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FROM THE CHAIR OF THE NOMENCLATURE COMMITTEE

Dr. Jutta Zipfel

Since 2005, the president of the Meteoritical Society has appointed seven new members, among whom are G. Benedix, H. Chennaoui, H. Connolly, W. Hsu, C. Smith, and A. Yamaguchi. I welcome these new members and wish them successful years on the committee. I also thank members that rotated off the committee during this time, R. Harvey, M. Kimura, D. Kring, Y. Lin, and H. Palme, for their time and effort spent working on the committee. On behalf of the entire Committee I extend special thanks to S. Russell and M. Grady, who also rotated off the committee and could not continue their work as editors of the Meteoritical Bulletin. When Sara and Monica took over in 2002, the number of non-Antarctic meteorites reported was 493. Soon after, in 2004, it reached a maximum of 857. We all owe them our highest respect and gratitude for keeping the system functioning through this difficult time.

During the last couple of years, the Nomenclature Committee of the Meteoritical Society experienced a number of significant changes. Harold Connolly was appointed new editor of the Meteoritical Bulletin in May 2005. At the same time, I took over the chair of the Nomenclature Committee from Jeff Grossman. During the first months, Jeff was of tremendous support in getting the committee, and especially Harold and me, started. We had many discussions about what changes could make the system more efficient and how to implement these changes so that they were relatively transparent to submitters, associated editors, and the Nomenclature Committee members.

Harold worked hard to structure the editorship in a way that permitted the new goals to be achieved. Major changes include: 1) an increased number of associate editors (Caroline Smith and Gretchen Benedix were appointed as associate editors for meteorites from Northwest Africa and Akira Yamaguchi for meteorites from Asia and the Pacific); 2) a regular review and voting schedule, the dates of which are announced on our Web page; 3) templates for tables and short descriptions; 4) submissions through the editor only. Also, he has given this and future editions of the Meteoritical Bulletin a new look. Meteorites are listed for each continent separately. Single descriptions are divided into history, physical properties, petrography, geochemistry, classification, and type specimen. He has also added images and will invite specified classifiers to submit images of described meteorites for future bulletins. In addition, starting in 2006 the Meteoritical Bulletin will be published twice a year.

Jeff Grossman has created and installed a meteorite database and search engine on the society's website, http://www.meteoriticalsociety.orgsimple_template.cfm?code=pub_bulletin. He will regularly update his database as it provides information on the publication status of a given meteorite.

This is especially important to authors of papers and abstracts because editors of various journals, including *Meteoritics & Planetary Science* and *Geochimica et Cosmochimica Acta*, will no longer publish papers that contain provisional or unofficial meteorite names. I encourage everyone working in the field of meteoritics to use our new online database. On behalf of the entire committee, we are most grateful to Jeff for his hard work in creating and maintaining this online service for all communities.

During the last two years it has been tremendously helpful to rely on the support of Herbert Palme, president of the Meteoritical Society. President Palme regards the Nomenclature Committee as currently the most important committee among all committees of the Meteoritical Society. With his support, we have finally brought about new structures to serve the needs of the various meteorite communities. In part, the increasing number of newly recovered and classified meteorites motivated the committee to make many of these changes. I would like to stress that meeting the needs of the various meteorite communities may require additional changes in the coming year. It is my aspiration that all meteorite communities—scientists, classifiers, collectors, dealers, and all interested in meteorites—will benefit equally from these.

FROM THE EDITOR

Harold C. Connolly, Jr.

In February 2006 I attended the Tucson Gem and Mineral Show, held in the great city of Tucson, Arizona, USA. It was an amazing learning experience. For the first time I met many dealers, collectors, and classifiers from around the world. I had the great pleasure of meeting and discussing many issues surrounding meteoritics with Ms. A. Black, Mr. M. Taylor, Mr. E. Olson, Mr. J. Scharder, Mr. Martin Horejsi, Mr. M. Farmer, Mr. R. Verish, Mr. G. Heslep, Mr. R. Wesel, M. B. Fectay, Mme. C. Bidaut, and many others. I attended Mr. M. Blood's auction, which was great fun and a wonderful learning experience. Some friends and colleagues were also in attendance such as Drs. A. Ruzicka and M. Hutson, Dr. W. Hsu and his wife, and Dr. A. Ehlmann and his wife. I would like to thank the director of the Southwest Meteorite Center, Dr. D. Lauretta and the curator of the center, Mr. M. Killgore, for their invitation to attend the show and to speak about nomenclature to the many meteorite communities attending the show. Also speaking were L. Welzenback from the Smithsonian Institution, who spoke on meteorite classification, and M. Killgore, who spoke about the Southwest Meteorite Center. Dr. Lauretta and Curator Killgore were wonderful hosts and really aided me with a common goal: building bridges between the many meteorite communities. The increasing, almost alarming, rate of meteorite recovery from around the world is and will continue to drive new thinking on issues related to meteorite science, nomenclature, collecting, and dealing. I look forward to future visits to the Tucson show, seeing the many new friends and colleagues.

Noteworthy Recovery

The office of the editor, the entire Nomenclature Committee, and all of the Meteoritical Society congratulate Steve Arnold of Arkansas, USA, Phil Mani of Texas, USA, and their colleagues for the recovery of a whopping 650 kg of Brenham!

The New Look of the Meteoritical Bulletin

With this edition, the presentation of the Meteoritical Bulletin changes. We hope to continue to make changes, as we feel they are needed to meet our goals of better serving the communities. This edition presents the descriptions or basic classification information for over 400 meteorites, 99% of which are new recoveries, either finds or falls. Keeping with our goals of presenting consistent data tables and descriptions, some meteorites typically published in the Meteoritical Bulletin, such as those from the United States of America's Antarctic collection, will be published in the March 2007 edition. Due to a low number of meteorites recovered from Asia, Europe, and other planets, these are presented only in descriptive format.

In closing, I need to thank many people who help to produce this volume and who were supportive in the last year when many issues surrounding the Meteoritical Bulletin were in transition. It is critical to recognize the amazing team of associate editors. They are co-authors of the Meteoritical Bulletin, and they serve the society by performing what is often tedious work. This past year, they all worked extremely hard to improve communication between the Nomenclature Committee, the Meteoritical Bulletin, submitters, and classifiers, and I deeply thank them. I am very appreciative of Tim Jull, the editor of *Meteoritics & Planetary Science,* Agnieszka Baier and everyone else at the production office, for their support in transforming the Meteoritical Bulletin to its new format.

AFRICA

Specific Locations within Africa

Acfer 366 **26°36′56″N, 03°56′14″E**

Acfer region, Libya
Find: November 2002
Carbonaceous chondrite (CH3)

History: A single stone weighing 1456 g was found in the Acfer region of Libya by Filiberto Ercolani (deceased 2004).
Petrography: (V. Moggi-Cecchi, A. Salvadori, and G. Pratesi, *MSP*) The outer surface displays a small portion of fusion crust. The stone is composed of 60 vol% lithic and crystal fragments, 20 vol% chondrules, and 30 vol%

nonsilicate phases. Chondrules range from 30–300 μm with a mean apparent diameter of 90 μm. Chondrule textural types: cryptocrystalline (C) = 58%, granular olivine (GO) + granular olivine-pyroxene (GOP) = 22%, porphyritic olivine (PO) = 17%, and barred olivine (BO) = 3% (all vol%). Most of the larger chondrules are GO/GOP. Nonsilicate phases are mainly Fe,Ni metal (predominantly kamacite) and minor sulfides. The metal and sulfide grains range from 10–100 μm, are rounded to irregular in texture, and are homogeneously distributed through the meteorite, within and outside of chondrules.

Geochemistry: EPMA of chondrule olivine indicate a fairly homogeneous composition ($Fo_{97–100}$; mean Fo_{97}) although olivine in fragments has a more variable composition ($Fo_{80–99}$; mean Fo_{95}). Low-Ca pyroxene in chondrules and fragments is relatively homogenous ($En_{93–100}Wo_{1–5}$). High-Ca pyroxene is rare, occurring only in PO chondrules ($Fs_{23.8}Wo_{31.9}$). Plagioclase is found in chondrules and as angular fragments, and ranges from An_{80} to An_{100}. Kamacite has a high Ni content (5–9 wt%). Sulfides are typically troilite (Ni = 1–2 wt%) although some pyrrhotite grains with Ni = 11 wt% are observed. Oxygen isotope: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O$ = 1.781, $\delta^{18}O$ = 4.610, $\Delta^{17}O$ = –0.616 (all ‰).

Classification: Carbonaceous chondrite (CH3); S1, moderate weathering.

Specimens: A total of 30 g type specimen, one thin section, and the main mass of 1410 g are on deposit at *MSP* (inventory number MSP 2273).

Acfer 374 **26°36′52″N, 04°03′18″E**

Acfer region, Libya

Find: November 2002

Carbonaceous chondrite (CO3)

History: Seven small fragments, weighing 118 g in total, were found in the Acfer area of Libya by an Italian dealer. The largest mass weighs 30 g.

Physical Characteristics: (V. Moggi-Cecchi, A. Salvadori, and G. Pratesi, *MSP*) The hand specimen has an outer surface that is brown-red while the interior is darker.

Petrography: Chondrules range in size from 30 to 450 μm (mean 110 μm). Chondrules textural types: GO to GOP = 61%, PO = 17%, GOP = 12%, radial pyroxene (RP) = 4%, C = 4%, POP = 1%, and BO = 1% (all vol%). Matrix/chondrules ratio is ~0.5. Chondrules are set in a very fine-grained matrix composed of olivine, phyllosilicates, and pyroxene. Calcium-rich, aluminum-rich inclusions (CAIs), and amoeboid olivine inclusions (AOIs) account for about 10 vol% of the meteorite. Opaque phases (6–8 vol%) include Fe,Ni alloys, troilite, pentlandite, and pyrrhotite. Rare grains of awaruite (Ni_2Fe), tetrataenite (FeNi), schreibersite, and nickel phosphide are present.

Geochemistry: (SEM and EPMA) Olivine composition is variable ($Fo_{55–99}$, mean Fo_{94}, n = 26 [n refers to the number of analyses performed]), with narrow compositional ranges in type I chondrules, mainly GO ($Fo_{95–100}$, mean $Fo_{97.1}$) and wider in type II ($Fo_{55–100}$). Mean Cr_2O_3 content in 10 MgO-poor olivines (FeO > 2 wt%) is 0.35 wt%. Olivine in AOIs is Fo-rich, $Fo_{96–100}$. Low-Ca pyroxene is predominantly enstatite ($En_{85–100}$) with different mean values for crystals in and out of chondrules ($En_{80.4}$ and $En_{96.7}$, respectively). POP chondrules have high-Ca pyroxenes ($En_{62.43}Wo_{36.58}Fs_{0.90}$). Kamacite (Ni = 4–5.00, mean value 4.61 [both wt%]; Co = 0.1–1.00, mean value 0.16 [both wt%]). Oxygen isotope: (I. Franchi and R. Greenwood, *OU*) $\delta^{17}O$ = –6.042, $\delta^{18}O$ = –2.306, $\Delta^{17}O$ = –4.843 (all ‰).

Classification: Carbonaceous chondrite (CO3); S2, minimal weathering.

Specimens: All the fragments, two polished thin sections, and the main mass of 30 g are on deposit at the *MSP* (inventory number MSP 2283).

Hammadah al Hamra 337 **29°00′00″N, 12°07′40″E**

Hammadah al Hamra region, Libya

Find: 24 February 2001

Carbonaceous chondrite (CK4)

History: A single stone weighing 198 g was found in February 2001 in the Hammadah al Hamra region of Libya by Giovanni Pratesi (*MSP*) during a scientific expedition.

Physical Characteristics: (V. Moggi-Cecchi, A. Salvadori, and G. Pratesi, *MSP*) The main mass has a dark brown external surface with fusion crust in some areas. In hand sample the chondrules are set in a dark green matrix and CAIs (up to 1 mm) are present.

Petrography: The thin section contains few chondrules (not perfectly delineated and sometimes altered) set in fine-grained matrix with several coarser-grained olivine crystals. Chondrules range from 380 to 1800 μm (mean value 700 μm on n = 25) and account for about 20% of the total volume. Chondrule textural types: POP = 72%, PO = 12%, and GOP = 16% (all vol%). Very rare and extremely altered AOIs (2 vol%) and abundant CAIs (~1 mm) are observed. Plagioclase crystals can be found in GO and PO chondrules. Metal alloys are extremely rare (<0.01 vol%). Magnetite (inside and outside chondrules) is abundant (~8 vol%). Sulfides (mainly pyrrhotite) are rare and are located in the matrix. Rare kamacite and moncheite $(Pt,Pd)(Te,Bi)_2$ are also present.

Chemistry: (EPMA) Olivine compositions are quite homogeneous ($Fo_{68–75}$; mean Fo_{74}), with the exception of rare zoned olivine crystals ($Fo_{68–93}$) in PO chondrules. Low-Ca pyroxenes in GOP chondrules are En_{90-100}. High-Ca pyroxenes in POP chondrules have an augitic composition ($Wo_{50}En_{50–60}Fs_{0–10}$). Plagioclase and devitrified mesostasis is albitic ($An_{25–50}$). Magnetite (Cr_2O_3 = 2–3 wt%): Sulfides (Ni = 1–2 wt%); kamacite with low Ni. Oxygen isotope: (I. Franchi, R. Greenwood, *OU*) $\delta^{17}O$ = –3.668, $\delta^{18}O$ = –0.369, $\Delta^{17}O$ = –3.496 (all ‰).

Classification: Carbonaceous chondrite (CK4); S1, moderate to extensive weathering.
Specimens: The main mass (174 g), a 24 g type specimen, and two thin sections are on deposit at *MSP (*inventory number MSP 1592).

Mafuta **16°54′09″S, 30°24′26″E**
Mafuta Farm, Makonde District, Zimbabwe
Find: 1 December 1984
Iron (IID)
History: On 1 December 1984, while clearing rocks from his fields with an assistant, Mr. Murray Alexander found an iron meteorite on Mafuta Farm, Makonde District, northern Zimbabwe. In 1993, Mr. Alexander agreed to have a slice cut for scientific studies. The cutting was done in Harare and a slice (about 9.5 × 4.5 × 1 cm) was sent to Vienna for further studies.
Physical Characteristics: (C. Koeberl, *UVien*) The original mass and dimensions were 71.5 kg and 40 × 20 cm, respectively. The exterior has little rust and a brownish color.
Petrography: A medium octahedrite (kamacite band width between 0.4 and 1.1 mm) and rich in schreibersite (up to 5 mm), but it does not contain any large sulfide exposed on the large slice. The kamacite is recrystallized to an equigranular intergrowth of ~0.5 mm grains.
Geochemistry: Bulk composition: (C. Koeberl, *UVien*; INAA J. Wasson *UCLA*; PIXE W. Przybylowicz, *NACSA*) First sample: Ni = 9.71, Co = 0.61 (both wt%), Cr = 32, Ga = 67, As = 4.8, Os = 13.3, Ir = 15.0 (all ppm), and Au = 615 ppb. Second sample: Ni = 10.03, Co = 0.67 (both wt%), Cr = 62, Cu = 246, Ga = 72.7, As = 5.0, W = 2.92, Ir = 15.4, Pt = 19.8 (all ppm), and Au = 645 ppb.
Classification: (J. Wasson, *UCLA*) Iron (IID).
Specimens: A total of 221 g of sample is on deposit at the *NHMV* (inventory number M6694). Mr. M. Alexander of Mafuta Farm, Zimbabwe, holds the main mass.

Northeast Africa

Northeast Africa 002
Possibly Libya
Find: 2004
Iron (IID, anomalous)
History: A 5480 g iron meteorite was purchased in 2004.
Petrography: (J. Wasson, *UCLA*) The meteorite consists of small domains 0.81 × 2 cm, filled with a fine Widmanstätten pattern of kamacite bandlets, often in parallel clusters of several bands, each ~0.2 mm wide. No inclusions are present. Cracks are present between several of the domains. Bulk composition: Cr = 138, Co = 6.6, Ni = 102 (all mg/g); Cu = 259, Ga = 71, As = 4.2, W = 3.0, Ir = 23, and Au = 0.56 (all μg/g).
Classification: Iron (IID) with anomalous structure. The bulk composition is similar to that of IID-an Arltunga, which has an anomalous (but still finer) structure.
Specimens: A 131 g full slice type specimen is on deposit at *UCLA*. John Birdsell holds the main mass.

Northeast Africa 003 **30°28′N, 13°33′E**
Libya
Find: November 2000/December 2001
Achondrite (lunar, mare basalt and basaltic breccia)
History: A dark gray, 6 g stone was found by a prospector 12 km NW from Al Qaryah ash Sharqiyah in Wadi Zamzam area, Libya, in December 2001. A stone of 118 g with incomplete fusion crust was found nearby in December 2001.
Petrography: (J. Haloda and P. Tycova, *PCU*) The meteorite contains two adjacent parts, mare basalt and basaltic breccia, both of which were investigated in detail. The main portion (~75 vol%) of the meteorite is coarse-grained, low-Ti olivine-rich basalt, showing porphyritic texture of olivine (Fo_{19-73}), zoned pyroxene ($En_{5-71}Wo_{6-38}$), and plagioclase (An_{84-92}) with late-stage mesostasis containing silica, Fe-rich pyroxene and pyroxferroite, plagioclase, ilmenite, troilite, and apatite. Opaque phases include chromite, Ti-rich chromite, ulvöspinel, ilmenite, troilite, and trace Fe,Ni metal; shock veins and impact melt pockets are present. All plagioclase is totally converted to maskelynite. Mineral modes are (vol%) olivine = 17.5, pyroxene = 60.6, plagioclase = 18.2, ilmenite = 1.2, spinel = 0.8, mesostasis + impact melt = 1.8.
Geochemistry: Bulk composition: SiO_2 = 44.7, TiO_2 = 1.3, Cr_2O_3 = 0.5, Al_2O_3 = 8.0, FeO = 21.8, MnO = 0.3, MgO = 13.6, CaO = 9.2, Na_2O = 0.3, K_2O = 0.1 (all wt%), Fe/Mn = 81. Concentration of selected elements (INAA; R. Korotev, *WashU*) Sc = 50.8, Co = 50.5, Ni = 84, Hf = 1.1, Ta = 0.15, Th = 0.43, U = 0.2 (all ppm); REE pattern is flat at 10 × CI with slight negative Eu anomaly, not depleted in LREE. Adjacent part is basaltic breccia (~25 vol%) consisting of well-consolidated glassy impact-melt matrix containing scattered mineral fragments of chemical composition identical with the coarse-grained low-Ti olivine-rich basalt and two larger clasts of low-Ti mare basalt lithologies. The low-Ti basaltic clasts are finer-grained and petrologically more evolved. No regolith component or highland material is present.
Classification: Achondrite (lunar mare basalt and basaltic breccia).
Specimens: A 20 g type specimen and two polished thin sections are on deposit at *PCU*. An anonymous finder holds the main mass.

Northwest Africa

Northwest Africa 869
Northwest Africa
Find: 2000 or 2001
Ordinary chondrite (L4–6)
History: It is quite clear that meteorite collectors in Northwest Africa have discovered a large L chondrite strewn

field at an undisclosed location. At least 2 metric tons of material comprising thousands of individuals has been sold under the name NWA 869 in the market places of Morocco and around the world. Individual masses are known to range from <1 g to >20 kg. It is certain that NWA 869 is paired with other NWA meteorites, although no systematic survey has been done. It is also possible that some stones sold as NWA 869 are not part of the same fall, although dealers are confident that most of the known masses are sufficiently distinctive from other NWA meteorites in terms of surface and internal appearance that the error rate should be fairly low. Scientists are advised to confirm the classification of any specimens they obtain before publishing results under this name.
Petrography and Geochemistry: (A. Rubin, *UCLA*) A fragmental breccia of type 4–6 material; one thin section dominated by an L5 lithology gave olivine ($Fa_{24.2}$). **Classification**: Ordinary chondrite (L4–6); W1, S3. **Specimens**: A 189.3 g type specimen is on deposit at *UCLA*.

Northwest Africa 999
Morocco
Find: 2000
Achondrite (eucrite)
History: A 330 g brecciated stone was purchased at the Tucson show by D. Gregory from an anonymous Moroccan dealer.
Petrology: (P. Warren, *UCLA*) An extremely fine-grained (0.01–0.1 mm) stone with thoroughly exsolved pyroxenes, some pyroxenes (<1 vol%) up to 0.6 mm in maximum dimension. Microphenocrysts are compositionally identical to the groundmass pyroxenes.
Geochemistry: Low-Ca pyroxene ($En_{32.0}Wo_{2.3}$); high-Ca pyroxene ($En_{27.8}Wo_{44.1}$). Bulk chemistry: (INAA, *UCLA* two chips) Al_2O_3 = 12.5 wt%, Na = 2.83 and 2.84 (both wt%); Sc = 32 and 33; Sm = 2.1 and 2.2 (both µg/g); Fe/Mn = 36, 37.
Classification: Achondrite (eucrite); low to moderate shock.
Specimens: A 20 g type specimen is on deposit at *UCLA*. Gregory holds the main mass.

Northwest Africa 1006
Morocco
Find: 2001
Achondrite (ureilite)
History: On 27 August 2001, M. Farmer purchased a 24.5 g sample in Quarzazate, Morocco.
Petrography: (P. Warren, *UCLA*) The meteorite is mostly composed of olivine and pigeonite with minor orthopyroxene. The Px/(Px+Ol) ratio is ~0.4. Olivines have rims with reduced chemistry.
Geochemistry: Olivine (cores $Fo_{89.6}$; CaO = 0.33; Cr_2O_3 = 0.64 [both wt%; *n* = 47]), pigeonite ($En_{82.8}Wo_{7.9}$; Cr_2O_3 = 0.99, Al_2O_3 = 0.57, MnO = 0.47 [all wt%; *n* = 17]), orthopyroxene ($En_{86.4}Wo_{4.7}$; Cr_2O_3 = 0.95, Al_2O_3 = 0.62 [both wt%; *n* = 3; all analyses by EMP]). Based on INAA data (*UCLA*), typical ureilite trace-element composition (except for weathering effects): Sc = 9.4, Ni = 720, Zn = 330 (all µg/g); Ir = 124, Au = 16.1 (both ng/g).
Classification: Achondrite (ureilite); low shock.
Specimens: A 5.86 g type specimen is on deposit at *UCLA*. M. Farmer holds the main mass.

Northwest Africa 1460
Morocco
Find: June 2002
Achondrite (Martian, basaltic shergottite)
History: In January 2002, A. Habibi provided several small fragments of a 70.2 g complete stone with a fresh, black fusion crust to A. and G. Hupé for analysis. N. Oakes later purchased the stone for more detailed investigation.
Physical Characteristics: A complete stone weighing 70.2 g with a fresh black fusion crust. Dimensions of the stone are 47 × 34 × 27 mm.
Petrography: (A. Irving and S. Kuehner, *UWS*) The stone is largely unweathered and coarse-grained, with large, pale yellow-green pyroxene and glassy maskelynite laths clearly visible. Texture is subophitic to intersertal.
Geochemistry: Pyroxenes are zoned with cores of orthopyroxene ($Fs_{20}Wo_3$; FeO/MnO = 30.7) mantled by augite ($Fs_{27}Wo_{31}$; FeO/MnO = 32.2) with rims of Fe-rich pigeonite ($Fs_{55}Wo_{18}$ to $Fs_{85}Wo_{13}$; FeO/MnO = 41.0–36.8). Plagioclase ($Ab_{51}Or_{1-2}$, maskelynite) has patchy compositional zoning. Accessory minerals are merrillite, Cl-F-bearing apatite, exsolved Fe-Ti oxides (ilmenite lamellae in titanomagnetite), ilmenite, chromite, pyrrhotite, K-rich glass, silica, and baddeleyite (occurs as blades up to 50 µm long). Fine-grained symplectitic intergrowths composed of fayalite+silica+hedenbergite occurs at the margins of pigeonite grains. Other symplectitic intergrowths of fayalite+silica also occur, commonly at the boundaries between merrillite and pyroxene. Textures, mineralogy, and mineral compositions are essentially identical to NWA 480, with which this sample is paired. Cosmogenic isotopes: (K. Nishizumi, *SSL*) Give a cosmic ray exposure age of 2.6 ± 0.2 Ma. Radiogenic isotopes and formation age: (L. Nyquist and C.-Y. Shih, *JSC*) A preliminary Sm-Nd isochron age of 352 ± 30 Ma and a Rb-Sr isochron age of 313 ± 3 Ma. **Classification**: Achondrite (Martian, basaltic shergottite); minimal weathering.
Specimens: A 2.5 g type specimen is on deposit at *JSC*. A 2.6 g type specimen and one polished thin section are on deposit at *MNB*. A 5.7 g type specimen and two polished thin sections are on deposit at *UWS*. A 3.5 g type specimen is on deposit at *NAU*. An anonymous collector holds the main mass.

Northwest Africa 1462
Morocco
Find: 2002
Achondrite (ureilite)

History: On 3 March 2002, D. Gregory purchased a 203 g sample in Erfoud, Morocco.
Petrography: (P. Warren, *UCLA*) The meteorite is mostly composed of olivine and pigeonite. The Px/(Px+Ol) ratio is ~0.3. Olivines have rims with reduced chemistry.
Geochemistry: Olivine ($Fo_{78.1}$; CaO = 0.30, Cr_2O_3 = 0.30 [both wt%; n = 10]), pigeonite ($En_{68.1}Wo_{14.4}$; Cr_2O_3 = 1.23, Al_2O_3 = 1.93, MnO = 0.44 [all wt%; n = 12]). Based on INAA data (*UCLA*), typical ureilite trace-element composition: Sc = 9.4, Ni = 900, Zn = 159 (all µg/g); Ir = 360, Au = 31 (all ng/g).
Classification: Achondrite (ureilite); low shock.
Specimens: A 20.2 g type specimen is on deposit at *UCLA*. D. Gregory holds the main mass.

Northwest Africa 1918
Morocco
Find: January 2003
Achondrite (eucrite, basaltic)
History: D. Gregory purchased a complete, fusion-crusted stone weighing 136 g from a Moroccan dealer in January 2003.
Petrography: (A. Irving and S. Kuehner, *UWS*) Unbrecciated, with subophitic texture of dark grey pigeonite grains and groups of small anorthite laths, ilmenite (with rare baddeleyite inclusions), troilite, and Ni-free metal.
Geochemistry: Some of the large pigeonite grains have ribbon-like clinopyroxene exsolution lamellae within host orthopyroxene ($Fs_{61.6}Wo_{1.4}$; FeO/MnO = 33.7); clinopyroxene ($Fs_{29.6}Wo_{39.2}$; FeO/MnO = 29.2) occurs also as discrete grains along with silica.
Classification: Achondrite (eucrite, basaltic).
Specimens: A 20.2 g type specimen and one polished thin section are on deposit at *UWS*. Gregory holds the main mass.

Northwest Africa 1923
Morocco
Find: March 2003
Achondrite (eucrite, gabbroic)
History: D. Gregory purchased an extremely fresh, unbrecciated stone weighing 112 g with black fusion crust from a Moroccan dealer in March 2003.
Petrography: (A. Irving and S. Kuehner, *UWS*) Coarse-grained, noncumulus, igneous texture with primary grain contacts. Subequal amounts anorthite and pale yellow pigeonite with minor chromite.
Geochemistry: Anorthite (An_{95}); low-Ca pyroxene grains consist of orthopyroxene ($Fs_{37.8}Wo_{2.9}$; FeO/MnO = 25.8) with sparse blades of exsolved clinopyroxene ($Fs_{16.3}Wo_{43.2}$; FeO/MnO = 23.8).
Classification: Achondrite (eucrite, gabbroic).
Specimens: A 20.4 g type specimen and one polished thin section are on deposit at *UWS*. Gregory holds the main mass.

Northwest Africa 1929
Morocco
Find: May 2003
Achondrite (howardite)
History: A 922.2 g, partially crusted, complete stone was purchased in Erfoud, Morocco, in May 2003.
Petrography: (T. Bunch and J. Wittke, *NAU*) A breccia of 72 vol% cumulate eucrite clasts, 8% subophitic clasts, 14% diogenites, and 6% melt clasts. Pervasive solid-state recrystallization of plagioclase and pyroxenes with localized melt pockets and veins in clasts.
Geochemistry: Coarse-grained gabbroic eucrite: Pyroxene ($Fs_{45–40}Wo_{7–20}$); plagioclase ($An_{91.2–95.3}$); metal (Ni = 0.97; Cr = 0.87 [both wt%]). Diogenite: Pyroxene ($Fs_{43–54}Wo_{2.5–3.6}$; Fe/Mn = 36, 37).
Classification: Achondrite (howardite); high shock.
Specimens: A 22.02 g type specimen is on deposit at *NAU*. Farmer holds the main mass.

Northwest Africa 2200
Morocco
Find: August 2004
Achondrite: (lunar, feldspathic breccia)
History: A completely crusted, 552 g, ellipsoidal stone was found in the Atlas Mountains, Morocco, and purchased in Erfound by a Moroccan dealer for D. Gregory in August 2004.
Petrography and Geochemistry: (S. Kuehner and A. Irving, *UWS*) Breccia consisting of coarse, greyish-to-whitish lithic and mineral clasts in a darker glassy-to-finely crystalline matrix. Lithic clasts are mainly very fine-grained, quench-textured, feldspathic rocks that probably result from impact melting of anorthositic to gabbroic anorthositic precursors. A small percentage of the clasts are ophitic-textured mare basalts. Mineral clasts include anorthitic plagioclase, olivine ($Fa_{30–60}$), exsolved pigeonite, irregular grains of metal (Ni = 10–45 wt%), Ti-rich chromite, Ti-poor chromite, pyroxene-like glass, schreibersite (Ni = 5 wt%), clinopyroxene, ilmenite, troilite, and rare zirconolite. Clinopyroxene and orthopyroxene grains in mineral and lithic clasts have Fe/(Fe+Mg) = 0.258–0.482 with Ti/(Ti+Cr) = 0.53–0.75. FeO/MnO ratios measured for olivine (99.7, 105.5), clinopyroxene (73.7), and orthopyroxene (65.4) are unmistakably within the ranges for these minerals in known lunar rocks. Feldspar grains in mineral and lithic clasts have a narrow compositional range of $An_{95.8–97.4}$.
Classification: Achondrite (lunar, feldspathic breccia).
Specimens: A 20.5 g type specimen, one polished thin section, and one polished mount are on deposit at *UWS*. D. Gregory holds the main mass.

Northwest Africa 2210
Morocco
Find: December 2004

Carbonaceous chondrite (CH3)

History: D. Gregory purchased a black, magnetic stone weighing 74 g in December 2004 from D. Bessey, who had obtained this material from a Moroccan dealer in Erfoud.

Petrography: (A. Irving and S. Kuehner, *UWS*) Relatively fine grained (10–89 μm) with glass spheres ($En_{99}Fo_{99}$) and chondrules (size range 10–80 μm), together with broken fragments of the same, in a sparse matrix.

Geochemistry: Abundant metal (15–20% by volume) which is mainly kamacite (5–10 wt% Ni), but in places taenite (Ni = ~20 wt%). Most of the chondrules contain very magnesian olivine (Fa_1) and/or orthopyroxene (Fs_1) in a mesostasis of glass, but some chondrules and fragments have more ferroan silicates (up to Fa_{50} and Fs_{50}). Some cryptocrystalline chondrule fragments are composed of very fine intergrowths of low-Ca and high-Ca pyroxene and glass spheres have compositions intermediate between forsterite and enstatite. Other phases identified include Cr-Al-rich diopside, troilite, feldspathic glass, and rare, Al-rich chromite. No CAIs were observed. Oxygen isotopes: (D. Rumble, *CIW*) Analyses of two whole rock fragments by laser fluorination gave, respectively, $\delta^{18}O$ = 3.95, 4.11; $\delta^{17}O$ = 1.07, 1.05; $\Delta^{17}O$ = −1.02, −1.12 (all ‰).

Classification: Carbonaceous chondrite (CH3).

Specimens: A 14.8 g type specimen and one polished thin section are on deposit at *UWS*. Gregory holds the main mass.

Northwest Africa 2225

Morocco

Find: April 2004

Achondrite (ureilite)

History: D. Bessy purchased one mass of 40 g in Erfoud, Morocco.

Petrography: (Paul Warren, *UCLA*) The stone is composed mostly of olivine and pigeonite ((Px/Px+Ol) = ~0.25) with minor carbon-rich matrix.

Geochemistry: Olivine ($Fo_{82.3}$); CaO = 0.36, Cr_2O_3 = 0.71 (both wt%, n = 25 cores only); pigeonite ($En_{75.2}Wo_{9.8}$; Al_2O_3 = 0.85, Cr_2O_3 = 1.22, MnO = 0.41 [all wt%, n = 13 analyses]). Bulk trace elements: Sc = 7.0, Ni = 1140, Zn = 280 (all μg/g); Ir = 231, Au = 9.8 (both ng/g).

Classification: Achondrite (ureilite).

Specimens: A 8.3 g type specimen is on deposit at *UCLA*. D. Bessey hold the main mass of 20 g. N. Gessler holds 11 g.

Northwest Africa 2646

Algeria or Morocco

Find: December 2004

Achondrite (Martian, plagioclase-olivine clinopyroxenite)

History: A 9.3 g, broken stone (allegedly part of a larger specimen found at an unknown site in Algeria or Morocco) was purchased from a Moroccan dealer in December 2004 for N. Oakes.

Petrography and Geochemistry: (T. Bunch and J. Wittke, *NAU*; A. Irving and S. Kuehner, *UWS*) The specimen is relatively coarse-grained and has an overall gray color, but grain surfaces have a thin whitish coating. It is modally heterogeneous and is composed of ~40.7% pigeonite, ~24.3% augite, ~21.6% olivine, and ~11.4% maskelynite, with 2% chromite, ilmenite, merrillite, and pyrrhotite. Euhedral to subhedral chromite (Cr/(Cr+Al) = 0.869, Mg/(Mg+Fe) = 0.12) and augite ($Fs_{19–23}Wo_{26–36}$; FeO/MnO = 22–27; Cr_2O_3 = 0.6, Al_2O_3 = 2.2 [both wt%]) appear to have crystallized first, followed by subhedral to anhedral olivine ($Fa_{38–44}$; FeO/MnO = 35–56). These are poikilitically enclosed in large oikocrysts of pigeonite ($Fs_{24.4}Wo_{5.7}$ zoned to $Fs_{34.4}Wo_{12.1}$; FeO/MnO = 26–32); augite and olivine chadacrysts tend to be clustered. Laths of plagioclase (now maskelynite, $An_{58.4–60.7}Or_{0.9}$), some in clusters, occur interstitially to pigeonite grains. All maskelynite grains are rimmed by zones up to 40 μm in width consisting of a mixture of fine grained calcite, hydrous Al-rich silicate (possibly kaolinite), and very minor calcium chloride, which appear to be replacing the primary feldspar. This specimen has affinities to the six recognized "lherzolitic shergottites," but differs from them in having a higher abundance of plagioclase and more ferroan mafic mineral compositions.

Classification: Achondrite (Martian, plagioclase-olivine clinopyroxenite); minimal weathering.

Specimens: A 3.4 g type specimen and one polished thin section are on deposit at *NAU*. One polished mount is on deposit at *UWS*. N. Oakes holds the main mass.

Northwest Africa 2656

Morocco or Algeria

Find: 2003

Achondrite (acapulcoite)

History: A 386 g broken stone with weathered fusion crust (part of a larger ~7.5 kg mass found in 2003) was purchased in Erfoud, Morocco, in 2004 for N. Oakes.

Petrography: (T. Bunch and J. Wittke, *NAU*; A. Irving, *UWS*) The specimen is recrystallized into homogeneous polygonal and subhedral grains with a grain size of <1 mm and a ~ equal distribution of phases.

Composition: Olivine ($Fa_{8.0}$; FeO/MnO = 16–19 [n = 25]), orthopyroxene ($Fs_{8.4}Wo_{2.4}$; [n = 17]), plagioclase ($An_{18.3–21.0}Or_{2.8–3.4}$), chromite ((Cr/Cr+Al) = 0.85; Mg/(Mg+Fe) = 0.41). Troilite, schreibersite, and kamacite are also present. Oxygen isotopes: (D. Rumble, *CIW*) Replicate analyses by laser fluorination gave $\delta^{17}O$ = 1.71, 1.69; $\delta^{18}O$ = 5.05, 5.04; $\Delta^{17}O$ = −0.953, −0.973 (all ‰).

Classification: Achondrite (acapulcoite); low shock, moderate weathering.

Specimens: A 21 g type specimen and one polished thin section are on deposit at *NAU*. Oakes holds the main mass.

Northwest Africa 2700

Morocco

Find: 2004

Achondrite (lunar, olivine gabbro with regolith breccia)

History: A light green to dark complete stone of 31.7 g was purchased in Erfoud, Morocco, in November 2004.
Petrography and Geochemistry: (T. Bunch and J. Wittke, *NAU*) The specimen consists of olivine gabbro and regolith breccia lithologies. The cumulate olivine gabbro contains ~50 vol% olivine ($Fa_{29.3–34.7}$; FeO/MnO = 94), pigeonite ($Fs_{22–28.3}Wo_{5.6–10}$; FeO/MnO = 52), augite ($Fs_{13.2}Wo_{38.5}$), plagioclase and minor maskelynite (An_{89}), Ba-rich alkali feldspar ($Or_{92}An_4$; BaO = 8.9 wt%), Cr-spinel, ilmenite, phosphate, and troilite. The breccia lithology is dominated by small olivine gabbro fragments and also contains subvariolitic basalt clasts with zoned pyroxenes ($Fs_{44}Wo_{29}$ to $Fs_{58}Wo_{23}$; FeO/MnO = 57); plagioclase (An_{90}); ilmenite, and Fe-rich, low-Ca pyroxene ($Fs_{80.8}Wo_{14}$); symplectites of fayalite (Fa_{91}); hedenbergite ($Fs_{60.3}Wo_{32.7}$); silica; clear to yellow glass spherules; agglutinates, high silica fayalitic rocks ($Fa_{95.6}$); ulvöspinel; K_2O-rich glass (K_2O = 8.8; SiO_2 = 77 [both wt%]), and pure SiO_2.
Classification: Achondrite (lunar, olivine gabbro with regolith breccia) where the olivine gabbro is moderately shocked and minimally weathered. Note: This sample may be paired with NWA 773.
Specimens: A 6.8 g type specimen and two thin sections are on deposit at *NAU*. An anonymous finder holds the main mass.

Northwest Africa 2703
Morocco
Find: 2004
Achondrite (ureilite)
History: A complete partially crusted stone weighing 121 g was purchased in Erfoud, Morocco.
Petrography: (J. Wittke and T. Bunch, *NAU*): A fine-grained (≤1 mm) ureilite that has a low level of reduction.
Composition: Olivine (cores, $Fa_{12.3}$; FeO/MnO = 22), pigeonite ($Fs_{10.6}Wo_{5.1}$; FeO/MnO = 14), clinopyroxene ($Fs_{6.5}Wo_{37}$; FeO/MnO = 13). Metal, sulfide, and graphite ribbons also present.
Classification: Achondrite (ureilite); low shock; minimal weathering.
Specimens: A 20.5 g type specimen is on deposit at *NAU*. G. Hupé holds the main mass.

Northwest Africa 2705
Morocco
Find: 2004
Achondrite (ureilite)
History: A complete 70 g stone was purchased in Erfoud, Morocco.
Petrography: (J. Wittke and T. Bunch, *NAU*) Specimen shows well-formed, basal deformation lamellae in olivine with small enclaves of slightly rotated domains. The olivines and pyroxenes contain a large amount of fine-grained graphite inclusions. Olivine margins show limited reduction. Modal analyses of silicates (vol%): Olivine = 95, pigeonite = 3, orthopyroxene = 2.
Composition: Olivine (cores, $Fa_{22.3}$; FeO/MnO = 40–47), pigeonite (small grains, $Fs_{7.8}Wo_{7.7}$; FeO/MnO = 8), orthopyroxene ($Fs_{3.5}Wo_{2.7}$).
Classification: Achondrite (ureilite); moderate shock, minimal weathering.
Specimens: A 16.8 g type specimen is on deposit at *NAU*. G. Hupé holds the main mass.

Northwest Africa 2708
Morocco
Find: 2004
Carbonaceous chondrite (CK4)
History: A single partially crusted stone of 528 g was purchased in Erfoud, Morocco, in January 2005.
Petrography: (J. Wittke and T. Bunch, *NAU*) Specimen contains rare, partially altered CAI; melt clasts and chondrules with fairly sharp margin/matrix boundaries.
Geochemistry: Matrix olivine ($Fa_{29.7\pm2.7}$), magnetite (Cr_2O_3 = 4.6, Al_2O_3 = 2.19 [both wt%]), poorly crystallized plagioclase ($An_{78.4}$), pentlandite (Co = 1.87 wt%). Chondrules: Olivine ($Fa_{30.6\pm1.95}$), Ca-rich pyroxene ($Fs_{43.5}Wo_{48.7}$), magnetite (Cr_2O_3 = 3.2, Al_2O_3 = 1.0 [both wt%]). Magnetite in melt clasts contains Ni-bearing, exsolved ilmenite.
Classification: Carbonaceous chondrite (CK4); host = low shock; clasts = moderate to highly shocked, moderate weathering.
Specimens: A 20.3 g type specimen is on deposit at *NAU*. G. Hupé holds the main mass.

Northwest Africa 2711
Morocco
Find: 2004
Mesosiderite
History: A complete stone of 433 g was purchased in Erfoud, Morocco.
Petrography: (J. Wittke and T. Bunch, *NAU*) The specimen contains a relatively even distribution of metal and silicates with coarse orthopyroxene grains with margins that are recrystallized and contain numerous merrillite inclusions. The matrix is recrystallized. Modal content (vol%): Orthopyroxene = 66, metal = 16, plagioclase = 10, Ca pyroxene = 4, merrillite = 2, chromite and sulfide = 2.
Composition: Orthopyroxene ($Fs_{26.8}Wo_{3.1}$; FeO/MnO = 31); plagioclase ($An_{92.9}$).
Classification: Achondrite (mesosiderite); low shock, minimal weathering.
Specimens: A 24 g type specimen is on deposit at *NAU*. G. Hupé holds the main mass.

Northwest Africa 2724
Northwest Africa
Find: 2004
Achondrite (eucrite, polymict)
History: A 3804 g crusted complete stone was purchased in Erfoud, Morocco, in 2004.

Petrography: (J. Wittke and T. Bunch, *NAU*) The specimen mostly consists of cumulate basalt clasts that range from coarse-grained (~2 mm) to very fine-grained (~0.1 mm) with less than 5 vol% of subophitic basalts observed. Cumulate basaltic clasts are unusually low in ilmenite, chromite, and metal compared with other cumulate eucrites.
Composition: Despite the large range in grain size, pyroxene compositions show a rather narrow range: low-Ca pyroxenes ($Fs_{59.1–62}Wo_{3.2–3.8}$), pigeonite ($Fs_{46.5–51}Wo_{12.4–16.6}$), Ca-rich pyroxenes ($Fs_{40–2.1}Wo_{30.5–40.5}$), plagioclase ($An_{89.4–92.7}$).
Classification: Achondrite (eucrite, polymict); low shock, minimal weathering.
Specimens: A 34 g type specimen is on deposit at *NAU*. E. Thompson holds the main mass.

Northwest Africa 2727
Morocco or Algeria
Find: June/July 2005
Achondrite (lunar, mare basalt/gabbro breccia)
History: Four stones of 30.6 g, 11.6 g, 64 g, and 85 g were purchased from Moroccan dealers in Erfoud for a consortium of North American collectors in June and July of 2005.
Petrography and Geochemistry: (T. Bunch and J. Wittke, *NAU*; A. Irving and S. Kuehner, *UWS*; R. Korotev, *WUSL*) All stones are very similar and consist of clast-dominated polymict breccias composed of >80 vol% olivine-phyric basalt and gabbroic/diabasic clasts (0.2 cm to several cm across) within a finer breccia matrix. The basalt clasts show a wide range in mineral compositions, but all contain phenocrysts of olivine ($Fa_{28–99}$; FeO/MnO = 98.9) and some also have phenocrysts of pyroxferroite or chromite all in a fine-grained matrix consisting of intergrown pigeonite, pyroxferroite, K-Ba feldspar, ilmenite, merrillite, baddeleyite, troilite, silica, and glass. The gabbroic clasts range in texture from coarser-grained (>3 mm) hypidiomorphic gabbro to finer-grained (~1 mm) diabasic clasts. Both types of gabbroic lithologies consist mainly of pigeonite ($Fs_{23.3–31.3}Wo_{8.7–11.5}$; FeO/MnO = 60–69) and subhedral to anhedral olivine ($Fa_{34.1–41}$; FeO/MnO = 85–99) with less abundant augite ($Fs_{24.1–47.5}Wo_{24.4–32.1}$) and partly maskelite, blocky to tabular plagioclase ($An_{81–94}$). The breccia matrix consists mainly of gabbroic debris with fragments of basalt, silica polymorph, symplectites, subparallel intergrowths of anorthite + pyroxferroite + ilmenite and shock-melted material. Bulk compositions: (R. Korotev, *WUSL*) INAA of 11 subsamples show that they vary considerably in bulk composition, with the most Fe-rich subsample nearly indistinguishable from NWA 3160 basalt. All other subsamples are compositionally equivalent to mixtures of NWA 3160 basalt and the regolith breccia lithology of NWA 773, but with slightly lower concentrations of incompatible elements. Note: Based on petrography, mineral compositions, and bulk compositions, these stones are paired with NWA 3160 and may be paired with NWA 773.
Classification: Achondrite (lunar, mare basalt/gabbro breccia).
Specimens: A 20.2 g type specimen and two polished thin sections are on deposit at *NAU*. A 0.5 g type specimen is on deposit at *WUSL*. Oakes, Reed, Boswell, and Turecki hold the main masses.

Northwest Africa 2736
Northwest Africa
Find: September 2004
Achondrite (aubrite)
History: M. Killgore purchased a 171.51 g stone in September 2004.
Petrography: (D. Hill, K. Domanik, and J. Lowe, *UAz*; I. Franchi, *OU*) The meteorite is made up primarily of enstatite (~60 vol%) and plagioclase (30 vol%) that are 50–100 µm in size with an equigranular igneous texture. The groundmass is cross-cut by an extensive network of (oxidized) kamacite and daubreelite veins that follow silicate grain boundaries. An unusual feature of this meteorite is large, euhedral graphite up to 500 µm in length within kamacite veins and interstitial to the silicates. Several round inclusions up to 2 mm in diameter that contain bars of enstatite and plagioclase are observed.
Composition: Enstatite ($En_{99}Fs_0Wo_1$; avg. mg# = 9), plagioclase ($Ab_{78.8}An_{15.9}Or_{5.3}$). Oxygen isotopes: (I. Franchi, *OU*) $\delta^{17}O$ = 2.017, $\delta^{18}O$ = 3.732, $\Delta^{17}O$ = 0.076 (all ‰).
Classification: Achondrite (aubrite); low shock, moderate weathering.
Specimens: A total of 37.14 g of type specimens are on deposit at *UAz*. M. Killgore holds the main mass.

Northwest Africa 2737
Morocco
Find: 2000
Achondrite (Martian, chassignite)
History: In August 2000, meteorite collectors discovered a stone fragmented into nine pieces (308 g, 128 g, 74 g, 47 g, 38 g, 6.4 g, 3.3 g, 2.0 g, and 4.3 g for a total mass of 611 g) in the western part of the Sahara.
Petrography and Geochemistry: (P. Beck, Ph. Gillet, B. Reynard, B. van de Moortele, *ENSL*; J.A. Barrat, M. Bohn, J. Cotton, *UBO*) Olivine ($Fo_{78.2–79.1}$; Mn/Fe = 0.018; ~89.6 vol%), chromite (4.6 vol%), low-Ca pyroxene ($En_{78.5}Wo_{2.7}Fs_{18.8}$ to $En_{76.6}Wo_{3.2}Fs_{20.2}$), high-Ca pyroxenes ($En_{73.5}Wo_{8.0}Fs_{18.5}$ to $En_{64.0}Wo_{22.1}Fs_{13.9}$; Mn/Fe 0.030 [total of low- and high-Ca pyroxene ~4.1 vol%]), and sanidine glass (~1.6 vol%) with traces of apatite. The texture is that of a cumulate dominated by mm-size anhedral to subhedral olivine crystals, sometimes poikilitically enclosed in augite ($En_{54.6}Wo_{32.8}Fs_{12.6}$ to $En_{46.7}Wo_{44.1}Fs_{9.2}$). Oxygen isotopes: (I. Franchi, R. Greenwood, *OU*) $\delta^{17}O$ = 2.40, $\delta^{18}O$ = 4.02, $\Delta^{17}O$ = 0.315; $\delta^{17}O$ = 2.30, $\delta^{18}O$ = 3.85, $\Delta^{17}O$ = 0.295 (all ‰, *n* = 2). Furthermore, NWA 2737 displays trace element abundances similar to Chassigny. For example, its REE

pattern resembles that of Chassigny but with a more pronounced LREE enrichment.
Classification: Achondrite (Martian, chassignite); highly shocked.
Specimens: A 20 g type specimen is on deposit at *ENSL*. B. Fectay and C. Bidaut of La mémoire de la Terre hold the main mass.

Northwest Africa 2758
Morocco
Find: 2004
Achondrite (eucrite, polymict breccia)
History: Four partial stones weighing a total of 458 g were purchased in Erfoud, Morocco, in October 2004.
Petrography and Geochemistry: (J. Wittke and T. Bunch, *NAU*) The sample contains an assortment of cumulate (maximum grain size = 1.8 mm), subophitic (maximum grain size = 0.2 mm), and shock-melted to crystallized basalts. Cumulate basalts: Pyroxenes ($Fs_{49.3}Wo_{2.8}$; $Fs_{38.8}Wo_{13.9}$; $Fs_{48.5}Wo_{21.2}$; FeO/MnO for all = 31–40), plagioclase (An_{87}); chromite (Cr/(Cr+Al) = 0.77). Subophitic basalts: Pyroxenes ($Fs_{39.1-45.6}Wo_{8.7-15.8}$; FeO/MnO = 30–36), plagioclase (An_{89}), chromite (Cr/(Cr+Al) = 0.87).
Classification: Achondrite (eucrite, polymict breccia); low to high shock, minimal weathering.
Specimens: A 46 g type specimen is on deposit at *NAU*. Olsen holds the main mass.

Northwest Africa 2784
Morocco
Find: 2004
Achondrite (eucrite, polymict breccia)
History: A 141 g stone was purchased in Erfoud, Morocco, in October 2004.
Petrography: (T. Bunch and J. Wittke, *NAU*) A brecciated cumulate host (grain size up to 2.1 mm) with clasts of subophitic (maximum grain size, 0.12 mm) and recrystallized granular (average grain size, 0.03 mm) basalts.
Geochemistry: All analyzed lithologies are very similar in pyroxene and plagioclase composition. Orthopyroxenes ($Fs_{62-64.1}Wo_{2.1-2.8}$), Ca-rich pyroxene ($Fs_{27-31.1}Wo_{43.7-44.8}$), and plagioclase ($An_{87.8-89.7}$). Pigeonite exsolution lamellae are too thin to analyze; cumulate contains Cr-rich ilmenite (Cr_2O_3 = 15.1 wt%) and Cr-poor ilmenite. Other lithologies contain chromite of similar composition, Cr/(Cr+Al) = 0.85, and minor ilmenite.
Classification: Achondrite (eucrite, polymict breccia); low shock (no maskelynite), minimal weathering.
Specimens: A 25 g type specimen is on deposit at *NAU*. Birdsell holds the main mass.

Northwest Africa 2794
Morocco
Find: 2005
Achondrite (howardite)
History: A 145 g single stone with partial fusion crust was purchased in Erfoud, Morocco, in 2005.
Petrography: (J. Wittke and T. Bunch, *NAU*) Contains fine to medium cumulate basalt clast size (<3 mm diameter) and even finer-grained subophitic basalts (<1 mm) with diogenite fragments up to 8 mm.
Geochemistry: Cumulate basalt pyroxenes: Orthopyroxene ($Fs_{49.4-64.7}Wo_{2.1-2.5}$), exsolved pigeonite ($Fs_{45.1-54.4}Wo_{13.1-6.7}$), Ca pyroxene ($Fs_{36.0-47.1}Wo_{19.6-24.1}$). All pyroxene FeO/MnO = 29–34 (n = 27). Diogenite: Orthopyroxene ($Fs_{26.7-30}Wo_{2.2-2.5}$; FeO/MnO = 24–30).
Classification: Achondrite (howardite); moderate weathering and low to moderate shock.
Specimens: A 21.4 g type specimen is on deposit at *NAU*. G. Hupé holds the main mass.

Northwest Africa 2795
Morocco
Find: 2005
Achondrite (diogenite)
History: A 329 g partial stone with moderately weathered fusion crust was purchased in Erfoud, Morocco, in 2005.
Petrography: (J. Wittke and T. Bunch, *NAU*) Brecciated fine to coarse grain size (<1 cm).
Geochemistry: Orthopyroxene ($Fs_{26.2}Wo_{2.5}$; FeO/MnO = 29.5), minor Ca-rich pyroxene ($Fs_{18.5}Wo_{28.8}$), plagioclase ($An_{87.7}$), chromite (Cr/(Cr+Al) = 0.79), ilmenite, and kamacite present.
Classification: Achondrite (diogenite), moderately shocked (some maskelynite and high strain in orthopyroxene).
Specimens: A 20.4 g type specimen is on deposit at *NAU*. G. Hupé holds the main mass.

Northwest Africa 2853
Morocco
Find: 2005
Achondrite (howardite)
History: A 1006 g fully crusted stone was purchased in Erfoud, Morocco, in 2005.
Petrography: (T. Bunch and J. Wittke, *NAU*) Contains heterogeneously distributed orthopyroxene fragments that tend to be large (2–9 mm in diameter). Diogenite modes for three thin sections give 0, 9, and 15 vol%. Eucrites have a fine- to coarse-grained size range and consist of subophitic and cumulate textured basalts. Most pyroxenes recrystallized into small, polygonal aggregates; plagioclase melted, although original grain boundaries are preserved and crystallized into fine-grained fibrous to radiating textures.
Geochemistry: Host: Pigeonite ($Fs_{45.3-51.7}Wo_{5.8-9.0}$; FeO/MnO = 29–33), exsolution lamellae ($Fs_{33.6-39.4}Wo_{19.0-25.4}$). Diogenite: Orthopyroxenes ($Fs_{22.6-25.6}Wo_{1.8-2.3}$; FeO/MnO = 24–27), plagioclase ($An_{89-94.3}$).
Classification: Achondrite (howardite); high shock.
Specimens: A 22 g type specimen is on deposit at *NAU*. Regelman holds the main mass.

Northwest Africa 2890
Northwest Africa
Find: 2004
Achondrite (howardite)

History: An anonymous finder recovered a single stone of 132 g within the North African Sahara in 2004.

Petrography and Geochemistry: (A. Greshake, *MNB*) Polymict breccia with eucritic and diogenitic fragments embedded in a clastic matrix and contains dark impact melt fragments. Eucrite clasts consist mainly of frequently exsolved Ca pyroxene and plagioclase ($An_{96.4–97.3}$), pigeonite ($Fs_{37.3–53.0}Wo_{9.3–13.4}$), augite ($Fs_{23.0–31.1}Wo_{39.6–43.3}$), with minor olivine, Mg-Al-chromite, and ilmenite. Diogenitic lithologies are dominated by orthopyroxene ($Fs_{18.8–32.0}$) that are not always zoned.

Classification: Achondrite (howardite); low-shock, minimal weathering.

Specimens: A 22.1 g type specimen and one thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2895
Northwest Africa
Find: 2004
Achondrite (ureilite)

History: A single stone of 43 g was found 2004 by an anonymous finder in the North African Sahara.

Petrography and Geochemistry: (A. Greshake, *MNB*) The sample is dominantly composed of large pigeonite ($Fs_{9.9–10.8}Wo_{5.2–10.1}$; Cr_2O_3 = 1.1 wt%) often enclosing small pyroxenes and less abundant olivines.

Geochemistry: Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = +3.27, $\delta^{18}O$ = +8.243, $\Delta^{17}O$ = −1.016 (all ‰).

Classification: Achondrite (urelilite); low shock, moderate weathering.

Specimens: A 8.9 g type specimen and one thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2897
Northwest Africa
Find: 2004
Rumuruti-like (R3–6)

History: An anonymous finder recovered one small stone of 23.3 g in 2004 in the North African Sahara.

Petrography: (A. Greshake, *MNB*) Olivine ($Fa_{1.2–59.8}$), low-Ca pyroxene ($Fs_{1.5–30}Wo_{0.1–4.9}$), augite ($Fs_{7–17}Wo_{24.4–48.5}$), and plagioclase ($An_{4.9–14}$).

Geochemistry: Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = +5.542, $\delta^{18}O$ = +5.06, $\Delta^{17}O$ = +2.91 (all ‰), which are close to Rumuruti itself.

Classification: Rumuruti-like (R3–6); low shock, minimal weathering.

Specimens: A 5.75 g type specimen and one polished thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2898
Northwest Africa
Find: 2003
Ordinary chondrite (H7)

History: An anonymous finder recovered a single stone of 136 g within the North African Sahara in 2003.

Petrography: (A. Greshake, *MNB*) The meteorite has a totally recrystallized texture, with abundant 120° triple junctions of olivine ($Fa_{17.7}$), low-Ca pyroxene ($Fs_{15.6}Wo_{3.6}$), and feldspar ($An_{12.3–18.9}$). No chondrules were observed.

Geochemistry: Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = +2.905, $\delta^{18}O$ = +4.4, $\Delta^{17}O$ = +0.617 (all ‰).

Classification: Ordinary chondrite (H7); S2, W1/2.

Specimens: A 23 g type specimen and one polished thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2899
Northwest Africa
Find: 2004
Ordinary chondrite (H-related impact-melt rock)

History: A single stone of 11 g was found 2004 by an anonymous finder in the North African Saharan desert.

Petrography: (A. Greshake, *MNB*) The stone is composed of small, mostly euhedral olivines ($Fa_{6.1–23.9}$) embedded into a glassy groundmass. Most olivines show a pronounced compositional zoning with Mg-rich cores and Fe-rich rims or vice versa. Small spherical Fe,Ni sulfides are often found in the groundmass and Fe,Ni metal is present. Chondrules were not observed.

Geochemistry: Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = +3.088, $\delta^{18}O$ = +4.898, $\Delta^{17}O$ = +0.541 (all ‰).

Classification: Orindary chondrite (H-related impact-melt rock) with shock-related crystallized impact melt, W0/1.

Specimens: A 2.5 g type specimen and one polished thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2900
Northwest Africa
Find: 2004
Carbonaceous chondrite (CV3)

History: An anonymous finder recovered a single stone of 1375 g within the North African Sahara in 2004.

Petrography: (A. Greshake, *MNB*) The stone has a grayish appearance and contains up to centimeter-size dark- and light-colored inclusions and is composed of large chondrules, CAIs, and mineral fragments—all set into a fine-grained, grayish matrix.

Geochemistry: Olivine ($Fa_{14.2}$, range $Fa_{0.2–31.1}$), low-Ca

pyroxene ($Fs_{0.8–22.9}$). Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = –1.361, $\delta^{18}O$ = +3.027, $\Delta^{17}O$ = –2.935 (all ‰).
Classification: Carbonaceous chondrite (CV3); low shock, moderate weathering.
Specimens: A 20.5 g type specimen and one thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2901
Northwest Africa
Find: 2004
Carbonaceous chondrite (CV3)
History: An anonymous finder recovered a single stone of 308 g within the North African Sahara in 2004.
Petrography: (A. Greshake, *MNB*) The sample contains large chondrules, CAIs, and mineral fragments set into a fine-grained, dark-appearing matrix.
Geochemistry: Olivine ($Fa_{25.9}$, range $Fa_{0.4–32.1}$), low-Ca pyroxene ($Fs_{20.8–22.7}$). Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = –1.226, $\delta^{18}O$ = +3.587, $\Delta^{17}O$ = –3.091 (all ‰).
Classification: Carbonaceous chondrite (CV3); low shock, extensive weathering.
Specimens: A 21.1 g type specimen and one thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2902
Northwest Africa
Find: 2003
Ordinary chondrite (L-related, impact-melt rock)
History: An anonymous finder recovered several stones weighing 1000 g in total within the North African Sahara in 2003.
Petrography: (A. Greshake, *MNB*) Shows both Fe,Ni metal-poor and Fe,Ni metal-rich lithologies that both consist of small olivines, pyroxenes, and opaque phases embedded into a glassy Si,Al-rich groundmass. Ca-rich pyroxenes are rare. Olivine ($Fa_{12.9–23.9}$) and pyroxene ($Fs_{11.2–19.7}Wo_{1.1–2.7}$) are often compositionally zoned and sometimes pyroxene is overgrown by olivine. No chondrules are observed.
Geochemistry: Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) Metal-poor lithology: $\delta^{17}O$ = +3.24, $\delta^{18}O$ = +4.095, $\Delta^{17}O$ = +1.106 (all ‰). Metal-rich lithology: $\delta^{17}O$ = +3.452, $\delta^{18}O$ = +4.505, $\Delta^{17}O$ = +1.109 (all ‰).
Classification: Ordinary chondrite (L-related, impact-melt rock); shock-related crystallized impact melt, W1/2.
Specimens: A 22.7 g type specimen and one polished thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 2904
Northwest Africa
Find: Spring 2003
Achondrite (eucrite, polymict)
History: Four stones totaling 29.04 g were recovered in the spring of 2003 from the western part of the Sahara in Morocco.
Classification and Mineralogy: (A. Greshake and M. Kurz, *MNB*) A polymict breccia consisting of lithic and mineral clasts set into a more fine-grained, brecciated groundmass of dominantly plagioclase and often exsolved Ca pyroxene; plagioclase frequently contains pyroxene and ilmenite inclusions. Plagioclase, $An_{84.6–90.7}$; low-Ca pyroxene, $Fs_{44.5–55.8}Wo_{1.8–2.1}$; Ca pyroxene, $Fs_{22.3–43.4}Wo_{15.6–42.6}$; minor phases include Ti-rich chromite, silica, and ilmenite. Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O$ = +2.16, $\delta^{18}O$ = +4.58, $\Delta^{17}O$ = –0.222 (all ‰) and (R. Clayton and T. Mayeda, *UChi*): $\delta^{17}O$ = +2.13, $\delta^{18}O$ = +4.74, $\Delta^{17}O$ = –0.33 (all ‰).
Classification: Achondrite (eucrite, polymict); moderate to high shock, extensive weathering.
Specimens: A 9.95 g type specimen and one polished thin section are on deposit at *MNB*. Main mass with an anonymous finder.

Northwest Africa 2913
Morocco
Find: 2005
Achondrite (eucrite, monomict melt breccia)
History: A 100.2 g complete stone was purchased in Erfoud, Morocco, in May 2005.
Petrography: (J. Wittke and T. Bunch, *NAU*) Specimen contains medium-grained (<2 mm), centimeter-size, cumulate basalt clasts set in a microbreccia melt matrix. Clasts are moderately shocked with partial maskelynization of plagioclase and mechanical twinning, optical mosaicism and reduced birefringence in pyroxenes. The dark matrix is a flow mixture of FeO-rich glasses, very small cumulate basalt fragments, and patches of quench-textured microbasalt.
Geochemistry: Monomict cumulate basalt: host Ca-poor pyroxene ($Fs_{55.4–57.8}Wo_{5.1–2.9}$), FeO/MnO = 28; exsolved augite ($Fs_{24.2}Wo_{44.7}$), FeO/MnO = 36; plagioclase/maskelynite ($An_{90.8}$); chromite Cr/(Cr+Al) = 0.86.
Classification: Achondrite (eucrite, monomict melt breccia); moderate shock, minimal weathering.
Specimens: A 21 g type specimen is deposited at *NAU*. Birdsell holds the main mass.

Northwest Africa 2914
Morocco
Find: April 2005
Achondrite (eucrite, monomict breccia)
History: Three paired partial stones weighing a total of 122 g were purchased in Erfoud, Morocco, in April 2005.
Petrography: (T. Bunch and J. Wittke, *NAU*) Cataclastic cumulate basalt that shows a remarkable range of shock features that include alternating bands of cataclastic and melt flows, mylonite-like swirls and lenticular masses, and

rounded, finely crushed breccia clasts that are separated by dark, glassy to cryptocrystalline bands.
Geochemistry: Host: orthopyroxene ($Fs_{59.3–62.7}Wo_{3.1–1.9}$; FeO/MnO = 31), exsolved augite ($Fs_{26.8–27.8}Wo_{43–42.1}$; FeO/MnO = 28), plagioclase (An_{92}); chromite (Cr/(Cr+Al) = 0.88).
Classification: Achondrite (eucrite monomict breccia) with moderate to high degree of shock and low degree of weathering.
Specimens: A 21.1 g type specimen is on deposit at *NAU*. Birdsell holds the main mass.

Northwest Africa 2923
Morocco
Find: July 2005
Achondrite (diogenite polymict breccia)
History: A 606 g complete stone fully crusted with moderately fresh fusion crust was purchased in Erfoud, Morocco, in July 2005.
Physical Characteristics: (T. Bunch and J. Wittke, *NAU*) A light buff-color interior matrix with clear, yellow, green, dark diogenite clasts.
Petrography: Modal analyses of a 27 cm^2 surface area: diogenites (grain size <2.7 cm) = 83, olivine microbasalts = 6, shock melt clasts = 5, recrystallized cumulate basalts = 4, chromite, sulfide, ilmenite, metal = 2 (all vol%).
Geochemistry: Diogenite: Orthopyroxenes ($Fs_{22–27.6}Wo_{2.9}$; FeO/MnO = 28–31). Unique olivine microbasalt clasts: olivine ($Fa_{33.6}$; FeO/MnO = 54; these are microphenocrysts <0.48 mm in diameter), orthopyroxene (<0.2 mm) ($Fs_{27.7}Wo_{2.8}$; FeO/MnO = 27) with <0.05 mm diameter grains of vermicular metal (Ni = 6.2 wt%), and FeS (Cr = 6.2 wt%); minor diopside ($Fs_{10.0}Wo_{45.7}$).
Classification: Achondrite (diogenite, polymict breccia); low to high (recrystallized melts) shock, minimal weathering.
Specimens: A 50 g type specimen is on deposit at *NAU*. Farmer holds the main mass.

Northwest Africa 2924
Algeria
Find: 2005
Mesosiderite
History: Over 180 kg (several thousand pieces) have been recovered from a small strewn field in Algeria. The largest known piece weighs about 5000 g; most are small pieces that weigh less than 200 g.
Petrography and Geochemistry: (T. Bunch and J. Wittke, *NAU*) Fine-grained (<0.5 mm) matrix consists of brecciated and partially recrystallized subophitic to granular basalts that enclose larger (up to 2.5 mm) subrounded to subangular olivine (Fa_{28}), pigeonite ($Fs_{31}Wo_{5.4}$; FeO/MnO = 25.7; Cr_2O_3 = 0.87, Al_2O_3 = 1.28 [both wt%]) that rarely shows twinning. These cataclastic basalts contain unusually calcic plagioclase ($An_{99.3}$) with little FeO (<0.04 wt%); highly twinned pigeonite is compositionally similar to the much larger clast pigeonite ($Fs_{32}Wo_{5.7}$), but with very little Cr_2O_3 and Al_2O_3. Merrillite is also present. Metal blebs (Ni = 6.6 wt%) are irregular in shape and typically <2 mm in size with the exception of metal aggregates and rare, centimeter-size metal nuggets with included pigeonite.
Classification: Mesosiderite; low shock, variable degree of weathering dependent on the specimen size.
Specimens: A 85 g type specimen is on deposit at *NAU*. Farmer holds a 16 kg of sample.

Northwest Africa 2975
Algeria
Find: 2005
Achondrite (Martian, basaltic shergottite)
History: A minimally weathered fully encrusted whole stone of 70.1 g was purchased in Erfoud, Morocco, by M. Farmer in November 2005.
Petrography: (T. Bunch and J. Wittke, *NAU*; A. Irving, *UWS*) A medium-grained (<3.1 mm greatest dimension) basaltic shergottite that consists of ~57.3 vol% augite and pigeonite pyroxenes, and 38.3 vol% plagioclase (present as shock-formed maskelynite and glasses) with minor opaques (2.7 vol%) and phosphates (1.7 vol%) arranged in a weakly foliated subophitic to granular texture. Accessory phases include ulvöspinel, ilmenite, chlorapatite, merrillite, pyrrhotite, Si-Al-Na-K-rich glasses, and baddeleyite. Vesicular black glass veins (<3 mm in width) and pockets (up to 6 mm) are prominent.
Geochemistry: Pigeonite ($Fs_{35.2–57.6}Wo_{12.6–16.5}$; FeO/MnO = 28–38) and augite ($Fs_{27.2–41.5}Wo_{30.8–35.2}$) show mottled compositional zoning. Fe-rich margins of pigeonite contain very thin (0.2–0.5 µm) orthopyroxene exsolution lamellae. Maskelynite is compositionally homogeneous $An_{55}Or_{1.8}$ in contrast to mesostasis maskelynite ($An_{48–60}Or_{9.2}$) and glasses. Melt inclusions (15–60 µm, longest dimension) in ulvöspinel have rims of Fe-rich pigeonite ($Fs_{73.5}Wo_{5.8}$), merrillite, and pyrrhotite; cores are Si-Al-K-Na-rich glass. Bulk composition: Calculated average bulk composition based on analyzed phases and their modes of three melt inclusions is: SiO_2 = 70.2, Al_2O_3 = 8.5, TiO_2 = 0.8, FeO = 2.1, MnO = 0.2, MgO = 2.35, CaO = 3.5, Na_2O = 0.95, K_2O = 2.1, and P_2O_5 = 2.8 (all wt%) with trace amounts of NiO, CoO, and S. One melt inclusion contains only fayalite (Fa_{84}) mantled around a core of glass (K_2O = 6.4, SiO_2 = 78; both wt%).
Classification: Achondrite (Martian basaltic shergottite); moderate to high shock, minimal weathering.
Specimens: A 20.2 g type specimen and one thin section are on deposit at *NAU*. An anonymous owner holds the main mass.

Northwest Africa 2977
Morocco or Algeria
Find: 2005 November
Achondrite (lunar, gabbro)
History: A single minimally weathered fusion-encrusted stone of 233 g was purchased from a Moroccan dealer in Tagounite, Morocco, by M. Farmer in November 2005.

Petrography and Geochemistry: (J. Wittke and T. Bunch, *NAU*; A. Irving, *UWS*) The specimen consists of a single yellow-green, relatively coarse-grained rock traversed by thin, black glass-rich veins. It is an olivine-rich, two-pyroxene cumulate gabbro composed of olivine ($Fa_{31.7}$; FeO/MnO = 96; 52 vol%), ($Fs_{26.6}Wo_{6.7}$; 23 vol%), augite ($Fs_{16.2}Wo_{29}$; 9 vol%), and plagioclase (An_{56}; 14 vol%) with minor amounts of Ba-K feldspar, chromite, ilmenite, and merrillite. Larger pigeonite grains commonly enclose equant olivine grains, which contain abundant melt inclusions (0.025–0.125 mm). Plagioclase is partially converted to maskelynite, and pyroxenes and olivine exhibit shock lamellae and undulatory extinction. Note: This specimen is identical in texture and mineral composition to the gabbro clasts in NWA 773 and NWA 2700 and thus appears to be paired with those breccia specimens.
Classification: Achondrite (lunar, gabbro); minimal weathering.
Specimens: A 20.1 g type specimen and one polished thin section are on deposit at *NAU*. A 0.5 g specimen is on deposit at *WUSL*. An anonymous owner holds the main mass.

Northwest Africa 2995
Algeria
Find: 2005
Achondrite (lunar feldspathic breccia)
History: A 538 g fully crusted and minimally weathered stone was purchased in Morocco by A. Aaronson in November 2005.
Petrography and Geochemistry: (T. Bunch and J. Wittke, *NAU*) The feldspathic fragmental breccia contains many highlands fine-grained lithologies. Norite: Orthopyroxene ($Fs_{26.4}Wo_4$; FeO/MnO = 66). Olivine basalt: Olivine ($Fa_{87.2}$; FeO/MnO = 95), plagioclase ($An_{84.7}$). Subophitic basalt: Ca pyroxene ($Fs_{25–48}Wo_{37.1–25.9}$), pigeonite ($Fs_{27.8–31.7}Wo_{15.4–9.3}$; FeO/MnO = 53), olivine ($Fa_{36.3}$; FeO/MnO = 90), plagioclase (An_{97}). Gabbro: Olivine ($Fa_{34.7}$; FeO/MnO = 95), pigeonite ($Fs_{28.2}Wo_{8.9}$; FeO/MnO = 67), plagioclase (An_{94}). KREEPy-like basalt: Plagioclase ($Ab_{50}Or_{17.4}$), K feldspar ($Ab_{14.3}Or_{83.}$) in addition to silica, phosphate, and Fe-rich pyroxenes. Troctolite: olivine ($Fa_{30.8}$; FeO/MnO = 94), plagioclase ($An_{94.7}$). Granulitic impact melts: Olivine (Fa_{31}), orthopyroxene ($Fs_{25.2}Wo_{3.4}$), plagioclase (An_{95}). Anorthosite: ($An_{92.7–96.8}$), glassy impact melts, coarse-grained mineral fragments, and a 0.350 mm-size grain of meteoritic Ni, Fe-metal (Ni = 6.3, Co = 1.0 [both wt%]). In addition, the assemblage appears to be characterized by large amounts of breccias within breccias with at least four generations of brecciation observed in one centimeter-size breccia clast. Numerous shock-induced melt veins are present along large breccia clast margins as well as isolated melt pockets within clasts. Interior weathering grade is very low, all glasses are fresh, and no apparent terrestrial alteration veins were noted.
Classification: Achondrite (lunar, feldspathic breccia).
Specimens: A 21.2 g type specimen is on deposit at *NAU*. Aaronson holds the main mass.

Northwest Africa 2999
Morocco or Algeria
Find: 2004
Achondrite (angrite)
History: Twelve individual dark brown stones totaling 392 g, each with a thin fusion crust, were purchased from a Moroccan dealer in Tagounite by G. Hupé in August 2004.
Physical Characteristics: Grain size is predominantly from 0.1 to 0.5 mm, but all stones have irregularly distributed, larger yellowish plagioclase grains (up to 6 mm across) exhibiting an iridescent luster.
Petrography: (A. Irving and S. Kuehner, *UWS*; T. Bunch and J. Wittke, *NAU*) Based upon examination of thin sections of all separate stones, this meteorite is texturally heterogeneous. Terrestrial weathering has resulted in partial replacement of metal and minor grain boundary staining by iron hydroxides. The overall texture is protogranular, but there are large porphyroclasts of anorthite, spinel, and polygranular olivine. Anorthite also occurs as narrow (10–20 μm wide) coronas around spinel grains adjacent to clinopyroxene and both spinel and diopside are compositionally zoned away from the coronas. Texturally, this meteorite is very different from most angrites.
Geochemistry: The major minerals are Ca-rich olivine ($Fa_{39.8–41.0}$; FeO/MnO = 77–97; CaO = 0.6–1.3 wt%), Al,Ti-bearing diopside ($Fs_{9.6–11.3}Wo_{53–54}$; FeO/MnO = 55–130; Al_2O_3 = 5–9, TiO_2 = 0.5–2.4 [both wt%]), minor Cr-pleonaste spinel (Mg/(Mg+Fe) = 0.44–0.47, Al_2O_3 = 55–60, Cr_2O_3 = 4.7–8.7 [both wt%]), pure anorthite (containing Na_2O < 0.02 wt%), and kamacite, troilite, and S-bearing calcium silicophosphate. Oxygen isotopes: (D. Rumble, *CIW*) Triplicate analyses of acid-washed whole rock samples by laser fluorination gave, respectively, $\delta^{18}O$ = 3.839, 4.093, 4.154; $\delta^{17}O$ = 1.974, 2.054, 2.095; $\Delta^{17}O$ = –0.041, –0.095, –0.086 (all ‰).
Classification: Achondrite (angrite).
Specimens: A 22 g type specimen and one polished thin section are on deposit at *NAU*. Three polished thin sections are on deposit at *UWS*. G. Hupé holds the main mass.

Northwest Africa 3151
Morocco or Algeria
Find: April 2005
Achondrite (brachinite)
History: A 1500 g complete stone with a thin, translucent crust was purchased by G. Hupé in Tagounite, Morocco, in April 2005.
Petrography and Geochemistry: (A. Irving and S. Kuehner, *UWS*) Coarse-grained dunitic rock (grain size 0.7–1.6 mm) with protogranular texture, composed predominantly of olivine ($Fa_{35.7}$; FeO/MnO = 81; 95 vol%) with minor clinopyroxene ($Fs_{10.5–10.6}Wo_{44.7–45.2}$; FeO/MnO = 44; Cr_2O_3 = 0.65 Al_2O_3 = 0.95 [both wt%]), altered metal (with some relict taenite), troilite, chromite (Cr/(Cr+Al) = 0.727–0.731) with very rare K-poor, sodic plagioclase ($An_{36.2–39.9}Or_{0.2}$),

and orthopyroxene. Although the silicate minerals are fresh, terrestrial weathering has altered some of the primary metal to hydroxides, which also form thin coatings along grain boundaries. Oxygen isotopes: (D. Rumble, *CIW*) Replicate analyses of acid-washed whole rock samples by laser fluorination gave $\delta^{18}O = +4.86 \pm 0.03$, $\delta^{17}O = +2.42 \pm 0.02$, $\Delta^{17}O = -0.15 \pm 0.02$ (all ‰).
Classification: Achondrite (brachinite).
Specimens: A 20 g type specimen and one polished thin section are on deposit at *UWS*. G. Hupé holds the main mass.

Northwest Africa 3160
Morocco
Find: July 2005
Achondrite (lunar, mare basalt breccia)
History: In July 2005, A. and G. Hupé purchased three broken stones with a total weight of 34 g from a Moroccan dealer in Erfoud, Morocco.
Physical Characteristics: The largest stone (28 g) has a partial thin weathered fusion crust.
Petrography: (R. Zeigler and R. Korotev, *WUSL*; A. Irving and S. Kuehner, *UWS*) The large specimen consists almost entirely of a fine-grained, olivine-phyric basalt clast with minor attached breccia matrix and appears to be part of a larger, coarse-grained, polygenic breccia. The two small stones are pieces of the breccia. The basalt contains phenocrysts of euhedral to subhedral olivine (~0.1–0.9 mm) and minor chromite (<0.1 mm).
Geochemistry: Olivine phenocrysts are zoned, with cores typically $Fo_{55–70}$ and rims extending to ~Fo_{40} with FeO/MnO ratios of 91–105. The groundmass has spinifex olivine (Fo_{29}) and skeletal pyroxene ($En_{37–39}Wo_{11–13}$; FeO/MnO = 71–75) set in a fine-grained matrix of pyroxene ($En_{35–39}Wo_{20–23}$), olivine (~Fo_{22}), and glass. The breccia lithology is a fragmental breccia consisting primarily of olivine ($Fo_{6–82}$) and pyroxene ($En_{1–68}Wo_{9–39}Fs_{16–83}$), with minor amounts of plagioclase ($An_{82–97}$) and trace silica; hedenbergite-fayalite-silica symplectite (after former pyroxferroite), and Fe-Ti-Cr oxides.
Classification: Achondrite (lunar, mare basalt breccia). Note: These samples may be paired with NWA 2727.
Specimens: A 4.8 g type specimen and one polished thin section are on deposit at *UWS*. A 2.1 g specimen is on deposit at *WUSL*. A. Hupé holds the main mass.

Northwest Africa 3163
Mauritania or Algeria
Find: August 2005
Achondrite (lunar, feldspathic granulitic impactite)
History: In August 2005, G. Hupé purchased a 1634 g stone from a Moroccan dealer in Ouarzazate.
Petrography and Geochemistry: (A. Irving and S. Kuehner, *UWS*) The exterior is almost completely coated by a thin, transparent, greenish fusion crust. The pale gray interior has multiple shock fractures (with very minor calcite coatings) and some thin glass veins. Poikiloblastic recrystallized breccia, with larger grains of plagioclase (~70 vol%) enclosing much smaller grains (less than 100 μm across) of pyroxenes (~20 vol%), olivine (~10 vol%), and accessory Ti-chromite (Cr/(Cr+Al) = 0.714–0.736; Mg/(Mg+Fe) = 0.121–0.143; TiO_2 = 9.1–18.4 wt%), ilmenite, troilite, and metal (Ni = ~15 wt%). Anorthitic plagioclase ($An_{97.4–98.2}$) has been converted by shock almost entirely to maskelynite (although domains of birefringent, less-shocked feldspar remain). Pigeonitic pyroxene grains have very fine-scale exsolution lamellae of augite ($Fs_{14.5–16.1}Wo_{40.2–40.5}$; FeO/MnO = 41.7–43.8) within orthopyroxene ($Fs_{32.0–33.9}Wo_{4.4–5.8}$; FeO/MnO = 55.5–61.2). Olivine ($Fa_{38.0–40.9}$; FeO/MnO = 91.7–110).
Classification: Achondrite (lunar, feldspathic granulitic impactite).
Specimens: A 20.1 g type specimen and one polished thin section are on deposit at *UWS*. G. Hupé holds the main mass.

Northwest Africa 3164
Morocco or Algeria
Find: August 2004
Achondrite (angrite)
History: In August 2004, A. Aaronson purchased many individual dark brown stones totaling 928 g from nomads in Rabat.
Petrography: (T. Bunch and J. Wittke, *NAU*; A. Irving and S. Kuehner, *UWS*) All stones have irregularly distributed, larger yellowish plagioclase grains exhibiting a luster. The overall texture is granular, but there are large porphyroclasts of anorthite, spinel, and polygranular olivine. There are clinopyroxene-spinel symplectites around anorthite porphyroclasts in contact with olivine, and anorthite also occurs as narrow (10–20 μm wide) coronas around spinel grains adjacent to clinopyroxene.
Geochemistry: The major minerals are Ca-rich olivine ($Fa_{39.1–41.2}$; FeO/MnO = 62–84; CaO = 1.2–1.8 wt%), Al,Ti-bearing diopside ($Fs_{10.3}Wo_{52}$; FeO/MnO = 130–142; Al_2O_3 = 6–7, TiO_2 = 1–1.6 [both wt%]), minor Cr-bearing pleonaste spinel (Mg/(Mg+Fe) = 45.7, Al_2O_3 = 59.7, Cr_2O_3 = 4.7 [both wt%]), almost pure anorthite (<0.02 wt% Na_2O), and accessory kamacite and troilite. No kirschsteinite or orthopyroxene was found. Primary metal is partly replaced by limonite, which also occurs along grain boundaries.
Classification: Achondrite (angrite). Note: The sample may be paired with NWA 2999.
Specimens: A 21 g type specimen and one polished thin section are on deposit at *NAU*. Boswell holds the main mass.

Northwest Africa 3368
Northwest Africa
Find: 2005
Achondrite (eucrite)
History: John Birdsell and Marvin Killgore purchased a 1600 g stone.
Petrography: (D. Hill and K. Gardner, *UAz*) The stone was 100% covered with black fusion crust. There are a variety of

light and dark angular clasts ranging in size from several mm to ~2 cm and rounded grains several millimeters in diameter. They are set in a light matrix typical of eucrites except for its distinct pink hue. Some systematic variations in the color exist. Approximately half of the slice is slightly darker pink than the other with an indistinct, irregular boundary.
Geochemistry: Pyroxene ($Wo_6En_{36}Fs_{59}$ and $Wo_{40}En_{30}Fs_{30}$), plagioclase ($An_{90}Ab_{10}Or_{0.4}$), chromite (TiO_2 = 5–27, Al_2O_3 = 5 [both wt%]), with minor ilmenite present. Bulk INAA (*UAz*) indicate ~10× CI REE abundances.
Classification: Achondrite (eucrite); minimal weathering.
Specimens: One thick section type specimen of 20.5 g and three small chips totaling 2.5 g are on deposit at *UAz*. M. Killgore holds the main mass.

Northwest Africa 4017
Northwest Africa
Find: 2005
Mesosiderite
History: An anonymous finder recovered a single stone of 216.9 g in 2005 from the western part of the Sahara in Morocco.
Petrography: (A. Greshake, *MNB*) A stony portion consists of dominant low-Ca pyroxene, plagioclase, and phosphates. Minor phases include silica, troilite, and small Fe,Ni metal grains. Pyroxene grains often contain numerous small Fe,Ni metal, troilite, and silica inclusions.
Geochemistry: Pyroxene, $Fs_{25.5–40.8}$; plagioclase, $An_{92.4}$ (total range $An_{90.5–93.7}$). The metal is mostly kamacite.
Classification: Achondrite (mesosiderite) with low degree of shock and low to moderate degree of weathering.
Specimens: A 23.4 g type specimen and one polished thin section are on deposit at *MNB*. HSSH-Pirmasens of Germany holds the main mass.

Northwest Africa 4018
Northwest Africa
Find: 2005
Achondrite (eucrite, polymict)
History: A single stone of 158.6 g was found in 2005 in the western part of the Sahara in Morocco.
Petrography: (A. Greshake, *MNB*) A polymict breccia composed of lithic and mineral clasts set into a fine-grained brecciated groundmass. The lithic clasts are mostly fine- or coarse-grained basaltic fragments with rare impact melt clasts. Mineral fragments are dominantly plagioclase and exsolved Ca pyroxene. Minor phases include silica, Al-Ti-chromite, and ilmenite.
Geochemistry: Plagioclase ($An_{87–92.2}$), pyroxene ($Fs_{42.9–54.0}Wo_{2.7–19.0}$).
Classification: Achondrite (eucrite, polymict); moderate shock, moderate weathering.
Specimens: A 23.1 g type specimen and one polished thin section are on deposit at *MNB*. HSSH-Pirmasens of Germany holds the main mass.

Northwest Africa 4019
Northwest Africa
Find: 2005
Achondrite (eucrite, polymict)
History: A single stone of 504.7 g partly covered with fusion crust was found in 2005 in the western part of the Sahara in Morocco.
Petrography: (A. Greshake, *MNB*) A polymict breccia dominated by large basaltic clasts set into a fine-grained groundmass with rare melt clasts and large mineral fragments, the latter being mostly plagioclase and exsolved Ca pyroxene. Minor phases include silica and ilmenite.
Geochemistry: Plagioclase ($An_{74.1–90.7}$), pyroxene ($Fs_{41.6–65.4}Wo_{2.9–29.3}$).
Classification: Achondrite (eucrite, polymict); low shock, minimal weathering.
Specimens: A 22 g type specimen and one polished thin section are on deposit at *MNB*. HSSH-Pirmasens of Germany holds the main mass.

Northwest Africa 4023
Northwest Africa
Find: 2005
Achondrite (eucrite, polymict)
History: A single stone of 17.2 g partly covered with fusion crust was found in the western part of the Sahara in Morocco in 2005.
Petrography: (A. Greshake, *MNB*) A polymict breccia consisting of basaltic, melt clasts, and mineral clasts set into a fine-grained brecciated groundmass. Mineral fragments are dominantly plagioclase and exsolved Ca pyroxene. Minor phases include silica, Al-Ti-chromite, and ilmenite.
Geochemistry: Plagioclase ($An_{78.6–94.2}$), pyroxene ($Fs_{27.7–56.5}Wo_{2.7–40.2}$).
Classification: Achondrite (eucrite, polymict) with a high degree of shock and moderate degree of weathering.
Specimens: A 3.45 g type specimen and one polished thin section are on deposit at *MNB*. HSSH-Pirmasens of Germany holds the main mass.

Northwest Africa 4032
Northwest Africa
Find: 2004
Achondrite (eucrite, polymict)
History: A single stone of 10.5 g partly covered with fusion crust was found in the western Sahara in Morocco in 2004.
Petrography: (A. Greshake, *MNB*) A polymict breccia consisting of basaltic and mineral clasts set into a fine-grained groundmass with mineral fragments that are dominantly large plagioclase and exsolved Ca pyroxene. Minor phases include silica, troilite, and ilmenite.
Geochemistry: Plagioclase ($An_{79–91.4}$), pyroxene ($Fs_{26.6–61.2}Wo_{2.6–42.5}$).
Classification: Achondrite (eucrite, polymict); high shock, minimal weathering.

Specimens: A 2.2 g type specimen and one polished thin section are on deposit at *MNB*. JNMC-Zürich, Switzerland, holds the main mass.

Northwest Africa 4034

Northwest Africa
Find: 2005
Achondrite (diogenite)

History: A single stone of 1513 g partly covered with fusion crust was found in 2005 by an anonymous finder in the western part of the Sahara in Morocco.

Petrography: (A. Greshake, *MNB*) The specimen is dominated by large blocky orthopyroxenes; locally, these crystals are brecciated into smaller grains. Minor phases include Mg-Al-Cr-spinel and plagioclase.

Geochemistry: Orthopyroxene ($Fs_{25.2}Wo_{3.3}$), plagioclase ($An_{81.3–83}$).

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

Specimens: A 24.5 g type specimen and one polished thin section are on deposit at *MNB*. JNMC-Zurich of Zurich, Switzerland, holds the main mass.

Northwest Africa 4039

Northwest Africa
Find: 2005
Achondrite (eucrite, monomict breccia)

History: Several stones totaling 950 g were found in 2005 by an anonymous finder in 2004 in the western part of the Sahara in Morocco.

Petrography: (A. Greshake, *MNB*) An unusual eucrite with dominantly coarse-grained basaltic texture of exsolved Ca pyroxene and plagioclase cross-cut by centimeter-size granular bands or crushed zones. Locally these zones display an equigranular texture with 120° grain boundaries; minor phases include orthopyroxene, silica, ilmenite, troilite, and Al-Ti chromite.

Geochemistry: Plagioclase ($An_{90.1}$, range $An_{88.3–92.6}$), orthopyroxene ($Fs_{58.1–62.2}Wo_{2.7–4.6}$), pigeonite ($Fs_{50.7–58.6}Wo_{5.2–15.7}$), augite ($Fs_{26.3–34.9}Wo_{32.1–44.1}$).

Classification: Achondrite (eucrite, monomict breccia); high shock, moderate weathering.

Specimens: A 20.1 g type specimen and one polished thin section are on deposit at *MNB*. An anonymous finder holds the main mass.

Northwest Africa 4040

Find: 2004
Ordinary chondrite (L3)

History: A complete stone weighing 226.3 g was found by an anonymous finder in the western Sahara in Morocco.

Petrography: (A. Greshake, *MNB*) The sample is a brecciated ordinary chondrite with centimeter-size dark and light inclusions. The dark inclusion is composed of small anhedral, mostly skeletal olivine displaying compositional zoning from an Mg-rich core to a more Fe-rich rim embedded into a mostly glassy groundmass containing small dendrites of olivine and pyroxene, with sulfide spherules also present. A light inclusion is a brecciated intergrowth of compositionally zoned olivine and low-Ca pyroxene. Si, Al-rich glass occurs in the interstitial areas of the rock and commonly contains sulfide spherules. The sample contains abundant chondrules with a chondrule/matrix ratio typical of L chondrites. The mean chondrule size is ~0.7 mm. The petrologic type is probably very low.

Composition: Olivine ($Fa_{0.4–29.5}$), pyroxene ($Fs_{2.8–23.9}$).

Classification: Ordinary chondrite (L3); S2, W2.

Specimens: One 24.5 g type specimen and one polished thin section are on deposit at *MNB*. Stefan Ralew of Germany holds the main mass.

Northwest Africa 4042

Find: 2004
Achondrite (ungrouped)

History: A single stone weighing 56.2 g was found by an anonymous finder in the western part of the Sahara in Morocco.

Petrography, Composition, and Classification: (A. Greshake, *MNB*) The rock is composed of mostly equigranular olivine (~93.3), somewhat larger low-Ca pyroxene (~4.6), Fe,Ni metal (0.7), pyrrhotite (~0.4), and Mg-Al-Ti chromite (~1.1; all vol%).

Geochemistry: Olivine ($Fa_{20.3}$; Cr_2O_3 and CaO between 0.03–0.07 wt%), pyroxene ($Fs_{16.2}Wo_{1.0}$). Total C = 834 ppm (I. Franchi and R. C. Greenwood, *OU*). Oxygen isotopes: (I. Franchi and R. C. Greenwood, *OU*) $\delta^{17}O = 2.539$, $\delta^{18}O = 5.178$, $\Delta^{17}O = -0.154$ (all ‰; $n = 5$) plot close to aubrites, brachinites, and winonaites; however, no unambiguous assignment to a particular meteorite class can be made.

Classification: Achondrite (ungrouped); low shock.

Specimens: One 11.6 g type specimen and one thin section are on deposit at *MNB*. Stefan Ralew of Kunibertstraße 29, 12524 Berlin, Germany, holds the main mass.

Northwest Africa 4123

Northwest Africa
Find: 2004
Achondrite (eucrite, polymict)

History: A single stone of 46.9 g was found by an anonymous finder in the western part of the Sahara in Morocco and purchased in 2004 in Erfoud.

Petrography: (A. Greshake, *MNB*) Polymict breccia with basaltic, impact melt, and mineral clasts set into a fine-grained matrix of exsolved Ca pyroxene, plagioclase, and opaques. Large mineral clasts are present and are predominantly plagioclase and exsolved low-Ca pyroxene. Exsolution lamellae in pyroxene are generally very fine. Minor phases include silica and ilmenite.

Geochemistry: Plagioclase ($An_{90.3}$), pyroxene ($Fs_{39.1–55.0}Wo_{2.3–17.4}$).

Classification: Achondrite (eucrite, polymict); moderate shock, minimal weathering.
Specimens: A 10 g type specimen is on deposit at *MNB*. Mr. Christian Anger of Austria holds the main mass.

Northwest Africa 4215
Mhamid, Morocco
Find: April 2002
Achondrite (diogenite, unbrecciated)
History: This single stone was bought by Bruno Fectay and Carine Bidaut in Mhamid, Morocco, in April 2002.
Physical Characteristics: A single brown stone weighing 46.4 g and displaying limited patches of fusion crust.
Petrography: (J. A. Barrat, M. Bohn, *UBO-IUEM*; P. Beck, Ph. Gillet, *ENSL*) The sample displays a well-preserved cumulative texture, consisting of zoned xenomorphic orthopyroxene grains on the order of 500 µm in size, with a few large chromite crystals (<5 vol%, up to 3 mm). Accessory olivine and scarce diopside grains occur within the groundmass, usually around the chromite crystals. Minor phases are cristobalite (determined by Raman spectrometry), troilite, and metal. This meteorite is weathered and its fractures are filled by calcite, limonite, and gypsum typical of hot desert alteration.
Geochemistry: (J. A. Barrat, M. Bohn, J. Cotten, *UBO-IUEM*; R. Greenwood, I. Franchi, *OU*) Orthopyroxenes ($En_{76.2}Wo_{1.1}Fs_{22.7}$ to $En_{68.6}Wo_{5.5}Fs_{25.9}$); olivines ($Fo_{76}$ to Fo_{71}); chromites (Mg# = 14.3–44.0, Cr# = 42.2–86.5) are chemically zoned (EMP). The bulk composition of this stone has been determined for major and trace elements (ICP-AES, ICP-MS). Its FeO, CaO abundances and most of the trace element concentrations (Sr, Ba, Pb, and REE among others) are high and indicate a significant contribution of the secondary minerals (limonite+calcite). In order to remove the terrestrial contribution, a subsample has been leached with hot HCl. The residue, made essentially of orthopyroxene and chromite, is similar in major and trace element abundances to diogenites as shown by the shape of its REE pattern and by its high Al/Ga ratio. Oxygen isotopic: (R. Greenwood, I. Franchi, *OU*) Were determined on a fraction of the leached powder, $\delta^{17}O = 1.431 \pm 0.102$, $\delta^{18}O = 3.203 \pm 0.205$ relative to V-SMOW, and $\Delta^{17}O = -0.248 \pm 0.005$ (all ‰).
Classification: Achondrite (diogenite, unbrecciated).
Specimens: A total of 10 g type specimen and two polished thick sections are on deposit at *ENSL*. Bruno Fectay and Carine Bidaut of La mémoire de la Terre hold the main mass.

THE AMERICAS

North America

Lucerne Valley 028 34°29′25″N, 116°57′34″W
San Bernardino County, California, USA
Find: 11 October 2003
Carbonaceous chondrite (CK4)
History: Two small dark gray stones weighing 3.0 g (LV 028) and 10.1 g (LV 029) were found within 100 meters of each other by R. Matson while searching for meteorites on Lucerne Dry Lake. Six additional fragments (LV 030, 031, 032, 035, 036, and 037) were found during detailed searches in March 2004, scattered over a linear kilometer. Total mass is 36.61 g.
Petrography: (A. E. Rubin, *UCLA*) The meteorites contain ~15 vol% chondrules with a mean apparent diameter of ~500 µm. Chondrule types include BO, PO, and POP. The principal opaque phases are magnetite and pyrrhotite. The magnetite occurs both as small grains and as clumps as large as 250 µm. The pyrrhotite is moderately abundant. Olivine ($Fa_{33.2\pm0.4}$), groundmass of 25–50 µm.
Classification: The stones are carbonaceous (CK4); moderate shock.
Specimens: A 7.33 g type specimen is on deposit at *UCLA*. Matson holds the main mass.

Mohawk 32°43′8″N, 113°42′6″W
Yuma County, Arizona, USA
Find: October 2000
Iron (IAB complex)
History: One mass of 586 g found in the desert near Mohawk, Arizona, by Don Armijo.
Geochemistry: (D. Hill and D. A. Kring, *UAz*) Bulk composition: Fe = 88.9 ± 0.7, Co = 0.443 ± 0.003, Ni = 7.41 ± 0.7 (all wt%); Ir = 2.42, Au 1.6, Ga = 76, Ge = 292 ± 28 (all ppm) as analyzed by INAA.
Classification: Iron (IAB complex) with kamacite bandwidth of 2.8 ± 1.1 mm (coarse octahedrite).
Specimens: A 37.4 g type specimen is on deposit at *LPL*. The main mass is held by Don Armijo.

Nova 005
Location is unconfirmed within the Americas
Find: 2002
Ordinary chondrite (L5)
History: One mass of 242 g was found. There have been a variety of explanations of how and where this meteorite was found. The current version involves an 80-year-old man as having found this stone while hunting for obsidian artifacts in the Cactus Flat-Coso Junction-Red Hill-Fossil Falls area (the east side of Rose Valley, California). The find location has been alternatively represented as Owens Lake, then Rose Valley, and most recently Fossil Falls.
Physical Characteristics: (A. Rubin, *UCLA*) The stone was found with 100% black fusion crust with a few spots of a rust-like color. The interior is cream-colored and sparsely speckled with orange spots.
Petrography: The sample is ~30 vol% chondrules and 70 vol% matrix. Most sulfide and metal grains appear slightly oxidized. Olivine ($Fa_{24.2}$). Note: The terrestrial age (Battelle Labs) is 25 ± 6 yr.
Classification: Ordinary chondrite (L5); S1, W1.

Specimens: A 41.2 g sample is on deposit at *UCLA*. A total of ~200 g is held by Meteorite Recovery Lab.

Orlando **28°32′51′′N, 81°21′44′′W**

Orange County, Florida, USA
Fall: 8 November 2004
Achondrite (eucrite, monomict)

History: On Monday, November 8, 2004, around 6:15 P.M., Ms. Donna Shuford was startled by the noise of something hitting the side of her house. She discovered that something had hit the top of her car and ricocheted onto the side of her house. A single ~180 g stone that had fragmented on impact was found.

Petrography and Geochemistry: (D. Mittlefehldt and M. Zolensky, *NASA JSC*) Major phases are low-Ca pyroxene ($Wo_3En_{35}Fs_{62}$; Fe/Mn ~30) with lamellae of high-Ca pyroxene ($Wo_{45}En_{29}Fs_{26}$), and calcic plagioclase ($An_{71-83}Ab_{16-28}Or_{\sim1}$). Minor phases include titanian chromite (TiO_2 = 16–20, Al_2O_3 = 2–3, MgO = 0.4, MnO = 0.8; [all wt%]), ilmenite (MgO = 0.5, MnO = 0.9 [both wt%]), with silica, iron sulfide, and Fe,Ni metal. The rock is largely unbrecciated, but has shock veins with granular texture and containing some glass. Remnant ophitic/subophitic igneous texture is preserved with plagioclase laths ~1 mm by ~30 µm, and ~2 mm blocky pyroxene grains. In much of the rock, pyroxene has been recrystallized to ~20–50 µm equant grains while plagioclase retains its original shape.

Classification: Achondrite (eucrite, monomict).

Specimens: A 20 g type specimen is on deposit at *SI*. The finder holds the main mass.

Pedernales **30°20′N, 98°57′W**

Gillespie County, Texas, USA
Find: 1 December 1980
Iron (ungrouped and related to IAB clan)

History: Mr. John Stitt excavated a mass of 691 g from a depth of 4 feet from an Indian rock midden on ranch land close to Fredericksburg.

Geochemistry: (J. T. Wasson, *UCLA*) Bulk composition: Co = 4.89, Ni = 75.0 (both mg/g); Ga = 65, Ge = 190, As = 16.4, Ir = 1.17, Au = 1.455 (all µg/g).

Classification: The stone is an iron of the IAB complex, but it is not a member of the IAB main group or the subgroups. It is closely related to Algarrabo and slightly further away in composition from Livingston (Tennessee). The kamacite bandwidth is 0.9 ± 0.2 mm (medium octahedrite). In some areas such bands have merged to create bands twice as wide.

Classification: Iron (ungrouped and related to IAB clan).

Specimens: A 23 g type specimen is on deposit at *UCLA* and one 86 g type specimen is on deposit at *ASU*. The main mass is held by B. Barnett.

Purmela **29°30′N, 98°3′W**

Coryell County, Texas, USA
Find: 10 January 1977
Iron (IIF)

History: Calvin Perryman recovered one 4.5 kg mass on a farm road.

Petrography and Geochemistry: (M. McGehee, *ASU*; J. Wasson, *UCLA*) Metal composition determined by INAA, Ni = 107, Co = 6.2 (both mg/g), Ga = 14, As = 4.3, Ir = 11 (all µg/g). Discontinuous kamacite spindles (<2 mm wide) are visible on an etched surface. The metal also contains troilite nodules (<1 mm to ~18 mm wide).

Classification: Iron IIF, plessitic octahedrite.

Specimens: A 406.3 g type specimen is on deposit at *ASU*. M. Jones holds the main mass.

San Pedro Jacuaro **19°46′N, 100°39′W**

Estado de Michoacan de Ocampo, Mexico
Fall: 1 December 1968
Ordinary chondrite (LL6)

History: In December 1968, Jose Dimas Bautista of San Luis Potosi, Mexico, heard a loud "airplane type" sound while working outside the mines in the Sierra Madres mountains near San Pedro Jacuaro. A search recovered a 460 g mass from a fresh hole in the sand. He kept it in his possession until July 2003, when he brought it to the attention of Robert Cucchiara of Alameda, California, who recognized it as a meteorite.

Geochemistry: (P. Sipiera, Harper, K. Cole, *Univ. Illinois*) Olivine ($Fa_{27.7}$), pyroxene ($Fs_{23.2}Wo_{2.0}$).

Classification: Ordinary chondrite (LL6); S2, W0.

Specimens: A 20 g type specimen is on deposit at *PSF*. Robert Cucchiara holds the main mass.

Superior Valley 014 **35°14′160′′N, 117°02′527′′W**

San Bernardino County, CA, USA
Find: 25 August 2002
Achondrite (acapulcoite)

History: A 1.77 g specimen was found by Jason Utas.

Petrography: (A. Rubin, *UCLA*) The rock has a granular texture consisting mainly of quasi-equant olivine and low-Ca pyroxene grains from 60 to 500 µm in size and averaging ~160 µm. Accessory plagioclase grains ~200 µm with polysynthetic twinning are also present. In some areas the silicate grains are densely packed and many grain boundaries meet at 120° triple junctions. In other areas the silicate grains are separated and surrounded by limonite. The separated silicate grains range in shape from fragmental to subrounded to subhedral. No relict chondrules were observed. Some silicate grains contain 100–300 µm long curvilinear trails of 2–4 µm chromite blebs. The rock is very weathered and contains abundant limonite and patches of clay phases. Nevertheless, a few patches of troilite and rare grains of metallic Fe,Ni are present.

Geochemistry: Olivine ($Fa_{4.6}$), pyroxene ($Fs_{6.9\pm0.1}Wo_{2.9\pm1.6}$).

Classification: Achondrite (acapulcoite); moderate shock.

Specimens: A 0.49 g type specimen is on deposit at *UCLA*. The main mass is held by Jason Utas.

ANTARCTICA

Grove Mountains

Grove Mountains (GRV) 024516 73°00′S, 75°12′E
Antarctica
Find: 2003
Achondrite (ureilite)

History: A stone of 24.7 g was found within a moraine during the 19th Chinese Antarctic Research Exploration in Grove Mountains.

Physical Characteristics: (Miao B., Xu L., Lin Y., *IGGCAS*) It is brownish grey, with some yellow and dark grey spots and no fusion crust.

Petrography: It shows typical ureilite texture consisting mainly of olivine and pigeonite with minor carbonaceous matrix (graphite and diamond were identified by Raman). Triple junctions with an angle of 120° are common among coarse-grained silicates.

Geochemistry: Olivine ($Fo_{84.0\pm0.4}$ with homogeneous cores), pigeonite ($En_{77.1\pm0.4}Wo_{9.3\pm0.1}Fs_{13.6\pm0.4}$). Olivine grains have reduced rims (Fa ≤5.4 mol%) that contain abundant fine-grained inclusions of Ni-poor metal and sulfide. Limonite veins are common.

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

Specimens: The entire specimen is on deposit at the *GUT.*

ASIA

People's Republic of China

Fukang 44°26′N, 87°38′E
Fukang, Xinjiang Province
Find: 2000
Pallasite (main group)

History: An anonymous finder recovered a 1003 kg specimen near Fukang, China, in 2000. The sample was at the Tucson Gem and Mineral Show in February 2005, and seen by D. S. Lauretta of *UAz*. Approximately 20 kg had been removed from the main mass by the finder before the Tuscon show and the mass investigated at *UAz* was 983 kg. (D. S. Lauretta, D. Hill, M. Killgore, D. Della-Giustina, Y. Goreva, *UAz*; I. Franchi, *Open U*).

Petrography and Geochemistry: Olivine: Throughout the large mass, olivines vary in shape from rounded to angular; many are fractured. They range in size from <5 mm to several cm. The main pallasite contains several regions of "massive" olivine clusters up to 11 cm in diameter with thin metal veins only a few millimeters in width. $Fo_{86.4}$ with molar Fe/Mg = 0.1367, Fe/Mn = 40.37, and Ni = 0.03 wt%. Zoning was not observed for Al, Cr, Ca, Mn, or Fe typical of olivines in main-group pallasites. Metal and sulfides: Groundmass is mostly kamacite with some occurrences of kamacite mantles surrounding taenite cores, rounded taenite adjacent to kamacite, and regions of "comb plessite." Kamacite contains an average Ni = 6.98 wt%. Schreibersite is enclosed by wide kamacite bands and as mantles adjacent to olivines. Two populations of schreibersite are present with Ni = 26 and 35 wt% near chromite. Vermicular sulfide (troilite) is present in some olivine. Thin veins of kamacite and troilite occur inside many olivines as well. Minor phases: Euhedral chromites up to 0.5 cm, rounded whitlockite adjacent to olivine, and troilite heterogeneously distributed in thin veins. Several regions, ranging from <100 µm to several millimeters, that contain a complex mixture of olivine, low-Ca pyroxene, troilite, and whitlockite were observed adjacent to chromite. Bulk composition: Fe = 89.9 ± 0.3, Ni = 9.0 ± 0.2, P = 0.62 ± 0.02, Co = 0.51 ± 0.01 (all wt%); Ge = 41 ± 4, As = 26 ± 5, Ga = 19.1 ± 0.5, Pd = 5.1 ± 0.2, Au = 2.6 ± 0.2, (all µg/g); Ir = 43 ± 4 ng/g. Oxygen isotopes: $\delta_{18}O$ = 2.569, $\delta^{17}O$ = 1.179, $\Delta^{17}O$ = –0.157 (all ‰).

Classification: Pallasite (main group).

Specimens: A total of 31 kg of type specimen is on deposit at *UAz*. M. Killgore holds a total of 31 kg. An anonymous collector holds the main mass.

Fig. 1. Dante Lauretta with the main mass of Fukang at the University of Arizona.

Ulasitai 44°57′24″N, 91°24′09″E
Mulei County, Xinjiang Province
Find: 28 April 2004
Iron (IIIE)

History: A single iron meteorite weighing 430 kg was found during fieldwork by Mr. Xiaodong Li, a geologist. The meteorite was discovered on the hillside in the Mountain Beita area, Mulei county, Xinjiang Province.

Physical Characteristics: (Miao B., Xu L., Lin Y., *IGGCAS*) The meteorite has an angular shape with cm-scale concaves on its surface and is dark brown with a sub-cm layer of limonite on its bottom, but with no fusion crust remaining.

Petrography and Geochemistry: Kamacite (Ni = 6.87–7.39 Co = 0.47–0.75 [both wt%]), taenite (Ni = 11.6–36.7 Co = 0.22–0.65 [both wt%]), Widmanstätten pattern with 0.6–

2.0 mm (average 1.14 mm) kamacite bandwidths. Bulk composition: Ni = 10.03 wt% (by ICP-AES), and trace elements (by ICP-MS, in µg/g) Ge = 31.28, Ga = 16.09, Ir = 0.22. Minor phases include schreibersite, cohenite, troilite, and chromite.
Classification: Iron (IIIE). Note: This meteorite may be paired with Armanty.
Specimens: A 530 g type specimen is on deposit at *GUT* and 730 g at *IGGCAS*. The finder holds the main mass.

EUROPE

Germany

Königsbrück **51°16′0″N, 13°54′0″E**
Königsbrück, Saxony, Germany
Find: May 2004
Ordinary chondrite (H/L4)
History: A complete oriented stone weighing 51.8 g, partly covered with fusion crust, was found by an anonymous finder on a field close to the village of Königsbrück, Saxony, Germany, during a search for moldavites.
Petrography: (A. Greshake and M. Kurz, *NHB*) The sample is a fresh, unbrecciated stone with equilibrated olivine and unequilibrated pyroxene.
Geochemistry: Olivine ($Fa_{22.6}$), pyroxene ($Fs_{8.2–20.1}$).
Classification: Ordinary chondrite (H/L4); S4, W1.
Specimens: A 11.7 g type specimen plus one thin section are on deposit at *MNB*. An anonymous finder holds the main mass.

Pallasovka **49°52′0″N, 46°36′7″E**
Volgograd district, Russia
Find: July 1990
Pallasite
History: One stone weighing 198 kg was found by N. F. Kharitonov at a shore of an artificial water reservoir, 27.5 km from the town of Pallasovka. Interestingly, the town was named after Peter Pallas (1741–1811), a famous naturalist who took part in the discovery and the first study of the Pallas Iron Mass, which was found near Krasnojarsk in 1749 and gave the name of the pallasite meteorite group. A. E. Milanovsky transferred a sample of the meteorite to the Vernadsky Institute, Moscow.
Petrography and Geochemistry: (M. A. Ivanova, N. N. Kononkova, *Vernad*; S. E. Borisovsky, Institute of Geology of Ore Deposits, Mineralogy, Moscow)
Petrography: The stone consists of approximately equal parts of olivine and metal, and has abundant brown, rusty fusion crust with regmaglypts.
Geochemistry: Olivine (mg# 87.7, Fe/Mn = 45.2, Fe/Mg = 0.14; similar to main group pallasites). Metal (bulk ICP AES) Ni = 13.1 wt%; Ir = 0.12, Au = 2.8, Pt = 3.2, Ga = 22.5, Ge = 24.9 (all ppm). Kamacite (Co = 0.61, Ni = 7.21; both wt%) and taenite (Co = 0.35, Ni = 26.5 both wt%). Additional phases: Troilite (Ni = 0.41 wt%), schreibersite, and chromite (mg# 36; Fe/Mn = 48.9; Cr/(Cr+Al) = 77.2). Note: Chromites in this sample differ in composition from that of the main and Eagle Station groups.
Classification: Pallasite (Main group).
Specimens: A 9336 g sample and one polished section are on deposit at *Vernad*. The main mass is held by an anonymous purchaser.

MIDDLE EAST

Oman, Dhofar

Dhofar 1277 **19°10′84″ N, 54°25′13″E**
Oman
Find: 8 March 2005
Carbonaceous chondrite (CM2)
History: One mass of 10 g was found in March 2005 in the Dhofar region of Oman.
Physical Characteristics: (M. Ivanova, *Vernad*; F. Brandstaetter, *NHMW*) The sample has some dark brown fusion crust.
Petrography: The meteorite consists of altered POP, rare BO chondrules and chondrule fragments, olivine aggregates with halos around, and fragments of a nonhydrated matrix material set within a phyllosilicate matrix. Scarce isolated olivine and pyroxene grains and refractory inclusions consisting of altered silicates, perovskite, and spinel are present.
Geochemistry: Olivine ($Fa_{0.4–61}$; CaO = 0.26, Cr_2O_3 = 0.36 [both wt%]), low-Ca pyroxene ($Fs_{1.3–7.2}Wo_{0.5–3.2}$), high-Ca ($Fs_{21}Wo_{27.5}$). Minor phases are tochilinite, kamacite, pyrrhotite, pentlandite, Cr, P-rich sulfides, chromite, and Ca carbonates.
Classification: Carbonaceous chondrite (CM2); S1.
Specimens: A 3.2 g type specimen and one thin section are on deposit at *Vernad*. The main mass is with anonymous finder.

Dhofar 1285 **19°18′15″N, 54°33′3″E**
Oman
Find: 11 December 2002
Achondrite (ureilite)
History: Three dark brown stones, broken into fragments of total weight 406 g, were found on 11 December 2002 in the desert of Oman. The fragments were separated by ~2.5 km.
Petrography: (Lorenz, *Vernad*; Brandstätter, *NHMW*) A coarse-grained rock that consists mainly of olivine with minor amounts of pyroxene. The veins of troilite and Fe,Ni metal crosscut the whole rock. Accessory phases, graphite, and daubreelite are present.
Geochemistry: The cores of olivine grains ($Fo_{76.6}$; Fe/Mn = 59) are surrounded by reduction rims (~50 µm in width), which contain small Fe-rich metal grains. The composition of olivine within the reduction rims gradually changes from Fo_{78}; Fe/Mn = 51 on the inside towards Fo_{96}; Fe/Mn = 8.6 at the outer edge. The outer parts of the olivine grain rims are

completely replaced by a fine-grained aggregate of olivine (Fo_{97-99}), troilite, and metal. Reduction zones are developed along cracks and veins that cross-cut olivine grains. Pyroxene ($En_{78.7}Wo_{9.8}$; Fe/Mn = 20) contains numerous, tiny, co-oriented inclusions of Ca-rich pyroxene ($En_{56.2}Wo_{37.3}$; Fe/M = 13), SiO_2-rich feldspathic ($Ab_{50}An_{48.5}$) glass, low-Ni Fe,Ni metal grains, and extremely fine, poorly resolvable exsolution lamellae of Ca pyroxene. In places, pyroxene grains also have reduction rims with composition $En_{83}Wo_{6.7}$. Cr_2O_3 contents of olivine and pyroxene (0.7 and 1.1 wt% respectively) and CaO content of olivine = 0.4 wt% are in the ranges of those established for ureilites.

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

Specimens: A 92.48 g type specimen and one thin section are on deposit at *Vernad.* An anonymous finder holds the main mass.

Dhofar 1286 **18°25′579″N, 54°25′719″E**

Oman

Find: December 2005

Achondrite (eucrite, polymict)

History: Two pieces of meteorite weighing 898 g in total were found on a sandy surface in the desert of Oman. The distance between the fragments was about 30 m. Joined together, the fragments form an almost complete individual sample with ~10% missing.

Petrography: (Lorenz, *Vernad* and Brandstätter, *NHMW*) On the unbroken surfaces, black fusion crust is partly preserved. The meteorite is a polymict breccia consisting of fragments of medium- to coarse-grained metamorphosed gabbroic rocks and fine- to medium-grained subophitic basaltic rocks. Minor equigranular metamorphic pyroxene-feldspar rocks, melts, and melt matrix breccias are present. The rock fragments are situated in a fine-grained clastic matrix and comprise 60 vol% of the whole meteorite. Accessory minerals are troilite, chromite, ilmenite, silica, Ca phosphate, and metal Fe,Ni.

Geochemistry: Pyroxene ($En_{35.1-62.8}Wo_{1.8-5.7}$; Fe/Mn = 30) with exsolved augite ($En_{21.1-54.2}Wo_{21.1-38.9}$).

Classification: Achondrite (eurcrite, polymict).

Specimens: A 20.6 g type specimen and one polished section are on deposit at *Vernad.* An anonymous finder holds the main mass.

Sayh al Uhaymir 402 **21°4′37″N, 57°16′11″E**

Oman

Find: 2004

Achondrite (ungrouped enstatite)

History: A meteorite collector recovered a single stone was found in the desert of Oman.

Physical Characteristics: The stone, weighing 78 g, has a brown surface color and is free of fusion crust.

Petrography: (D. D. Badjukov, *Vernad;* F. Brandstaetter, *NHMV*) The meteorite consists of <2 millimeter-size silicate clasts embedded in an iron oxide groundmass; the silicate clasts are composed of fine (0.002–0.5 mm, average 0.05 mm) fragments of enstatite crystals in a matrix consisting of aggregates of a few millimeters wide plagioclase laths in a transparent glass. Fine droplets and blebs of metal, ninigerite, and troilite are dispersed in the glass. Silicate mode (vol%) for enstatite and matrix is 63% and 37%, respectively. Mineral chemistry: Enstatite (Fs_1Wo_1), glass (SiO_2 = 70–75, Al_2O_3 = 17–18, MgO = 4–5, Na_2O = 5–6, FeO and K_2O < 1 [all wt%]), metal (Si = 2 wt%), ninigerite (Ca = 1.3, Cr = 1.8 [both wt%]); troilite contains Cr, Ti, and Mn.

Classification: Achondrite (ungrouped enstatite). The texture and mineralogy imply that it could be an impact melt rock; relic fragments of enstatite show strong mosaicism and planar features. The meteorite is permeated by iron oxides (45 vol%) but the silicate clasts are unaltered.

Specimens: A 17.0 g type specimen and one thin section are on deposit at *Vernad.* An anonymous collector holds the main mass.

METEORITES FROM OTHER PLANETARY BODIES

Meridiani Planum, Mars **1°56′46″S, 354°28′24″E**

MER landing site, Meridiani Planum, Mars

Find: 5 January 2005

Iron (IAB complex)

History: While exploring the remnants of the heat shield on Meridiani Planum, the Mars Exploration Rover (MER) Opportunity imaged the surroundings with its panoramic camera (PanCam). On sol 324, a close-by object with a maximum dimension of 31 cm across became for the first time clearly visible in one of these images. Subsequent PanCam images reveal a smooth rock surface covered by depressions partly reminiscent of regmaglypts.

Classification and Description: (Athena Science Team) Spectra obtained by the Miniature Thermal Emission spectrometer on sol 339 and 342 show a thermal emissivity of 0.35, which is only consistent with metal indicating that the object was an iron meteorite. Detailed investigations from sol 349 to 352 by the in situ instruments on the rover's arm, the Rock Abrasion Tool (RAT), Microscopic Imager (MI), Mössbauer Spectrometer (MB), and Alpha Particle X-Ray Spectrometer (APXS), confirmed the metallic nature and allowed classification. Classification based on analyses of a brushed surface: MB, ~94% of the Fe is bound in kamacite, and APXS, dust corrected composition of iron is Ni = ~7 wt%; Ge = ~300, Ga = <70 (both ppm), consistent with its classification as an iron (IAB complex).

Specimens: Type specimen and main mass, Mars.

ERRATA

1. In Meteoritical Bulletin No. 87, the recovery date of Tanezrouft 059, Tanezrouft 060, and Tanezrouft 061 was

incorrectly reported. These meteorites were recovered on 16 May 2002 with Tanezrouft 056 and Tanezrouft 057.
2. In Meteoritical Bulletin No. 88, the meteorite Cheder is classified as an iron (IIIAB), but it is actually an iron (IID).
3. In Meteoritical Bulletin No. 89, Table 7, two meteorites are listed under the name NWA 1392. The first one, with a mass of 1091 g, should have been named NWA 1391. The second one, with a mass of 64 g, is the assigned NWA 1392.

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ABBREVIATIONS FOR CLASSIFIERS, ANALYSTS, AND TYPE SPECIMEN LOCATIONS

A list of type specimen locations, classifiers, and analysts referenced from the tables of approved meteorites. The abbreviations appear in the location column of the tables. Unless specifically noted, all type specimens are at the home institution of the first listed analyst and main masses are with anonymous finders. A PDF file with a a key to the abbreviations used for each institute listed in italics below and throughout the Meteoritical Bulletin is available for download at our home page: http://www.meteoriticalsociety.org/bulletin/institutions.pdf. Unless specifically noted, all main masses are located with an anonymous finder.

ASU1: Type specimen on deposit at *ASU,* L. Bleacher, classifier. M. Miller holds the main mass.

ASU1-1: Type specimen on deposit at *ASU,* L. Bleacher, classifier. J. Gwilliam holds the main mass.

ASU1-2: Type specimen on deposit at *ASU,* L. Bleacher, classifier. B. Southern holds the main mass.

Bart1: Type specimen on deposit at *Vernad.* R. Bartoschewitz, classifier. Purchased U. Eger. *Vernad;* specimen, Bart; main mass, U. Eger.

Bart2: Type specimen on deposit at *MPI.* F. Wlotzka (MPI) and R. Bartoschewitz, classifiers. Purchased Fectay, the main mass with Bart.

Bart3: Type specimen on deposit at *Vernad.* R. Bartoschewitz, classifier. Purchased Fectay, the main mass with Bart.

CML1-1: Type specimen on deposit at *CML.* K. R. Carroll classifier under the mentorship of M. Hutson.

CML1-2: Type specimen on deposit at *CML.* M. Hutson (*CML*), classifier. L. Sloan holds the main mass.

IfP1: Type specimen on deposit at *Mun*, A. Sokol, Meimeier, and A. Bischoff, classifiers.

IfP2: Type specimen on deposit at *Mun*, Niemeier, Jording, and A. Bischoff, classifiers.

LPL1: Type specimen on deposit at *LPL*, D. Hill, classifier. E. Ghior holds the main mass.

MIN-KB1: Type specimen on deposit at *MIN-KB,* R. Bartoschewitz and P. Appel, classifiers. R. Bartoschewitz holds the main mass.

MNB1-1: Type specimen on deposit at *MNB*, A. Greshake and M. Kurz, classifiers.

MNB1-2: Type specimen on deposit at *MNB*, A. Greshake, classifier.

MNB1-3: Type specimen on deposit at *MNB*, A. Greshake, classifier. The main mass held by JNMC-Zürich, Switzerland.

MNB1-4: Type specimen on deposit at *MNB*, A. Greshake, classifier. The main mass is held by HSSH-Primasens, Germany.

NAU1: Type specimen on deposit at *NAU,* J. Wittke and T. Bunch, classifiers.

NHMV1: Type specimen on deposit at *NHMV* (inventory # M6694). C. Koeberl (*NHMV*) and J. Wasson (*UCLA*), classifiers.

MNB1-5: Type specimen on deposit at *MNB*, A. Greshake and M. Kurz (*MNB*), classifiers.

MNHNP-1: Type specimen on deposit at *MNHNP* and main mass with anonymous finder. M. Benise and B. Zanda (*MNHNP*), classifiers.

MSP1: Type specimen on deposit at at *MSP-PO* and the main mass with an anonymous finder. V. Moggie Cecchi, A. Salvadori, and G. Pratesi (*MSP*), classifiers.

NUM1: Type specimen on deposit at *NUM,* M. Kimura, classifier.

SHIM1: Type specimen on deposit at *Shim,* C. Fukuda, classifier.

SHIM2: Type specimen on deposit at *Shim,* C. Nishina, classifier.

SI1-MZ: Type specimen on deposit at the *SI,* D. Mittlefehldt and M. Zolensky, classifiers. D. Shuford holds the main mass.

UCLA1: Type specimen on deposit at *UCLA*, A. Rubin, classifier. M. Matson holds the main mass.

UCLA1-1: Type specimen on deposit at *UCLA*, A. Rubin, classifier. P. Utas holds the main mass.

UCLA1-2: Type specimen on deposit at *UCLA*, A. Rubin, classifier. J. Utas holds the main mass.

ULCA2/LPL: Type specimens are on deposit at *UCLA* and *LPL*, J. Wasson, classifier.

UNM1: Type specimen on deposit at University of New Mexico, R. Jones, classifier. J. Pringle holds the main mass.

UWS1: Type specimen on deposit at *UWS*, A. Irving and S. Kuehner, classifiers.

Vernad1-1: Type specimen on deposit at *Vernad,* M. Ivanova, classifier.

Vernad1-2: Type specimen on deposit at *Vernad,* M. Ivanova, classifier and N. Kononkova, analyst.

Vernad1-3: Type specimen on deposit at *Vernad* and *MSU,* M. Ivanova of Vernad, classifier and A. Ulianov of *MSU,* analyst.

Vernad2-1: Type specimen on deposit at *Vernad,* C. Lorenz of *Vernad,* classifier.

Table 1. Meteorites from specific locations within Africa.

Name	Abbreviation	Find/Fall	Place of recovery	Date of recovery (dd/mm/yyyy)	Latitude (N)	Longitude (E)	Mass (g)	Pieces	Class[a]	Shock	WG[b]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Magnetic susc.	Type spec. (g)	Location of type[c]	Comments
Acfer 341	Acfer 341	Find	Algeria	05/12/2002	27°28′	3°50′	132	7	L3	S5	W1	20.4 ± 4	14.8 ± 4.8	–	4.84	20.5	MNHNP-1	–
Acfer 366	Acfer 366	Find	Algeria	11/2002	26°36.56′	03°56.14′	1456	1	CH3	–	–	–	–	–	–	All	MSP1	See separate entry
Acfer 374	Acfer 374	Find	Algeria	11/2002	26°36.52′	04°03.18′	118	Many	CO3	–	–	–	–	–	–	All	MSP1	See separate entry
Dar al Gani 1041	DaG 1041	Find	Dar al Gani, Libya	1998	27°05.00′	16°03.30′	169	1	CO3	S2	–	0.4–60.8	0.8–21.7	–	–	23.8	MNB1-5	Mean diameter of chondrules ~140 µm
Goronyo	Goronyo	Find	Nigeria	31/10/2001	13°16′	5°24′	11,000	1	H4	S4	W1	21.8	19.9	–	–	161	UNM1	–
Hammada al Hamra 337	HaH 337	Find	Hammada al Hamra; Libya	24/02/2001	29°00.00′	12°07.40′	198	1	CK4	–	–	–	–	–	–	All	MSP1	See separate entry
Mafuta	Mafuta	Find	Makonde District, Zimbabwe	12/01/1984	16°54.09′	30°24.26′	71.5 kg	1	Iron (IID)	–	–	–	–	–	–	221	NHMV	–

[a]Class = classification.

[b]WG = weathering grade.

[c]For location of type: MNB1-5 = classified by A. Greshake, *MNB*, and M. Kurz; type specimen: *MNB*; main mass with anonymous finder. MNHNP-1 = classified by B. Devouard and J.-L. Devidal, *UPB*, M. Denise and B. Zanda, *MNHNP*; type specimen, *MNHNP*; main masses with finders, F. Beroud and C. Boucher. MSP1 = classified by V. Moggi Cecchi, A. Salvadori, and G. Pratesi, *MSP*; type specimen, *MSP-PO*; main mass with anonymous finder. NHMV = classified by C. Koeberl, *NHMV*, and J. Wasson, *UCLA*; type specimen *NHMV* (inventory #M6694); main mass with finder, Mr. M. Alexander of Mafuta Farm, Zimbabwe. UNM1 = classified by R. Jones, Institute of Meteoritics, University of New Mexico, 200 Yale N.E., Albuquerque, New Mexico 87131, USA; type specimen and thin section, Institute of Meteoritics, main mass, Twelker.

Table 2. Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 869	Unknown	2001 or 2002	n kg	n	L4–6	189.3	S3	W1	24.2	–	UCLA1	–
NWA 999	Morocco	2000	330	1	Euc	20	L-M	–	–	68	–	See separate entry
NWA 1006	Morocco	27/08/2001	24.5	1	Ure	5.86	L	–	~10	–	–	See separate entry
NWA 1460	Morocco	05/1998	70.2	1	Martian	Various	–	Min	–	–	–	See separate entry
NWA 1462	Er-Mor	03/03/2002	203	1	Ure	20.2	Low	–	~22	–	–	See separate entry
NWA 1617[h]	Ag-Mor	06/1998	21	1	Acp	4.5	–	–	–	–	UWS1	See separate entry in MB 88
NWA 1918	Morocco	01/2003	136	1	Euc	20.2	–	–	–	–	–	See separate entry
NWA 1923	Morocco	03/2003	112	1	Euc	20.4	High	–	–	–	–	See separate entry
NWA 1929	Er-Mor	05/2003	922.2	1	How	22.02	High	–	–	–	NAU1	See separate entry
NWA 2040	Er-Mor	2003	1200	1	LL3.1	20.3	S2	W3	1.4–52.4	–	NAU1	Olv (FeO/MnO = 44–61, Cr_2O_3 = 0.32 ± 0.19)
NWA 2134	Er-Mor	2004	916	1	H6	24	S2	W3	18.4	16.3	NAU1	–
NWA 2135	Er-Mor	2004	421	1	LL4	26.4	S2	W4	29.4	24	NAU1	–
NWA 2136	Er-Mor	2004	1045	1	L3.5	22	S2	W3	18.9 ± 6.5	–	NAU1	Olv (Cr_2O_3 = 0.11 ± 0.07)
NWA 2137	Er-Mor	2004	6174	1	LL3.7	24.6	S2	W2	23.5 ± 5.7	–	NAU1	–
NWA 2200	Morocco	08/2004	552	1	Lunar	20.5	–	–	–	–	–	See separate entry
NWA 2210	Er-Mor	12/2004	74	1	CH3	14.8	–	–	–	–	–	See separate entry
NWA 2225	Er-Mor	04/2004	40	1	Ure	20	–	–	~18	–	–	See separate entry
NWA 2439	Münster	12/2002	660	1	H5	22.0	S2	W1	18.5	15.5	IfP1	–

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 2440	Münster	04/2004	182	13	H5	20.0	S3	W1	17	14.5	IfP1	–
NWA 2441	Munich	10/2002	156	1	L3–6	20.0	S2	W2/3	27.5 ± 3.5	20.5 ± 2.5	IfP1	–
NWA 2442	Munich	10/2002	192	1	H5	20.0	S4	W2/3	18.5	15.5	IfP1	–
NWA 2444	Dortmund	11/2003	74	1	H6	18.0	S4	W1	17	15.5	IfP1	–
NWA 2445	Sainte-Marie	06/2002	42	1	H3–5	10.0	S1	W1	16.5 ± 7	15 ± 3	IfP1	–
NWA 2450	Stuttgart	04/2004	766	1	H4–6	26.0	S1	W2	17	14 ± 1	IfP1	–
NWA 2457	Sainte Marie	06/2004	172	1	Imc	22.0	S2	W2	10.5 ± 3	–	IfP1	–
NWA 2458	Sainte Marie	06/2004	284	1	L3	22.0	S4	W1	15 ± 10	10 ± 7	IfP1	–
NWA 2463	Sainte Marie	06/2004	62	1	H6	11.0	S2	W3	18	15.5	IfP1	–
NWA 2464	Sainte Marie	06/2004	126	1	H6	22.0	S2	W3	18.5	16	IfP1	–
NWA 2465	Sainte Marie	06/2004	1.167	15	H4	26.0	S2	W2	17	15 ± 1.5	IfP1	–
NWA 2468	Sainte Marie	06/2004	25	1	H6	5.0	S2	W1	17	15	IfP1	–
NWA 2469	Sainte Marie	06/2004	348	3	H5/6	22.0	S4	W1	20.5	18	IfP1	–
NWA 2470	Sainte Marie	06/2004	266	1	L3–4	20.0	S2	W2	21 ± 1.3	14.5 ± 3	IfP1	–
NWA 2471	Sainte Marie	06/2004	374	1	H6	24.0	S2	W3	18	14.5	IfP1	–
NWA 2472	Sainte Marie	06/2004	362	1	H4	30.0	S2	W2	16	14.5	IfP1	–
NWA 2473	Sainte Marie	06/2004	60	1	L4	14.0	S2	W4	22.5	18.5 ± 1.5	IfP1	–
NWA 2478	Sainte Marie	06/2004	473	5	L6	22.0	S4	W5	24	20.5	IfP1	Ringwoodite
NWA 2646	Morocco	12/2004	9.3	1	Martian	3.4	–	–	–	–	–	See separate entry
NWA 2656	Unknown	2003	386	1	Acp	21	Low	W3	8.0	8.4	–	See separate entry
NWA 2681	Er-Mor	2004	37	1	CO3.5	6.2	S2	W2	38.5 ± 2.4	–	NAU1	Plag ($An_{86}Or_3$) + rare CAIs
NWA 2690	Er-Mor	2004	15,000	n	Euc	35	M-H	W2	–	–	NAU1	Paired with NWA 1929
NWA 2697	Er-Mor	2004	9424	1	CV3	23	S1	W2	38.1–53.6	–	NAU1	Matrix olivine only
NWA 2698	Er-Mor	2004	134	1	How	20.3	S3-5	W2	–	–	NAU1	Euc ($Fs_{47.2–0}Wo_{7–18}$) Paired with NWA 1929
NWA 2699	Er-Mor	2005	1294	n	Acp	22	Low	W3	8.2 ± 0.2	9.1 ± 0.2	NAU1	Opx (Wo_{30}; $An_{23.8}$) Paired with NWA 2656
NWA 2700	Unknown	2004	31.7	1	Lunar	6.8	–	–	–	–	NAU1	See separate entry
NWA 2701	Er-Mor	2004	1168	1	LL5	21.6	S2–4	W2	28.7	23.5	NAU1	–
NWA 2702	Er-Mor	2005	215	1	R4	20.3	S2	W4	39.5 ± 2.4	–	NAU1	Plag ($An_{44.1}Or_{4.8}$) Chromite (Cr# = 89.7)
NWA 2703	Unknown	2004	121	1	Ure	20.5	Low	Min	12.3	10.6	–	See separate entry
NWA 2704	Er-Mor	2005	871	1	L3.8	27.3	S2	W2	21.3–29.5	18.2–24.2	NAU1	–
NWA 2705	Unknown	2005	30	1	Ure	16.8	–	–	22.3	–	–	See separate entry
NWA 2706	Er-Mor	2005	1913	1	H4	26.2	S3–S6	W2	17.5	–	NAU1	–
NWA 2707	Er-Mor	2005	577	1	H5	23.1	S2	W3	18.7	16.8	NAU1	–
NWA 2708	Unknown	2004	528	1	CK4	20.3	M-H	Mod	–	–	–	See separate entry
NWA 2709	Er-Mor	2005	148	1	L4	21	S3	W2	22.8	20	NAU1	–
NWA 2710	Er-Mor	2005	216	1	H5	20	S2	W1	18.8	16.3	NAU1	–
NWA 2711	Unknown	2004	433	1	Mes	24	–	–	–	–	–	See separate entry
NWA 2712	Er-Mor	2005	2500	1	H5	25.4	S2	W2	18.5	16.6	NAU1	–
NWA 2713	Er-Mor	2004	184	1	H5	21.1	S2	W2	18.8	16.8	NAU1	–
NWA 2714	Er-Mor	2004	1656	Several	Acp	20.2	low	W3/4	8.1	8.6	NAU1	Plag (A 22.2); Chromite, Cr# = 0.85; Paired with NWA 2656
NWA 2717	Er-Mor	2004	70	1	LL3.5	15.1	S2	W2	25.8 ± 12.7	–	NAU1	Olv (Cr_2O_3 = 0.13 ± 0.08)
NWA 2718	Er-Mor	2004	254	1	CO3.1	26.8	S2	W4	20.8–53.6	–	NAU1	Olv (Cr_2O_3 = 0.26 ± 0.10)

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 2719	Er-Mor	2004	7581	1	L4	30	S5	W2	23.8	20.4	NAU1	–
NWA 2720	Er-Mor	2004	155	1	L4	20.5	S5	W1	23.4	19.6	NAU1	–
NWA 2721	Er-Mor	2004	46.5	1	L3.8	10.3	S2	W2	22.2 ± 5.6	–	NAU1	–
NWA 2722	Er-Mor	2004	707	1	L4	33	S4	W2	22	19	NAU1	–
NWA 2723	Er-Mor	2004	169	1	L-Imc	23	S5–6	W1	22.5–24.8	–	NAU1	Quench olv = $Fa_{24.7–26.9}$
NWA 2724	Er-Mor	2004	3804	1	Euc	21	L-M	Min	–	–	–	See separate entry
NWA 2725	Er-Mor	2004	200	1	L5	46	S2	W2	25.3	21.3	NAU1	–
NWA 2726	Er-Mor	2004	86	1	LL3.6	36	S2	W2	26.8± 8.9	–	NAU1	–
NWA 2727	Er-Mor	2005	191.2	4	Lunar	20.2	–	–	–	–	–	See separate entry
NWA 2728	Er-Mor	2004	338	1	CO3.2	46	S2	W2	42.2 ± 6.3	–	NAU1	Olv (Cr_2O_3 = 0.12 ± 0.09)
NWA 2737	Morocco	2000	611	9	Martian	20	–	–	–	–	–	See separate entry
NWA 2754	Er-Mor	2004	5500	1	LL5	22.2	S4	W2	29.6	24.7	NAU1	–
NWA 2758	Er-Mor	2004	678	4	Euc	37.5	L-H	Min	–	–	–	See separate entry
NWA 2760	Er-Mor	2004	607	1	CO3.1	22	S1	W2	1.2–49.4	–	NAU1	Olv (Cr_2O_3 = 0.22 ± 0.14)
NWA 2761	Er-Mor	2003	234	1	LL3.6	21.6	S2	W2	13.8–29.0	–	NAU1	–
NWA 2762	Er-Mor	2004	156	1	Ure	21.1	Low	Min	15.2	–	NAU1	Olivine/pigeonite= 19:1 (vol%) Olv rim ($Fa_{12.4}$)
NWA 2763	Er-Mor	2004	69	1	EL6	17.2	S2	W1	–	–	NAU1	Pyx ($Fs_{0.2}Wo_{1.3}$); An_{18}; CaS, MnS, FeS, daubreelite
NWA 2765	Er-Mor	2004	68	1	Euc	14	Low	Min	–	–	NAU1	$Fs_{46}Wo_{6.9}$; An_{93} Paired with NWA 1849
NWA 2766	Er-Mor	2004	214	1	LL3.9	23.9	S2	W2	29.8	24	NAU1	–
NWA 2767	Er-Mor	2004	82.3	1	LL6	16.8	S2	W1	29.7	24.8	NAU1	–
NWA 2768	Er-Mor	2004	2200	1	LL4	31	S2	W3	28.5	24.7	NAU1	–
NWA 2769	Er-Mor	2004	126	1	LL3.2	20.1	S2	W2	1–37.2	–	NAU1	Olv (Cr_2O_3 = 0.31 ± 0.24)
NWA 2770	Er-Mor	2004	58	1	LL4	10.1	S3	W3	29.1	24.4	NAU1	–
NWA 2771	Er-Mor	2004	390	1	H5	44	S1	W1	18.3	16.3	NAU1	–
NWA 2772	Er-Mor	2004	35	1	LL6	8	S4	W3	30	24.7	NAU1	–
NWA 2773	Er-Mor	2004	656	1	L3.9	53	S2	W3	23.0 ± 3.2	–	NAU1	–
NWA 2774	Er-Mor	2004	398	1	H4	20.4	S2	W1	18.8	16.3	NAU1	–
NWA 2776	Er-Mor	2004	289	1	H5	20.3	S2	W3	18.4	16	NAU1	–
NWA 2777	Er-Mor	2004	1987	2	H5	21.6	S2	W3	19	17.2	NAU1	–
NWA 2778	Er-Mor	2004	442	1	H4	23	S2	W4	17.5	16.2	NAU1	–
NWA 2779	Er-Mor	2004	1537	1	L5	21.1	S3	W3	24.3	20.6	NAU1	–
NWA 2781	Er-Mor	2004	528	2	L4–5	20.5	S4	W3	24.5	20.3	NAU1	–
NWA 2782	Er-Mor	2005	330	1	Mes	23.5	Low	W2	–	–	NAU1	Opx ($Fs_{26.5}Wo_{3.1}$) Pyx (FeO/MnO = 27.5–30)
NWA 2783	Er-Mor	2005	176	1	H4	22	S3	W2	18.7	15.8	NAU1	–
NWA 2784	Unknown	2005	141	1	Euc	27	Low	W1	–	–	NAU1	See separate entry
NWA 2785	Er-Mor	2005	264	1	L3.5	25.2	S2	W2	13–28	–	NAU1	Olv (Cr_2O_3 = 0.05–0.15)
NWA 2786	Er-Mor	2005	30	1	Mes	6	Mod	W1	–	–	NAU1	Pyx ($Fs_{28.1}Wo_{3.0}$, FeO/MnO = 27); An_{93}; kamacite (Ni = 5.4)
NWA 2787	Er-Mor	2005	32	1	CK4	6.5	S2	W3	30.5	–	NAU1	Mag (Cr_2O_3 = 3.9, Al_2O_3 = 1.2)
NWA 2792	Er-Mor	2005	18.6	1	Ure	4.4	Mod	W2	20.3 (core)	–	NAU1	Olv (FeO/MnO = 46) Pyx ($Fs_{17.8}Wo_{7.5}$, FeO/MnO = 26)

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 2793	Er-Mor	2005	768	1	L4	24.5	S4	W2	24	19.9	NAU1	–
NWA 2794	Er-Mor	2005	145	1	How	21.4	L-M	Mod	–	–	–	See separate entry
NWA 2795	Er-Mor	2005	329	1	Dio	20.4	Low	Mod	–	–	–	See separate entry
NWA 2796	Er-Mor	2005	34	1	LL3.1	6.4	S2	W3	3.2–56.1	–	NAU1	Olv (Cr_2O_3 = 0.44 ± 0.19, FeO/MnO = 38–63)
NWA 2797	Er-Mor	2005	1211	1	L3.8	21.9	S2	W2	19.2–24.2	–	NAU1	(FeO/MnO) in olivine = 34–50
NWA 2798	Er-Mor	2005	1805	3	L3.2	23.6	S2	W1	5–39	–	NAU1	Olv-Cr_2O_3 = 0.21 ± 0.09
NWA 2799	Er-Mor	2005	1311	1	LL6/7	21.3	S1	W2	29.7 ± 0.02	25.1 ± 0.02	NAU1	Plag ($An_{12}Or_{5.1}$) 1 chondrule fragment per 1.4 cm^2
NWA 2801	Er-Mor	2005	7700	1	Dio	20	Low	W3	27.4	–	NAU1	Olv (FeO/MnO = 27); $Fs_{22.6}Wo_{1.8}$; Paired with NWA 1877
NWA 2802	Er-Mor	2005	30	2	CV3	6	S2	W3	36.4–52.1	–	NAU1	–
NWA 2803	Er-Mor	2005	4500	1	L5	45	S2	W2	24.6	23.8	NAU1	–
NWA 2822	Er-Mor	2005	1675	3	R4	26.2	S2	W2–4	39.5 ± 0.4	–	NAU1	Olv (FeO/MnO = 83); Pyx ($Fs_{12.1}Wo_{45.8}$); Polymict
NWA 2823	Er-Mor	2005	144	1	LL6	20.8	S3	W1	28.8	24.1	NAU1	–
NWA 2825	Er-Mor	2004	664	1	Pac	21.1	low	W3	22	18.9	NAU1	Olv (FeO/MnO = 63.5) Paired with NWA 3133
NWA 2826	Er-Mor	2004	685	1	LL5	22	S2	W1	28.2	22.1	NAU1	Paired with NWA 2053
NWA 2827	Er-Mor	2004	1000	1	LL4	21.3	S2	W2	27.8	22.4	NAU1	
NWA 2829	Er-Mor	2004	687	1	Dio	21.7	Mod	W2	28	23.1	NAU1	Olv (FeO/MnO = 46) Paired with NWA 1877
NWA 2830	Er-Mor	2005	1130	1	H4	23.3	S2	W3	19.1	17	NAU1	–
NWA 2831	Er-Mor	2005	429	1	L4	20	S2	W4	27.9	23	NAU1	–
NWA 2832	Er-Mor	2005	359	1	LL4	21.5	S3	W3	30.7	24.4	NAU1	–
NWA 2833	Er-Mor	2005	2112	1	L3.8	21.6	S2	W3	23.4 ± 5.3	20 ± 3.3	NAU1	–
NWA 2834	Er-Mor	2005	792	1	L5	23.5	S2	W3	24.3	20.3	NAU1	–
NWA 2835	Er-Mor	2005	1233	1	H7	23.3	S2	W4	17.8	16.4	NAU1	Plag (An_{80}) Paired with NWA 2353
NWA 2836	Er-Mor	2005	1300	1	LL3.7	30	S2	W3	29.7 ± 5.3	–	NAU1	–
NWA 2837	Er-Mor	2005	41	1	CV3	7.4	S2	W0/1	36–54	–	NAU1	–
NWA 2838	Er-Mor	2005	253	1	L4	28	S2	W2	22	19.8	NAU1	–
NWA 2839	Er-Mor	2004	144	1	L4	37	S4	W3	24.7	20.8	NAU1	–
NWA 2840	Er-Mor	2004	129	1	L4	25	S3–5	W1	23.6	20.4	NAU1	–
NWA 2841	Er-Mor	2004	190	1	H3.9	25	S2	W1	18.0 ± 1.4	16.2 ± 0.8	NAU1	–
NWA 2842	Er-Mor	2004	423	1	L4	31	S2	W2	24.2	20.6	NAU1	–
NWA 2843	Er-Mor	2004	404	1	H3.9	57	S2	W0/1	17.5 ± 2.0	15.6 ± 1.6	NAU1	–
NWA 2844	Er-Mor	2004	837	1	L5	52	S2	W3	24.4	20.6	NAU1	–
NWA 2845	Er-Mor	2004	546	1	H4	37	S3	W2	17.5	16	NAU1	–
NWA 2846	Er-Mor	2004	352	1	L4	52	S4–6	W5	24.1	20.7	NAU1	Ringwoodite in melt veins
NWA 2847	Er-Mor	2004	283	1	H4	51	S2	W2	17.8	16.2	NAU1	–
NWA 2848	Er-Mor	2004	538	1	L4	35	S4	W2	23.8	20.5	NAU1	Maskelynite present
NWA 2849	Er-Mor	2004	846	1	L4	37	S2	W3	23.9	20.5	NAU1	–
NWA 2850	Er-Mor	2004	561	1	L5	29	S3	W3	24.7	20.8	NAU1	–
NWA 2851	Er-Mor	2004	417	1	L4	22	S2	W3	24.1	20.7	NAU1	–

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 2852	Unknown	2004	398	1	Pac	21.1	Low	W3	22.2	18.7	NAU1	Olv = (FeO/MnO = 63.8) Paired with NWA 3133
NWA 2853	Unknown	2004	1000	1	How	22	High	–	–	–	NAU1	See separate entry
NWA 2854	Er-Mor	2004	167	1	CK3/4	20.3	S2	W2	33.5	–	NAU1	Olv (FeO/MnO = 101); Mag (Cr_2O_3 = 4.8, Al_2O_3 = 1.86)
NWA 2856	Er-Mor	2004	1609	1	H4	41	S2	W3	18.8	16.4	NAU1	–
NWA 2857	Er-Mor	2004	5866	1	L4	40	S2	W2	23.3	20.7	NAU1	–
NWA 2858	Er-Mor	2004	2335	1	L4	40	S3	W1	24.7	20.4	NAU1	–
NWA 2859	Er-Mor	2004	920	1	H4	32	S2	W2	18.1	16.1	NAU1	–
NWA 2860	Er-Mor	2004	878	1	H4	23	S2	W1	18.6	16.5	NAU1	–
NWA 2861	Er-Mor	2004	2029	1	L4	63	S3	W3	25.2	21.7	NAU1	–
NWA 2862	Er-Mor	2004	486	1	H4	50	S2	W3	18.5	16.3	NAU1	–
NWA 2863	Er-Mor	2004	480	1	L4	41	S2	W3	24.9	20.6	NAU1	–
NWA 2864	Er-Mor	2004	90	1	LL4	19	S3	W2	28.9	23.8	NAU1	–
NWA 2865	Er-Mor	2004	1503	1	L4	25	S2	W2	24	20.9	NAU1	–
NWA 2866	Er-Mor	2005	213	1	Acp	21	Low	W3	8.2 ± 0.2	9.2 ± 0.2	NAU1	Plag ($An_{24.5}Or_{2.8}$); Cpx ($Fs_{4.2}Wo_{43.5}$); Chromite (Cr# = 70); Paired with NWA 2656
NWA 2867	Er-Mor	2002	60	1	CK4	20	S1	W0/1	30.5 ± 2.3	–	NAU1	(FeO/MnO) in olivine = 133 Magnetite (Cr_2O_3 = 3.8, Al_2O_3 = 0.88 wt%)
NWA 2871	Er-Mor	2005	3467	1	Acp	24.1	Low	W3	8.4	9.1	NAU1	Plag (An24.3); Paired with NWA 2656 Chromite (Cr# = 71)
NWA 2890	Unknown	2004	132	1	How	22.1	–	–	–	–	–	See separate entry
NWA 2899	Unknown	2004	11	1	Oc	2.5	–	–	–	–	–	See separate entry
NWA 2900	Unknown	2004	1375	1	CV3	20.5	–	–	–	–	–	See separate entry
NWA 2901	Unknown	2004	308	1	CV3	21.1	–	–	–	–	–	See separate entry
NWA 2902	Unknown	2003	1000	n	Oc-Imc	22.7	–	–	12.9–23.9	11.2–19.7	–	See separate entry
NWA 2904	Unknown	2003	29.04	4	Euc	9.95	–	–	–	–	–	See separate entry
NWA 2905	Er-Mor	2004	205	1	L4	21	S2	W2	24.3	21.1	NAU1	–
NWA 2906	Er-Mor	2004	215	1	L4	26.8	S2	W2	23.7	20.6	NAU1	–
NWA 2908	Er-Mor	2003	148	1	LL4	26.2	S2	W1	28.7	24	NAU1	–
NWA 2910	Er-Mor	2005	41	1	Euc	8.2	M-H	W2	–	–	NAU1	Py ($Fs_{58.5}Wo_{3.9}$); Lamellae ($Fs_{42.1}Wo_{26.6}$); Plag (An_{89})
NWA 2911	Er-Mor	2005	113	1	L3.5	20	S2	W2	23.1 ± 0.08	–	NAU1	Olv (Cr_2O_3 = 0.13 ± 0.08)
NWA 2912	Unknown	2005	203	1	How	22.1	Low	Min	–	–	NAU1	Dio ($Fs_{29.2}Wo_{4.2}$); Euc ($Fs_{49}Wo_{2.7}$)
NWA 2913	Unknown	2005	100	3	Euc	23.1	–	Min	–	–	–	See separate entry
NWA 2914	Unknown	2005	399	1	Euc	21.1	–	Min	–	–	–	See separate entry
NWA 2917	Morocco	2005	256	1	LL4	20.8	S3	W2	29.3	23.8	NAU1	–
NWA 2918	Morocco	2005	237	1	CO3.0	20	S1	W2	1.2–64.5	–	NAU1	Olv (Cr_2O_3 = 0.38 ± 0.24)
NWA 2919	Morocco	2005	1214	3	H4	20.6	S2	W4	17.8	15.7	NAU1	–
NWA 2920	Morocco	2005	734	1	LL3.5	20.4	S2	W4	29.7 ± 5.1	23.2 ± 3.2	NAU1	–
NWA 2921	Morocco	2005	195	1	CK3.8	20.5	S1	W3	39.5 ± 1.3	–	NAU1	Olv (FeO/MnO = 72–76)

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 2922	Morocco	2005	186	1	L5	20.3	S3	W3	24.4	20.2	NAU1	–
NWA 2923	Unknown	2005	16,000	n	Dio	50	–	–	–	–	–	See separate entry
NWA 2924	Unknown	2005	606	1	Mes	85	–	–	–	–	–	See separate entry
NWA 2927	Er-Mor	2005	171	1	H4	20.1	S2	W2	18.8	16.7	NAU1	–
NWA 2932	Er-Mor	2005	206	1	Mes	23.2	S2	W2	29.4	31.3	NAU1	Large metal nuggets; Paired with NWA 2923
NWA 2933	Er-Mor	2005	511	1	L3.3	21.3	S2	W2	25.2 ± 15	–	NAU1	Olv (Cr_2O_3 = 0.16 ± 0.07) Paired with NWA 2685
NWA 2935	Er-Mor	2005	460	1	LL6/7	29	S3	W2	31.7	25.7	NAU1	–
NWA 2936	Er-Mor	2005	290	1	H4	24	S2	W2	16.8	15.2	NAU1	–
NWA 2937	Er-Mor	2005	351	1	H5	25	S2	W3	18.8	17	NAU1	–
NWA 2938	Er-Mor	2003	7000	1	H4	24.7	S1	W4	17.7	15.9	NAU1	–
NWA 2939	Er-Mor	2003	107	1	R4	20.2	S2	W4	38.9 ± 0.05	–	NAU1	Olv (FeO/MnO = 81–91); Plag (An_{13})
NWA 2940	Er-Mor	2003	138	1	R3.9	20.4	S2	W3	38.7 ± 2.1	–	NAU1	Olv (FeO/MnO = 74–81); Plag ($An_{11.7}$)
NWA 2941	Er-Mor	2003	115	1	R3.8	20.4	S2	W2	39.1 ± 3.4	–	NAU1	Olv (FeO/MnO = 75–86); Plag ($An_{8.4–18.6}$)
NWA 2942	Unknown	2003	345	1	Euc	20.6	Mod	W2	–	–	NAU1	Pyx ($Fs_{62.1}Wo_{2.3}$, $Fs_{52}Wo_{11.4}$); Plag ($An_{90.7}$); Chromite (Cr# = 83)
NWA 2943	Er-Mor	2005	300	1	R3–6	22.8	S1	W3	28.2 ± 13	22.1 ± 7.2	NAU1	–
NWA 2975	Algeria	2005	70.1	1	Martian	20.2	–	–	–	–	–	See separate entry
NWA 2977	Tag-Mor	11/2005	233	1	Lunar	20.1	–	Min	–	–	–	See separate entry Paired with NWA 773 and NWA 2700
NWA 2995	Algeria	2005	538	1	Lunar	21.2	–	–	–	–	–	See separate entry
NWA 2999	Tag-Mor	08/2004	392	12	Ang	22.0	–	–	–	–	–	See separate entry
NWA 3151	Tag-Mor	04/2005	1500	1	Bra	20.0	–	–	–	–	–	See separate entry
NWA 3160	Er-Mor	07/2005	34	3	Lunar	4.8	–	–	–	–	–	See separate entry Paired with NWA 2727
NWA 3163	Ouarzazate	08/2005	1634	1	Lunar	20.1	–	–	–	–	–	See separate entry
NWA 3164	Rab-Mor	08/2004	928	n	Ang	21.0	–	–	–	–	–	See separate entry Paired with NWA 2999
NWA 3169	Er-Mor	2003	4500	1	LL5	62.4	S2-5	W3	27.6	23	NAU1	–
NWA 3172	Er-Mor	2003	187	1	H4	24.7	S4	W1	19.4	17.2	NAU1	–
NWA 3342	Morocco	1998	1250	1	H/L4	31.4	S2	W1	17–28	11.2–19.9	Shim1	–
NWA 3343	Morocco	1998	760	1	L4	23.2	S2	W1	22–27	21	Shim2	–
NWA 3347	Dortmund	10/2000	4480	1	L3–5	26.0	S4	W2–3	24 ± 1.2	20.5 ± 1	IfP2	–
NWA 3348	Dortmund	10/2000	654	1	L5	23.0	S3	W2	22	20	IfP2	–
NWA 3349	Hamburg	11/2000	297	1	L6	22.0	S3	W1–2	24.5	20.5	IfP2	–
NWA 3350	Hamburg	11/2000	110	1	Ure	20.0	S2	–	21	18.5	IfP2	–
NWA 3351	Hamburg	11/2000	132	1	LL4–6	22.0	S2	W3	28	22.5	IfP2	–
NWA 3352	Hamburg	11/2000	7430	1	H6	22.0	S4	W3	17.5	15.5	IfP2	–
NWA 3353	Stuttgart	02/2001	3220	1	L6	20.0	S4	W3	24.5	21	IfP2	Ringwoodite
NWA 3354	Stuttgart	02/2001	723	1	H6	21.0	S3	W1–2	18	16.5	IfP2	–
NWA 3355	Stuttgart	02/2001	617	1	L6	19.0	S3	W2	24	20	IfP2	–
NWA 3356	Stuttgart	02/2001	2075	3	L6	21.0	S4	W2	24	20	IfP2	–

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 3357	Sainte Marie	05/2000	1030	1	L4–6	30.0	S2	W1	22.5	19.5	IfP2	–
NWA 3358	Sainte Marie	05/2001	1162	1	H(L)3	23.0	–	W2	13.5 ± 7	11 ± 10	IfP2	–
NWA 3359	Sainte Marie	06/2005	509	1	Euc	20.0	S2	W1	–	55.5 ± 2	IfP2	–
NWA 3360	Dortmund	10/2000	112	1	H3–5	20.0	S3	W2	19 ± 2.4	16 ± 2.1	IfP2	–
NWA 3361	Dortmund	10/2000	29	1	L3–6	8.5	S4	W1–2	24 ± 2.7	19 ± 1.8	IfP2	–
NWA 3362	Dortmund	10/2000	741	1	L4–6	30.0	S4	W1	23.5	19	IfP2	–
NWA 3363	Dortmund	10/2000	801	1	L4–6	27.0	S4	W1	23	19	IfP2	–
NWA 3364	Sainte Marie	2004	538	1	R3–5	41.0	S2	W3	39.5 ± 2.5	–	IfP2	–
NWA 3365	Sainte Marie	2004	84	1	LL4–6	13.0++	S2	W1	29	23.5	IfP2	–
NWA 3366	Unknown	2004	245	1	H6	22.0	S2	W2	18	14	IfP2	–
NWA 3367	Münster	2005	214	1	L3–6	20.0	S2	W1	24.2 ± 1.4	17.6 ± 1.8	IfP2	–
NWA 3368	Unknown	2005	1600	1	Euc	23.0	–	–	–	–	–	See separate entry
NWA 4000	Morocco	23/10/2002	1465	1	L4	89.5	S3	W2	24–26	22–24	NUM1	–
NWA 4001	Morocco	23/10/2002	1113	1	L4	24.8	S3	W3	23–27	21–26	NUM1	–
NWA 4002	Morocco	2004	93.8	1	L3–6	92.7	S3–S6	W1	24.3–24.7	12.5–21.2	CML1-1	–
NWA 4003	Morocco	02/2002	357	1	H5	353.5	S3	W1	18.8 ± 0.5	17.2 ± 1.2	CML1-1	–
NWA 4004	Morocco	2005	76.1	1	H5	17.3	S2	W2	17.2	15.3	MNB1-1	–
NWA 4005	Morocco	2005	470.9	1	H5/6	25.2	S2	W3	18.3	16.2	MNB1-1	–
NWA 4006	Morocco	2004	758.1	3	L4 Imc	23.6	–	W0/1	22.6	9.8–20.3	MNB1-1	–
NWA 4007	Morocco	2005	511	1	H6	61.6	S3	W2	17.6	15.6	MNB1-1	–
NWA 4008	Morocco	2005	195	1	L6	21.1	S4	W2	24.1	19.9	MNB1-1	–
NWA 4009	Morocco	2005	856	1	H5/6	21.1	S2	W2	18.2	16.1	MNB1-1	–
NWA 4010	Morocco	2005	1676	1	L4	29.6	S3	W2	23.9	5.2–21.1	MNB1-1	–
NWA 4011	Morocco	2004	77.7	1	H3	17.3	S3	W1	0.7–25.3	8.1–20.8	MNB1-1	–
NWA 4012	Morocco	2005	149.4	1	L4	24.4	S2	W2	26.6	10.9–24.7	MNB1-1	–
NWA 4013	Morocco	2004	20.7	1	H6	4.5	S2	W3	18.4	16.5	MNB1-1	–
NWA 4014	Morocco	2004	35.7	1	L3	7.8	S2	W1	0.6–28.7	1.7–28.6	MNB1-1	–
NWA 4015	Morocco	2004	3.5	1	H3	0.7	S2	W2	0.9–43.8	2.7–17.4	MNB1-1	–
NWA 4016	Morocco	2005	81.6	1	L3	18.0	S3/4	W2	0.3–22.7	4.6–37.3	MNB1-1	–
NWA 4017	Morocco	2005	216.9	1	Mes	23.4	Low	M-M	–	–	–	See separate entry
NWA 4018	Morocco	2005	158.6	1	Euc	23.1	Mod	Mod	–	–	–	See separate entry
NWA 4019	Morocco	2005	504.7	1	Euc	22.0	Low	Min	–	–	–	See separate entry
NWA 4020	Morocco	2005	209.4	10	L/LL3	21.9	S3/4	W3	1.4–27.3	4.0–23.1	MNB1-1	–
NWA 4021	Morocco	2005	1212.5	5	LL6	22.8	S2/3	W0/1	27.7	22.9	MNB1-1	–
NWA 4022	Morocco	2005	886.9	1	L3	22.6	S3/4	W2	1.2–41.7	5.3–30.3	MNB1-1	–
NWA 4023	Morocco	2005	17.2	1	Euc	3.5	High	Mod	–	–	–	See separate entry
NWA 4027	Morocco	2005	1024	1	H6	25.0	S2	W2/3	18.6	16.6	MNB1-1	–
NWA 4028	Morocco	2004	810	1	L6	25.9	S4	W2/3	24.5	21	MNB1-1	–
NWA 4029	Morocco	2004	2072	1	L6	24.6	S4	W2/3	24.3	20.6	MNB1-1	–
NWA 4030	Morocco	2004	87	1	L6	20.5	S4	W1	24.7	20.2	MNB1-1	–
NWA 4031	Morocco	2004	390	1	LL6	21.1	S4	W0/1	28.4	22.7	MNB1-1	–
NWA 4032	Morocco	2004	10.5	1	Euc	2.2	High	Min	–	–	–	See separate entry
NWA 4033	Morocco	2004	1042	1	L/LL5	25.7	S3	W1	26.6	21.3	MNB1-1	–
NWA 4034	Morocco	2005	1513	1	Dio	24.5	Mod	High	–	–	–	See separate entry
NWA 4035	Morocco	2005	355	1	H6	22.3	S2	W1	17.4	15.6	MNB1-1	–
NWA 4036	Morocco	2005	22,000	1	L6 Imc	36.2		W1	23.4	20.3	MNB1-1	–
NWA 4037	Morocco	2005	>300,000	n	L4–6	22.0	S3/4	W1	23.3	2.1–20.9	MNB1-1	–

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 4038	Morocco	2005	23	1	CO3	4.6	S2	W2/3	0.4–47.8	1–2.2	MNB1-1	–
NWA 4039	Morocco	2005	950	n	Euc	20.1	High	Mod	–	–	–	See separate entry
NWA 4040	Morocco	2004	226.3	1	L3	24.5	S2	W2	0.4–29.5	2.8–23.9	–	See separate entry
NWA 4041	Morocco	2004	42	1	LL6	8.4	S2	W1	28.7	23.2	MNB1-1	–
NWA 4042	Morocco	2004	56.2	1	Aung	11.6	S2	W2	–	–	–	See separate entry
NWA 4043	Morocco	2004	40.05	1	EL6	8.3	S2	W0	–	0.1–1.5	MNB1-2	–
NWA 4044	Morocco	2005	1365	1	LL6	23.2	S3	W1	29.9	24	MNB1-1	–
NWA 4045	Morocco	2005	1000	1	L6	33.0	S3/4	W1	26.9	22.6	MNB1-1	–
NWA 4046	Morocco	2005	140	1	LL6	20.1	S3	W2	28.5	23	MNB1-1	–
NWA 4047	Morocco	2005	200	1	H4–5	20.1	S2	W0/1	16.9	4.8–16.3	MNB1-1	–
NWA 4048	Morocco	2004	60	1	L3	7.4++	S2	W2	8.1–28.5	1.7–22.9	MNB1-1	–
NWA 4050	Morocco	02/2002	58	1	H3–4	54.0	S2	W2	19.3 ± 6.5	13.1 ± 4.5	CSM1-1	Kamacite (Co = 0.42)
NWA 4052	Er-Mor	Unknown	66	1	L3–6	14.2	S4	W1	–	1.9–20.8	MNB1-1	–
NWA 4053	Er-Mor	Unknown	610	1	H5	26.8	S2	W2/3	–	15.6	MNB1-1	–
NWA 4054	Er-Mor	Unknown	454	1	H5	23.2	S2	W2	–	15.5	MNB1-1	–
NWA 4055	Er-Mor	Unknown	196	1	L6	22.2	S2/3	W1	–	19.8	MNB1-1	–
NWA 4057	Er-Mor	Unknown	103.4	1	L3	23.8	S4	W1	–	8.6–21.1	MNB1-1	–
NWA 4058	Er-Mor	Unknown	58	1	LL6	12.8	S4	W0	–	24.3	MNB1-1	–
NWA 4060	Er-Mor	Unknown	292	1	L6	22.2	S4	W1	–	19.9	MNB1-1	–
NWA 4061	Er-Mor	Unknown	41.2	1	H4/5	9.4	S2	W3	18	16.1	MNB1-1	–
NWA 4063	Er-Mor	Unknown	132.4	1	L6	24.2	S4	W1	23.3	19.9	MNB1-1	–
NWA 4064	Er-Mor	Unknown	130.6	1	H6	21.0	S2	W3	17.4	15.5	MNB1-1	–
NWA 4065	Er-Mor	Unknown	146.4	1	H5	23.8	S3	W3	18.2	16.4	MNB1-1	–
NWA 4066	Er-Mor	Unknown	254	1	H5	22.6	S2	W2	16.5	14.8	MNB1-1	–
NWA 4067	Er-Mor	Unknown	335.4	2	L5	23.6	S3	W2	23.5	19.8	MNB1-1	–
NWA 4068	Er-Mor	Unknown	460	1	H4/5	22.4	S2	W3	17.5	15.8	MNB1-1	–
NWA 4069	Er-Mor	Unknown	506	1	L6	21.6	S3	W2	23.9	20.6	MNB1-1	–
NWA 4072	Er-Mor	Unknown	334.7	2	L5	23.0	S4	W2	24.5	20.9	MNB1-1	–
NWA 4073	Er-Mor	Unknown	242	1	H6	27.0	S3	W2/3	18.9	16.5	MNB1-1	–
NWA 4074	Er-Mor	Unknown	216	1	H5/6	24.4	S4	W1/2	16.7	15.5	MNB1-1	–
NWA 4076	Er-Mor	Unknown	143.1	1	L6	23.2	S4	W1	23.6	20	MNB1-1	–
NWA 4077	Er-Mor	Unknown	89.9	1	H6	19.8	S2	W1	17.9	15.7	MNB1-1	–
NWA 4078	Er-Mor	Unknown	53.1	1	L5	12.2	S3	W1	23.3	20.1	MNB1-1	–
NWA 4079	Er-Mor	Unknown	192	1	L5	22.8	S4	W2	24.3	20.5	MNB1-1	–
NWA 4080	Er-Mor	Unknown	99.1	1	L6	22.0	S3	W1	24.5	20.4	MNB1-1	–
NWA 4083	Er-Mor	Unknown	77.5	1	L4	18.0	S2	W1	27.2	14.3–22.2	MNB1-1	–
NWA 4084	Er-Mor	Unknown	70	1	H3	16.2	S2	W1	1.1–20.2	1.1–16.2	MNB1-1	–
NWA 4085	Er-Mor	Unknown	68.7	1	L6	14.0	S4	W3	24.1	20.4	MNB1-1	–
NWA 4087	Er-Mor	Unknown	57.8	1	L6	12.8	S2	W0/1	23.4	20.2	MNB1-1	–
NWA 4089	Er-Mor	Unknown	96.8	1	H/L 4/5	20.2	S2	W3	21.2	18.1	MNB1-1	–
NWA 4090	Er-Mor	Unknown	776.3	6	L6	26.8	S4	W1	24.4	20.6	MNB1-1	–
NWA 4092	Er-Mor	Unknown	147.6	2	L6	23.8	S3/4	W2	23.9	20	MNB1-1	–
NWA 4094	Er-Mor	Unknown	143.5	1	H4	21.2	S3	W1	17.9	14.0–17.4	MNB1-1	–
NWA 4097	Er-Mor	Unknown	128.5	1	H/L3	27.6	S2	W2	7.9–24	4.7–18.8	MNB1-1	–
NWA 4098	Er-Mor	Unknown	1470	1	L4/5	21.4	S3	W1	23.4	19.6	MNB1-1	–
NWA 4101	Er-Mor	Unknown	261	2	H4	22.8	S2	W2/3	17.6	14.0–17.0	MNB1-1	–
NWA 4102	Er-Mor	Unknown	169	1	L6	23.8	S4	W3	23.8	19.8	MNB1-1	–

Table 2. *Continued.* Meteorites from Northwest Africa.

Name	Recovery area (or purchase)[a]	Recovery date (dd/mm/yyyy)	TKM[b] (g)	Pieces[c]	Class[d]	Ty mass[e] (g)	SS[f]	WG[g]	Fa (mol%)	Fs (mol%)	Location	Comments
NWA 4103	Er-Mor	Unknown	112.8	1	L3	23.8	S4	W2	9.6–24.8	2.8–21.8	MNB1-1	–
NWA 4104	Er-Mor	Unknown	60	1	H4	13.0	S2	W2	17	15.6	MNB1-1	–
NWA 4107	Er-Mor	Unknown	53.1	1	L6	12.0	S3	W2	23.9	20.6	MNB1-1	–
NWA 4109	Er-Mor	Unknown	233	1	L6	20.8	S4	W3	24.3	20	MNB1-1	–
NWA 4110	Er-Mor	Unknown	309	1	L6	21.4	S3	W3	23.3	19.4	MNB1-1	–
NWA 4112	Er-Mor	Unknown	45	1	L6	9.4	S3	W1	24.4	20.3	MNB1-1	–
NWA 4113	Er-Mor	Unknown	78.4	2	L4	17.8	S4	W1	23	6.4–19.5	MNB1-1	–
NWA 4116	Er-Mor	Unknown	90.6	1	H5/6	20.0	S3	W1	17.8	16	MNB1-1	–
NWA 4117	Er-Mor	Unknown	70	1	H3/4	14.4	S2	W3	13.0–14.8	10.9–13.0	MNB1-1	–
NWA 4120	Er-Mor	Unknown	15,200	1	L6	28.8	S4	W2/3	24.5	21	MNB1-1	–
NWA 4121	Er-Mor	Unknown	750	1	L6	22.8	S4	W1	24.1	20.5	MNB1-1	–
NWA 4123	Er-Mor	2004	46.9	1	Euc	10.0	Mod	Min	–	–	–	See separate entry
NWA 4124	Er-Mor	Unknown	81.8	1	H6	17.4	S2	W3	18.1	15.7	MNB1-1	–
NWA 4125	Er-Mor	Unknown	209	1	L5/6	25.6	S4	W2	24.1	21.3	MNB1-1	–
NWA 4127	Er-Mor	Unknown	54.4	1	L6	11.8	S3	W3	26.7	22.6	MNB1-1	–
NWA 4129	Er-Mor	Unknown	42.9	1	H3	10.4	S2	W1	0.9–18.7	6.3–20.5	MNB1-1	–
NWA 4135	Er-Mor	Unknown	91.1	1	L6	27.2	S4	W2	24.6	20.5	MNB1-1	–
NWA 4136	Er-Mor	Unknown	78.2	1	L6	17.4	S2	W2	24.8	20.8	MNB1-1	–
NWA 4137	Er-Mor	Unknown	121.1	1	L6	22.0	S3	W2	24.3	20.3	MNB1-1	–
NWA 4139	Er-Mor	Unknown	341	1	H6	24.8	S2	W3	16.7	15.0	MNB1-1	–
NWA 4140	Er-Mor	Unknown	139.1	1	L6	23.6	S4	W1	24.2	20.1	MNB1-1	–
NWA 4141	Er-Mor	Unknown	70.3	1	L6	16.6	S3	W3	22.9	20.2	MNB1-1	–
NWA 4142	Er-Mor	Unknown	63	1	H4	13.4	S2	W1	16.9	14.9	MNB1-1	–
NWA 4143	Er-Mor	Unknown	74.4	1	L4	18.4	S3	W2/3	23.8	15.3–20.0	MNB1-1	–
NWA 4145	Er-Mor	Unknown	122.3	1	H4	21.6	S2	W1	17.3	10.5–16.7	MNB1-1	–
NWA 4146	Er-Mor	Unknown	305.6	2	L6	29.6	S3	W3	24.1	20.6	MNB1-1	–
NWA 4150	Er-Mor	Unknown	436.4	2	H/L6 Imc	25.0	–	W0/1	24.1	19.9	MNB1-1	–
NWA 4152	Er-Mor	Unknown	91.7	1	H/L6	24.0	S3	W2	20.4	20.4	MNB1-1	–
NWA 4153	Er-Mor	Unknown	75.4	1	H/L6	19.8B	S4	W3	20.1	20.1	MNB1-1	–
NWA 4154	Er-Mor	Unknown	132.5	1	H/L6	24.8	S4	W4	20.6	20.6	MNB1-1	–
NWA 4155	Er-Mor	Unknown	247	1	H/L6	30.8	S4	W3	21.2	21.2	MNB1-1	–
NWA 4156	Er-Mor	Unknown	165	1	H/L6	29.2	S4	W3	19.9	19.9	MNB1-1	–
NWA 4157	Er-Mor	Unknown	135	1	L3	33.3	S2	W1	18.3	14.8	Vernad1-1	–
NWA 4158	Hamburg	Unknown	77.7	1	H5	27.9	S4	W0	18.8	16	Vernad1-1	–
NWA 4215	Mha-Mor	04/2002	46.4	1	Dio	10.0	–	–	–	–	ENSL	–

[a]Recovery area (or purchase) = where the meteorites were recovered (or found) or where they were purchased. Ag-Mor = Agadir, Morocco; Er-Mor = Erfound, Morocco; Mha-Mor = Mhamid, Morocco; Rab-Mor = Rabat, Morocco; Tag-Mor = Tagounite, Morocco; Hamburg = purchased in Hamburg from a dealer from Morocco.

[b]TKM = total known mass.

[c]Pieces = total number of pieces; n = numerous pieces.

[d]Class = classification. Ang = angrite; Aung = achondrite, ungrouped; Bra = brachinite; Dio = diogenite; Acp = acapolcoite; Euc = eucrite; How = howardite; Imc = impact melt rock; Mes = mesosiderite; Pac = primitive achondrite; Ure = ureilite.

[e]Ty mass = type specimen mass. Type masses with ++ next to them all have at least one thin section on deposit and additional materials are expected to be deposited in the future.

[f]SS = shock stage. Min = minimal; Mod = moderate; L-M = low to moderate; M-H = moderate to high.

[g]WG = weathering grade. Mod = moderate; M-M = minimal to moderate.

[h]Reclassification from an winonaite (MB 88) to an acapulcoite. All samples listed above were purchased. All reported analyses are given in wt%, unless otherwise stated.

Table 3. Meteorites from Grove Mountains, Antarctica.

Name	Latitude (S)	Longitude (E)	Mass (g)	Date of find	Class[a]	SS[b]	WG[c]	Fa (mol%)	Fs (mol%)	Comments	Info
GRV 024516	73°00′	75°12′	24.7	01/2003	Ure	–	–	–	–	See separate entry	IGGCAS
GRV 024517	73°00′	75°12′	40.5	01/2003	H5	S1	W2	16.0 ± 0.4	13.6 ± 0.4	–	IGGCAS

[a]Class = classification.
[b]SS = shock stage.
[c]WG = weathering grade.

Table 4. Meteorites from North America.

Name	Find site	Find location	Latitude (N)	Longitude (W)	Mass (g)	Recovery date (dd/mm/yyyy)	Pieces	Class[a]	SS[b]	WG[c]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Ty mass[d] (g)	Location	Comments[e]
Black Rock																
BR 001	Dry lake	Pershing, NV	40°52.030′	119°11.011′	152.0	29/08/2003	1	L6	S4	W2	25.3 ± 0.2	21.6 ± 0.5	1.7 ± 0.2	21.1	UNM1	–
Buck Mountains																
BM 001	Pediment	Mojave, AZ	34°43.947′	114°13.354′	50.0	29/02/2004	1	H6	S2	W3	18.3 ± 0.3	16.8 ± 0.6	1.2 ± 0.2	10.0	CML1-2	–
BM 002	Pediment	Mojave, AZ	34°43.16′	114°12.47′	18.4	10/04/2004	1	L6	S2	W2–3	25.1 ± 0.7	21.1 ± 0.9	1.5 ± 0.2	9.1	CML1-2	–
Lucerne Valley																
LV 028	Dry lake	San Bernardino, CA	34°29.25′	116°57.34′	3.0	10/11/2003	1	CK4	S2	–	33.2 ± 0.4	–	–	1.2	UCLA1	See separate entry
LV 029	Dry lake	San Bernardino, CA	34°29.25′	116°57.34′	10.1	10/11/2003	1	CK4	S2	–	33.2 ± 0.4	–	–	2.2	UCLA1	Paired
LV 030	Dry lake	San Bernardino, CA	34°29.25′	116°57.478′	4.1	03/07/2004	1	CK4	S2	–	–	–	–	–	UCLA1	Paired
LV 031	Dry lake	San Bernardino, CA	34°29.226′	116°57.468′	3.2	03/07/2004	1	CK4	S2	–	–	–	–	–	UCLA1	Paired
LV 032	Dry lake	San Bernardino, CA	34°29.409′	116°56.991′	11.9	03/07/2004	1	CK4	S2	–	–	–	–	2.1	UCLA1	Paired
LV 035	Dry lake	San Bernardino, CA	34°29.208′	116°57.502′	0.9	13/03/2004	1	CK4	S2	–	–	–	–	0.9	UCLA1	Paired
LV 036	Dry lake	San Bernardino, CA	34°29.276′	116°57.383′	2.5	13/03/2004	1	CK4	S2	–	–	–	–	–	UCLA1	Paired
LV 037	Dry lake	San Bernardino, CA	34°29.332′	116°57.134′	0.9	13/03/2004	1	CK4	S2	–	–	–	–	0.9	UCLA1	Paired
LV 050	Dry lake	San Bernardino, CA	34°29.237′	116°57.500′	6.85	05/02/2005	1	H4	S1	W2	17.8 ± 0.1	–	–	1.8	UCLA1	–
Mohawk	Desert	Yuma, AZ	32°43.8′	113°42.6′	586	01/10/2000	1	Iron	–	–	–	–	–	37.4	–	See separate entry
Orlando	Residential	Orange, FL	28°32′51″	81°21′44″	180	11/08/2004	1	Euc	–	–	–	–	–	20.0	–	See separate entry
Pedernales	Ranch	Gillespie, TX	30°20′	98°57′	691	12/01/1980	1	Iron	–	–	–	–	–	23 and 86	–	See separate entry
Purmela	Farm	Coryell, TX	29°30′	98°3′	4500	10/01/1977	1	Iron	–	–	–	–	–	406.3	–	See separate entry
Sacramento Wash																
SaW 001	Flat desert	Mojave, AZ	34°45.382′	114°14.061′	98.9	11/08/2003	1	H4	S2	W3	18.0 ± 3.5	15.8 ± 0.3	1.1 ± 0.2	28.2	ASU1	Not paired
SaW 002	Desert ridge	Mojave, AZ	34°45.381′	114°14.058′	892.8	13/03/2004	2	H4	S1	W1	18.6 ± 0.3	9.0 ± 1.0	0.4 ± 0.2	103.0	ASU1	Not paired
SaW 003	Desert hill	Mojave, AZ	34°45.524′	114°14.005′	89.2	22/03/2004	1	H4	S2	W3	17.2 ± 5.1	15.7 ± 5.0	1.1 ± 0.5	21.6	ASU1-1	Not paired
SaW 004	Desert ridge	Mojave, AZ	34°45.047′	114°13.630′	28.6	17/04/2004	1	H5	S1	W3	18.3 ± 0.3	16.2 ± 0.3	1.4 ± 0.3	6.3	ASU1	Not paired
Superior Valley																
SuV 013	Dry lake	San Bernardino, CA	35°14.0′	117°02.367′	2.7	24/08/2002	1	L5	S2	W4	24.7 ± 0.2	–	–	0.6	UCLA1-1	–

Table 4. *Continued.*Meteorites from North America.

Name	Find site	Find location	Latitude (N)	Longitude (W)	Mass (g)	Recovery date (dd/mm/yyyy)	Pieces	Class[a]	SS[b]	WG[c]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Ty mass[d] (g)	Location	Comments[e]
SuV 014	Dry lake	San Bernardino, CA	35°14.160′	117°02.527′	1.8	25/08/2002	1	Acp	–	–	4.6	6.9 ± 0.1	2.9 ± 1.6	0.5	–	See separate entry
SuV 018	Dry lake	San Bernardino, CA	35°14.227′	117°00.910′	11.3	26/08/2002	1	H5	S2	W5	19.1 ± 1.8	15.6 ± 2.5	1.1 ± 0.4	2.5	UCLA1	–
Trilby Wash	Basin	Maricopa County, AZ	33°55′	112°33′	846.0	13/01/2005	22	L4	S1	W3	27.7 ± 0.2	20.7 ± 0.4	1.6 ± 0.2	87.7	ASU1-2	–
Warm Springs Wilderness	Desert ridge	Mojave County, AZ	34°47.219′	114°15.031′	156.9	22/12/2003	2	H4–6	S2	W1	17.7 ± 2.6	15.6 ± 1.1	1.4 ± 0.2	35.2	ASU1-1	Not paired

[a]Class= classification.
[b]SS = shock stage.
[c]WG = weathering grade.
[d]Ty mass = type specimen mass.
[e]Paired = paired with LV 028. See LV 028 for type specimen mass and depository; Not paired = sample is not paired with Franconia (H5).

Table 5. List of meteorites from the Middle East, the country of Oman.

Name	Recovery date (dd/mm/yyyy)	Latitude (N)	Longitude (E)	Mass (g)	Pieces[a]	Class[b]	Shock	WG[c]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Ty mass (g)[d]	Location	Comments
Dhofar														
Dho 1278	2005	19°35′55.1″	55°00′10.6″	54.7	1	H6	S2	W2/3	23.6	19.6	–	13.5 MNB	MNB1-3	–
Dho 1279	2005	18°15′04.2″	54°11′53.6″	1588	1	L6	S4	W3	23.8	19.3	–	25 MNB	MNB1-3	–
Dho 1280	2005	18°16′37.8″	54°15′19.7″	4473	n	H6	S4	W2/3	16.8	15.5	–	28.9 MNB	MNB1-3	–
Dho 1281	2005	18°13′10.1″	54°18′18.5″	140	1	L6	S2	W3/4	23.2	19.3	–	25.2 MNB	MNB1-3	–
Dho 1282	2005	18°33′07.2″	54°00′07.8″	582	1	L5	S4	W3	23.2	20.4	–	20.5 MNB	MNB1-3	–
Dho 1283	2005	18°33′14.1″	54°01′10.5″	502	4	L5	S4	W3	22.8	19.8	–	24.3 MNB	MNB1-3	–
Dho 1284	2005	18°31′55.2″	54°02′03.7″	558	1	L5/6	S4	W3	23.7	20.7	–	22.6 MNB	MNB1-4	–
Dho 1285	2002	19°18.15′	54°33.3′	406	11	Ure	–	–	–	92.48	–	–	–	See separate entry
Dho 1286	12/2005	18°25.579′	54°25.719′	898	2	–	–	–	–	78	–	20.6	–	See separate entry
Dho 1288	12/09/2004	18°16.7′	54°17.1′	43,600	n	H5	S3	W2/3	17.80	17.40	1.10	1683	Vernad1-2	–
Dho 1289	12/03/2004	18°38.0′	54°25.3′	37,000	n	L4	S2	W3/4	24.70	21.30	1.50	1870	Vernad1-2	–
Dho 1290	12/01/2004	18°34.2′	54°25.4′	1211.3	20	LL4	S3	W0/1	28.0	21.30	1.60	270.8	Vernad1-2	Breccia
Dho 1291	11/04/2001	18°19.0′	54°08.8′	66	1	H3.9	S2	W3	18.1–26.3	15.8–22.4	1.50	14.1	Vernad1-2	–
Dho 1292	04/07/2001	18°51.1′	54°39.7′	26	1	H3.9	S2	W3	8.2–18.3	16.6–21.7	1.50	10.6	Vernad1-2	–
Dho 1293	14/07/2001	18°50.8′	54°39.9′	69	2	H3.9	S3	W3	18.0–22.4	16.60	1.20	17.5	Vernad1-2	–
Dho 1294	12/02/2003	19°23.9′	54°31.8′	86	1	L/LL5	S1	W3	26.40	22.20	1.60	20.10/13.10	Vernad1-2	–
Dho 1295	11/02/2003	19°07.5′	54°43.1′	30	1	L/LL6	S4	W2	25.80	22.20	1.40	7.5/6.8	Vernad1-2	–
Dho 1296	18/01/2002	18°10.0′	54°05.0′	48	1	L5	S3	W3	25.0	22.40	1.40	15.1/9.8	Vernad1-2	–
Dho 1297	12/12/2001	19°08.4′	54°46.2′	130 + 54	2	H5	S3	W3	19.40	16.70	1.70	40.7/38.8	Vernad1-2	–
Dho 1298	15/01/2002	19°07.0′	54°47.1′	52	1	H5	S3	W3/4	18.40	16.40	1.20	10.9/12.4	Vernad1-2	–
Dho 1299	15/01/2002	19°08.2′	54°47.1′	20	1	H6	S2	W3	19.90	17.30	1.40	6.5/4.9	Vernad1-2	–
Dho 1300	16/01/2002	19°08.3′	54°39.5′	42	4	H6	S3	W2	17.20	15.70	1.20	14.6/9.9	Vernad1-2	–
Dho 1301	12/07/2004	18°25.579′	54°25.719′	898	2	Peuc	–	–	–	32–59	1.8–38.9	206	Vernad2-1	See separate entry
Dho 1302	03/12/2005	18°55.168′	54°21.742′	23.90	1	How	–	–	–	21–48	1.1–43.4	7.595	Vernad2-1	See separate entry
Dho 1303	11/12/2002	19°18.15′	54°33.3′	404	7	Ure	S3	W4	–	–	–	92.48	Vernad2-1	See separate entry

Table 5. *Continued.* List of meteorites from the Middle East, the country of Oman.

Name	Recovery date (dd/mm/yyyy)	Latitude (N)	Longitude (E)	Mass (g)	Pieces[a]	Class[b]	Shock	WG[c]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Ty mass (g)[d]	Location	Comments
Dho 1304	13/03/2005	18°40.032′	54°21.972′	85	1	H5	S1	W3–4	18.7	16.6	–	18.17	Vernad2-1	–
Dho 1305	12/03/2005	18°47.705′	54°09.077′	34	1	H5	S2	W3	18.5	16.3	–	15.08	Vernad2-1	–
Dho 1306	02/12/2004	18°20.697′	54°15.52′5	104	1	L4	S1	W4	22.6	19.9	–	22.55	Vernad2-1	–
Dho 1307	08/03/2005	19°19.719′	54°32.258′	90	1	H4	S1	W4	17.6	17.9	–	25.16	Vernad2-1	–
Dho 1308	08/12/2004	18°43.795′	54°22.478′	192	12	H5	S1	W4	18.9	16.8	–	41.5	Vernad2-1	–
Dho 1309	12/04/2004	19°17.463′	54°33.81′	204	1	H4	S2	W4	17.4	15.8	–	41.9	Vernad2-1	–
Dho 1310	17/01/2002	19°23.6′	54°35.7′	76	1	L5	S4	W3/4	24.90	21.40	1.60	17.3/15.9	Vernad1-2	–
Dho 1311	08/03/2005	19°18.9′	54°31.8′	66	1	H5	S2	W3	18.6	16.2	1.4	23.6	Vernad3-1	–
Dho 1312	11/10/2002	19°6.3′	54°50.6′	86	1	L/LL4	S4	W1	26.4	22.5	1.5	18	Vernad1-2	–
Dho 1313	18/02/2004	18°49.1′	54°27.3′	154	1	H6	S5	W2	17.7	15.3	1.5	44.5	Vernad3-1	–
Dho 1314	18/02/2004	19°17.8′	54°34.1′	104	1	H5	S2	W3	17.7	15.5	1.3	24	Vernad3-1	Ca-Pyx: $Wo_{43.8}Fs_{5.0}$
Dho 1315	12/12/2001	19°09.1′	54°46.5′	12	1	L/LL5	S4	W3/4	26.4	21.8	1.7	4.1/4.3	Vernad1-2	–
Dho 1316	10/02/2003	19°02.7′	54°23.6′	30	1	L/LL6	S3	W4	26.4	22.5	1.5	11.2/8.4	Vernad1-2	–
Dho 1317	05/04/2001	18°25.2′	54°06.2′	12	1	L6	S3	W1	24.9	21	1.6	4.2	Vernad1-2	–
Jiddat al Harasis														
JaH 056	13/01/2002	19°13.8′	55°10.9′	20	1	H5	S2	W3	19.20	16.60	1.40	4.5/4.6	Vernad1-2	–
JaH 057	03/2000	~19.8°	54.6°	246	1	L6	S4	W2	24.60	20.40	–	56	Vernad3-1	–
JaH 123	19/02/2004	19°44.0′	55°44.0′	248	1	LL5	S2	W3	27.7	22.5	2	45.2	Vernad3-1	–
JaH 124	03/2000	~19.8°	54.8°	1414	12	L5	S3	W4	24.30	20.60	–	276	Vernad3-1	–
JaH 125	17/02/2004	19°37.4′	55°0.6′	36	1	H6	S2	W4	19.3	16.4	1.3	10.2	Vernad3-1	Ca-Px: $Wo_{42.4}Fs_{6.0}$
JaH 130	27/06/1905	19°35′55.1″	55°00′10.6″	54.7	1	L6	S2	W2/3	23.6	19.6	–	13.5 MNB	MNB1-3	–
Sayh al Uhaymir														
SaU 176	02/04/2001	21°02.9′	57°15.5′	19	1	H6	S2–3	W4	19.00	16.8	1.6	4.3/4.4	Vernad1-2	–
SaU 177	09/12/2001	20°59.7′	57°19.5′	48	1	LL6	S1	W2	26.1	21.2	1.7	11.6/9.6	Vernad1-2	–
SaU 309	27/06/1905	20°55′39.6″	57°16′56.4″	714	49	L6	S4	W3	23.7	20.7	–	23.9 MNB	MNB1-3	–
SaU 310	03/2000	~21.2°	57.1°	94	3	L6	S4	W4	24.40	20.90	–	30	Vernad3-1	–
SaU 311	15/02/2004	21°0.1′	57°18.7′	214	1	H4	S2	W3	16.8	14.7	1	40.7	Vernad3-1	Ca-Px: $Wo_{43.4}Fs_{4.8}$
SaU 312	20/02/2004	20°36.7′	56°45.3′	278	1	L6	S3	W4	23.8	20	1.4	59	Vernad3-1	Ca-Px: $Wo_{42.6}Fs_{6.9}$
SaU 313	20/02/2004	20°40.8′	56°48.9′	412	1	H4	S2	W3	17.2	15.7	1.2	82.7	Vernad3-1	Ca-Px: $Wo_{40.1}Fs_{5.5}$
SaU 314	21/02/2004	21°0.7′	57°18.7′	4	1	H5	S3	W4	17.8	15.4	1	2	Vernad3-1	Ca-Px: $Wo_{43.7}Fs_{5.4}$
SaU 315	21/02/2005	21°0.8′	57°18.9′	6	1	H6	S2	W4	17.4	15.5	1.4	4.7	Vernad3-1	–
SaU 316	21/02/2006	21°0.3′	57°18.7′	10	1	L4	S4	W4	22.8	19	1.2	3.6	Vernad3-1	–
SaU 317	15/02/2004	20°59.7′	57°19.6′	8	1	H5	S2	W3	17.5	15.3	1.2	2.2	Vernad3-1	Ca-Px: $Wo_{43.4}Fs_{6.0}$
SaU 318	15/02/2005	20°59.9	57°18.7′	70	3	H5	S2	W4	17.5	15.3	1.5	32.8	Vernad3-1	–
SaU 319	15/02/2006	21°5.4′	57°15.5′	550	n	H5	S2	W4	18	15.7	1.3	117.2	Vernad3-1	–
SaU 320	22/02/2004	21°4.5′	57°15.8′	18	1	H6	S3	W2	18.3	16.1	1.4	6.3	Vernad3-1	–
SaU 321	22/02/2004	21°5.9′	57°16.7′	220	12	L5	S3	W3	24.1	19.8	1.4	53.9	Vernad3-1	–
SaU 322	05/03/2005	21°3.6′	57°17.8′	468	1	H5	S6	W2	17.4	15	1	102.3	Vernad3-1	Ca-Px: $Wo_{43.7}Fs_{5.1}$ Partial melting
SaU 323	10/12/2001	20°59.8′	57°19.8′	112	1	H6	S3	W2	19.7	16.7	1.3	24.3/30.3	Vernad1-2	–
SaU 324	11/01/2002	20°59.8′	57°19.0′	42	2	H/L6	S3	W3/4	20.3	17.6	1.5	17/13.5	Vernad1-2	–
SaU 325	22/02/2004	21°0.3′	57°19.5′	76	1	H5	S4	W2	17.8	15.5	1.2	19.6	Vernad3-1	Ca-Px: $Wo_{41.9}Fs_{4.6}$
SaU 326	22/02/2004	21°0.5′	57°18.6′	1352	1	L6	S4	W3	23.1	19.4	1.5	218	Vernad3-1	Ca-Px: $Wo_{42.3}Fs_{6.8}$
SaU 402	06/26/1905	21°4′37″	57°16′11″	–	–	–	–	–	–	–	–	–	–	–

Table 5. *Continued.* List of meteorites from the Middle East, the country of Oman.

Name	Recovery date (dd/mm/yyyy)	Latitude (N)	Longitude (E)	Mass (g)	Pieces[a]	Class[b]	Shock	WG[c]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Ty mass (g)[d]	Location	Comments
Shişr														
Shişr 045	2005	18°09′06.1″	53°56′53.6″	2298	1	H6	S3	W2/3	17	15.2	–	27.7	MNB1-4	–
Shişr 046	2005	18°32′55.1″	53°57′01.8″	182	21	L5	S3	W2	23.1	19.5	–	23.2	MNB1-4	–
Shişr 047	2005	18°32′50.8″	53°59′39.4″	396	3	L6	S4	W3	22.7	19.1	–	23.7	MNB1-4	–
Shişr 048	2005	18°32′50.9″	53°59′59.5″	375	1	L5/6	S3	W3	23	20.2	–	21.7	MNB1-4	–

[a]n = numerous samples.
[b]Class = classification. Euc = eucrite; How = howardite; Peuc = polymict eucrite; Ure = ureilite.
[c]WG = weathering grade.
[d]Ty mass = type specimen mass. MNB after a type mass indicates that it is deposited at *MNB*. For those masses where two entries occur in the cell, the first is on deposit at *Vernad*, the second at *MSU*.

Table 6. Meteorites from South America.

Name	Find site	Find location	Latitude (S)	Longitude (W)	TKM[a] (g)	Found (dd/mm/yyy)	Pieces	Class[b]	SS[c]	WG[d]	Fa (mol%)	Fs (mol%)	Wo (mol%)	Ty mass (g)[e]	Location	Comments
Mercedes	Small hill	Argentina	34°40′	59°20′	3301.0	22/12/1994 and 25/05/1995	26	H5	–	W3	18.9 ± 0.7	17.6 ± 2.6	1.2 ± 0.5	22.0	LPL1	–
Minas Gerais b	Collection	Minas Gerais, Brazil			42.6	00/00/2001	1	H4	S3	W1–2	19.2 ± 2.0	15.1 ± 5.6	1.4 ± 1.1	11.3	MIN-KB1	–
San Pedro Jacuaro	Mountains	Ocampo, Mexico	19°46′	100°39′	460	12/01/1968	1	LL6	S2	W0	27.7	23.2	2	20.0	–	See separate entry

[a]TKM = total known mass.
[b]Class = classification.
[c]SS = shock stage.
[d]WG = weathering grade.
[e]Ty mass = type specimen mass.