National Aeronautics and Space Administration

Antarctic Meteorite Newsletter

Volume 29, Number 2 Sept. 2006

Curator's Comments

Kevin Righter
NASA-JSC

New Meteorites

It is with great pleasure that we announce what is a record breaking number of meteorites in this newsletter. In the fall of 1992, the Antarctic Meteorite Newsletter announced 800 new meteorites, but this one shatters that old record, with a whopping 856 new meteorites. This large number is a reflection of the increased numbers of finds from the past several seasons, and also the hard work of personnel at the Smithsonian Institution (Emma Bullock, Allie Gale, Lauren La Croix, Valerie Slater-Reynolds, Linda Welzenbach and Tim McCoy) and the Johnson Space Center (Kathleen McBride, Kevin Righter, Cecilia Satterwhite). They include samples from the 2003, 2004 and 2005 ANSMET seasons from the Mt. Cranfield Icefield (CRA), Grosvenor Mountains (GRO), La Paz Icefield (LAP), Miller Range (MIL), Sanford Cliffs (SAN), MacAlpine Hills (MAC), Roberts Massif (RBT), and MacKay Glacier (MCY) regions. Descriptions are given for 91 very diverse meteorites ; 8 diogenites , 6 brecciated eucrites, 3 howardites, 24 CM chondrites , 1 CR chondrite, 2 CV chondrites, 5 CO chondrites, 1 CK chondrite, 1 CB chondrite, 2 enstatite chondrites, 16 unusual ordinary chondrites, 8 R chondrites, 4 ureilites, 2 lunar basaltic meteorites (one paired with the LAP group), 2 acapulcoite/lodranites, 1 ungrouped achondrite, 1 mesosiderite, and three unusual iron meteorites.

MIL 05035 is a new lunar basaltic meteorite containing completely maskelynitized plagioclase feldspar like Asuka 881757, but with a slightly different texture and mineralogy.The MIL 05082 is the first Gujba-like (CBa) bencubbinite in the US Antarctic meteorite collection, as the previous 4 samples have been CBb types (QUE94411, QUE94627, QUE 99309, MAC 02675). Two samples may be related to the HED parent body, and/or may represent rare mantle material from a small asteroid - RBT 04239 (ungrouped achondrite) and MIL 03443 (mesosiderite). Perhaps they are related to the ungrouped achondrites QUE 93148 or NWA 2968, both of which have an affinity with the HED parent body. The distinctively green, olivine-rich and paired MIL 05029 and MIL 05136 dunites are very similar to L7 ordinary chondrite impact melt rocks such as PAT 91501. Finally, MAC 041193 is a rare (and small – 1.318 g) transitional member of the acapulcoite-lodranite group similar to EET 84302 and GRA 95209.

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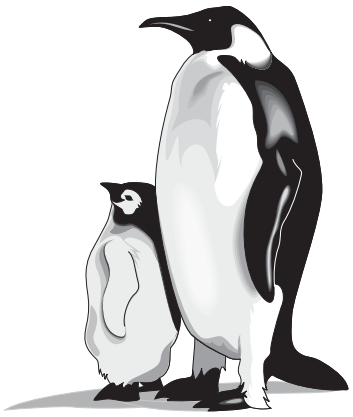
A periodical issued by the Meteorite Working Group to inform scientists of the basic characteristics of specimens recovered in the Antarctic.

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

Inside this Issue



Sample Request Deadline
September 13, 2006

MWG Meets
September 28-29, 2006

Free publication available at: **http://curator.jsc.nasa.gov/antmet/amn/amn.cfm**

All newsletters now available online

As part of the effort to make the resources of the US Antarctic Meteorite Program available electronically, JSC had pdf files created for all newsletters from the start of the program – Antarctic Meteorite Newsletter vol. 1, no. 1 (February 1978) to vol. 17, no. 2 (August 1994). These pdf files are now accessible from our webpage where one normally finds links to the newsletters:

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

Photos of hand samples and thin sections

As part of the effort to make the resources of the US Antarctic Meteorite Program available electronically, JSC and SI have been working together to create digital images of meteorites collected and announced in newsletters prior to the digital age ~ 1994. These images are slowly being added to the classification database online:

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

and those of you interested should check periodically for updates. It is our goal to have all of this information online for non-ordinary chondrites, and to have equal information available for each sample regardless of collection date.

Lunar Meteorite Compendium

Work is continuing on the Lunar Meteorite Compendium. Draft chapters have been completed for twenty lunar meteorites, including all of those collected in Antarctica (ANSMET and NIPR). These will soon be posted on our website. In the meantime if you have some lunar meteorite publications that you think may be relevant to such a project, please send them to *kevin.righter-1@nasa.gov*. A few of you have done this already, and it has been very beneficial - thank you!

Address Updates

If your email address has changed recently, please let us know and send the updated address to either Cecilia Satterwhite or Kevin Righter, so that we can make certain our database is current.

Plans for the 2006-2007 Field Season

Ralph Harvey, Principal Investigator
Antarctic Search for Meteorites (ANSMET) Program

Planning for the upcoming ANSMET season hits high gear just as the northern summer ends. Of course, when submitted years ago the proposals that support this work include some wishful targets; and a detailed, official planning document is submitted in April each year to choose specific sites. But only now, with scant months to go, are the details for the 2006-2007 field season being finalized; when we'll leave, what aircraft we'll be flying, how many flights we're allocated, even whether or not the pilots are actually willing to land where we ask them to. It is a time for careful negotiation and flexibility, with a certain amount of stoicism; sometimes you've got to let fate lead you where it wants you to go. But that doesn't stop us from having pretty elaborate plans!

For the coming season ANSMET will once again deploy two teams of meteorite hunters. The 8-person systematic searching team will operate at icefields in the Grosvenor Mountains region of the central Transantarctic Mountains. 3 key sites are targeted; the Larkman Nunatak icefield, where 80 specimens were recovered in just a few days during the 04-05 field season; the nearby Mt. Block / Mt. Mauger icefields, which we have planned to visit several times in the past but never gotten to, and the Mt. Raymond / Mt. Cecily area, where 164 meteorites were recovered during the 1985 and 1995 field seasons. At all three locations the field team will establish a base camp and then begin systematic recovery of meteorite specimens through overlapping transect searches of exposed blue ice. Travel between these sites will be "old school" snowmobile traverses (we're feeling very "retro" this year). It's not an easy year to predict numbers, either.

The 4-person reconnaissance team is going to extremes this year, exploring the potential for meteorite concentrations at a number of previously unvisited icefields in the southernmost Transantarctic Mountains. Eight icefields have been targeted in the Scott / Reedy/ Klein glacier region, near the Graves Nunataks, the headwaters of the Robeson, Amundsen and Scott Glaciers, and in the Wisconsin Range. As usual, this small and mobile team will set their priorities on the fly, taking weather and meteorite concentration levels into account as they prospect for the next great set of icefields. One thing for certain is that the Recon team always gets the nice views.

So keep your fingers crossed, your paperwork in order, and let's hope fate brings us something really interesting!

New Meteorites

2003-2005 Collection

Pages 4-39 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 29 (1), Feb. 2006. 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 inital 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, Cecilia Satterwhite
Antarctic Meteorite Laboratory
NASA Johnson Space Center
Houston, Texas

Tim McCoy, Linda Welzenbach, Allie Gale, Valerie Reynolds, Lauren La Croix and Emma Bullock
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
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

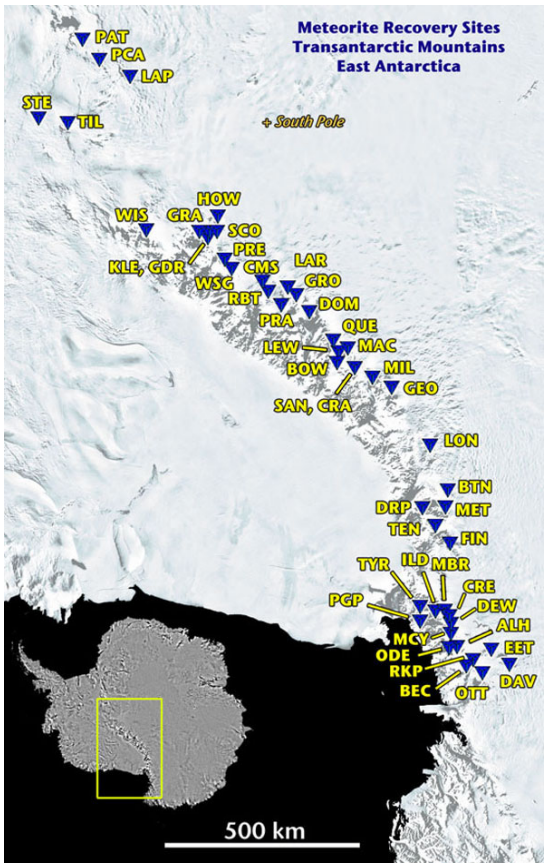


Table 1

List of Newly Classified Antarctic Meteorites **

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
ALH 03541	~t	1053.5	H5 CHONDRITE	B	A		
ALH 03542	~t	20.4	L6 CHONDRITE	B/C	A/B		
CRA 03540	t	151.9	L3 CHONDRITE	BE	A/B	0-26	7-17
GRO 03003	~	10640.0	L5 CHONDRITE	CE	C		
GRO 03004	~t	2470.0	L5 CHONDRITE	B/CE	B/C		
GRO 03005	~t	2576.0	L5 CHONDRITE	B/CE	B/C		
GRO 03006	~t	1161.6	L5 CHONDRITE	B/CE	B/C		
GRO 03008	~t	1693.0	L5 CHONDRITE	B/CE	B/C		
GRO 03009	~t	1112.9	L5 CHONDRITE	B/CE	B/C		
GRO 03010	~t	1397.5	L5 CHONDRITE	B/C	B		
GRO 03011	~t	1257.6	L5 CHONDRITE	B/CE	B/C		
GRO 03012	~t	1184.0	L5 CHONDRITE	A/BE	B/C		
GRO 03018	~t	1554.0	L5 CHONDRITE	BE	B		
GRO 03026	~t	561.2	L5 CHONDRITE	B/C	B		
GRO 03030	~	895.3	L5 CHONDRITE	B/CE	A/B		
GRO 03034	~t	274.6	LL5 CHONDRITE	A/B	A		
GRO 03040	~t	150.4	H5 CHONDRITE	B/C	A		
GRO 03041	~t	183.8	L5 CHONDRITE	A/B	A/B		
GRO 03042	~t	288.3	L5 CHONDRITE	A/B	A/B		
GRO 03043	~t	274.5	L5 CHONDRITE	A/B	A/B		
GRO 03044	~t	275.5	L5 CHONDRITE	B/C	A/B		
GRO 03045	~t	256.1	L5 CHONDRITE	B/C	A/B		
GRO 03046	~t	196.1	L5 CHONDRITE	B	A		
GRO 03047	~t	282.0	L5 CHONDRITE	B/CE	A		
GRO 03048	~t	394.4	L5 CHONDRITE	B/C	A/B		
GRO 03049	~t	311.3	L5 CHONDRITE	B/C	A/B		
GRO 03055	t	384.4	L4 CHONDRITE	B/C	A	23	20
GRO 03056	~t	422.5	H5 CHONDRITE	B	A/B		
GRO 03057	~t	662.9	L5 CHONDRITE	B/C	A/B		
GRO 03058	~t	420.7	L5 CHONDRITE	B/C	A/B		
GRO 03059	~t	625.3	L5 CHONDRITE	A/BE	A/B		
GRO 03064	~	392.5	LL5 CHONDRITE	B	A/B		
GRO 03065	~	303.9	L5 CHONDRITE	B/C	B		
GRO 03066	~	265.1	L5 CHONDRITE	A/B	A		
GRO 03067	~	140.1	L5 CHONDRITE	B	A		
GRO 03068	~	288.2	L5 CHONDRITE	B/CE	A/B		
GRO 03069	~	219.3	L5 CHONDRITE	B/CE	A/B		
GRO 03075	~t	294.2	LL5 CHONDRITE	A/B	A		
GRO 03076	~t	257.7	H5 CHONDRITE	B/C	A		
GRO 03077	~t	201.1	L5 CHONDRITE	B/CE	A/B		
GRO 03078	~t	239.8	LL5 CHONDRITE	A/B	A		
GRO 03079	~t	165.4	LL5 CHONDRITE	A/B	A		
GRO 03110	~t	111.5	L5 CHONDRITE	B/C	A		
GRO 03115	~t	86.1	LL5 CHONDRITE	A	A		
GRO 03116	t	108.3	CR2 CHONDRITE	B/C	A/B	1-37	1-8
GRO 03117	~t	87.5	L5 CHONDRITE	B/C	A/B		
GRO 03118	~t	64.1	L5 CHONDRITE	B/C	A/B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
GRO 03119	~t	75.4	L5 CHONDRITE	B/C	A/B		
LAP 03551	~	2703.4	L6 CHONDRITE	A/B	A		
LAP 03552	~	3521.5	L6 CHONDRITE	A/B	A/B		
LAP 03554	~t	4201.2	H4 CHONDRITE	B	A/B		
LAP 03555	~	458.8	L5 CHONDRITE	A/B	A		
LAP 03556	~	1823.0	L5 CHONDRITE	A/B	A		
LAP 03557	~	1505.1	L5 CHONDRITE	A/B	A		
LAP 03558	~	1521.1	L4 CHONDRITE	B	A		
LAP 03559	~	1839.1	L6 CHONDRITE	A/B	A		
LAP 03560	~	1780.0	L6 CHONDRITE	A/B	A/B		
LAP 03561	~	1853.2	L5 CHONDRITE	B	A/B		
LAP 03562	~	833.5	H5 CHONDRITE	B/C	B		
LAP 03563	~	868.5	L6 CHONDRITE	A/B	A		
LAP 03564	~t	853.8	H4 CHONDRITE	B	A		
LAP 03565	~	1198.7	L5 CHONDRITE	B	A		
LAP 03566	~	1454.4	L6 CHONDRITE	A/B	A/B		
LAP 03567	~	1009.5	L6 CHONDRITE	A/B	A/B		
LAP 03568	~t	514.9	LL6 CHONDRITE	A/B	A/B		
LAP 03570	~	801.6	LL4 CHONDRITE	B	A		
LAP 03571	~	796.9	L5 CHONDRITE	B/C	A		
LAP 03574	~	580.7	LL6 CHONDRITE	A/B	A		
LAP 03575	~	643.0	LL5 CHONDRITE	B	A		
LAP 03576	~	561.0	LL4 CHONDRITE	B	A		
LAP 03577	~t	556.2	LL6 CHONDRITE	A/B	A/B		
LAP 03578	~t	471.6	L5 CHONDRITE	A/B	A/B		
LAP 03579	~t	411.8	LL4 CHONDRITE	B/C	A/B		
LAP 03580	~t	582.9	LL6 CHONDRITE	A/B	A/B		
LAP 03581	~t	541.0	LL4 CHONDRITE	B	A/B		
LAP 03582	~t	408.6	LL5 CHONDRITE	B	B		
LAP 03584	~t	311.4	LL5 CHONDRITE	B	B		
LAP 03585	~t	289.0	L5 CHONDRITE	A/B	A/B		
LAP 03586	~t	343.9	L5 CHONDRITE	A/B	A		
LAP 03588	~t	209.6	L5 CHONDRITE	A/B	A/B		
LAP 03589	~t	232.7	H4 CHONDRITE	B	A		
LAP 03590	~	342.6	LL5 CHONDRITE	A/B	A/B		
LAP 03591	~	235.6	L6 CHONDRITE	B	B		
LAP 03592	~	192.0	LL5 CHONDRITE	C	B/C		
LAP 03594	~	297.0	L5 CHONDRITE	B	B		
LAP 03595	~	175.4	LL5 CHONDRITE	B	C		
LAP 03596	~	397.1	LL5 CHONDRITE	B	A/B		
LAP 03597	~	245.2	LL4 CHONDRITE	B	B		
LAP 03598	~	327.2	L5 CHONDRITE	B	B		
LAP 03599	~	413.2	LL6 CHONDRITE	A/B	A/B		
LAP 03600	t	353.0	LL5 CHONDRITE	A	A/B	29	23
LAP 03601	~t	331.7	H4 CHONDRITE	A/B	A		
LAP 03602	~t	420.8	L6 CHONDRITE	A/B	A		
LAP 03603	~t	305.4	L5 CHONDRITE	B/C	A		
LAP 03604	~t	392.3	L5 CHONDRITE	A/B	A		
LAP 03606	~t	486.1	LL6 CHONDRITE	A/B	A		
LAP 03607	~t	359.2	L5 CHONDRITE	A/B	A		
LAP 03608	~t	330.7	H4 CHONDRITE	B	A		
LAP 03609	~t	451.0	L5 CHONDRITE	B	A		
LAP 03610	~t	447.2	L5 CHONDRITE	A/B	A		
LAP 03611	~t	376.1	LL6 CHONDRITE	A/B	A/B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 03612	~t	206.2	H6 CHONDRITE	B/C	A/B		
LAP 03613	~t	229.8	L5 CHONDRITE	A/B	A		
LAP 03614	~t	98.4	LL6 CHONDRITE	A/B	A		
LAP 03615	~t	120.9	H4 CHONDRITE	B/C	A		
LAP 03616	~t	99.5	H5 CHONDRITE	B/C	A/B		
LAP 03617	~t	173.8	L5 CHONDRITE	A/B	B		
LAP 03618	~t	165.0	L5 CHONDRITE	B/C	A		
LAP 03619	t	164.3	L4 CHONDRITE	A/B	A	23	14-19
LAP 03620	~	121.8	L6 CHONDRITE	B	B		
LAP 03621	~	173.5	L5 CHONDRITE	A/B	A		
LAP 03622	~	127.1	L5 CHONDRITE	A	A		
LAP 03623	~	147.8	L5 CHONDRITE	A/B	A/B		
LAP 03625	~	144.7	L6 CHONDRITE	B/C	B		
LAP 03626	~	145.2	L4 CHONDRITE	B/C	A/B		
LAP 03627	~	155.5	L6 CHONDRITE	B/C	A		
LAP 03628	~	103.3	L5 CHONDRITE	B	A/B		
LAP 03629	~	56.0	L6 CHONDRITE	A/B	A/B		
LAP 03633	~t	261.5	L5 CHONDRITE	B/C	A		
LAP 03634	~t	103.3	L5 CHONDRITE	A	A		
LAP 03635	~t	124.3	LL5 CHONDRITE	A/B	A		
LAP 03636	~t	190.0	L5 CHONDRITE	A/B	A		
LAP 03638	~t	134.8	L5 CHONDRITE	A/B	A		
LAP 03639	t	139.9	R CHONDRITE	A/B	A	19-38	13-29
LAP 03640	~t	168.7	H4 CHONDRITE	B	A		
LAP 03641	~t	212.1	H6 CHONDRITE	B/C	A		
LAP 03642	~t	175.8	H6 CHONDRITE	B/CE	A		
LAP 03643	~t	230.2	L5 CHONDRITE	B/C	A		
LAP 03644	~t	126.4	LL5 CHONDRITE	A/B	A		
LAP 03646	~t	207.8	L5 CHONDRITE	A/B	A		
LAP 03647	~t	219.5	LL5 CHONDRITE	A/B	A		
LAP 03648	~t	214.7	LL5 CHONDRITE	A/B	A		
LAP 03649	~t	149.4	L5 CHONDRITE	A/B	A/B		
LAP 03650	~	150.7	LL4 CHONDRITE	B	A/B		
LAP 03651	~	162.0	L5 CHONDRITE	A/B	A		
LAP 03652	~	98.6	L5 CHONDRITE	A/B	A		
LAP 03653	~	75.6	L5 CHONDRITE	A/B	A/B		
LAP 03654	~	89.3	LL5 CHONDRITE	B	A		
LAP 03655	~	49.6	L5 CHONDRITE	B/C	A		
LAP 03656	~	74.6	LL6 CHONDRITE	A/B	A		
LAP 03657	~	87.0	L5 CHONDRITE	B/C	A		
LAP 03658	~	79.7	LL6 CHONDRITE	A/B	A		
LAP 03659	~	95.3	L6 CHONDRITE	A/B	A/B		
LAP 03660	~t	96.0	L5 CHONDRITE	A/B	A		
LAP 03661	~t	103.1	L5 CHONDRITE	A/B	A/B		
LAP 03662	~t	68.1	LL5 CHONDRITE	A/B	A/B		
LAP 03663	~t	64.1	L5 CHONDRITE	A/B	A		
LAP 03664	~t	61.4	LL6 CHONDRITE	A	A/B		
LAP 03665	~t	40.8	L5 CHONDRITE	A	B/C		
LAP 03666	~t	86.9	L5 CHONDRITE	A/B	A/B		
LAP 03667	~t	42.4	L5 CHONDRITE	A/B	A		
LAP 03668	~t	42.0	LL5 CHONDRITE	A/B	A		
LAP 03669	~t	96.1	L4 CHONDRITE	A/B	A		
LAP 03670	~t	85.7	H6 CHONDRITE	CE	A/B		
LAP 03671	~t	73.0	L5 CHONDRITE	B	B		
LAP 03672	~t	45.8	H4 CHONDRITE	B/C	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 03673	~t	76.4	L4 CHONDRITE	B/C	A		
LAP 03674	~t	38.1	L5 CHONDRITE	B/CE	A		
LAP 03675	~t	35.7	L5 CHONDRITE	B	B		
LAP 03676	~t	52.0	LL5 CHONDRITE	B	B		
LAP 03678	~t	58.0	L5 CHONDRITE	B/C	A/B		
LAP 03679	~t	75.3	L5 CHONDRITE	B/C	B		
LAP 03680	~	55.8	L6 CHONDRITE	A/B	A		
LAP 03681	~	126.2	L4 CHONDRITE	B	A		
LAP 03682	~	123.7	L5 CHONDRITE	A/B	A		
LAP 03683	~	57.7	L5 CHONDRITE	A/B	A		
LAP 03684	~	61.5	L4 CHONDRITE	B	A		
LAP 03685	~	54.8	H5 CHONDRITE	B/C	A		
LAP 03686	~	42.0	L5 CHONDRITE	A/B	A		
LAP 03687	~	54.5	L5 CHONDRITE	A/B	A		
LAP 03688	~	86.8	H5 CHONDRITE	B/C	A/B		
LAP 03689	~	95.4	L5 CHONDRITE	B	A		
LAP 03690	~t	69.1	LL5 CHONDRITE	A/B	A		
LAP 03691	~t	88.3	L5 CHONDRITE	A/B	A		
LAP 03692	~t	78.4	H5 CHONDRITE	B/CE	A		
LAP 03693	~t	71.0	LL5 CHONDRITE	A/B	A		
LAP 03694	~t	83.1	L5 CHONDRITE	A/B	A		
LAP 03695	~t	44.0	H6 CHONDRITE	B/CE	A		
LAP 03696	~t	39.0	LL6 CHONDRITE	A/B	A		
LAP 03697	~t	58.7	LL5 CHONDRITE	A/B	A		
LAP 03698	~t	84.5	LL5 CHONDRITE	A/B	A		
LAP 03699	~t	89.5	H5 CHONDRITE	A/B	A		
LAP 03700	~	85.8	H4 CHONDRITE	B	A/B		
LAP 03701	~	57.7	L5 CHONDRITE	A	A/B		
LAP 03702	~	58.3	H4 CHONDRITE	B/C	B		
LAP 03703	~	97.2	L5 CHONDRITE	A/B	A/B		
LAP 03704	~	61.4	H6 CHONDRITE	C	A		
LAP 03705	~	59.4	L5 CHONDRITE	A	A		
LAP 03706	~	30.5	L6 CHONDRITE	B/C	B		
LAP 03707	~	84.6	H5 CHONDRITE	A	A		
LAP 03708	~	39.3	L6 CHONDRITE	A	A		
LAP 03709	~	41.3	LL6 CHONDRITE	B/C	B		
LAP 03710	~t	40.2	H6 CHONDRITE	C	B		
LAP 03711	~t	63.5	H6 CHONDRITE	C	B		
LAP 03712	~t	84.9	L5 CHONDRITE	B	B		
LAP 03713	~t	69.1	H5 CHONDRITE	C	B		
LAP 03714	t	80.7	L4 CHONDRITE	A/B	A/B	23	13-18
LAP 03715	~t	53.0	LL5 CHONDRITE	A/B	A/B		
LAP 03716	~t	25.7	LL6 CHONDRITE	B	B		
LAP 03717	~t	58.6	LL5 CHONDRITE	B	B		
LAP 03720	~	51.4	LL5 CHONDRITE	B/C	B		
LAP 03721		87.5	UREILITE	B	B/C	9-25	
LAP 03722		29.6	UREILITE	B	B/C	4-24	
LAP 03723	~	97.5	L6 CHONDRITE	B	B		
LAP 03724	~	60.5	H5 CHONDRITE	C	A/B		
LAP 03725	~	45.7	LL6 CHONDRITE	B	B		
LAP 03726	~	57.9	L6 CHONDRITE	B/C	A/B		
LAP 03727	~	30.0	LL5 CHONDRITE	B	B		
LAP 03728	~	62.1	L6 CHONDRITE	A/B	A/B		
LAP 03729	~	58.0	LL5 CHONDRITE	B/C	B		
LAP 03730	~t	47.0	L5 CHONDRITE	B	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 03731	t	56.0	R CHONDRITE	B	A	36	29
LAP 03732	~t	89.3	L5 CHONDRITE	B	B		
LAP 03733	~t	31.2	L5 CHONDRITE	C	A/B		
LAP 03734	~t	19.2	H6 CHONDRITE	B	B/C		
LAP 03735	~t	130.1	L5 CHONDRITE	B	B		
LAP 03736	~t	68.0	LL6 CHONDRITE	B	B		
LAP 03737	~t	23.2	L5 CHONDRITE	B	B		
LAP 03738	~t	30.2	L5 CHONDRITE	A/B	B		
LAP 03739	~t	63.3	L5 CHONDRITE	B	A		
LAP 03740	~t	35.5	LL5 CHONDRITE	A/BE	A/B		
LAP 03741	~t	70.1	L5 CHONDRITE	A/B	A		
LAP 03742	~t	38.1	L5 CHONDRITE	B	A		
LAP 03743	~t	46.3	L5 CHONDRITE	B	A		
LAP 03744	~t	79.4	L6 CHONDRITE	B	A		
LAP 03745	~t	40.7	H5 CHONDRITE	B/CE	A		
LAP 03746	~t	49.0	L6 CHONDRITE	A/B	A		
LAP 03747	~t	55.4	H6 CHONDRITE	B/CE	A/B		
LAP 03748	~t	65.9	H5 CHONDRITE	B/C	A/B		
LAP 03749	~t	22.5	L5 CHONDRITE	A/B	A		
LAP 03750	~t	29.6	LL6 CHONDRITE	A/B	A/B		
LAP 03751	~t	49.5	L5 CHONDRITE	A/B	A/B		
LAP 03752	~t	49.3	H6 CHONDRITE	C	B		
LAP 03753	~t	27.9	H6 CHONDRITE	C	C		
LAP 03754	~t	36.7	LL6 CHONDRITE	A/B	A/B		
LAP 03755	~t	28.4	LL5 CHONDRITE	A/B	A/B		
LAP 03756	~t	56.1	L5 CHONDRITE	B	A/B		
LAP 03757	~t	25.0	LL6 CHONDRITE	B	B		
LAP 03758	~t	28.1	L4 CHONDRITE	A	A/B		
LAP 03759	~t	48.8	H4 CHONDRITE	C	A		
LAP 03760	~t	8.6	H6 CHONDRITE	C	B		
LAP 03761	~t	26.1	L5 CHONDRITE	B/C	B		
LAP 03762	~t	34.5	L5 CHONDRITE	B	B		
LAP 03763	~t	50.7	H6 CHONDRITE	CE	B		
LAP 03764	~t	33.6	L5 CHONDRITE	B	B		
LAP 03765	~t	73.7	H4 CHONDRITE	B	A/B		
LAP 03766	~t	23.0	L5 CHONDRITE	B	B		
LAP 03767	~t	38.8	L5 CHONDRITE	B/C	B		
LAP 03768	~t	84.3	L5 CHONDRITE	B	B		
LAP 03769	~t	61.1	H4 CHONDRITE	B/C	B		
LAP 03770	~	35.4	L5 CHONDRITE	B	B		
LAP 03771	~	55.3	H5 CHONDRITE	C	B		
LAP 03772	~	102.6	L5 CHONDRITE	B	B		
LAP 03773	~	55.7	L5 CHONDRITE	A/B	B		
LAP 03774	~	58.2	L5 CHONDRITE	B	A		
LAP 03775	~	23.0	L6 CHONDRITE	A/B	A/B		
LAP 03776	~	14.6	L6 CHONDRITE	B/C	B		
LAP 03777	~	71.9	H5 CHONDRITE	C	A/B		
LAP 03778	~	91.2	L5 CHONDRITE	B	A/B		
LAP 03779	~	41.5	L5 CHONDRITE	B	B		
LAP 03781		35.0	DIOGENITE	B	A/B	22	23
LAP 03783	~	17.3	L6 CHONDRITE	C	B/C		
LAP 03786		22.4	CM2 CHONDRITE	A/B	A	1-40	6
LAP 03789	~	20.8	L6 CHONDRITE	B/C	A		
LAP 03790	~t	37.8	L5 CHONDRITE	A/B	A/B		
LAP 03791	~t	16.6	L5 CHONDRITE	B	A/B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 03792	~t	7.4	H6 CHONDRITE	C	A/B		
LAP 03793	t	15.0	R CHONDRITE	BE	A/B	35	28
LAP 03794	~t	8.5	H4 CHONDRITE	C	A/B		
LAP 03795	~t	3.2	H6 CHONDRITE	C	C		
LAP 03796	t	16.5	DIOGENITE	B	A/B		23
LAP 03797	~t	4.6	H6 CHONDRITE	C	B		
LAP 03798	~t	4.5	H6 CHONDRITE	C	A		
LAP 03799	~t	6.9	L5 CHONDRITE	B	B		
LAP 03822		1.7	L CHONDRITE METAL	C	A	24	20
LAP 03824		1.5	L CHONDRITE METAL	C	A	24	20
LAP 03900	~t	8.9	L5 CHONDRITE	B/C	B		
LAP 03901	~t	8.6	L5 CHONDRITE	B/C	B		
LAP 03902	t	6.2	R CHONDRITE	A/B	A	37	11-21
LAP 03903	~t	12.7	L5 CHONDRITE	C	B		
LAP 03904	~t	13.8	H6 CHONDRITE	C	A/B		
LAP 03905	~t	15.4	L5 CHONDRITE	B	B		
LAP 03906	~t	11.9	L4 CHONDRITE	B	A/B		
LAP 03907	~t	5.8	L5 CHONDRITE	C	A/B		
LAP 03908	~t	6.4	L5 CHONDRITE	C	A/B		
LAP 03909	~t	6.6	H6 CHONDRITE	C	B		
LAP 03950	~	7.8	H5 CHONDRITE	B/C	A		
LAP 03991		10.5	H5 CHONDRITE	C	C	17	15
LAP 031000		27.9	DIOGENITE	B	A/B	22	23
LAP 031037	~	0.1	FUSION CRUST	A/B	A/B		
LAP 031043		8.1	CM2 CHONDRITE	A/B	A/B	1-48	
LAP 031046		14.6	H5 CHONDRITE	C	C	19	17
LAP 031047		16.5	L CHONDRITE (IMPACT MELT)	A	A	23	17
LAP 031062		12.3	EUCRITE (BRECCIATED)	A/B	A/B		17-41
LAP 031079		1.8	CM1 CHONDRITE	C	C		
LAP 031109		14.5	UREILITE	B/C	A	9-25	
LAP 031113		2.2	EUCRITE (BRECCIATED)	A	A		21-64
LAP 031117		4.2	CO3 CHONDRITE	B	A/B	1-36	1
LAP 031120	~t	6.2	L5 CHONDRITE	B	B		
LAP 031121	~t	11.9	L5 CHONDRITE	B	B		
LAP 031122	~t	6.1	L5 CHONDRITE	B	B		
LAP 031123	~t	19.6	L5 CHONDRITE	B	B		
LAP 031124	~t	10.4	L5 CHONDRITE	B	B		
LAP 031125	t	7.0	H CHONDRITE (IMPACT MELT)	B	A	17	16
LAP 031126	~t	8.5	LL6 CHONDRITE	A	A		
LAP 031127	~t	33.8	LL6 CHONDRITE	A/B	A		
LAP 031128	~t	32.5	LL6 CHONDRITE	A	A		
LAP 031129	~t	13.5	H6 CHONDRITE	CE	A/B		
LAP 031140	~	5.5	LL6 CHONDRITE	B/C	B		
LAP 031142	~	9.9	L5 CHONDRITE	B	A/B		
LAP 031144		2.5	R CHONDRITE	C	A/B	16-42	7-19
LAP 031146	~	4.9	H5 CHONDRITE	B/C	A/B		
LAP 031147	~	5.5	LL6 CHONDRITE	B	A		
LAP 031148	~	3.6	H6 CHONDRITE	C	A		
LAP 031149	~	2.3	H6 CHONDRITE	C	A		
LAP 031160	~t	38.9	L5 CHONDRITE	C	A/B		
LAP 031161	~t	18.6	L5 CHONDRITE	C	B		
LAP 031162	~t	25.1	L4 CHONDRITE	B	B		
LAP 031163	~t	37.3	L4 CHONDRITE	A/B	A/B		
LAP 031164	~t	32.2	L5 CHONDRITE	B	B		
LAP 031165	t	27.0	CM2 CHONDRITE	B	B	1-51	

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 031166 t	15.1	CM1-2 CHONDRITE	B	B	0-1	
LAP 031167 ~t	10.7	L5 CHONDRITE	C	B		
LAP 031168 ~t	11.7	L5 CHONDRITE	B/C	B		
LAP 031169 ~t	7.5	L4 CHONDRITE	C	B		
LAP 031190 t	4.7	EUCRITE (BRECCIATED)	A	A		25-57
LAP 031191 ~t	5.3	L5 CHONDRITE	B/CE	B		
LAP 031192 ~t	1.6	L5 CHONDRITE	B/C	B		
LAP 031193 ~t	3.1	L4 CHONDRITE	B/C	B		
LAP 031194 ~t	2.4	H6 CHONDRITE	C	B		
LAP 031195 t	0.6	CM2 CHONDRITE	B	B	1-33	2-22
LAP 031196 ~t	5.2	L5 CHONDRITE	C	B		
LAP 031197 ~t	0.5	H6 CHONDRITE	B	B		
LAP 031198 ~t	5.6	L5 CHONDRITE	B/C	B		
LAP 031199 ~t	1.4	H6 CHONDRITE	B	B		
LAP 031200 ~t	15.4	H6 CHONDRITE	C	A/B		
LAP 031201 ~t	24.3	H4 CHONDRITE	B	A/B		
LAP 031202 ~t	18.1	H6 CHONDRITE	C	A/B		
LAP 031203 ~t	25.2	L5 CHONDRITE	B	A		
LAP 031204 ~t	23.2	H6 CHONDRITE	C	A/B		
LAP 031205 ~t	14.4	L5 CHONDRITE	B	A/B		
LAP 031206 ~t	26.8	H6 CHONDRITE	B/C	A/B		
LAP 031207 ~t	19.7	L5 CHONDRITE	B	A/B		
LAP 031208 ~t	26.0	L4 CHONDRITE	B	A/B		
LAP 031209 ~t	29.5	L5 CHONDRITE	B	A/B		
LAP 031220	3.1	EH4 CHONDRITE	C	B		0-2
LAP 031221 ~	7.2	LL6 CHONDRITE	A	A/B		
LAP 031222 ~	5.4	H6 CHONDRITE	C	A		
LAP 031223	4.8	L3 CHONDRITE	B/C	B	1-27	3-19
LAP 031224 ~	7.0	LL6 CHONDRITE	A/B	A/B		
LAP 031225 ~	3.3	LL6 CHONDRITE	B	A/B		
LAP 031226 ~	2.7	LL6 CHONDRITE	B	A/B		
LAP 031227 ~	4.5	L5 CHONDRITE	C	A		
LAP 031228 ~	2.4	L5 CHONDRITE	B/C	A/B		
LAP 031229 ~	5.2	LL5 CHONDRITE	B	A/B		
LAP 031230 ~t	12.9	H5 CHONDRITE	C	B		
LAP 031231 ~t	12.8	LL6 CHONDRITE	B	A/B		
LAP 031232 ~t	14.0	L5 CHONDRITE	C	B		
LAP 031233 ~t	35.2	L5 CHONDRITE	B/C	B		
LAP 031234 ~t	11.9	L5 CHONDRITE	B/C	B		
LAP 031235 ~t	33.6	H6 CHONDRITE	C	A		
LAP 031236 ~t	13.0	L5 CHONDRITE	C	B		
LAP 031237 ~t	9.6	H6 CHONDRITE	C	B/C		
LAP 031238 ~t	9.4	L5 CHONDRITE	B	B		
LAP 031239 ~t	8.7	L5 CHONDRITE	B	B		
LAP 031250 ~	1.1	L6 CHONDRITE	B	A/B		
LAP 031252	0.8	CM1 CHONDRITE	BE	B		
LAP 031253 ~	1.0	L5 CHONDRITE	B	B		
LAP 031254 ~	1.3	H6 CHONDRITE	B	A/B		
LAP 031257 ~	1.4	L5 CHONDRITE	B	B		
LAP 031258 ~	2.1	H5 CHONDRITE	C	B		
LAP 031259 ~	1.6	L5 CHONDRITE	C	B		
LAP 031260 ~t	11.8	H5 CHONDRITE	C	C		
LAP 031261 ~t	6.8	L5 CHONDRITE	B	A/B		
LAP 031262 ~t	11.1	L5 CHONDRITE	B/C	B		
LAP 031263 ~t	15.6	L5 CHONDRITE	B	A/B		

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 031264 ~t	8.1	L5 CHONDRITE	B	A/B		
LAP 031265 ~t	8.0	L6 CHONDRITE	A/B	A/B		
LAP 031266 ~t	4.4	H5 CHONDRITE	C	B		
LAP 031267 ~t	16.6	L5 CHONDRITE	B	B		
LAP 031268 t	15.4	CM2 CHONDRITE	B	B	1-38	1-5
LAP 031270 ~	3.2	H6 CHONDRITE	C	A/B		
LAP 031271 ~	8.0	LL5 CHONDRITE	C	B		
LAP 031272 ~	3.0	LL6 CHONDRITE	C	B		
LAP 031273 ~	3.6	H6 CHONDRITE	B	A		
LAP 031274 ~	5.5	L6 CHONDRITE	C	A		
LAP 031275	6.1	R CHONDRITE	B/C	A	17-42	24
LAP 031276 ~	6.2	L5 CHONDRITE	C	A		
LAP 031277 ~	2.2	LL6 CHONDRITE	C	B		
LAP 031278 ~	2.5	L5 CHONDRITE	C	B		
LAP 031290 ~t	5.3	LL5 CHONDRITE	B/C	B		
LAP 031291 ~t	13.7	LL5 CHONDRITE	B	B		
LAP 031292 ~t	2.1	LL6 CHONDRITE	B	B		
LAP 031293 ~t	1.1	H5 CHONDRITE		A/B		
LAP 031294 ~t	4.4	H5 CHONDRITE	C	A/B		
LAP 031295 ~t	1.7	LL5 CHONDRITE	B	B		
LAP 031296 ~t	1.9	LL5 CHONDRITE	B	B		
LAP 031297 ~t	2.1	LL5 CHONDRITE	B	B		
LAP 031298 ~t	5.5	L6 CHONDRITE	C	B		
LAP 031299 t	6.9	CM2 CHONDRITE	B	B	1-43	1-38
LAP 031300 ~t	9.4	LL5 CHONDRITE	B/C	B		
LAP 031301 ~t	6.6	L5 CHONDRITE	C	B		
LAP 031302 ~t	23.0	LL5 CHONDRITE	B/C	B/C		
LAP 031303 ~t	4.0	LL5 CHONDRITE	B/C	B		
LAP 031304 ~t	1.3	L5 CHONDRITE	B	B		
LAP 031305 ~t	6.5	LL5 CHONDRITE	B/C	B		
LAP 031306 ~t	18.8	LL5 CHONDRITE	B	B		
LAP 031307 ~t	45.8	L4 CHONDRITE	B	A/B		
LAP 031308 t	8.7	H CHONDRITE (IMPACT MELT)	C	C	19	16
LAP 031309 t	14.1	DIOGENITE	B	A		23
LAP 031310 t	11.4	H4 CHONDRITE	C	B	18	11-22
LAP 031311 ~t	14.7	L5 CHONDRITE	B/C	A/B		
LAP 031312 ~t	11.4	LL6 CHONDRITE	A/B	A/B		
LAP 031313 ~t	18.4	H5 CHONDRITE	C	B		
LAP 031314 ~t	20.4	L5 CHONDRITE	B/C	A/B		
LAP 031315 ~t	34.0	L5 CHONDRITE	B	A/B		
LAP 031316 t	25.8	EUCRITE (BRECCIATED)	B	A/B		27-84
LAP 031317 ~t	16.1	L5 CHONDRITE	B	A/B		
LAP 031318 ~t	17.3	L5 CHONDRITE	B/C	B		
LAP 031319 ~t	17.5	H6 CHONDRITE	B	A/B		
LAP 031321 t	1.3	L CHONDRITE METAL	C	B	24	20
LAP 031330 ~t	10.7	LL5 CHONDRITE	B	A/B		
LAP 031331 ~t	17.7	LL5 CHONDRITE	B	A/B		
LAP 031332 ~t	12.8	LL5 CHONDRITE	C	B/C		
LAP 031333 ~t	8.5	H6 CHONDRITE	C	C		
LAP 031334 ~t	5.5	L5 CHONDRITE	C	B		
LAP 031335 ~t	8.7	LL5 CHONDRITE	A/B	A/B		
LAP 031336 ~t	19.3	L5 CHONDRITE	C	B		
LAP 031337 ~t	9.4	LL6 CHONDRITE	B	A/B		
LAP 031338 ~t	22.9	LL6 CHONDRITE	B	B/C		
LAP 031339 ~t	75.5	L4 CHONDRITE	B/C	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 031340	~t	2.7	H6 CHONDRITE	C	B		
LAP 031341	~t	1.5	H6 CHONDRITE	C	B		
LAP 031342	t	3.2	UREILITE	C	A/B	2-21	
LAP 031343	~t	3.6	L5 CHONDRITE	C	A/B		
LAP 031344	~t	6.2	LL5 CHONDRITE	B	B		
LAP 031345	~t	7.3	H5 CHONDRITE	C	A/B		
LAP 031346	t	5.4	L3 CHONDRITE	B/C	B	5-40	4-16
LAP 031347	t	9.0	L3 CHONDRITE	C	B	0-33	2-5
LAP 031348	~t	5.7	LL5 CHONDRITE	B/C	B		
LAP 031349	~t	6.1	H5 CHONDRITE	C	B		
LAP 031350	~t	2.4	LL6 CHONDRITE	A/B	A		
LAP 031351	~t	2.6	L6 CHONDRITE	B	A		
LAP 031352	~t	1.5	L5 CHONDRITE	B/C	B		
LAP 031353	~t	4.7	H5 CHONDRITE	C	A/B		
LAP 031354	~t	8.2	L5 CHONDRITE	B/C	B		
LAP 031355	~t	9.2	L6 CHONDRITE	B/C	A		
LAP 031356	~t	3.2	L5 CHONDRITE	C	C		
LAP 031357	~t	2.9	H6 CHONDRITE	C	A/B		
LAP 031358	~t	4.3	H5 CHONDRITE	C	A/B		
LAP 031359	~t	2.5	L6 CHONDRITE	B/C	B		
LAP 031360	~t	10.8	H5 CHONDRITE	C	A/B		
LAP 031361	~t	12.3	H6 CHONDRITE	C	B		
LAP 031362	~t	4.7	H5 CHONDRITE	C	B		
LAP 031363	~t	9.1	L4 CHONDRITE	B	B		
LAP 031364	~t	5.4	L5 CHONDRITE	C	B		
LAP 031365	~t	11.8	H5 CHONDRITE	C	B		
LAP 031366	~t	12.8	H5 CHONDRITE	C	B		
LAP 031367	~t	3.7	LL6 CHONDRITE	A/B	A/B		
LAP 031368	~t	10.1	H5 CHONDRITE	C	B		
LAP 031369	~t	3.2	L6 CHONDRITE	B/C	B		
LAP 031371		8.8	CM2 CHONDRITE	B	B	1-36	1-30
LAP 031373	~	15.1	LL5 CHONDRITE	C	B/C		
LAP 031374	~t	6.5	LL5 CHONDRITE	C	B		
LAP 031375	~t	4.5	L5 CHONDRITE	B	B		
LAP 031376	~t	2.0	H5 CHONDRITE	C	B/C		
LAP 031377	~t	2.2	L5 CHONDRITE	C	B/C		
LAP 031378	~t	1.5	L5 CHONDRITE	C	B/C		
LAP 031379	t	4.3	EUCRITE (BRECCIATED)	A/B	A/B		25-57
LAP 031380	~t	1.1	L5 CHONDRITE	B	A/B		
LAP 031382	~t	0.4	H6 CHONDRITE	B/C	A/B		
LAP 031383	~t	1.4	LL6 CHONDRITE	A/B	A/B		
LAP 031384	~t	0.2	LL5 CHONDRITE	B	A/B		
LAP 031385	~t	0.6	H6 CHONDRITE	B/C	A/B		
LAP 031386	~t	0.3	H6 CHONDRITE	B/C	A/B		
LAP 031387	t	1.1	R CHONDRITE	B	A/B	6-38	1-30
LAP 031388	~t	0.8	H6 CHONDRITE	B/C	A/B		
LAP 031389	~t	1.0	H5 CHONDRITE	B	A/B		
LAP 031391	~	1.7	LL6 CHONDRITE	A/B	A		
LAP 031392	~	3.3	H5 CHONDRITE	B/C	A		
LAP 031393	~	1.1	H6 CHONDRITE	B	A		
LAP 031394	~	1.7	H5 CHONDRITE	B/C	A		
LAP 031395	~	3.0	H6 CHONDRITE	B/C	A		
MIL 03331	~t	1550.0	H6 CHONDRITE	C	C		
MIL 03332	~t	2395.0	L5 CHONDRITE	A/B	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 03333	~t	1922.0	L5 CHONDRITE	A/B	B/C		
MIL 03334	~t	4025.9	H6 CHONDRITE	B/CE	A		
MIL 03335	~t	2283.3	L5 CHONDRITE	B/CE	A/B		
MIL 03336	~t	969.8	L5 CHONDRITE	BE	A/B		
MIL 03337	~t	1564.7	LL5 CHONDRITE	A/BE	A		
MIL 03338	~t	1597.3	L5 CHONDRITE	A/BE	A/B		
MIL 03339	~t	903.7	LL5 CHONDRITE	A/B	A/B		
MIL 03340	~t	911.5	LL5 CHONDRITE	A/B	B/C		
MIL 03341	~t	717.2	LL5 CHONDRITE	A/B	A/B		
MIL 03342	~t	658.0	H5 CHONDRITE	B	A/B		
MIL 03343	~t	765.0	H5 CHONDRITE	B/C	B/C		
MIL 03344	~t	536.5	H5 CHONDRITE	B/C	B/C		
MIL 03345	~t	603.1	L6 CHONDRITE	B/C	B/CE		
MIL 03347	~t	548.2	LL6 CHONDRITE	A/B	B/C		
MIL 03348	~t	395.0	LL6 CHONDRITE	B	A/B		
MIL 03349	~t	274.6	H5 CHONDRITE	B/C	A		
MIL 03350	~t	309.3	LL5 CHONDRITE	A/B	A/B		
MIL 03351	~t	368.6	LL6 CHONDRITE	B/C	B		
MIL 03352	~t	258.7	H5 CHONDRITE	C	B/C		
MIL 03353	~t	262.9	L5 CHONDRITE	B/C	A		
MIL 03354	~t	159.8	L5 CHONDRITE	B/C	A		
MIL 03355	~t	202.6	L6 CHONDRITE	B	A		
MIL 03357	~t	501.2	H5 CHONDRITE	C	B		
MIL 03358	~t	323.2	H5 CHONDRITE	C	B		
MIL 03359	~t	502.7	L5 CHONDRITE	B	BE		
MIL 03365	~t	1114.8	L5 CHONDRITE	A/B	A/B		
MIL 03366	~t	815.9	L5 CHONDRITE	B/C	A/B		
MIL 03367	~t	372.9	H6 CHONDRITE	B/C	B/C		
MIL 03370	~t	169.8	H5 CHONDRITE	C	B		
MIL 03371	t	82.7	L4 CHONDRITE	B	A	24	19
MIL 03372	~t	97.8	LL5 CHONDRITE	B/C	A/B		
MIL 03373	~t	103.9	L5 CHONDRITE	B	A		
MIL 03374	~t	71.3	L5 CHONDRITE	B/CE	A		
MIL 03375	~t	125.9	L5 CHONDRITE	C	A/B		
MIL 03376	~t	212.5	H6 CHONDRITE	C	B		
MIL 03377	t	129.8	CO3 CHONDRITE	B	A/B	1-42	
MIL 03378	~t	145.1	L5 CHONDRITE	C	B		
MIL 03379	~t	207.5	H5 CHONDRITE	C	A/B		
MIL 03380	~t	85.7	L5 CHONDRITE	B	A/B		
MIL 03381	~t	46.0	H5 CHONDRITE	B/C	A		
MIL 03382	~t	58.4	LL5 CHONDRITE	B/C	A		
MIL 03383	~t	191.0	L5 CHONDRITE	A/B	A		
MIL 03384	~t	122.5	LL5 CHONDRITE	B	A/B		
MIL 03385	~t	99.3	LL6 CHONDRITE	A/B	A		
MIL 03386	~t	127.0	L5 CHONDRITE	B/C	A/B		
MIL 03387	~t	68.3	L5 CHONDRITE	B	A		
MIL 03388	~t	154.3	L5 CHONDRITE	B	A		
MIL 03389	~t	146.0	LL5 CHONDRITE	B	A		
MIL 03390	~t	83.9	H5 CHONDRITE	B/C	A		
MIL 03391	~t	68.9	L5 CHONDRITE	B	A		
MIL 03392	~t	94.5	LL5 CHONDRITE	B	A		
MIL 03393	~t	64.7	H5 CHONDRITE	B/C	A		
MIL 03394	~t	22.3	H6 CHONDRITE	B/C	B		
MIL 03395	~t	20.0	H5 CHONDRITE	B/CE	A/B		
MIL 03396	~t	29.1	H5 CHONDRITE	B/C	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 03397	~t	3.9	H5 CHONDRITE	B/C	A		
MIL 03398	~t	16.6	H5 CHONDRITE	B/C	A/B		
MIL 03399	~t	18.6	LL5 CHONDRITE	A/B	A		
MIL 03420	~t	45.1	LL5 CHONDRITE	A/B	A		
MIL 03421	~t	2.4	H5 CHONDRITE	B/C	A		
MIL 03422	~t	29.4	L5 CHONDRITE	B	A		
MIL 03423	~t	45.4	LL5 CHONDRITE	A/B	A		
MIL 03424	~t	4.4	LL5 CHONDRITE	A/B	A		
MIL 03425	~t	18.2	H5 CHONDRITE	B/C	A/B		
MIL 03426	~t	35.2	L5 CHONDRITE	B/C	A/B		
MIL 03427	~t	54.7	H5 CHONDRITE	B/C	A/B		
MIL 03428	~t	23.5	L5 CHONDRITE	B/C	A/B		
MIL 03429	~t	27.3	H5 CHONDRITE	B/CE	A		
MIL 03430	~	4.4	H5 CHONDRITE	C	A/B		
MIL 03431	~	5.8	H6 CHONDRITE	CE	A/B		
MIL 03433	~	16.5	H6 CHONDRITE	C	A		
MIL 03434	~	6.5	L5 CHONDRITE	B/C	B		
MIL 03435	~	4.6	H5 CHONDRITE	C	A/B		
MIL 03436	~	14.2	H6 CHONDRITE	C	A/B		
MIL 03437	~	6.8	H6 CHONDRITE	C	A/B		
MIL 03438	~	37.0	H5 CHONDRITE	C	B		
MIL 03439		1.4	H3 CHONDRITE	B	A	2-20	0-15
MIL 03440	~t	31.7	H6 CHONDRITE	C	A/B		
MIL 03441	~t	34.3	L5 CHONDRITE	B/C	B		
MIL 03442	t	63.8	CO3 CHONDRITE	C	A/B	0-38	2
MIL 03443	t	46.3	MESOSIDERITE	B	B	26	
RBT 03520	~t	1327.7	LL6 CHONDRITE	A/B	A/B		
RBT 03521	~t	1378.0	LL5 CHONDRITE	A	A		
RBT 03524	~	182.6	H6 CHONDRITE	C	A		
RBT 03525	~	299.7	L5 CHONDRITE	A/B	A/B		
RBT 03526	~	269.0	H5 CHONDRITE	C	A		
RBT 03527	~	142.3	L5 CHONDRITE	B	B		
RBT 03528	~	78.3	LL6 CHONDRITE	B	A/B		
RBT 03529	~	128.5	H5 CHONDRITE	C	B		
SAN 03450	~	5168.0	L5 CHONDRITE	B	A/B		
SAN 03454	~	1346.8	L5 CHONDRITE	B	A		
SAN 03457	~	786.9	L5 CHONDRITE	B	B		
SAN 03464	~	919.1	L5 CHONDRITE	BE	A/B		
SAN 03465	~	596.5	L5 CHONDRITE	B	A/B		
SAN 03466	~	553.4	L5 CHONDRITE	BE	A/B		
SAN 03467	~	462.9	L5 CHONDRITE	B	A/B		
SAN 03470	~	224.1	L5 CHONDRITE	B/CE	A/B		
SAN 03471	~	237.4	L5 CHONDRITE	BE	A/B		
SAN 03472		195.2	HOWARDITE	B	A/B		20-52
SAN 03473		125.4	DIOGENITE	B/C	A	22	23
SAN 03474	~	224.5	L5 CHONDRITE	BE	A/B		
SAN 03475	~	179.8	L5 CHONDRITE	B/C	A		
SAN 03476	~	145.6	L5 CHONDRITE	BE	A/B		
SAN 03477	~	108.0	L5 CHONDRITE	B/C	A/B		
SAN 03478	~	107.2	LL5 CHONDRITE	BE	A/B		
SAN 03479	~	58.7	LL5 CHONDRITE	B/C	A/B		
LAP 04836		263.1	DIOGENITE	B	A		23

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 04837	542.0	DIOGENITE	B	A		23
LAP 04838	323.5	HOWARDITE	B	A/B		23-54
LAP 04839	569.4	DIOGENITE	B	A		23
LAP 04841	56.0	LUNAR-BASALT	A/B	A/B		27-75
LAP 04845	1.1	R CHONDRITE	B	A/B	13-38	8-16
LAP 04846	0.5	EUCRITE (BRECCIATED)	B	A/B		12-41
LAR 04328 ~	15850.0	H5 CHONDRITE	B/C	A/B		
MAC 04990 ~	0.2	L5 CHONDRITE	B	B		
MAC 04991 ~	0.6	L5 CHONDRITE	B	B		
MAC 04992 ~	0.6	L5 CHONDRITE	B	B		
MAC 04994 ~	0.5	L5 CHONDRITE	B	B		
MAC 04995 ~	0.4	L5 CHONDRITE	B	B		
MAC 041010 ~	0.9	L5 CHONDRITE	B	B		
MAC 041011 ~	0.4	L5 CHONDRITE	B	B		
MAC 041012 ~	0.8	L5 CHONDRITE	B	B		
MAC 041013 ~	0.4	L5 CHONDRITE	B	B		
MAC 041014 ~	0.6	L5 CHONDRITE	B	B		
MAC 041015 ~	0.4	L5 CHONDRITE	B	B		
MAC 041016 ~	0.7	L5 CHONDRITE	B	B		
MAC 041017 ~	1.1	L5 CHONDRITE	B	B		
MAC 041018 ~	1.2	L5 CHONDRITE	B	B		
MAC 041019 ~	0.8	L5 CHONDRITE	B	B		
MAC 041070 ~	0.7	L5 CHONDRITE	B	B		
MAC 041071 ~	1.0	L5 CHONDRITE	B	B		
MAC 041072 ~	1.2	L5 CHONDRITE	B	B		
MAC 041073 ~	0.6	L5 CHONDRITE	B	B		
MAC 041074 ~	0.3	L5 CHONDRITE	B	B		
MAC 041120 ~	0.9	L5 CHONDRITE	B	B		
MAC 041121 ~	0.9	L5 CHONDRITE	B	B		
MAC 041122 ~	0.5	L5 CHONDRITE	B	B		
MAC 041123 ~	0.8	L5 CHONDRITE	B	B		
MAC 041124 ~	0.5	H5 CHONDRITE	B	B		
MAC 041125 ~	0.5	L5 CHONDRITE	B	B		
MAC 041126 ~	0.6	L5 CHONDRITE	B	B		
MAC 041127	0.5	H4 CHONDRITE	B	B	19	5-21
MAC 041128 ~	0.5	H5 CHONDRITE	B	B		
MAC 041129 ~	0.7	L5 CHONDRITE	B	B		
MAC 041130 ~	0.3	LL5 CHONDRITE	B	B		
MAC 041131 ~	0.6	L5 CHONDRITE	B	B		
MAC 041132 ~	0.2	L5 CHONDRITE	B	B		
MAC 041133 ~	0.4	L5 CHONDRITE	B	B		
MAC 041134 ~	0.7	L5 CHONDRITE	B	B		
MAC 041135 ~	0.4	L5 CHONDRITE	B	B		
MAC 041136 ~	1.2	L5 CHONDRITE	B	B		
MAC 041137 ~	0.6	H5 CHONDRITE	B	B		
MAC 041138 ~	0.9	H5 CHONDRITE	B	B		
MAC 041139 ~	0.6	L5 CHONDRITE	B	B		
MAC 041140 ~	0.3	L5 CHONDRITE	B	B		
MAC 041141 ~	0.5	L5 CHONDRITE	B	B		
MAC 041142 ~	0.6	L5 CHONDRITE	B	B		
MAC 041143 ~	0.7	L5 CHONDRITE	B	B		
MAC 041144 ~	0.9	H4 CHONDRITE	B	B		
MAC 041145 ~	0.9	L5 CHONDRITE	B	B		

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MAC 041146 ~	0.7	L5 CHONDRITE	B	B		
MAC 041147 ~	0.7	L5 CHONDRITE	B	B		
MAC 041148 ~	0.8	L5 CHONDRITE	B	B		
MAC 041149 ~	0.4	L5 CHONDRITE	B	B		
MAC 041150 ~	1.3	L4 CHONDRITE	B	B		
MAC 041151 ~	0.5	L5 CHONDRITE	B	B		
MAC 041152 ~	0.3	H5 CHONDRITE	B	B		
MAC 041153 ~	0.5	L5 CHONDRITE	B	B		
MAC 041154 ~	0.2	L5 CHONDRITE	B	B		
MAC 041155 ~	0.3	L5 CHONDRITE	B	B		
MAC 041156 ~	0.4	H5 CHONDRITE	B	B		
MAC 041157 ~	0.9	H5 CHONDRITE	B	B		
MAC 041158 ~	0.5	L5 CHONDRITE	B	B		
MAC 041159 ~	0.3	L5 CHONDRITE	B	B		
MAC 041180 ~	0.6	L5 CHONDRITE	B	B		
MAC 041181 ~	1.1	L5 CHONDRITE	B	B		
MAC 041182 ~	0.9	L5 CHONDRITE	B	B		
MAC 041183 ~	1.1	L5 CHONDRITE	B	B		
MAC 041184 ~	1.6	L4 CHONDRITE	B	B		
MAC 041185 ~	0.8	L5 CHONDRITE	B	B		
MAC 041186 ~	0.2	H5 CHONDRITE	B	B		
MAC 041187 ~	0.5	L6 CHONDRITE	B	B		
MAC 041188 ~	0.9	L5 CHONDRITE	B	B		
MAC 041189 ~	0.7	L5 CHONDRITE	B	B		
MAC 041190 ~	1.2	L4 CHONDRITE	B	B		
MAC 041191 ~	0.4	L5 CHONDRITE	B	B		
MAC 041192 ~	0.4	L5 CHONDRITE	B	B		
MAC 041193	1.3	ACAPUL/LODRAN	B	A/B	11	11
MAC 041194 ~	0.5	H5 CHONDRITE	B	B		
MAC 041195 ~	0.9	LL5 CHONDRITE	B	B		
MAC 041196 ~	0.5	L5 CHONDRITE	B	B		
MAC 041197 ~	1.4	L6 CHONDRITE	B	B		
MAC 041198 ~	0.8	L5 CHONDRITE	B	B		
MAC 041199 ~	1.0	L5 CHONDRITE	B	B		
MAC 041200 ~	0.5	L5 CHONDRITE	B	B		
MAC 041201 ~	0.8	L4 CHONDRITE	B	B		
MAC 041202 ~	0.5	L5 CHONDRITE	B	B		
MAC 041203 ~	0.2	L5 CHONDRITE	B	B		
MAC 041204 ~	1.0	H5 CHONDRITE	B	B		
MAC 041205 ~	1.3	L5 CHONDRITE	B	B		
MAC 041206 ~	0.9	L5 CHONDRITE	B	B		
MAC 041207 ~	0.8	L5 CHONDRITE	B	B		
MAC 041208 ~	0.5	L5 CHONDRITE	B	B		
MAC 041209 ~	0.4	L5 CHONDRITE	B	B		
MAC 041210 ~	0.5	L5 CHONDRITE	B	B		
MAC 041211 ~	0.4	L5 CHONDRITE	B	B		
MAC 041212 ~	1.0	L5 CHONDRITE	B	B		
MAC 041213 ~	0.4	L5 CHONDRITE	B	B		
MAC 041214 ~	0.2	L5 CHONDRITE	B	B		
MAC 041215 ~	1.0	H5 CHONDRITE	B	B		
MAC 041216 ~	0.7	LL6 CHONDRITE	B	B		
MAC 041217 ~	1.8	L5 CHONDRITE	B	B		
MAC 041218 ~	0.9	L5 CHONDRITE	B	B		
MAC 041219	0.5	CM2 CHONDRITE	B	B	1-38	
MAC 041220 ~	0.8	L5 CHONDRITE	B	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MAC 041221	~	0.5	L5 CHONDRITE	B	B		
MAC 041222	~	0.9	L5 CHONDRITE	B	B		
MAC 041223	~	0.9	L5 CHONDRITE	B	B		
MAC 041224	~	0.8	L5 CHONDRITE	B	B		
MAC 041225	~	0.4	L5 CHONDRITE	B	B		
MAC 041226	~	1.1	L5 CHONDRITE	B	B		
MAC 041227	~	0.5	L5 CHONDRITE	B	B		
MAC 041228	~	1.5	L5 CHONDRITE	B	B		
MAC 041229	~	1.3	L5 CHONDRITE	B	B		
MAC 041230	~	1.2	L5 CHONDRITE	B	B		
MAC 041231	~	1.5	L5 CHONDRITE	B	B		
MAC 041232	~	1.0	L5 CHONDRITE	B	B		
MAC 041233	~	1.1	L5 CHONDRITE	B	B		
MAC 041234	~	1.1	L5 CHONDRITE	B	B		
MAC 041235	~	1.8	L5 CHONDRITE	B	B		
MAC 041236		1.5	L4 CHONDRITE	B	B		
MAC 041237	~	1.5	L5 CHONDRITE	B	B		
MAC 041238	~	1.6	L5 CHONDRITE	B	B		
MAC 041239	~	1.5	L5 CHONDRITE	B	B		
RBT 04110	~	172.1	LL6 CHONDRITE	B/C	C		
RBT 04111	~	273.6	H6 CHONDRITE	C	A/B		
RBT 04112	~	204.3	LL5 CHONDRITE	B	A/B		
RBT 04114		281.6	L3 CHONDRITE	B/C	A/B	1-29	3-18
RBT 04116	~	1142.9	LL6 CHONDRITE	A/B	A/B		
RBT 04119	~	945.5	H5 CHONDRITE	C	C		
RBT 04150	~	27.5	H5 CHONDRITE	C	B		
RBT 04151	~	120.0	H6 CHONDRITE	C	B		
RBT 04152	~	151.9	H6 CHONDRITE	C	B		
RBT 04153	~	86.1	L5 CHONDRITE	B/C	B		
RBT 04154	~	103.8	H5 CHONDRITE	C	B		
RBT 04155	~	103.6	H6 CHONDRITE	C	B		
RBT 04156	~	100.2	H6 CHONDRITE	C	B		
RBT 04157	~	62.6	H5 CHONDRITE	C	B		
RBT 04158	~	86.4	LL6 CHONDRITE	B/C	B		
RBT 04159	~	61.9	H6 CHONDRITE	C	B		
RBT 04160	~	60.0	H6 CHONDRITE	C	A/B		
RBT 04161	~	57.1	H5 CHONDRITE	C	A/B		
RBT 04162		52.3	IRON-UNGROUPED		A		
RBT 04163	~	35.6	H5 CHONDRITE	C	B		
RBT 04164	~	11.9	H6 CHONDRITE	C	C		
RBT 04165	~	14.4	H6 CHONDRITE	C	B		
RBT 04166	~	11.1	LL6 CHONDRITE	C	A/B		
RBT 04167	~	23.5	H5 CHONDRITE	C	B		
RBT 04168	~	11.3	H6 CHONDRITE	C	A/B		
RBT 04169	~	9.1	H6 CHONDRITE	C	A/B		
RBT 04180	~	19.7	H6 CHONDRITE	C	B		
RBT 04181	~	3.1	LL5 CHONDRITE	B	B		
RBT 04182	~	20.0	H6 CHONDRITE	C	B		
RBT 04183	~	12.0	H6 CHONDRITE	C	B		
RBT 04184	~	11.5	H5 CHONDRITE	C	B		
RBT 04185	~	7.7	LL5 CHONDRITE	B	A/B		
RBT 04186		4.6	IRON-IIE (?)		A	18-20	16-19
RBT 04187	~	5.1	L5 CHONDRITE	C	A/B		
RBT 04188	~	10.3	LL6 CHONDRITE	B	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
RBT 04189	~	11.6	H5 CHONDRITE	C	B		
RBT 04200	~	31.3	H6 CHONDRITE	C	A/B		
RBT 04201	~	12.2	L5 CHONDRITE	C	B		
RBT 04202	~	14.8	H5 CHONDRITE	C	C		
RBT 04203	~	17.8	LL6 CHONDRITE	B	C		
RBT 04204	~	13.3	H6 CHONDRITE	C	B		
RBT 04205	~	12.4	H5 CHONDRITE	C	B		
RBT 04206	~	12.8	L5 CHONDRITE	C	A/B		
RBT 04207	~	38.2	H5 CHONDRITE	C	A/B		
RBT 04209	~	2.2	LL6 CHONDRITE	C	A/B		
RBT 04220	~	66.8	H5 CHONDRITE	C	B		
RBT 04222	~	64.0	L5 CHONDRITE	B	A/B		
RBT 04223	~	28.4	L5 CHONDRITE	B	B		
RBT 04224	~	44.8	LL5 CHONDRITE	C	B		
RBT 04225	~	34.1	H6 CHONDRITE	C	A/B		
RBT 04226	~	29.0	H5 CHONDRITE	C	B		
RBT 04227	~	57.3	L6 CHONDRITE	B	A/B		
RBT 04228		19.8	ACAPULCOITE	C	C	8	10
RBT 04229	~	75.1	H5 CHONDRITE	C	B		
RBT 04230	~	68.9	L5 CHONDRITE	C	A/B		
RBT 04231	~	11.1	LL6 CHONDRITE	B	A/B		
RBT 04232	~	9.3	H5 CHONDRITE	C	A/B		
RBT 04233	~	20.3	L5 CHONDRITE	C	B		
RBT 04235	~	8.5	H6 CHONDRITE	C	C		
RBT 04236	~	13.8	LL5 CHONDRITE	A	A		
RBT 04237	~	40.9	L5 CHONDRITE	C	B		
RBT 04239		12.0	ACHON. UNGROUPED	C	A/B	24	20
RBT 04299		55.2	IRON-UNGROUPED				
RBT 04302		11.6	CV3 CHONDRITE	B	B	1-9	1
RBT 04309		1.3	CM2 CHONDRITE	BE	B	1-50	
MCY 05200	~	3532.3	LL5 CHONDRITE	A/B	A		
MCY 05201	~	1917.7	L5 CHONDRITE	A/BE	A/B		
MCY 05202	~	1178.1	L5 CHONDRITE	A/BE	A		
MCY 05203	~	1078.4	LL6 CHONDRITE	A/BE	A/B		
MCY 05204	~	894.3	LL6 CHONDRITE	A	B		
MCY 05205	~	350.9	L6 CHONDRITE	B	A/B		
MCY 05206	~	247.2	LL6 CHONDRITE	B	A/B		
MCY 05207	~	210.9	L6 CHONDRITE	B/C	A/B		
MCY 05208	~	167.2	L6 CHONDRITE	B/C	B/C		
MCY 05209	~	104.7	LL6 CHONDRITE	A/B	A/B		
MCY 05210	~	426.4	LL5 CHONDRITE	A/B	A		
MCY 05211	~	344.8	LL5 CHONDRITE	A/B	A		
MCY 05212	~	319.7	L5 CHONDRITE	B/C	A		
MCY 05213	~	352.3	LL5 CHONDRITE	A/B	A		
MCY 05214	~	306.1	L4 CHONDRITE	B/C	A/B		
MCY 05215	~	254.3	LL5 CHONDRITE	B	A		
MCY 05216	~	145.5	L5 CHONDRITE	A/B	A/B		
MCY 05217	~	198.7	L5 CHONDRITE	B/C	A		
MCY 05218		214.5	H3 CHONDRITE	B/C	A/B	1-21	2-9
MCY 05219		145.0	CV3 CHONDRITE	B	A/B	0-4	
MCY 05220	~	96.6	L5 CHONDRITE	B	A/B		
MCY 05221	~	81.0	L5 CHONDRITE	C	B		
MCY 05222	~	81.3	LL5 CHONDRITE	A/B	A		
MCY 05223	~	69.0	H5 CHONDRITE	C	A		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MCY 05224	~	40.5	LL5 CHONDRITE	B	A		
MCY 05225	~	67.6	LL6 CHONDRITE	A	A		
MCY 05226	~	65.5	L5 CHONDRITE	C	A/B		
MCY 05227	~	6.3	LL6 CHONDRITE	A/B	B		
MCY 05228	~	29.9	L6 CHONDRITE	C	B/C		
MCY 05229		9.7	CM2 CHONDRITE	B	B	1-28	
MCY 05230		60.1	CM2 CHONDRITE	B	A	1-32	
MCY 05231		6.2	CM1-2 CHONDRITE	B	A/B	0-33	1-40
MCY 05232		2.1	CK4 CHONDRITE	B	B	33	
MCY 05233	~	8.7	L5 CHONDRITE	C	A/B		
MCY 05234		0.8	CM1-2 CHONDRITE	B	A/B	0-2	
MCY 05236	~	2.1	L6 CHONDRITE	C	A/B		
MCY 05237	~	9.7	L5 CHONDRITE	B	A/B		
MCY 05238	~	1.4	L5 CHONDRITE	C	A/B		
MCY 05241	~	2.5	L5 CHONDRITE	B/C	A/B		
MCY 05242		2.0	CM2 CHONDRITE	B	B	1-25	6
MCY 05243	~	11.1	L6 CHONDRITE	B/C	B		
MCY 05244	~	3.1	LL5 CHONDRITE	B	A/B		
MCY 05245		1.3	CM2 CHONDRITE	B	B	0-40	3
MCY 05247	~	9.2	LL5 CHONDRITE	B	A/B		
MCY 05249	~	4.7	LL5 CHONDRITE	B	B		
MCY 05250	~	34.9	L6 CHONDRITE	B/C	B		
MCY 05251		25.3	CM2 CHONDRITE	B	B	1-38	1
MCY 05252	~	41.5	LL6 CHONDRITE	A/B	A/B		
MCY 05253	~	18.2	H6 CHONDRITE	B/C	B		
MCY 05254	~	8.8	LL6 CHONDRITE	A/B	A/B		
MCY 05260	~	4.2	L5 CHONDRITE	B/C	B		
MCY 05261	~	0.2	LL5 CHONDRITE	B	A/B		
MCY 05262	~	0.8	LL6 CHONDRITE	B	A/B		
MCY 05263	~	0.9	LL6 CHONDRITE	B	A/B		
MIL 05024		196.6	CO3 CHONDRITE	A/B	A	0-55	
MIL 05029		132.7	L CHONDRITE (IMPACT MELT)	A/BE	A/B	25	21
MIL 05035		142.2	LUNAR-BASALT	A/B	A/B		31-55
MIL 05050		253.3	L3 CHONDRITE	B	A/B	6-25	3-17
MIL 05051	~	368.0	L5 CHONDRITE	C	A/B		
MIL 05082		12.0	CB CHONDRITE	B	B	1-3	1-3
MIL 05085		18.6	HOWARDITE	B	B		27-60
MIL 05104		41.0	CO3 CHONDRITE	B	A	1-28	1
MIL 05112		2.8	CM2 CHONDRITE	CE	C	1-4	
MIL 05118		1.4	H4 CHONDRITE	CE	B	20	17
MIL 05119		0.9	CM2 CHONDRITE	B	B	0-32	
MIL 05124		2.6	CM2 CHONDRITE	B	B	1-20	32
MIL 05133		4.6	LL5 CHONDRITE	A	A/B	28	24
MIL 05136		8.3	L CHONDRITE (IMPACT MELT)	B/C	B	25	21
MIL 05137		2.4	CM1 CHONDRITE	BE	B		
MIL 05139		10.6	EH3 CHONDRITE	C	C	2	0-3
MIL 05152		46.6	CM2 CHONDRITE	B	A/B	1-37	1-26
TYR 05180	~	244.2	L5 CHONDRITE	B/C	A/B		

Table 2

Newly Classified Specimens Listed By Type

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
Achondrites							
MAC 041193		1.3	ACAPUL/LODRAN	B	A/B	11	11
RBT 04228		19.8	ACAPULCOITE	C	C	8	10
RBT 04239		12.0	ACHON. UNGROUPED	C	A/B	24	20
LAP 03781		35.0	DIOGENITE	B	A/B	22	23
LAP 03796	t	16.5	DIOGENITE	B	A/B		23
LAP 031000		27.9	DIOGENITE	B	A/B	22	23
LAP 031309	t	14.1	DIOGENITE	B	A		23
SAN 03473		125.4	DIOGENITE	B/C	A	22	23
LAP 04836		263.1	DIOGENITE	B	A		23
LAP 04837		542.0	DIOGENITE	B	A		23
LAP 04839		569.4	DIOGENITE	B	A		23
LAP 031062		12.3	EUCRITE (BRECCIATED)	A/B	A/B		17-41
LAP 031113		2.2	EUCRITE (BRECCIATED)	A	A		21-64
LAP 031190	t	4.7	EUCRITE (BRECCIATED)	A	A		25-57
LAP 031316	t	25.8	EUCRITE (BRECCIATED)	B	A/B		27-84
LAP 031379	t	4.3	EUCRITE (BRECCIATED)	A/B	A/B		25-57
LAP 04846		0.5	EUCRITE (BRECCIATED)	B	A/B		12-41
SAN 03472		195.2	HOWARDITE	B	A/B		20-52
LAP 04838		323.5	HOWARDITE	B	A/B		23-54
MIL 05085		18.6	HOWARDITE	B	B		27-60
LAP 04841		56.0	LUNAR-BASALT	A/B	A/B		27-75
MIL 05035		142.2	LUNAR-BASALT	A/B	A/B		31-55
LAP 03721		87.5	UREILITE	B	B/C	9-25	
LAP 03722		29.6	UREILITE	B	B/C	4-24	
LAP 031109		14.5	UREILITE	B/C	A	9-25	
LAP 031342	t	3.2	UREILITE	C	A/B	2-21	
Carbonaceous Chondrites							
MIL 05082		12.0	CB CHONDRITE	B	B	1-3	1-3
MCY 05232		2.1	CK4 CHONDRITE	B	B	33	
LAP 031079		1.8	CM1 CHONDRITE	C	C		
LAP 031252		0.8	CM1 CHONDRITE	BE	B		
MIL 05137		2.4	CM1 CHONDRITE	BE	B		
LAP 031166	t	15.1	CM1-2 CHONDRITE	B	B	0-1	
MCY 05231		6.2	CM1-2 CHONDRITE	B	A/B	0-33	1-40
MCY 05234		0.8	CM1-2 CHONDRITE	B	A/B	0-2	

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 03786		22.4	CM2 CHONDRITE	A/B	A	1-40	6
LAP 031043		8.1	CM2 CHONDRITE	A/B	A/B	1-48	
LAP 031165	t	27.0	CM2 CHONDRITE	B	B	1-51	
LAP 031195	t	0.6	CM2 CHONDRITE	B	B	1-33	2-22
LAP 031268	t	15.4	CM2 CHONDRITE	B	B	1-38	1-5
LAP 031299	t	6.9	CM2 CHONDRITE	B	B	1-43	1-38
LAP 031371		8.8	CM2 CHONDRITE	B	B	1-36	1-30
MAC 041219		0.5	CM2 CHONDRITE	B	B	1-38	
RBT 04309		1.3	CM2 CHONDRITE	BE	B	1-50	
MCY 05229		9.7	CM2 CHONDRITE	B	B	1-28	
MCY 05230		60.1	CM2 CHONDRITE	B	A	1-32	
MCY 05242		2.0	CM2 CHONDRITE	B	B	1-25	6
MCY 05245		1.3	CM2 CHONDRITE	B	B	0-40	3
MCY 05251		25.3	CM2 CHONDRITE	B	B	1-38	1
MIL 05112		2.8	CM2 CHONDRITE	CE	B	1-20	
MIL 05119		0.9	CM2 CHONDRITE	B	B	0-32	
MIL 05124		2.6	CM2 CHONDRITE	B	B	1-20	32
MIL 05152		46.6	CM2 CHONDRITE	B	A/B	1-37	1-26
LAP 031117		4.2	CO3 CHONDRITE	B	A/B	1-36	1
MIL 03377	t	129.8	CO3 CHONDRITE	B	A/B	1-42	
MIL 03442	t	63.8	CO3 CHONDRITE	C	A/B	0-38	2
MIL 05024		196.6	CO3 CHONDRITE	A/B	A	0-55	
MIL 05104		41.0	CO3 CHONDRITE	B	A	1-28	1
GRO 03116	t	108.3	CR2 CHONDRITE	B/C	A/B	1-37	1-8
RBT 04302		11.6	CV3 CHONDRITE	B	B	1-9	1
MCY 05219		145.0	CV3 CHONDRITE	B	A/B	0-4	
Chondrites Type 3							
MIL 03439		1.4	H3 CHONDRITE	B	A	2-20	0-15
MCY 05218		214.5	H3 CHONDRITE	B/C	A/B	1-21	2-9
CRA 03540	t	151.9	L3 CHONDRITE	BE	A/B	0-26	7-17
LAP 031223		4.8	L3 CHONDRITE	B/C	B	1-27	3-19
LAP 031346	t	5.4	L3 CHONDRITE	B/C	B	5-40	4-16
LAP 031347	t	9.0	L3 CHONDRITE	C	B	0-33	2-5
RBT 04114		281.6	L3 CHONDRITE	B/C	A/B	1-29	3-18
MIL 05050		253.3	L3 CHONDRITE	B	A/B	6-25	3-17
Chondrites Ungrouped							
LAP 03822		1.7	L CHONDRITE METAL	C	A	24	20
LAP 03824		1.5	L CHONDRITE METAL	C	A	24	20
LAP 031321	t	1.3	L CHONDRITE METAL	C	B	24	20
E Chondrites							
MIL 05139		10.6	EH3 CHONDRITE	C	C	2	0-3
LAP 031220		3.1	EH4 CHONDRITE	C	B		0-2

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
H Chondrites							
LAP 031125	t	7.0	H CHONDRITE (IMPACT MELT)	B	A	17	16
LAP 031308	t	8.7	H CHONDRITE (IMPACT MELT)	C	C	19	16
Irons							
RBT 04162		52.3	IRON-UNGROUPED				
RBT 04186		4.6	IRON-IIE (?)				
RBT 04299		55.2	IRON-UNGROUPED				
L Chondrites							
LAP 031047		16.5	L CHONDRITE (IMPACT MELT)	A	A	23	17
MIL 05029		132.7	L CHONDRITE (IMPACT MELT)	A/BE	A/B	25	21
MIL 05136		8.3	L CHONDRITE (IMPACT MELT)	B/C	B	25	21
R Chondrites							
LAP 03639	t	139.9	R CHONDRITE	A/B	A	19-38	13-29
LAP 03731	t	56.0	R CHONDRITE	B	A	36	29
LAP 03793	t	15.0	R CHONDRITE	BE	A/B	35	28
LAP 03902	t	6.2	R CHONDRITE	A/B	A	37	11-21
LAP 031144		2.5	R CHONDRITE	C	A/B	16-42	7-19
LAP 031275		6.1	R CHONDRITE	B/C	A	17-42	24
LAP 031387	t	1.1	R CHONDRITE	B	A/B	6-38	1-30
LAP 04845		1.1	R CHONDRITE	B	A/B	13-38	8-16
Stony Irons							
MIL 03443	t	46.3	MESOSIDERITE	B	B	26	

**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 t indicates that the samples were thawed in MPL (see Feb., 2006 newsletter for explanation)

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), and No. 90 (Meteoritics and Planetary Science 41, in press).

CM1-2 CHONDRITE

MCY 05234 with MCY 05231

CM2 CHONDRITE

LAP 031371 with LAP 03786
LAP 031165, LAP 031195, LAP 031268 and LAP 031299 with LAP 031043
MCY 05230, MCY 05242, MCY 05245 and MCY 05251 with MCY 05229
MIL 05124 with MIL05112

CO3 CHONDRITE

MIL 03442, MIL05024 and MIL05104 with MIL 03377

DIOGENITE

LAP 03781, LAP 03796, LAP 031000, LAP 031309, LAP 04836, LAP 04837 and LAP 04839 with LAP 91900

EUCRITE (BRECCIATED)

LAP 031379 with LAP 031190

H CHONDRITE (IMPACT MELT)

LAP 031308 with LAP 031173

IRON-UNGROUPED

RBT 04299 with RBT 04162

L CHONDRITE (IMPACT MELT)

MIL 05136 with MIL 05029

L CHONDRITE METAL

LAP 03824 and LAP 031321 with LAP 03822

LUNAR-BASALT

LAP 04841 with LAP 02205

R CHONDRITE

LAP 03731, LAP 03793, LAP 03902, LAP 031144, LAP 031387 and LAP 04845 with LAP 03639

UREILITE

LAP 03721, LAP 03722 and LAP 031109 with LAP 03587

Petrographic Descriptions

Sample No.:	CRA 03540
Location:	Mt Cranfield Ice Field
Field No.:	14911
Dimensions (cm):	6.3 x 5.0 x 2.5
Weight (g):	151.916
Meteorite Type:	L3 Chondrite

Macroscopic Description: Cecilia Satterwhite

The exterior has a black fusion crust over 60% of its surface. The fusion crust is frothy in areas and fractures are visible. Evaporite deposits and rust are present. Areas without fusion crust are rusty brown with some rust stained inclusions. The interior is a dark gray matrix with abundant inclusions. Inclusions are lighter in color than the surrounding matrix and some are weathered.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy

The section exhibits numerous well-defined chondrules (up to 2 mm) in a black matrix of fine-grained silicates, metal and troilite. Polysynthetically twinned pyroxene is abundant and a few chondrules contain glass. The meteorite is moderately weathered. Silicates are unequilibrated; olivines range from Fa_{0-26} and pyroxenes from Fs_{7-17}. The meteorite is an L3 chondrite and may be of low subtype (estimated subtype 3.3).

Sample No.:	GRO 03116
Location:	Grosvenor Mountains
Field No.:	15611
Dimensions (cm):	4.0 x 3.0 x 2.5
Weight (g):	108.286
Meteorite Type:	CR2 Chondrite

Macroscopic Description: Cecilia Satterwhite

90% black/brown fusion crust covers the exterior surface. Some areas are rusty with oxidation, pits and fractures. The interior is a rusty brown with abundant mm-sized weathered inclusions.

Thin Section (,2) Description: Tim McCoy

The section exhibits large (up to 1.5 mm), well-defined, metal-rich chondrules and CAI's in a dark matrix of FeO-rich phyllosilicate. Silicates are unequilibrated; olivines range from $Fa_{1-36,}$ with most Fa_{0-2}, and pyroxenes from $Fs_{1-8}Wo_{1-2}$. The meteorite is a CR2 chondrite.

Sample No.:	LAP 03639, LAP 03731, LAP 03793, LAP 03902, LAP 031144, LAP 031387, LAP 04845
Location:	LaPaz Ice Field
Field No.:	16019, 16519, 16071, 16379, 16623, 16593, 17199
Dimensions (cm):	9.0 x 5.5 x 3.6; 4.0 x 2.5 x 3.0; 3.0 x 2.0 x 2.0; 2.0 x 1.5 x 1.25; 1.5 x 1.0 x 1.0; 1.25 x 0.5 x 1.0; 1.5 x 1.0 x 0.75
Weight (g):	139.938; 55.963; 15.043; 6.162; 2.479; 1.093; 1.137
Meteorite Type:	R Chondrite

Macroscopic Description: Kathleen McBride and Cecilia Satterwhite

The exteriors of these R chondrites have brown/black fusion crust with some evaporites. The interiors are gray with some large light and dark inclusions. Some oxidation and rust is present.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy

The sections are so similar that a single description suffices. The sections consist of ~50% of well-defined, small (up to 1 mm) chondrules set in a slightly recrystallized matrix of silicates and sulfides (both troilite and pentlandite). Olivines are nearly homogeneous ($Fa_{35-38,}$ with a small tail of analyses down to Fa_{6}) and pyroxenes exhibit a larger range (Fs_{1-30}). The meteorites are R chondrites, probably of petrologic type 4.

Sample No.:	LAP 03721, LAP 03722, LAP 031109
Location:	LaPaz Ice Field
Field No.:	16503, 16770, 16890
Dimensions (cm):	4.5 x 3.5 x 3.0; 3.5 x 2.5 x 2.5; 2.1 x 1.5 x 1.2
Weight (g):	87.495; 29.550; 14.5
Meteorite Type:	Ureilite

Macroscopic Description: Kathleen McBride and Cecilia Satterwhite

The exteriors have dark brown fusion crust exhibiting polygonal fractures and a few iridescent halos. Areas lacking fusion crust reveal a weathered brown interior. The interiors are hard but friable and revealed a dark gray matrix. Shiny grains with no apparent cleavage planes and translucent minerals with a slight yellow tint and opaque white to light gray grains are visible.

Thin Section (,2) Description: Valerie Reynolds, Tim McCoy and Linda Welzenbach

These sections are similar and almost certainly paired with LAP 03587, which was described as follows: The section consists of an aggregate of large olivine and pyroxene grains up to 2 mm across. Individual olivine grains are rimmed by carbon-rich material containing traces of metal. Shock effects in olivine are minor; pyroxenes exhibit mosaicism. Olivine has cores of Fa_{25}, and rims of Fa_{10}. Pigeonite is $Fs_{14-20}Wo_{8-10}$. The meteorite is a ureilite.

Sample No.:	LAP 03781, LAP 03796, LAP031000, LAP 031309, LAP 04836, LAP 04837, LAP 04839
Location:	LaPaz Ice Field
Field No.:	16027, 16383, 16254, 16962, 16911, 16384, 16375
Dimensions(cm):	4.5 x 2.0 x 2.5; 3.0 x 2.0 x 2.0; 3.0 x 2.75 x 2.0; 3.0 x 2.0 x 2.0; 7.0 x 4.5 x 4.5; 9.0 x 6.5 x 5.0; 9.5 x 6.0 x 5.5
Weight (g):	35.004;16.525; 27.874;14.062; 263.1;542.0; 569.4
Meteorite Type:	Diogenite

Macroscopic Description: Kathleen McBride

The exterior of these diogenites has chocolate brown patches of fusion crust. The exposed interior has a rough texture and light green to white clasts. The interior is a light matrix, stained in areas with a washed out rusty color. Green clasts ranging in size from < 2 mm are visible.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy

The sections show a groundmass of coarse (up to 1.5 mm) comminuted pyroxene of composition of $Fs_{23}Wo_{2}$. The meteorites are diogenites and are compositionally similar to LAP 91900, with which they may be paired.

Sample No.:	LAP 03786, LAP 031371
Location:	LaPaz Ice Field
Field No.:	16835, 16954
Dimensions (cm):	4.75 x 2.0 x 2.0; 3.0 x 2.0 x 1.25
Weight (g):	22.395; 8.813
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

The exterior has purple black fusion crust with polygonal fractures. The interior is black and powdery with light <1 mm sized chondrules/inclusions.

Thin Section (,2) Description: Tim McCoy and Emma Bullock

The sections consist of moderately abundant small chondrules (up to 0.5 mm), mineral grains and CAIs set in a black matrix; metal and sulfide grains are present. Olivine compositions are Fa_{1-40}, orthopyroxene is Fs_{1-30}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorites are CM2 chondrites.

Sample No.:	LAP 03822, LAP 03824, LAP 031321
Location:	LaPaz Ice Field
Field No.:	16778, 16964, 16649
Dimensions (cm):	1.0 x 0.5 x 0.75; 1.0 x 0.75 x 0.5; 1.0 x 0.5 x 0.5
Weight (g):	1.732; 1.454; 1.309
Meteorite Type:	L Chondrite Metal

Macroscopic Description: Kathleen McBride

Exteriors have a brown/black fusion crust with oxidation. All of these appear to have high iron content and resembles metal.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds

These meteorites are so similar that a single description suffices. All three are cm-sized meteorites comprised of 80-95+% metal displaying Neumann bands and mm-sized inclusions of silicates. The silicates sometimes exhibit relict chondrules. Silicates are homogeneous (Fa_{24}, Fs_{20}). These appear to be anomalously large metal particles separated from an L chondrite.

Sample No.:	LAP 031043, LAP 031165, LAP 031195, LAP 031268, LAP 031299
Location:	LaPaz Ice Field
Field No.:	16435, 16670, 16682, 16813, 16980
Dimensions (cm):	3.0 x 2.5 x 1.0; 4.0 x 3.0 x 3.0; 1.25 x 1.25 x 0.25; 3.0 x 2.5 x 2.0; 2.5 x 1.8 x 1.25
Weight (g):	8.121; 27.00; 0.625; 15.407; 6.927
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

Black polygonally fractured fusion crust is on the exterior of these meteorites. The interior of these carbonaceous chondrites is a black powdery matrix with light gray and white chondrules and inclusions.

Thin Section (,2) Description: Tim McCoy

The sections consist 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_{1-48}; rare orthopyroxenes are Fs_{1-38}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorites are CM2 chondrites.

Sample No.:	LAP 031046
Location:	LaPaz Ice Field
Field No.:	16856
Dimensions (cm):	2.5 x 1.5 x 1.75
Weight (g):	14.639
Meteorite Type:	H5 Chondrite

Macroscopic Description: Kathleen McBride

The exterior of this ordinary chondrite is dark brown. The interior is brown, friable and crumbles easily.

Thin Section (,2) Description: Tim McCoy

The meteorite is an H5 chondrite (Fa_{19}, Fs_{17}) that has been extensively shock-blackened and veined. No high-pressure polymorphs (e.g., ringwoodite) were noted during optical microscopy.

Sample No.:	LAP 031047
Location:	LaPaz Ice Field
Field No.:	16900
Dimensions (cm):	3.5 x 2.0 x 1.5
Weight (g):	16.471
Meteorite Type:	L Chondrite (Impact Melt)

Macroscopic Description: Kathleen McBride

50% of the exterior is dull black with oxidation halos. The interior is a dark brown matrix which is friable and very weathered.

Thin Section (,2) Description: Tim McCoy

The section is an L chondrite (Fa_{23}, Fs_{17}) that has been partially to completely impact remelted. A fine-grained uniform texture includes numerous voids and rounded composite metal-sulfide particles.

Sample No.:	LAP 031062
Location:	LaPaz Ice Field
Field No.:	16437
Dimensions (cm):	2.5 x 2.5 x 1.0
Weight (g):	12.245
Meteorite Type:	Eucrite (Brecciated)

Macroscopic Description: Kathleen McBride

50% of the exterior of this eucrite has black fusion crust with glassy patches. The interior is tan to light brown with no metal and black and white specks are visible.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds

This meteorite consists of a brecciated matrix that contains abundant coarse (up to 2 mm) mineral fragments and rare polyminerallic clusters. Mineral compositions are relatively homogeneous with orthopyroxene ($Fs_{41}Wo_{1}$), lamellae of augite ($Fs_{17}Wo_{41}$), and plagioclase ($An_{89}Or_{0.5}$). The Fe/Mn ratio of the pyroxene is ~28. The meteorite is a brecciated eucrite.

Sample No.:	LAP 031079
Location:	LaPaz Ice Field
Field No.:	16427
Dimensions (cm):	1.5 x 1.0 x 1.0
Weight (g):	1.843
Meteorite Type:	CM1 Chondrite

Macroscopic Description: Kathleen McBride

The exterior is a dull dark gray color. The interior of this carbonaceous chondrite is a muddy gray with no distinctive features.

Thin Section (,2) Description: Tim McCoy

The section consists of a few small chondrules (up to 0.5 mm) that have been completely replaced by phyllosilicate set in an Fe-rich serpentine matrix. No isolated mineral grains or CAIs are apparent; sulfide and carbonate grains are present. Unaltered olivine or pyroxene grains of sufficient size for microprobe analyses were not found. The meteorite is a highly altered CM chondrite probably of petrologic type 1.

Sample No.:	LAP 031113
Location:	LaPaz Ice Field
Field No.:	16120
Dimensions (cm):	1.4 x 1.2 x 0.8
Weight (g):	2.245
Meteorite Type:	Eucrite (Brecciated)

Macroscopic Description: Cecilia Satterwhite

75% of this achondrite's exterior surface has shiny black fusion crust with some white and light gray inclusions visible. The interior is a light, fine grained gray matrix with various sized white and light gray clasts.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds

This meteorite is dominated by fine-grained (~200 micron average grain size) basaltic material which occurs as both the host and clasts. Occasional fine-grained clasts up to 1 mm and large individual pyroxene and plagioclase crystals up to 1.5 mm occur. Pyroxene exhibits a range of compositions from approximately $Fs_{50-64}Wo_{2-4}$ to $Fs_{25}Wo_{43}$, reflecting exsolution, and plagioclase is An_{79-93}. The Fe/Mn ratio of the pyroxene is ~28. The meteorite is a brecciated eucrite.

Sample No.:	LAP 031117
Location:	LaPaz Ice Field
Field No.:	16672
Dimensions (cm):	2.1 x 1.2 x 0.5
Weight (g):	4.173
Meteorite Type:	CO3 Chondrite

Macroscopic Description: Cecilia Satterwhite

The exterior has black fractured fusion crust that is frothy in areas. The interior is a fine grained black matrix with mm sized white inclusions.

Thin Section (,2) Description: Tim McCoy

The section consists 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_{1-36}, with a continuous range of intermediate compositions and a slight peak at Fa_{1-5}. A single pyroxene is Fs_{1}. The meteorite is a CO3 chondrite.

Sample No.:	LAP 031125
Location:	LaPaz Ice Field
Field No.:	16364
Dimensions (cm):	2.0 x 1.5 x 1.25
Weight (g):	7.039
Meteorite Type:	H Chondrite (Impact Melt)

Macroscopic Description: Kathleen McBride

The exterior of this meteorite is a dull brown color with no fusion crust. The interior of this ordinary chondrite is black, friable and has some rust.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy

The meteorite exhibits a relatively coarse (50-100 micron grain size), equigranular silicate matrix including rounded to irregular, metal-sulfide blebs reaching 0.5 mm and vesicles reaching 0.5 mm. Mafic silicate compositions (Fa_{17}, Fs_{16}) indicate H chondrite parentage and texture suggests it is an impact melt.

Sample No.:	LAP 031166
Location:	LaPaz Ice Field
Field No.:	16363
Dimensions (cm):	3.5 x 2.25 x 1.5
Weight (g):	15.083
Meteorite Type:	CM1-2 Chondrite

Macroscopic Description: Kathleen McBride

Purplish black fractured fusion crust covers 80% of the exterior. The interior is a dull black matrix with tiny white chondrules. This meteorite is soft and moderately friable.

Thin Section (,2) Description: Tim McCoy

The section consists of a few small chondrules (up to 0.5 mm) that have been nearly replaced by phyllosilicate, with only a few remaining unaltered olivines, set in an Fe-rich serpentine matrix. Sulfide and carbonate grains are present. Olivine is Fa_{0-1}. The meteorite is a highly altered CM chondrite of petrologic type 1-2.

Sample No.:	LAP 031190, LAP 031379
Location:	LaPaz Ice Field
Field No.:	16611, 16598
Dimensions (cm):	2.5 x 1.5 x 1.0; 2.0 x 1.5 x 1.25
Weight (g):	4.733; 4.335
Meteorite Type:	Eucrite (Brecciated)

Macroscopic Description: Kathleen McBride

The exterior surface has black/brown fusion crust, shiny on some surfaces, dull on others. The exterior is a gray matrix with little rust and dark gray and white angular clasts.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds

These meteorites are so similar that a single description suffices. The meteorites are dominated by fine-grained (~200 micron average grain size) basaltic material with patches of interlocking euhedral plagioclase crystals up to 1 mm and basaltic clasts up to 1 mm. Weathering is moderate. Mineral compositions are homogeneous with orthopyroxene ($Fs_{56}Wo_3$), with lamellae of augite ($Fs_{25}Wo_{43}$), and plagioclase ($An_{89}Or_{0.5}$). The Fe/Mn ratio of the pyroxene is ~29. The meteorites are brecciated eucrites.

Sample No.:	LAP 031220
Location:	LaPaz Ice Field
Field No.:	16044
Dimensions (cm):	2.25 x 1.25 x 0.75
Weight (g):	3.098
Meteorite Type:	EH4 Chondrite

Macroscopic Description: Kathleen McBride

60% of the exterior has brown/black fusion crust. The interior black matrix is very rusty with minor metal and a rough texture.

Thin Section (,2) Description: Tim McCoy

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. It has about 1.4 wt.% Si in the metal. Pyroxene is Fs_{0-2}. The meteorite is an EH4 chondrite.

Sample No.:	LAP 031223
Location:	LaPaz Ice Field
Field No.:	16677
Dimensions (cm):	1.5 x 1.5 x 1.5
Weight (g):	4.778
Meteorite Type:	L3 Chondrite

Macroscopic Description: Kathleen McBride
The exterior is covered with brown/black fusion crust with polygonal fractures. The coarse grained interior is rusty with low metal and some gray and rust stained chondrules visible.

Thin Section (,2) Description: Tim McCoy
The section exhibits numerous small, well-defined chondrules (up to 1.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Silicates are unequilibrated; olivines range from Fa_{1-27} and pyroxenes are Fs_{3-19}. The meteorite is an L3 chondrite (estimated subtype 3.6).

Sample No.:	LAP 031252
Location:	LaPaz Ice Field
Field No.:	16094
Dimensions (cm):	1.5 x 1.0 x 0.5
Weight (g):	0.803
Meteorite Type:	CM1 Chondrite

Macroscopic Description: Kathleen McBride
The exterior is covered with brown/black fusion crust with polygonal fractures.

Thin Section (,2) Description: Tim McCoy
The section consists of a few small chondrules (up to 0.5 mm) that have been completely replaced by phyllosilicate set in an Fe-rich serpentine matrix. No isolated mineral grains or CAIs are apparent; sulfide and carbonate grains are present. Unaltered olivine or pyroxene grains of sufficient size for microprobe analyses were not found. The meteorite is a highly altered CM1 chondrite.

Sample No.:	LAP 031275
Location:	LaPaz Ice Field
Field No.:	16190
Dimensions (cm):	2.75 x 1.25 x 1.25
Weight (g):	6.148
Meteorite Type:	R Chondrite

Macroscopic Description: Kathleen McBride
Brown/black fusion crust with oxidation halos covers 100% of this meteorite's exterior surface. The interior has a gray matrix with rust and small black inclusions.

Thin Section (,2) Description: Tim McCoy
The section consist of rare, well-defined, chondrules (up to 1 mm) set in a recrystallized matrix of silicates and sulfides (both troilite and pentlandite). Olivines are nearly homogeneous ($Fa_{38-42,}$ with a small tail of analyses down to Fa_{17}) and a singe pyroxene is Fs_{24}. The meteorite is an R chondrite of type 5.

Sample No.:	LAP 031308
Location:	LaPaz Ice Field
Field No.:	16735
Dimensions (cm):	2.25 x 1.5 x 1.5
Weight (g):	8.673
Meteorite Type:	H Chondrite (Impact Melt)

Macroscopic Description: Kathleen McBride
This H chondrite has a rough brown interior which crumbles easily.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy
The meteorite exhibits an area with microcrystalline silicate matrix including rounded metal-sulfide blebs reaching 20 microns, as well as relict grains, chondrules and clasts reaching up to a few mm that are highly-shocked with local metal-sulfide redistribution. Mafic silicate compositions (Fa_{19}, Fs_{17}) indicate H chondrite parentage and texture suggests it is an impact melt breccia. Pairing with the LAP 031173 group is possible.

Sample No.:	LAP 031316
Location:	LaPaz Ice Field
Field No.:	16711
Dimensions (cm):	3.5 x 2.5 x 2.0
Weight (g):	25.819
Meteorite Type:	Eucrite (Brecciated)

Macroscopic Description: Kathleen McBride
A small patch of thick black fusion crust is visible on the exterior surface. The interior is gray with glass vein (?). Some areas are vesicular and others are white and powdery.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
This meteorite consists of a highly-shocked clastic matrix of pyroxene and plagioclase up to 1 mm. Both pyroxene and plagioclase are mosaicized. Pyroxene exhibits a range of compositions ($Fs_{27-61}Wo_{2-44}$) reflecting exsolution of augite and orthopyroxene. The Fe/Mn ratio is ~28. Plagioclase is An_{80-90}. The meteorite is a brecciated eucrite.

Sample No.:	LAP 031342
Location:	LaPaz Ice Field
Field No.:	16276
Dimensions (cm):	1.75 x 1.5 x 0.75
Weight (g):	3.182
Meteorite Type:	Ureilite

Macroscopic Description: Kathleen McBride
The exterior has brown/black fusion crust with oxidation halos. The interior has a crystalline matrix with rust and high metal.

Thin Section (,2) Description: Linda Welzenbach and Valerie Reynolds
The section consists of an aggregate of large olivine and pyroxene grains up to 2 mm across. Individual olivine grains are rimmed by carbon-rich material containing traces of metal. Olivine has cores of Fa_{21}, and rims of Fa_{2}. Pigeonite is Fs_{18},Wo_{6}. The meteorite is a ureilite.

Sample No.:	LAP 031346
Location:	LaPaz Ice Field
Field No.:	16971
Dimensions (cm):	2.0 x 1.25 x 1.25
Weight (g):	5.403
Meteorite Type:	L3 Chondrite

Macroscopic Description: Kathleen McBride
The exterior has thick dull black fusion crust. The matrix is a rusty black with moderate amounts of metal. Light and rusty chondrules are visible.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy
The section exhibits numerous well-defined chondrules (up to 2.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Polysynthetically twinned pyroxene is abundant and a few chondrules contain glass. The meteorite is moderately weathered. Silicates are unequilibrated; olivines range from Fa_{5-40} and pyroxenes from Fs_{4-16}. The meteorite is an L3 chondrite and may be of low subtype (estimated subtype 3.3).

Sample No.:	LAP 031347
Location:	LaPaz Ice Field
Field No.:	16708
Dimensions (cm):	2.0 x 2.0 x 1.25
Weight (g):	8.957
Meteorite Type:	L3 Chondrite

Macroscopic Description: Kathleen McBride
100% of the exterior is covered with brown/black fusion crust. The interior is dark rusty to black with mm sized rusty stained chondrules.

Thin Section (,2) Description: Valerie Reynolds and Tim McCoy
The small section exhibits numerous well-defined chondrules (up to 2.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Polysynthetically twinned pyroxene is abundant. The meteorite is moderately weathered. Silicates are unequilibrated; olivines range from Fa_{0-33} and pyroxenes from Fs_{2-5}. The meteorite is an L3 chondrite (estimated subtype 3.6).

Sample No.:	MIL 03377, MIL 03442, MIL 05024, MIL 05104
Location:	Miller Range
Field No.:	13602, 13285, 18062, 18051
Dimensions (cm):	5.0 x 5.0 x 3.0; 5.0 x 3.0 x 2.0; 4.9 x 4.6 x 3.2; 4.0 x 3.0 x 2.0
Weight (g):	129.75; 63.835; 196.63; 41.018
Meteorite Type:	C03 Chondrite

Macroscopic Description: Kathleen McBride and Cecilia Satterwhite

Exterior surfaces are covered with smooth chocolate brown to black fusion crust. The interiors range from hard to soft black rusty matrix with dark and light colored chondrules/inclusions.

Thin Section (,2) Description: Tim McCoy

The sections 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_{0-55}, with a continuous range of intermediate compositions and a slight peak at Fa_{1-5}. Pyroxene is Fs_{1-2}. The meteorites are CO3 chondrites.

Sample No.:	MIL 03439
Location:	Miller Range
Field No.:	11376
Dimensions (cm):	1.0 x 1.25 x 0.75
Weight (g):	1.367
Meteorite Type:	H3 Chondrite

Thin Section (,2) Description: Tim McCoy

The section exhibits numerous small, well-defined chondrules (up to 1.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Silicates are unequilibrated; olivines range from Fa_{2-20} and pyroxenes are Fs_{0-15}. The meteorite is an H3 chondrite (estimated subtype 3.6).

Sample No.:	MIL 03443
Location:	Miller Range
Field No.:	13260
Dimensions (cm):	4.0 x 3.0 x 2.0
Weight (g):	46.253
Meteorite Type:	Mesosiderite

Macroscopic Description: Kathleen McBride

60% of the exterior has smooth, thin brown/black fusion crust with polygonal fractures. The interior is a soft and friable tan matrix with green inclusions ranging in size from 1-7 mm.

Thin Section (,2) Description: Tim McCoy

The section shows a groundmass of coarse (up to 1.5 mm) comminuted olivine of composition of Fa_{26} (Fe/Mn ~ 42) with minor troilite, metal and spinel. The meteorite is tentatively classified as a clast from a mesosiderite – where similar olivine-rich clasts have been reported – but the possibility that it samples the missing dunitic component from the HED parent body should be considered.

Sample No.:	SAN 03472
Location:	Sanford Cliffs
Field No.:	14959
Dimensions (cm):	5.5 x 6.0 x 2.5
Weight (g):	195.238
Meteorite Type:	Howardite

Macroscopic Description: Cecilia Satterwhite

Exterior has brown/black dull fusion crust with rust and fractures. The interior is a fine grained tan matrix with mm sized light, dark and weathered inclusions.

Thin Section (,2) Description: Tim McCoy

The section shows a groundmass of comminuted pyroxene and plagioclase (up to 0.5 mm) with fine- to coarse-grained basaltic clasts ranging up to 1 mm. Most of the pyroxene is orthopyroxene with compositions ranging from $Fs_{20-52}Wo_{1-4}$ and a single augite of $Fs_{22}Wo_{42}$. The Fe/Mn ratio of the pyroxene is ~30. Plagioclase is $An_{92}Or_{0.2}$. The meteorite is a howardite.

Sample No.:	SAN 03473
Location:	Sanford Cliffs
Field No.:	14903
Dimensions (cm):	5.4 x 4.0 x 3.6
Weight (g):	125.352
Meteorite Type:	Diogenite

Macroscopic Description: Cecilia Satterwhite
The exterior is a dull gray to tan color with no fusion crust visible. The weathered interior is tan with green crystals.

Thin Section (,2) Description: Tim McCoy
The section shows a groundmass of coarse (up to 1.5 mm) comminuted pyroxene of composition of $Fs_{23}Wo_{2}$. The meteorite is a diogenite.

Sample No.:	LAP 04838
Location:	LaPaz Ice Field
Field No.:	17167
Dimensions (cm):	6.5 x 6.0 x 4.5
Weight (g):	323.5
Meteorite Type:	Howardite

Macroscopic Description: Kathleen McBride
90% of the exterior has thick, shiny black fusion crust with a ropy texture. Several vugs are present. The interior is a light gray matrix with numerous clasts of various sizes and colors.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
The section shows a groundmass of comminuted pyroxene and plagioclase (up to 0.5 mm) with coarse-grained basaltic clasts, isolated mineral grains and impact-produced glass spherules and clasts. Pyroxene exhibits a broad range of compositions ($Fs_{23-54}Wo_{3-36}$) and plagioclase of An_{89}. The Fe/Mn ratio of the pyroxene is ~30. The meteorite is a howardite.

Sample No.:	LAP 04841
Location:	LaPaz Ice Field
Field No.:	17462
Dimensions (cm):	5.0 x 2.5 x 2.5
Weight (g):	55.992
Meteorite Type:	Lunar-Basalt

Macroscopic Description: Kathleen McBride
Dull, black fusion crust covers over 50% of the exterior. Some surfaces have shiny areas. The interior is a pinkish tan and white matrix with black glass filled veins.

Thin Section (,2) Description: Valerie Reynolds, Tim McCoy and Linda Welzenbach
The meteorite is almost certainly paired with the LAP 02205 pairing group. LAP 02205 was described as follows: The section consists of coarse-grained unbrecciated basalt with elongate pyroxene (up to 0.5 mm) and plagioclase laths (up to 1 mm) (~60:40 px:plag), rare phenocrysts of olivine (up to 1 mm) and interstitial oxides and late-stage mesostasis. Shock effects include undulatory extinction in pyroxene and shock melt veins and pockets. Microprobe analyses reveal pigeonite to augite of $Fs_{26-80}Wo_{14-36}$, plagioclase is $An_{85-90}Or_{0-1}$ and a single olivine phenocryst is Fa_{50}. The Fe/Mn ratio in the pyroxenes averages ~60. The meteorite is a lunar olivine-bearing basalt.

Sample No.:	LAP 04846
Location:	LaPaz Ice Field
Field No.:	17409
Dimensions (cm):	1.0 x 0.75 x 0.5
Weight (g):	0.512
Meteorite Type:	Eucrite (Brecciated)

Macroscopic Description: Kathleen McBride
80% of exterior has shiny black fusion crust. The gray matrix has some rust stains and white inclusions are visible.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
This meteorite consists of a brecciated matrix that contains abundant coarse (up to 2 mm) mineral fragments and rare polyminerallic clusters. Mineral compositions are relatively homogeneous with orthopyroxene ($Fs_{41}Wo_{2}$), with lamellae of augite ($Fs_{12}Wo_{45}$), and plagioclase ($An_{91}Or_{0.5}$). The Fe/Mn ratio of the pyroxene is ~30. The meteorite is a brecciated eucrite.

Sample No.:	MAC 041193
Location:	MacAlpine Hills
Field No.:	15807
Dimensions (cm):	1.0 x 1.5 x 0.5
Weight (g):	1.318
Meteorite Type:	Acapulcoite-Lodranite

Thin Section (,2) Description: Tim McCoy

The section exhibits a granoblastic texture with abundant triple junctions and grain sizes of 100-300 microns. Olivine, pyroxene, plagioclase and coarse metal are uniformly distributed, but sulfide is markedly depleted relative to chondrites. Olivine is Fa_{11}, pyroxene is $Fs_{11}Wo_2$ and plagioclase is $An_{15}Or_5$. The meteorite is a member of the acapulcoite-lodranite clan. It is not paired with MAC 88177, but is similar in some respects to the transitional members EET 84302 and GRA 95209.

Sample No.:	MAC 041219
Location:	MacAlpine Hills
Field No.:	15819
Dimensions (cm):	1.0 x 1.0 x 0.5
Weight (g):	0.475
Meteorite Type:	CM2 Chondrite

Thin Section (,2) Description: 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 and sulfide grains are present. Olivine compositions are Fa_{1-38}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.

Sample No.:	RBT 04114
Location:	Roberts Massif
Field No.:	16395
Dimensions (cm):	7.5 x 4.5 x 5.0
Weight (g):	281.6
Meteorite Type:	L3 Chondrite

Macroscopic Description: Kathleen McBride

50% of the exterior has thin, black fusion crust. The interior is rusty black matrix with high metal content. There are 1-2 mm sized light colored chondrules visible; some are rust stained.

Thin Section (,2) Description: Tim McCoy

The section exhibits numerous small, well-defined chondrules (up to 1.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Weathering is moderate. Silicates are unequilibrated; olivines range from Fa_{1-29} and pyroxenes are Fs_{3-18}. The meteorite is an L3 chondrite (estimated subtype 3.6).

Sample No.:	RBT 04162, RBT 04299
Location:	Roberts Massif
Field No.:	16208, 15114
Dimensions (cm):	3.5 x 2.0 x 2.0; 5.5 x 2.0 x 2.0
Weight (g):	52.315; 55.198
Meteorite Type:	Iron-Ungrouped

Macroscopic Description: Tim McCoy and Linda Welzenbach

Both RBT 04299 and RBT 04162 exhibit a common external appearance. Surfaces are heavily oxidized, rough and flaking. Some fusion crust can be found on RBT 04162. One to three mm yellow halos surrounding pin holes occur all over the surface of RBT 04299. Cut faces show extremely fine scale structure.

Thin Section (,2) Description: Tim McCoy

The sections consist of ~70% Fe,Ni metal and ~30% troilite (FeS). The metal occurs as a dendritic texture within the troilite matrix. The structure is at an extremely fine scale, with dendrite arm spacings of ~50 microns. Rare, small (<20 mm) chromites are present. The meteorites are ungrouped irons and share some similarities with other ungrouped, sulfide-rich iron meteorites, such as HOW 88403.

Sample No.:	RBT 04186
Location:	Roberts Massif
Field No.:	16233
Dimensions (cm):	2.0 x 1.0 x 0.5
Weight (g):	4.622
Meteorite Type:	Iron-IIE (?)

Macroscopic Description: Tim McCoy and Linda Welzenbach

Sample is very irregularly shaped with ~1 mm weathered (orange colored) silicate inclusions in surface cavities and fractures. Surface of the metal is highly oxidized.

Thin Section (,2) Description: Tim McCoy

The section consists dominantly of metal, with subequant kamacite grains ranging from 200 mm to 3 mm in maximum dimension. In two places, lamellar kamacite with a bandwidth of ~200 mm is bounded by a coarse plessitic texture. Included within the metal are individual silicate grains of ~100 mm in dimension and polyminerallic clusters up to 1 mm. The silicates include olivine (Fa_{18-20}), pyroxene (Fs_{16-19}) and plagioclase. A barred texture suggestive of relict chondrules was found in one area. Also found in the metal, although not observed in association with the silicates, are phosphates, including both whitlockite and chlorapatite. The largest of these is a vein-like structure on the edge of the specimen and protruding inward ~3 mm. The meteorite may be related to the IIE irons.

Sample No.:	RBT 04228
Location:	Roberts Massif
Field No.:	14633
Dimensions (cm):	3.5 x 3.0 x 1.25
Weight (g):	19.776
Meteorite Type:	Acapulcoite

Macroscopic Description: Kathleen McBride

The fusion crust is rusty black with cracks. The interior has a rusty granular texture with a high metal content and crumbles easily.

Thin Section (,2) Description: Tim McCoy

The section exhibits a granoblastic texture with abundant triple junctions and grain sizes of 100-300 microns. Olivine, pyroxene and plagioclase are uniformly distributed, but metal and sulfide exhibit a very heterogeneous distribution on a mm-scale. Olivine is Fa_{8}, pyroxene is $Fs_{10}Wo_{2}$ and plagioclase is $An_{13}Or_{5}$. The meteorite is an acapulcoite.

Sample No.:	RBT 04239
Location:	Roberts Massif
Field No.:	16319
Dimensions (cm):	2.5 x 2.0 x 1.25
Weight (g):	11.964
Meteorite Type:	Achondrite-Ungrouped

Macroscopic Description: Kathleen McBride

90% of the exterior has brown/black fusion crust with polygonal fractures and oxidation halos. The interior is rusty black with high metal content.

Thin Section (,2) Description: Tim McCoy

The section consists of an olivine-rich groundmass with pyroxene, plagioclase, metal and troilite present. Micron-sized metal-sulfide veinlets are abundant and a few relict chondrules are present. Olivine is Fa_{24}, orthopyroxene is $Fs_{20}Wo_{2}$, clinopyroxene is $Fs_{8}Wo_{44}$ and plagioclase is $An_{10}Or_{5}$. The FE/MN in pyroxene is about 30. The meteorite may be an ungrouped primitive achondrite and has some similarities to the Divnoe meteorite (Petaev et al., Meteoritics, 29, 182).

Sample No.:	RBT 04302
Location:	Roberts Massif
Field No.:	15113
Dimensions (cm):	2.5 x 2.0 x 1.0
Weight (g):	11.608
Meteorite Type:	CV3 Chondrite

Macroscopic Description: Kathleen McBride

Exterior has rough brown/black fusion crust on 10% of its surface. The interior is rusty black with some 1-2 mm chondrules of various colors.

Thin Section (,2) Description: Tim McCoy

The section exhibits large chondrules (up to 3 mm) and CAIs in a dark matrix. Olivines range from Fa_{1-9}, with most Fa_{1-5}, and pyroxenes are Fs_{1}. The meteorite is a CV3 chondrite.

Sample No.:	RBT 04309
Location:	Roberts Massif
Field No.:	15148
Dimensions (cm):	1.75 x 1.0 x 0.5
Weight (g):	1.258
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride
100% of the exterior is covered with brown/black fusion crust with polygonal fractures. The interior is a black matrix with evaporites and dark chondrules.

Thin Section (,2) Description: Tim McCoy and Emma Bullock
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_{1-50}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.

Sample No.:	MCY 05218
Location:	MacKay Glacier
Field No.:	17650
Dimensions (cm):	6.5 x 6.5 x 2.5
Weight (g):	214.538
Meteorite Type:	H3 Chondrite

Macroscopic Description: Cecilia Satterwhite
98% of the exterior has black/brown fusion crust with fractures and oxidation. The interior is brown with dark gray to black areas. Abundant inclusions are visible; some are gray and white but most are weathered.

Thin Section (,2) Description: Tim McCoy
The section exhibits numerous small, well-defined chondrules (up to 1.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Silicates are unequilibrated; olivines range from Fa_{1-21}, with a weak peak at Fa_{19}, and pyroxenes from Fs_{2-9}. The meteorite is a H3 chondrite (estimated subtype 3.6).

Sample No.:	MCY 05219
Location:	MacKay Glacier
Field No.:	17360
Dimensions (cm):	6.0 x 4.0 x 3.5
Weight (g):	144.994
Meteorite Type:	CV3 Chondrite

Macroscopic Description: Kathleen McBride
10% of the exterior has brown/black fusion crust with the exposed interior revealing a gray to black matrix with tan and gray inclusions. The interior is a black matrix with numerous chondrules of various shades of gray, a few gray angular clasts are visible. This meteorite is very hard.

Thin Section (,2) Description: Tim McCoy
The section exhibits large chondrules (up to 3 mm) and CAIs in a dark matrix. Olivines range from Fa_{0-4}. The meteorite is a CV3 chondrite.

Sample No.:	MCY 05229, MCY 05230, MCY 05242, MCY 05245, MCY 05251
Location:	MacKay Glacier
Field No.:	17344, 17392, 13659, 13639, 17348
Dimensions (cm):	3.5 x 2.5 x 1.5; 4.5 x 4.5 x 2.0; 1.5 x 1.5 x 0.5; 1.5 x 1.0 x 0.5; 3.5 x 3.5 x 2.5
Weight (g):	9.746; 60.07; 1.982; 1.258; 25.253
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride
The fusion crust on the exteriors of these carbonaceous chondrites range from brown to black to purplish patches and some have polygonal fractures. The interiors are a black soft matrix with mm sized white inclusions.

Thin Section (,2) Description: Tim McCoy and Emma Bullock
The sections consist 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_{0-40}, pyroxene is Fs_{1-6}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorites are CM2 chondrites.

Sample No.:	MCY 05231, MCY 05234
Location:	MacKay Glacier
Field No.:	17332, 13694
Dimensions (cm):	3.0 x 1.0 x 1.25; 1.25 x 0.75 x 0.5
Weight (g):	6.158; 0.795
Meteorite Type:	CM1-2 Chondrite

Macroscopic Description: Kathleen McBride

The exteriors have some purplish black fusion crust with polygonal fractures. The interiors have a soft black matrix with light colored chondrules/inclusions.

Thin Section (,2) Description: Tim McCoy and Emma Bullock

The sections consist of rare small chondrules and individual silicates in a highly-altered matrix. Olivine compositions are $Fa_{0-33,}$ pyroxene is Fs_{1-40}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorites are CM1-2 chondrites.

Sample No.:	MCY 05232
Location:	MacKay Glacier
Field No.:	17308
Dimensions (cm):	1.0 x 1.25 x 0.75
Weight (g):	2.085
Meteorite Type:	CK4 Chondrite

Macroscopic Description: Kathleen McBride

90% of the exterior has purplish black fusion crust with polygonal fractures. The interior is a dark gray matrix with dark colored chondrules.

Thin Section (,2) Description: Tim McCoy

The section consists of large (up to 2 mm), well-defined chondrules in a matrix of finer-grained silicates, sulfides and very abundant magnetite. The meteorite is weathered and extensively shock blackened. Silicates are homogeneous (Fa_{33}). The meteorite is a CK4 chondrite.

Sample No.:	MIL 05029, MIL 05136
Location:	Miller Range
Field No.:	18098, 18174
Dimensions (cm):	5.5 x 4.4 x 4.0; 2.5 x 2.0 x 1.0
Weight (g):	132.68; 8.308
Meteorite Type:	L Chondrite (Impact Melt)

Macroscopic Description: Kathleen McBride and Cecilia Satterwhite

The exterior of 05029 has tiny black patches of fusion crust, the rest is a mottled gray with green crystals visible; 05136 has no fusion crust. The interior is a yellowish gray matrix with abundant green inclusions. There are some rusty areas.

Thin Section (,2) Description: Tim McCoy

The sections are so similar that a single description suffices. The meteorites consist of large (up to 4 mm) orthopyroxene grains with interstitial feldspar with both of these phases poikilitcally enclosing 50-200 mm olivine grains. Minor metal and sulfide are present, with sulfide occasionally rimming metal. Silicates (olivine of Fa_{25}, orthopyroxene of $Fs_{21}Wo_4$, plagioclase of $An_{16}Or_3$) are compositionally within the range of L chondrites. The meteorites are likely L ordinary chondrite impact melt rocks and similar in some respects to PAT 91501 (Mittlefehldt and Lindstrom, MAPS, 36, 439).

Sample No.:	MIL 05035
Location:	Miller Range
Field No.:	18784
Dimensions (cm):	4.5 x 4.0 x 3.5
Weight (g):	142.216
Meteorite Type:	Lunar-Basalt

Macroscopic Description: Kathleen McBride

The exterior has about 95% black, shiny fusion crust. The interior is pinkish-tan in color with no rusting. The rock is moderately hard and has an unusual granular texture with a vague resemblance to granite. There are numerous inclusions; linear white features a few mm in length, melted appearing black, glassy inclusions with an iridescent “peacock ore” opalescent sheen, a transparent, glass like mineral, and a few clay-like powdery areas.

Thin Section (,2) Description: Tim McCoy

The section exhibits an unbrecciated texture of coarse-grained (several mm) pyroxene and maskelynite with interstitial sulfides, iron-titanium oxides, intergrowths of fayalite-silicate-augite, and other late-stage glasses and minerals (including BaO-enriched potassium feldspar). Pyroxenes are strongly zoned and include pigeonites and augites with a range of compositions $Fs_{31-55}Wo_{15-42}$ and Fe/Mn of ~60. Plagioclase is $An_{83-92}Or_{0-2}$. The meteorite is a lunar basalt, although it exhibits some properties (e.g., maskelynite) unusual among known lunar samples.

Sample No.:	MIL 05050
Location:	Miller Range
Field No.:	18758
Dimensions (cm):	8.5 x 5.5 x 4.0
Weight (g):	253.3
Meteorite Type:	L3 Chondrite

Macroscopic Description: Kathleen McBride

85% of this ordinary chondrite's exterior has rough brown/black fusion crust with polygonal fractures. The interior is a black matrix with abundant chondrules of various sizes and colors.

Thin Section (,2) Description: Tim McCoy

The section exhibits numerous small, well-defined chondrules (up to 1.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Silicates are unequilibrated; olivines range from Fa_{6-25} and pyroxenes are Fs_{3-17}. The meteorite is an L3 chondrite (estimated subtype 3.6).

Sample No.:	MIL 05082
Location:	Miller Range
Field No.:	18110
Dimensions (cm):	2.5 x 1.75 x 2.25
Weight (g):	11.980
Meteorite Type:	CB Chondrite

Macroscopic Description: Kathleen McBride

The exterior has 10% brown/black fusion crust. The black and white crystalline matrix has large 3-7 mm sized chondrules, rusty and gray in color.

Thin Section (,2) Description: Tim McCoy

The section consists of subequal amounts of metal and sulfide. 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 similar to the bencubbinite/CB chondrites and resembles Gujba in some respects (Weisberg et al., 2002, LPSC XXXIII, #1551).

Sample No.:	MIL 05085
Location:	Miller Range
Field No.:	18731
Dimensions (cm):	3.0 x 1.5 x 2.5
Weight (g):	18.648
Meteorite Type:	Howardite

Macroscopic Description: Kathleen McBride

Only 5% of the exterior has shiny black fusion crust. The interior is a gray and tan matrix with vugs and white, black, gray and tan clasts.

Thin Section (,2) Description: Tim McCoy

The section shows a groundmass of comminuted pyroxene and plagioclase (up to 0.5 mm) with fine to coarse-grained basaltic clasts ranging up to 2 mm. Impact melt glass, including melt spherules, is present. Pyroxene exhibits a broad range of compositions ($Fs_{60}Wo_6$ to $Fs_{27}Wo_{42}$) and many grains exhibit twinning. The Fe/Mn ratio of the pyroxene is ~30. Plagioclase is ~$An_{88}Or_{0.2}$. The meteorite is a howardite.

Sample No.:	MIL 05112, MIL 05124
Location:	Miller Range
Field No.:	18057, 18122
Dimensions (cm):	2.0 x 1.5 x 1.0; 2.0 x 1.0 x 1.0
Weight (g):	2.754; 2.591
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

The exterior of 05112 is yellow brown with fractures; 05124 has patches of purplish black fusion crust. The interiors are brown and black with light colored inclusions.

Thin Section (,2) Description: Tim McCoy and Emma Bullock

The sections consist 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_{1-20}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorites are CM2 chondrites.

Sample No.:	MIL 05119
Location:	Miller Range
Field No.:	18036
Dimensions (cm):	1.0 x 0.75 x 0.75
Weight (g):	0.855
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride
Patches of purplish-black fusion are on the exterior. The interior is a dull black matrix with light colored chondrules.

Thin Section (,2) Description: Tim McCoy and Emma Bullock
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_{0-32}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.

Sample No.:	MIL 05137
Location:	Miller Range
Field No.:	18149
Dimensions (cm):	1.5 x 1.5 x 0.75
Weight (g):	2.419
Meteorite Type:	CM1 Chondrite

Macroscopic Description: Kathleen McBride
The exterior has black fusion crust on 25% of its surface. The interior has a lumpy black matrix with some evaporites and hard to distinguish chondrules.

Thin Section (,2) Description: Tim McCoy
The section consists of a few small chondrules (up to 0.5 mm) that have been completely replaced by phyllosilicate set in an Fe-rich serpentine matrix. No isolated mineral grains or CAIs are apparent; sulfide and carbonate grains are present. The section exhibits a strong fabric formed by the alignment of elongated remnant chondrules. Unaltered olivine or pyroxene grains of sufficient size for microprobe analyses were not found. This meteorite is a CM1 Chondrite.

Sample No.:	MIL 05139
Location:	Miller Range
Field No.:	18161
Dimensions (cm):	3.0 x 2.0 x 1.25
Weight (g):	10.603
Meteorite Type:	EH3 Chondrite

Macroscopic Description: Kathleen McBride
50% of the exterior has smooth brown/black fusion crust. The interior is a rusty brown color that is very weathered and crumbles easily.

Thin Section (,2) Description: Tim McCoy
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. Microprobe analyses show the olivine is Fa_2 and pyroxene is Fs_{0-3}. Metal contains ~0.6 wt. % Si. The meteorite is a type 3 enstatite chondrite, probably an EH3.

Sample No.:	MIL 05152
Location:	Miller Range
Field No.:	18000
Dimensions (cm):	4.75 x 4.0 x 2.0
Weight (g):	46.607
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride
Small patches of purplish-black fusion crust are on the exterior; some evaporites are present. The interior is a black matrix with tiny light colored chondrules.

Thin Section (,2) Description: Tim McCoy and Emma Bullock
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_{1-37} and pyroxenes are Fs_{1-26}. The matrix consists pre-dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.

Sample Request Guidelines

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 76, 79, and 82-90 available in the following volumes and pages of *Meteoritics* and *Meteoritics and Planetary Science*: 29, p. 100-143; 31, A161-A174; 33, A221-A240; 34, A169-A186; 35, A199-A225; 36, A293-A322; 37, A157-A184; 38, A189-A248; 39, A215-A272; 40, A201-263; 41, in press. 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:

cecilia.e.satterwhite1@jsc.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.

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. 13, 2006** deadline will be reviewed at the MWG meeting **Sept. 28-29, 2006** in Washington, D.C. Requests that are received after the deadline may be delayed for review until MWG meets again in the Spring of 2007. **Please submit your requests on time.** Questions pertaining to sample requests can be directed to the MWG secretary by e-mail, fax or phone.

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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://www-curator.jsc.nasa.gov/antmet/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/
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
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://homepages.ihug.co.nz/~afs/index.html
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/