Antarctic Meteorite Newsletter

Volume 33, Number 1 February 2010

A periodical issued by the Meteorite Working Group to inform scientists of the basic characteristics of specimens recovered in the Antarctic.

Edited by Cecilia Satterwhite and Kevin Righter, NASA Johnson Space Center, Houston, Texas 77058

Curator's Comments

Kevin Righter
NASA-JSC

New meteorites

This newsletter reports 341 new meteorites from the 2006, 2007 and 2008 ANSMET seasons from the Larkman Nunatak (LAR), Miller Range (MIL), and Dominion Range (DOM) regions, respectively. Included are many carbonaceous chondrites from the Miller Range 2007 season, many of which are paired and paired with samples reported in the previous newsletter. The summary of samples is as follows: 2 ureilites, 2 brecciated eucrites, 2 LL chondrite impact melts, one anomalous H5 chondrite, 4 EH3 chondrites (paired), 3 LL3.8 chondrites (paired), one CB chondrite (perhaps paired with MIL 05082), 13 CM2 chondrites (6 pairing groups), 6 CO3 (all paired with MIL 07531 from the previous newsletter), and 13 CV3 (two paring groups and most paired with MIL 07671 from the previous newsletter).

2006-2007 sample processing completed

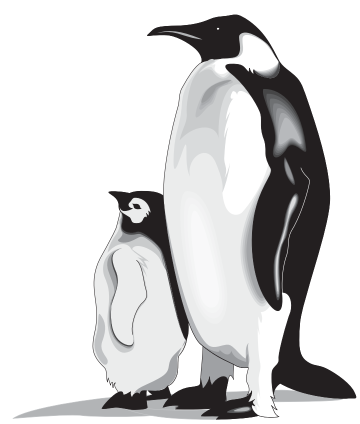
With this newsletter, the characterization of the 2006-2007 season meteorites is complete. There were a total of 4 from D'Angelo Bluff (DNG), 34 from Scott Glacier (SCO), 48 from Grosvenor Range (GRO), 621 from Larkman Nunatak (LAR), and 135 from Graves Nunatak (GRA). In addition, 12 samples were found to be terrestrial. The collection from that season includes a great diversity of meteorites – 2 mesosiderites, 7 HEDs, spectacular LL impact melts, 2 lodranites and ureilites, 3 irons, 2 fascinating ungrouped achondrites, two lunar meteorites, a shergottite, and 25 carbonaceous chondrites. A summary of the finds for 2006 samples (or any other season) can be generated using our advanced search on the classification database on our webpage:
http://curator.jsc.nasa.gov/antmet/query.cfm

Lunar Meteorite Compendium

The Lunar meteorite compendium was completed in May 2007 by the Antarctic meteorite group. The number of lunar meteorites was 42 then, and now it has grown to 62. The compendium will soon be updated and current to January 2010. If you know of research that is not mentioned or covered in the chapters, please let us know: kevin.righter-1@nasa.gov. Kevin will update them as frequently as he can (there have been three updates since 2007).

continued on p.2

Inside this Issue



Sample Request Deadline
Feb. 17, 2010

MWG Meets
March 5-6, 2010

Report on the 2009-2010 ANSMET Field Season
Ralph Harvey, ANSMET

Every ANSMET field season is memorable in some fashion, and the memories can be good (a particularly interesting find), bad (a 6-day windstorm to start the season), fun (the Christmas "mime-off") or just ugly (The death of 6 snowmobiles under one driver). The 2009-2010 field season was no exception, and will be remembered for several exceptional things. First, it was a "good weather" season. After the past 4-5 years Mother Nature owed us a break, and the field team got it this year, with only about 5 days of weather too windy or snowy for effective searching. As a result the field team systematically searched a much larger area than predicted, and slightly over 1000 specimens were recovered. Also memorable was that cool specimens started showing up early and kept coming. The SI curators joke that regardless of the total number of meteorites recovered, a typical season always yields about 50 unusual (i.e., non-ordinary-chondrites) specimens. Based on this, they've suggested we just head home after the first 50 finds and save a lot of effort. That tactic might actually have worked this year; about a dozen very cool specimens showed up in the first few days of searching, and every day seemed to bring at least a few more hard-to-identify (and thus easy-to-love) finds. Finally, it was a welcome season where everything went pretty closely to plan, and plan A at that; flights were on time, equipment worked and lasted through the season, and there were no shortages of key material. That was a big change from the last few seasons, where plan A quickly devolved into plan C or D with shortened field time and balky equipment. In a nutshell, the 2009-2010 ANSMET field season went extremely well, and the field team (consisting of John Schutt, Lindsay Keller, Neyda Abreu, Vera Fernandez, Jim Karner, Bingkui Miao, Brian Hynek and Marc Fries) made the best of it. You'll be seeing the fruits of their labor in the Fall newsletter, and I am convinced that the rocks themselves will make this a memorable season for ANSMET sample users.

The 2009-2010 ANSMET field team enjoying Christmas dinner al fresco.
From left to right: Marc Fries, John Schutt, Vera Fernandez, Lindsay Keller, Bryan Hynek, Neyda Abreu, Jim Karner, Bingkui Miao.

Re-classification of some carbonaceous and ordinary chondrites, HEDs, and a lunar meteorite

In a few previous newsletters (AMN 30, no. 2, 31 no. 1) we announced US Antarctic meteorite reclassifications of various chondrites and achondrites, in light of new data obtained since the original classifications. Continuing to update our database, here are listed re-classifications of various HED, carbonaceous, enstatite and ordinary chondrites. These are based on either new published information, or correction of terminology.

GENERIC	NEW CLASS	CURRENT CLASS	REASON OR ISSUE
EET 96010	CM2	CV3	see notes and [3,4]
WIS 91600	CM2	C2	see notes and [27]
EET 96286	CR2	CV3	see notes and [1,2]
MET 01017	CV3 anom	CR2	see notes and [1]
EET 96026	CV3 reduced	R	see notes and [3,4,5,6,7]
MET 01149	R3	CK3	see notes
MIL 07006	Lunar feldspathic breccia	Lunar basaltic breccia	see notes and [18] and [26]
MET 00452	L(LL)3.05	H3.5	[8]
MET 00526	L(LL)3.05	H3.0	[8]
GRO 95502	L3.2	L3.5	[8]
GRO 95544	L3.2	L3.5	[8]
MET 96503	L3.10	L3.6	[8]
ALHA81001	Eu “ub”	Eu “pm”	not a polymict eucrite, [9,10,11]
LEW 87010	Eu “ub”	Eu “pm”	see notes and [10], [13]
RKPA80204	Eu “br”	Eu “ub”	ssee notes and [10], [13], [14]
GRO95633	howardite	Eu “br”	see notes and [10], [12]
RKPA80207	H3.2-3.7	L3.2/3.7	it is a breccia, so hyphen, not slashes
ALH 85062	H3.5-4	L3.5/4	it is a breccia, so hyphen, not slashes
ALHA81024	H3.6	L3.6	H: [20]
WIS 91627	H3.8	H3.7	3.8: [17]
ALHA78149	H4	L3	H4: [16]
LEW 88021	H4	L4	H4: Met Bull 83, 1999
EET 83221	H4-6	H4/6	it is a breccia, so hyphen, not slashes
ALH 84006	H4/5	H4-5	it is transitional, so slashes, not hyphen
ALHA78147	H5/6	H5-6	it is transitional, so slashes, not hyphen
EET 96188	L/LL3.2	L(LL)3.2	Parentheses is the wrong notation here
ALHA77252	L3-6	L3.8	L3-6 from orig. desc.; not paired with 77216
LEW 86549	L3.0-3.7	L3.0/3.7	it is a breccia, so hyphen, not slashes
RKP 86700	L3.0-3.9	L3.0/3.9	it is a breccia, so hyphen, not slashes
GRO 95539	L3.1	L3	3.1: [17]
LEW 86022	L3.2-3.5	L3.2/3.5	it is a breccia, so hyphen, not slashes
EET 83395	L3.2-3.6	L3.2/3.6	it is a breccia, so hyphen, not slashes
MAC 88199	L3.3	L3.4	3,3: [17]
LEW 86307	L3.3-3.5	L3.3/3.5	it is a breccia, so hyphen, not slashes
EET 83399	L3.3-3.6	L3.3/3.6	it is a breccia, so hyphen, not slashes
EET 83260	L3.3-3.7	L3.3/3.7	it is a breccia, so hyphen, not slashes
ALH 83008	L3.4-3.7	L3.4/3.7	it is a breccia, so hyphen, not slashes
EET 82601	L3.5-3.7	L3.5/3.7	it is a breccia, so hyphen, not slashes
RKPA79008	L3.5-3.8	L3.5/3.8	it is a breccia, so hyphen, not slashes

GENERIC	NEW CLASS	CURRENT CLASS	REASON OR ISSUE
LEW 86021	L3.5-3.9	L3.5/3.9	it is a breccia, so hyphen, not slashes
RKPA80256	L3.6-4	L3.6/4	it is a breccia, so hyphen, not slashes
ALHA77216	L3.7-3.9	L3.7/3.9	it is a breccia, so hyphen, not slashes
ALHA79022	L3.7-4	L3.7/4	it is a breccia, so hyphen, not slashes
EET 90628	L3.4	L3.5	3.4: [17]
GRO 95505	L3.4	L3.3	3.4: [24] [17]
LEW 88175	L3.4	LL3.8	3.4: [17]
QUE 93705	L3.4	L3.7	3.7: [17]
LEW 87284	L3.5	L3.6	3.5: [17]
ALH 84086	L3.8	LL3.8	L: [19]
TIL 82408	LL3.1-3.5	LL3.1/3.5	it is a breccia, so hyphen, not slashes
ALH 83010	LL3.3	L3.3	LL: [19]
ALHA81251	LL3.3	LL3.2/3.4	3.3: [22]
LEW 88561	LL3.3	LL3.6	3.3: [17]
ALHA79003	LL3.4	LL3	3.4: [21]
ALHA78119	LL3.5	L3.5	LL: [19]
ALHA77304	LL3.7	L4	3.7: [15]
QUE 99861	LL5/6	LL5-6	it is transitional, so slashes, not hyphen
GRO 95645	CM1	C2	
EET 90986	CM2	C2	see notes below
EET 92103	CM2	C2	“
EET 96018	CM2	C2	“
EET 96029	CM2	C2	“
GRA 98005	CM2	C2	“
LON 94101	CM2	C2	“
LON 94102	CM2	C2	“
MCY 92500	CM2	C2	“
MCY 92502	CM2	C2	“
PCA 91084	CM2	C2	“
PCA 91147	CM2	C2	“
PCA 91203	CM2	C2	“
PCA 91327	CM2	C2	“
QUE 93004	CM2	C2	“
QUE 93006	CM2	C2	“
QUE 93017	CM2	C2	“
QUE 94220	CM2	C2	“
QUE 94222	CM2	C2	“
QUE 94582	CM2	C2	“
QUE 94734	CM2	C2	“
QUE 97003	CM2	C2	“
QUE 97005	CM2	C2	“
RKP 92400	CM2	C2	“
RKP 92401	CM2	C2	“
RKP 92402	CM2	C2	“
TIL 91722	CM2	C2	“
EET 96031	H4-anom	H4	anomalous due to reduced nature (AMN 21(1))
EET 96037	H4-anom	H4	anomalous due to reduced nature (AMN 21(1))
EET 96040	H4-anom	H4	anomalous due to reduced nature (AMN 21(1))
EET 96047	H4-anom	H4	anomalous due to reduced nature (AMN 21(1))
EET 96123	H4-anom	H4	anomalous due to reduced nature (AMN 21(1))
QUE 94570	L4-anom	C4	a reduced L chondrite: [25]

Specific sample notes:

Chondrites

MET 01017 original classification in AMN 26, no. 2, as a CR2 chondrite, but several studies have brought information to light that is inconsistent with that classification. Raman data, as well as isotopic data for C, H, and O indicate this meteorite is not a CR2, but a CV3 (possibly reduced) chondrite ([1] Busemann et al., 2007). Because the type of CV3 is not clear, and it has anomalous properties, we will reclassify it as CV3 anomalous.

EET 96286 original classification in AMN 21, no. 2 as a CV3 chondrite, but several studies have brought information to light that is inconsistent with that classification. Raman data, as well as isotopic data for C, H, and O indicate this meteorite is not a CV3, but a CR2 chondrite ([1] Busemann et al., 2007; [2] Makide et al., 2009).

EET 96026 original classification in AMN 21 no. 1, as an R chondrite, but several studies have brought information to light that is inconsistent with that classification. Oxygen isotope data ([3] Clayton and Mayeda, 2003), as well as magnetic susceptibility data ([4] Rochette et al., 2008) indicate this meteorite is not an R chondrite, but a CV3 chondrite.

EET 96010 original classification in AMN 21, no. 1 as an CV3 chondrite, but several studies have brought information to light that is inconsistent with that classification. Oxygen isotope data ([3] Clayton and Mayeda, 2003), as well as magnetic susceptibility data ([4] Rochette et al., 2008) and bulk compositional data ([5] Moriarty et al., 2009; [6,7] Tonui et al., 2001, 2002) indicate this meteorite is not an CV3 chondrite, but a CM2 chondrite, and one with extensive hydration like Belgica 7904.

WIS 91600 originally classified as a C2 chondrite. Oxygen isotope data ([3] Clayton and Mayeda, 2003), and bulk compositional data ([5] Moriarty et al., 2009) indicate this meteorite has a bulk composition like CM, but has seen extensive hydration like Belgica 7904.

MET 01149 original classification in AMN 26, no. 2 (and Met Bull. 88) as a CK3 chondrite, but several unpublished studies have yielded information inconsistent with this classification. Because of the small nature of the sample, and the relatively rare class of CK3, the curator has decided to change this classification even with unpublished data to avoid confusion from requestors. MET 01149 is re-classified as an R3 because it contains many grains of Fa39 olivine, R-chondrite-size chondrules, and several cryptocrystalline chondrules (which are very rare in CK chondrites). INAA data generated at UCLA indicates that the rock has low abundances of refractory lithophile elements and relatively high Fe, consistent with an R-chondrite classification. (A. E. Rubin, 2009, pers. comm.).

Lunar meteorite

MIL 07006 original classification in AMN 31, no. 2 as a lunar basaltic breccia, but additional studies of more thin sections have revealed a predominance of feldspathic material over basaltic [18,26]. This is also reflected in the bulk composition which has high Al_2O_3 like other feldspathic regolith breccia [18]. MIL 07006 is reclassified as an lunar anorthositic regolith breccia.

HED meteorites

ALHA81001 original classification in AMN 6, no. 1, as an anomalous eucrite. Later reclassified in AMN 17, no. 1, as a polymict eucrite. Numerous thin sections reveal no brecciation and subsequent chemical and textural studies ([9] Warren et al, 1996; [10] Mittlefehldt and Lindstrom, 2003 and [11] Mayne et al. 2009) all suggest reclassification as unbrecciated eucrite.

GRO 95633 original classification in AMN 20, no. 2, as a brecciated eucrite. Subsequent studies and numerous thin sections reveal various eucritic lithologies and also orthopyroxene. Bulk compositions of [10] Mittlefehldt and Lindstrom, 2003 and [12] Okamoto et al. (2004) indicate clear >10% mixture of diogenitic material with the eucritic material. Therefore this sample is reclassified as a howardite.

LEW 87010 original classification in AMN 11, no. 2 as a eucrite. Later reclassified in AMN 17, no. 1, as a polymict eucrite, but listed in MetBase 7.1 as monomict (brecciated eucrite). Subsequent studies and several thin sections reveal no brecciation, and compositional studies of [13] Warren et al, 2009 and [10] Mittlefehldt and Lindstrom, 2003 all show very low siderophile element concentrations. Therefore this sample is reclassified as an unbrecciated eucrite.

RKPA80204 original classification in AMN 4, no. 2, as a eucrite. Later reclassified in AMN 17, no. 1, as a eucrite unbrecciated. Subsequent studies and numerous thin sections reveal brecciation ([14] Yamaguchi et al., 1997) and low siderophile elements consistent with a monomict breccia ([13] Warren et al, 2009; [10] Mittlefehldt and Lindstrom, 2003). Therefore this sample is reclassified as a brecciated eucrite.

HEDs considered for reclassification but not changed:

ALH 85015 this is a small sample so limited sections are available. Only one shows eucritic material, so it's classification as a diogenite stands.

EET 92023 this sample was suggested to be polymict based on high siderophile element concentrations, but there is no evidence for breccciation in any sections. Instead it appears that the higher metal contents are contributing to the high siderophile element concentrations. Therefore, this sample remains classified as an unbrecciated eucrite. It is possible that it is a clast from a mesosiderite, but this would require additional studies to verify.

EET 90020 there are some literature reports of hand sample regions that look fine grained and possibly brecciated, but all thin sections of this sample exhibit no brecciation, but instead have a fine grained and course grained portions. Both of these have triple junctions boundaries indicating heating to metamorphic conditions. Additionally, vugs are reported in some areas. Nonetheless the classification as an unbrecciated eucrites stands.

Other notes and references: Many carbonaceous chondrites were initially classified as C2 in early newsletters. These are mostly CM2, based on matrix properties, chondrules abundance and sizes, and therefore all these samples have been reclassified more specifically here as CM2.

[1] Busemann, H. et al., (2007) Characterization of insoluble organic matter in primitive meteorites by microRaman spectroscopy. *Meteoritics & Planetary Science, 42*, 1387–1416.

[2] Makide, K. et al., (2009) Oxygen- and magnesium-isotope compositions of calcium–aluminum-rich inclusions from CR2 carbonaceous chondrites. *Geochimica et Cosmochimica Acta, 73*, 5018–5050.

[3] Clayton R. N. and Mayeda T. K. (2003) Oxygen isotopes in carbonaceous chondrites (abstract). International Symposium on the Evolution of Solar System Materials: A New perspective from Antarctic Meteorites. National Institute of Polar Research, Tokyo, Japan, 13-14.

[4] Rochette et al. (2008) Magnetic classification of stony meteorites: 2. Non-ordinary chondrites. *Meteoritics & Planetary Science, 43,* 959–980.

[5] Moriarty, G. et al. (2009) Compositions of four unusual CM or CM-related Antarctic chondrites. *Chemie der Erde – Geochemistry, 69*, 161-168.

[6] Tonui, E. et al. (2001) Petrographic and Chemical Evidence of Thermal Metamorphism in New Carbonaceous Chondrites. *Meteoritics & Planetary Science, 36*, Supplement, A207.

[7] Tonui, E. et al. (2002) Petrographic, chemical and spectroscopic data on thermally metamorphosed carbonaceous chondrites (abstract #1288). *33rd Lunar and Planetary Science Conference*. CD-ROM.

[8] Grossman, J.N. and Brearley, A. (2005) *Meteoritics & Planetary Science,40*, 87-122.

[9] P.H.Warren et al. (1996), *Papers 21st Symp. Ant. Met.*, 195, NIPR Tokyo.

[10] Mittlefehldt, D.W., and Lindstrom, M.M. (2003) Geochemistry of eucrites: Genesis of basaltic eucrites, and Hf and Ta as petrogenetic indicators for altered Antarctic eucrites. *Geochimica et Cosmochimica Acta, 67*, no. 10, 1911-1935.

[12] C.Okamato et al. (2004), *Papers 28th Symp. Ant. Met.*, 68 (abs.) NIPR Tokyo .

[11] Mayne, R.G., McSween, Jr., H.Y., McCoy, T.J., and Gale, A., (2009) Petrology of the unbrecciated eucrites. *Geochimica et Cosmochimica Acta, 73*, 794-819.

[13] Warren P. H., Kallemeyn, G.W., Huber, H., Ulff-Møller, and Choe, W. (2009) Siderophile and other geochemical constraints on mixing relationships among HED-meteoritic breccias. *Geochimica et Cosmochimica Acta, 73*, iss. 19, 5918-5943.

[14] Yamaguchi, A. et al. (1997) Shock and thermal history of equilibrated eucrites from Antarctica. Antarctic Meteorite Research. *Twenty first Symposium on Antarctic Meteorites*, NIPR Symposium No. 10, National Institute of Polar Research, 415.

[15] Scott, E.R.D. (1984) *Smith. Contrib. Earth Sci. 26*, 75.

[16] Kojima, H. and K. Yanai (1996), *Meteorite News, 6*, (1), errata leaf.

[17] Benoit, P. et al. (2002) *Meteoritics & Planetary Science 37*, 793.

[18] Korotev, R.L. et al. (2009) *LPSC XL*, #1137.

[19] Ozaki et al. (1999) *24th Symp. Ant Met*. NIPR, 154.

[20] Sears, D.W.G. and Weeks, K. (1986) *GCA, 50,* 2815.

[21] Scott, E.R.D. et al. (1982) *Meteoritics, 17*, 65.

[22] Sears, D.W.G. and Hasan (1987) *Surv. Geophys. 9*.

[23] Kallemeyn, G. (1998) *Meteoritics & Planetary Science, 33*, A81.

[24] Benoit, P., and Sears, D.W.G. (1997) *AMN, 20*(2), 13

[25] Kallemeyn, G. (1998) *Meteoritics & Planetary Science 33*, A80.

[26] Liu, Y. et al. (2009) *LPSC XL*, #2105.

New Meteorites

2006, 2007 and 2008 Collections

Pages 8-23 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 32(2), Sept. 2009. Specimens of special petrologic type (carbonaceous chondrite, unequilibrated ordinary chondrite, achondrite, etc.) are represented by separate descriptions unless they are paired with previously described meteorites. However, some specimens of non-special petrologic type are listed only as single line entries in Table 1. For convenience, new specimens of special petrological type are also recast in Table 2.

Macroscopic descriptions of stony meteorites were performed at NASA/JSC. These descriptions summarize hand-specimen features observed during initial examination. Classification is based on microscopic petrography and reconnaissance-level electron microprobe analyses using polished sections prepared from a small chip of each meteorite. For each stony meteorite the sample number assigned to the preliminary examination section is included. In some cases, however, a single microscopic description was based on thin sections of several specimens believed to be members of a single fall.

Meteorite descriptions contained in this issue were contributed by the following individuals:

Kathleen McBride, Roger Harrington and Cecilia Satterwhite
Antarctic Meteorite Laboratory
NASA Johnson Space Center
Houston, Texas

Linda Welzenbach, Cari Corrigan Karen Stockstill, and Tim McCoy
Department of Mineral Sciences
U.S. National Museum of Natural History
Smithsonian Institution
Washington, D.C.

Antarctic Meteorite Locations

ALH — Allan Hills
BEC — Beckett Nunatak
BOW — Bowden Neve
BTN — Bates Nunataks
CMS — Cumulus Hills
CRA — Mt.Cranfield Ice Field
CRE — Mt. Crean
DAV — David Glacier
DEW — Mt. DeWitt
DNG — D'Angelo Bluff
DOM — Dominion Range
DRP — Derrick Peak
EET — Elephant Moraine
FIN — Finger Ridge
GDR — Gardner Ridge
GEO — Geologists Range
GRA — Graves Nunataks
GRO — Grosvenor Mountains
HOW — Mt. Howe
ILD — Inland Forts
KLE — Klein Ice Field
LAP — LaPaz Ice Field
LAR — Larkman Nunatak
LEW — Lewis Cliff
LON — Lonewolf Nunataks
MAC — MacAlpine Hills
MBR — Mount Baldr
MCY — MacKay Glacier
MET — Meteorite Hills
MIL — Miller Range
ODE — Odell Glacier
OTT — Outpost Nunatak
PAT — Patuxent Range
PCA — Pecora Escarpment
PGP — Purgatory Peak
PRA — Mt. Pratt
PRE — Mt. Prestrud
QUE — Queen Alexandra Range
RBT — Roberts Massif
RKP — Reckling Peak
SAN — Sandford Cliffs
SCO — Scott Glacier
STE — Stewart Hills
TEN — Tentacle Ridge
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range
WSG — Mt. Wisting

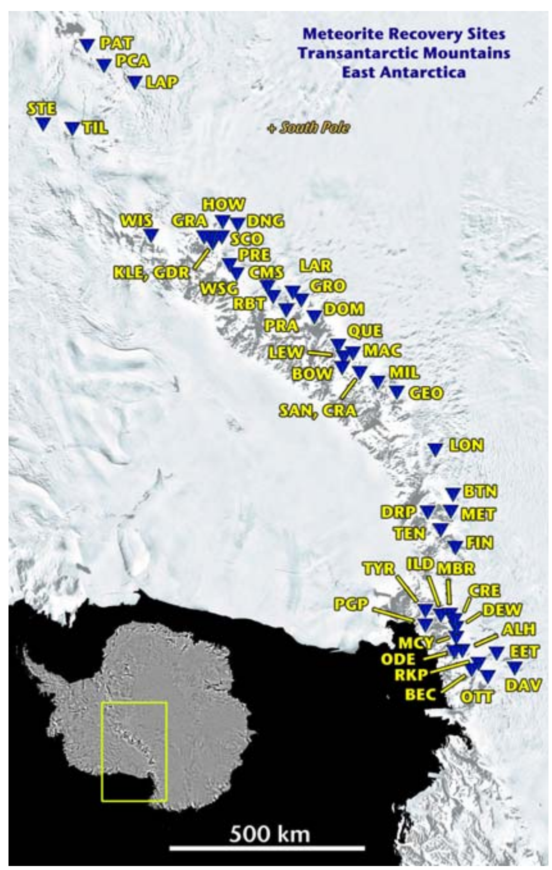


Table 1

List of Newly Classified Antarctic Meteorites **

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAR 06279		729.8	LL3.8 CHONDRITE	B	A	14-40	6-19
LAR 06283		878.2	LL3.8 CHONDRITE	Be	A	10-44	3-28
LAR 06295		225.7	H5-6 CHONDRITE	B/C	A	18	16
LAR 06320		161.2	LL3.8 CHONDRITE	B/C	A	2-30	2-9
LAR 06401		168.1	L5 CHONDRITE	B	A/B	25	21
LAR 06423	~	16.3	L4 CHONDRITE	B	A/B		
LAR 06502		11.0	H5 CHONDRITE	C	A	19	17
LAR 06507		12.1	LL CHONDRITE (IMPT MELT)	Be	B	34	11
LAR 06618		43.5	UREILITE	Ce	C	7-19	
MIL 07011	~	7120.0	L5 CHONDRITE	B/Ce	A		
MIL 07012	~	2604.4	LL6 CHONDRITE	C	C		
MIL 07013	~	1491.3	L5 CHONDRITE	C	B		
MIL 07014	~	710.4	H6 CHONDRITE	B/C	B/C		
MIL 07015	~	472.4	H5 CHONDRITE	B/C	B/C		
MIL 07017	~	3094.4	H5 CHONDRITE	Ce	B		
MIL 07018	~	1665.7	LL6 CHONDRITE	Be	B		
MIL 07019	~	1669.2	L5 CHONDRITE	C	C		
MIL 07020	~	930.0	L5 CHONDRITE	C	A/B		
MIL 07021	~	746.7	H5 CHONDRITE	B	A		
MIL 07022	~	1126.9	L6 CHONDRITE	C	C		
MIL 07023	~	2085.0	L5 CHONDRITE	C	C		
MIL 07024	~	747.4	L6 CHONDRITE	B	A		
MIL 07025	~	1072.7	H5 CHONDRITE	B	A		
MIL 07026	~	879.3	L5 CHONDRITE	A/B	A/B		
MIL 07027	~	1041.1	L5 CHONDRITE	C	C		
MIL 07029	~	991.1	H6 CHONDRITE	B/C	B		
MIL 07030	~	592.8	H5 CHONDRITE	B/C	B		
MIL 07031	~	930.0	H6 CHONDRITE	B	A		
MIL 07032	~	194.7	L6 CHONDRITE	B/C	C		
MIL 07033	~	349.4	L6 CHONDRITE	B/C	B		
MIL 07034	~	240.0	L6 CHONDRITE	B/C	C		
MIL 07035	~	270.1	H6 CHONDRITE	B	A		
MIL 07036	~	234.1	H5 CHONDRITE	B	B		
MIL 07037	~	362.4	L6 CHONDRITE	B/C	A/B		
MIL 07038	~	431.9	L6 CHONDRITE	B/C	A/B		
MIL 07039	~	258.9	L5 CHONDRITE	A/B	A/B		
MIL 07040	~	413.0	H5 CHONDRITE	C	B		
MIL 07041	~	257.3	L6 CHONDRITE	B	B		
MIL 07042	~	184.8	H5 CHONDRITE	B	C		
MIL 07043	~	288.0	H5 CHONDRITE	C	B		
MIL 07044	~	460.7	H5 CHONDRITE	C	B/C		
MIL 07045	~	308.7	L5 CHONDRITE	B/C	C		
MIL 07046	~	441.8	H5 CHONDRITE	C	C		
MIL 07047	~	733.2	L6 CHONDRITE	C	C		
MIL 07048	~	222.2	L6 CHONDRITE	B/C	C		
MIL 07049	~	577.4	H5 CHONDRITE	C	C		
MIL 07050		176.9	H4 CHONDRITE	C	C	20	18
MIL 07051	~	93.1	H5 CHONDRITE	C	B		
MIL 07052	~	164.4	L5 CHONDRITE	B	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 07053	~	76.5	L5 CHONDRITE	B	B/C		
MIL 07054	~	62.9	L5 CHONDRITE	B/C	B		
MIL 07055	~	51.1	H6 CHONDRITE	B	A/B		
MIL 07056	~	68.1	L6 CHONDRITE	C	A/B		
MIL 07057	~	114.9	H5 CHONDRITE	C	A/B		
MIL 07058	~	53.0	H5 CHONDRITE	C	C		
MIL 07059	~	81.9	L6 CHONDRITE	B/C	B		
MIL 07060	~	0.4	H5 CHONDRITE	B/C	B		
MIL 07061	~	0.8	H6 CHONDRITE	B/C	B		
MIL 07062	~	1.6	H6 CHONDRITE	B/C	A/B		
MIL 07063	~	6.7	L6 CHONDRITE	C	B		
MIL 07064	~	0.3	H6 CHONDRITE	B	B		
MIL 07066	~	0.4	L6 CHONDRITE	B	B		
MIL 07067	~	0.8	L5 CHONDRITE	B	B		
MIL 07068	~	1.9	L6 CHONDRITE	C	B		
MIL 07069	~	0.7	H6 CHONDRITE	B	B		
MIL 07070	~	18.8	H6 CHONDRITE	B/Ce	A/B		
MIL 07071	~	9.4	H5 CHONDRITE	B/C	A		
MIL 07072	~	0.3	L6 CHONDRITE	B	A		
MIL 07073	~	0.3	H5 CHONDRITE	B/C	A		
MIL 07074	~	4.5	H5 CHONDRITE	B/C	A		
MIL 07075	~	1.4	H5 CHONDRITE	C	A		
MIL 07076	~	13.1	H5 CHONDRITE	B/C	A		
MIL 07077	~	10.4	H5 CHONDRITE	B	A		
MIL 07078	~	0.6	H5 CHONDRITE	B/C	A		
MIL 07079	~	57.7	H5 CHONDRITE	B/C	A/B		
MIL 07080	~	20.9	H5 CHONDRITE	C	A/B		
MIL 07081	~	3.4	H5 CHONDRITE	C	B		
MIL 07082	~	12.6	H5 CHONDRITE	C	A/B		
MIL 07084	~	4.2	H5 CHONDRITE	C	A/B		
MIL 07085	~	0.8	H5 CHONDRITE	B/C	B		
MIL 07086	~	14.5	H5 CHONDRITE	C	A/B		
MIL 07087	~	13.0	H5 CHONDRITE	C	B		
MIL 07088	~	7.5	L5 CHONDRITE	A/B	B		
MIL 07089	~	32.9	H5 CHONDRITE	C	B		
MIL 07090	~	3.2	H6 CHONDRITE	C	B		
MIL 07091	~	7.8	H5 CHONDRITE	B/C	Be		
MIL 07092	~	0.5	H6 CHONDRITE	B/C	B		
MIL 07093	~	1.1	LL5 CHONDRITE	B	B		
MIL 07094	~	25.2	H6 CHONDRITE	C	B		
MIL 07095	~	47.6	H6 CHONDRITE	C	B		
MIL 07096	~	9.1	H6 CHONDRITE	C	B		
MIL 07097	~	7.1	H5 CHONDRITE	B	B		
MIL 07098	~	54.8	L5 CHONDRITE	B	B		
MIL 07100	~	254.9	H6 CHONDRITE	B	A		
MIL 07101	~	285.2	H6 CHONDRITE	C	C		
MIL 07102	~	350.8	H6 CHONDRITE	C	B		
MIL 07103	~	138.4	H6 CHONDRITE	C	C		
MIL 07104	~	109.7	H6 CHONDRITE	C	A		
MIL 07105	~	139.9	H5 CHONDRITE	C	C		
MIL 07106	~	118.2	H5 CHONDRITE	C	B		
MIL 07107	~	112.8	H5 CHONDRITE	C	B		
MIL 07109	~	133.8	H5 CHONDRITE	C	C		
MIL 07110	~	256.4	H6 CHONDRITE	B/C	Ae		
MIL 07111	~	269.2	L6 CHONDRITE	A/B	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 07112	~	332.6	L5 CHONDRITE	A/B	A		
MIL 07113	~	264.5	H6 CHONDRITE	B/C	A/B		
MIL 07115	~	106.6	H5 CHONDRITE	B/C	A/B		
MIL 07116	~	72.1	H6 CHONDRITE	B/C	A		
MIL 07117	~	104.6	H6 CHONDRITE	B/C	A/B		
MIL 07118	~	146.6	L4 CHONDRITE	B	Ae		
MIL 07120	~	179.1	L4 CHONDRITE	B/C	B		
MIL 07121	~	358.3	H5 CHONDRITE	C	B		
MIL 07122	~	221.1	H6 CHONDRITE	C	B		
MIL 07123	~	303.4	L6 CHONDRITE	B	A/B		
MIL 07124	~	378.6	L5 CHONDRITE	B	A/B		
MIL 07125	~	213.3	L5 CHONDRITE	A/B	A		
MIL 07126	~	210.4	H5 CHONDRITE	B	A/B		
MIL 07127	~	180.3	H5 CHONDRITE	B	A/B		
MIL 07128	~	156.4	H6 CHONDRITE	C	B		
MIL 07129	~	371.4	H6 CHONDRITE	B	A/B		
MIL 07130	~	33.7	H5 CHONDRITE	B/C	A/B		
MIL 07131	~	56.0	H6 CHONDRITE	B/C	A/B		
MIL 07132	~	71.0	H6 CHONDRITE	B/C	A		
MIL 07133	~	95.4	H6 CHONDRITE	B/C	A/B		
MIL 07134	~	102.1	H5 CHONDRITE	B/C	A		
MIL 07135	~	132.7	H6 CHONDRITE	B/C	A/B		
MIL 07136	~	62.0	H5 CHONDRITE	B/C	A/B		
MIL 07137	~	110.4	L5 CHONDRITE	B	A/B		
MIL 07138	~	91.3	H5 CHONDRITE	B	A/B		
MIL 07140	~	50.4	L5 CHONDRITE	B	B		
MIL 07141	~	91.6	H6 CHONDRITE	C	A/B		
MIL 07142	~	91.8	H6 CHONDRITE	B/C	B		
MIL 07143	~	81.9	H6 CHONDRITE	C	B		
MIL 07144	~	73.3	H5 CHONDRITE	C	B		
MIL 07145	~	153.2	L6 CHONDRITE	C	B		
MIL 07146	~	53.2	L4 CHONDRITE	B	B		
MIL 07148	~	35.1	H5 CHONDRITE	A/B	B		
MIL 07149	~	49.1	H5 CHONDRITE	C	B		
MIL 07150	~	86.2	H5 CHONDRITE	C	B		
MIL 07151	~	45.7	H6 CHONDRITE	A	A		
MIL 07152	~	98.2	L6 CHONDRITE	B	B		
MIL 07153	~	122.2	L6 CHONDRITE	B/C	A		
MIL 07154	~	91.4	L5 CHONDRITE	C	C		
MIL 07155	~	91.6	H6 CHONDRITE	B/C	A		
MIL 07156	~	57.1	H6 CHONDRITE	B	A		
MIL 07157	~	62.7	H6 CHONDRITE	B/C	A/B		
MIL 07158	~	50.6	H6 CHONDRITE	B/C	A		
MIL 07159	~	120.2	L6 CHONDRITE	A/B	A/B		
MIL 07160	~	54.0	H6 CHONDRITE	B/C	B		
MIL 07161	~	22.0	H6 CHONDRITE	B	B		
MIL 07162	~	43.0	H6 CHONDRITE	B	B		
MIL 07163	~	63.0	H6 CHONDRITE	B	A		
MIL 07164	~	85.5	L6 CHONDRITE	B	B/C		
MIL 07165	~	54.1	H5 CHONDRITE	B/Ce	B		
MIL 07166	~	104.2	L6 CHONDRITE	B/C	B		
MIL 07167	~	129.2	H5 CHONDRITE	B	B/C		
MIL 07168	~	87.5	H5 CHONDRITE	B	B/C		
MIL 07169	~	56.2	H5 CHONDRITE	B	B/C		
MIL 07170	~	58.8	L6 CHONDRITE	C	A/B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 07171	~	56.9	L6 CHONDRITE	B/C	B		
MIL 07172	~	138.1	L5 CHONDRITE	C	B		
MIL 07173	~	30.9	H6 CHONDRITE	C	C		
MIL 07174	~	65.4	H6 CHONDRITE	C	B		
MIL 07175	~	31.5	H5 CHONDRITE	B/C	B		
MIL 07176	~	75.5	L5 CHONDRITE	B/C	A/B		
MIL 07177	~	83.5	L5 CHONDRITE	B/C	B/C		
MIL 07178	~	44.8	H5 CHONDRITE	C	C		
MIL 07179	~	32.7	L6 CHONDRITE	C	A/B		
MIL 07180	~	113.9	L5 CHONDRITE	B/C	A/B		
MIL 07181	~	136.3	L6 CHONDRITE	B/C	A		
MIL 07182		112.0	CO3 CHONDRITE	B	A	0-42	6
MIL 07183	~	110.7	H6 CHONDRITE	B/C	A/B		
MIL 07184	~	134.1	L5 CHONDRITE	B	A		
MIL 07185	~	115.4	L6 CHONDRITE	B/C	A/B		
MIL 07186	~	40.3	L6 CHONDRITE	B/C	A/B		
MIL 07187	~	106.6	H5 CHONDRITE	B/C	A		
MIL 07188	~	105.0	H5 CHONDRITE	B	A		
MIL 07189	~	54.7	L6 CHONDRITE	B/C	A		
MIL 07190	~	65.5	L6 CHONDRITE	C	A/B		
MIL 07191	~	49.0	H6 CHONDRITE	B/C	B/C		
MIL 07192	~	78.0	L5 CHONDRITE	C	B		
MIL 07194	~	73.1	H6 CHONDRITE	B/C	B		
MIL 07195	~	64.9	H6 CHONDRITE	B/C	B/C		
MIL 07196	~	59.5	L6 CHONDRITE	C	C		
MIL 07197	~	85.5	L6 CHONDRITE	C	C		
MIL 07198	~	75.2	L6 CHONDRITE	B/C	C		
MIL 07199	~	130.4	L6 CHONDRITE	B/C	C		
MIL 07220	~	1.7	H6 CHONDRITE	C	A/B		
MIL 07221	~	5.3	H6 CHONDRITE	C	B		
MIL 07222	~	2.5	H6 CHONDRITE	C	B		
MIL 07223	~	1.6	L6 CHONDRITE	C	B		
MIL 07224	~	1.6	L6 CHONDRITE	C	A/B		
MIL 07225	~	4.5	H6 CHONDRITE	C	A/B		
MIL 07226	~	5.4	H6 CHONDRITE	C	B		
MIL 07227	~	3.9	H6 CHONDRITE	C	B		
MIL 07228	~	2.7	H6 CHONDRITE	C	B		
MIL 07229	~	1.7	L6 CHONDRITE	B/C	B		
MIL 07240	~	28.9	H5 CHONDRITE	B/C	A/B		
MIL 07241		33.6	EH3 CHONDRITE	B	A/B		1-15
MIL 07242	~	24.0	H5 CHONDRITE	B	A		
MIL 07243	~	21.4	L6 CHONDRITE	A/B	A		
MIL 07244	~	6.1	L6 CHONDRITE	A/B	A		
MIL 07245	~	3.2	L6 CHONDRITE	A/B	A		
MIL 07246	~	2.7	L6 CHONDRITE	A/B	A		
MIL 07247	~	1.7	H6 CHONDRITE	B/C	A/B		
MIL 07248	~	2.2	H6 CHONDRITE	B/C	A		
MIL 07249	~	4.7	L4 CHONDRITE	B	A/B		
MIL 07250	~	1.4	H6 CHONDRITE	C	B		
MIL 07251	~	14.5	H6 CHONDRITE	C	B		
MIL 07252	~	2.4	H6 CHONDRITE	C	C		
MIL 07253	~	5.6	H6 CHONDRITE	C	B		
MIL 07254	~	2.7	L6 CHONDRITE	C	B		
MIL 07255	~	7.7	L6 CHONDRITE	B/C	B		
MIL 07256	~	0.4	L6 CHONDRITE	B	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 07257	~	4.2	H6 CHONDRITE	C	A/B		
MIL 07258	~	3.0	L6 CHONDRITE	B	B		
MIL 07260	~	2.4	H6 CHONDRITE	C	B		
MIL 07261	~	17.3	H6 CHONDRITE	C	B		
MIL 07262	~	0.3	L6 CHONDRITE	B/C	C		
MIL 07263	~	2.3	H6 CHONDRITE	C	B		
MIL 07264	~	5.7	L6 CHONDRITE	B	B		
MIL 07265		0.6	CO3 CHONDRITE	B	B	1-73	1-16
MIL 07266	~	9.7	H6 CHONDRITE	C	B		
MIL 07267	~	7.4	H6 CHONDRITE	C	C		
MIL 07268		1.1	LL6 CHONDRITE	B	B	31	26
MIL 07269	~	1.9	H5 CHONDRITE	B	B		
MIL 07270	~	32.8	H6 CHONDRITE	B/C	A/B		
MIL 07271	~	21.7	H6 CHONDRITE	B/C	A/B		
MIL 07272	~	59.2	L6 CHONDRITE	A/B	A		
MIL 07273		33.9	H5 CHONDRITE (ANOMALOUS)	B/C	A/B	16	14
MIL 07274	~	23.7	H6 CHONDRITE	B/Ce	A/B		
MIL 07275	~	29.3	H5 CHONDRITE	B/C	A/B		
MIL 07276	~	15.0	L5 CHONDRITE	A/B	A		
MIL 07277		34.1	CV3 CHONDRITE	B	A/B	0-13	1-9
MIL 07278	~	33.0	L5 CHONDRITE	B/C	A/B		
MIL 07279	~	9.8	H5 CHONDRITE	B/C	Ae		
MIL 07301	~	4.3	L6 CHONDRITE	B/C	B		
MIL 07307	~	0.5	H6 CHONDRITE	B	A/B		
MIL 07308	~	13.2	L5 CHONDRITE	B/C	B		
MIL 07309	~	5.9	L6 CHONDRITE	C	B		
MIL 07312	~	9.7	L6 CHONDRITE	B	A		
MIL 07316	~	2.2	H6 CHONDRITE	B/C	B		
MIL 07317	~	1.3	H6 CHONDRITE	C	A		
MIL 07318	~	4.0	H6 CHONDRITE	C	B		
MIL 07319	~	0.9	L6 CHONDRITE	B	A		
MIL 07320	~	4.2	L6 CHONDRITE	B/C	C		
MIL 07321	~	1.3	H6 CHONDRITE	C	A/B		
MIL 07323	~	16.1	L5 CHONDRITE	B/C	B		
MIL 07324	~	12.2	L6 CHONDRITE	B/C	B		
MIL 07325	~	2.9	L5 CHONDRITE	C	B		
MIL 07326	~	15.8	H6 CHONDRITE	B	A/B		
MIL 07327	~	10.6	H6 CHONDRITE	C	B		
MIL 07328	~	1.0	L5 CHONDRITE	B	B		
MIL 07329	~	6.1	H6 CHONDRITE	C	B		
MIL 07330	~	1.1	L6 CHONDRITE	B	B		
MIL 07331	~	7.6	L5 CHONDRITE	B	A/B		
MIL 07332	~	17.2	L5 CHONDRITE	B/C	A/B		
MIL 07333	~	12.8	H5 CHONDRITE	C	B		
MIL 07334	~	11.5	H6 CHONDRITE	C	B		
MIL 07335	~	16.3	H5 CHONDRITE	B	B		
MIL 07337	~	7.3	H6 CHONDRITE	C	B		
MIL 07339	~	1.2	L4 CHONDRITE	A/B	A/B		
MIL 07360	~	2.5	L5 CHONDRITE	B	B		
MIL 07362	~	4.2	H6 CHONDRITE	C	A		
MIL 07363	~	1.8	H6 CHONDRITE	C	B		
MIL 07364		1.0	EH3 CHONDRITE	B	B	2	1-12
MIL 07365	~	13.6	H6 CHONDRITE	C	B		
MIL 07366	~	2.1	H6 CHONDRITE	C	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 07367	~	1.4	L6 CHONDRITE	C	B		
MIL 07368		2.0	CO3 CHONDRITE	B	A/B	0-45	1
MIL 07369		2.8	EH3 CHONDRITE	C	B		0-4
MIL 07370	~	45.6	L6 CHONDRITE	C	B		
MIL 07371	~	10.8	LL5 CHONDRITE	C	C		
MIL 07372	~	52.5	LL5 CHONDRITE	B/C	B		
MIL 07373	~	20.8	L5 CHONDRITE	C	C		
MIL 07374	~	14.9	L5 CHONDRITE	B/C	A/B		
MIL 07375	~	4.0	H6 CHONDRITE	B/C	A/B		
MIL 07376	~	12.1	H5 CHONDRITE	B/C	B		
MIL 07377	~	28.9	H6 CHONDRITE	B	B		
MIL 07378	~	13.5	L5 CHONDRITE	C	C		
MIL 07379	~	10.0	L5 CHONDRITE	C	C		
MIL 07390	~	7.4	H6 CHONDRITE	C	B		
MIL 07391	~	1.7	H6 CHONDRITE	C	B		
MIL 07392	~	5.2	H5 CHONDRITE	C	B		
MIL 07393		11.8	EH3 CHONDRITE	C	B/C		0-4
MIL 07394	~	12.2	H6 CHONDRITE	C	B/C		
MIL 07395	~	4.2	L6 CHONDRITE	A/B	A		
MIL 07396	~	11.8	H6 CHONDRITE	C	A/B		
MIL 07397	~	2.7	L5 CHONDRITE	C	B		
MIL 07398	~	2.8	L5 CHONDRITE	C	B		
MIL 07399	~	0.5	L5 CHONDRITE	B	B		
MIL 07402	~	1.6	L5 CHONDRITE	C	B		
MIL 07405	~	1.8	H5 CHONDRITE	C	B		
MIL 07406	~	6.1	H6 CHONDRITE	C	B		
MIL 07410	~	11.9	L5 CHONDRITE	B	B		
MIL 07412	~	22.3	H5 CHONDRITE	C	C		
MIL 07413	~	2.4	L5 CHONDRITE	B/C	A		
MIL 07414	~	1.9	L5 CHONDRITE	B	A/B		
MIL 07415	~	21.2	H6 CHONDRITE	C	B		
MIL 07416	~	0.3	H6 CHONDRITE	B/C	B		
MIL 07419	~	2.4	L5 CHONDRITE	B	B		
MIL 07433		1.7	L5 CHONDRITE	B/C	A	24	21
MIL 07447		32.0	UREILITE	B/Ce	A/B	10-17	14
MIL 07486		5.4	L5 CHONDRITE	C	B	23	20
MIL 07488		0.3	H4 CHONDRITE	B	A	18	16
MIL 07497		4.1	CM2 CHONDRITE	B	A/B	0-76	4
MIL 07546		0.4	CO3 CHONDRITE	B	B	0-51	1-4
MIL 07570		3.2	LL6 CHONDRITE	A/B	A	30	25
MIL 07588		1.4	CB CHONDRITE	A/B	A	1-3	1-3
MIL 07590		1.8	CV3 CHONDRITE	B	B	1-20	
MIL 07591		1.5	H5 CHONDRITE	C	B	18	16
MIL 07597		1.0	CV3 CHONDRITE	B	B	3-64	1
MIL 07669		15.8	CV3 CHONDRITE	Be	B	1-41	
MIL 07672		1.8	CM2 CHONDRITE	Be	C	0-8	
MIL 07674		4.2	CM2 CHONDRITE	B	B	0-55	1
MIL 07675		37.4	CM2 CHONDRITE	Be	B	0-47	5
MIL 07678		7.7	CV3 CHONDRITE	B/C	B	0-36	
MIL 07680		2.5	CM2 CHONDRITE	B	B	0-39	
MIL 07681		20.7	CV3 CHONDRITE	B/C	B	0-47	5
MIL 07682		5.1	CM2 CHONDRITE	B	B	1-52	
MIL 07683		3.1	CV3 CHONDRITE	B	B	0-13	1
MIL 07684		1.3	CV3 CHONDRITE	B	B	0-10	3
MIL 07685		9.7	CV3 CHONDRITE	B/C	B	0-44	1

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 07688	0.9	CO3 CHONDRITE	B	B	0-51	
MIL 07690	4.9	CV3 CHONDRITE	B	B	1-39	
MIL 07691	4.0	CV3 CHONDRITE	B	B	1-37	1
MIL 07692	5.2	CM2 CHONDRITE	Be	B	0-54	
MIL 07695	1.4	CO3 CHONDRITE	B	B	0-60	0-6
MIL 07696	16.4	CV3 CHONDRITE	Ce	B	0-46	1
MIL 07699	2.0	CV3 CHONDRITE	B	Ce	0-8	1
MIL 07701	5.7	CM2 CHONDRITE	Be	B		
MIL 07702	7.4	CM2 CHONDRITE	B	A	0-19	
MIL 07703	13.6	CM2 CHONDRITE	Be	B	0-48	
DOM 08001	1305.4	EUCRITE (BRECCIATED)	A/B	A		25-6
DOM 08002	173.2	LL CHONDRITE (IMPT MELT)	Be	A/B	30	25
DOM 08003	109.0	CM2 CHONDRITE	B	A/B	2-48	
DOM 08007	24.7	H5 CHONDRITE	A/B	A	20	17
DOM 08008	27.1	EUCRITE (BRECCIATED)	B/C	A		26-6
DOM 08009	5.2	CM2 CHONDRITE	B/C	B/C	1-4	1-21
DOM 08016	6.2	CM2 CHONDRITE	B/Ce	B/C	1-31	3-19
DOM 08019	1434.5	LL5 CHONDRITE	B	B		

Table 2

Newly Classified Specimens Listed By Type

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
Achondrites						
DOM 08001	1305.4	EUCRITE (BRECCIATED)	A/B	A		25-6
DOM 08008	27.1	EUCRITE (BRECCIATED)	B/C	A		26-6
LAR 06618	43.5	UREILITE	Ce	C	7-19	
MIL 07447	32.0	UREILITE	B/Ce	A/B	10-17	14
Carbonaceous Chondrites						
MIL 07588	1.4	CB CHONDRITE	A/B	A	1-3	1-3
MIL 07497	4.1	CM2 CHONDRITE	B	A/B	0-76	4
MIL 07672	1.8	CM2 CHONDRITE	Be	C	0-8	
MIL 07674	4.2	CM2 CHONDRITE	B	B	0-55	1
MIL 07675	37.4	CM2 CHONDRITE	Be	B	0-47	5
MIL 07680	2.5	CM2 CHONDRITE	B	B	0-39	
MIL 07682	5.1	CM2 CHONDRITE	B	B	1-52	
MIL 07692	5.2	CM2 CHONDRITE	Be	B	0-54	
MIL 07701	5.7	CM2 CHONDRITE	Be	B		
MIL 07702	7.4	CM2 CHONDRITE	B	A	0-19	
MIL 07703	13.6	CM2 CHONDRITE	Be	B	0-48	
DOM 08003	109.0	CM2 CHONDRITE	B	A/B	2-48	
DOM 08009	5.2	CM2 CHONDRITE	B/C	B/C	1-4	1-21
DOM 08016	6.2	CM2 CHONDRITE	B/Ce	B/C	1-31	3-19
MIL 07182	112.0	CO3 CHONDRITE	B	A	0-42	6
MIL 07265	0.6	CO3 CHONDRITE	B	B	1-73	1-16
MIL 07368	2.0	CO3 CHONDRITE	B	A/B	0-45	1
MIL 07546	0.4	CO3 CHONDRITE	B	B	0-51	1-4
MIL 07688	0.9	CO3 CHONDRITE	B	B	0-51	
MIL 07695	1.4	CO3 CHONDRITE	B	B	0-60	0-6
MIL 07277	34.1	CV3 CHONDRITE	B	A/B	0-13	1-9
MIL 07590	1.8	CV3 CHONDRITE	B	B	1-20	
MIL 07597	1.0	CV3 CHONDRITE	B	B	3-64	1
MIL 07669	15.8	CV3 CHONDRITE	Be	B	1-41	
MIL 07678	7.7	CV3 CHONDRITE	B/C	B	0-36	
MIL 07681	20.7	CV3 CHONDRITE	B/C	B	0-47	5
MIL 07683	3.1	CV3 CHONDRITE	B	B	0-13	1
MIL 07684	1.3	CV3 CHONDRITE	B	B	0-10	3
MIL 07685	9.7	CV3 CHONDRITE	B/C	B	0-44	1
MIL 07690	4.9	CV3 CHONDRITE	B	B	1-39	
MIL 07691	4.0	CV3 CHONDRITE	B	B	1-37	1
MIL 07696	16.4	CV3 CHONDRITE	Ce	B	0-46	1
MIL 07699	2.0	CV3 CHONDRITE	B	Ce	0-8	1
Chondrites - Type 3						
LAR 06279	729.8	LL3.8 CHONDRITE	B	A	14-40	6-19
LAR 06283	878.2	LL3.8 CHONDRITE	Be	A	10-44	3-28
LAR 06320	161.2	LL3.8 CHONDRITE	B/C	A	2-30	2-9

Table 2

Newly Classified Specimens Listed By Type

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
E Chondrites						
MIL 07241	33.6	EH3 CHONDRITE	B	A/B		1-15
MIL 07364	1.0	EH3 CHONDRITE	B	B	2	1-12
MIL 07369	2.8	EH3 CHONDRITE	C	B		0-4
MIL 07393	11.8	EH3 CHONDRITE	C	B/C		0-4
H Chondrites						
MIL 07273	33.9	H5 CHONDRITE (ANOMALOUS)	B/C	A/B	16	14
L Chondrites						
LAR 06507	12.1	LL CHONDRITE (IMPT MELT)	Be	B	34	11
DOM 08002	173.2	LL CHONDRITE (IMPT MELT)	Be	A/B	30	25

**Notes to Tables 1 and 2:

“Weathering” Categories:

A: Minor rustiness; rust haloes on metal particles and rust stains along fractures are minor.
B: Moderate rustiness; large rust haloes occur on metal particles and rust stains on internal fractures are extensive.
C: Severe rustiness; metal particles have been mostly stained by rust throughout.
E: Evaporite minerals visible to the naked eye.

“Fracturing” Categories:

A: Minor cracks; few or no cracks are conspicuous to the naked eye and no cracks penetrate the entire specimen.
B: Moderate cracks; several cracks extend across exterior surfaces and the specimen can be readily broken along the cracks.
C: Severe cracks; specimen readily crumbles along cracks that are both extensive and abundant.

The ~ indicates classification by optical methods. This can include macroscopic assignment to one of several well-characterized, large pairing groups (e.g., the QUE LL5 chondrites), as well as classification based on oil immersion of several olivine grains to determine the approximate index of refraction for grouping into H, L or LL chondrites. Petrologic types in this method are determined by the distinctiveness of chondrules boundaries on broken surfaces of a 1-3 g chip. While this technique is suitable for general characterization and delineation of equilibrated ordinary chondrites, those undertaking detailed study of any meteorite classified by optical methods alone should use caution. It is recommended that a polished thin section be requested to accompany any chip and appropriate steps for a more detailed characterization should be undertaken by the user. (Tim McCoy, Smithsonian Institution)

Table 3

Tentative Pairings for New Meteorites

Table 3 summarizes possible pairings of the new specimens with each other and with previously classified specimens based on descriptive data in this newsletter issue. Readers who desire a more comprehensive review of the meteorite pairings in the U.S. Antarctic collection should refer to the compilation provided by Dr. E.R. D. Scott, as published in issue 9(2) (June 1986). Possible pairings were updated in Meteoritical Bulletins No. 76 (Meteoritics 29, 100-143), No. 79 (Meteoritics and Planetary Science 31, A161-174), No. 82 (Meteoritics and Planetary Science 33, A221-A239), No. 83 (Meteoritics and Planetary Science 34, A169-A186), No. 84 (Meteoritics and Planetary Science 35, A199-A225), No. 85 (Meteoritics and Planetary Science 36, A293-A322), No. 86 (Meteoritics and Planetary Science 37, A157-A184), No. 87 (Meteoritics and Planetary Science 38, A189-A248), No. 88 (Meteoritics and Planetary Science 39, A215-272), No. 89 (Meteoritics and Planetary Science 40, A201-A263), No. 90 (Meteoritics and Planetary Science 41, 1383-1418), No. 91 (Meteoritics and Planetary Science, 42, 413-466), No. 92 (Meteoritics and Planetary Science 42, 1647-1692), No. 93 (Meteoritics and Planetary Science 43, 571-632) and No. 94 (Meteoritics and Planetary Science 43, 1551–1588) and No. 95 (Meteoritics and Planetary Science 44, No. 3, 429–462), No. 96 (Meteoritics and Planetary Science 44, No. 9, 1355-1397), and No. 97 (Meteoritics and Planetary Science 45, in press).

CB CHONDRITE
MIL 07588 with MIL 05082

CM2 CHONDRITE
MIL 07702 with MIL 07672
MIL 07674, MIL 07675, MIL 07680, MIL 07682, MIL 07692, and MIL 07703 with MIL 07497

CO3 CHONDRITE
MIL 07265, MIL 07368, MIL 07546, MIL 07688, and MIL 07695 with MIL 07182

CV3 CHONDRITE
MIL 07597, MIL 07669, MIL 07678, MIL 07681, MIL 07683, MIL 07684, MIL 07685, MIL 07690, MIL 07691, MIL 07696, and MIL 07699 with MIL 07590

EH3 CHONDRITE
MIL 07364, MIL 07369, and MIL 07393 with MIL 07241

LL3.8 Chondrite
LAR 06283, and LAR 06320 with LAR 06279

Sample No.:	LAR 06279; LAR 06283; LAR 06320	
Location:	Larkman Nunatak	
Field No.:	19898;19633; 19214	
Dimensions (cm):	9.5 x 6.5 x 4.0; 10.0 x 9.5 x 4.5; 5.8 x 4.2 x 3.0	
Weight (g):	729.8; 878.2; 161.21	
Classification:	LL3 Chondrite	

Macroscopic Description: Cecilia Satterwhite

These chondrites all have black fusion crust with rusty areas and oxidation haloes. Areas without fusion crust are brown. The interior is a gray to black matrix with some oxidation and metal. Inclusions and chondrules are visible on the exterior as well as the interior and are lighter than the matrix and vary in size.

Thin Section (,2) Description: Cari Corrigan, Tim McCoy and Linda Welzenbach

The sections exhibit numerous large, well-defined chondrules (up to 1.5 mm) and occasional melt clasts in a matrix of fine-grained silicates, metal, and troilite. Weak shock effects are present. Polysynthetically twinned pyroxene is abundant. Silicates are unequilibrated; olivines range from Fa_{2-44} and pyroxenes from Fs_{3-28}. The meteorites are LL3 chondrites (estimated subtype 3.8).

Sample No.:	LAR 06507
Location:	Larkman Nunatak
Field No.:	19639
Dimensions (cm):	2.5 x 1.5 x 1.5
Weight (g):	12.054
Classification:	LL Chondrite (Impact Melt Breccia)

Macroscopic Description: Kathleen McBride

The exterior has a thick patch of fusion crust covering <5% of the surface.. The interior is gray in color with an oxidation rind, evaporites and is low in metal. Millimeter sized gray chondrules are present.

Thin Section (,2) Description: Cari Corrigan

This section consists of a matrix of individual mineral fragments up to 100 microns in a melt-textured matrix with rounded to ellipsoidal metal-sulfide blebs. It also exhibits larger (up to several mm) unmelted chondritic fragments with rare relict barred olivine chondrules. Olivine is Fa_{34}, pyroxene is Fs_{11}. This meteorite is an LL chondrite impact melt breccia.

Sample No.:	LAR 06618
Location:	Larkman Nunatak
Field No.:	19140
Dimensions (cm):	4.25 x 3.25 x 2.0
Weight (g):	43.498
Classification:	Ureilite

Macroscopic Description: Kathleen McBride

Thick black vesicular fusion crust covers 30% of the exterior of this meteorite. The surface has slightly platy fracturing. The rusty brown interior is coarse grained with minor evaporates in tiny spots.

Thin Section (,4) Description: Cari Corrigan

The section consists of an aggregate of large (up to 2.5 mm) olivine grains. Individual olivine grains are rimmed by carbon-rich material containing traces of metal. Metal forms veins between olivines. Olivine has cores of Fa_{19}, with rims reduced to Fa_7. The meteorite is a ureilite.

Sample No.:	MIL 07182; MIL 07265; MIL 07368; MIL 07546; MIL 07688; MIL 07695
Location:	Miller Range
Field No.:	17857; 18364; 18617; 17541; 18664; 17395
Dimensions (cm):	4.8 x 4.2 x 2.5; 0.75 x 0.75 x 0.5; 1.25 x 1.0 x 0.75; 0.75 x 0.75 x 0.5; 0.5 x 0.75 x 1.; 1.0 x 1.0 x 0.7
Weight (g):	111.976; 0.550; 2.010; 0.440; 0.940; 1.358
Classification:	CO3 Chondrites

Macroscopic Description: Kathleen McBride, Roger Harrington and Cecilia Satterwhite

All of these carbonaceous chondrites have black fusion crust covering 50 to100% of the exterior surface. The interiors are fine grained, dark gray to black matrix with some rust and oxidation near the edges. Tiny white inclusions are visible, some are rusty.

Thin Section (,2) Description: Cari Corrigan, Tim McCoy and Linda Welzenbach

These meteorites are so similar that a single description suffices. The sections consist of abundant small (up to 1 mm) chondrules, chondrule fragments, and mineral grains in a dark matrix. Metal and sulfide occur within and rimming the chondrules. Olivine ranges in composition from Fa_{0-73}. Pyroxene analyses range from Fs_{1-17}. These meteorites are CO3 chondrites and are probably members of the MIL 07531 pairing group.

Sample No.:	MIL 07273
Location:	Miller Range
Field No.:	19762
Dimensions (cm):	2.1 x 2.1 x 2.0
Weight (g):	33.883
Classification:	H5 Chondrite (Anomalous)

Macroscopic Description: Cecilia Satterwhite

The exterior is covered by black fusion crust with rusty oxidized areas. Most of the interior is a rusty brown especially along fractures. Some dark gray areas are visible with metal and small light gray inclusions.

Thin Section (,2) Description: Cari Corrigan, Tim McCoy and Linda Welzenbach

This meteorite is a moderately metamorphosed, shock blackened chondrite whose mafic silicate compositions are more magnesian (Fa_{16}, Fs_{14}) than typically seen in H chondrites. It is similar to several chondrites described as low-FeO chondrites by Russell et al. (1998, MAPS, 853-856) and is petrologic type 5.

Sample No.:	MIL 07241; MIL 07364; MIL 07369; MIL 07393
Location:	Miller Range
Field No.:	18386; 17882; 18615; 18689
Dimensions (cm):	4.2 x 3.6 x 1.2; 1.25 x 1.0 x 0.25; 1.5 x 1.0 x 0.75; 3.0 x 2.0 x 1.5
Weight (g):	33.602; 0.950; 2.800; 11.76
Classification:	EH3 Chondrites

Macroscopic Description: Kathleen McBride and Cecilia Satterwhite

Exteriors of these meteorites are covered with brown/black fusion crust. The interiors range from dark gray to black in color with heavy oxidation, rust and metal. Some have rusty weathered inclusions and chondrules.

Thin Section (,2) Description: Cari Corrigan, and Tim McCoy

These sections are similar enough that one description suffices. The sections show an aggregate of chondrules (up to 1 mm), chondrule fragments, and pyroxene grains in a matrix of about 30% metal and sulfide, including daubreelite. Chondrules contain traces of olivine. Microprobe analyses show the olivine is Fa_2 and pyroxene is Fs_{1-12}, though most are Fs_1. Kamacite contains 2.7 wt. % Si. These meteorites are EH3 chondrites.

Sample No.:	MIL 07277
Location:	Miller Range
Field No.:	17371
Dimensions (cm):	3.0 x 3.0 x 2.0
Weight (g):	34.096
Classification:	CV3 Chondrite

Macroscopic Description: Cecilia Satterwhite

The exterior has brown/black fusion crust with oxidation and rusty patches. The interior is dark gray to black matrix with some oxidation. Abundant inclusions and chondrules are visible.

Thin Section (,2) Description: Cari Corrigan, Tim McCoy and Glenn MacPherson

This section exhibits large chondrules (up to 3 mm), metal, silicate particles and CAIs in a dark matrix. It is heavily weathered and shock flattened. Olivines range from Fa_{0-13} and low-Ca pyroxene is Fs_{1-9}. The meteorite is an unequilibrated carbonaceous chondrite, probably a reduced CV3.

Sample No.:	MIL 07447
Location:	Miller Range
Field No.:	19014
Dimensions (cm):	3.8 x 2.0 x 2.0
Weight (g):	31.956
Classification:	Ureilite

Macroscopic Description: Cecilia Satterwhite

90% black fractured fusion crust covers the surface of this achondrite. Some oxidation is present. The interior is a dark gray to black matrix with a crystalline texture and some rusty areas.

Thin Section (,2) Description: Cari Corrigan, and Tim McCoy

The section consists of an aggregate of large (up to 1 mm) olivine and pigeonite grains. Individual olivine grains are rimmed by carbon-rich material containing traces of metal. Metal forms veins between olivines. Olivine has cores of Fa_{17} with rims reduced to Fa_{10}. Pigeonite compositions are $Fs_{14}Wo_{10}$. The meteorite is a ureilite.

Sample No.:	MIL 07588
Location:	Miller Range
Field No.:	17983
Dimensions (cm):	1.0 x 1.0 x 1.0
Weight (g):	1.363
Classification:	CB Chondrite

Macroscopic Description: Cecilia Satterwhite

The exterior is a gray color with some patches of weathered fusion crust and oxidation. The matrix is gray with some metal, oxidation and mm sized light, dark and weathered inclusions,

Thin Section (,2) Description: Cari Corrigan, Tim McCoy and Linda Welzenbach

The section consists of metal and chondrules. Metal occurs as rounded particles up to 4 mm in diameter. Chondrules and chondrule fragments up to 0.5 mm are dominated by radiating pyroxene textures with olivine present. Silicates are magnesian (Fa_{1-3}, Fs_{1-3}). The meteorite is a CB chondrite and may be paired with MIL 05082.

Sample No.:	MIL 07590; MIL 07597; MIL 07669; MIL 07678; MIL 07681; MIL 07683; MIL 07684; MIL 07685; MIL 07690; MIL 07691; MIL 07696; MIL 07699
Location:	Miller Range
Field No.:	17596; 17987; 18385; 17540; 17993; 17590; 18116; 18351; 17980; 19753; 18322; 17546
Dimensions (cm):	1.5 x 1.0 x 0.5; 1.25 x 1.25 x 0.5; 3.0 x 2.0 x 1.5; 3.0 x 2.0 x 1.0; 3.0 x 2.5 x 1.5; 2.5 x 1.0 x 0.5; 1.0 x 1.5 x 0.5; 2.25 x 2.25 x 1.0; 2.5 x 2.0 x 1.0; 1.5 x 2.5 x 0.7; 3.5 x 3.5 x 1.0; 1.2 x 2.0 x 0.7
Weight (g):	1.750; 0.980; 15.750; 7.660; 20.690; 3.080; 1.310; 9.660; 4.933; 3.998; 16.447; 1.958
Classification:	CV3 Chondrite

Macroscopic Description: Kathleen McBride and Roger Harrington

The exteriors of these carbonaceous chondrites have brown/black fusion crust with polygonal fractures. The interiors of these meteorites have dark gray to black matrixes with some weathered areas. Most have white and light gray chondrules and inclusions. 07669 has mint green colored evaporates over half of its surface.

Thin Section (,2) Description: Cari Corrigan, Tim McCoy and Linda Welzenbach

The sections are so similar that a single description suffices. The sections exhibit large chondrules (up to 3 mm) and CAIs in a dark matrix. Olivines range from Fa_{0-64} and low-Ca pyroxene is Fs_{1-5}. The meteorites are unequilibrated carbonaceous chondrites, probably reduced CV3. These are likely paired with the MIL 07671 pairing group previously reported. Pairing of MIL 07690 and MIL 07683 is considered tentative, as the former is dominated by fusion crust and the latter, while similar to other members of the group, lacks metal grains in the thin section examined.

Sample No.:	MIL 07672; MIL 07702	
Location:	Miller Range	
Field No.:	19237; 17565	
Dimensions (cm):	1.5 x 1.25 x 0.75; 3.0 x 1.5 x 1.2	
Weight (g):	1.760; 7.376	
Classification:	CM2 Chondrites	

Macroscopic Description: Roger Harrington and Kathleen McBride

The exterior of 07672 has black fusion crust with polygonal fractures and evaporites. Both CM2's have a black fine grained matrix.

Thin Section (,2) Description: Cari Corrigan, Tim McCoy, Linda Welzenbach and Karen Stockstill

The sections are so similar that a single description suffices. The sections consist of moderately abundant small chondrules (up to 0.5 mm), mineral grains, and CAIs set in a black matrix; rare metal, sulfide and carbonate grains are present. Chondrules are moderately to heavily altered. Olivine compositions are Fa_{0-19}. Aqueous alteration of the matrix is substantial, but the chondrules are only modestly altered. The meteorites are CM2 chondrites.

Sample No.:	MIL 07497; MIL 07674; MIL 07675; MIL 07680; MIL 07682; MIL 07692; MIL 07703
Location:	Miller Range
Field No.:	18134; 18324; 19858; 18173; 17851; 17908; 17998
Dimensions (cm):	2.0 x 1.0 x 1.0; 2.5 x 1.5 x 1.0; 3.75 x 3.5 x 2.75; 2.5 x 1.75 x 0.75; 2.5 x 1.5 x 0.75; 2.5 x 1.0 x 2.0; 2.5 x 3.0 x 2.0
Weight (g):	4.060; 4.230; 37.430; 2.470; 5.100; 5.230; 13.619
Classification:	CM2 Chondrite

Macroscopic Description: Kathleen McBride and Roger Harrington

The exteriors of these meteorites have purplish black to black fusion crust with polygonal fractures. The interior matrixes range in color from gray to black, fine grained with white and light gray inclusions. Some have rusty areas and some have evaporites.

Thin Section (,2) Description: Tim McCoy, Cari Corrigan, Linda Welzenbach, Karen Stockstill

The sections are so similar that a single description suffices. The sections consist of moderately abundant small chondrules (up to 0.5 mm), mineral grains, and CAIs set in a black matrix; rare metal and sulfide grains are present. Chondrules are very lightly altered. Olivine compositions are Fa_{0-55} pyroxene is Fs_{1-5}. Aqueous alteration of the matrix is substantial, but the chondrules are only modestly altered. The meteorites are CM2 chondrites.

Sample No.:	DOM 08001
Location:	Dominion Range
Field No.:	19327
Dimensions (cm):	12.5 x 13.5 x 8.0
Weight (g):	1305.4
Classification:	Eucrite (Brecciated)

Macroscopic Description: Roger Harrington

Shiny black fusion crust covers 80% of the exterior surface. The remaining 20% is a light gray medium to fine-grained matrix with medium gray mottling and trace rust spots. This sample has several elongate, oriented voids on the top-west face that range in diameter from 1 to 14 mm. The interior is a light gray medium to fine-grained matrix with medium gray mottling and trace rust spots.

Thin Section (,2) Description: Cari Corrigan

This meteorite is dominated by fine-grained (~200 micron average grain size) basaltic material which occurs as both the host and clasts within these meteorites. Occasional coarser-grained clasts, with grain sizes up to 1.5 mm, are observed. Mineral compositions are homogeneous with orthopyroxene ($Fs_{61}Wo_2$), with lamellae of augite ($Fs_{25}Wo_{45}$), and plagioclase ($An_{86}Or_{0.8}$). The Fe/Mn ratio of the pyroxene is ~34. The meteorite is a brecciated eucrite

Sample No.:	DOM 08002	
Location:	Dominion Range	
Field No.:	17134	
Dimensions (cm):	6.5 x 5.0 x 4.0	
Weight (g):	173.220	
Classification:	LL Chondrite (Impact Melt)	

Macroscopic Description: Kathleen McBride

80% of the exterior is covered with brown/black fusion crust with polygonal fractures and evaporates. The interior has a medium gray matrix with lighter gray clasts that range in size from 0.5 – 1.5 mm.

Thin Section (,2) Description: Cari Corrigan

This section consists of a matrix of individual mineral fragments up to 100 microns in a melt-textured matrix with rounded to ellipsoidal metal-sulfide blebs. It also exhibits larger (up to several mm) unmelted chondritic fragments with relict barred olivine and radial pyroxene chondrules. Olivine is Fa_{30}, pyroxene is Fs_{25}. This meteorite is an LL chondrite impact melt breccia.

Sample No.:	DOM 08003
Location:	Dominion Range
Field No.:	18574
Dimensions (cm):	6.5 x 4.5 x 4.0
Weight (g):	108.980
Classification:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

95% of the exterior is purple to brown fusion crust with polygonal fractures. The interior matrix is black and contains <mm sized white chondrules.

Thin Section (,2) Description: Cari Corrigan

The section consists of a few small chondrules (up to 0.5 mm), mineral grains and CAIs set in a black matrix; rare metal, sulfide and carbonate grains are present. Olivine compositions are Fa_{3-48}. Aqueous alteration of the matrix is substantial, but the chondrules are only modestly altered. The meteorite is a CM2 chondrite.

Sample No.:	DOM 08008
Location:	Dominion Range
Field No.:	19186
Dimensions (cm):	3.5 x 4.0 x 2.5
Weight (g):	27.07
Classification:	Eucrite (Brecciated)

Macroscopic Description: Roger Harrington

Dull black fusion crust covers 5% of the exterior surface. The remaining 95% is a heavily pitted, light gray medium to fine-grained matrix with rust brown mottling. The interior is a light gray, medium to fine-grained matrix with dark gray mottling.

Thin Section (,2) Description: Cari Corrigan

This meteorite is dominated by fine-grained (~200 micron average grain size) basaltic material which occurs as both the host and clasts within these meteorites. Occasional coarser-grained clasts, with grain sizes up to 2 mm, are observed. Mineral compositions are homogeneous with orthopyroxene ($Fs_{60}Wo_2$), with lamellae of augite ($Fs_{26}Wo_{43}$), and plagioclase ($An_{92}Or_{0.1}$). The Fe/Mn ratio of the pyroxene is ~34. The meteorite is a brecciated eucrite.

Sample No.:	DOM 08009
Location:	Dominion Range
Field No.:	18274
Dimensions (cm):	2.0 x 1.75 x 1.75
Weight (g):	5.230
Classification:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

The exterior is a dull brown color with polygonal fractures. The dark brown to black interior has <mm sized white inclusions.

Thin Section (,2) Description: Cari Corrigan, and Tim McCoy

The section consists of a few small chondrules (up to 0.5 mm), mineral grains, and CAIs set in a black matrix; rare metal, sulfide and carbonate grains are present. Olivine compositions are Fa_{1}-$_{4}$ pyroxene is Fs_{1-21}. The meteorite is a CM2 chondrite.

Sample No.:	DOM 08016
Location:	Dominion Range
Field No.:	18296
Dimensions (cm):	2.5 x 1.5 x 1.0
Weight (g):	6.190
Classification:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

The exterior is a dull brown color with polygonal fractures. The interior is dark brown to black and has <mm sized white inclusions. There is rusting along a penetrating fracture. Evaporites and metal are visible.

Thin Section (,2) Description: Cari Corrigan

The section consists of moderately abundant small chondrules (up to 0.5 mm), mineral grains, and CAIs set in a black matrix; rare metal, sulfide and carbonate grains are present. Olivine compositions are Fa_{1-31} pyroxene is Fs_{3-19}. Aqueous alteration of the matrix is substantial, but the chondrules are only modestly altered. The meteorite is a CM2 chondrite.

Sample Request Guidelines

The Meteorite Working Group (MWG), is a peer-review committee which meets twice a year to guide the collection, curation, allocation, and distribution of the U.S. collection of Antarctic meteorites. The deadline for submitting a request is 2 weeks prior to the scheduled meeting.

Requests that are received by the MWG secretary by **Feb. 17, 2010 deadline** will be reviewed at the MWG meeting **March 5-6, 2010 in Woodlands, Tx.** Requests that are received after the deadline may be delayed for review until MWG meets again in the Fall of 2010. Please submit your requests on time. Questions pertaining to sample requests can be directed to the MWG secretary by e-mail, fax or phone.

Requests for samples are welcomed from research scientists of all countries, regardless of their current state of funding for meteorite studies. Graduate student requests should have a supervising scientist listed to confirm access to facilities for analysis. All sample requests will be reviewed in a timely manner. Sample requests that do not meet the curatorial allocation guidelines will be reviewed by the Meteorite Working Group (MWG). Issuance of samples does not imply a commitment by any agency to fund the proposed research. Requests for financial support must be submitted separately to an appropriate funding agency. As a matter of policy, U.S. Antarctic meteorites are the property of the National Science Foundation, and all allocations are subject to recall.

Samples can be requested from any meteorite that has been made available through announcement in any issue of the ***Antarctic Meteorite Newsletter*** (beginning with 1(1) in June, 1978). Many of the meteorites have also been described in five *Smithsonian Contributions to the Earth Sciences*: Nos. 23, 24, 26, 28, and 30. Tables containing all classified meteorites as of August 2006 have been published in the Meteoritical Bulletins and *Meteoritics* and *Meteoritics and Planetary Science* (these are listed in Table 3 of this newsletter. They are also available online at:

http://www.meteoriticalsociety.org/simple_template.cfm?code=pub_bulletin

The most current listing is found online at:

http://curator.jsc.nasa.gov/curator/antmet/us_clctn.htm

All sample requests should be made electronically using the form at:

http://curator.jsc.nasa.gov/curator/antmet/samreq.htm

The purpose of the sample request form is to obtain all information MWG needs prior to their deliberations to make an informed decision on the request. Please use this form if possible.

The preferred method of request transmittal is via e-mail. Please send requests and attachments to:

JSC-ARES-MeteoriteRequest@nasa.gov

Type **MWG Request** in the e-mail subject line. Please note that the form has signature blocks. The signature blocks should only be used if the form is sent via Fax or mail.

Each request should accurately refer to meteorite samples by their respective identification numbers and should provide detailed scientific justification for proposed research. Specific requirements for samples, such as sizes or weights, particular locations (if applicable) within individual specimens, or special handling or shipping procedures should be explained in each request. Some meteorites are small, of rare type, or are considered special because of unusual properties. Therefore, it is very important that all requests specify both the optimum amount of material needed for the study and the minimum amount of material that can be used. Requests for thin sections that will be used in destructive procedures such as ion probe, laser ablation, etch, or repolishing must be stated explicitly.

Consortium requests should list the members in the consortium. All necessary information should be typed on the electronic form, although informative attachments (reprints of publication that explain rationale, flow diagrams for analyses, etc.) are welcome.

Antarctic Meteorite Laboratory Contact Numbers

Please submit request to**: JSC-ARES-MeteoriteRequest@nasa.gov**

Kevin Righter
Curator
Mail code KT
NASA Johnson Space Center
Houston, Texas 77058
(281) 483-5125
kevin.righter-1@nasa.gov

Cecilia Satterwhite
Lab Manager/MWG Secretary
Mail code KT
NASA Johnson Space Center
Houston, Texas 77058
(281) 483-6776
cecilia.e.satterwhite@nasa.gov

FAX: 281-483-5347

Meteorites On-Line

Several meteorite web site are available to provide information on meteorites from Antarctica and elsewhere in the world. Some specialize in information on martian meteorites and on possible life on Mars. Here is a general listing of ones we have found. We have not included sites focused on selling meteorites even though some of them have general information. Please contribute information on other sites so we can update the list.

JSC Curator, Antarctic meteorites	http://curator.jsc.nasa.gov/antmet/index.cfm
JSC Curator, Lunar Meteorite Compendium	http://www-curator.jsc.nasa.gov/antmet/lmc/index.cfm
JSC Curator, martian meteorites	http://www-curator.jsc.nasa.gov/antmet/marsmets/index.cfm
JSC Curator, Mars Meteorite Compendium	http://www-curator.jsc.nasa.gov/antmet/mmc/index.cfm
Antarctic collection	http://geology.cwru.edu/~ansmet/
Smithsonian Institution	http://www.minerals.si.edu/
LPI martian meteorites	http://www.lpi.usra.edu
NIPR Antarctic meteorites	http://www.nipr.ac.jp/
Meteoritical Bulletin online Database	http://tin.er.usgs.gov/meteor/metbull.php
Museo Nazionale dell'Antartide	http://www.mna.it/english/Collections/collezioni_set.htm
BMNH general meteorites	http://www.nhm.ac.uk/research-curation/departments/mineralogy/research-groups/meteoritics/index.html
Chinese Antarctic meteorite collection	http://birds.chinare.org.cn/en/yunshiku/
UHI planetary science discoveries	http://www.psrd.hawaii.edu/index.html
Meteoritical Society	http://www.meteoriticalsociety.org/
Meteoritics and Planetary Science	http://meteoritics.org/
Meteorite! Magazine	http://meteoritemag.uark.edu
Geochemical Society	http://www.geochemsoc.org
Washington Univ. Lunar Meteorite	http://epsc.wustl.edu/admin/resources/moon_meteorites.html
Washington Univ. "meteor-wrong"	http://epsc.wustl.edu/admin/resources/meteorites/meteorwrongs/meteorwrongs.htm

Other Websites of Interest

Mars Exploration	http://mars.jpl.nasa.gov
Rovers	http://marsrovers.jpl.nasa.gov/home/index.html
Near Earth Asteroid Rendezvous	http://near.jhuapl.edu/
Stardust Mission	http://stardust.jpl.nasa.gov
Genesis Mission	http://genesismission.jpl.nasa.gov
ARES	http://ares.jsc.nasa.gov/
Astromaterials Curation	http://www-curator.jsc.nasa.gov/