veins intrudes into an olivine crystal as a plate. Olivine crystals have minor cracks, but shock effect is minor. Some pigeonite grains show a twin texture.

Mineral compositions: Olivine $Fo_{79–82}$ (core) and $>Fo_{90}$ (rims). Major pyroxenes have pigeonite compositions ($Fs_{19}Wo_{10}$). A large olivine crystal contains a small ellipsoidal inclusion of pigeonite, 0.26 × 0.20 mm, with small regions of high-Ca ($Fs_{14}Wo_{35}$) and low-Ca ($Fs_{17.3}Wo_{4.8}$). Pyroxenes enclosed in thick rims of the small ellipsoidal inclusion of pigeonite within the olivine grain; another ellipsoidal inclusion (0.16 × 0.09 mm) has low-Ca pyroxene composition ($Fs_{18.5}Wo_{4.6}$). Microscopic observations and Raman analyses (T. Nakamuta, *KyuU*) show tiny diamond crystals occurring in blade-shaped graphite crystals.

Classification: Achondrite (ureilite); minimum weathering, minimum shock.

Type specimen: A total of 17.22 g of sample and one thin section are on deposit at *NSMT*. *Hori* holds the main mass.

Northwest Africa 4508

Northwest Africa
Find: 2001
Achondrite (ureilite)

History: Purchased in Rissani, Morocco in April 2001.

Physical characteristics: One subrounded blocky mass (5 × 3 × 2 cm) of 182 g and covered with dark brown, moderately weathered fusion crust.

Petrography: (H. Takeda, *Chiba* and A. Yamaguchi, *NIPR*). The sample contains fine-grained, granoblastic olivine, partly darkened pyroxene with carbonaceous (graphite) veins at grain boundaries. Minor weathering and heavily shocked. A few grains of pyroxene or olivine crystals form larger grains (0.7 × 0.4 to 3 × 1 mm). An original olivine crystal is broken into many very fine crystallites to show a granoblastic texture. There is an unusual texture of pyroxene crystals found in one of the sections studied.

Mineral compositions and geochemistry: Olivine ($Fo_{83–86}$ [cores], up to Fo_{89} [rims]); pigeonite ($Fs_{14}Wo_{7}$; $Wo_{6–10}$ range). Oxygen isotopes: (M. Kusakabe, *OkaU*) $\delta^{17}O$ = 2.97, $\delta^{18}O$ = 7.66 (both ‰).

Classification: Achondrite (ureilite).

Type specimen: A total of 20.2 g of sample and one thin section are on deposit at *NIPR*. *Fectay* holds the main mass.

Northwest Africa 4519

Morocco
Find: 2001
Achondrite (ureilite)

History: Purchased in Zagora, Morocco in 2001.

Physical characteristics: The deformed conical shaped mass (114 g; 6.5 × 3.5 cm) is partially fusion-crusted.

Petrography: (H. Takeda, *Chiba* and A. Yamaguchi, *NIPR*). It contains olivine and pyroxene with carbonaceous veins at grain boundaries. Mafic silicate crystals seem to show a preferred orientation, two to three crystals up to 4.2 × 1.4 mm in size are joined with common elongation direction without carbonaceous veins to form a large aggregate (~4.2 × 3.8 mm) with carbonaceous materials around it.

Mineral compositions and geochemistry: Olivine ($Fo_{83–80}$ [cores]; Fo_{89} [rims]), pyroxene ($Fs_{16.7}Wo_{8.6}$). Oxygen isotopes: (M. Kusakabe, *OkaU*), $\delta^{17}O$ = 3.29, $\delta^{18}O$ = 8.20 (both ‰).

Classification: Achondrite (ureilite); minimal weathering.

Type specimen: A total of 20 g of sample and two thin sections are on deposit at *NIPR*. *Fectay* holds the main mass.

Northwest Africa 4523
Al Nif, Morocco
Find: April 2001
Achondrite (eucrite, basaltic)
History: Carine and Bruno Fectay purchased the rock in Al Nif, Morocco in April 2001.
Physical characteristics The very fresh stone weights 174 g and is nearly covered with fusion crust. The interior of the stone is light gray in color and displays a brecciated texture with dark clasts ranging from a few mm to about 1.5 cm.
Petrography: (J. A. Barrat and M. Bohn, *IUEM*; A. Yamaguchi, *NIPR*) Two types of clasts are found in a fine-grained recrystallized matrix: medium-grained ophitic/subophitic and fine-grained clasts. Medium-grained clasts (~1–2 mm) display a subophitic texture, and are composed of plagioclase, pyroxene (pigeonitic core and augitic rim), silica, ilmenite, chromite, and recrystallized mesostasis. Fine-grained clasts consist of pyroxene phenocrysts (~150 μm in diameter) in a fine-grained groundmass that consists of plagioclase, pigeonite, augite, silica, ilmenite, troilite, and K-feldspar.
Geochemistry: (J. A. Barrat, M. Benoit, J. Cotton, *IUEM* and A. Yamaguchi, *NIPR*). Mineral phases in clasts and matrix have identical composition; pyroxenes ($Mg_{35.9}Ca_{4.7}Fe_{59.4}$ to $En_{30.2}Wo_{43.3}Fs_{26.5}$; FeO/MnO = 34 [n = 265]) and plagioclase ($An_{90–71}$). Bulk composition: $FeO_{total}/MgO = 2.84$ (ICP-AES) close to typical main group eucrites but exhibits the highest concentrations in $K_2O = 0.15$ wt% measured in eucrites. Moreover, it is richer in $TiO_2 = 1.35$ wt% (ICP-MS) and incompatible trace elements relative to Stannern. Its REE element pattern is flat ($L_{an}/Y_{bn} = 1.29$) and displays a marked negative Eu anomaly (Eu/Eu* = 0.62). Bulk oxygen isotopic: (R. C. Greenwood, I. A. Franchi, *OU*) composition is $\delta^{17}O = 1.757 \pm 0.004$, $\delta^{18}O = 3.791 \pm 0.013$, $\Delta^{17}O = –0.230 \pm 0.003$ (all ‰).
Classification: Achondrite (eucrite, basaltic) and lies on the Stannern trend.
Type specimens: A total of 21 g of sample and one thick section are on deposit at *IUEM*. *Fectay* holds the main mass.

Northwest Africa 4527
Algeria
Find: Summer 2006
Achondrite (Martian, basaltic shergottite)
History: The stones were recovered in Algeria in summer 2006, and G. Hupé purchased them in M'Hamid, Morocco, in July 2006.
Physical characteristics: The meteorite consists of two broken, brown stones weighing 10.06 g. The stones have weathering rinds ~2 mm thick.
Petrography: (A. Irving and S. Kuehner, *UWS*) Olivine occurring with either prismatic low-Ca pyroxene phenocrysts or chromite microphenocrysts is set in a matrix of pigeonite, maskelynite, Ti-chromite, ilmenite, merrillite, and pyrrhotite. Minor veinlets of calcite and barite are present.
Mineral compositions: Olivine phenocrysts are zoned from $Fa_{19.8–22.4}$ (cores) to $Fa_{49.2–50.9}$ (rims) (FeO/MnO = 41–56); pyroxene phenocrysts are zoned from orthopyroxene cores ($Fs_{22.8}Wo_{4.1}$, FeO/MnO = 40) to pigeonite rims ($Fs_{40.1}Wo_{11.9}$, FeO/MnO = 40); olivine microphenocrysts $Fa_{32.7}$ (FeO/MnO = 51); maskelynite ($An_{53.7–66.4}$ $Or_{0.7–0.1}$); matrix chromite is relatively Ti-rich, whereas chromite occurring as microphenocrysts and as inclusions in olivine phenocrysts is Ti-poor and Mg-rich.
Classification: Achondrite (Martian, basaltic shergottite).
Type specimens: A total of 2.1 g of sample and one thin section are on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4531
Morocco or Algeria
Find: September 2005
Ordinary chondrite (type 3)
History: Purchased at the Denver Mineral Show by A. Hupé in September 2005.
Physical characteristics: Three light brown stones (total weight 38.9 g) lacking fusion crust and with abundant large chondrules.
Petrography: (A. Irving and S. Kuehner, *UWS*) Closely packed PO and POP chondrules with a mean diameter 1.0 mm. Chondrules contain accessory phases such as partially altered kamacite, taenite, and troilite. The content of metal (+minor Fe hydroxide) = 2 vol%.
Geochemistry: Olivine ($Fa_{4–27}$) Oxygen isotopes: (D. Rumble, *CIW*) Analysis of an acid-washed whole rock sample by laser fluorination gave $\delta^{18}O = 5.25$, $\delta^{17}O = 3.47$, $\Delta^{17}O = 0.709$ (all ‰). Although these $\Delta^{17}O$ values are within the range for H chondrites, this specimen is much too poor in metal to be an H chondrite.
Classification: Ordinary chondrite (type 3); S1, W1/2.
Specimens: A total of 7.8 g of sample and one polished thin section are on deposit at *UWS*. *AHupé* holds the main mass.

Northwest Africa 4587
Algeria
Find: September 2006
Achondrite (ungrouped)
History: G. Hupé purchased the rock in September 2006 in Erfoud, Morocco.
Physical characteristics: The meteorite comprises a single, dense stone (530 g) without fusion crust. The main constituent (pyroxene) is a distinctive deep brown color and several large opaque grains are visible.
Petrography: (A. Irving and S. Kuehner, *UWS*) Granular texture with large pyroxene grains (pigeonite with numerous

fine, parallel exsolution lamellae of clinopyroxene), and interstitial polycrystalline plagioclase (with rims of silica against pyroxene). Accessory minerals are skeletal ilmenite, merrillite, Ni-bearing pyrrhotite and rare kamacite. One large oikocryst of ilmenite + Ti-chromite contains numerous chadacrysts of plagioclase and has narrow rims of fayalitic olivine adjacent to surrounding pyroxene.

Mineral compositions: Pyroxene consists of host pigeonite ($Fs_{63.4}Wo_{6.9}$ FeO/MnO = 67.6, TiO_2 = 0.49 wt%) and lamellae of clinopyroxene ($Fs_{35.4}Wo_{38.9}$, FeO/MnO = 69.4, TiO_2 = 0.90 wt%); plagioclase (An_{85}); olivine rim adjacent to ilmenite ($Fa_{81.9}$, FeO/MnO = 112).

Classification: Achondrite (ungrouped). This very fresh stone is essentially identical to NWA 011, NWA 2400, and NWA 2976, and evidently is paired with them.

Specimens: A total of 20 g of sample is on deposit at *UWS*. *GHupé* holds the main mass.

Northwest Africa 4590 30°19.025′N, 4°56.573′W

Morocco/Algeria
Find: June 2006
Achondrite (angrite)

History: Scattered fragments from a small stone which appears to have shattered upon landing recently were recovered from an area of ~40 m^2 in the Morocco-Algeria border zone, 21 km SSW of Tamassint oasis and 18 km S of Agoult, Morocco. G. Hupé purchased all the recovered material in June 2006 in Tagounite, Morocco. He then traveled to Tamassint and was shown the location by the original find and measured GPS coordinates.

Physical characteristics: Fragments totaling 212.8 g of a very friable specimen composed of coarse yellow-green, black and white grains; very fresh with preserved shiny, black fusion crust on some pieces, and minor pale orange terrestrial weathering coatings on some broken surfaces.

Petrography: (A. Irving and S. Kuehner, *UWS*) Coarse-grained (mostly 0.6–1.6 mm, but some olivine grains up to 12 mm) with a cumulate texture and composed of clinopyroxene (33 vol%, with rare pigeonite exsolution lamellae), pure anorthite (28 vol%), olivine (14 vol%, with prominent subparallel exsolution lamellae 10–50 microns wide of kirschsteinite), kirschsteinite (5 vol%, with thin exsolution lamellae of olivine), ulvöspinel (18 vol%), and accessory glass, troilite merrillite, Ca silicophosphate, and kamacite (making up the remaining 5 vol%). Some anorthite occurs as subhedral grains partially enclosed within large ulvöspinel grains, but most occurs as intercumulus aggregates. Clinopyroxene is strongly zoned with paler-colored, corroded cores surrounded by darker purple-brown mantles and distinct rims. Thin (5–50 μm wide) discontinuous, curvilinear zones of glass are present on some grain boundaries (notably those between anorthite and ulvöspinel, but also around and cutting across troilite grains), and are associated with secondary clinopyroxene, kirschsteinite, olivine, anorthite, and troilite grains; these films of glass + daughter minerals truncate kirschsteinite exsolution lamellae in adjacent olivine. This angrite is unlike other known specimens, having neither a fine-grained quench or ophitic/intersertal basaltic texture nor a coarse metamorphic texture.

Mineral compositions and geochemistry: Clinopyroxene ($Fs_{20.8–33.3}Wo_{53–54.9}$; FeO/MnO = 85–278), olivine host ($Fa_{72.6–74.7}Ln_{3.5–3.6}$; FeO/MnO = 70–87), kirschsteinite lamellae ($Fa_{44.7–45.4}Ln_{46–47.2}$; FeO/MnO = 73–82), kirschsteinite host ($Fa_{46.6–47.5}Ln_{43.6–45.5}$; FeO/MnO = 63–68), olivine lamellae ($Fa_{75–76.7}Ln_{2.7–2.8}$; FeO/MnO = 71–74). Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two aliquots of acid-washed mineral fragments by laser fluorination gave, $\delta^{18}O$ = 3.845, 3.881; $\delta^{17}O$ = 1.927, 1.967; $\Delta^{17}O$ = 0.0956, 0.0745 (all ‰).

Classification: Achondrite (angrite).

Specimens: A total of 20.01 g of sample, two polished thin sections and two polished mounts are on deposit at *UWS*, and 4 g at *PSF*. *GHupé* holds the main mass.

Northwest Africa 4615

Northwest Africa
Find: 2006
Rumuruti chondrite (R3.4)

History: The meteorite was recovered by an anonymous hunter in the western part of the Sahara and purchased by J. Nauber in Morocco in 2006.

Physical characteristics: A 10.5 g stone.

Petrography: (A. Greshake, *MNB*) Various textural types of chondrules with clearly defined outlines as well as chondrule and mineral fragments, all embedded in a dark, fine-grained matrix. The meteorite appears unbrecciated in the thin section studied.

Mineral compositions: Olivine ($Fa_{23.9±14.7}$; range $Fa_{2.4–41.5}$), low-Ca pyroxene ($Fs_{14.5±6.9}$; range $Fs_{3.8–25.3}$).

Classification: Rumuruti chondrite (R3.4); S2, moderate weathering.

Type specimens: A total of 2.9 g of sample plus one polished thin section are on deposit at *MNB*. *JNMC* holds the main mass.

Northwest Africa 4619

Northwest Africa
Find: 2006
Rumuruti chondrite (R3–5)

History: The meteorite was collected by an anonymous finder in the western part of the Sahara and bought by J. Nauber in Morocco in 2006.

Physical characteristics: A 704 g stone.

Petrography: (A. Greshake, *MNB*) A brecciated chondrite with dark and brighter lithologies ranging from petrological type 3 to 5.

Mineral compositions: Olivine (Fa_{36}; range $Fa_{23–39}$), low-Ca pyroxene ($Fs_{18.2}$; range $Fs_{9.7–29.6}$).

Classification: Rumuruti chondrite (R3–5); S2, moderate weathering.
Type specimens: A total of 20.8 g of sample plus one polished thin section are on deposit at *MNB*. *JNMC* holds the main mass.

Northwest Africa 4624
Northwest Africa
Find: 2006
Achondrite (eucrite)
History: The meteorite was recovered by an anonymous collector in the northern part of the Sahara and bought by Jürgen Nauber in Ensisheim, France, in 2006.
Physical characteristics: Two stones totaling 175 g.
Petrography: (A. Greshake, *MNB*). An unbrecciated achondrite mainly consisting of exsolved pyroxene and calcic plagioclase displaying a cumulate texture. Minor phases include chromite, pyrrhotite, troilite, and SiO_2. The meteorite contains several dark shock veins.
Mineral compositions: Pyroxene ($Fs_{35.5–43.3}Wo_{2.7–15.6}$) and plagioclase ($An_{91.1–93}$).
Classification: Achondrite (eucrite); extensive shock; moderate weathering.
Type specimens: A total of 21.5 g of sample plus one polished thin section are on deposit at *MNB*. *JNMC* holds the main mass.

Northwest Africa 4636
Northwest Africa
Find: 2005
Mesosiderite
History: The meteorite was collected by an anonymous finder in the western part of the Sahara and bought by the main mass holder at a meteorite fair in Germany from two different dealers.
Physical characteristics: Several dark stones totaling 2850 g.
Petrography: (A. Greshake, *MNB* and M. Kurz, *Kurz*). The stony portion of the meteorite consists of dominant pyroxene, plagioclase, and phosphates. Minor phases include troilite, silica, and small metallic Fe-Ni grains. Metal is mostly kamacite.
Mineral compositions and geochemistry: Pyroxene ($Fs_{31.1–35.0}$ $Wo_{4.8–9.1}$), plagioclase ($An_{94.5}$; range $An_{91.8–95.5}$). Oxygen isotopes: (I. A. Franchi and R. C. Greenwood, *OU*) The mean of two replicates $\delta^{17}O = 2.09$, $\delta^{18}O = 4.38$, $\Delta^{17}O = –0.19$ (all ‰).
Classification: Mesosiderite; minimal shock and moderate weathering.
Type specimens: A total of 29 g of sample plus one polished thin section are on deposit at *MNB*. The anonymous purchaser holds the main mass.

Northwest Africa 4677
Northwest Africa
Find: July 2006
Achondrite (eucrite, monomict)
History: F. Béroud purchased the meteorite in July 2006 at Ste Marie-aux-Mines, France. According to the Moroccan seller, the meteorite was found in the Sahara and other pieces had been previously sold.
Physical characteristics: A single, complete, partially crusted stone weighing 156.4 g.
Petrography: (A. Seddiki, *Ud'OEA* and *UJM*; B. Moine, J. Y. Cottin, *UJM*; B. Devouard, *UBP* and M. Denise, *MNHNP*). The rock is brecciated and transected by impact melt veins. Undeformed clasts mostly consist of pyroxene and plagioclase grains (1–4 mm) with a cumulative texture. The pyroxenes are pigeonites with very fine (<1 μm) exsolution lamellae. These clasts are embedded in a finer grained clastic matrix of the same nature. Accessory phases include spinel and taenite-kamacite-troilite assemblages and silica.
Mineral compositions and geochemistry: Spinel (Fe,Ti-rich chromite, Cr_2O_3 = 45 wt%), plagioclase (An_{91}), pigeonite ($Fs_{41.20–42.40}Wo_{7–10}$), pyroxene (Fe/Mn = 27–32). Kamacite (Ni = 4.9) and taenite (Ni = 38.5–44.6, both wt%).
Classification: Achondrite (eucrite, monomict); S3, minimal weathering. The meteorite is similar to Dhofar 007 and EET 92023.
Type specimens: A type specimen of 20.2 g is on deposit at *MNHNP* and two sections are kept at *UBP*. *Béroud* holds the main mass.

Northwest Africa 4678
Morocco
Find: August 2006
Achondrite (diogenite)
History: F. Béroud purchased the meteorite in August 2006 in Rissani, Morocco.
Physical characteristics: A 3.60 g individual, oriented, nearly complete stone with black fusion crust over approximately 90% of the specimen.
Petrography: (A. Seddiki, *UO* and *UJM*; B. Moine, J. Y. Cottin, *UJM*; B. Devouard, *UBP*; M. Denise, *MNHNP*). The stone is composed predominantly of Ca-poor pyroxene with small inclusions of spinel and troilite.
Mineral compositions and geochemistry: Ca-poor pyroxene ($Fs_{29.8–28.6}Wo_{3.5–4.1}$), pyroxene (Fe/Mn = 26.4–31.8 [atomic]). Spinel Ti-poor chromite (Cr_2O_3 = 56 wt%).
Classification: Achondrite (diogenite); minimum shock and weathering.
Type specimens: The main mass of 3.34 g is deposited at *MNHNP* and one thin section is kept at *UBP*.

Northwest Africa 4693
Morocco
Find: 2006
Rumuruti chondrite (R3–6)
History: The meteorite was recovered by an anonymous finder in western part of the Sahara and bought by the main mass holder in Erfoud, Morocco, in 2006.
Physical characteristics: One stone weighting 866.2 g.
Petrography: (A. Greshake, *MNB*). A brecciated chondrite with pronounced dark and brighter lithologies ranging from petrological type 3 to 6.
Mineral compositions: Olivine ($Fa_{24.3}$; range $Fa_{4.6–39.2}$) and low-Ca pyroxene (Fs_{30}; range $Fs_{2.3–34.7}$).
Classification: Rumuruti chondrite (R3–6); S2, moderate weathering.
Type specimens: A total of 24.3 g of sample plus one polished thin section are on deposit at *MNB*. *HSSH* holds the main mass.

Northwest Africa 4747
Morocco
Find: 2001
Mesosiderite
History: Purchased in Alnif, Morocco, in 2001 by B. Fectay.
Physical characteristics: A single rounded stone of 1.2 kg with no fusion crust.
Petrography: (A. Yamaguchi, *NIPR*). The thin section reveals a breccia composed of silicate fragments (<1 mm) (~80 vol%) in a matrix of Fe, Ni-rich metal and minor troilite. There are a few large nodules of metallic Fe-Ni (<several mm). The silicate fragments are mainly pyroxene, plagioclase, and minor silica minerals.
Mineral compositions: (A. Yamaguchi, *NIPR*). Low-Ca pyroxene ($Fs_{28.3–32.5}Wo_{0.8–2.6}$; FeO/MnO = ~30) and plagioclase ($An_{87.9–90.7}$).
Classification: Mesosiderite.
Type specimens: A total of 20.9 g of sample and one thin section is on deposit at *NIPR*. *Fectay* holds the main mass.

A list of all meteorites approved from Northwest Africa is presented in Table 2.

THE AMERICAS

North America

Richland (Fredericksburg)
A 47 kg iron meteorite was reportedly found near Fredericksburg, Texas. Chemical analysis (Wasson et al. 2007) showed that it is indistinguishable from Richland, a 13.6 kg IIAB iron that was found ~300 km away. It is likely that these meteorites are paired and that one (or both) masses were transported by humans from their original find locations. Henceforth, the name Fredericksburg shall be an unofficial synonym for Richland. The new mass may be referred to as "Richland (Fredericksburg)." A total of 213 g is on deposit at *UCLA*.

South America

Peru

Cerro La Tiza 14°31′59.56″S, 75°46′30.40″W
Cerro La Tiza, Ica, Peru
Find: September 14, 2002
Ordinary chondrite (H4)
History: K. Hönninger and N. Diaz Zegarra recovered this meteorite in the course of an expedition.
Physical characteristics: The meteorite consists of three pieces with a total mass of 3740 g (3475 g, 235 g, and 30 g). Fragments are irregularly formed, shiny and of brownish color with very small black patches of fusion crust left.
Petrography: (S. P. Schwenzer, *MPI* and J. Zipfel, *SNG*) Sharply defined chondrules up to 0.8 cm in diameter. In rare chondrules turbid glass is observed. Fragments are fractured. Along cracks weathering is more pronounced.
Mineral compositions and geochemistry: Olivine ($Fa_{17.9±0.2}$) and pyroxene ($Fs_{15.9±0.4}$), both homogeneous.
Classification: Ordinary chondrite (H4); S3, W3.
Type specimens: A total of 97 g of sample and one thin section on deposit at *MPI*. The finders hold the main mass.

ANTARCTICA

ANSMET

Meteorites collected by Antarctic Search for Meteorites (ANSMET) teams and their collaborators between 1976 and 1981 officially have the letter A before their number, e.g., Allan Hills A77307, abbreviated ALHA77307. However, the use of this letter A is henceforth to be considered optional. Thus, Allan Hills 77307, abbreviated ALH 77307, is equally correct and equivalent to the official name and abbreviation.

Table 3 lists 1213 meteorites recovered from Antarctica by the ANSMET program during the 2003 through 2005 seasons. For more information on these meteorites, please visit the curation home page of the Johnson Space Center, National Aeronautic and Space Administration, at http://curator.jsc.nasa.gov.

PNRA

Table 4 lists meteorites collected by the Italian team, Programma Nazionale Ricerche in Antartide (PNRA) recovered from the Allan Hills blue ice field (Victoria Land, Antarctica) in November 2006. Mineralogy and classification

performed by L. Folco (*MNA-SI*) and P. Rochette (*CEREGE*). Magnetic classification was conducted according to Rochette et al. (2003) and Folco et al. (2006) using a SM30 susceptivimeter. All main masses and type specimens are on deposit at *MNA-SI*.

PRIC

Table 5 lists meteorites collected by the Chinese Antarctic Expedition to Grove Mountains, Antarctica, in 2006 and submitted through the Polar Research Institute of China (*PRIC*).

Grove Mountains 052049 72°46′23″N, 75°20′8″E
Grove Mountains, Antarctica
Find: January 16, 2006
Ordinary chondrite (L5)
History: X. Liu recovered the stone in a large moraine west to the northern part of Gale Escarpment in Grove Mountains.
Physical characteristics: It is a round stone mostly covered with fusion crust. The meteorite weights 96.7 g. Magnetic susceptibility: $\log\chi = 4.60 \times 10^{-9}$ m^3/kg.
Petrography: (Y. Lin, B. Miao, S. Hu, and L. Feng, *IGGCAS*). It contains large melt veins (>3 mm thick) with abundant rounded silicate clasts embedded in microcrystalline matrix. Olivine grains in the melt veins common have FeO-rich ringwoodite rims and FeO-poor wadsleyite interiors. Chondrules in the unmolten parts are recognized.
Mineral compositions: olivine ($Fa_{24.0\pm0.4}$); low Ca-pyroxene ($Fs_{20.6\pm0.5}$).
Classification: Ordinary chondrite (L5); S6, W1
Type specimen: All of the mass is on deposit at *PRIC*.

Grove Mountains 055364 72°59′36″N, 75°13′6″E
Grove Mountains, Antarctica
Find: January 9, 2006
Mesosiderite
History: X. Chen recovered the meteorite in a large moraine west of the middle of the Gale Escarpment in Grove Mountains.
Physical characteristics: A 396.4 g meteorite with a round shape and many concaved areas. Part of the black fusion crust remains.
Petrography: (Y. Lin, B. Miao, S. Hu, and L. Feng, *IGGCAS*). It contains 23.9 vol% metallic Fe-Ni. The silicate part consists mainly of low-Ca pyroxene (61.8 vol%), plagioclase (32.3 vol%), and silica (5.9 vol%), with minor olivine, chromite, and phosphates. Olivine occurs as clasts with embayed outlines and is surrounded by layers of low-Ca pyroxene and fine-grained chromite. Low-Ca pyroxene grains are nearly homogeneous, without exsolved lamellae of Ca-pyroxene. Phosphates commonly occur along the boundaries of Fe,Ni-rich metal with minor schreibersite.
Mineral compositions and geochemistry: Olivine ($Fa_{27.9\pm3.1}$; FeO/MnO = 37 ± 3), low Ca-pyroxene ($Fs_{29.5\pm3.8}$; FeO/MnO = 22 ± 2), and plagioclase ($An_{88.7–90.3}Ab_{9.0–11.1}$).
Classification: Mesosiderite; minimal weathering.
Type specimens: The entire sample is on deposit at *PRIC*.

ASIA

Arabian Peninsula
The Meteoritical Bulletin announces a new name series, Arabian Peninsula (AP), approved after considerable debate by the Nomenclature Committee of the Meteoritical Society.

The five approved meteorites listed below, along with reportedly 18 ordinary chondrites, were recovered near the Rub al-Khali Desert (Empty Quarter) by workers in 2005 and 2006. They were all sent to an anonymous American collector for verification in August 2006.

Arabian Peninsula 001
United Arab Emirates
Find: 2006
Achondrite (diogenite)
History and physical characteristics: This 145 g stone is very fresh with black crust and flow ridges.
Petrography: (T. Bunch and J. Wittke, *NAU*) Unbrecciated medium-grained orthopyroxenite with inclusions of euhedral chromite crystals. Contains 94 vol% orthopyroxene, 4 vol% chromite, 2 vol% FeS, and trace olivine. Orthopyroxene exhibits heavy undulatory extinction, shear zones show intense granulation and distortion of minerals.
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{21.6}Wo_{2.0}$; FeO/MnO = 29), olivine ($Fa_{27.3}$, FeO/MnO = 45) and chromite (Cr/[Cr + Al] = 79).
Classification: Achondrite (diogenite); moderate shock, minimum weathering.
Type specimen: A 21 g sample is on deposit at *NAU*. The main mass holder is anonymous.

Arabian Peninsula 002
United Arab Emirates
Find: 2006
Achondrite (eucrite)
Physical characteristics: A dark, 54 g completely crusted stone.
Petrography: (T. Bunch and J. Wittke, *NAU*). Eucrite breccia with ophitic to subophitic textures. Contains pigeonite, augite, plagioclase, FeS, metal, and SiO_2. Pigeonite cores are rimmed by subcalcic augite. Pigeonite basal sections show well-developed twinning and plagioclase has extensive Carlsbad-albite twinning. Mesostasis pockets consist of fine-grained intergrowths of plagioclase, SiO_2, and FeS.

Mineral compositions and geochemistry: Pigeonite cores ($Fa_{41.4}Wo_{8.2}$; FeO/MnO = 30), subcalcic augite rims ($Fs_{46}Wo_{21.6}$; FeO/MnO = 29) and plagioclase ($An_{84.2–92.2}$).
Classification: Achondrite (eucrite); minimal shock, minimal weathering with minor carbonate/ iron oxide veins.
Type specimen: A 10.8 g sample is on deposit at *NAU*. The main mass holder is anonymous.

Arabian Peninsula 003
United Arab Emirates
Find: 2006
Achondrite (diogenite)
Physical characteristics: A 56 g stone that has been heavily sandblasted, no crust remains.
Petrography: (J. Wittke and T. Bunch, *NAU*) Unbrecciated with well-developed preferred orientation of orthopyroxene. Large chromite crystals (<2 mm) are surrounded by a corona-like "necklace" of very small orthopyroxene and olivine grains. Chromite also has very tiny (<0.01 mm) inclusions of pigeonite, diopside, plagioclase, and FeS. Small grains of FeS, metal, and clusters of olivine occur as inclusions in cumulate orthopyroxene.
Mineral compositions and geochemistry: Orthopyroxene ($Fs_{23.5}Wo_{2.3}$; FeO/MnO = 28), orthopyroxene inclusions ($Fs_{21}Wo_{2.7}$; FeO/MnO = 28), olivine ($Fa_{25.5}$; FeO/MnO = 43), diopside inclusions ($Fs_{11.1}Wo_{42}$), and chromite (Cr/[Cr + Al] = 0.76).
Classification: Achondrite (diogenite); minimal shock, weathering in the interior is minimal.
Type specimen: A 11.2 g sample is on deposit at *NAU*. The main mass holder is anonymous.

Arabian Peninsula 004
United Arab Emirates
Find: 2006
Achondrite (diogenite)
Physical characteristics: A 31 g stone that is partially covered with a dull black fusion crust.
Petrography: (T. Bunch and J. Wittke, *NAU*) Protogranular texture with several poikilitic grains of orthopyroxene host and rounded olivine inclusions. Mineral modes (vol%): orthopyroxene = 94, olivine = 4, chromite, metal, and FeS = 2.
Mineral compositions and geochemistry: orthopyroxene ($Fs_{24.3}Wo_{3.7}$; FeO/MnO = 28), olivine ($Fa_{30.3}$; FeO/MnO = 45), chromite (Cr/[Cr + Al] = 66), metal (Ni = 3.1 wt%).
Classification: Achondrite (diogenite); minimal shock, minimal weathering.
Type specimen: A 7 g sample is on deposit at *NAU*. The main mass holder is anonymous.

Arabian Peninsula 005
United Arab Emirates
Find: 2005
Achondrite (eucrite, monomict breccia)
Physical characteristics: A brownish 146 g stone, with no fusion crust, partially desert-etched by sandblasting.
Petrography: (J. Wittke and T. Bunch, *NAU*) Porphyroclastic texture of relict cumulate basalt clasts surrounded by a fine-grained matrix of recrystallized basalt. Thin, shock-melt veins transcend the sample. Prominent iron oxide staining surrounds metal grains.
Mineral characteristics and geochemistry: Pigeonite ($Fs_{52.5}Wo_{8.7}$; FeO/MnO = 33), augite ($Fs_{42.8}Wo_{27.2}$), chromite (Cr/[Cr + Al] = 75), and plagioclase ($An_{90.5}$).
Classification: Achondrite (eucrite, monomict breccia); moderate shock and weathering.
Type specimen: A 21 g sample is on deposit at *NAU*. The main mass holder is anonymous.

Arabian Peninsula 006
United Arab Emirates
Find: 2005
Achondrite (eucrite, monomict breccia)
Physical characteristics: A 67 g stone that has somewhat weathered fusion crust and desert staining.
Petrography: (J. Wittke and T. Bunch, *NAU*) A fine-grained, eucrite monomict breccia. Ophitic- to subophitic-textured, plagioclase contains numerous, tiny (<0.02 mm) oriented euhedral pyroxene crystals. Has a moderate degree of undulatory extinction in plagioclase and pyroxenes. Contains orthopyroxene, pigeonite, augite, plagioclase, ilmenite, chromite, FeS, and metal.
Mineral compositions and geochemistry: Orthopyroxene host ($Fs_{56.6}Wo_{2.2}$; FeO/MnO = 29), augite exsolution lamellae ($Fs_{28.8}Wo_{43.6}$), pigeonite ($Fs_{52}Wo_{8.7}$; FeO/MnO = 33), and chromite (Cr[Cr + Al] = 84).
Classification: Achondrite (eucrite, monomict breccia); minimal shock and weathering.
Type specimen: A 13.5 g sample is on deposit at *NAU*. The main mass holder is anonymous.

China

Weikengquan **40°16′N, 99°49′E**
Jiuquan City, Gansu Province, China
Find: November 2, 2006
Ordinary chondrite (H5, breccia)
History: The stone lay on sand close to dunes at the northwestern boundary of the Badanjilin Desert. H. Zang recovered the stone on the way from the base to Weikengquan.
Physical characteristics: The stone is 665 g, roughly ball-shaped and ~10 cm in diameter. It has a complete fusion crust with many cracks penetrating inside. Sand grains adhere on the crust.
Petrography: (Y. Lin, B. Miao and S. Hu, *IGGCAS*) It is a brecciated chondrite, consisting of numerous almond-like clasts cemented by fine-grained impact melt. In the clasts chondrules are readily recognized, and troilite is much more

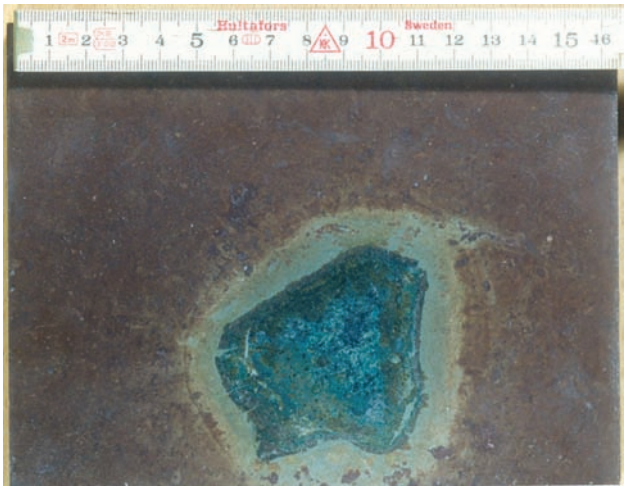

Fig. 2. An image of Österplana 002.

abundant than metallic Fe-Ni. In the melt breccias, metallic Fe-Ni and troilite occur as small spheres, and there are nodule-like clasts with ringwoodite rims and wadsleyite interior.

Mineral compositions: Olivine ($Fa_{19.4\pm0.4}$) and low Ca-pyroxene ($Fs_{17.1\pm0.2}$) are homogeneous, but plagioclase shows variation ($An_{11.7–20.6}Ab_{69.8–85.5}Qr_{1.5–10.6}$). Magnetic susceptibility: $\log\chi = 4.45 \times 10^{-9}$ m^3/kg.

Classification: Ordinary chondrite (H5, breccia); S6, W3.

Type specimens: A sample of 359 g is on deposit at *IGGCAS*. The finder holds 306 g.

Oman

Dhofar 1427 **19°6.771′N, 54°49.126′E**

Qitbit, Dhofar, Oman
Find: January 17, 2001
Achondrite (ureilite)

History: A meteorite was found by an anonymous finder in the Omani desert about 34 km ESE of Qitbit on January 17, 2001.

Physical characteristics: The meteorite is a single dark brown stone of 12.92 g with a magnetic susceptibility of $\log\chi = 4.57 \times 10^{-9}$ m^3/kg.

Petrography: (Bartoschewitz, *Bart*) Coarse-grained texture with triple junctions and curved grain boundaries formed by large (1–2 mm) elongated recrystallized olivines and minor pyroxenes (<1 mm). Grain boundaries are outlined by dark carbonaceous matrix material with finely dispersed metal.

Mineral composition and geochemistry: (Bartoschewitz, *Bart* and P. Appel, B. Mader, *Kiel*) Olivines ($Fo_{74.2–79.8}$, CaO = 0.34, and Cr_2O_3 = 0.64 [all in wt%], Fe/Mn = 51); and pyroxenes, $Fs_{13.0–21.6}$, $Wo_{1.4–9.1}$, Cr_2O_3 = 0.97 (in wt%).

Classification: Achondrite (ureilite) with mosaicised typical texture.

Type specimens: A total of 2.6 g of sample is on deposit at *Kiel*. A 1.7 g slice and one thin section are on deposit at *Bart*. The anonymous finder holds the main mass.

Sayh al Uhaymir 290 **21°04′31.6″N, 57°08′49.3″E**

Oman, Al Wusta
Find: February 13 and November 6, 2004
Carbonaceous chondrite (CH3)

History: Sixty-four fragments were discovered within a distance of ~10 m by Rainer and Claudia Bartoschewitz during a natural science expedition on a gravel plateau of Miocene fresh-water limestone of Middle Fars group about 35 km SSW of Ghaba Resthouse (Adam County).

Physical characteristics: Sixty-four fragments weighing between 0.2 to 888 g amount to a total of 1.796 kg.

Petrography: The meteorite is mostly composed of small chondrules (<20 μm) of various textural types, ~15% fine-grained metal, few small "matrix lumps," and rare refractory inclusions.

Mineral composition and geochemistry: (R. Bartoschewitz, *Bart*, P. Appel and B. Mader, *Kiel*, M.I. Prudêncio, *ITN*, U. Krähenbühl, *Bern*) Pyroxene ($Fs_{3.99–5.16}$ $Wo_{3.01–1.80}$; Al_2O_3 = 1.90, Cr_2O_3 = 0.62 [wt%]), Ti-rich pyroxene ($Fs_{2.88}Wo_{19.66}$; Al_2O_3 = 10.40, Cr_2O_3 = 1.27 [wt%]), olivine ($Fa_{1.88–0.83}$, CaO = 0.43–0.27, Al_2O_3 = 0.27, Cr_2O_3 = 0.47 [all wt%]), sulfide (Ni = 0.4–21.7 [wt%]), kamacite (Ni = 3.7–8.0, Co = 0.35–0.56, Si = 0.02–0.15, Cr = 0.08–0.40 [all wet%]), tetrataenite (Ni = 59.2, Co = 1.45 [wt%]). Whole rock siderophile, chalcophile, and lithophile element abundances similar to other CHs. Magnetic susceptibility: $\log\chi = 5.2 \times 10^{-9}$ m^3/kg. Noble gas isotopes (J. Park and K. Nagao, *UTokE*, Japan, R. Okazaki, *KyuU*) high concentrations of solar noble gases. O isotopes (M. Kusakabe, *OkaU*) $^{17}O = 1.91‰$, $^{18}O = 5.71‰$.

Classification: Carbonaceous chondrite (CH3); moderate weathering.

Type specimens: A total of 20.1 g are on deposit *UTokE*. *Bart* holds 1500 g and one thin section.

Table 6 lists all approved meteorites from Asia.

EUROPE

Sweden

The Nomenclature Committee has recognized the new category of relict meteorites. From the Guidelines for Meteorite Nomenclature, http://www.meteoriticalsociety.org/bulletin/nc-guidelines.htm#s77, a relict meteorite is defined in such a fashion that special provisions are made for highly altered materials that may have a meteoritic origin, designated relict meteorites, which are dominantly (>95%) composed of secondary minerals formed on the body on which the object was found. Examples of such material may include some types of "meteorite shale," "fossil meteorites," and fusion crust (as defined in section 1.2 of the guidelines).

The naming of relict meteorites is defined in section 7.7 of the guidelines. A special type of name should be assigned to relict meteorites. The documentation required for these names must include a description of the material, the location and date of the find, the approximate mass or size, the location of the main mass, and the type of meteoritic material it is suspected to represent. The name must conform to all applicable parts of sections 2–6 of the guidelines, and must be approved by the Nomenclature Committee prior to publication. Relict meteorite names may be converted to formal meteorite names by a second vote of the committee, subject to the requirements of section 7.1 of the guidelines.

Reported in Table 7 are two new name series, Österplana and Gullhögen. Both are relict of ordinary chondrites recovered from strata of Ordovician age.

ERRATA

Errata to previous editions of The Meteoritical Bulletin.

The Meteoritical Bulletin, No. 85, 2001

In Table 4, NWA 265 is listed with coordinates of recovery. However, these coordinates should be disregarded and, as published, they are unknown.

The Meteoritical Bulletin, No. 88, 2004

In Table 5, Dhofar 607 is listed with coordinates of recovery as 10°43.728′N, 54°11.432′E. The correct coordinates are 18°43.728′N, 54°11.432′E.

The description for Maromandia reports coordinates of recovery as 48.1°S 14.2°E. The correct coordinates of recovery should be 14.2°S 48.1°E.

The Meteoritical Bulletin, No. 89, 2005

In Table 2, Little Spring Creek is listed as having a mass of 29,500 g. The correct mass is 2950 g.

To Table 5, the following changes are made: Dhofar 543: H6, S3, W2; $Fa_{19.7\pm0.14}$; $Fs_{17.2\pm0.25}$, $Wo_{1.13\pm0.02}$; Chromite (Al_2O_3 = 7.8, 2.6% MgO = 2.6, MnO = 0.9 [all wt%]). Whitlockite is observed. Dhofar 545: LL4 (breccia), S2, W2; $Fa_{31.4\pm1.02}$; $Fs_{25.6\pm0.73}$; $Wo_{2.45\pm0.08}$.

In Table 7, NWA 774 is listed with a mass of 523 g, purchased in Tucson in 2001, and the main mass is located at the *SWML*. The correct mass is 1440 g, it was purchased from an anonymous collector in 2000, and *Tobin* holds the main mass.

In Table 7, NWA 775 is listed with a mass of 1440 g and the main mass as located at the *SWML*. The correct mass is 3280 g and *Tobin* holds the main mass.

In Table 7, NWA 2738 and 2739 are reported as being classified by Ted Bunch with the type specimen at *NAU*. It should read that V. Moggi-Cecchi and G. Pratesi of *MSP* as classifiers with the type specimen at *MSP*.

The Meteoritical Bulletin, No. 90, 2006

In Table 2, NWA 2457 is classified as an impact melt clast but it should be listed as an impact melt breccia. Furthermore, the follow additions to NWA samples should be printed within the comment column of Table 2: NWA 3347: breccia; NWA 3349: shock veins; NWA 3351: breccia, impact-shock breccia clasts; NWA 3352: calcite veins; NWA 3353: shock veins, ringwoodite, partly S6; NWA 3355: calcite vein; NWA 3356: shock veins; NWA 3357: shock veins, breccia, shock darkening; NWA 3359: $An_{79\pm6}$, shock veins, breccia, polymict, impact-melt clasts, impact melt breccia clasts; NWA 3360: breccia, impact-melt clasts; NWA 3361: shock veins, breccia, impact melt breccia clasts; NWA 3362: shock veins, breccia, shock darkening; NWA 3363: shock veins, breccia, shock darkening; NWA 3364: breccia; NWA 3365: shock veins, breccia; NWA 3367: breccia, shock veins.

In Table 5, Dhofar 1301 is printed on June 15, 2006; however, this sample was shown to be the same as Dhofar 1286. Dhofar 1301 is thus not a valid name and is not official.

In Table 6, Minas Gerais b is incorrectly listed. It should be listed as Minas Gerais (b).

The Meteoritical Bulletin, No. 91, 2007

In Table 1, Tanezrouft 88 and 89 should be 088 and 089.

In Table 2, NWA 969 is listed as an LL7. It should be LL6/7.

In Table 2, NWA 2748 is listed as L 3.4. It should be listed as LL 3.4.

In Table 2, NWA 2954 is listed as having a 145 g. This should be 1246 g. The main mass is listed as being held by *Reed*; however, *Martinez* holds the main mass.

In Table 3, Santa Vitoria do Palmar is incorrectly spelled as Santa Vitorio do Palmar. It is also listed with a mass of 5910.0 g but this should be 50,360 g. The correct coordinates of recovery, both in the write-up and in Table 3, are 33°30′34″S, 53°24′39″W.

In Table 5, Dhofar 962 was recovered on January 6, 2004. Dhofar 969, 971, 973, and 975 were all recovered on

January 7, 2004. Dhofar 985 and 987 were recovered on January 10, 2004. Dhofar 1400 was recovered on November 25, 2003. UAE 001 was recovered on January 18, 2005.

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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.

AMSA-1: Pickard, Williams, and McKinnon. Type specimen, *AMAS*. Main mass: *Bessy*.

AMSA-2: Classified: Pickard, Williams, and McKinnon, *AMAS*. Type specimen, *AMAS*. Main mass: *Bathurst*.

AMSA-3: Classified: Pickard, Williams and McKinnon, *AMAS*. Type specimen, *AMAS*. Main mass: Anonymous.

IZU-1: Classified: A. Ibhi, H. Nachit, *IZU*; H. Chennaoui Aoudjehane, *UHAC*. Main mass: *IZU*.

LundU-1: Classified: B. Schmitz and M. Tassinari, *LundU*. Type specimen: LundU. Main mass: *LundU*.

LundU-2: Classified: B. Schmitz and M. Tassinari, *LundU*. Type specimen: *LundU*. Main mass: Undisclosed.

LundU-3: Classified: B. Schmitz. Type specimen: *LundU*. Main mass: *LundU*.

MNA-SI-1: Classified: L. Folco, *MNA-SI*. Type specimen: *OAM*. Main mass: *OAM*.

MNHNP-1: Classified: M. Bourot-Denise, *MNHNP*. Type specimen: *MNHNP* + 120.8 g. Main mass: *Goueslain and Parodi*.

MNHNP-2: Classified: M. Bourot-Denise, *MNHNP*. Type specimen: *MNHNP*. Main mass: *Goueslain and Parodi*.

MNHNP-3: Classified: M. Bourot-Denise, *MNHNP*. Type specimen: *MNHNP*. Main mass: *P. Thomas*.

MNHNP-4: Classified: M. Bourot-Denise, *MNHNP*. Type specimen: *MNHNP*. Main mass: *Giessler*.

MSP-1: Classified: V. Cecchi Moggi and G. Pratesi *MSP*. Type specimen: *MSP*. Main mass: *MSP*.

MNB-1: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: Anonymous.

MNB-2: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: Stehlik.

MNB-3: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: *HSSH*.

MNB-4: Classified: A. Greshake, *MNB*. Type specimen: *MNB*. Main mass: *Ralew*.

NAU-1: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Farmer*.

NAU-2: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Aaronson*.

NAU-3: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Cimala*.

NAU-4: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Hall*.

NAU-5: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Boswell*.

NAU-6: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Reed*.

NAU-7: Classified: T. Bunch, *NAU*. Type specimen: *NAU*. Main mass: *Oaks*.

NAU-8: Classified: T. Bunch and Wittke, *NAU*. Type specimen: NAU. Main mass: *Boswell*.

NAU-9: Classified: T. Bunch and Wittke, *NAU*. Type specimen: *NAU*. Main mass: *Aaronson*.

NIPR-1: Classified: A. Yamaguchi, *NIPR*. Type specimen: *NIPR*. Main mass: *Fectay*.

Ud'OEA-1: Classified: A. Seddiki, *Ud'OEA* and *UJM*; B. Moine, J. Y. Cottin, *UJM*; M. Denise, V. Sautter, J. P. Lorand, *MNHNP*. Type specimen: *MNHNP* and *UJM*. Main mass: Anonymous.

UWS-1: Classified: A. Irving, *UWS*. Type specimen: *UCLA* and *UWS*. Main mass: *Gregory*.

UWS-2: Classified: A. Irving, *UWS*. Type specimen: *UWS*. Main mass: *Gregory*.

UWS-3: Classified: A. Irving, *UWS*. Type specimen: *UWS*. Main mass: *PSF*.

UWS-4: Classified: A. Irving, *UWS*. Type specimen: *UWS*. Main mass: *GHupé*.

UWS-5: Classified: A. Irving, *UWS*. Type specimen: *UWS*. Main mass: *AHupé*.

UWS-6: Classified: A. Irving, *UWS*. Type specimen: *UWS*. Main mass: *Ralew*.

UWS-7: Classified: A. Irving, *UWS*. Type specimen: *UAz*. Main mass: *Farmer*.

UWS-8: Classified: A. Irving, *UWS*. Type specimen: *UAz*. Main mass: *Jirasek*.

Additional Abbreviations Used in the Text

For chondrule textural types: PO = porphyritic olivine, POP = porphyritic olivine pyroxene, PP = porphyritic pyroxene.

Abbreviations for the location meteorites recovered by ANSMET: ALH = Allan Hills, CRS = Mount Cranfield, CMS = Cumulus Hills; DOM = Dominion Range; GRO = Grosvenor Mountains; LAP = LaPaz Icefield; LAR = Larkman Nunatak; MAC = MacAlpine Hills; MCY = MacKay Glacier; MIL = Miller Range; PRA = Mount Pratt, RBT = Roberts Massif, SAN = Sandford Cliffs, and TYR = Taylor Glacier.

Table 1. A list of meteorites recovered from specific locations within Africa.

Name	Location of recovery	Date of recovery	Find/ Fall	Latitude (N)	Longitude (E)	Total known mass (g)	No. of pieces	Class	Type specmen mass (g)	SS	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus (log χ)	Info	Comments
Algeria																	
Acfer 386	Tamanghasset, Algeria	Jan-2004	Find	27°21.61′	03°42.00′	200	1	L5	20.4	3	2	24.5	21.7	1.4		MSP-1	
Acfer 387	Tamanghasset, Algeria	Jan-2004	Find	27°33.48′	04°00.90′	177	6	H4-6	22.8	3	3	18.5	14.0	1.2		MSP-1	Brecciated
Acfer 388	Tamanghasset, Algeria	Jan-2004	Find	27°37′	03°52′	1072	1	H4	24.6	1	3	18.9	14.7	1.2		MSP-1	
Acfer 389	Tamanghasset, Algeria	Jan-2004	Find	27°30.24′	03°40.90′	397	3	H5	21.8	2	2	18.6	16.4	1.2		MSP-1	
Acfer 390	Tamanghasset, Algeria	Jan-2004	Find	27°30.15′	03°41.58′	578	1	H4	22.3	2	1	19.4	20.4	1.1		MSP-1	
Ilafegh 017	Adrar, Algeria	Jan-2004	Find	21°35.44′	01°31.45′	1063	7	H5	21.5	2	2	18.6	16.6	1.4		MSP-1	
Plateau du Tademait 06	Adrar, Algeria	Jan-2004	Find	27°22.22′	00°42.37′	2995	24	LL6	23.8	1	4	30.7	24.9	2.1		MSP-1	
Silet	Tamanghasset, Algeria (Rocky desert)	Jan-2004	Find	22°47′	04°09′	971	4	L5	20.8	3	4	25.1	21.1	1.4		MSP-1	
Egypt																	
Great Sand Sea 022	Al Wadi al Jadid, Egypt	1994	Find	25°55′	25°40′	0.9	1	H6	0.7	S2	W2	19.2	16.8			MSP-1	
Great Sand Sea 023	Al Wadi al Jadid, Egypt	1996	Find	25°10′	25°40′	1.5	1	H5	1.4	S4/5	W3	18.5	16.2			MSP-1	Brecciated
Great Sand Sea 024	Al Wadi al Jadid, Egypt	1996	Find	25°16.99′	25°36.50′	7.8	1	H5	7.6	S2	W1	18.8	16.5			MSP-1	
Great Sand Sea 025	Al Wadi al Jadid, Egypt	2005	Find	25°22.41′	25°42.37′	10.9	1	L5	10.9	S3	W3	23.8	20.1			MSP-1	
Libya																	
Dar al Gani 1043	Dar al Gani, Libya	12-Dec-2005	Find	27°26′	16°00′	32.1	1	LL6	30	S2	W4	30.1	26.1			MNA-SI-1	
Dar al Gani 1044	Dar al Gani, Libya	Nov-2006	Find	27°27′02″	16°11′30″	235	2	LL5	235	S3	W1	29.1	23.9			MNA-SI-1	
Dar al Gani 1047	Dar al Gani, Libya	16-May-1999	Find	27°02′09″	16°23′07″	49.8	1	Ure	10.2	Mod	Mod	3.6–22.4	3.7–22.4			MNB-1	Polymict breccia with fine-grained chondritic lithologies
Dar al Gani 1048	Dar al Gani, Libya	28-Jun-2001	Find	27°12.10′	16°18.67′	0.801	1	Lunar	0.33								See separate entry
Mauritania																	
Adam Talha	Adam Talha, Mauritania (see IGN map 1/200000 feuille NF-29-XIV)	28-Jan-2005	Find	22°59.61′	10°09.22′W	259.3	2	LL3.2	21	S4	W2	0.72–36.8 (10.36 ± 12.19)	1.22–27.46 (5.36 ± 10.86)		4.64	MNHNP-1	
Bassikounou	11 km SE of Bassikounou, Hodh Ech Chargui, Mauritania	12-Oct-2006	Fall	15°47′	5°54′W	29560	>20	H5	115	S2	W0	18.6	16.3				See separate entry
Rhall Amane 001	Rhall Amane, Mauritania (see IGN map 1/000000 Ouadane NE-29-30)	27-Jan-2005	Find	23°17.55′	10°10.49′W	224	1	H4	20.53	S3	W2	19.89 ± 0.48	17.3 ± 0.31			MNHNP-2	
Rhall Amane 002	Rhall Amane, Mauritania (see IGN map 1/000000 Ouadane NE-29-30)	25-Jan-2005	Find	23°23.44′	9°56.41′W	383	1	LL6	20	S2	W2	25.81 ± 0.39	22.3 ± 0.56			MNHNP-2	
Sueilila	Sueilila, Mauritania (see IGN Map 1/1000000 Cap Bojador NG 28)	10-Feb-2005	Find	24°38.18′	14°42.98′W	13266	1	LL6	61	S1	W1	25.70 ± 0.28	21.86 ± 0.48			MNHNP-2	
Morocco																	
Al Haggounia 001	All Haggounia, Morocco	2006	Find	27°30′	12°30′W	~3 metric tons	Many	Aub									See separate entry
Istifane 001	Istifane region, southeastern Morocco	17-Aug-2005	Find	31°29.911′	5°43.045′W	131.6	3	H4	104	S3	W4	18.4–19.2	16.2–17.5				See separate entry
Istifane 002	Istifane region, southeastern Morocco	17-Aug-2005	Find	31°29.909′	5°43.044′W	40	1	H5	40	S5	W3	15.5	16.8				See separate entry
Istifane 003	Istifane region, southeastern Morocco	17-Aug-2005	Find	31°29.150′	5°43.027′W	18.5	1	L5	18.5	S5	W2	24.9	21.4				See separate entry
Istifane 004	Istifane region, southeastern Morocco	19-May-2006	Find	31°30.165′	5°42.916′W	10.8	1	H5	10.8	S2	W2	19.1	15.4				See separate entry

Table 1. *Continued.* A list of meteorites recovered from specific locations within Africa.

Name	Location of recovery	Date of recovery	Find/ Fall	Latitude (N)	Longitude (E)	Total known mass (g)	No. of pieces	Class	Type specmen mass (g)	SS	WG	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic sus (log χ)	Info	Comments
Nigeria																	
Gashua	Near desert settlement Kolomari, Gashua, Dapchi district, Nigeria	Apr-1984	Fall	~12°51′	~11°02′	4162	1	L6	40.4	S4	W1	23.8	20				See separate entry

For class (which refers to classification): Aub = aubrite; Ure = ureilite.
Shock stage (SS): Min = minimal, Mod = moderate; Ext = extensive; IM= impact melt.
Weathering grade (WG): Min = minimal, Mod = moderate; Ext = extensive.

Table 2. A list of all approved meteorites from northwest Africa.

Name	Date of recovery or purchase	Location of recovery or purchase	Total known mass (g)	No. of pieces	Class	Type specimen mass (g)	SS	WG	Fa mol%	Fs mol%	Wo mol%	Magnetic sus (log χ)	Information	Comments
NWA 801	2001	Zagora, Morocco	5,000	Many	CR2	77.4								See separate entry
NWA 1461	Mar-2002	Erfoud, Morocco	252	1	Dio	23 + 1.3								See separate entry
NWA 1924	Jan-2001	Efroud, Morocco	255	1	CV3	20.4								See separate entry
NWA 2044	Aug-2003	Efroud, Morocco	661	1	CV3	22.4								See separate entry
NWA 2764	2005	Efroud, Morocco	134	1	Euc	20.1							NAU-7	$Fs5_{3.0–57.8}Wo_{2.1–4.5}$; $Fs_{48.3}Wo_{14.5}$
NWA 2956	2005	Efroud, Morocco	161	1	Euc	22	Mod	Min					NAU-9	$Fs_{37–46.3.3}Wo_{3.9–5.6}$; $Fs_{32.5–36}Wo_{17.7–39.7}$; basaltic
NWA 2959	2005	Efroud, Morocco	121	1	Euc	21.1	Min	Min					NAU-8	$Fs_{55.2}Wo_{2.0}$; $Fs_{14.3}Wo_{42.7}$
NWA 3157	2004	Denver, Colorado USA	51.7	1	OC (type 3)	10.6								See separate entry
NWA 3221	2002	Rissani, Morocco	38.5	1	Ure	7.7								See separate entry
NWA 3222	2000	Morocco	79	1	Ure	15.8								See separate entry
NWA 3223	2002	Morocco	51	1	Ure	9.8								See separate entry
NWA 3340	Apr-2006	Algeria or Morocco	12.7	2	CM2-an	2.7								See separate entry
NWA 4223	Dec-2005	Algeria	329	2	Dio	24								See separate entry
NWA 4226	Dec-2005	Algeria	617	1	H7	20.1			18.5–19.2	16.3	3.5–3.9		UWS-4	$\delta^{18}O$ = 3.03, 3.33; $\delta^{17}O$ = 4.33, 4.95; $\Delta^{17}O$ = 0.752, 0.726 (all ‰)
NWA 4229	Dec-2005	Tagounite, Morocco	439	1	H7	20.3			18.4–18.7	16.4	3.1–4.2		UWS-4	$\delta^{18}O$ = 2.95, 3.11; $\delta^{17}O$ = 4.29, 4.52; $\Delta^{17}O$ = 0.693, 0.732 (all ‰)
NWA 4230	Dec-2005	Rissani, Morocco	134	1	Meso	20.1								See separate entry
NWA 4232	Dec-2005	Tagounite, Morocco	124	2	EL3	20								See separate entry
NWA 4255	Sep-2002	Hamada du Draa	6000	Many hundreds	Dio	21								See separate entry
NWA 4269	Sep-2004	Hamada du Draa	54	1	Euc	19.2								See separate entry
NWA 4271	Feb-2003	Hamada du Draa	6	1	Euc	2.55								See separate entry
NWA 4272	Dec-2003	Northwest Africa	6,768	1	Dio	20								See separate entry
NWA 4292	Sep-2005	Denver, Colorado, USA	12,000	1	L6	21	S2	W2	25.1–25.6	21	1.3		UWS-5	
NWA 4293	Sep-2005	Denver, Colorado, USA	25,000	1	H6	20.2	S4	W2	18.6–19.2	16.4–17.0	1.5		UWS-5	
NWA 4294	Feb-2006	Tucson, Arizona, USA	84	1	OC (type 3)	22								See separate entry
NWA 4298	Sept-2005	Efroud, Morocco	18	1	OC (type 3)	4								See separate entry
NWA 4300	Mar-2006	Erfoud, Morocco	45,200	1	H5	41.4	S2	W3	19.5	17.1	1.5		UWS-5	
NWA 4302	Dec-2005	Tagounite, Morocco	46.2	2	Dio	9.3								See separate entry
NWA 4304	2004	Baden, Austria	22.97	18	Ure	4.6								See separate entry
NWA 4312	2004	Zagora, Morocco	48	1	H6	10.6	S4	W1	17.1	14.5			MNB-2	
NWA 4313	2004	Zagora, Morocco	118	1	L6	20.8	S4	W3	23.6	20.6			MNB-2	Contains shock veins
NWA 4319	2004	Zagora, Morocco	68	1	L6	15.6	S3	W3/4	22.7	19.3			MNB-2	

Table 2. *Continued.* A list of all approved meteorites from northwest Africa.

Name	Date of recovery or purchase	Location of recovery or purchase	Total known mass (g)	No. of pieces	Class	Type specimen mass (g)	SS	WG	Fa mol%	Fs mol%	Wo mol%	Magnetic sus (log χ)	Information	Comments
NWA 4320	2004	Zagora, Morocco	160	1	H3	22.2	S2	W4	1.4–13.0	3.0–9.0			MNB-2	No shock veins and no ringwoodite are observed
NWA 4323	2004	Zagora, Morocco	70	2	L4	14.8	S3	W1	21.9	4.2–21.2			MNB-2	Contains shock veins
NWA 4325	2004	Zagora, Morocco	180	1	H5	21.4	S2	W2	16.8	15.2			MNB-2	
NWA 4328	2004	Zagora, Morocco	28	1	L type Imr	6.6	IM	W3	23.4	19.7			MNB-2	
NWA 4329	2004	Zagora, Morocco	26	1	H3/4	6	S2	W3	12.5–17.9	3.6–18.1			MNB-2	
NWA 4331	2004	Zagora, Morocco	21	1	H3/4	4.8	S2	W1	13.3–16.1	2.6–17.0			MNB-2	
NWA 4334	2004	Zagora, Morocco	83	1	H/L3	17.4	S3	W1	2.0–30.0	4.3–17.2			MNB-2	
NWA 4337	2002	Zagora, Morocco	42	1	L5	9.4	S3	W2	26.4	22			MNB-2	
NWA 4338	2002	Zagora, Morocco	53	1	H5	11.8	S2	W2	17.4	15.7			MNB-2	
NWA 4339	2002	Zagora, Morocco	40	1	L3	8.2	S2	W2	0.4–32.2	8.4–26.9			MNB-2	
NWA 4343	2002	Zagora, Morocco	23	1	H3	5.8	S2	W0/1	0.4–17.4	1.0–17.7			MNB-2	
NWA 4351	2002	Zagora, Morocco	4500	12	L type Imr	36.6	IM	W0/1	21.9	18.3			MNB-2	
NWA 4353	2003	Erfoud, Morocco	230	1	L5/6	21.9	S3	W2	23.3	19.8			MNB-1	
NWA 4354	2004	Erfoud, Morocco	1891	1	L6 Imb	21.5		W2	23.9	20.2			MNB-1	
NWA 4357	2005	Erfoud, Morocco	264.7	1	H/L3	30	S4	W1	3.7–31.1	2–24.3			MNB-3	
NWA 4360	2005	Erfoud, Morocco	308.5	many	R3.6	23.2								See separate entry
NWA 4362	2005	Erfoud, Morocco	60.1	1	CK5/6	14.4								See separate entry
NWA 4363	2005	Erfoud, Morocco	244.4	1	H4/5	22.4	S2	W3	17.3	15.4			MNB-3	
NWA 4364	2005	Erfoud, Morocco	232.8	1	L4/5	24.5	S4	S2	23.1	19.3			MNB-3	
NWA 4365	2005	Erfoud, Morocco	474.3	1	L4/5	25.4	S3	W4	22.2	19.1			MNB-3	
NWA 4366	2005	Erfoud, Morocco	274.1	1	H6	28.4	S2	W3/4	17.6	15.6			MNB-3	
NWA 4367	2005	Erfoud, Morocco	51.5	1	H4/5	30.5	S2	W3	17.8	15.5			MNB-3	
NWA 4371	2005	Munich, Germany	339.7	1	H4 Imb	20.7	S4-IM	W2	17.8	15.1–18.6			MNB-3	
NWA 4372	2005	Munich, Germany	64.8	1	CK4	13.5								See separate entry
NWA 4373	2005	Munich, Germany	56.8	1	H4/5	14.2	S2	W4	17.7	15.9			MNB-3	
NWA 4374	2005	Munich, Germany	33.1	1	H5	8.2	S2	W3/4	17.8	16.1			MNB-3	
NWA 4375	2005	Munich, Germany	12.2	1	Win	3.9								See separate entry
NWA 4377	2005	Stuttgart, Germany	49.2	1	L/LL5	11.1	S3	W0	27.1	22.1			MNB-3	
NWA 4378	2005	Stuttgart, Germany	42.1	1	LL5/6	9.4	S4	W2	30.3	24.8			MNB-3	Contains shock veins
NWA 4379	2005	Erfoud, Morocco	494.4	1	CV3	20.6	S2	W2/3	0.1–75	0.9–1.5			MNB-3	
NWA 4380	2006	Erfoud, Morocco	211.2	many	Dio	22.5								See separate entry
NWA 4389	2005	Midelt, Morocco	55	1	Ure	12.1	Low	Mod	22.8	19.8			MNB-4	Reduced rim: $Fa_{5.1–16.6}$
NWA 4391	2005	Midelt, Morocco	54.8	1	Euc	11.4								See separate entry
NWA 4392	2005	Krefeld, Germany	490	1	R4	21.7	S2	W3	38.4	9–17.5			MNB-4	
NWA 4396	2006	Tagounite, Morocco	680	1	Euc	20								See separate entry
NWA 4397	2006	Tagounite, Morocco	34	1	Euc	6.8								See separate entry
NWA 4398	2005	Tagounite, Morocco	228	1	Euc	20.3								See separate entry
NWA 4399	2005	Tagounite, Morocco	210	many	Acp	20.3								See separate entry
NWA 4424	2006	Bir Ganduz area, Western Sahara	756.0	1	LL5	23.63	S3	W4	25.46 ± 0.31	21.65 ± 0.33		4.19	MNHNP-3	~21°36′N, 16°30′W
NWA 4426	2006	Erfoud, Morocco/ Algeria border	757.0	1	H5	37.56	S2	W4	18.72 ± 0.43	17.58 ± 1.16		4.73	MNHNP-3	
NWA 4427	2006	Erfoud, Morocco/ Algeria border	158.0	1	H5	38.52	S2	W4	19.1 ± 0.35	16.91 ± 0.22		4.91	MNHNP-3	
NWA 4470	Jul-2006	Rissani, Morocco	631	48	Euc	20.1								See separate entry
NWA 4473	July-2006	Laâyoune, Morocco	32	1	Dio	20.1								See separate entry
NWA 4475	Aug-2005	Tagounite, Morocco	9,990	1	L5	30	S2	W1	24.1	20.9	1.2		UWS-4	
NWA 4478	Sep-2006	Algeria, Morocco	444	2	Lod	20.1								See separate entry
NWA 4479	Apr-2004	Tagounite, Morocco	552	2	H6	20.9	S2	W2	19.1–19.6	16.4	1.3		UWS-4	

Table 2. *Continued.* A list of all approved meteorites from northwest Africa.

Name	Date of recovery or purchase	Location of recovery or purchase	Total known mass (g)	No. of pieces	Class	Type specimen mass (g)	SS	WG	Fa mol%	Fs mol%	Wo mol%	Magnetic sus (log χ)	Information	Comments
NWA 4480	Sept-2006	Tagounite, Morocco	13	1	Martian									See separate entry
NWA 4482	Aug-2006	Tagounite, Morocco	5,812	30	Pal	20.1								See separate entry
NWA 4484	Jun-2006	Rissani, Morocco	140	7	Euc	20								See separate entry
NWA 4486	Sept-2004	Denver, Colorado, USA	21.3	1	OC (type 3)	4.6								See separate entry
NWA 4506	Oct-2006	Denver, Colorado, USA	23.2	1	Pal	8.17								See separate entry
NWA 4507	2006	Tucson, Arizona, USA	85	1	Ure	17.22								See separate entry
NWA 4508	2001	Rissani, Morocco	182	1	Ure	20.2								See separate entry
NWA 4519	2001	Zagora, Morocco	114	1	Ure	20								See separate entry
NWA 4523	2001	Al Nif, Morocco	174	1	Euc	21								See separate entry
NWA 4524	Sep-2006	Tagounite, Morocco	185.5	1	L4	20.1	S2	W1	25.4–25.7	20.8–21.1	1.1–1.2		UWS-4	
NWA 4526	Sep-2006	Tagounite, Morocco	52,850	52	H4	33.8	S2	W2/3	19.1–19.7	16.2	1.2		UWS-4	
NWA 4527	July-2006	M'Hamid, Morocco	10	2	Martian	2.1								See separate entry
NWA 4528	Sep-2006	Tagounite, Morocco	239,976	60	H5	27.1	S2	W2/3	19.1–19.8	15.7	1.5		UWS-4	
NWA 4531	Sept-2005	Denver, Colorado, USA	39	1	OC (type 3)	7.8								See separate entry
NWA 4532	Sep-2005	Denver, Colorado, USA	68.7	1	H4	14	S1	W1	17.4–17.7	14.9	0.8		UWS-5	
NWA 4533	Sep-2005	Denver, Colorado, USA	1,245	1	H4	32.8	S2	W2	19.1	16.8	1.3		UWS-5	
NWA 4535	Sep-2005	Denver, Colorado, USA	1,490	1	H5	22.4	S2	W3	19.5	17	1.3		UWS-5	
NWA 4546	2006	Erfoud, Morocco	7200	many	H4	64	S2	W2	18.5	16.4	1.7		NAU-1	Olv of Pyx? FeO/MnO = 41
NWA 4547	2006	Erfoud, Morocco	3600	many	L4	25	S3-5	W2	23.7	21.4	1.8		NAU-1	FeO/MnO = 53
NWA 4548	2006	Erfoud, Morocco	9132	many	L4	28	S2	W2	22.8	20	2.1		NAU-1	FeO/MnO = 47
NWA 4552	2006	Erfoud, Morocco	280	3	LL6	22	S4	W2	32.6	25.8	1.8		NAU-2	FeO/MnO = 62
NWA 4554	2006	Erfoud, Morocco	500	1	L5	23	S2	W2	25.2	21.1	2.9		NAU-3	
NWA 4555	2006	Erfoud, Morocco	1313	1	H4	20.6	S2	W3	19.1	17	2		NAU-3	
NWA 4557	2006	Erfoud, Morocco	250	1	L4	18.7	S3-5	W1	23	19.8	2.4		NAU-3	Shock darkened
NWA 4558	2006	Erfoud, Morocco	900	1	L4	25.7	S2	W2	24.5	21.6	1.8		NAU-3	
NWA 4559	2006	Erfoud, Morocco	900	4	LL5	20.5	S3-5	W2	31.8	25	2.1		NAU-3	
NWA 4562	1998	Aqalmim, Morocco	440	1	L4	20.7	S2	W2	22.9	20.2	1.8		NAU-3	
NWA 4563	1998	Aqalmim, Morocco	89	1	H4	17.8	S2	W2	19	17.1	1.6		NAU-3	
NWA 4564	2006	Erfoud, Morocco	500	1	LL5	23	S2	W2	27.8	23.4	2		NAU-3	
NWA 4565	2005	Erfoud, Morocco	87	1	L4	18	S3-5	W1	24.1	20.6	1.5		NAU-4	Shock darkened
NWA 4567	2005	Erfoud, Morocco	307	1	H4	22.1	S2	W1	17.7	15.6	2.4		NAU-5	
NWA 4570	2005	Erfoud, Morocco	243	1	L4	20.1	S3-5	W1	23.8	20.5	1.4		NAU-4	Shock darkened
NWA 4587	July-2006	Erfoud, Morocco	530	1	Ach-ung	20								See separate entry
NWA 4588	2005	Agadir	1530	1	L5	26.1	S5	W0	23.8–24.6	20.0– 20.8	2.4–2.5		UWS-8	Olivine (FeO/MnO = 45–48)
NWA 4590	June-2006	Tagounite, Morocco	213	many	Ang	20.01								See separate entry
NWA 4615	2006	Morocco	10.5	1	R3.4	2.9								See separate entry
NWA 4619	2006	Morocco	704	1	R3-5	20.8								See separate entry
NWA 4624	2006	Ensisheim, France	175	2	Euc	21.5								See separate entry
NWA 4636	2005	Germany	2850	>2	Meso	29								See separate entry
NWA 4649	2006	Erfoud, Morocco	3200	1	LL6	35	S3	W2	28.8	24			AMSA-1	
NWA 4653	2006	Erfoud, Morocco	843	1	L5	22	S2	W1	23.8	21.6	2		NAU-2	Polymict; thick melt veins <3 mm
NWA 4656	2006	Erfoud, Morocco	5000	1	H4	34	S2	2	18.6	16.1	2.2		NAU-6	
NWA 4677	Jul-2006	France	156.4	1	Euc	20.2								See separate entry
NWA 4678	Aug-2006	Rissani, Morocco	3.6	1	Dio	3.34								See separate entry
NWA 4680	Nov-2006	Erfoud, Morocco	3830	1	L4-6	23	S3	W1	24.2	20.5			AMSA-1	Brecciated
NWA 4681	2006	Erfoud, Morocco	3994	1	L5	38	S3	W4	24.7	21			AMSA-2	
NWA 4682	2006	Erfoud, Morocco	2920	1	L5	30	S4	W3	23.3	20			AMSA-2	
NWA 4683	2006	Erfoud, Morocco	1552	1	H4	22	S3	W2	18.9	16.5 ± 1			AMSA-2	

Table 2. *Continued.* A list of all approved meteorites from northwest Africa.

Name	Date of recovery or purchase	Location of recovery or purchase	Total known mass (g)	No. of pieces	Class	Type specimen mass (g)	SS	WG	Fa mol%	Fs mol%	Wo mol%	Magnetic sus (log χ)	Information	Comments
NWA 4684	2006	Erfoud, Morocco	3650	1	H5	24	S4	W4	18.9	16.5 ± 1			AMSA-1	
NWA 4686	May-2006	Erfoud, Morocco	851	4	H4	22	S2	W2-3	17.7	15.5 ± 1			AMSA-3	Brecciated
NWA 4687	May-2006	Erfoud, Morocco	703	1	H6	22	S3	W3	19.7	17 ± 1			AMSA-3	
NWA 4688	May-2006	Erfoud, Morocco	2184	481	H5	22	S3	W3	18.9	16.5 ± 1			AMSA-3	481 pieces range from 1.7 g to 20 g
NWA 4693	Nov-2006	Erfoud, Morocco	866	1	R3–6	24.3								See separate entry
NWA 4695	2006	Morocco	20.20	1	H6	4.6	S3	W2	18	16.6			MNB-1	
NWA 4727	Mar-2006	Agadir, Morocco	605		L6	57	S5	W2	24.98 ± 0.24	21.71 ± 0.75		4.44	MNHNP-4	Mostly individuals, some fragments; dark-light breccia; melt-filled veins
NWA 4747	2001	Erfoud, Morocco	1200	1	Meso	20.9								See separate entry

For class (which refers to classification): Acp = acapulcoite; Ang = angrite; Aung = achondrite, ungrouped; Bra = brachinite; Dio = diogenite; Euc = eucrite; How = howardite; Imb = impact-melt breccia; Imr = impact-melt rock; Mes = mesosiderite.
Shock stage (SS): Min = minimal, Mod = moderate; Ext = extensive; IM= impact melt.
Weathering grade (WG): Min = minimal, Mod = moderate; Ext = extensive.
All meteorites are finds and purchased unless otherwise stated.

Table 3. A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
Allan Hills (ALH)							
ALH 03541	H5	1053.5	B	A			t
ALH 03542	L6	20.4	B/C	A/B			t
Cranfield Peak (CRA)							
CRA 03540	L3	151.9	BE	A/B	0–26		t
Grosvenor Mountains (GRO)							
GRO 03003	L5	10,640	CE	C			
GRO 03004	L5	2470	B/CE	B/C			t
GRO 03005	L5	2576	B/CE	B/C			t
GRO 03006	L5	1161.6	B/CE	B/C			t
GRO 03008	L5	1693	B/CE	B/C			t
GRO 03009	L5	1112.9	B/CE	B/C			t
GRO 03010	L5	1397.5	B/C	B			t
GRO 03011	L5	1257.6	B/CE	B/C			t
GRO 03012	L5	1184	A/BE	B/C			t
GRO 03018	L5	1554	BE	B			t
GRO 03026	L5	561.2	B/C	B			t
GRO 03030	L5	895.3	B/CE	A/B			
GRO 03034	LL5	274.6	A/B	A			t
GRO 03040	H5	150.4	B/C	A			t
GRO 03041	L5	183.8	A/B	A/B			t
GRO 03042	L5	288.3	A/B	A/B			t
GRO 03043	L5	274.5	A/B	A/B			t
GRO 03044	L5	275.5	B/C	A/B			t
GRO 03045	L5	256.1	B/C	A/B			t
GRO 03046	L5	196.1	B	A			t
GRO 03047	L5	282	B/CE	A			t
GRO 03048	L5	394.4	B/C	A/B			t
GRO 03049	L5	311.3	B/C	A/B			t
GRO 03055	L4	384.4	B/C	A	23	20	t
GRO 03056	H5	422.5	B	A/B			t
GRO 03057	L5	662.9	B/C	A/B			t
GRO 03058	L5	420.7	B/C	A/B			t
GRO 03059	L5	625.3	A/BE	A/B			t
GRO 03064	LL5	392.5	B	A/B			
GRO 03065	L5	303.9	B/C	B			
GRO 03066	L5	265.1	A/B	A			
GRO 03067	L5	140.1	B	A			
GRO 03068	L5	288.2	B/CE	A/B			
GRO 03069	L5	219.3	B/CE	A/B			
GRO 03075	LL5	294.2	A/B	A			t
GRO 03076	H5	257.7	B/C	A			t
GRO 03077	L5	201.1	B/CE	A/B			t
GRO 03078	LL5	239.8	A/B	A			t
GRO 03079	LL5	165.4	A/B	A			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
GRO 03110	L5	111.5	B/C	A			t
GRO 03115	LL5	86.1	A	A			t
GRO 03116	CR2	108.3	B/C	A/B	1–37	1–8	t
GRO 03117	L5	87.5	B/C	A/B			t
GRO 03118	L5	64.1	B/C	A/B			t
GRO 03119	L5	75.4	B/C	A/B			t
LaPaz Icefield (LAP)							
LAP 03551	L6	2703.4	A/B	A			
LAP 03552	L6	3521.5	A/B	A/B			
LAP 03554	H4	4201.2	B	A/B			
LAP 03555	L5	458.8	A/B	A			t
LAP 03556	L5	1823	A/B	A			
LAP 03557	L5	1505.1	A/B	A			
LAP 03558	L4	1521.1	B	A			
LAP 03559	L6	1839.1	A/B	A			
LAP 03560	L6	1780	A/B	A/B			
LAP 03561	L5	1853.2	B	A/B			
LAP 03562	H5	833.5	B/C	B			
LAP 03563	L6	868.5	A/B	A			
LAP 03564	H4	853.8	B	A			
LAP 03565	L5	1198.7	B	A			t
LAP 03566	L6	1454.4	A/B	A/B			
LAP 03567	L6	1009.5	A/B	A/B			
LAP 03568	LL6	514.9	A/B	A/B			
LAP 03570	LL4	801.6	B	A			t
LAP 03571	L5	796.9	B/C	A			
LAP 03574	LL6	580.7	A/B	A			
LAP 03575	LL5	643	B	A			
LAP 03576	LL4	561	B	A			
LAP 03577	LL6	556.2	A/B	A/B			
LAP 03578	L5	471.6	A/B	A/B			t
LAP 03579	LL4	411.8	B/C	A/B			t
LAP 03580	LL6	582.9	A/B	A/B			t
LAP 03581	LL4	541	B	A/B			t
LAP 03582	LL5	408.6	B	B			t
LAP 03584	LL5	311.4	B	B			t
LAP 03585	L5	289	A/B	A/B			t
LAP 03586	L5	343.9	A/B	A			t
LAP 03588	L5	209.6	A/B	A/B			t
LAP 03589	H4	232.7	B	A			t
LAP 03590	LL5	342.6	A/B	A/B			t
LAP 03591	L6	235.6	B	B			
LAP 03592	LL5	192	C	B/C			
LAP 03594	L5	297	B	B			
LAP 03595	LL5	175.4	B	C			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 03596	LL5	397.1	B	A/B			
LAP 03597	LL4	245.2	B	B			
LAP 03598	L5	327.2	B	B			
LAP 03599	LL6	413.2	A/B	A/B			
LAP 03600	LL5	353	A	A/B	29	23	
LAP 03601	H4	331.7	A/B	A			t
LAP 03602	L6	420.8	A/B	A			t
LAP 03603	L5	305.4	B/C	A			t
LAP 03604	L5	392.3	A/B	A			t
LAP 03606	LL6	486.1	A/B	A			t
LAP 03607	L5	359.2	A/B	A			t
LAP 03608	H4	330.7	B	A			t
LAP 03609	L5	451	B	A			t
LAP 03610	L5	447.2	A/B	A			t
LAP 03611	LL6	376.1	A/B	A/B			t
LAP 03612	H6	206.2	B/C	A/B			t
LAP 03613	L5	229.8	A/B	A			t
LAP 03614	LL6	98.4	A/B	A			t
LAP 03615	H4	120.9	B/C	A			t
LAP 03616	H5	99.5	B/C	A/B			t
LAP 03617	L5	173.8	A/B	B			t
LAP 03618	L5	165	B/C	A			t
LAP 03619	L4	164.3	A/B	A	23	14–19	t
LAP 03620	L6	121.8	B	B			t
LAP 03621	L5	173.5	A/B	A			
LAP 03622	L5	127.1	A	A			
LAP 03623	L5	147.8	A/B	A/B			
LAP 03625	L6	144.7	B/C	B			
LAP 03626	L4	145.2	B/C	A/B			
LAP 03627	L6	155.5	B/C	A			
LAP 03628	L5	103.3	B	A/B			
LAP 03629	L6	56	A/B	A/B			
LAP 03633	L5	261.5	B/C	A			
LAP 03634	L5	103.3	A	A			t
LAP 03635	LL5	124.3	A/B	A			t
LAP 03636	L5	190	A/B	A			t
LAP 03638	L5	134.8	A/B	A			t
LAP 03639	R	139.9	A/B	A	19–38	13–29	t
LAP 03640	H4	168.7	B	A			t
LAP 03641	H6	212.1	B/C	A			t
LAP 03642	H6	175.8	B/CE	A			t
LAP 03643	L5	230.2	B/C	A			t
LAP 03644	LL5	126.4	A/B	A			t
LAP 03646	L5	207.8	A/B	A			t
LAP 03647	LL5	219.5	A/B	A			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 03648	LL5	214.7	A/B	A			t
LAP 03649	L5	149.4	A/B	A/B			t
LAP 03650	LL4	150.7	B	A/B			t
LAP 03651	L5	162	A/B	A			
LAP 03652	L5	98.6	A/B	A			
LAP 03653	L5	75.6	A/B	A/B			
LAP 03654	LL5	89.3	B	A			
LAP 03655	L5	49.6	B/C	A			
LAP 03656	LL6	74.6	A/B	A			
LAP 03657	L5	87	B/C	A			
LAP 03658	LL6	79.7	A/B	A			
LAP 03659	L6	95.3	A/B	A/B			
LAP 03660	L5	96	A/B	A			
LAP 03661	L5	103.1	A/B	A/B			t
LAP 03662	LL5	68.1	A/B	A/B			t
LAP 03663	L5	64.1	A/B	A			t
LAP 03664	LL6	61.4	A	A/B			t
LAP 03665	L5	40.8	A	B/C			t
LAP 03666	L5	86.9	A/B	A/B			t
LAP 03667	L5	42.4	A/B	A			t
LAP 03668	LL5	42	A/B	A			t
LAP 03669	L4	96.1	A/B	A			t
LAP 03670	H6	85.7	CE	A/B			t
LAP 03671	L5	73	B	B			t
LAP 03672	H4	45.8	B/C	A			t
LAP 03673	L4	76.4	B/C	A			t
LAP 03674	L5	38.1	B/CE	A			t
LAP 03675	L5	35.7	B	B			t
LAP 03676	LL5	52	B	B			t
LAP 03678	L5	58	B/C	A/B			t
LAP 03679	L5	75.3	B/C	B			t
LAP 03680	L6	55.8	A/B	A			t
LAP 03681	L4	126.2	B	A			
LAP 03682	L5	123.7	A/B	A			
LAP 03683	L5	57.7	A/B	A			
LAP 03684	L4	61.5	B	A			
LAP 03685	H5	54.8	B/C	A			
LAP 03686	L5	42	A/B	A			
LAP 03687	L5	54.5	A/B	A			
LAP 03688	H5	86.8	B/C	A/B			
LAP 03689	L5	95.4	B	A			
LAP 03690	LL5	69.1	A/B	A			
LAP 03691	L5	88.3	A/B	A			t
LAP 03692	H5	78.4	B/CE	A			t
LAP 03693	LL5	71	A/B	A			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 03694	L5	83.1	A/B	A			t
LAP 03695	H6	44	B/CE	A			t
LAP 03696	LL6	39	A/B	A			t
LAP 03697	LL5	58.7	A/B	A			t
LAP 03698	LL5	84.5	A/B	A			t
LAP 03699	H5	89.5	A/B	A			t
LAP 03700	H4	85.8	B	A/B			t
LAP 03701	L5	57.7	A	A/B			
LAP 03702	H4	58.3	B/C	B			
LAP 03703	L5	97.2	A/B	A/B			
LAP 03704	H6	61.4	C	A			
LAP 03705	L5	59.4	A	A			
LAP 03706	L6	30.5	B/C	B			
LAP 03707	H5	84.6	A	A			
LAP 03708	L6	39.3	A	A			
LAP 03709	LL6	41.3	B/C	B			
LAP 03710	H6	40.2	C	B			
LAP 03711	H6	63.5	C	B			t
LAP 03712	L5	84.9	B	B			t
LAP 03713	H5	69.1	C	B			t
LAP 03714	L4	80.7	A/B	A/B	23	13–18	t
LAP 03715	LL5	53	A/B	A/B			t
LAP 03716	LL6	25.7	B	B			t
LAP 03717	LL5	58.6	B	B			t
LAP 03720	LL5	51.4	B/C	B			t
LAP 03721	Ure	87.5	B	B/C	9–25		
LAP 03722	Ure	29.6	B	B/C	4–25		
LAP 03723	L6	97.5	B	B			
LAP 03724	H5	60.5	C	A/B			
LAP 03725	LL6	45.7	B	B			
LAP 03726	L6	57.9	B/C	A/B			
LAP 03727	LL5	30	B	B			
LAP 03728	L6	62.1	A/B	A/B			
LAP 03729	LL5	58	B/C	B			
LAP 03730	L5	47	B	B			
LAP 03731	R	56	B	A	36	29	t
LAP 03732	L5	89.3	B	B			t
LAP 03733	L5	31.2	C	A/B			t
LAP 03734	H6	19.2	B	B/C			t
LAP 03735	L5	130.1	B	B			t
LAP 03736	LL6	68	B	B			t
LAP 03737	L5	23.2	B	B			t
LAP 03738	L5	30.2	A/B	B			t
LAP 03739	L5	63.3	B	A			t
LAP 03740	LL5	35.5	A/BE	A/B			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 03741	L5	70.1	A/B	A			t
LAP 03742	L5	38.1	B	A			t
LAP 03743	L5	46.3	B	A			t
LAP 03744	L6	79.4	B	A			t
LAP 03745	H5	40.7	B/CE	A			t
LAP 03746	L6	49	A/B	A			t
LAP 03747	H6	55.4	B/CE	A/B			t
LAP 03748	H5	65.9	B/C	A/B			t
LAP 03749	L5	22.5	A/B	A			t
LAP 03750	LL6	29.6	A/B	A/B			t
LAP 03751	L5	49.5	A/B	A/B			t
LAP 03752	H6	49.3	C	B			t
LAP 03753	H6	27.9	C	C			t
LAP 03754	LL6	36.7	A/B	A/B			t
LAP 03755	LL5	28.4	A/B	A/B			t
LAP 03756	L5	56.1	B	A/B			t
LAP 03757	LL6	25	B	B			t
LAP 03758	L4	28.1	A	A/B			t
LAP 03759	H4	48.8	C	A			t
LAP 03760	H6	8.6	C	B			t
LAP 03761	L5	26.1	B/C	B			t
LAP 03762	L5	34.5	B	B			t
LAP 03763	H6	50.7	CE	B			t
LAP 03764	L5	33.6	B	B			t
LAP 03765	H4	73.7	B	A/B			t
LAP 03766	L5	23	B	B			t
LAP 03767	L5	38.8	B/C	B			t
LAP 03768	L5	84.3	B	B			t
LAP 03769	H4	61.1	B/C	B			t
LAP 03770	L5	35.4	B	B			t
LAP 03771	H5	55.3	C	B			
LAP 03772	L5	102.6	B	B			
LAP 03773	L5	55.7	A/B	B			
LAP 03774	L5	58.2	B	A			
LAP 03775	L6	23	A/B	A/B			
LAP 03776	L6	14.6	B/C	B			
LAP 03777	H5	71.9	C	A/B			
LAP 03778	L5	91.2	B	A/B			
LAP 03779	L5	41.5	B	B			
LAP 03781	Dio	35	B	A/B	22	2	
LAP 03783	L6	17.3	C	B/C			
LAP 03786	CM2	22.4	A/B	A	1–40	6	
LAP 03789	L6	20.8	B/C	A			
LAP 03790	L5	37.8	A/B	A/B			
LAP 03791	L5	16.6	B	A/B			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 03792	H6	7.4	C	A/B			t
LAP 03793	R	15	BE	A/B	35	28	t
LAP 03794	H4	8.5	C	A/B			t
LAP 03795	H6	3.2	C	C			t
LAP 03796	Dio	16.5	B	A/B		23	t
LAP 03797	H6	4.6	C	B			t
LAP 03798	H6	4.5	C	A			t
LAP 03799	L5	6.9	B	B			t
LAP 03822	L-metal	1.7	C	A	24	20	t
LAP 03824	L-metal	1.5	C	A	24	20	
LAP 03900	L5	8.9	B/C	B			
LAP 03901	L5	8.6	B/C	B			t
LAP 03902	R	6.2	A/B	A	37	11–21	t
LAP 03903	L5	12.7	C	B			t
LAP 03904	H6	13.8	C	A/B			t
LAP 03905	L5	15.4	B	B			t
LAP 03906	L4	11.9	B	A/B			t
LAP 03907	L5	5.8	C	A/B			t
LAP 03908	L5	6.4	C	A/B			t
LAP 03909	H6	6.6	C	B			t
LAP 03950	H5	7.8	B/C	A			t
LAP 03991	H5	10.5	C	C	17	15	
LAP 031000	Dio	27.9	B	A/B	22	2	
LAP 031037	FC	0.1	A/B	A/B			
LAP 031043	CM2	8.1	A/B	A/B	1–48		
LAP 031046	H5	14.6	C	C	19	17	
LAP 031047	L-IM	16.5	A	A	23	17	
LAP 031062	Euc-brecciated	12.3	A/B	A/B		17–41	
LAP 031079	CM1	1.8	C	C			
LAP 031109	Ure	14.5	B/C	A	9–25		
LAP 031113	Euc-brecciated	2.2	A	A		21–64	
LAP 031117	CO3	4.2	B	A/B	1–36	1	
LAP 031120	L5	6.2	B	B			
LAP 031121	L5	11.9	B	B			t
LAP 031122	L5	6.1	B	B			t
LAP 031123	L5	19.6	B	B			t
LAP 031124	L5	10.4	B	B			t
LAP 031125	H-IM	7	B	A	17	16	t
LAP 031126	LL6	8.5	A	A			t
LAP 031127	LL6	33.8	A/B	A			t
LAP 031128	LL6	32.5	A	A			t
LAP 031129	H6	13.5	CE	A/B			t
LAP 031140	LL6	5.5	B/C	B			t
LAP 031142	L5	9.9	B	A/B			
LAP 031144	R	2.5	C	A/B	16–42	7–19	

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 031146	H5	4.9	B/C	A/B			
LAP 031147	LL6	5.5	B	A			
LAP 031148	H6	3.6	C	A			
LAP 031149	H6	2.3	C	A			
LAP 031160	L5	38.9	C	A/B			
LAP 031161	L5	18.6	C	B			t
LAP 031162	L4	25.1	B	B			t
LAP 031163	L4	37.3	A/B	A/B			t
LAP 031164	L5	32.2	B	B			t
LAP 031165	CM2	27	B	B	1–51		t
LAP 031166	CM1-2	15.1	B	B	0–1		t
LAP 031167	L5	10.7	C	B			t
LAP 031168	L5	11.7	B/C	B			t
LAP 031169	L4	7.5	C	B			t
LAP 031190	Euc-brecciated	4.7	A	A		25–57	t
LAP 031191	L5	5.3	B/CE	B			t
LAP 031192	L5	1.6	B/C	B			t
LAP 031193	L4	3.1	B/C	B			t
LAP 031194	H6	2.4	C	B			t
LAP 031195	CM2	0.6	B	B	1–33	2–22	t
LAP 031196	L5	5.2	C	B			t
LAP 031197	H6	0.5	B	B			t
LAP 031198	L5	5.6	B/C	B			t
LAP 031199	H6	1.4	B	B			t
LAP 031200	H6	15.4	C	A/B			t
LAP 031201	H4	24.3	B	A/B			t
LAP 031202	H6	18.1	C	A/B			t
LAP 031203	L5	25.2	B	A			t
LAP 031204	H6	23.2	C	A/B			t
LAP 031205	L5	14.4	B	A/B			t
LAP 031206	H6	26.8	B/C	A/B			t
LAP 031207	L5	19.7	B	A/B			t
LAP 031208	L4	26	B	A/B			t
LAP 031209	L5	29.5	B	A/B			t
LAP 031220	EH4	3.1	C	B		0–2	t
LAP 031221	LL6	7.2	A	A/B			
LAP 031222	H6	5.4	C	A			
LAP 031223	L3	4.8	B/C	B	1–27	3–19	
LAP 031224	LL6	7	A/B	A/B			
LAP 031225	LL6	3.3	B	A/B			
LAP 031226	LL6	2.7	B	A/B			
LAP 031227	L5	4.5	C	A			
LAP 031228	L5	2.4	B/C	A/B			
LAP 031229	LL5	5.2	B	A/B			
LAP 031230	H5	12.9	C	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 031231	LL6	12.8	B	A/B			t
LAP 031232	L5	14	C	B			t
LAP 031233	L5	35.2	B/C	B			t
LAP 031234	L5	11.9	B/C	B			t
LAP 031235	H6	33.6	C	A			t
LAP 031236	L5	13	C	B			t
LAP 031237	H6	9.6	C	B/C			t
LAP 031238	L5	9.4	B	B			t
LAP 031239	L5	8.7	B	B			t
LAP 031250	L6	1.1	B	A/B			t
LAP 031252	CM1	0.8	BE	B			
LAP 031253	L5	1	B	B			
LAP 031254	H6	1.3	B	A/B			
LAP 031257	L5	1.4	B	B			
LAP 031258	H5	2.1	C	B			
LAP 031259	L5	1.6	C	B			
LAP 031260	H5	11.8	C	C			
LAP 031261	L5	6.8	B	A/B			t
LAP 031262	L5	11.1	B/C	B			t
LAP 031263	L5	15.6	B	A/B			t
LAP 031264	L5	8.1	B	A/B			t
LAP 031265	L6	8	A/B	A/B			t
LAP 031266	H5	4.4	C	B			t
LAP 031267	L5	16.6	B	B			t
LAP 031268	CM2	15.4	B	B	1–38	1–5	t
LAP 031270	H6	3.2	C	A/B			t
LAP 031271	LL5	8	C	B			
LAP 031272	LL6	3	C	B			
LAP 031273	H6	3.6	B	A			
LAP 031274	L6	5.5	C	A			
LAP 031275	R	6.1	B/C	A	17–42	24	
LAP 031276	L5	6.2	C	A			
LAP 031277	LL6	2.2	C	B			
LAP 031278	L5	2.5	C	B			
LAP 031290	LL5	5.3	B/C	B			
LAP 031291	LL5	13.7	B	B			t
LAP 031292	LL6	2.1	B	B			t
LAP 031293	H5	1.1		A/B			t
LAP 031294	H5	4.4	C	A/B			t
LAP 031295	LL5	1.7	B	B			t
LAP 031296	LL5	1.9	B	B			t
LAP 031297	LL5	2.1	B	B			t
LAP 031298	L6	5.5	C	B			t
LAP 031299	CM2	6.9	B	B	1–43	1–38	t
LAP 031300	LL5	9.4	B/C	B			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 031301	L5	6.6	C	B			t
LAP 031302	LL5	23	B/C	B/C			t
LAP 031303	LL5	4	B/C	B			t
LAP 031304	L5	1.3	B	B			t
LAP 031305	LL5	6.5	B/C	B			t
LAP 031306	LL5	18.8	B	B			t
LAP 031307	L4	45.8	B	A/B			t
LAP 031308	H-IM	8.7	C	C	19	16	t
LAP 031309	Dio	14.1	B	A		23	t
LAP 031310	H4	11.4	C	B	18	11–22	t
LAP 031311	L5	14.7	B/C	A/B			t
LAP 031312	LL6	11.4	A/B	A/B			t
LAP 031313	H5	18.4	C	B			t
LAP 031314	L5	20.4	B/C	A/B			t
LAP 031315	L5	34	B	A/B			t
LAP 031316	Euc-brecciated	25.8	B	A/B		27–84	t
LAP 031317	L5	16.1	B	A/B			t
LAP 031318	L5	17.3	B/C	B			t
LAP 031319	H6	17.5	B	A/B			t
LAP 031321	L-metal	1.3	C	B	24	20	t
LAP 031330	LL5	10.7	B	A/B			t
LAP 031331	LL5	17.7	B	A/B			t
LAP 031332	LL5	12.8	C	B/C			t
LAP 031333	H6	8.5	C	C			t
LAP 031334	L5	5.5	C	B			t
LAP 031335	LL5	8.7	A/B	A/B			t
LAP 031336	L5	19.3	C	B			t
LAP 031337	LL6	9.4	B	A/B			t
LAP 031338	LL6	22.9	B	B/C			t
LAP 031339	L4	75.5	B/C	B			t
LAP 031340	H6	2.7	C	B			t
LAP 031341	H6	1.5	C	B			t
LAP 031342	Ure	3.2	C	A/B	2–21		t
LAP 031343	L5	3.6	C	A/B			t
LAP 031344	LL5	6.2	B	B			t
LAP 031345	H5	7.3	C	A/B			t
LAP 031346	L3	5.4	B/C	B	5–40	4–16	t
LAP 031347	L3	9	C	B	0–33	2–5	t
LAP 031348	LL5	5.7	B/C	B			t
LAP 031349	H5	6.1	C	B			t
LAP 031350	LL6	2.4	A/B	A			t
LAP 031351	L6	2.6	B	A			t
LAP 031352	L5	1.5	B/C	B			t
LAP 031353	H5	4.7	C	A/B			t
LAP 031354	L5	8.2	B/C	B			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 031355	L6	9.2	B/C	A			t
LAP 031356	L5	3.2	C	C			t
LAP 031357	H6	2.9	C	A/B			t
LAP 031358	H5	4.3	C	A/B			t
LAP 031359	L6	2.5	B/C	B			t
LAP 031360	H5	10.8	C	A/B			t
LAP 031361	H6	12.3	C	B			t
LAP 031362	H5	4.7	C	B			t
LAP 031363	L4	9.1	B	B			t
LAP 031364	L5	5.4	C	B			t
LAP 031365	H5	11.8	C	B			t
LAP 031366	H5	12.8	C	B			t
LAP 031367	LL6	3.7	A/B	A/B			t
LAP 031368	H5	10.1	C	B			t
LAP 031369	L6	3.2	B/C	B			t
LAP 031371	CM2	8.8	B	B	1–36	1–30	t
LAP 031373	LL5	15.1	C	B/C			
LAP 031374	LL5	6.5	C	B			
LAP 031375	L5	4.5	B	B			t
LAP 031376	H5	2	C	B/C			t
LAP 031377	L5	2.2	C	B/C			t
LAP 031378	L5	1.5	C	B/C			t
LAP 031379	Euc-brecciated	4.3	A/B	A/B		25–57	t
LAP 031380	L5	1.1	B	A/B			t
LAP 031382	H6	0.4	B/C	A/B			t
LAP 031383	LL6	1.4	A/B	A/B			t
LAP 031384	LL5	0.2	B	A/B			t
LAP 031385	H6	0.6	B/C	A/B			t
LAP 031386	H6	0.3	B/C	A/B			t
LAP 031387	R	1.1	B	A/B	1–38	1–30	t
LAP 031388	H6	0.8	B/C	A/B			t
LAP 031389	H5	1	B	A/B			t
LAP 031391	LL6	1.7	A/B	A			t
LAP 031392	H5	3.3	B/C	A			
LAP 031393	H6	1.1	B	A			
LAP 031394	H5	1.7	B/C	A			
LAP 031395	H6	3	B/C	A			
LAP 04750	L5	5.9	B/C	A/B			
LAP 04751	H-IM	2.8	B/C	A/B	19	16	
LAP 04752	L5	1.4	B	B			
LAP 04753	L5	5.2	C	A			
LAP 04755	L6	4.3	B	A/B			
LAP 04756	LL5	6.7	C	A/B			
LAP 04757	Acp	12.8	C	B	13	12–17	
LAP 04758	L6	7.5	C	B/C			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAP 04759	H4	6.3	C	B	19	16	
LAP 04770	H5	1.1	B	B	19	16	
LAP 04771	CM2	0.6	B	B	1–50	2	
LAP 04772	L5	1.6	B/C	A			
LAP 04773	Acp	8.3	C	A/B	13	13–16	
LAP 04774	L5	5.4	C	A			
LAP 04775	L6	4.1	B	B	24	21	
LAP 04776	L5	3.8	B	B			
LAP 04777	L5	3.4	B	B			
LAP 04778	L5	7.9	C	A/B			
LAP 04779	Ure	1.8	C	B/C	4–22		
LAP 04830	LL5	4.3	B	A/B	4–22		
LAP 04831	L6	0.3	B	A			
LAP 04832	H6	0.9	C	B			
LAP 04833	L6	0.5	C	C			
LAP 04834	H5	0.9	B	B			
LAP 04835	L6	0.8	B	B			
LAP 04836	Dio	263.1	B	A		23	
LAP 04837	Dio	542	B	A		23	
LAP 04838	How	323.5	B	A/B		23–54	
LAP 04839	Dio	569.4	B	A		23	
LAP 04841	Lunar-basalt	56	A/B	A/B		27–75	
LAP 04845	R	1.1	B	A/B	13–38	8–16	
LAP 04846	Eur (brecciated)	0.5	B	A/B		12–41	
Larkman Nunatak (LAR)							
LAR 04328	H5	15,850	B/C	A/B			
LAR 04360	H6	15.2	C	AB			
LAR 04361	H6	7.2	C	A/B			
LAR 04363	H6	31.4	C	B			
LAR 04365	H6	14.6	C	B			
LAR 04366	H6	5.9	C	A/B			
LAR 04367	H6	12.3	C	B			
LAR 04368	LL6	4.3	A	A			
LAR 04370	H6	15.5	C	B			
LAR 04371	H6	17.1	C	B			
LAR 04372	L5	9.2	C	B			
LAR 04373	H6	16.3	C	B			
LAR 04374	L4	20.2	C	A/B			
LAR 04375	L6	17.3	B/C	A/B			
LAR 04376	H5	12.5	B/C	A/B			
LAR 04377	LL6	24	B	A/B			
LAR 04378	L6	36.2	C	B			
LAR 04379	H6	9.2	C	B			
LAR 04381	H6	14.7	C	A			
LAR 04383	L5	2.4	C	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
LAR 04384	L4	10.1	B/C	B			
LAR 04385	H6	43.9	C	B/C			
LAR 04386	H6	24.1	C	B			
LAR 04387	H6	6.2	C	A/B			
LAR 04388	H6	25.6	C	A			
LAR 04389	LL6	9.6	B	B			
MacAlpine Hills (MAC)							
MAC 04990	L5	0.2	B	B			
MAC 04991	L5	0.6	B	B			
MAC 04992	L5	0.6	B	B			
MAC 04994	L5	0.5	B	B			
MAC 04995	L5	0.4	B	B			
MAC 041010	L5	0.9	B	B			
MAC 041011	L5	0.4	B	B			
MAC 041012	L5	0.8	B	B			
MAC 041013	L5	0.4	B	B			
MAC 041014	L5	0.6	B	B			
MAC 041015	L5	0.4	B	B			
MAC 041016	L5	0.7	B	B			
MAC 041017	L5	1.1	B	B			
MAC 041018	L5	1.2	B	B			
MAC 041019	L5	0.8	B	B			
MAC 041070	L5	0.7	B	B			
MAC 041071	L5	1	B	B			
MAC 041072	L5	1.2	B	B			
MAC 041073	L5	0.6	B	B			
MAC 041074	L5	0.3	B	B			
MAC 041120	L5	0.9	B	B			
MAC 041121	L5	0.9	B	B			
MAC 041122	L5	0.5	B	B			
MAC 041123	L5	0.8	B	B			
MAC 041124	H5	0.5	B	B			
MAC 041125	L5	0.5	B	B			
MAC 041126	L5	0.6	B	B			
MAC 041127	H4	0.5	B	B	19	5–21	
MAC 041128	H5	0.5	B	B			
MAC 041129	L5	0.7	B	B			
MAC 041130	LL5	0.3	B	B			
MAC 041131	L5	0.6	B	B			
MAC 041132	L5	0.2	B	B			
MAC 041133	L5	0.4	B	B			
MAC 041134	L5	0.7	B	B			
MAC 041135	L5	0.4	B	B			
MAC 041136	L5	1.2	B	B			
MAC 041137	H5	0.6	B	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MAC 041138	H5	0.9	B	B			
MAC 041139	L5	0.6	B	B			
MAC 041140	L5	0.3	B	B			
MAC 041141	L5	0.5	B	B			
MAC 041142	L5	0.6	B	B			
MAC 041143	L5	0.7	B	B			
MAC 041144	H4	0.9	B	B			
MAC 041145	L5	0.9	B	B			
MAC 041146	L5	0.7	B	B			
MAC 041147	L5	0.7	B	B			
MAC 041148	L5	0.8	B	B			
MAC 041149	L5	0.4	B	B			
MAC 041150	L4	1.3	B	B			
MAC 041151	L5	0.5	B	B			
MAC 041152	H5	0.3	B	B			
MAC 041153	L5	0.5	B	B			
MAC 041154	L5	0.2	B	B			
MAC 041155	L5	0.3	B	B			
MAC 041156	H5	0.4	B	B			
MAC 041157	H5	0.9	B	B			
MAC 041158	L5	0.5	B	B			
MAC 041159	L5	0.3	B	B			
MAC 041180	L5	0.6	B	B			
MAC 041181	L5	1.1	B	B			
MAC 041182	L5	0.9	B	B			
MAC 041183	L5	1.1	B	B			
MAC 041184	L4	1.6	B	B			
MAC 041185	L5	0.8	B	B			
MAC 041186	H5	0.2	B	B			
MAC 041187	L6	0.5	B	B			
MAC 041188	L5	0.9	B	B			
MAC 041189	L5	0.7	B	B			
MAC 041190	L4	1.2	B	B			
MAC 041191	L5	0.4	B	B			
MAC 041192	L5	0.4	B	B			
MAC 041193	Acp/Lod	1.3	B	A/B	11	11	
MAC 041194	H5	0.5	B	B			
MAC 041195	LL5	0.9	B	B			
MAC 041196	L5	0.5	B	B			
MAC 041197	L6	1.4	B	B			
MAC 041198	L5	0.8	B	B			
MAC 041199	L5	1	B	B			
MAC 041200	L5	0.5	B	B			
MAC 041201	L4	0.8	B	B			
MAC 041202	L5	0.5	B	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MAC 041203	L5	0.2	B	B			
MAC 041204	H5	1	B	B			
MAC 041205	L5	1.3	B	B			
MAC 041206	L5	0.9	B	B			
MAC 041207	L5	0.8	B	B			
MAC 041208	L5	0.5	B	B			
MAC 041209	L5	0.4	B	B			
MAC 041210	L5	0.5	B	B			
MAC 041211	L5	0.4	B	B			
MAC 041212	L5	1	B	B			
MAC 041213	L5	0.4	B	B			
MAC 041214	L5	0.2	B	B			
MAC 041215	H5	1	B	B			
MAC 041216	LL6	0.7	B	B			
MAC 041217	L5	1.8	B	B			
MAC 041218	L5	0.9	B	B			
MAC 041219	CM2	0.5	B	B	1–38		
MAC 041220	L5	0.8	B	B			
MAC 041221	L5	0.5	B	B			
MAC 041222	L5	0.9	B	B			
MAC 041223	L5	0.9	B	B			
MAC 041224	L5	0.8	B	B			
MAC 041225	L5	0.4	B	B			
MAC 041226	L5	1.1	B	B			
MAC 041227	L5	0.5	B	B			
MAC 041228	L5	1.5	B	B			
MAC 041229	L5	1.3	B	B			
MAC 041230	L5	1.2	B	B			
MAC 041231	L5	1.5	B	B			
MAC 041232	L5	1	B	B			
MAC 041233	L5	1.1	B	B			
MAC 041234	L5	1.1	B	B			
MAC 041235	L5	1.8	B	B			
MAC 041236	L3	1.5	B	B			
MAC 041237	L5	1.5	B	B			
MAC 041238	L5	1.6	B	B			
MAC 041239	L5	1.5	B	B			
MacKay Glacier (MCY)							
MCY 05200	LL5	3532.3	A/B	A			
MCY 05201	L5	1917.7	A/BE	A/B			
MCY 05202	L5	1178.1	A/BE	A			
MCY 05203	LL6	1078.4	A/BE	A/B			
MCY 05204	LL6	894.3	A	B			
MCY 05205	L6	350.9	B	A/B			
MCY 05206	LL6	247.2	B	A/B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MCY 05207	L6	210.9	B/C	A/B			
MCY 05208	L6	167.2	B/C	B/C			
MCY 05209	LL6	104.7	A/B	A/B			
MCY 05210	LL5	426.4	A/B	A			
MCY 05211	LL5	344.8	A/B	A			
MCY 05212	L5	319.7	B/C	A			
MCY 05213	LL5	352.3	A/B	A			
MCY 05214	L4	306.1	B/C	A/B			
MCY 05215	LL5	254.3	B	A			
MCY 05216	L5	145.5	A/B	A/B			
MCY 05217	L5	198.7	B/C	A			
MCY 05218	H3	214.5	B/C	A/B	1–21	2–9	
MCY 05219	CV3	145	B	A/B	0–4		
MCY 05220	L5	96.6	B	A/B			
MCY 05221	L5	81	C	B			
MCY 05222	LL5	81.3	A/B	A			
MCY 05223	H5	69	C	A			
MCY 05224	LL5	40.5	B	A			
MCY 05225	LL6	67.6	A	A			
MCY 05226	L5	65.5	C	A/B			
MCY 05227	LL6	6.3	A/B	B			
MCY 05228	L6	29.9	C	B/C			
MCY 05229	CM2	9.7	B	B	1–28		
MCY 05230	CM2	60.1	B	A	1–32		
MCY 05231	CM1-2	6.2	B	A/B	0–33	1–40	
MCY 05232	CK4	2.1	B	B	33		
MCY 05233	L5	8.7	C	A/B			
MCY 05234	CM1-2	0.8	B	A/B	0–2		
MCY 05235	L6	1.3	B/C	B			
MCY 05236	L6	2.1	C	A/B			
MCY 05237	L5	9.7	B	A/B			
MCY 05238	L5	1.4	C	A/B			
MCY 05239	Mes	19.3	C	B	34–39	27–36	
MCY 05240	LL5	1.2	B/C	A/B			
MCY 05241	L5	2.5	B/C	A/B			
MCY 05242	CM2	2	B	B	1–25	6	
MCY 05243	L6	11.1	B/C	B			
MCY 05244	LL5	3.1	B	A/B			
MCY 05245	CM2	1.3	B	B	0–40	3	
MCY 05246	L6	1.2	B/C	B			
MCY 05247	LL5	9.2	B	A/B			
MCY 05248	L5	0.8	B/C	B			
MCY 05249	LL5	4.7	B	B			
MCY 05250	L6	34.9	B/C	B			
MCY 05251	CM2	25.3	B	B	1–38	1	

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MCY 05252	LL6	41.5	A/B	A/B			
MCY 05253	H6	18.2	B/C	B			
MCY 05254	LL6	8.8	A/B	A/B			
MCY 05255	L5	1	B/C	B			
MCY 05256	H6	1.3	B/C	B			
MCY 05257	L6	0.5	B/C	B			
MCY 05258	L6	0.6	B/C	B			
MCY 05259	L6	0.8	B/C	B			
MCY 05260	L5	4.2	B/C	B			
MCY 05261	LL5	0.2	B	A/B			
MCY 05262	LL6	0.8	B	A/B			
MCY 05263	LL6	0.9	B	A/B			
MCY 05264	L6	0.8	B/C	B			
Miller Range (MIL)							
MIL 03331	H6	1550	C	C			
MIL 03332	L5	2395	A/B	A			
MIL 03333	L5	1922	A/B	B/C			
MIL 03334	H6	4025.9	B/CE	A			
MIL 03335	L5	2283.3	B/CE	A/B			
MIL 03336	L5	969.8	BE	A/B			t
MIL 03337	LL5	1564.7	A/BE	A			t
MIL 03338	L5	1597.3	A/BE	A/B			t
MIL 03339	LL5	903.7	A/B	A/B			t
MIL 03340	LL5	911.5	A/B	B/C			t
MIL 03341	LL5	717.2	A/B	A/B			t
MIL 03342	H5	658	B	A/B			t
MIL 03343	H5	765	B/C	B/C			t
MIL 03344	H5	536.5	B/C	B/C			t
MIL 03345	L6	603.1	B/C	B/CE			t
MIL 03347	LL6	548.2	A/B	B/C			t
MIL 03348	LL6	395	B	A/B			t
MIL 03349	H5	274.6	B/C	A			t
MIL 03350	LL5	309.3	A/B	A/B			t
MIL 03351	LL6	368.6	B/C	B			t
MIL 03352	H5	258.7	C	B/C			t
MIL 03353	L5	262.9	B/C	A			t
MIL 03354	L5	159.8	B/C	A			t
MIL 03355	L6	202.6	B	A			t
MIL 03357	H5	501.2	C	B			t
MIL 03358	H5	323.2	C	B			t
MIL 03359	L5	502.7	B	BE			t
MIL 03365	L5	1114.8	A/B	A/B			t
MIL 03366	L5	815.9	B/C	A/B			t
MIL 03367	H6	372.9	B/C	B/C			t
MIL 03370	H5	169.8	C	B			t

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MIL 03371	L4	82.7	B	A	24	19	t
MIL 03372	LL5	97.8	B/C	A/B			t
MIL 03373	L5	103.9	B	A			t
MIL 03374	L5	71.3	B/CE	A			t
MIL 03375	L5	125.9	C	A/B			t
MIL 03376	H6	212.5	C	B			t
MIL 03377	CO3	129.8	B	A/B	1–42		t
MIL 03378	L5	145.1	C	B			t
MIL 03379	H5	207.5	C	A/B			t
MIL 03380	L5	85.7	B	A/B			t
MIL 03381	H5	46	B/C	A			t
MIL 03382	LL5	58.4	B/C	A			t
MIL 03383	L5	191	A/B	A			t
MIL 03384	LL5	122.5	B	A/B			t
MIL 03385	LL6	99.3	A/B	A			t
MIL 03386	L5	127	B/C	A/B			t
MIL 03387	L5	68.3	B	A			t
MIL 03388	L5	154.3	B	A			t
MIL 03389	LL5	146	B	A			t
MIL 03390	H5	83.9	B/C	A			t
MIL 03391	L5	68.9	B	A			t
MIL 03392	LL5	94.5	B	A			t
MIL 03393	H5	64.7	B/C	A			t
MIL 03394	H6	22.3	B/C	B			t
MIL 03395	H5	20	B/CE	A/B			t
MIL 03396	H5	29.1	B/C	A			t
MIL 03397	H5	3.9	B/C	A			t
MIL 03398	H5	16.6	B/C	A/B			t
MIL 03399	LL5	18.6	A/B	A			t
MIL 03420	LL5	45.1	A/B	A			t
MIL 03421	H5	2.4	B/C	A			t
MIL 03422	L5	29.4	B	A			t
MIL 03423	LL5	45.4	A/B	A			t
MIL 03424	LL5	4.4	A/B	A			t
MIL 03425	H5	18.2	B/C	A/B			t
MIL 03426	L5	35.2	B/C	A/B			t
MIL 03427	H5	54.7	B/C	A/B			t
MIL 03428	L5	23.5	B/C	A/B			t
MIL 03429	H5	27.3	B/CE	A			t
MIL 03430	H5	4.4	C	A/B			t
MIL 03431	H6	5.8	CE	A/B			t
MIL 03433	H6	16.5	C	A			t
MIL 03434	L5	6.5	B/C	B			t
MIL 03435	H5	4.6	C	A/B			t
MIL 03436	H6	14.2	C	A/B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MIL 03437	H6	6.8	C	A/B			
MIL 03438	H5	37	C	B			
MIL 03439	H3	1.4	B	A	2–20	0–15	
MIL 03440	H6	31.7	C	A/B			
MIL 03441	L5	34.3	B/C	B			
MIL 03442	CO3	63.8	C	A/B	0–38	2	
MIL 03443	Mes	46.3	B	B	26		
MIL 05001	L5	3055.5	BE	B			
MIL 05002	H5	21,490	CE	C			t
MIL 05003	LL5	2181.8	A/B	A/B			t
MIL 05004	L6	831.1	B/C	B/C			t
MIL 05005	L5	1127.8	BE	A			t
MIL 05006	L5	1234.8	BE	A			
MIL 05007	L5	304.4	B/C	B			
MIL 05008	H5	330.9	B/CE	A/B			
MIL 05009	L6	396.8	A/B	A			
MIL 05010	H4	582.4	B/C	A/B	19	16	
MIL 05011	L5	1608.3	A/B	A/B			
MIL 05012	L5	2409.6	A/B	A			
MIL 05013	CO3	1494.6	B/CE	A/B	1–47	1–6	
MIL 05014	L5	881.6	A/B	A			
MIL 05015	L5	1025.8	B	B			
MIL 05016	L5	1336.2	C	A/B			
MIL 05017	H5	987.2	B/C	B/CE			
MIL 05019	L5	394.4	B/C	A/B			
MIL 05020	L5	368.7	B/C	B/C			
MIL 05021	LL5	300.5	A/B	A			
MIL 05022	L5	235.7	B/CE	A/B			
MIL 05023	LL4	133.1	A/B	A/B			
MIL 05024	CO3	196.6	A/B	A	0–55		
MIL 05025	L5	104.3	A/B	A			
MIL 05026	L5	72.5	B/C	B			
MIL 05027	LL6	67.5	A/BE	A			
MIL 05028	LL5	77.9	A/B	A/B			
MIL 05029	L -IM	132.7	A/BE	A/B	25	21	
MIL 05030	LL5	112.9	B	A/B			
MIL 05032	H6	127.8	B/C	A/B			
MIL 05033	H5	179.2	C	A/B			
MIL 05034	L6	192.4	C	B			
MIL 05035	Lunar-basalt						
MIL 05036	L6	314.1	C	B			
MIL 05037	H5	239	C	A/B			
MIL 05038	L6	187.4	C	C			
MIL 05039	L5	227.6	A/B	A/B			
MIL 05040	L5	305.4	B	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MIL 05041	Eur (brecciated)	239.8	B	B/C	60		
MIL 05042	LL5	262.6	A/B	A/B			
MIL 05043	L6	308	C	C			
MIL 05044	L5	180.2	C	C			
MIL 05045	L5	283.4	B/CE	A/B			
MIL 05046	L5	388.3	B	A/B			
MIL 05047	LL5	289.7	A/BE	A			
MIL 05048	L5	197.2	B/C	B			
MIL 05049	L5	152	B/C	B			
MIL 05050	L3	253.3	B	A/B	6–25	3–17	
MIL 05051	L5	368	C	A/B			
MIL 05052	L5	257.6	C	B			
MIL 05053	LL6	399	B	B/C			
MIL 05054	H5	233.6	B/C	A			
MIL 05055	LL5	109.2	A/B	A			
MIL 05056	LL5	113.6	B	A			
MIL 05057	LL6	472.2	A/B	A/B			
MIL 05058	L6	128.1	A/B	B/C			
MIL 05059	L5	118.5	B/C	A			
MIL 05060	LL6	34.7	A/B	A			
MIL 05061	L5	58.8	B/C	A/B			
MIL 05062	How	23.8	B	A	29–54		
MIL 05063	L5	23.3	B/C	A/B			
MIL 05064	L5	82.5	A/B	A/B			
MIL 05065	H5	23.3	B/C	A			
MIL 05066	H5	21.1	A/B	A			
MIL 05067	LL5	42	A/B	A/B			
MIL 05068	H5	36.1	A/B	A/B			
MIL 05070	L6	61.9	C	B			
MIL 05071	L6	28.4	C	B			
MIL 05072	L5	28.1	C	A/B			
MIL 05073	LL5	106.7	B	A/B			
MIL 05074	H5	88.4	C	A/B			
MIL 05075	L5	86.8	C	B			
MIL 05076	L3	59.5	B	A/B			
MIL 05077	L5	32.5	C	B			
MIL 05078	LL6	41.2	A/B	A/B			
MIL 05079	L5	82.7	A/B	B			
MIL 05080	LL6	30.2	A/B	A/B			
MIL 05081	H6	41.2	C	C			
MIL 05082	CB	12	B	B	1–3	1–3	
MIL 05083	L6	35.7	B/C	B			
MIL 05084	L6	30.9	B/C	B			
MIL 05085	How	18.6	B	B		27–60	
MIL 05086	CM2	1.7	BE	A/B	0–25	0–4	

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MIL 05087	LL6	13.1	B	B			
MIL 05088	L5	16.8	B	B			
MIL 05089	L6	17.3	A/B	B			
MIL 05090	L6	23.5	A/B	B			
MIL 05091	L5	14.8	C	A/B			
MIL 05092	L5	31.5	C	A/B			
MIL 05093	LL6	6.9	A	A			
MIL 05094	LL5	9.4	B/C	B			
MIL 05095	LL5	28.3	B	B			
MIL 05096	LL5	13.9	A/B	B			
MIL 05097	LL6	24.6	B	B			
MIL 05098	H4	9.9	C	B			
MIL 05099	L5	49.9	B	A/B			
MIL 05100	L6	17.3	C	C			
MIL 05101	L5	22.2	C	C			
MIL 05102	L5	12.8	B/C	B			
MIL 05103	L5	5.6	C	B			
MIL 05104	CO3	41	B	A	1–28	1	
MIL 05105	L5	33.3	A/B	A			
MIL 05106	LL5	12	A/B	A			
MIL 05107	LL6	18.7	A/BE	A			
MIL 05108	L6	19.5	C	A/B			
MIL 05109	LL5	5	B/C	B			
MIL 05111	L5	0.9	B/C	B			
MIL 05112	CM2	2.8			1–20		
MIL 05113	LL5	0.3	B/C	B			
MIL 05114	H6	7.8	C	A/B			
MIL 05115	L5	5.9	B/C	B			
MIL 05116	L5	2.2	C	A/B			
MIL 05117	L5	1.3	B/C	B			
MIL 05118	H4	1.4	CE	B	20	17	
MIL 05119	CM2	0.9	B	B	0–32		
MIL 05120	L6	2.7	C	A/B			
MIL 05121	LL6	2	B/C	B			
MIL 05122	L6	0.8	C	A/B			
MIL 05123	L6	5.2	C	A/B			
MIL 05124	CM2	2.6	B	B	1–20	32	
MIL 05125	L5	0.8	C	A/B			
MIL 05127	LL6	3.5	B/C	B			
MIL 05128	L6	1.9	C	B			
MIL 05129	LL6	2.8	A/B	A			
MIL 05130	L6	12.5	A/B	A			
MIL 05131	L6	4.7	B/C	B			
MIL 05132	L6	17.4	C	B			
MIL 05133	LL5	4.6	A	A/B	28	24	

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
MIL 05134	L6	3.6	C	A/B			
MIL 05135	L6	4.9	C	B			
MIL 05136	L-IM	8.3	B/C	B	25	21	
MIL 05137	CM1	2.4	BE	B			
MIL 05138	LL6	7.5	A	A/B			
MIL 05139	EH3	10.6	C	C	2	0–3	
MIL 05140	H6	13.4	C	C			
MIL 05141	L5	1.6	C	C			
MIL 05142	L5	11.4	C	B			
MIL 05143	L6	4.2	C	B			
MIL 05145	LL6	2.1	A	A/B			
MIL 05146	L5	2.3	C	B			
MIL 05148	L6	0.9	C	B			
MIL 05149	L5	2.6	B	B			
MIL 05150	L5	42.3	C	B			
MIL 05151	LL6	101.5	A	A/B			
MIL 05152	CM2	46.6	B	A/B	1–37	1–26	
MIL 05153	L5	51.2	B/C	B			
MIL 05154	L5	72	B/C	A/B			
MIL 05155	L-IM	53.5	B	B	25	21	
MIL 05156	LL6	94.4	B	B			
MIL 05157	L6	95.2	A/B	B			
MIL 05158	L6	73.7	C	B			
MIL 05159	LL5	89	B	B			
MIL 05160	L5	38.4	C	A			
MIL 05161	H6	24.6	C	B			
MIL 05162	L5	33.7	C	B			
MIL 05163	H6	42.9	C	B			
MIL 05164	L6	38.8	B/C	B			
MIL 05165	How	25.6	B	B		30–60	
MIL 05166	H6	39.7	C	A			
MIL 05167	L6	29	C	A			
MIL 05168	L6	75.7	B	B			
MIL 05169	L5	48.1	B/C	B			
MIL 05171	H6	4.3	C	B/C			
Mount Pratt (PRA)							
PRA 04401	How	55	CE	B		1–60	
PRA 04402	How	37.8	B	B		16–60	
PRA 04403	LL6	655.7	B	A			
PRA 04404	LL6	358.9	B	A			
PRA 04405	LL6	1373.5	A	A			
PRA 04406	H6	1188.6	C	A/B			
PRA 04407	L5	508	B	A/B			
PRA 04408	LL6	384.7	A/B	A			
PRA 04409	LL6	326.8	A/B	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
PRA 04410	LL5	278.6	B	A			
PRA 04411	LL5	170.6	B/C	A/B			
PRA 04412	L6	82.8	C	B			
PRA 04413	L5	84.6	B	A			
PRA 04415	LL6	106.8	B	A/B			
PRA 04416	LL5	69.8	B/C	B			
PRA 04417	LL5	87.5	B	B			
PRA 04418	L5	36.7	B/C	B			
PRA 04419	LL6	62.9	B	A			
PRA 04420	L6	21.6	C	B			
PRA 04421	L5	25.7	C	B			
PRA 04422	LL6	5060	A	A			
Roberts Massif (RBT)							
RBT 03520	LL6	1327.7	A/B	A/B			
RBT 03521	LL5	1378	A	A			
RBT 03524	H6	182.6	C	A			
RBT 03525	L5	299.7	A/B	A/B			
RBT 03526	H5	269	C	A			
RBT 03527	L5	142.3	B	B			t
RBT 03528	LL6	78.3	B	A/B			t
RBT 03529	H5	128.5	C	B			
RBT 04100	L6	2609	C	B			
RBT 04101	L5	1918.6	C	B/C			
RBT 04102	L5	1328.4	B/C	A/B			
RBT 04103	H5	184.9	C	A/B			
RBT 04104	LL5	204.8	A/B	A/B	29	24	
RBT 04105	L5	298.2	C	B			
RBT 04106	L4	292.4	C	C			
RBT 04107	LL5	522.9	B	A/B			
RBT 04108	L6	386.1	B/C	B			
RBT 04109	LL6	198.9	B	B			
RBT 04110	LL6	172.1	B/C	C			
RBT 04111	H6	273.6	C	A/B			
RBT 04112	LL5	204.3	B	A/B			
RBT 04113	L6	383.2	C	C			
RBT 04114	L3	281.6	B/C	A/B	1–29	3–18	
RBT 04115	LL5	1456.3	B	A/B			
RBT 04116	LL6	1142.9	A/B	A/B			
RBT 04117	H5	965.3	C	A/B			
RBT 04118	LL5	985.5	A/B	B			
RBT 04119	H5	945.5	C	C			
RBT 04120	L5	766.4	C	A			
RBT 04121	L5	495.4	B	A			
RBT 04122	H5	302.1	B/C	C			
RBT 04123	H6	367.7	C	A/B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
RBT 04124	H6	297.4	C	B			
RBT 04125	LL5	375.4	A/B	B			
RBT 04126	L5	1348.2	C	B			
RBT 04128	L5	1104.8	B/C	A/BE			
RBT 04129	LL5	1140	B	B			
RBT 04134	L5	277.3	C	B			
RBT 04135	L6	245.5	C	B			
RBT 04136	LL5	217.4	B	A/B			
RBT 04137	H4	235.2	C	B			
RBT 04138	L5	219.7	C	B			
RBT 04139	L5	141.4	C	B			
RBT 04140	L6	35.3	C	B/C			
RBT 04141	H5	126	C	B			
RBT 04142	H6	101.4	C	B/C			
RBT 04144	H6	192.7	C	A/B			
RBT 04145	H6	47.3	C	B			
RBT 04146	H6	130.7	C	B			
RBT 04147	L6	126.6	C	A/B			
RBT 04148	H6	124.1	C	A/B			
RBT 04149	H6	94.7	CE	C			
RBT 04150	H5	27.5	C	B			
RBT 04151	H6	120	C	B			
RBT 04152	H6	151.9	C	B			
RBT 04153	L5	86.1	B/C	B			
RBT 04154	H5	103.8	C	B			
RBT 04155	H6	103.6	C	B			
RBT 04156	H6	100.2	C	B			
RBT 04157	H5	62.6	C	B			
RBT 04158	LL6	86.4	B/C	B			
RBT 04159	H6	61.9	C	B			
RBT 04160	H6	60	C	A/B			
RBT 04161	H5	57.1	C	A/B			
RBT 04162	Iron-ung	52.3					
RBT 04163	H5	35.6	C	B			
RBT 04164	H6	11.9	C	C			
RBT 04165	H6	14.4	C	B			
RBT 04166	LL6	11.1	C	A/B			
RBT 04167	H5	23.5	C	B			
RBT 04168	H6	11.3	C	A/B			
RBT 04169	H6	9.1	C	A/B			
RBT 04170	LL5	71.3	B	A/B			
RBT 04171	H5	170.3	C	A/B			
RBT 04172	H5	141.6	B/C	A/B			
RBT 04173	L5	99.6	B/C	A/B			
RBT 04174	L5	110.5	C	A/B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
RBT 04175	L5	61.2	B/C	A/B			
RBT 04176	L5	22.1	B/C	A/B			
RBT 04177	L6	42.6	B	B			
RBT 04178	H6	27.4	C	A/B			
RBT 04179	L5	19.8	C	A/B			
RBT 04180	H6	19.7	C	B			
RBT 04181	LL5	3.1	B	B			
RBT 04182	H6	20	C	B			
RBT 04183	H6	12	C	B			
RBT 04184	H5	11.5	C	B			
RBT 04185	LL5	7.7	B	A/B			
RBT 04186	Iron-IIE (?)	4.6			18–20	16–19	
RBT 04187	L5	5.1	C	A/B			
RBT 04188	LL6	10.3	B	B			
RBT 04189	H5	11.6	C	B			
RBT 04190	L6	191.5	B	B			
RBT 04191	L5	69	C	A/B			
RBT 04192	L5	28.5	C	B/C			
RBT 04193	L5	85	C	A/B			
RBT 04194	L5	123.9	B	A/B			
RBT 04195	L5	162	C	A/B			
RBT 04196	L5	93.3	A/B	A			
RBT 04197	L5	39.9	C	B			
RBT 04198	L5	77.9	B	A/B			
RBT 04199	L5	38.3	C	B			
RBT 04200	H6	31.3	C	A/B			
RBT 04201	L5	12.2	C	B			
RBT 04202	H5	14.8	C	C			
RBT 04203	LL6	17.8	B	C			
RBT 04204	H6	13.3	C	B			
RBT 04205	H5	12.4	C	B			
RBT 04206	L5	12.8	C	A/B			
RBT 04207	H5	38.2	C	A/B			
RBT 04208	H6	1.1	C	B/C			
RBT 04209	LL6	2.2	C	A/B			
RBT 04210	H4	133.5	A/B	A/B	18	16	
RBT 04211	H5	182.7	C	A/B			
RBT 04212	H6	136.1	C	C			
RBT 04213	L5	127.9	B	A			
RBT 04214	H5	73.9	C	C			
RBT 04215	H5	111.8	C	C			
RBT 04216	L5	86.5	C	B/C			
RBT 04217	L5	187.3	C	B/C			
RBT 04218	L5	118.9	C	A/B			
RBT 04219	L5	69.2	C	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
RBT 04220	H5	66.8	C	B			
RBT 04221	H5	57.3	C	B			
RBT 04222	L5	64	B	A/B			
RBT 04223	L5	28.4	B	B			
RBT 04224	LL5	44.8	C	B			
RBT 04225	H6	34.1	C	A/B			
RBT 04226	H5	29	C	B			
RBT 04227	L6	57.3	B	A/B			
RBT 04228	Acp	19.8	C	C	8	10	
RBT 04229	H5	75.1	C	B			
RBT 04230	L5	68.9	C	A/B			
RBT 04231	LL6	11.1	B	A/B			
RBT 04232	H5	9.3	C	A/B			
RBT 04233	L5	20.3	C	B			
RBT 04234	H6	16.3	C	B			
RBT 04235	H6	8.5	C	C			
RBT 04236	LL5	13.8	A	A			
RBT 04237	L5	40.9	C	B			
RBT 04238	L5	10.1	C	C			
RBT 04239	Achon-ung	12	C	A/B	24	20	
RBT 04241	L6	86.7	B/C	A			
RBT 04242	L5	54.6	B/C	B/C			
RBT 04243	H5	41.4	B/C	A/B			
RBT 04244	LL6	73.5	A/B	A			
RBT 04245	L5	34	B/C	B/C			
RBT 04246	LL5	28.1	A/B	A			
RBT 04247	H5	44.2					
RBT 04248	L5	35.6	B/C	A/B			
RBT 04249	L5	25.2	B/C	B/C			
RBT 04250	L5	7.9	C	B			
RBT 04252	L5	32.7	B	A/B			
RBT 04253	L5	47	C	B			
RBT 04254	L5	54.9	C	B			
RBT 04256	L5	34.7	C	B			
RBT 04257	L5	34.1	C	B			
RBT 04258	L5	7.6	C	B			
RBT 04259	LL6	4.5	B/C	B			
RBT 04260	CM2	86.3	CE	C	0–1	1	
RBT 04261	Martian	78.8	B	B	39	20–27	
RBT 04262	Martian	204.6	B	B	38–40	16–32	
RBT 04270	L6	370.6	C	A/B			
RBT 04271	L5	341.8	B/C	B/C			
RBT 04272	L5	400.5	B/C	B			
RBT 04273	H5	257.1	C	B			
RBT 04274	L5	431.1	C	B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
RBT 04275	L5	712.2	B/C	B			
RBT 04276	H6	189.7	C	B			
RBT 04277	H5	326.9	B/C	B			
RBT 04279	H5	195	B/C	B			
RBT 04280	L5	225.7	C	B			
RBT 04281	H5	138.4	C	B			
RBT 04282	L5	144.9	C	B			
RBT 04283	LL5	119.6	B	B/C			
RBT 04284	LL5	102.8	B/C	B			
RBT 04285	L6	83.2	C	B			
RBT 04286	H6	67.8	C	B			
RBT 04287	H5	37.8	C	B			
RBT 04288	H5	45	C	B			
RBT 04289	H5	43.1	C	B			
RBT 04290	H5	25.6	B	B			
RBT 04291	L5	54.2	C	B			
RBT 04292	L5	32.3	C	B			
RBT 04293	L5	72.2	C	A/B			
RBT 04294	L5	59.3	C	B			
RBT 04295	L5	70.3	C	A/B			
RBT 04296	L5	52.9	B/C	A/B			
RBT 04297	L5	77.5	C	B			
RBT 04298	LL5	44	BE	B			
RBT 04299	Iron-ung	55.2					
RBT 04300	L5	3.1	C	B			
RBT 04301	L5	9.1	C	B			
RBT 04302	CV3	11.6	B	B	1–9	1	
RBT 04303	L5	16.6	C	B			
RBT 04304	L5	8.5	C	B			
RBT 04305	L5	14.7	C	B/C			
RBT 04306	L6	11.8	C	B			
RBT 04307	L5	8.1	A/B	A			
RBT 04308	L5	7.1	B/C	B			
RBT 04309	CM2	1.3	BE	B	1–50		
Sanford Cliffs (SAN)							
SAN 03450	L5	5168	B	A/B			
SAN 03454	L5	1346.8	B	A			
SAN 03457	L5	786.9	B	B			
SAN 03464	L5	919.1	BE	A/B			
SAN 03465	L5	596.5	B	A/B			
SAN 03466	L5	553.4	BE	A/B			
SAN 03467	L5	462.9	B	A/B			
SAN 03470	L5	224.1	B/CE	A/B			
SAN 03471	L5	237.4	BE	A/B			

Table 3. *Continued.* A list of all meteorites approved from the 2003 to 2005 ANSMET seasons.

Name	Class[a]	Mass (g)	WG[b]	Fracturing	Fa (mol%)	Fs (mol%)	Info
SAN 03472	How	195.2	B	A/B		20–52	
SAN 03473	Dio	125.4	B/C	A	22	2	
SAN 03474	L5	224.5	BE	A/B			
SAN 03475	L5	179.8	B/C	A			
SAN 03476	L5	145.6	BE	A/B			
SAN 03477	L5	108	B/C	A/B			
SAN 03478	LL5	107.2	BE	A/B			
SAN 03479	LL5	58.7	B/C	A/B			
Taylor Glacier (TYR)							
TYR 05180	L5	244.2	B/C	A/B			

[a]For class (which refers to classification): Acp = acapulcoite; Ang = angrite; Achon-ung = achondrite, ungrouped; Bra = brachinite; Dio = diogenite; Euc = eucrite; FC = fusion crust chondrite; How = howardite; Iron-ung = iron ungrouped; IM-Im = impact melt; Imr = impact-melt rock; Mes = mesosiderite; Pal = pallasite; PrA = primitive achondrite; Ure = ureilite. Other abbreviations can be found on the JSC Curation Web page.

[b]WG = weathering grade.
t = thawed.

Table 4. A list of meteorites recovered by Programma Nazionale Ricerche in Antartide (PNRA), the Italian government-sponsored expedition.

Name	Type of find site	Date of recovery	Latitude (S)	Longitude (E)	Total known mass (g)	No. of pieces	Class	SS	WG	Fa (mol%)	Fs (mol%)	Magnetic sus (log χ)	Type specimen mass (g)	Info	Comments
Allan Hills 06001	Blue ice	15-Oct-2006	76°43.017′	158°46.117′	128.1	1	H5	S3	W1-2	18.3	17.5	5.09	128.1	MNA-SI	
Allan Hills 06002	Blue ice	15-Oct-2006	76°44.552′	158°50.583′	119.2	1	H~5					5.04	119.2	MNA-SI	Likely paired with ALH 06001
Allan Hills 06003	Blue ice	15-Oct-2006	76°42.677′	158°47.570′	25	1	H~5					5.07	25	MNA-SI	Likely paired with ALH 06001
Allan Hills 06004	Blue ice	15-Oct-2006	76°42.313′	158°46.703′	61.7	1	H~5					5.07	61.7	MNA-SI	Likely paired with ALH 06001
Allan Hills 06005	Blue ice	15-Oct-2006	76°42.313′	158°46.703′	6	1	H~5					5.05	6	MNA-SI	Likely paired with ALH 06001
Allan Hills 06006	Blue ice	15-Oct-2006	76°42.335′	158°46.552′	280.9	4	H~5					5.08	280.9	MNA-SI	Likely paired with ALH 06001
Allan Hills 06007	Blue ice	15-Oct-2006	76°42.331′	158°46.550′	226.3	1	H5	S3	W1-2	18.7	16.9	5.20	226.3	MNA-SI	Likely paired with ALH 06001
Allan Hills 06008	Blue ice	15-Oct-2006	76°42.331′	158°46.491′	120	2	H~5					5.06	120	MNA-SI	Likely paired with ALH 06001
Allan Hills 06009	Blue ice	15-Oct-2006	76°42.729′	158°46.516′	28.6	1	H~5					5.08	28.6	MNA-SI	Likely paired with ALH 06001
Allan Hills 06010	Blue ice	15-Oct-2006	76°42.758′	158°46.717′	1.08	1	H~5					5.07	1.08	MNA-SI	Likely paired with ALH 06001
Allan Hills 06011	Blue ice	15-Oct-2006	76°42.753′	158°46.716′	24.3	1	H~5					5.10	24.3	MNA-SI	Likely paired with ALH 06001
Allan Hills 06012	Blue ice	15-Oct-2006	76°43.040′	158°46.439′	91	2	H5	S3	W1-2	18.7	17.8	5.07	91	MNA-SI	Likely paired with ALH 06001

Table 5. A list of meteorites recovered by the Chinese Antarctic Expedition.

Name	Date of recovery	Latitude (N)	Longitude (E)	Total known mass (g)	No. of pieces	Class	SS	WG	Fa (mol%)	Fs (mol%)	Magnetic sus (log χ)	Type specimen mass (g)	Comments
Grove Mountain													
GRV 052049	16-Jan-2006	72°46′23″	75°20′8″	96.7	1	L5	S6	W1	$Fa_{24.0 \pm 0.4}$	$Fs_{20.6 \pm 0.5}$	4.6	PRIC	See separate entry
GRV 055364	9-Jan-2006	72°59′36″	75°13′6″	396.4	1	Mes						PRIC	See separate entry

For class (which refers to classification): Mes = mesosiderite.

Table 6. A list of all approved meteorites from Asia.

Name	Location of recovery	Date of recovery or purchase	Find/ fall	Latitude (N)	Longitude (E)	Total known mass (g)	No. of pieces	Class	Type specimen mass (g)	SS	WG	Fa mol%	Fs mol%	Wo mol%	Magnetic sus (log χ)	Comments
United Arab Emirates																
Arabian Peninsula 001	United Arab Emirates	2006	Find			145	1	Dio	21							See separate entry
Arabian Peninsula 002	United Arab Emirates	2006	Find			54	1	Euc	10.8							See separate entry
Arabian Peninsula 003	United Arab Emirates	2006	Find			56	1	Dio	11.2							See separate entry
Arabian Peninsula 004	United Arab Emirates	2006	Find			31	1	Dio	7							See separate entry
Arabian Peninsula 005	United Arab Emirates	2005	Find			146	1	Euc	21							See separate entry
Arabian Peninsula 006	United Arab Emirates	2005	Find			67	1	Euc	13.5							See separate entry
China																
Weikengquan	Jiuquan City, Gansu Province	2006	Find	40°16′	99°49′	665	1	H5	359	6	3	19.4 ± 0.4	17.1 ± 0.2		4.45	See separate entry
Oman																
Dhofar 1427	Dhofar region	17 January 2001	Find	19°6.771′	54°49.126′	12.92	1	Ure	2.6							See separate entry
Sayh al Uhaymir 290	Sayh al Uhaymir region	2004	Find	21°04′31.6″	54°49.126′	17,960	64	CH3	20.1							See separate entry

For class (which refers to classification): Dio = diogenite; Euc = eucrite.
SS = shock stage.
WG = weathering grade.

Table 7. A list of approved relict meteorites from Sweden.

Name	Abbreviation	Date of recovery	Longitude (N)	Latitude (E)	Approximate sizes (cross sections in mm)	Info	Comments
Österplana	Öst 001	1987	58°35′	13°26′	45 × 30	LundU-1	Weathered meteorite contained in red limestone plate (98 × 80 × 50 mm). Light gray reduction halo (total cross section including meteorite: 135 × 135 mm) around dark gray depression from which most of the meteorite has weathered out. This stone has a synonym of Österplana 001.
Österplana 002	Öst 002	10-Oct-1993	58°35′	13°26′	55 × 55 × > 13	LundU-1	Dark meteorite in red limestone plate (165 × 130 × 12 mm). Thin, light gray reduction halo (75 × 75 mm).
Österplana 003	Öst 003	8-Nov-1993	58°35′	13°26′	45 × >25 × >15	LundU-1	Dark meteorite in red pentagonal limestone plate (about 100 × 80 × 10 × 110 × 18 × (height) 17 mm). Plate cut diagonally through center of meteorite. Central part of meteorite bluish-greenish, surrounded by rusty red cm-thick zone. Light reduction halo extends ~1 cm out from meteorite.
Österplana 004	Öst 004	6-Jan-1994	58°35′	13°26′	50 × 52	LundU-1	Dark meteorite in red limestone plate (127 × 175 × 31 mm). Light reduction halo (52 × 54 mm). Two prominent worm burrows in plate. One worm track follows closely outer rim of reduction halo. In the plate there is also a perfectly round white circle of calcite from a vertically positioned nautiloid shell.

Table 7. *Continued.* A list of approved relict meteorites from Sweden.

Name	Abbreviation	Date of recovery	Longitude (N)	Latitude (E)	Approximate sizes (cross sections in mm)	Info	Comments
Österplana 005	Öst 005	8-Feb-1990	58°35′	13°26′	about 10 × 10	LundU-2	Small somewhat square-shaped meteorite with intense reduction halo.
Österplana 006	Öst 006	Identified 5-May-1992; recovered in the 1960s	58°35′	13°26′	50 × 50	LundU-2	Strongly weathered, square-shaped meteorite with sharp edges. Most of meteorite mass is lost and mainly the depression of the meteorite remains (~Öpl 001). The meteorite is in front of a garage entrance and has been driven over by cars thousands of times.
Österplana 007	Öst 007	28-Dec-1993	58°35′	13°26′	95 × 80; 95 × 80	LundU-1	Large dark, very round meteorite in two large plates (each 480 × 480 × 30 mm). Surrounded by inner light orange reduction halo (210 × 200 mm) and an another outer darker red halo. Meteorite with halos looks like an eye, where the meteorite is the pupil.
Österplana 008	Öst 008	5-May-1995	58°35′	13°26′	40 × 18; 28 × 15	LundU-1	Dark meteorite with elliptical shape in two red limestone plates sawed perpendicularly to the sea floor. Plate sizes are 160 × 100 × 27 mm and 160 × 100 × 20 mm.
Österplana 009	Öst 009	15-Jan-1996	58°35′	13°26′	40 × 25 × 8	LundU-1	Dark meteorite in red limestone plate (97 × 116 × 54 mm). Meteorite at edge of plate and sawed through both perpendicularly and horizontally relative to the sea floor.
Österplana 010	Öst 010	1995	58°35′	13°26′	35 × 20	LundU-1	Dark meteorite in very small and thin red limestone plate (67 × 80 × 6 mm). Meteorite has extraordinarily well preserved chondrule structures. Chondrules are on average 0.5 to 0.6 mm in diameter. Size of reduction halo 50 × 70 mm.
Österplana 011	Öst 011	31-Jan-1007	58°35′	13°26′	37 × 44; 32 × 57	LundU-1	Very dark, almost black meteorite in two large red limestone plates (each 400 × 400 × 25 mm). Light reduction halos (85 × 85 mm). Worm tracks along the rim of the reduction halo. A particularly sharp-edged meteorite.
Österplana 012	Öst 012	10-Sep-1996	58°35′	13°26′	58 × 21	LundU-1	Distinctly elongate, "coprolite-shaped" gray, greenish and reddish meteorite in red limestone plate (215 × 165 × 30 mm).
Österplana 013	Öst 013	11-Mar-1996	58°35′	13°26′	23 × 34	LundU-1	Small teardrop shaped dark meteorite in red limestone plate (215 × 237 × 22 mm) with worm burrows. Proportionally large (110 × 110 mm), but diffuse gray reduction halo.
Österplana 014	Öst 014	11-Apr-1996	58°35′	13°26′	40 × 30	LundU-1	Dark pear-shaped meteorite in red limestone plate (245 × 170 × 30 mm). Very intense and distinct light orange-gray reduction halo (80 × 80 mm).
Österplana 015	Öst 015	1-Jun-1996	58°35′	13°26′	23 ×15 × >11	LundU-1	Gray distinctly square-shaped meteorite in red limestone plate (135 × 125 × 12 mm). Diffuse, but large gray reduction halo (70 × 60 mm).
Österplana 016	Öst 016	4-Aug-1996	58°35′	13°26′	22 × 15	LundU-1	Dark meteorite in red limestone plate (95 × 145 × 12 mm). Thin, very intense orange-gray reduction halo (28 × 24 mm). Large nautiloid shell in plate (vertical cross section of two chambers).
Österplana 017	Öst 017	15-May-1997	58°35′	13°26′	20 × 27	LundU-1	Very dark, almost black squared to subrounded meteorite in large red limestone plate (400 × 250 × 34 mm) with large nautiloid shell spanning almost diagonally across most of the plate. Chambers of shell excellently displayed. Very intense light gray reduction halo (60 × 60 mm) around meteorite. Worm tracks along margin of and in reduction halo.
Österplana 018	Öst 018	15-Jan-1996	58°35′	13°26′	25 × 32; 40 × 33	LundU-1	Very dark, almost black meteorite, somewhat triangular-shaped, in two red limestone plates (190 × 150 × 12 and 190 × 160 × 12 mm). Nautiloid shell extending along the whole long side of the limestone plate. Plate cuts through shell. Reduction halo (60 × 50 mm).

Table 7. *Continued*. A list of approved relict meteorites from Sweden.

Name	Abbreviation	Date of recovery	Longitude (N)	Latitude (E)	Approximate sizes (cross sections in mm)	Info	Comments
Österplana 019	Öst 019	15-Apr-1997	58°35′	13°26′	35 × 20; 40 × 65	LundU-1	Large dark meteorite in two large red limestone plates (500 × 300 × 12 mm and 520 × 300 × 13 mm). In one plate excellently preserved long nautiloid shell with perfectly exposed chambers and siphuncle crosses plate almost diagonally. In second plate more diffuse imprint of the same shell. Weak imprints also of other shells in the two plates. Meteorite occurs in one of the corners of the large plates.
Österplana 020	Öst 020	10-Jun-1997	58°35′	13°26′	25 × 17	LundU-1	Dark meteorite with "rugged" margins in red limestone plate (220 × 170 × 12 mm). Meteorite in corner of plate. Thin, intense reduction halo (35 × 30 mm).
Österplana 021	Öst 021	15-Jun-1997	58°35′	13°26′	about 12 × 25	LundU-1	Gray, subrounded to square shaped meteorite in red limestone steps of the garden of Gunnebo castle. Meteorite is presently weathering at a fast rate.
Österplana 022	Öst 022	27-Nov-1999	58°35′	13°26′	18 × 18	LundU-1	Dark meteorite with five subrounded corners in red limestone plate (~110 × 110 × 23 mm). One side of plate cut diagonally giving the plate a somewhat triangular appearance (but still four corners). Intense, solar-corona like, reduction halo (50 × 50 mm).
Österplana 023	Öst 023	2-Dec-1999	58°35′	13°26′	40 × 35; 50 × 30	LundU-1	Dark meteorite in two very large red limestone plates (each 1200 × 700 × 24 mm). Many nautiloid shells on plate. Intense reduction halos (70 × 60 mm).
Österplana 024	Öst 024	2-Dec-1999	58°35′	13°26′	25 × 15	LundU-1	Dark elongate meteorite in rough red limestone block (not sawed or polished) (130 × 90 mm). Prominent light gray reduction halo (60 × 50 mm).
Österplana 025	Öst 025	29-Mar-2000	58°35′	13°26′	11 × 7	LundU-1	Very small dark meteorite in proportionally very large red limestone plate (570 × 740 × 30 mm). Two large nautiloid shells in plate. Thin, intense reduction halo (15 × 11 mm).
Österplana 026	Öst 026	17-Mar-2000	58°35′	13°26′	50 × 30	LundU-1	Dark meteorite in very large red limestone plate (1115 × 735 × 18). Intense reduction halo (50 × 60 mm). Two very large nautiloid shells (560 and 350 mm) in plate. One only about 100 mm from meteorite.
Österplana 027	Öst 027	29-Mar-2000	58°35′	13°26′	60 × 55; 50 × 70	LundU-1	Dark meteorite with shape similar to Indian subcontinent in two red limestone plates (415 × 355 × 30 and 660 × 400 × 30 mm). Plates with very intense red and orange colors, prominent reduction halo (about 110 × 110 mm).
Österplana 028	Öst 028	11-Sep-2000	58°35′	13°26′	30 × 20	LundU-1	Gray meteorite, shape somewhat triangular, but rounded corners, in red limestone plate (385 × 200 × 22 mm). Comparatively large, but diffuse reduction halo (90 × 90 mm). Halo changes color from gray to reddish gray. Worm burrows in reduction halo.
Österplana 029	Öst 029	2-Oct-1998	58°35′	13°26′	80 × 50 × 20; 80 × 50; 80 × 50	LundU-1	Loose meteorite and two blocks with the enclosing red limestone. In the blocks there are imprints made by the meteorite. Some meteoritic material is left in these depressions. The loose meteorite has a compressed appearance; it is dark greenish gray. In the two blocks (each 230 × 260 × 30 mm) with dark gray to black imprints of the meteorites there are also large gray reduction halos.
Österplana 030	Öst 030	8-Apr-1994	58°35′	13°26′	80 × 124; 80 × 124	LundU-1	Large black rounded (somewhat bean- or kidney-shaped) meteorite in two gray limestone plates (each 315 × 315 × 30 mm).

Table 7. *Continued*. A list of approved relict meteorites from Sweden.

Name	Abbreviation	Date of recovery	Longitude (N)	Latitude (E)	Approximate sizes (cross sections in mm)	Info	Comments
Österplana 031	Öst 031	15-Sep-1998	58°35′	13°26′	50 × 50; 65 × 45	LundU-1	Black meteorite (looks almost like opal) in two gray limestone plates (160 × 80 × 60 and 160 × 90 × 50 mm). The larger meteorite part on one plate has three very sharp corners, like a triangle, but the "hypotenuse" is curved. The other smaller part on a separate plate represents a cut through the margin of the meteorite. The shape of this meteorite part is entirely different from the larger part: two areas, one round, one triangular connected by a thin bridge.
Österplana 032	Öst 032	11-Sep-2000	58°35′	13°26′	210 × 65 × 41; 210 × 65 × 50	LundU-1	Largest meteorite found by 2006. Occurs in two gray limestone blocks (each 730 × 180 × 65 mm). The saw has cut the blocks and the meteorite perpendicularly relative to the sea floor. Meteorite has fish-like shape. Well displayed hardgrounds in blocks. One prominent hardground a few centimeters below meteorite. Meteorite itself not on hardground but has sunk into the originally soft sediment.
Österplana 033	Öst 033	12-Oct-2000	58°35′	13°26′	50 × 25; 65 × 35	LundU-1	Dark elliptical, rounded meteorite in two gray limestone plates (300 × 290 × 40 and 400 × 400 × 30 mm). Prominent fresh cracks through the meteorite part on the smaller plate.
Österplana 034	Öst 034	2-Nov-1998	58°35′	13°26′	20 × 25; 16 × 26	LundU-1	Dark gray to black, vaguely square-shaped meteorite in two limestone plates (each 165 × 145 × 30 mm) with the characteristic reddish gray color of the Flora bed.
Österplana 035	Öst 035	20-Mar-1996	58°35′	13°26′	80 × 60 × 15; 85 × 70 × 30; 42 × 40 ×31	LundU-1	Perhaps the most beautiful and perfect fossil meteorite found by 2006. A large rounded meteorite, with perfectly preserved chondrule structures almost throughout the entire exposed meteorite surface. Structure of an extraneous clast in original meteorite also preserved. Meteorite occurs in three plates of red limestone (195 × 290 × 31; 195 × 300 × 30 and 195 × 300 × 30 mm). One plate contains a not-so-nice cut through the margin of the meteorite. The two other plates contain the excellent cuts and texturally preserved surfaces through the meteorite. The upper and lower part of a nautiloid shell is exposed on each of these two plates. Prominent worm tracks around meteorite. Outer parts of meteorite have flaky appearance.
Österplana 036	Öst 036	24-Oct-1996	58°35′	13°26′	65 × 44; 65 × 44	LundU-1	Dark weathered, "ugly" meteorite at crack surface in two red limestone blocks/plates (300 × 110 × 31 mm and 320 × 110 × 31 mm). Only a part of the meteorite is preserved and it occurs at the margin of the two blocks.
Österplana 037	Öst 037	2-Oct-1998	58°35′	13°26′	60 × 45; 60 × 50	LundU-1	Strongly weathered, brownish meteorite in two red limestone blocks (460 × 220 × 50 and 470 × 220 × 50 mm). Very large gray reduction halo (230 × 160 mm). From the lowest part of the Sextummen bed, the s.k. Måcka bed.
Österplana 038	Öst 038	15-Jun-1999	58°35′	13°26′	40 × 20 × 18	LundU-1	Dark, rust brown meteorite in red limestone plate (150 × 130 × 25 mm). Meteorite at margin of plate and sawed through both the vertical and horizontal directions. Large diffuse reduction halo (110 × 110 mm).
Österplana 039	Öst 039	11-Sep-2000	58°35′	13°26′	35 × 32	LundU-1	Strongly weathered brown meteorite in limestone block (300 × 280 × 280 mm). Gray reduction halo (120 × 120 mm).
Österplana 040	Öst 040	10-Jun-2000	58°35′	13°26′	30 × 14	LundU-1	Small lip-shaped meteorite in red limestone plate (205 × 230 × 100 mm).
Österplana 041	Öst 041	1996	58°35′	13°26′	20 × 15	LundU-1	Dark meteorite in red limestone block (115 × 135 × 65 mm). Meteorite-exposing side of block is a raw (i.e., not sawed) rock surface, other sides sawed. Prominent gray reduction halo (80 × 80 mm).

Table 7. *Continued*. A list of approved relict meteorites from Sweden.

Name	Abbreviation	Date of recovery	Longitude (N)	Latitude (E)	Approximate sizes (cross sections in mm)	Info	Comments
Österplana 042	Öst 042	11-Sep-2000	58°35′	13°26′	35 × 30	LundU-1	Strongly brown-weathered round meteorite in dark red limestone block (280 × 300 × 80 mm). The meteorite is not sawed, but exposed on a rough rock surface. Prominent gray reduction halo (120 × 130 mm).
Österplana 043	Öst 043	17-Feb-2002	58°35′	13°26′	15 × 15	LundU-1	Small dark meteorite in red limestone plate (230 × 200 × 28 mm).
Österplana 044	Öst 044	17-Mar-2002	58°35′	13°26′	50 × 40	LundU-1	Medium-sized meteorite with very rusty appearance in red limestone block (115 × 85 × 55 mm). Some sides of block sawed, others rough rock surfaces. Meteorite sawed through both in vertical and horizontal directions.
Österplana 045	Öst 045	7-May-2002	58°35′	13°26′	35 × 20	LundU-1	Dark meteorite in red limestone block (170 × 130 × 48 mm). Meteorite-exposed surface not sawed, but sides of block are sawed. Prominent gray reduction halo (90 × 70 mm).
Österplana 046	Öst 046	5-May-2002	58°35′	13°26′	20 × 13	LundU-1	Dark meteorite in red limestone plate (91 × 60 × 11 mm). Intense light reduction halo (40 × 34 mm). Meteorite has somewhat rectangular appearance, with two sharp corners on one of the short sides, but opposing side has rounded corners.
Österplana 047	Öst 047	21-Nov-2002	58°35′	13°26′	37 × 27; 31 × 20	LundU-1	Dark meteorite in two gray limestone plates (106 × 136 × 29 and 106 × 136 × 54 mm). Meteorite sawed in perpendicular direction relative to sea floor. Orthoceratite shell (vertical cut) at the side above meteorite.
Gullhögen 001	Gul 001	14-Jun-2000	58°23′	13°48′	12 mm	LundU-3	Almost round gray structure in two red Orthoceratite limestone blocks. Surrounded by 5 cm reduction halo.