Antarctic Meteorite Newsletter

Volume 37, Number 2 September 2014

Curator's Comments
Kevin Righter, NASA-JSC

New meteorites

This newsletter reports 286 new meteorites from the 2010 and 2011 ANSMET seasons from the Dominion Range (DOM10) and Miller Range (MIL11) areas. Once again, we have a diversity of chondrites, and this newsletter includes detailed descriptions for 27 new carbonaceous chondrites (2 CO3 pairing groups of 20 and 5 samples each, a CR2 and a CM1/2), 2 enstatite chondrites (EL5 and EH3), and four low petrologic grade ordinary chondrites (two LL3.2s, LL3.6, L3.6).

This newsletter includes the last major batch of samples from the 2010 season to be classified, thus nearly completing the characterization from this season. A few additional samples will be announced in the Spring 2015 newsletter. Notable samples from the 2010 season include: 12 HEDs, 1 ureilite, 45 carbonaceous chondrites (CK, CO, CM, CR, CV), 4 enstatite chondrites, 2 hornblende-bearing R chondrites, 5 ordinary chondrite impact melts, and 6 low petrologic type ordinary chondrites. In addition to this diverse cross section of planetary materials, it looks as if the Dominion Range includes a large shower (hundreds of samples) of LL chondrites.

Loan agreements / inventory

Last September we initiated two new policies regarding the loans of Antarctic meteorites from the US collection at NASA JSC: annual inventory and loan agreements. Most of our principal investigators (PIs) have responded to these new policies and we thank you for your time in working through the details of both documents. This has been particularly difficult for those of you who have held samples for several decades. The inventories will be annual and the loan agreement will be good for 5 years. We want to thank you in advance for responding to our upcoming inventory requests in 2015, and just want to remind you that responding to the inventory is a requirement to stay in good standing for receiving new samples from the collection.

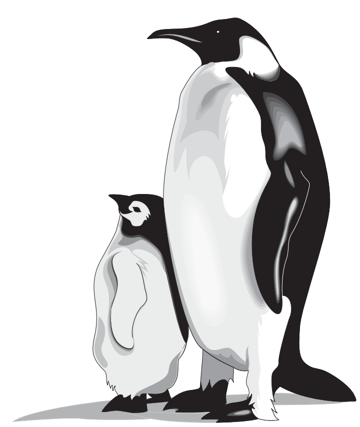
Delayed return of 2013 samples

Usually the Fall newsletter reports samples collected from the previous field season, but this year is an exception. At the time of the Spring 2014 newsletter we had just received word that the samples for the 2013-2014 ANSMET

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

Inside this Issue



Sample Request Deadline
September 23, 2014

MWG Meets
Oct. 9-10, 2014

season had been stranded at McMurdo due to adverse weather conditions during loading of the cargo vessels in February. Since then, the situation has not changed. The 2013-2014 season samples will be returned in Spring of 2015, along with samples collected during the upcoming 2014-2015 season. So in the Spring of 2015 we will receive two seasons worth of samples here at JSC. So, exciting new samples will be available in 2015.

Book

The past several years, the staff of the US Antarctic meteorite collection has been working on a book project with AGU and Wiley. The book, entitled “35 seasons of U.S. Antarctic Meteorites (1976-2011): A pictorial guide to the Collection” (editors K. Righter, R.P. Harvey, C.M. Corrigan, and T.J. McCoy), will cover the history, field operations, curation and statistical aspects of the collection, as well as feature articles on primitive chondrites, achondrites, lunar and martian meteorites, unusual meteorites (misfits), and exposure histories. At the center of the book there will be 80 color plates dedicated to 80 of the more influential samples in the collection. This book has been long in the making and should be of interest to a wide range of people from undergraduates to graduates to advanced scholars in the field.

Reclassifications

New information about two samples announced in previous newsletters have indicated a need for reclassification.

MIL 090697 was classified as a L6 Chondrite in the February 2014 (Vol.35 No.1) newsletter and is reclassified as a shocked L Chondrite. See petrographic descriptions in this newsletter for more information.

DOM 10344 was classified as a CR2 in the February 2014 (Vol.37 No. 1) newsletter.

Petrographic studies and INAA data provided by Alan Rubin and John Wasson (UCLA) indicate that DOM 10344 is an LL3 chondrite, probably LL3.4.

DOM 10344 has higher sulfide contents than a typical CR2. It has Radial Pyroxene and cryptocrystalline chondrules, which are very rare in CRs, and it has few igneous rims, which are common in CRs. UCLA probe data show $Fa_{10.5\pm7.5}$ (n=16) and $Fs_{10.9\pm8.7}$ (n=6). The PMD of Fa is 55, corresponding to subtype <3.4. It has rare clear, colorless, isotropic glass, approximately the same as for type 3.4-3.5 OC. Its Cr_2O_3 in ferroan olivine is 0.07±0.07 wt.%, corresponding to type >3.2. So, it is probably best classified as an LL3.4.

In addition, INAA data show 472 ug/g Co and 426 ng/g Ir in DOM 10344. This compares with a mean of 490 and 360 for LL chondrites (from Wasson and Kallemeyn, 1988) and 667 and 642 for CR chondrites from Kallemeyn et al. (1994). Additionally, DOM 10344 contains 129 ng/g Au which does not distinguish it from a CR, but is nonetheless consistent with LL.

New meteorite staff

Since the March newsletter, the Antarctic meteorite lab has experienced some change in personnel. Kathleen McBride, who has worked in the meteorite collection since 1995 has transitioned to a new position with the dust groups (Cosmic dust and Stardust). Her contributions to the meteorite collection over the years have been enormous, and for example have included processing of most of the martian meteorites and carbonaceous chondrites, both of which require cabinet processing. In addition to this work she has done the initial characterization of thousands of Antarctic meteorites. Her expertise and experience will be missed for sure, but the good news is that she is still with the Curation group.

In June, Mitchell Haller joined the curation staff at ARES and has been fully integrated into the Antarctic meteorite team. You will see Mitch’s name on many of the descriptions in this newsletter and he will be working closely with Cecilia Satterwhite on all of the aspects of meteorite curation. Mitch received his B.S. in Geology from SUNY-Potsdam in 2014.

Mitchell Haller has recently joined the ARES curation staff

Report from the Smithsonian – Fall 2014

Cari Corrigan

This newsletter reports the classification of meteorites from the 2009, 2010, and 2011 ANSMET seasons. With the 2013 samples trapped in McMurdo we are busy trying to close out the 2010 season, and with the publication of this newsletter, we will only have a few iron meteorites left to report. Stay tuned for Spring 2015! We have recently welcomed the following to the Division of Meteorites: Dr. Devin Schrader (Ph.D. 2012, University of Arizona), a new post doc, and Dr. Pam Salyer, who has been working with museum collections for the past two years and began working with us in the meteorite collection last fall. They have both been great additions to our group.

It is with mixed emotions that we report the impending departure of Linda Welzenbach, our Meteorite Collections Manager for the past 15 years. During this time she has had many accomplishments, including participation in the classification of almost 10,000 Antarctic meteorites, traveling to Antarctica to collect meteorites during two ANSMET seasons (2002 and 2005), and digitizing the meteorite collection. She has also overseen the major renovations/construction of our two meteorite storage facilities. Linda will be moving to Houston, TX, in November, to join her husband-to-be. While we will be very sorry to see her go, and will miss her expertise, we wish her all the best and thank her for her commitment to the care of the US Antarctic Meteorite Collection over the past 15 years!

Dr. Devin Schrader and Dr. Pamela Salyer have recently joined the Smithsonian's Division of Meteorites

Linda Welzenbach at the Smithsonian's meteorite lab

Preview of the 2014-2015 field season

Ralph Harvey, ANSMET

The 2014-2015 field season takes ANSMET back to the Davis-Ward icefields, one of a number of productive meteorite stranding surfaces in the southern headwaters of the Beardmore Glacier. ANSMET has visited the Davis-Ward icefields four times previously. Reconnaissance visits in 1985 and 2003 demonstrated the potential of the site, and later systematic searching visits in 2008 and 2010 led to the recovery of over 1000 meteorites from these icefields. Meteorites recovered from the Davis Ward site bear the DOM sample prefix, as do samples recovered from the nearby Dominion Range icefield.

The Davis-Ward site is fairly compact compared to many of the places ANSMET has worked, with a main icefield in the form of a pendant glacial tongue filling the area between Mt. Ward and the Davis Nunataks. A terminal moraine along the tongue's northern edge connects "Davis" to "Ward" and separates this main icefield from a set of icefields of similar total area on the downhill side of this moraine. The entire site is only about 10 km across, making daily commutes from camo to almost any recovery area quite reasonable. This is welcome change from places like the Miller Range where a trip from one end to the other can be a day-long production.

The proximity of Davis Nunataks and Mt. Ward to the exposed ice means that terrestrial rocks are common on almost all parts of these icefields. Even worse, most of these consist of dark, fine-grained dolerite and basalt, making it difficult to identify meteorites at a distance. There is a silver lining, however; several locations harbor a fantastically high spatial density of meteorites. In one such location, a linear depression informally known as "the Trough" (aptly named given the feeding-frenzy it often produced) it is not unusual for several dozen meteorites to be found on an area the size of a football field (see photo). Most days (weather-permitting) at Davis-Ward are productive and include a significant amount of warmth-inducing foot-searching.

Given some of the difficulties we faced last season (primarily due to last October's government shutdown) the unassuming and straight-forward job ahead of us at Davis-Ward is something to look forward to. Of course it's still a trip to the end of the Earth, so nothing is ever completely normal and predictable, and we'll bring our usual flexibility to the situation as we get ANSMET's 38th field season underway.

"The Trough" at the foot of Mt. Ward, with 27 meteorite flags in view.

New Meteorites

2009-2011 Collection

Pages 5-20 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 37(1), Feb. 2014. 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:

Mitchell Haller, Jeremy Kent, Charis Krysher, Roger Harrington, Kathleen McBride and Cecilia Satterwhite
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Houston, Texas

Cari Corrigan, Tim McCoy, Pamela Salyer and Linda Welzenbach
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Antarctic Meteorite Locations

ALH — Allan Hills
BEC — Beckett Nunatak
BOW — Bowden Neve
BTN — Bates Nunataks
BUC — Buckley Island
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
SZA — Szabo Bluff
TEN — Tentacle Ridge
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range
WSG — Mt. Wisting

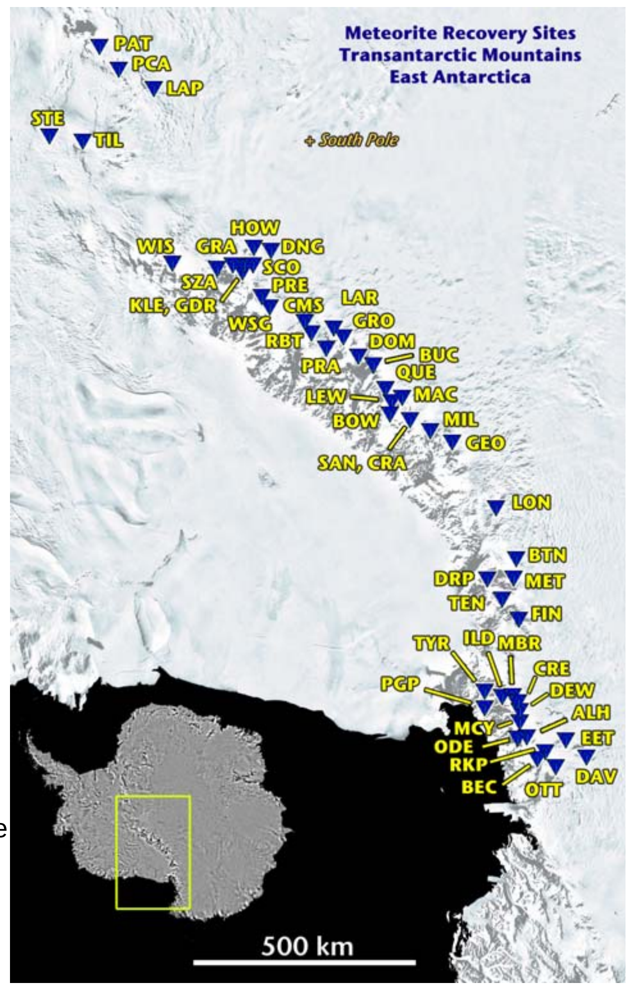

Table 1

List of Newly Classified Antarctic Meteorites **

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
DOM 10007	~	583.7	LL6 CHONDRITE	B	A/B		
DOM 10008	~	471.2	LL5 CHONDRITE	A/B	A		
DOM 10009	~	366.0	L5 CHONDRITE	B/C	A/B		
DOM 10010	~	640.8	L5 CHONDRITE	B/C	A		
DOM 10030	~	67.8	L5 CHONDRITE	B/C	A/B		
DOM 10031	~	80.4	L6 CHONDRITE	B/C	B		
DOM 10032	~	56.3	LL6 CHONDRITE	B/C	B/C		
DOM 10033	~	124.1	LL6 CHONDRITE	B	B		
DOM 10034	~	79.8	H6 CHONDRITE	C	B/C		
DOM 10035	~	87.8	LL6 CHONDRITE	B	A		
DOM 10036	~	81.3	LL6 CHONDRITE	B	B		
DOM 10037	~	48.5	LL6 CHONDRITE	A/B	A		
DOM 10038	~	79.3	LL6 CHONDRITE	B	A/B		
DOM 10039	~	95.2	L5 CHONDRITE	C	A/B		
DOM 10050	~	259.8	LL5 CHONDRITE	B	A/B		
DOM 10490		115.9	LL3.2 CHONDRITE	B	A	3-37	15
DOM 10556		119.9	L3.6 CHONDRITE	B	A/Be	18-38	3
DOM 10560	~	36.8	LL5 CHONDRITE	B	A/B		
DOM 10561	~	71.3	LL6 CHONDRITE	B	B		
DOM 10562	~	56.6	H6 CHONDRITE	C	B		
DOM 10563	~	66.5	LL6 CHONDRITE	B/C	B		
DOM 10564	~	80.5	LL6 CHONDRITE	B	B		
DOM 10565	~	43.6	L6 CHONDRITE	C	B		
DOM 10567	~	49.9	H6 CHONDRITE	C	B		
DOM 10568	~	50.1	LL6 CHONDRITE	B/C	B		
DOM 10569	~	44.8	LL6 CHONDRITE	A/B	A/B		
DOM 10621		45.9	LL3.6 CHONDRITE	B	A/B	21-40	3-32
DOM 10662		4.5	UREILITE	C	B	20-24	18
DOM 10690	~	3.7	H6 CHONDRITE	C	B		
DOM 10691	~	5.2	LL6 CHONDRITE	B/C	B		
DOM 10692	~	3.8	L6 CHONDRITE	C	B		
DOM 10693	~	19.8	LL6 CHONDRITE	B	B		
DOM 10694	~	15.6	LL6 CHONDRITE	B	B		
DOM 10695	~	4.7	H6 CHONDRITE	C	B		
DOM 10696	~	22.1	H6 CHONDRITE	C	B		
DOM 10697	~	21.5	H6 CHONDRITE	C	B		
DOM 10698	~	17.8	LL6 CHONDRITE	B	B		
DOM 10699	~	11.6	LL6 CHONDRITE	B/C	B		
DOM 10720	~	26.0	LL5 CHONDRITE	B	A/B		
DOM 10721	~	18.4	L6 CHONDRITE	B/C	A/B		
DOM 10722	~	23.0	H6 CHONDRITE	B/C	A/B		
DOM 10723	~	24.8	LL6 CHONDRITE	B	A/B		
DOM 10724	~	25.0	LL6 CHONDRITE	B	B		
DOM 10725	~	27.5	LL6 CHONDRITE	B	B		
DOM 10726	~	13.1	LL6 CHONDRITE	B	A/B		
DOM 10727	~	15.6	LL6 CHONDRITE	B/C	A/B		
DOM 10728	~	16.8	H6 CHONDRITE	B/C	B		
DOM 10729	~	33.1	LL6 CHONDRITE	B	A/B		
DOM 10730	~	147.7	LL6 CHONDRITE	A/B	A		
DOM 10731	~	100.9	LL6 CHONDRITE	A/B	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
DOM 10732	~	170.6	LL6 CHONDRITE	B	A		
DOM 10733	~	282.2	LL6 CHONDRITE	A/B	A		
DOM 10734	~	152.2	L5 CHONDRITE	B/C	A		
DOM 10735	~	62.9	LL6 CHONDRITE	B/C	B		
DOM 10736	~	86.7	LL6 CHONDRITE	B	B		
DOM 10737	~	51.9	H6 CHONDRITE	C	B		
DOM 10738	~	41.6	LL6 CHONDRITE	B	B		
DOM 10739	~	46.4	LL6 CHONDRITE	B	B		
DOM 10741		36.0	L6 CHONDRITE	A	A/B	25	21
DOM 10750	~	12.3	L5 CHONDRITE	B	A		
DOM 10752	~	20.7	L6 CHONDRITE	B/C	B		
DOM 10753	~	8.0	L5 CHONDRITE	C	B		
DOM 10754	~	38.0	L5 CHONDRITE	B/C	B		
DOM 10755	~	37.6	LL5 CHONDRITE	B/C	B		
DOM 10756	~	36.4	LL5 CHONDRITE	B	A/B		
DOM 10757	~	11.4	L5 CHONDRITE	C	B		
DOM 10758	~	28.4	LL6 CHONDRITE	A/B	A		
DOM 10759	~	18.7	LL6 CHONDRITE	B/C	B		
DOM 10890	~	8.6	L6 CHONDRITE	C	B		
DOM 10891	~	12.3	H5 CHONDRITE	C	B		
DOM 10892	~	12.5	L6 CHONDRITE	C	B		
DOM 10893	~	15.2	L6 CHONDRITE	C	B		
DOM 10894	~	15.5	H6 CHONDRITE	C	B		
DOM 10895	~	13.1	H6 CHONDRITE	C	B		
DOM 10896	~	10.4	H6 CHONDRITE	C	B		
DOM 10897	~	15.1	LL6 CHONDRITE	B	B		
DOM 10898	~	10.4	L5 CHONDRITE	C	B		
DOM 10899	~	18.1	L6 CHONDRITE	C	B		
MIL 11007	~	97.5	LL5 CHONDRITE	B/C	B		
MIL 11008	~	102.0	L6 CHONDRITE	B/C	A/B		
MIL 11009	~	111.0	L6 CHONDRITE	B/C	A/B		
MIL 11010	~	4.9	LL5 CHONDRITE	A/B	A/B		
MIL 11011	~	4.9	LL5 CHONDRITE	B	B		
MIL 11012	~	2.6	H6 CHONDRITE	B	A		
MIL 11013	~	5.2	LL6 CHONDRITE	A/B	A		
MIL 11014		3.8	EL5 CHONDRITE	B	B/C		0-1
MIL 11015	~	2.5	LL5 CHONDRITE	B	B		
MIL 11016	~	6.2	LL5 CHONDRITE	A/B	A/B		
MIL 11017	~	9.8	H5 CHONDRITE	C	C		
MIL 11018	~	9.6	L6 CHONDRITE	B	A		
MIL 11019		0.2	CO3 CHONDRITE	A/B	A/B	1-46	
MIL 11020	~	21.0	L6 CHONDRITE	B	A/B		
MIL 11021	~	52.9	LL6 CHONDRITE	B/Ce	A		
MIL 11023	~	19.0	L6 CHONDRITE	B/C	A/B		
MIL 11024	~	24.6	L6 CHONDRITE	A/B	B		
MIL 11026	~	6.8	LL5 CHONDRITE	A/B	A/B		
MIL 11027	~	22.0	LL5 CHONDRITE	B	B		
MIL 11028	~	46.0	LL5 CHONDRITE	A/B	B		
MIL 11029	~	32.4	L5 CHONDRITE	B/C	A		
MIL 11030	~	11.7	LL6 CHONDRITE	B	B		
MIL 11031	~	3.6	H6 CHONDRITE	B/C	A		
MIL 11032	~	11.9	L6 CHONDRITE	B/C	A/B		
MIL 11033		9.0	LL3.2 CHONDRITE	B	B/C	3-47	3-19
MIL 11034	~	12.4	LL6 CHONDRITE	B/C	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 11035	~	6.1	LL5 CHONDRITE	A/B	A/B		
MIL 11036	~	12.4	LL5 CHONDRITE	B	A		
MIL 11037	~	7.1	L6 CHONDRITE	B/C	B/C		
MIL 11038	~	4.8	H5 CHONDRITE	B	A		
MIL 11039	~	2.8	H5 CHONDRITE	B	A		
MIL 11042	~	503.1	H6 CHONDRITE	B	B		
MIL 11043	~	164.1	LL5 CHONDRITE	A/B	B/C		
MIL 11044	~	245.1	L5 CHONDRITE	B/C	A/B		
MIL 11045	~	135.6	LL6 CHONDRITE	A/Be	A		
MIL 11046	~	422.8	L5 CHONDRITE	B/C	A/B		
MIL 11047	~	309.7	LL6 CHONDRITE	A	A		
MIL 11048	~	99.5	L5 CHONDRITE	C	A/B		
MIL 11049	~	83.0	LL5 CHONDRITE	A/Be	B		
MIL 11050		53.2	CO3 CHONDRITE	B	A	1-48	2-9
MIL 11051		62.3	CO3 CHONDRITE	B/C	B	0-64	1-2
MIL 11052	~	38.1	L6 CHONDRITE	C	B		
MIL 11053		31.5	L6 CHONDRITE	B	C	25	
MIL 11054	~	21.8	L5 CHONDRITE	C	B		
MIL 11055		37.0	CO3 CHONDRITE	B	A	0-50	
MIL 11056	~	11.2	LL6 CHONDRITE	A/B	B		
MIL 11057		26.7	CO3 CHONDRITE	B	A	0-43	
MIL 11058	~	24.1	L5 CHONDRITE	C	B		
MIL 11059	~	25.3	LL6 CHONDRITE	A/B	A/B		
MIL 11060	~	14.3	LL6 CHONDRITE	A/B	A		
MIL 11061		10.6	CO3 CHONDRITE	B	B	0-51	
MIL 11062	~	4.8	LL5 CHONDRITE	B	A		
MIL 11063		6.5	CO3 CHONDRITE	B	A	0-47	10
MIL 11064	~	10.7	LL5 CHONDRITE	B/C	B		
MIL 11065	~	6.9	LL5 CHONDRITE	B/C	A		
MIL 11066	~	12.5	L5 CHONDRITE	C	B		
MIL 11067	~	12.5	L6 CHONDRITE	C	A/B		
MIL 11069		3.0	CO3 CHONDRITE	B	A	0-58	6.3
MIL 11070	~	2.0	LL6 CHONDRITE	B	B		
MIL 11071	~	3.1	L5 CHONDRITE	B/C	A/B		
MIL 11072	~	6.5	L6 CHONDRITE	B/C	B		
MIL 11073		3.3	EH3 CHONDRITE	C	C		0-3
MIL 11074	~	3.4	L6 CHONDRITE	C	A		
MIL 11075	~	3.0	L5 CHONDRITE	B	A		
MIL 11076	~	3.0	L6 CHONDRITE	C	A/B		
MIL 11077	~	10.6	LL6 CHONDRITE	B	B		
MIL 11078		15.9	L6 CHONDRITE	B/C	A/B	24	21-22
MIL 11079	~	17.5	LL5 CHONDRITE	B	B		
MIL 11080	~	19.7	L5 CHONDRITE	A/Be	A/B		
MIL 11081	~	24.9	L6 CHONDRITE	B/C	B/C		
MIL 11082	~	19.6	L5 CHONDRITE	B	B		
MIL 11083	~	34.3	L5 CHONDRITE	C	A/B		
MIL 11084	~	32.7	L6 CHONDRITE	B/C	B/C		
MIL 11085	~	21.6	L5 CHONDRITE	B	A/B		
MIL 11086	~	52.6	H6 CHONDRITE	B/C	A/B		
MIL 11087	~	52.5	L6 CHONDRITE	B	A		
MIL 11088	~	100.7	LL6 CHONDRITE	A/B	A		
MIL 11089	~	140.0	LL6 CHONDRITE	A/B	A		
MIL 11102	~	6.7	L6 CHONDRITE	B	A		
MIL 11103	~	5.6	H6 CHONDRITE	A/B	A		
MIL 11104	~	14.0	L5 CHONDRITE	B	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 11105	~	9.2	L5 CHONDRITE	B	A		
MIL 11106	~	6.4	L6 CHONDRITE	A/B	A		
MIL 11107	~	0.7	LL6 CHONDRITE	A/B	A		
MIL 11108	~	0.2	LL6 CHONDRITE	A/B	A		
MIL 11110		178.7	CO3 CHONDRITE	Be	A/B	1-47	5
MIL 11112	~	151.7	H6 CHONDRITE	B/C	A		
MIL 11113	~	152.4	LL6 CHONDRITE	B/C	A		
MIL 11114	~	124.5	L5 CHONDRITE	B/C	A/B		
MIL 11115	~	129.8	L5 CHONDRITE	B/C	A		
MIL 11116		119.4	CO3 CHONDRITE	B	A	1-49	1-20
MIL 11117	~	79.0	L5 CHONDRITE	B/C	A		
MIL 11118		39.5	CO3 CHONDRITE	B	A	0-44	
MIL 11119		29.9	CO3 CHONDRITE	B	A/B	0-56	1
MIL 11120		27.0	CO3 CHONDRITE	A	A	1-61	1-10
MIL 11121		26.9	CO3 CHONDRITE	A/B	A/B	0-62	
MIL 11122	~	21.2	L6 CHONDRITE	C	A/B		
MIL 11124		34.7	CO3 CHONDRITE	A	A	0-46	3-15
MIL 11125	~	50.5	L6 CHONDRITE	C	B		
MIL 11126	~	33.3	L5 CHONDRITE	C	A/B		
MIL 11127	~	36.2	L5 CHONDRITE	Ce	A		
MIL 11128	~	29.4	L6 CHONDRITE	C	A		
MIL 11129	~	17.3	L5 CHONDRITE	C	A		
MIL 11140		14.9	CO3 CHONDRITE	Be	A/B	0-48	
MIL 11142	~	10.1	L5 CHONDRITE	A/B	B		
MIL 11143	~	11.3	L5 CHONDRITE	B/C	B/C		
MIL 11145	~	5.3	LL5 CHONDRITE	A/B	B		
MIL 11146	~	8.4	LL5 CHONDRITE	A	A/B		
MIL 11147		11.9	CO3 CHONDRITE	A/Be	B	25-61	1
MIL 11148	~	6.9	L5 CHONDRITE	B/C	A/B		
MIL 11149	~	5.5	L6 CHONDRITE	A/Be	B		
MIL 11150		1.9	CO3 CHONDRITE	A/B	B	0-44	
MIL 11151	~	0.3	LL6 CHONDRITE	A/B	B/C		
MIL 11152		0.9	CO3 CHONDRITE	A/B	A/B	0-59	7
MIL 11153	~	2.5	L5 CHONDRITE	B	A		
MIL 11154		4.6	CO3 CHONDRITE	B	A	0-61	
MIL 11155	~	0.6	L5 CHONDRITE	A/B	B/C		
MIL 11156		1.8	H5 CHONDRITE	B/C	B/C	18-19	16
MIL 11157		1.6	CO3 CHONDRITE	A/B	B	0-50	
MIL 11158	~	9.3	L6 CHONDRITE	A/B	A		
MIL 11159	~	4.2	L6 CHONDRITE	A/B	A		
MIL 11160	~	31.8	L6 CHONDRITE	B	A		
MIL 11161	~	62.3	LL5 CHONDRITE	A/B	A		
MIL 11162	~	25.0	H6 CHONDRITE	B	A/B		
MIL 11163	~	36.7	LL6 CHONDRITE	B/C	A		
MIL 11164	~	78.9	LL6 CHONDRITE	A/B	B		
MIL 11165	~	85.8	L6 CHONDRITE	B	A		
MIL 11166	~	35.6	L6 CHONDRITE	B	B		
MIL 11167	~	27.4	L6 CHONDRITE	A/B	A		
MIL 11168	~	24.7	L6 CHONDRITE	B	A		
MIL 11169	~	25.6	H5 CHONDRITE	B	A/B		
MIL 11170	~	25.7	L6 CHONDRITE	B	A		
MIL 11171	~	23.4	L6 CHONDRITE	B	A		
MIL 11172	~	24.3	L6 CHONDRITE	B	A/B		
MIL 11173	~	69.9	L6 CHONDRITE	B	B		
MIL 11174	~	13.4	L6 CHONDRITE	B	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 11175	~	15.3	L6 CHONDRITE	B	A		
MIL 11176	~	27.8	L6 CHONDRITE	B	A/B		
MIL 11177	~	14.9	L6 CHONDRITE	B/C	B		
MIL 11179	~	9.2	LL6 CHONDRITE	B/C	A		
MIL 11210	~	394.3	L6 CHONDRITE	B	A/B		
MIL 11211	~	373.9	L5 CHONDRITE	B/C	A		
MIL 11212	~	188.0	L6 CHONDRITE	B/C	A/B		
MIL 11214	~	93.8	L5 CHONDRITE	B	A		
MIL 11215	~	111.0	H5 CHONDRITE	C	C		
MIL 11216	~	137.6	L6 CHONDRITE	B/C	A		
MIL 11217	~	82.0	L6 CHONDRITE	B	A		
MIL 11218	~	74.2	L5 CHONDRITE	B/C	B		
MIL 11219	~	85.9	L6 CHONDRITE	B/C	A/B		
MIL 11220	~	13.6	LL6 CHONDRITE	A/B	A/B		
MIL 11221	~	12.1	L6 CHONDRITE	B/C	A/B		
MIL 11222	~	16.1	L6 CHONDRITE	B/C	A/B		
MIL 11223	~	18.4	H5 CHONDRITE	B/C	A/B		
MIL 11224	~	13.1	L5 CHONDRITE	B/C	A		
MIL 11225	~	3.0	L5 CHONDRITE	B/C	A		
MIL 11226	~	10.3	LL5 CHONDRITE	A/B	A		
MIL 11227	~	6.1	LL6 CHONDRITE	A/B	A		
MIL 11228	~	4.5	LL5 CHONDRITE	B	A/B		
MIL 11229	~	19.6	LL5 CHONDRITE	A/B	A/B		
MIL 11230	~	6.4	LL6 CHONDRITE	B/C	A		
MIL 11231		3.7	CR2 CHONDRITE	B	A/B	0-2.4	2
MIL 11233	~	33.4	L5 CHONDRITE	B/C	A/B		
MIL 11234	~	24.6	LL5 CHONDRITE	B/C	A		
MIL 11235	~	40.1	H5 CHONDRITE	B/C	B		
MIL 11236	~	55.3	LL5 CHONDRITE	B/C	A		
MIL 11237		12.9	CO3 CHONDRITE	B	A	0-62	
MIL 11238	~	24.0	L5 CHONDRITE	B/C	A/B		
MIL 11239	~	29.7	LL5 CHONDRITE	B/C	A		
MIL 11250	~	22.0	H6 CHONDRITE	B/C	A/B		
MIL 11251	~	25.1	H6 CHONDRITE	B/C	A/B		
MIL 11252		26.7	CO3 CHONDRITE	B	A	0-44	
MIL 11253	~	14.9	H6 CHONDRITE	B/C	B		
MIL 11254	~	14.0	L6 CHONDRITE	B/C	B		
MIL 11256	~	26.4	L5 CHONDRITE	B/C	A/B		
MIL 11257	~	28.4	LL6 CHONDRITE	A/B	A		
MIL 11258	~	30.0	L6 CHONDRITE	B/Ce	A		
MIL 11259	~	20.8	L6 CHONDRITE	B/C	A		
MIL 11260	~	34.9	LL6 CHONDRITE	B	A		
MIL 11261		30.8	CO3 CHONDRITE	B	A	25-55	0-7
MIL 11262	~	46.4	L6 CHONDRITE	B/C	A		
MIL 11263	~	25.0	LL5 CHONDRITE	A/B	A		
MIL 11264	~	26.4	LL6 CHONDRITE	A/B	A		
MIL 11265	~	38.9	L5 CHONDRITE	B/C	A/B		
MIL 11266	~	34.0	L6 CHONDRITE	B/Ce	A		
MIL 11267	~	38.5	LL5 CHONDRITE	A/B	A/B		
MIL 11268	~	20.2	LL5 CHONDRITE	B/C	A/B		
MIL 11269	~	18.6	L6 CHONDRITE	B/C	A/B		
MIL 11270	~	7.8	L6 CHONDRITE	C	A/B		
MIL 11272		3.1	CM1/2 CHONDRITE	B	A/B	0-33	
MIL 11274	~	12.3	H6 CHONDRITE	B/C	A		
MIL 11275		17.1	LL6 CHONDRITE	A/B	A	28	23

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 11276	~	6.2	LL6 CHONDRITE	B/C	A/B		
MIL 11277	~	20.5	L5 CHONDRITE	A/B	A/B		
MIL 11278		10.8	LL5 CHONDRITE	A/B	A/B	29	24
MIL 11279	~	10.6	L5 CHONDRITE	A/B	A		
MIL 11280	~	2.2	L5 CHONDRITE	C	B		
MIL 11281	~	3.1	L5 CHONDRITE	C	A/B		
MIL 11282	~	0.7	L6 CHONDRITE	B	A/B		
MIL 11284	~	1.7	L6 CHONDRITE	C	A/B		
MIL 11286	~	3.9	LL6 CHONDRITE	C	A/B		
MIL 11287	~	7.7	LL5 CHONDRITE	B/C	B		
MIL 11288	~	4.6	L6 CHONDRITE	C	A/B		
MIL 11289	~	34.6	LL6 CHONDRITE	B	B		
MIL 11290		327.1	EUCRITE	Ae	A	80	44-67
MIL 11293		49.5	CO3 CHONDRITE	A/B	A	1	1-11
MIL 11295	~	147.7	LL6 CHONDRITE	A	A/B		
MIL 11297	~	390.9	LL6 CHONDRITE	B	A		
MIL 11298	~	623.1	LL5 CHONDRITE	A	A/B		

Table 2

Newly Classified Specimens Listed By Type

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
Achondrite						
MIL 11290	327.1	EUCRITE	Ae	A	80	44-67
DOM 10662	4.5	UREILITE	C	B	20-24	18
Carbonaceous Chondrites						
MIL 11272	3.1	CM1/2 CHONDRITE	B	A/B	0-33	
MIL 11019	0.2	CO3 CHONDRITE	B	A/B	1-46	
MIL 11050	53.2	CO3 CHONDRITE	B	A	1-48	2-9
MIL 11051	62.3	CO3 CHONDRITE	B/C	B	0-64	1-2
MIL 11055	37.0	CO3 CHONDRITE	B	A	0-50	
MIL 11057	26.7	CO3 CHONDRITE	B	A	0-43	
MIL 11061	10.6	CO3 CHONDRITE	B	B	0-51	
MIL 11063	6.5	CO3 CHONDRITE	B	A	0-47	10
MIL 11069	3.0	CO3 CHONDRITE	B	A	0-58	6.3
MIL 11110	178.7	CO3 CHONDRITE	Be	A/B	1-47	5
MIL 11116	119.4	CO3 CHONDRITE	B	A	1-49	1-20
MIL 11118	39.5	CO3 CHONDRITE	B	A	0-44	
MIL 11119	29.9	CO3 CHONDRITE	B	A/B	0-56	1
MIL 11120	27.0	CO3 CHONDRITE	A	A	1-61	1-10
MIL 11121	26.9	CO3 CHONDRITE	A/B	A/B	0-62	
MIL 11124	34.7	CO3 CHONDRITE	A	A	0-46	3-15
MIL 11140	14.9	CO3 CHONDRITE	Be	A/B	0-48	
MIL 11147	11.9	CO3 CHONDRITE	A/Be	B	25-61	1
MIL 11150	1.9	CO3 CHONDRITE	A/B	B	0-44	
MIL 11152	0.9	CO3 CHONDRITE	B	A/B	0-59	7
MIL 11154	4.6	CO3 CHONDRITE	B	A	0-61	
MIL 11157	1.6	CO3 CHONDRITE	A/B	B	0-50	
MIL 11237	12.9	CO3 CHONDRITE	B	A	0-62	
MIL 11252	26.7	CO3 CHONDRITE	B	A	0-44	
MIL 11261	30.8	CO3 CHONDRITE	B	A	25-55	0-7
MIL 11293	49.5	CO3 CHONDRITE	A/B	A	1	1-11
MIL 11231	3.7	CR2 CHONDRITE	B	A/B	0-2.4	2
Chondrites - Type 3						
DOM 10556	119.9	L3.6 CHONDRITE	B	A/Be	18-38	3
DOM 10490	115.9	LL3.2 CHONDRITE	B	A	3-37	15
MIL 11033	9.0	LL3.2 CHONDRITE	B	B/C	3-47	3-19
DOM 10621	45.9	LL3.6 CHONDRITE	B	A/B	21-40	3-32
E Chondrites						
MIL 11073	3.3	EH3 CHONDRITE	C	C		0-3
MIL 11014	3.8	EL5 CHONDRITE	B	B/C		0-1

**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 the Antarctic Meteorite Newsletter vol. 9 (no. 2) (June 1986). Possible pairings were updated in Meteoritical Bulletins 76, 79, 82 through 102, which are available online from the Meteoritical Society webpage:

http://www.lpi.usra.edu/meteor/metbull.php

CO3 CHONDRITE

MIL 11154, MIL 11157, MIL 11237, and MIL 11252 with MIL 11069

MIL 11019, MIL 11050, MIL 11051, MIL 11055, MIL 11057, MIL 11061, MIL 11063, MIL 11110, MIL 11116, MIL 11118, MIL 11119, MIL 11120, MIL 11121, MIL 11124, MIL 11140, MIL11147, MIL 11150, MIL 11152, MIL 11261 and MIL 11293 with MIL 07099

Petrographic Descriptions

This meteorite was previously announced in Spring Newsletter (37,1) Table 1

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 090697	Miller Range	20284	3.0 x 2.7 x 1.5	28.866	L Chondrite

Macroscopic Description: Roger Harrington
The exterior of this meteorite has black patches of fusion crust. Areas without fusion crust are rusty brown. Half of the interior is a gray matrix with some oxidation and the other half consists of metal.

Thin Section (,7) Description: Tim McCoy
The section examined included two pieces, each ~5 mm in maximum dimension. One piece is comprised dominantly of silicate and is typical of an equilibrated L chondrite. Metal and sulfide exhibit evidence of shock melting, including fizzed texture and shock blackening with trails of metal and/or sulfide. The other piece is >99% metal and includes kamacite and taenite. Silicate inclusions include fragmental pieces of chondritic material and micromelted silicate inclusions with a cellular texture. The meteorite is a shocked L chondrite containing an unusually large metal particle.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
DOM 10490	Dominion Range	21909	6.0 x 3.25 x 3.25	115.900	LL3.2 Chondrite

Macroscopic Description: Kathleen McBride
The exterior of this ordinary chondrite has dark brown fusion crust. The interior is a rusty brown matrix with high metal content and chondrules and inclusions of various sizes and colors.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer
The section exhibits numerous, large, well-defined chondrules (up to 1 cm) in a black matrix of fine-grained silicates, troilite and rare metal. Polysynthetically twinned pyroxene is abundant. The meteorite is mildly weathered. Weak shock effects are present. Silicates are unequilibrated; olivines range from Fa_{3-37}, with most grains clustered at Fa_{17} or Fa_{30}, and pyroxenes from Fs_{15}. The meteorite is an LL3 chondrite (estimated subtype 3.2).

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
DOM 10556	Dominion Range	21920	5.0 x 4.8 x 3.0	119.876	L3.6 Chondrite

Macroscopic Description: Cecilia Satterwhite
The exterior has black/brown fusion crust with oxidation and minor evaporites. The dark gray to black matrix has abundant inclusions and chondrules of various sizes and colors. Some rusty oxidation is scattered throughout.
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Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer
The section exhibits numerous, large, well-defined chondrules (up to 1 cm) in a black matrix of fine-grained silicates, troilite and rare metal. This meteorite is brecciated. Polysynthetically twinned pyroxene is abundant. The meteorite is mildly weathered. Weak shock effects are present. Silicates are unequilibrated; olivines range from Fa_{18-38}, with most grains clustered at Fa_{18} or Fa_{30}, and pyroxenes from Fs_3. The meteorite is an L3 chondrite (estimated subtype 3.6).

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
DOM 10621	Dominion Range	21226	4.5 x 2.7 x 2.0	45.865	LL3.6 Chondrite

<u>Macroscopic Description: Cecilia Satterwhite</u>
Black/brown fusion is present over 60% of the exterior with oxidation and some large inclusions/chondrules visible. The dark gray to black matrix has abundant inclusions/chondrules that are lighter than the matrix. Some minor metal and oxidation is visible.

<u>Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer</u>
The section exhibits numerous, well-defined chondrules (up to 3 mm) in a black matrix of fine-grained silicates, troilite and rare metal. Polysynthetically twinned pyroxene is abundant. The meteorite is moderately weathered. Weak shock effects are present. Silicates are unequilibrated; olivines range from Fa_{21-40}, with most grains clustered at Fa_{17} or Fa_{30}, and pyroxenes from Fs_{3-32}. The meteorite is an LL3 chondrite (estimated subtype 3.6).

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
DOM 10662	Dominion Range	17526	1.75 x 1.0 x 1.5	4.530	Ureilite

<u>Macroscopic Description: Kathleen McBride</u>
Thick black fusion crust with bubbles covers this ureilite's exterior surface. The interior is rusty black and fine grained with high metal content.

<u>Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer</u>
The section consists of an aggregate of large olivine and pyroxene grains up to 2 mm across. Metal within the section occurs in very small grains (5 microns) and is evenly distributed throughout the olivine. Carbon veins are discontinuous (olivine grains are not completely surrounded by matrix carbon). The whole section has been mosaicized by shock. Olivine composition is Fa_{20-24}. Pigeonite (Fs_{18},Wo_{4-5}). The meteorite is a shocked ureilite similar to GRA 98032.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11014	Miller Range	23284	1.4 x 1.2 x 0.8	3.779	EL5 Chondrite

<u>Macroscopic Description: Mitchell Haller</u>
85% of the fractured exterior has brownish red fusion crust with lighter brown spots. The interior is a reddish brown matrix with orange clasts, some metal is visible.

<u>Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer</u>
The section shows an aggregate of chondrules (up to 1 mm), chondrule fragments, and pyroxene grains in a matrix of about 30% metal and sulfide. Chondrules contain moderate to small abundances of olivine. Weathering is modest, with staining of some enstatite grains and minor alteration of metal and sulfides. Microprobe analyses show the pyroxene is Fs_{0-1}. The meteorite is a type 5 enstatite chondrite, probably an EL5.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11019	Miller Range	23286	0.7 x 0.4 x 0.3	0.155	CO3 Chondrite
MIL 11050	Miller Range	22576	3.5 x 2.5 x 2.0	53.160	CO3 Chondrite
MIL 11051	Miller Range	22590	5.0 x 2.5 x 2.5	62.270	CO3 Chondrite
MIL 11055	Miller Range	22594	3.25 x 3.0 x 2.0	37.010	CO3 Chondrite
MIL 11057	Miller Range	22599	3.5 x 2.5 x 1.25	26.680	CO3 Chondrite
MIL 11061	Miller Range	22569	6.0 x 4.5 x 4.5	230.240	CO3 Chondrite
MIL 11063	Miller Range	22568	7.0 x 6.0 x 3.5	330.730	CO3 Chondrite
MIL 11110	Miller Range	21564	5.7 x 5.4 x 3.0	178.680	CO3 Chondrite
MIL 11116	Miller Range	21554	5.5 x 3.5 x 3.7	119.444	CO3 Chondrite
MIL 11118	Miller Range	21587	3.5 x 3.0 x 2.0	39.498	CO3 Chondrite
MIL 11119	Miller Range	21552	3.1 x 2.5 x 2.0	29.887	CO3 Chondrite
MIL 11120	Miller Range	21557	3.5 x 3.0 x1.5	27.000	CO3 Chondrite
MIL 11121	Miller Range	21559	3.5 x 2.0 x 2.2	26.860	CO3 Chondrite
MIL 11124	Miller Range	21590	3.1 x 2.8 x 2.3	34.710	CO3 Chondrite
MIL 11140	Miller Range	21550	2.0 x 1.9 x 1.4	14.857	CO3 Chondrite
MIL 11147	Miller Range	21595	2.1 x 2.0 x 1.0	11.921	CO3 Chondrite
MIL 11150	Miller Range	21580	1.4 x 1.2 x 0.5	1.909	CO3 Chondrite
MIL 11152	Miller Range	21567	1.2 x 1.2 x 0.4	0.893	CO3 Chondrite
MIL 11261	Miller Range	22847	3.0 x 2.5 x 2.0	30.833	CO3 Chondrite
MIL 11293	Miller Range	22561	4.0 x 2.2 x 2.0	49.532	CO3 Chondrite

Macroscopic Description: Mitchell Haller, Charis Krysher, Kathleen McBride, Cecilia Satterwhite

The exteriors of these CO3's have brown/black fusion crust, some fractured with evaporites and rusty areas. The interiors range from rusty brown to black matrices with tiny white specks, some have rusty inclusions/chondrules. The textures range from fine to coarse grained.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

These sections consist of abundant, small (up to 1 mm) chondrules, chondrule fragments and mineral grains in a dark matrix. Metals and sulfides occur both within and rimming the chondrules. Olivine ranges in composition from Fa_{0-64}, with a continuous range of intermediate compositions. Pyroxenes range from $Fs_{1-15}Wo_{1-3}$. The matrix appears to consist largely of Fe-rich olivine. These meteorites are CO3 chondrites and are likely paired with the MIL 07099 pairing group.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11033	Miller Range	23875	3.0 x 1.5 x 1.0	8.962	LL3.2 Chondrite

Macroscopic Description: Mitchell Haller

Black fusion crust covers 60% of this ordinary chondrite's exterior surface, some areas have yellow oxidation. The black matrix has some oxidation with abundant multicolored chondrules and inclusions.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

This section exhibits small (up to 1.5 mm), well-defined chondrules in a black matrix of fine-grained silicates, troilite, and rare metal. Polysynthetically twinned pyroxene is abundant. The meteorite is moderately weathered. Weak shock effects are present. Silicates are unequilibrated; olivines range from Fa_{3-47} with a cluster at Fa_{22}, and pyroxenes from Fs_{3-19}. The meteorite is an LL3 chondrite (estimated subtype 3.2).

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11069	Miller Range	22571	11.0 x 7.0 x 5.0	798.800	CO3 Chondrite
MIL 11154	Miller Range	21474	2.0 x 1.0 x 1.0	4.576	CO3 Chondrite
MIL 11157	Miller Range	21496	1.4 x 1.3 x 0.4	1.631	CO3 Chondrite
MIL 11237	Miller Range	22566	2.5 x 1.8 x 1.5	12.866	CO3 Chondrite
MIL 11252	Miller Range	22832	3.5 x 2.5 x.2.0	26.719	CO3 Chondrite

Macroscopic Description: Mitchell Haller, Kathleen McBride, Cecilia Satterwhite

The exteriors of these carbonaceous chondrites have black/brown fusion crust with oxidation haloes and rusty areas. The interiors range from dark gray to black matrix with some oxidation and tiny white specks. Most are fine grained.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

These sections consist of abundant, small (up to 1 mm) chondrules, chondrule fragments, and mineral grains in a dark matrix. The matrix appears to consist largely of Fe-rich olivine. Metals and sulfides occur both within and rimming the chondrules. These meteorites have distinctly less metals and sulfides than the larger CO3 pairing group (MIL 07099). Olivine ranges in composition from Fa_{0-61}, with a continuous range of intermediate compositions. Pyroxenes range $Fs_{0-9}Wo_{1-3}$. These meteorites are CO3 chondrites and are likely paired.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11073	Miller Range	23868	2.0 x 1.5 x 0.5	3.300	EH3 Chondrite

Macroscopic Description: Kathleen McBride

The exterior has brown/black fusion crust with polygonal fractures. The interior is rusty with high metal content.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

The section shows an aggregate of distinct chondrules (up to 1 mm), chondrule fragments, and pyroxene grains in a matrix of about 30% metal and sulfide. Chondrules contain small to moderate abundances of olivine. Weathering is moderate, with staining of most enstatite grains and moderate alteration of metal and sulfides. Microprobe analyses show the pyroxene is Fs_{0-3}. The meteorite is a type 3 enstatite chondrite, probably an EH3.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11231	Miller Range	23239	1.5 x 1.5 x 0.8	3.708	CR2 Chondrite

Macroscopic Description: Cecilia Satterwhite

Black/brown fusion crust covers 95% of the exterior which is fractured and frothy in areas. The interior is a black matrix with visible chondrules and inclusions, some lighter than the matrix. Some rusty areas are visible.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Devin Schrader and Pamela Salyer

The section exhibits a variety of chondrule sizes (from 200 microns up to 3 mm), well-defined metal-rich chondrules, and CAIs in a dark matrix of FeO-rich phyllosilicate. Pyroxenes are polysynthetically twinned. Olivine compositions are Fa_{0-2}, and pyroxenes are Fs_2Wo_1. The meteorite is probably a CR2 chondrite.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11272	Miller Range	22849	2.0 x 1.0 x 0.6	3.117	CM1/2 Chondrite

Macroscopic Description: Cecilia Satterwhite

85% of the exterior has black fusion crust, frothy and fractured in areas. The interior is a black matrix with white specks visible.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

The section consists of a few small chondrules (up to 0.5 mm), mineral grains, and CAIs set in a black matrix; rare metal and sulfide grains are present. Olivine compositions are Fa_{0-33}. Aqueous alteration of the matrix is substantial, but the chondrules are modestly altered. The meteorite is a CM1/2 chondrite.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11275	Miller Range	22838	2.2 x 2.0 x 1.0	17.100	LL6 Chondrite

Macroscopic Description: Cecilia Satterwhite

The black/brown fusion crust covers 90% of the exterior and has some oxidation. The interior is a light gray matrix with oxidation and dark and light inclusions/chondrules visible.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

This meteorite is a typical LL6 chondrite. Of note is a large (3 mm) grain of calcium phosphate.

Sample No.	Location	Field No.	Dimensions (cm)	Weight (g)	Classification
MIL 11290	Miller Range	21553	8.0 x 6.0 x 4.0	327.100	Eucrite

Macroscopic Description: Mitchell Haller

95% of the exterior of this achondrite has jet black fusion crust, glassy and minor rust in areas. The interior matrix is gray with white inclusions, and some minor oxidation.

Thin Section (,2) Description: Cari Corrigan, Linda Welzenbach, Pamela Salyer

This meteorite is dominated by coarse-grained basaltic material. Feldspar laths are up to 1.5 mm. Pyroxene grains are also up to 1.5 mm. One finer-grained clast exists, with grain sizes up to 0.5 mm (also pyroxene and feldspar). Mineral compositions are orthopyroxene ($Fs_{59-67}Wo_{3-5}$), with lamellae of augite ($Fs_{50}Wo_{20}$, although lamellae were too small to get pure end-member compositions), and plagioclase ($An_{78-85}Or_{0.8-1.7}$). One olivine analysis was Fa_{80}. The Fe/Mn ratio of the pyroxene is 29-34. The meteorite is a eucrite.

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 **Sept. 23, 2014 deadline** will be reviewed at the MWG meeting on **Oct. 9-10, 2014 in Washington, D.C.** Requests that are received after the deadline may be delayed for review until MWG meets again in the Spring of 2015. 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/antmet/statistics.cfm

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

http://curator.jsc.nasa.gov/antmet/requests.cfm

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**

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Meteorites On-Line

Several meteorite web sites 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/
JSC Curator, HED Compendium	http://curator.jsc.nasa.gov/antmet/hed/
JSC Curator, Lunar Meteorite Compendium	http://curator.jsc.nasa.gov/antmet/lmc/
JSC Curator, Mars Meteorite Compendium	http://curator.jsc.nasa.gov/antmet/mmc/
ANSMET	http://artscilabs.case.edu/ansmet/
Smithsonian Institution	http://mineralsciences.si.edu/
Lunar Planetary Institute	http://www.lpi.usra.edu
NIPR Antarctic meteorites	http://www.nipr.ac.jp/
Meteoritical Bulletin online Database	http://www.lpi.usra.edu/meteor/metbull.php
Museo Nazionale dell'Antartide	http://www.mna.it/collezioni/catalogo-meteoriti-sede-di-siena
BMNH general meteorites	http://www.nhm.ac.uk/research-curation/research/projects/metcat/search/
Chinese Antarctic meteorite collection	http://birds.chinare.org.cn/en/resourceList/
UHI planetary science discoveries	http://www.psrd.hawaii.edu/index.html
Meteoritical Society	http://www.meteoriticalsociety.org/
Meteoritics and Planetary Science	https://journals.uair.arizona.edu/index.php/maps
Meteorite! Magazine	http://www.meteoritemag.org/
Geochemical Society	http://www.geochemsoc.org
Washington Univ. Lunar Meteorite	http://meteorites.wustl.edu/lunar/moon_meteorites.htm
Washington Univ. "meteor-wrong"	http://meteorites.wustl.edu/meteorwrongs/meteorwrongs.htm
Portland State Univ. Meteorite Lab	http://meteorites.pdx.edu/
Northern Arizona University	http://www4.nau.edu/meteorite/

Other Websites of Interest

OSIRIS-REx	http://osiris-rex.lpl.arizona.edu/
Mars Exploration	http://mars.jpl.nasa.gov
Rovers	http://marsrovers.jpl.nasa.gov/home/
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://curator.jsc.nasa.gov/