Antarctic Meteorite Newsletter

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Curator's Comments

Kevin Righter
NASA-JSC

New meteorites – shergottites and ungrouped chondrites

This newsletter reports 357 new meteorites from the 2004 and 2005 ANSMET seasons from the LaPaz Ice Field, Larkman Nunatak, Miller Range, MacKay Glacier, Mount Pratt, and Roberts Massif. These new samples include two olivine-phyric shergottites (paired), two low FeO ungrouped chondrites (paired), a ureilite, four howardites (2 pairing groups), a brecciated eucrite, a mesosiderite, L and H impact melts, a type 3 L chondrite, 3 CM2 chondrites, and a CO3 chondrite.

The low FeO chondrites have high metal contents (similar to H chondrites), but FeO contents lower than H, L and LL. These characteristics are shared by Burnwell and this new meteorite may have some affinities with it. The PRA howardites contain an unusually high number of carbonaceous chondrite (CM) clasts, illustrating that meteoritic breccias are mixtures of different impactor and target rock types in the regolith.

The olivine-phyric shergottites are characterized by the presence of maskelynite, and have Fe/Mn compositions clearly within martian meteorite values. The presence of both olivine and pyroxene phenocrysts in these shergottites make them similar (perhaps) to several other shergottites such as DaG 476/489, NWA 1195, 2046 and 2626. Similarities and differences between these new samples and other shergottites await further detailed study by the martian meteorite community.

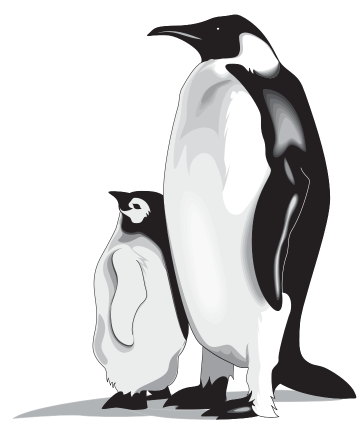
RBT 04262, the larger of the two shergottites

continued on p.2

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
March 2, 2007

MWG Meets
March 16-17, 2007

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

Finally, we would like to bring to your attention to LPSC sessions highlighting ANSMET samples. Talks and posters throughout the week will highlight the unusual achondrite RBT 04239, nakhlite MIL 03346, the new lunar meteorite MIL 05035, the unusual hornblende-bearing R chondrite LAP 04840, metal-rich chondrites QUE 94411 and MIL 05082, other Antarctic lunar and martian meteorites as well as many other unusual chondrites.

Fabulous Frozen Finds

Fabulous Frozen Finds is a new brief summary of new ANSMET meteorite finds that are being made available for scientific research by the US Antarctic Meteorite Program. This publication is aimed at other scientific organizations that are not necessarily part of the mainstream meteorite community. Fabulous Frozen Finds will be distributed twice yearly and will be available at the following website:

http://geology.cwru.edu/~harvey/fff/

Samples from all of the specimens highlighted in Fabulous Frozen Finds will, of course, be made freely available to qualified researchers around the world.

Terrie Bevill leaves ARES

In October 2006, Terrie Bevill left ARES to take a new position with the Orion Project. Terrie has been with ARES Curation since April 1997, and supported all of our collections by maintaining databases and webpages. In particular, she maintained the meteorite database that documents new meteorite samples, and the many changes made to them. She also worked with the MPL staff twice a year to produce beautiful newsletters announcing new meteorite samples. Terrie also provided an interface between the US Antarctic Meteorite collection and the Nomenclature Committee of the Meteoritical Society. Her expertise and tireless dedication to our collections will be missed greatly.

Additions to our webpage

a) New sample request form

The Meteorite Working Group has made some changes to the sample request form. Several fields have been added to the form to make consideration of requests more efficient. First, we are asking PI's for a title for their research project. Second, any collaborators on the project are named and institution identified. Third, if samples are requested for multiple analytical techniques, the mass of sample required for each technique is now required. And finally, certification of a research advisor who is a permanent faculty or research staff member at the institution is required. Omission of any of this information could cause a delay in any given request and associated sample allocation.

b) Allocation guidelines and special list online

Because the US Antarctic Meteorite Collection is maturing and available sample mass diminishes, samples are added to our protected (or special) list annually. In order to facilitate the flow of information, we have placed this list online on our webpage, along with the allocation guidelines for meteorites. Please consult these before making a request to be certain you are making a request that is consistent with the available sample material.

Recall of thin sections

Currently there are too many thin sections that have been out for greater than 4 years. At the request of the Meteorite Working Group, we are recalling all thin sections in two categories: a) those that are on the special list, and have been in your possession for greater than 1 year, and b) those that have been in your possession for greater than 4 years. In addition, these samples will be photo-documented to update our database. We anticipate the latter will aid our ability to locate the best and appropriate sample for any given request. Any PI who does not send in recalled thin sections could face a delay in having new requests reviewed and therefore samples allocated. If samples are still being studied by a given PI, those samples must be re-requested. If the thin section recall applies to you, you will be receiving a letter and email in the near future, and we want to thank you in advance for your cooperation in keeping our collection well maintained and characterized.

Lunar Meteorite Compendium

A compendium of 42 lunar meteorites has been completed by the MPL staff. It will be placed online sometime this spring. Because there are new lunar meteorites being discovered annually, these will have to be periodically updated. If you know of research that is not mentioned or covered in the chapters, please let us know – they are intended to be comprehensive summaries of samples. We will update them as frequently as we can. Please send information to: kevin.righter-1@nasa.gov.

Results from the 2006-2007 Field Season

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

The most recent ANSMET field season is now in the books, and while it was a tough season physically, the results should please anyone who's a customer of the Antarctic meteorites program. We deployed two teams: an 8-person team to conduct systematic searching on icefields around the Mt. Block/Mauger Nunataks and Larkman Nunataks region, and a 4-person team to conduct reconnaissance of several widely spaced icefields in the Graves Nunataks region. Both teams faced a lot of nasty (but typical, and expected) weather; roughly 50% of the days were too windy to work effectively. In spite of this, a lot of specimens were recovered. The systematic search team brought back 680 specimens, most of them from the Larkman Nunataks icefields, where the team foot-searched a very productive moraine on days too windy for snowmobile searching. The reconnaissance team felt the effects of the weather more severely; not only did high winds hamper their searching efforts, but it also limited their ability to move from one site to another via Twin Otter. In spite of this, the reconnaissance team brought back 176 from 4 sites, bringing the overall total for the 2006 collection to 856. And the word on the street is that the proportion of finds that are unusual, either in terms of size or classification, is higher than we've seen lately. By late summer we should know if this is true, or just wishful thinking by our wind-blown team.

One programmatic note. Budget constraints at NASA mean that there will be no reconnaissance team for the 07-08 field season; furthermore, there are no clear prospects for support at any time in the future. The systematic search efforts funded by NSF are solid for at least two more seasons, so there's no fear that the supply of Antarctic meteorites will dry up. However, it's also clear that the past 5 years of reconnaissance team activity have been exceptionally valuable, bringing many important new meteorites to the community (as this edition of the newsletter demonstrates). Over the next year I'll be reading the tea leaves carefully, looking for signs that I should pursue renewed support for the reconnaissance team. If you feel strongly that the two-team efforts should continue, I urge you to let me know, and consider ways you might bolster our case for re-establishing funding in the future.

From left to right-standing: Shaun Norman,Silvio Lorenzetti, John Schutt,Mike Rampey, Lysa Chizmadia, Ralph Harvey,Don Pettit, James Day, Cliff Leight
From left to right-seated: Nicolle Zellner, Linda Welzenbach, Barbara Cohen
(Not in photo: Matt Genge)

The systematic searching team collecting a specimen near Mt. Block

2004-2005 Collection

Pages 5-18 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 29 (2), Sept. 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

Lauren La Croix, Valerie Reynolds, Linda Welzenbach and Tim McCoy
Department of Mineral Sciences
U.S. National Museum of Natural History
Smithsonian Institution
Washington, D.C.

Antarctic Meteorite Locations

ALH — Allan Hills
BEC — Beckett Nunatak
BOW — Bowden Neve
BTN — Bates Nunataks
CMS — Cumulus Hills
CRA — Mt.Cranfield Ice Field
CRE — Mt. Crean
DAV — David Glacier
DEW — Mt. DeWitt
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

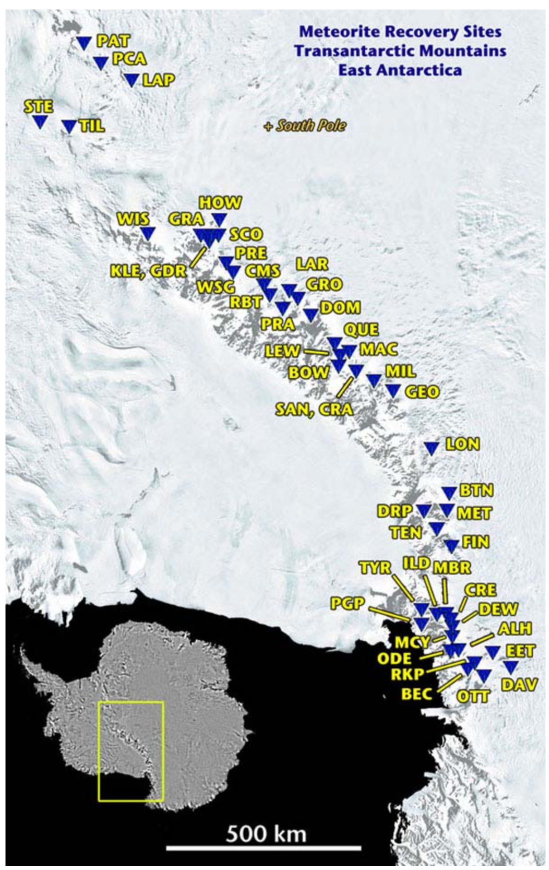


Table 1

List of Newly Classified Antarctic Meteorites **

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAP 04750 ~	5.9	L5 CHONDRITE	B/C	A/B		
LAP 04751	2.8	H CHONDRITE (IMPACT MELT)	B/C	A/B	19	16
LAP 04752 ~	1.4	L5 CHONDRITE	B	B		
LAP 04753 ~	5.2	L5 CHONDRITE	C	A		
LAP 04755 ~	4.3	L6 CHONDRITE	B	A/B		
LAP 04756 ~	6.7	LL5 CHONDRITE	C	A/B		
LAP 04757	12.8	CHONDRITE UNGROUPED	C	B	13	12-17
LAP 04758 ~	7.5	L6 CHONDRITE	C	B/C		
LAP 04759	6.3	H4 CHONDRITE	C	B	19	16
LAP 04770	1.1	H5 CHONDRITE	B	B	19	16
LAP 04771	0.6	CM2 CHONDRITE	B	B	1-50	2
LAP 04772 ~	1.6	L5 CHONDRITE	B/C	A		
LAP 04773	8.3	CHONDRITE UNGROUPED	C	A/B	13	13-16
LAP 04774 ~	5.4	L5 CHONDRITE	C	A		
LAP 04775	4.1	L6 CHONDRITE	B	B	24	21
LAP 04776 ~	3.8	L5 CHONDRITE	B	B		
LAP 04777 ~	3.4	L5 CHONDRITE	B	B		
LAP 04778 ~	7.9	L5 CHONDRITE	C	A/B		
LAP 04779	1.8	UREILITE	C	B/C	4-22	
LAP 04830 ~	4.3	LL5 CHONDRITE	B	A/B		
LAP 04831 ~	0.3	L6 CHONDRITE	B	A		
LAP 04832 ~	0.9	H6 CHONDRITE	C	B		
LAP 04833 ~	0.5	L6 CHONDRITE	C	C		
LAP 04834 ~	0.9	H5 CHONDRITE	B	B		
LAP 04835 ~	0.8	L6 CHONDRITE	B	B		
LAR 04360 ~	15.2	H6 CHONDRITE	C	AB		
LAR 04361 ~	7.2	H6 CHONDRITE	C	A/B		
LAR 04363 ~	31.4	H6 CHONDRITE	C	B		
LAR 04365 ~	14.6	H6 CHONDRITE	C	B		
LAR 04366 ~	5.9	H6 CHONDRITE	C	A/B		
LAR 04367 ~	12.3	H6 CHONDRITE	C	B		
LAR 04368 ~	4.3	LL6 CHONDRITE	A	A		
LAR 04370 ~	15.5	H6 CHONDRITE	C	B		
LAR 04371 ~	17.1	H6 CHONDRITE	C	B		
LAR 04372 ~	9.2	L5 CHONDRITE	C	B		
LAR 04373 ~	16.3	H6 CHONDRITE	C	B		
LAR 04374 ~	20.2	L4 CHONDRITE	C	A/B		
LAR 04375 ~	17.3	L6 CHONDRITE	B/C	A/B		
LAR 04376 ~	12.5	H5 CHONDRITE	B/C	A/B		
LAR 04377 ~	24.0	LL6 CHONDRITE	B	A/B		
LAR 04378 ~	36.2	L6 CHONDRITE	C	B		
LAR 04379 ~	9.2	H6 CHONDRITE	C	B		
LAR 04381 ~	14.7	H6 CHONDRITE	C	A		
LAR 04383 ~	2.4	L5 CHONDRITE	C	B		
LAR 04384 ~	10.1	L4 CHONDRITE	B/C	B		
LAR 04385 ~	43.9	H6 CHONDRITE	C	B/C		
LAR 04386 ~	24.1	H6 CHONDRITE	C	B		
LAR 04387 ~	6.2	H6 CHONDRITE	C	A/B		
LAR 04388 ~	25.6	H6 CHONDRITE	C	A		

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LAR 04389 ~	9.6	LL6 CHONDRITE	B	B		
PRA 04401	55.0	HOWARDITE	CE	B		1-60
PRA 04402	37.8	HOWARDITE	B	B		16-60
PRA 04403 ~	655.7	LL6 CHONDRITE	B	A		
PRA 04404 ~	358.9	LL6 CHONDRITE	B	A		
PRA 04405 ~	1373.5	LL6 CHONDRITE	A	A		
PRA 04406 ~	1188.6	H6 CHONDRITE	C	A/B		
PRA 04407 ~	508.0	L5 CHONDRITE	B	A/B		
PRA 04408 ~	384.7	LL6 CHONDRITE	A/B	A		
PRA 04409 ~	326.8	LL6 CHONDRITE	A/B	B		
PRA 04410 ~	278.6	LL5 CHONDRITE	B	A		
PRA 04411 ~	170.6	LL5 CHONDRITE	B/C	A/B		
PRA 04412 ~	82.8	L6 CHONDRITE	C	B		
PRA 04413 ~	84.6	L5 CHONDRITE	B	A		
PRA 04415 ~	106.8	LL6 CHONDRITE	B	A/B		
PRA 04416 ~	69.8	LL5 CHONDRITE	B/C	B		
PRA 04417 ~	87.5	LL5 CHONDRITE	B	B		
PRA 04418 ~	36.7	L5 CHONDRITE	B/C	B		
PRA 04419 ~	62.9	LL6 CHONDRITE	B	A		
PRA 04420 ~	21.6	L6 CHONDRITE	C	B		
PRA 04421 ~	25.7	L5 CHONDRITE	C	B		
PRA 04422 ~	5060.0	LL6 CHONDRITE	A	A		
RBT 04100 ~	2609.0	L6 CHONDRITE	C	B		
RBT 04101 ~	1918.6	L5 CHONDRITE	C	B/C		
RBT 04102 ~	1328.4	L5 CHONDRITE	B/C	A/B		
RBT 04103 ~	184.9	H5 CHONDRITE	C	A/B		
RBT 04104	204.8	LL5 CHONDRITE	A/B	A/B	29	24
RBT 04105 ~	298.2	L5 CHONDRITE	C	B		
RBT 04106 ~	292.4	L4 CHONDRITE	C	C		
RBT 04107 ~	522.9	LL5 CHONDRITE	B	A/B		
RBT 04108 ~	386.1	L6 CHONDRITE	B/C	B		
RBT 04109 ~	198.9	LL6 CHONDRITE	B	B		
RBT 04113 ~	383.2	L6 CHONDRITE	C	C		
RBT 04115 ~	1456.3	LL5 CHONDRITE	B	A/B		
RBT 04117 ~	965.3	H5 CHONDRITE	C	A/B		
RBT 04118 ~	985.5	LL5 CHONDRITE	A/B	B		
RBT 04120 ~	766.4	L5 CHONDRITE	C	A		
RBT 04121 ~	495.4	L5 CHONDRITE	B	A		
RBT 04122 ~	302.1	H5 CHONDRITE	B/C	C		
RBT 04123 ~	367.7	H6 CHONDRITE	C	A/B		
RBT 04124 ~	297.4	H6 CHONDRITE	C	B		
RBT 04125 ~	375.4	LL5 CHONDRITE	A/B	B		
RBT 04126 ~	1348.2	L5 CHONDRITE	C	B		
RBT 04128 ~	1104.8	L5 CHONDRITE	B/C	A/BE		
RBT 04129 ~	1140.0	LL5 CHONDRITE	B	B		
RBT 04134 ~	277.3	L5 CHONDRITE	C	B		
RBT 04135 ~	245.5	L6 CHONDRITE	C	B		
RBT 04136 ~	217.4	LL5 CHONDRITE	B	A/B		
RBT 04137 ~	235.2	H4 CHONDRITE	C	B		
RBT 04138 ~	219.7	L5 CHONDRITE	C	B		
RBT 04139 ~	141.4	L5 CHONDRITE	C	B		
RBT 04140 ~	35.3	L6 CHONDRITE	C	B/C		
RBT 04141 ~	126.0	H5 CHONDRITE	C	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
RBT 04142	~	101.4	H6 CHONDRITE	C	B/C		
RBT 04144	~	192.7	H6 CHONDRITE	C	A/B		
RBT 04145	~	47.3	H6 CHONDRITE	C	B		
RBT 04146	~	130.7	H6 CHONDRITE	C	B		
RBT 04147	~	126.6	L6 CHONDRITE	C	A/B		
RBT 04148	~	124.1	H6 CHONDRITE	C	A/B		
RBT 04149	~	94.7	H6 CHONDRITE	CE	C		
RBT 04170	~	71.3	LL5 CHONDRITE	B	A/B		
RBT 04171	~	170.3	H5 CHONDRITE	C	A/B		
RBT 04172	~	141.6	H5 CHONDRITE	B/C	A/B		
RBT 04173	~	99.6	L5 CHONDRITE	B/C	A/B		
RBT 04174	~	110.5	L5 CHONDRITE	C	A/B		
RBT 04175	~	61.2	L5 CHONDRITE	B/C	A/B		
RBT 04176	~	22.1	L5 CHONDRITE	B/C	A/B		
RBT 04177	~	42.6	L6 CHONDRITE	B	B		
RBT 04178	~	27.4	H6 CHONDRITE	C	A/B		
RBT 04179	~	19.8	L5 CHONDRITE	C	A/B		
RBT 04190	~	191.5	L6 CHONDRITE	B	B		
RBT 04191	~	69.0	L5 CHONDRITE	C	A/B		
RBT 04192	~	28.5	L5 CHONDRITE	C	B/C		
RBT 04193	~	85.0	L5 CHONDRITE	C	A/B		
RBT 04194	~	123.9	L5 CHONDRITE	B	A/B		
RBT 04195	~	162.0	L5 CHONDRITE	C	A/B		
RBT 04196	~	93.3	L5 CHONDRITE	A/B	A		
RBT 04197	~	39.9	L5 CHONDRITE	C	B		
RBT 04198	~	77.9	L5 CHONDRITE	B	A/B		
RBT 04199	~	38.3	L5 CHONDRITE	C	B		
RBT 04208	~	1.1	H6 CHONDRITE	C	B/C		
RBT 04210		133.5	H4 CHONDRITE	A/B	A/B	18	16
RBT 04211	~	182.7	H5 CHONDRITE	C	A/B		
RBT 04212	~	136.1	H6 CHONDRITE	C	C		
RBT 04213	~	127.9	L5 CHONDRITE	B	A		
RBT 04214	~	73.9	H5 CHONDRITE	C	C		
RBT 04215	~	111.8	H5 CHONDRITE	C	C		
RBT 04216	~	86.5	L5 CHONDRITE	C	B/C		
RBT 04217	~	187.3	L5 CHONDRITE	C	B/C		
RBT 04218	~	118.9	L5 CHONDRITE	C	A/B		
RBT 04219	~	69.2	L5 CHONDRITE	C	B		
RBT 04221	~	57.3	H5 CHONDRITE	C	B		
RBT 04234	~	16.3	H6 CHONDRITE	C	B		
RBT 04238	~	10.1	L5 CHONDRITE	C	C		
RBT 04241	~	86.7	L6 CHONDRITE	B/C	A		
RBT 04242	~	54.6	L5 CHONDRITE	B/C	B/C		
RBT 04243	~	41.4	H5 CHONDRITE	B/C	A/B		
RBT 04244	~	73.5	LL6 CHONDRITE	A/B	A		
RBT 04245	~	34.0	L5 CHONDRITE	B/C	B/C		
RBT 04246	~	28.1	LL5 CHONDRITE	A/B	A		
RBT 04247	~	44.2	H5 CHONDRITE	B/C	A		
RBT 04248	~	35.6	L5 CHONDRITE	B/C	A/B		
RBT 04249	~	25.2	L5 CHONDRITE	B/C	B/C		
RBT 04250	~	7.9	L5 CHONDRITE	C	B		
RBT 04252	~	32.7	L5 CHONDRITE	B	A/B		
RBT 04253	~	47.0	L5 CHONDRITE	C	B		
RBT 04254	~	54.9	L5 CHONDRITE	C	B		
RBT 04256	~	34.7	L5 CHONDRITE	C	B		

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
RBT 04257 ~	34.1	L6 CHONDRITE	C	B		
RBT 04258 ~	7.6	L5 CHONDRITE	C	B		
RBT 04259 ~	4.5	LL6 CHONDRITE	B/C	B		
RBT 04260	86.3	CM2 CHONDRITE	CE	C	0-1	1
RBT 04261	78.8	SHERGOTTITE	B	B	39	20-27
RBT 04262	204.6	SHERGOTTITE	B	B	38-40	16-32
RBT 04270 ~	370.6	L6 CHONDRITE	C	A/B		
RBT 04271 ~	341.8	L5 CHONDRITE	B/C	B/C		
RBT 04272 ~	400.5	L5 CHONDRITE	B/C	B		
RBT 04273 ~	257.1	H5 CHONDRITE	C	B		
RBT 04274 ~	431.1	L5 CHONDRITE	C	B		
RBT 04275 ~	712.2	L5 CHONDRITE	B/C	B		
RBT 04276 ~	189.7	H6 CHONDRITE	C	B		
RBT 04277 ~	326.9	H5 CHONDRITE	B/C	B		
RBT 04279 ~	195.0	H5 CHONDRITE	B/C	B		
RBT 04280 ~	225.7	L5 CHONDRITE	C	B		
RBT 04281 ~	138.4	H5 CHONDRITE	C	B		
RBT 04282 ~	144.9	L5 CHONDRITE	C	B		
RBT 04283 ~	119.6	LL5 CHONDRITE	B	B/C		
RBT 04284 ~	102.8	LL5 CHONDRITE	B/C	B		
RBT 04285 ~	83.2	L6 CHONDRITE	C	B		
RBT 04286 ~	67.8	H6 CHONDRITE	C	B		
RBT 04287 ~	37.8	H5 CHONDRITE	C	B		
RBT 04288 ~	45.0	H5 CHONDRITE	C	B		
RBT 04289 ~	43.1	H5 CHONDRITE	C	B		
RBT 04290 ~	25.6	H5 CHONDRITE	B	B		
RBT 04291 ~	54.2	L5 CHONDRITE	C	B		
RBT 04292 ~	32.3	L5 CHONDRITE	C	B		
RBT 04293 ~	72.2	L5 CHONDRITE	C	A/B		
RBT 04294 ~	59.3	L5 CHONDRITE	C	B		
RBT 04295 ~	70.3	L5 CHONDRITE	C	A/B		
RBT 04296 ~	52.9	L5 CHONDRITE	B/C	A/B		
RBT 04297 ~	77.5	L5 CHONDRITE	C	B		
RBT 04298 ~	44.0	LL5 CHONDRITE	BE	B		
RBT 04300 ~	3.1	L5 CHONDRITE	C	B		
RBT 04301 ~	9.1	L5 CHONDRITE	C	B		
RBT 04303 ~	16.6	L5 CHONDRITE	C	B		
RBT 04304 ~	8.5	L5 CHONDRITE	C	B		
RBT 04305 ~	14.7	L5 CHONDRITE	C	B/C		
RBT 04306 ~	11.8	L6 CHONDRITE	C	B		
RBT 04307 ~	8.1	L5 CHONDRITE	A/B	A		
RBT 04308 ~	7.1	L5 CHONDRITE	B/C	B		
MCY 05235 ~	1.3	L6 CHONDRITE	B/C	B		
MCY 05239	19.3	MESOSIDERITE	C	B	34-39	27-36
MCY 05240 ~	1.2	LL5 CHONDRITE	B/C	A/B		
MCY 05246 ~	1.2	L6 CHONDRITE	B/C	B		
MCY 05248 ~	0.8	L5 CHONDRITE	B/C	B		
MCY 05255 ~	1.0	L5 CHONDRITE	B/C	B		
MCY 05256 ~	1.3	H6 CHONDRITE	B/C	B		
MCY 05257 ~	0.5	L6 CHONDRITE	B/C	B		
MCY 05258 ~	0.6	L6 CHONDRITE	B/C	B		
MCY 05259 ~	0.8	L6 CHONDRITE	B/C	B		
MCY 05264 ~	0.8	L6 CHONDRITE	B/C	B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 05001	~	3055.5	L5 CHONDRITE	BE	B		
MIL 05002	~	21490.0	H5 CHONDRITE	CE	C		
MIL 05003	~	2181.8	LL5 CHONDRITE	A/B	A/B		
MIL 05004	~	831.1	L6 CHONDRITE	B/C	B/C		
MIL 05005	~	1127.8	L5 CHONDRITE	BE	A		
MIL 05006	~	1234.8	L5 CHONDRITE	BE	A		
MIL 05007	~	304.4	L5 CHONDRITE	B/C	B		
MIL 05008	~	330.9	H5 CHONDRITE	B/CE	A/B		
MIL 05009	~	396.8	L6 CHONDRITE	A/B	A		
MIL 05010		582.4	H4 CHONDRITE	B/C	A/B	19	16
MIL 05011	~	1608.3	L5 CHONDRITE	A/B	A/B		
MIL 05012	~	2409.6	L5 CHONDRITE	A/B	A		
MIL 05013		1494.6	CO3 CHONDRITE	B/CE	A/B	1-47	1-6
MIL 05014	~	881.6	L5 CHONDRITE	A/B	A		
MIL 05015	~	1025.8	L5 CHONDRITE	B	B		
MIL 05016	~	1336.2	L5 CHONDRITE	C	A/B		
MIL 05017	~	987.2	H5 CHONDRITE	B/C	B/CE		
MIL 05018	~	670.7	H6 CHONDRITE	B/C	A		
MIL 05019	~	394.4	L5 CHONDRITE	B/C	A/B		
MIL 05020	~	368.7	L5 CHONDRITE	B/C	B/C		
MIL 05021	~	300.5	LL5 CHONDRITE	A/B	A		
MIL 05022	~	235.7	L5 CHONDRITE	B/CE	A/B		
MIL 05023	~	133.1	LL4 CHONDRITE	A/B	A/B		
MIL 05025	~	104.3	L5 CHONDRITE	A/B	A		
MIL 05026	~	72.5	L5 CHONDRITE	B/C	B		
MIL 05027	~	67.5	LL6 CHONDRITE	A/BE	A		
MIL 05028	~	77.9	LL5 CHONDRITE	A/B	A/B		
MIL 05030	~	112.9	LL5 CHONDRITE	B	A/B		
MIL 05032	~	127.8	H6 CHONDRITE	B/C	A/B		
MIL 05033	~	179.2	H5 CHONDRITE	C	A/B		
MIL 05034	~	192.4	L6 CHONDRITE	C	B		
MIL 05036	~	314.1	L6 CHONDRITE	C	B		
MIL 05037	~	239.0	H5 CHONDRITE	C	A/B		
MIL 05038	~	187.4	L6 CHONDRITE	C	C		
MIL 05039	~	227.6	L5 CHONDRITE	A/B	A/B		
MIL 05040	~	305.4	L5 CHONDRITE	B	B		
MIL 05041		239.8	EUCRITE (BRECCIATED)	B	B/C		60
MIL 05042	~	262.6	LL5 CHONDRITE	A/B	A/B		
MIL 05043	~	308.0	L6 CHONDRITE	C	C		
MIL 05044	~	180.2	L5 CHONDRITE	C	C		
MIL 05045	~	283.4	L5 CHONDRITE	B/CE	A/B		
MIL 05046	~	388.3	L5 CHONDRITE	B	A/B		
MIL 05047	~	289.7	LL5 CHONDRITE	A/BE	A		
MIL 05048	~	197.2	L5 CHONDRITE	B/C	B		
MIL 05049	~	152.0	L5 CHONDRITE	B/C	B		
MIL 05052	~	257.6	L5 CHONDRITE	C	B		
MIL 05053	~	399.0	LL6 CHONDRITE	B	B/C		
MIL 05054	~	233.6	H5 CHONDRITE	B/C	A		
MIL 05055	~	109.2	LL5 CHONDRITE	A/B	A		
MIL 05056	~	113.6	LL5 CHONDRITE	B	A		
MIL 05057	~	472.2	LL6 CHONDRITE	A/B	A/B		
MIL 05058	~	128.1	L6 CHONDRITE	A/B	B/C		
MIL 05059	~	118.5	L5 CHONDRITE	B/C	A		
MIL 05060	~	34.7	LL6 CHONDRITE	A/B	A		
MIL 05061	~	58.8	L5 CHONDRITE	B/C	A/B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 05062		23.8	HOWARDITE	B	A		29-54
MIL 05063	~	23.3	L5 CHONDRITE	B/C	A/B		
MIL 05064	~	82.5	L5 CHONDRITE	A/B	A/B		
MIL 05065	~	23.3	H5 CHONDRITE	B/C	A		
MIL 05066	~	21.1	H5 CHONDRITE	A/B	A		
MIL 05067	~	42.0	LL5 CHONDRITE	A/B	A/B		
MIL 05068	~	36.1	H5 CHONDRITE	A/B	A/B		
MIL 05070	~	61.9	L6 CHONDRITE	C	B		
MIL 05071	~	28.4	L6 CHONDRITE	C	B		
MIL 05072	~	28.1	L5 CHONDRITE	C	A/B		
MIL 05073	~	106.7	LL5 CHONDRITE	B	A/B		
MIL 05074	~	88.4	H5 CHONDRITE	C	A/B		
MIL 05075	~	86.8	L5 CHONDRITE	C	B		
MIL 05076	~	59.5	L3 CHONDRITE	B	A/B	3-33	5-31
MIL 05077	~	32.5	L5 CHONDRITE	C	B		
MIL 05078	~	41.2	LL6 CHONDRITE	A/B	A/B		
MIL 05079	~	82.7	L5 CHONDRITE	A/B	B		
MIL 05080	~	30.2	LL6 CHONDRITE	A/B	A/B		
MIL 05081	~	41.2	H6 CHONDRITE	C	C		
MIL 05083	~	35.7	L6 CHONDRITE	B/C	B		
MIL 05084	~	30.9	L6 CHONDRITE	B/C	B		
MIL 05086		1.7	CM2 CHONDRITE	BE	A/B	0-25	0-4
MIL 05087	~	13.1	LL6 CHONDRITE	B	B		
MIL 05088	~	16.8	L5 CHONDRITE	B	B		
MIL 05089	~	17.3	L6 CHONDRITE	A/B	B		
MIL 05090	~	23.5	L6 CHONDRITE	C	A/B		
MIL 05091	~	14.8	L5 CHONDRITE	C	A/B		
MIL 05092	~	31.5	L5 CHONDRITE	C	A/B		
MIL 05093	~	6.9	LL6 CHONDRITE	A	A		
MIL 05094	~	9.4	LL5 CHONDRITE	B/C	B		
MIL 05095	~	28.3	L6 CHONDRITE	B	B		
MIL 05096	~	13.9	LL5 CHONDRITE	A/B	B		
MIL 05097	~	24.6	LL6 CHONDRITE	B	B		
MIL 05098	~	9.9	H4 CHONDRITE	C	B		
MIL 05099	~	49.9	L5 CHONDRITE	B	A/B		
MIL 05100	~	17.3	L6 CHONDRITE	C	C		
MIL 05101	~	22.2	L5 CHONDRITE	C	C		
MIL 05102	~	12.8	L5 CHONDRITE	B/C	B		
MIL 05103	~	5.6	L5 CHONDRITE	C	B		
MIL 05105	~	33.3	L5 CHONDRITE	A/B	A		
MIL 05106	~	12.0	LL5 CHONDRITE	A/B	A		
MIL 05107	~	18.7	LL6 CHONDRITE	A/BE	A		
MIL 05108	~	19.5	L6 CHONDRITE	C	A/B		
MIL 05109	~	5.0	LL5 CHONDRITE	B/C	B		
MIL 05111	~	0.9	L5 CHONDRITE	B/C	B		
MIL 05113	~	0.3	LL5 CHONDRITE	B/C	B		
MIL 05114	~	7.8	H6 CHONDRITE	C	A/B		
MIL 05115	~	5.9	L5 CHONDRITE	B/C	B		
MIL 05116	~	2.2	L5 CHONDRITE	C	A/B		
MIL 05117	~	1.3	L5 CHONDRITE	B/C	B		
MIL 05120	~	2.7	L6 CHONDRITE	C	A/B		
MIL 05121	~	2.0	LL6 CHONDRITE	B/C	B		
MIL 05122	~	0.8	L6 CHONDRITE	C	A/B		
MIL 05123	~	5.2	L6 CHONDRITE	C	A/B		
MIL 05125	~	0.8	L5 CHONDRITE	C	A/B		

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
MIL 05127	~	3.5	LL6 CHONDRITE	B/C	B		
MIL 05128	~	1.9	L6 CHONDRITE	C	B		
MIL 05129	~	2.8	LL6 CHONDRITE	A/B	A		
MIL 05130	~	12.5	L6 CHONDRITE	A/B	A		
MIL 05131	~	4.7	L6 CHONDRITE	B/C	B		
MIL 05132	~	17.4	L6 CHONDRITE	C	B		
MIL 05134	~	3.6	L6 CHONDRITE	C	A/B		
MIL 05135	~	4.9	L6 CHONDRITE	C	B		
MIL 05138	~	7.5	LL6 CHONDRITE	A	A/B		
MIL 05140	~	13.4	H6 CHONDRITE	C	C		
MIL 05141	~	1.6	L5 CHONDRITE	C	C		
MIL 05142	~	11.4	L5 CHONDRITE	C	B		
MIL 05143	~	4.2	L6 CHONDRITE	C	B		
MIL 05145	~	2.1	LL6 CHONDRITE	A	A/B		
MIL 05146	~	2.3	L5 CHONDRITE	C	B		
MIL 05148	~	0.9	L6 CHONDRITE	C	B		
MIL 05149	~	2.6	L5 CHONDRITE	B	B		
MIL 05150	~	42.3	L6 CHONDRITE	C	B		
MIL 05151	~	101.5	LL6 CHONDRITE	A	A/B		
MIL 05153	~	51.2	L5 CHONDRITE	B/C	B		
MIL 05154	~	72.0	L5 CHONDRITE	B/C	A/B		
MIL 05155		53.5	L CHONDRITE (IMPACT MELT)	B	B	25	21
MIL 05156	~	94.4	LL6 CHONDRITE	B	B		
MIL 05157	~	95.2	LL6 CHONDRITE	A/B	B		
MIL 05158	~	73.7	L6 CHONDRITE	C	B		
MIL 05159	~	89.0	LL5 CHONDRITE	B	B		
MIL 05160	~	38.4	L5 CHONDRITE	C	A		
MIL 05161	~	24.6	H6 CHONDRITE	C	B		
MIL 05162	~	33.7	L5 CHONDRITE	C	B		
MIL 05163	~	42.9	H6 CHONDRITE	C	B		
MIL 05164	~	38.8	L6 CHONDRITE	B/C	B		
MIL 05165		25.6	HOWARDITE	B	B		30-60
MIL 05166	~	39.7	H6 CHONDRITE	C	A		
MIL 05167	~	29.0	L6 CHONDRITE	C	A		
MIL 05168	~	75.7	L6 CHONDRITE	B	B		
MIL 05169	~	48.1	L5 CHONDRITE	B/C	B		
MIL 05171	~	4.3	H6 CHONDRITE	C	B/C		

Table 2

Newly Classified Specimens Listed By Type

Sample Number		Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
Achondrites							
MIL 05041		239.8	EUCRITE (BRECCIATED)	B	B/C		60
PRA 04401		55.0	HOWARDITE	CE	B		1-60
PRA 04402		37.8	HOWARDITE	B	B		16-60
MIL 05062		23.8	HOWARDITE	B	A		29-54
MIL 05165		25.6	HOWARDITE	B	B		30-60
RBT 04261		78.8	SHERGOTTITE	B	B	39	20-27
RBT 04262		204.6	SHERGOTTITE	B	B	38-40	16-32
LAP 04779		1.8	UREILITE	C	B/C	4-22	
Carbonaceous Chondrites							
LAP 04771		0.6	CM2 CHONDRITE	B	B	1-50	2
RBT 04260	~	86.3	CM2 CHONDRITE	CE	C	0-1	1
MIL 05086		1.7	CM2 CHONDRITE	BE	A/B	0-25	0-4
MIL 05013		1494.6	CO3 CHONDRITE	B/CE	A/B	1-47	1-6
Chondrites - Type 3							
MIL 05076	~	59.5	L3 CHONDRITE	B	A/B	3-33	5-31
Chondrite Ungrouped							
LAP 04757		12.8	CHONDRITE UNGROUPED	C	B	13	12-17
LAP 04773		8.3	CHONDRITE UNGROUPED	C	A/B	13	13-16
H Chondrites							
LAP 04751		2.8	H CHONDRITE (IMPACT MELT)	B/C	A/B	19	16
L Chondrites							
MIL 05155		53.5	L CHONDRITE (IMPACT MELT)	B	B	25	21
Stony Irons							
MCY 05239		19.3	MESOSIDERITE	C	B	34-39	27-36

**Notes to Tables 1 and 2:

“Weathering” Categories:

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

“Fracturing” Categories:

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

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

Table 3

Tentative Pairings for New Meteorites

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

CHONDRITE UNGROUPED

LAP 04773 with LAP 04757

CO3 CHONDRITE

MIL 05013 with MIL 03377

HOWARDITE

PRA 04402 with PRA 04401
MIL 05165 with MIL 05062

L CHONDRITE (IMPACT MELT)

MIL 05155 with MIL 05029

SHERGOTTITE

RBT 04262 with RBT 04261

Petrographic Descriptions

Sample No.:	LAP 04751	<u>Macroscopic Description: Kathleen McBride</u>
Location:	LaPaz Ice Field	100% brown/black fusion crust with oxidation haloes covers the exterior surface of this ordinary chondrite. The interior is smooth, brown in color.
Field No.:	17426	
Dimensions (cm):	1.5 x 1.0 x 1.0	
Weight (g):	2.810	<u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u>
Meteorite Type:	H Chondrite (Impact Melt)	This H chondrite ($Fa_{19}Fs_{16}$) is dominated by a melted matrix with rounded metal globules of <100 µm in diameter. Highly-metamorphosed clasts remain at the edge of the section. This small meteorite is an H impact melt breccia.

Sample No.:	LAP 04757; LAP 04773	<u>Macroscopic Description: Kathleen McBride</u>
Location:	LaPaz Ice Field	Exteriors of these meteorites have dull brown/black fusion crust with oxidation haloes. The interiors reveal a rusty brown/black matrix with high metal content.
Field No.:	17603; 17035	
Dimensions (cm):	2.5 x 2.0 x 1.0; 2.25 x 1.25 x 1.5	<u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u>
Weight (g):	12.8; 8.298	These meteorites are so similar that a single description suffices. The sections consist of abundant chondrules set in a metal- and sulfide-bearing, weathered matrix. Shock effects are present, including metal-sulfide melting at grain boundaries. Olivine is homogeneous at Fa_{13} and pyroxene exhibits a small range at Fs_{13-16}. Links to the acapulcoites or low-FeO chondrites (Russell et al., 1998, MAPS 33, 853-856) should be considered, although LAP 04773/04757 are less metamorphosed than the former and more magnesian than is typical for the latter.
Meteorite Type:	Chondrite Ungrouped	<u>Oxygen Isotope Analysis: D. Rumble</u>
		Analysis for two subsamples of LAP 04757 give: A) $\delta^{18}O$ = +3.67, $\delta^{17}O$ = +2.68, and $\Delta^{17}O$ = 0.746; B) $\delta^{18}O$ = +3.75, $\delta^{17}O$ = +2.94, and $\Delta^{17}O$ = 0.97. These values plot above the terrestrial fractionation line, suggesting an unusual low FeO ordinary chondrite such as Burnwell.

Sample No.:	LAP 04771	<u>Macroscopic Description: Kathleen McBride</u>
Location:	LaPaz Ice Field	50% of the exterior surface is covered with black fusion crust.
Field No.:	17429	
Dimensions (cm):	1.0 x 0.75 x 0.25	<u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u>
Weight (g):	0.575	The section 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_{1-50}, orthopyroxene is Fs_2. The matrix consists dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.
Meteorite Type:	CM2 Chondrite	

Sample No.:	LAP 04775	<u>Macroscopic Description: Kathleen McBride</u>
Location:	LaPaz Ice Field	50% of the exterior has brown/black fusion crust with a sheen. The interior is chocolate, rusty brown with high metal content.
Field No.:	17042	
Dimensions (cm):	2.0 x 1.25 x 0.75	
Weight (g):	4.133	<u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u>
Meteorite Type:	L6 Chondrite	This L6 chondrite ($Fa_{24}Fs_{21}$) contains prominent shock veins and shock-melt veins containing spherical metal-sulfide globules.

Sample No.:	LAP 04779
Location:	LaPaz Ice Field
Field No.:	17823
Dimensions (cm):	1.0 x 1.0 x 1.0
Weight (g):	1.849
Meteorite Type:	Ureilite

Macroscopic Description: Kathleen McBride

40% of the exterior surface has brown/black fusion crust. The soft interior is rusty black and very weathered.

Thin Section (,2) Description: Tim McCoy 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_{22}, with rims reduced to Fa_4. The meteorite is a ureilite.

Sample No.:	PRA 04401; PRA 04402
Location:	Mt. Pratt
Field No.:	15719; 15703
Dimensions (cm):	3.5 x 3.5 x 2.5; 4.5 x 3.5 x 2.0
Weight (g):	54.919; 37.759
Meteorite Type:	Howardite

Macroscopic Description: Kathleen McBride

20-50% of the exteriors have thin, shiny patches of black fusion crust. The interiors are charcoal gray to black matrix with no metal visible.

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

The meteorites are so similar that a single description suffices. The sections show a groundmass of comminuted pyroxene and plagioclase (up to 0.5 mm) with fine- to coarse-grained basaltic clasts ranging up to 5 mm. PRA 04401 contains particularly abundant CM2 clasts. Orthopyroxene compositions span a range of $Fs_{16-60}Wo_{1-3}$, although a single grain of Fs_1 was observed, presumably from the CM2 clast. The Fe/Mn ratio is ~30 and feldspar is anorthitic (An_{87-90}). The meteorites are howardites.

Sample No.:	RBT 04260
Location:	Roberts Massif
Field No.:	16425
Dimensions (cm):	6.5 x 4.5 x 2.0
Weight (g):	86.326
Meteorite Type:	CM2 Chondrite

Macroscopic Description: Kathleen McBride

The exterior has a purplish crust on 20% of its surface. The fractured interior is black with white evaporites. Evaporites cover most of the interior of this sample.

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

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. Many chondrules are aqueously altered. Olivine compositions are Fa_{0-1}; orthopyroxene is Fs_1. The matrix consists dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.

Sample No.:	RBT 04261; RBT 04262
Location:	Roberts Massif
Field No.:	16331; 15145
Dimensions (cm):	4.0 x 3.5 x 2.5; 6.5 x 5.5 x 3.5
Weight (g):	78.763; 204.6
Meteorite Type:	Shergottite

Macroscopic Description: Kathleen McBride

30-50% of the exterior surfaces have brown/black, rough textured fusion crust with glassy spots. The interior is soft and tan-gray in color with a sandy texture and low metal content.

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

These meteorites are so similar that a single description suffices. The sections are composed of a coarse-grained assemblage of pyroxene, olivine and maskelynite with grain sizes reaching up to 4 mm. Sulfides and oxides are present, as are shock melt veins and pockets. Olivine is Fa_{28-40}; pyroxenes exhibit a range of compositions from pigeonite to augite ($Fs_{16-32}Wo_{7-38}$; Fe/Mn ~ 22-30); feldspar is intermediate in composition (An_{30-55}). The meteorites are olivine-phyric shergottites.

Oxygen Isotope Analysis: D. Rumble

Analysis for two subsamples of RBT 04261 give: A) $\delta^{18}O$ = +4.28, $\delta^{17}O$ = +2.56, and $\Delta^{17}O$ = 0.314; B) $\delta^{18}O$ = +4.45, $\delta^{17}O$ = +2.66, and $\Delta^{17}O$ = 0.322. These values plot just above the terrestrial fractionation line, and are similar to many previous analyses of shergottites.

Sample No.: MCY 05239
Location: MacKay Glacier
Field No.: 17363
Dimensions (cm): 3.0 x 2.0 x 1.5
Weight (g): 19.344
Meteorite Type: Mesosiderite

Macroscopic Description: Kathleen McBride
100% of the exterior is covered with rusty brown/black fusion crust. The interior has a rusty, granular textured matrix with high metal.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
The section is a breccia composed of angular isolated grains up to 1.0 mm and clasts of orthopyroxene ($Fs_{27-36}Wo_4$), olivine (Fa_{34-39}), anorthitic feldspar (An_{90-95} Or_{0-1}), metal, troilite and oxides. Minor iron oxide staining is present. The meteorite is a mesosiderite.

Sample No.: MIL 05010
Location: Miller Range
Field No.: 18143
Dimensions (cm): 11.0 x 7.0 x 4.5
Weight (g): 582.4
Meteorite Type: H4 Chondrite

Macroscopic Description: Cecilia Satterwhite
The exterior of this ordinary chondrite has black fusion crust with oxidation haloes and some brown weathered and rusty areas. The interior is a brownish gray matrix with metal and mm sized inclusions. Black veins are visible.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
This H4 chondrite ($Fa_{19}Fs_{16}$) is cross-cut by shock veins up to 5 mm thick that contain olivine grains mosaicized and stained by shock.

Sample No.: MIL 05013
Location: Miller Range
Field No.: 18027
Dimensions (cm): 10.5 x 7.7 x 7.8
Weight (g): 1494.6
Meteorite Type: CO3 Chondrite

Macroscopic Description: Cecilia Satterwhite
This fractured carbonaceous chondrite has brown/black fusion crust covering 95% of its exterior surface. Evaporites and oxidation are visible. The interior is black with oxidation and some rusty areas. White specks and some metal are visible.

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
The meteorite is likely paired with the MIL 03377 pairing group, the original description of which was: 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 05041
Location: Miller Range
Field No.: 18026
Dimensions (cm): 7.0 x 5.0 x 4.0
Weight (g): 239.800
Meteorite Type: Eucrite (Brecciated)

Macroscopic Description: Kathleen McBride
40% of the exterior is covered with brown/black rough textured fusion crust. The exterior has some vugs. The tan and white interior is soft and somewhat friable

Thin Section (,2) Description: Tim McCoy and Valerie Reynolds
The meteorite consists of coarse-grained basaltic fragments up to 1 mm set in a coarse, recrystallized matrix. Mineral compositions are homogeneous with pyroxene of $Fs_{60}Wo_2$ and feldspar of $An_{89}Or_1$. The Fe/Mn ratio of the pyroxene is ~30. The meteorite is a brecciated eucrite.

Sample No.:	MIL 05062; MIL 05165	<u>Macroscopic Description: Cecilia Satterwhite and Kathleen McBride</u> 30-40% brown/black fusion crust is on the exteriors with polygonal fractures. The interiors are tan to gray in color and are friable. No metal is visible. Black and white inclusions and odd shaped clasts of various colors are visible. <u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u> The sections are so similar that a single description suffices. The sections show a groundmass of comminuted pyroxene and plagioclase (up to 0.5 mm) with fine- to coarse-grained basaltic clasts ranging up to 5 mm. Fine-grained clasts, presumably impact melt in origin, are observed. Most of the pyroxene is orthopyroxene and pigeonites with compositions ranging from $Fs_{29-57}Wo_{1-7}$, although augite of $Fs_{40-60}Wo_{24-40}$ is found. The Fe/Mn ratio is ~30 and feldspar is anorthitic (An_{90-92}). The meteorites are howardites.
Location:	Miller Range	
Field No.:	18769;18721	
Dimensions (cm):	3.6 x 3.5 x 2.1; 5.0 x 3.0 x 1.5	
Weight (g):	23.788; 25.611	
Meteorite Type:	Howardite	

Sample No.:	MIL 05076	<u>Macroscopic Description: Kathleen McBride</u> 100% of the exterior surface has smooth brown/black pitted fusion crust. The interior is dark brown to black matrix with small light colored chondrules. <u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u> The section exhibits numerous well-defined chondrules (up to 1.5 mm) in a black matrix of fine-grained silicates, metal and troilite. Weak shock effects are present. Polysynthetically twinned pyroxene is present. The meteorite is moderately weathered. Silicates are unequilibrated; olivines range from Fa_{3-33} and pyroxenes from Fs_{5-31}. The meteorite is an L3 chondrite (estimated subtype 3.5).
Location:	Miller Range	
Field No.:	18155	
Dimensions (cm):	4.0 x 3.0 x 2.0	
Weight (g):	59.524	
Meteorite Type:	L3 Chondrite	

Sample No.:	MIL 05086	<u>Macroscopic Description: Kathleen McBride</u> The exterior fusion crust is rough textured and black in color with evaporites. The interior has a soft black matrix with light colored inclusions. <u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u> 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. Many chondrules are aqueously altered. Olivine compositions are Fa_{0-25}, orthopyroxene is Fs_{0-4}. The matrix consists dominantly of an Fe-rich serpentine. The meteorite is a CM2 chondrite.
Location:	Miller Range	
Field No.:	18151	
Dimensions (cm):	1.75 x 1.0 x 1.5	
Weight (g):	1.732	
Meteorite Type:	CM2 Chondrite	

Sample No.:	MIL 05155	<u>Macroscopic Description: Kathleen McBride</u> Brown/black patches of fusion are on <5% of this meteorite's exterior. The interior matrix is coarse grained and tan to light green in color with visible olivine crystals. <u>Thin Section (,2) Description: Tim McCoy and Valerie Reynolds</u> The meteorite is paired with the MIL 05029 pairing group, the original description of which was: The meteorites consist of large (up to 4 mm) orthopyroxene grains with interstitial feldspar with both of these phases poikilitically enclosing 50-200 µm 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).
Location:	Miller Range	
Field No.:	18048	
Dimensions (cm):	5.0 x 4.0 x 2.0	
Weight (g):	53.508	
Meteorite Type:	L Chondrite (Impact Melt)	

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.satterwhite@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 **March 2, 2007** deadline will be reviewed at the MWG meeting **March 16-17, 2007** in Washington, D.C. Requests that are received after the deadline may be delayed for review until MWG meets again in the Fall 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/