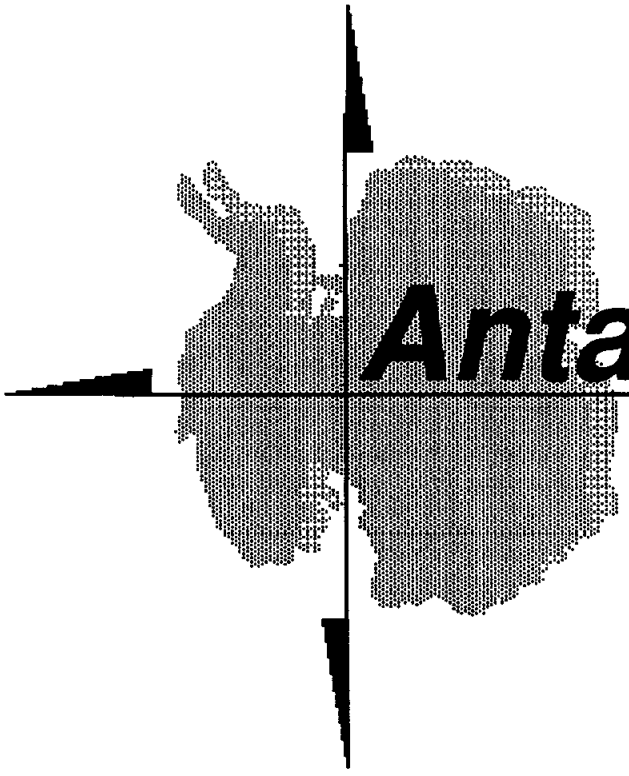

Antarctic Meteorite NEWSLETTER

INSIDE THIS ISSUE:

Volume 16
Number 1

March 1993

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

Edited by Roberta Score and Marilyn Lindstrom
Code SN2, NASA
Johnson Space Center,
Houston, Texas
77058

SAMPLE REQUEST DEADLINE:
April 5, 1993

MWG MEETS April 29 – May 1, 1993

SAMPLE REQUEST GUIDELINES

All sample requests should be made in writing to:

Secretary, MWG
SN2/Planetary Science Branch
NASA/Johnson Space Center
Houston, TX 77058 USA.

Requests that are received by the MWG Secretary before April 5, 1993, will be reviewed at the MWG meeting on April 29 – May 1, 1993, to be held in Houston, Texas. Requests that are received after the April 5 deadline may possibly be delayed for review until the MWG meets again in the Fall of 1993. **PLEASE SUBMIT YOUR REQUESTS ON TIME.** Questions pertaining to sample requests can be directed in writing to the above address or can be directed to the curator at (713) 483-5135 or the secretary at (713) 483-5125.

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 be initialed or countersigned by a supervising scientist to confirm access to facilities for analysis. All sample requests will be reviewed by the Meteorite Working Group (MWG), 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. 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 the appropriate funding agencies. As a matter of policy, U.S. Antarctic meteorites are the property of the National Science Foundation and all allocations are subject to recall.

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. Requests for thin sections which will be used in destructive procedures such as ion probe, etch or even repolishing, must be stated explicitly. Consortium requests should be initialed or countersigned by a member of each group in the consortium. All necessary information should probably be condensable into a one- or two-page letter, although informative attachments (reprints of publication that explain rationale, flow diagrams for analyses, etc.) are welcome.

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 Contr. Earth Sci.: Nos. 23, 24, 26, 28, and 30.

New Meteorites

This newsletter presents classifications of 365 meteorites collected by the ANSMET team during the 1987-1991 field seasons. Descriptions are presented for 23 meteorites of special petrologic type, including 10 achondrites, 7 carbonaceous chondrites, 13 enstatite chondrites, 1 unequilibrated chondrite, and 2 ungrouped chondrites. Ureilite **LEW88774** has a highly unusual assemblage of accessory minerals. The ungrouped chondrites are **PAT91546** which is nearly identical with ALH85085 and **PCA91241** which is similar to Carlisle Lake. Also provided are descriptions of two groups of unusual ordinary chondrites; PAT91504, a shock-blackened L6 and TIL91700, a metal-rich L4.

1992/93 ANSMET Field Season

This was another dynamic year for the ANSMET team. A field party of 6 worked new ice fields around Elephant Moraine, David Glacier and Reckling Moraine. The unofficial count is 257 specimens. We are told that this collection contains specimens that will spark some interest. McMurdo's new science laboratory, the Crary Laboratory, is now operational. This lab has been an asset to ANSMET by providing outside communication via E-mail and computer support for the field mapping project (AMLAMP).

Smithsonian Catalog Published

The Smithsonian Institution has recently published volume 30 of the Smithsonian Contributions to the Earth Sciences titled "Field and Laboratory Investigations of Antarctic Meteorites Collected by United States Expeditions, 1985-1987". Please contact Glenn MacPherson if you wish to receive a copy.

From 1987-1991 Collections

Pages 5-20 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 15(2) (September 1992). All specimens of special petrologic type (carbonaceous chondrite, unequilibrated ordinary chondrite, achondrite, etc.) are represented by separate descriptions. However, some specimens of non-special petrologic type are listed only as single line entries in Table 1. For convenience, new specimens of special petrologic type are also recast in Table 2.

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

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

Robbie Marlow, Cecilia Satterwhite,
Roberta Score, and Carol Schwarz
Antarctic Meteorite Laboratory
NASA/Johnson Space Center
Houston, Texas

Brian H. Mason and Glenn MacPherson
Department of Mineral Sciences
U.S. National Museum of
Natural History
Smithsonian Institution
Washington, D.C.

Antarctic Meteorite Locations

ALH — Allan Hills
BOW — Bowden Neve
BTN — Bates Nunataks
DOM — Dominion Range
DRP — Derrick Peak
EET — Elephant Moraine
GEO — Geologists Range
GRO — Grosvenor Mountains
HOW — Mt. Howe
ILD — Inland Forts
LAP — LaPaz Ice Field
LEW — Lewis Cliff
MAC — MacAlpine Hills
MBR — Mount Baldr
MET — Meteorite Hills
MIL — Miller Range
OTT — Outpost Nunatak
QUE — Queen Alexandra Range
PAT — Patuxent Range
PCA — Pecora Escarpment
PGP — Purgatory Peak
RKP — Reckling Peak
STE — Stewart Hills
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range

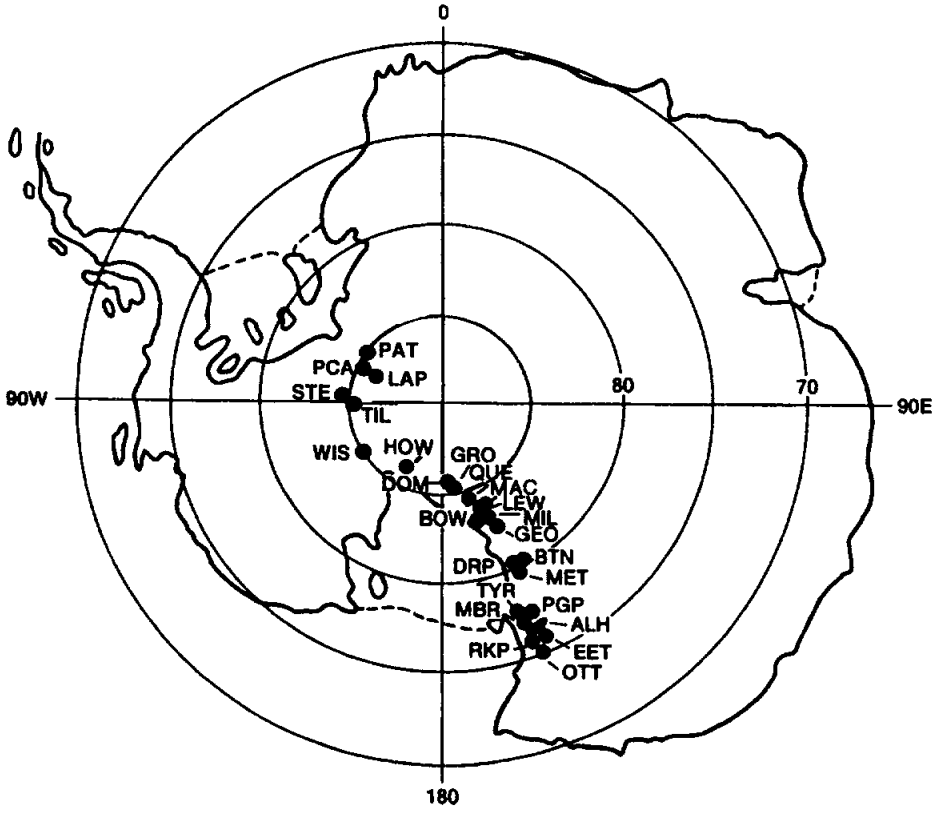

TABLE 1

List of Newly Classified Antarctic Meteorites**

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 87056~	0.1	AUBRITE	B	A/B		
LEW 88106~	19.6	H-6 CHONDRITE	B/C	A		
LEW 88626	7.7	H-5 CHONDRITE	C	A	19	17
LEW 88651	5.8	L-6 CHONDRITE	C	A	25	21
LEW 88653	9.4	H-5 CHONDRITE	C	A	19	17
LEW 88655	7.2	H-5 CHONDRITE	C	A	17	15
LEW 88660	4.0	H-6 CHONDRITE	C	A	18	16
LEW 88664	2.6	H-5 CHONDRITE	C	A	17	15
LEW 88665	7.3	H-5 CHONDRITE	C	A	17	15
LEW 88666	9.3	L-6 CHONDRITE	C	A	24	20
LEW 88667	6.7	H-5 CHONDRITE	C	A	17	15
LEW 88673	6.9	L-4 CHONDRITE	B/Ce	A	25	20
LEW 88674	2.7	H-5 CHONDRITE	C	A	18	16
LEW 88675	1.3	H-5 CHONDRITE	C	A	18	16
LEW 88676	1.6	H-5 CHONDRITE	C	A	19	17
LEW 88680	6.2	H-5 CHONDRITE	C	A	19	17
LEW 88681	9.0	H-5 CHONDRITE	B/C	A	18	16
LEW 88685	6.7	H-5 CHONDRITE	Ce	A	18	16
LEW 88692	3.9	L-6 CHONDRITE	C	A	24	21
LEW 88695	2.7	LL-6 CHONDRITE	B/C	A	31	25
LEW 88697	7.9	H-5 CHONDRITE	C	A	18	16
LEW 88701	2.8	LL-4 CHONDRITE	C	A	29	17-24
LEW 88702	3.9	H-5 CHONDRITE	C	A	19	17
LEW 88711	8.8	L-5 CHONDRITE	B/C	A	23	19
LEW 88713	7.6	H-5 CHONDRITE	C	A	18	16
LEW 88715	9.8	H-5 CHONDRITE	B/C	A	18	16
LEW 88716	6.0	H-5 CHONDRITE	C	A	18	16
LEW 88717	7.1	H-5 CHONDRITE	C	A	19	17
LEW 88722	3.4	H-5 CHONDRITE	C	A	18	16
LEW 88724	9.2	L-5 CHONDRITE	B/C	A	24	20
LEW 88725	5.5	H-5 CHONDRITE	C	A	18	16
LEW 88726	7.3	H-5 CHONDRITE	C	A	18	16
LEW 88727	6.0	H-5 CHONDRITE	C	A	19	17
LEW 88731	3.2	H-5 CHONDRITE	C	A	18	16
LEW 88733	6.6	L-5 CHONDRITE	C	A	24	20
LEW 88734	2.7	H-5 CHONDRITE	C	A	18	16
LEW 88735	8.0	H-5 CHONDRITE	C	A	18	16
LEW 88738	3.9	H-6 CHONDRITE	B/Ce	A	17	15
LEW 88746	4.3	LL-5 CHONDRITE	B/C	A	27	22
LEW 88749	7.1	L-5 CHONDRITE	C	A	24	20
LEW 88751	8.3	H-5 CHONDRITE	C	A	18	16
LEW 88754	2.7	LL-4 CHONDRITE	C	A	28	21-24
LEW 88755	8.6	H-4 CHONDRITE	C	A	18	12-15
LEW 88759	5.8	H-5 CHONDRITE	C	A	17	15
LEW 88760	3.1	H-6 CHONDRITE	C	A	18	16
LEW 88764	9.0	H-5 CHONDRITE	C	A	19	17
LEW 88765	4.2	H-5 CHONDRITE	C	A	19	17
LEW 88766	8.4	L-6 CHONDRITE	C	B/C	25	21
LEW 88772	7.4	UREILITE	C	A	11-18	11
LEW 88774	3.1	UREILITE	B/C	A	21-25	10-21
LEW 88779	6.8	LL-5 CHONDRITE	B/C	A	28	23

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
LEW 88784	2.6	H-6 CHONDRITE	C	A	19	17
LEW 88799	2.7	LL-6 CHONDRITE	C	A	28	23
EET 90640	9.7	L-5 CHONDRITE	B	A	23	20
EET 90650	15.7	L-5 CHONDRITE	B/Ce	A	23	19
EET 90651~	36.6	L-6 CHONDRITE	B	A		
EET 90652~	14.8	L-6 CHONDRITE	B	A		
EET 90653	8.9	H-5 CHONDRITE	B/C	A	18	16
EET 90654~	16.5	L-6 CHONDRITE	B	A		
EET 90655~	7.4	L-6 CHONDRITE	B	A		
EET 90656~	57.0	L-6 CHONDRITE	B	A		
EET 90657	16.1	L-5 CHONDRITE	B	B	24	20
EET 90658~	26.7	L-6 CHONDRITE	A/B	A		
EET 90659	1.4	L-6 CHONDRITE	B/Ce	A	24	20
EET 90660~	8.6	L-6 CHONDRITE	B	A		
EET 90661~	11.6	L-6 CHONDRITE	B	A		
EET 90662~	25.5	L-6 CHONDRITE	B	A		
EET 90663~	33.5	L-6 CHONDRITE	B	A		
EET 90664~	11.8	L-6 CHONDRITE	B	A		
EET 90665~	16.2	L-6 CHONDRITE	B	A		
EET 90666	10.2	H-6 CHONDRITE	B	A	18	16
EET 90667~	31.0	L-6 CHONDRITE	B	A		
EET 90668~	18.8	L-6 CHONDRITE	B	A		
EET 90669~	2.9	L-6 CHONDRITE	B	A		
LAP 91901	66.5	L-6 CHONDRITE	B	A	24	20
LAP 91902	119.2	L-6 CHONDRITE	B	A	24	20
PAT 91230~	119.2	L-6 CHONDRITE	C	A		
PAT 91502	620.4	L-4 CHONDRITE	B/C	B/C	25	19-23
PAT 91503~	463.9	L-6 CHONDRITE	B/C	A		
PAT 91504	350.4	L-6 CHONDRITE	B	B	25	21
PAT 91505~	270.9	L-6 CHONDRITE	B	B		
PAT 91506~	250.5	L-6 CHONDRITE	B	B		
PAT 91507~	211.8	L-6 CHONDRITE	A/B	A		
PAT 91508	264.6	L-5 CHONDRITE	B/C	A	24	21
PAT 91509	282.4	L-5 CHONDRITE	B	A	24	20
PAT 91510~	207.3	L-6 CHONDRITE	B	B		
PAT 91511~	232.3	L-6 CHONDRITE	B	A		
PAT 91512	177.4	L-5 CHONDRITE	B/Ce	A	25	21
PAT 91513~	276.0	L-6 CHONDRITE	B/C	A/B		
PAT 91514~	148.1	L-6 CHONDRITE	B/C	A		
PAT 91515~	49.5	L-6 CHONDRITE	B/C	B		
PAT 91518~	94.7	L-6 CHONDRITE	B/C	A		
PAT 91519	59.1	L-5 CHONDRITE	B/C	A	24	20
PAT 91520	66.6	L-5 CHONDRITE	B/C	A	24	20
PAT 91521	22.8	L-5 CHONDRITE	B/C	A	24	20
PAT 91522	160.2	L-5 CHONDRITE	B/C	A	24	20
PAT 91523~	76.6	L-6 CHONDRITE	A/B	A		
PAT 91524	63.4	L-5 CHONDRITE	B/C	A	24	20
PAT 91525~	11.9	L-6 CHONDRITE	C	A		
PAT 91526	18.4	H-4 CHONDRITE	B/C	A	18	11-20
PAT 91527~	75.7	L-6 CHONDRITE	B/C	A/B		
PAT 91529	12.6	L-5 CHONDRITE	B/C	A	24	20
PAT 91530~	0.8	L-6 CHONDRITE	C	A		

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
PAT 91531~	95.6	L-6 CHONDRITE	C	A		
PAT 91532~	60.6	L-6 CHONDRITE	B	A		
PAT 91533	16.7	L-5 CHONDRITE	C	A	24	20
PAT 91534~	7.2	L-6 CHONDRITE	Ce	A		
PAT 91535	29.4	LL-5 CHONDRITE	B/C	A	27	22
PAT 91536~	93.6	L-6 CHONDRITE	B	A		
PAT 91537	135.1	L-5 CHONDRITE	B	A/B	24	20
PAT 91538	26.9	L-5 CHONDRITE	C	A	23	19
PAT 91539~	42.7	H-6 CHONDRITE	B/C	A		
PAT 91540	10.5	H-5 CHONDRITE	B/C	A	18	16
PAT 91541	2.8	H-5 CHONDRITE	B/C	A	18	16
PAT 91542~	5.7	L-6 CHONDRITE	B/C	A		
PAT 91543	5.0	H-5 CHONDRITE	C	A	18	16
PAT 91544	9.1	H-5 CHONDRITE	B/C	A	19	17
PAT 91545	10.1	H-5 CHONDRITE	B/C	A	19	17
PAT 91546	17.9	CHONDRITE (UNGR)	B/C	A	1-2	1-5
PAT 91547	7.5	H-5 CHONDRITE	B/C	A	18	16
PAT 91548	5.7	H-5 CHONDRITE	B/C	A	18	16
PAT 91549	1.3	H-5 CHONDRITE	B/C	A	18	16
PAT 91550~	50.0	L-6 CHONDRITE	B/C	A		
PAT 91551~	5.8	L-6 CHONDRITE	B/C	A		
PAT 91552~	9.4	L-6 CHONDRITE	B/C	B/C		
PCA 91014	5768.0	L-5 CHONDRITE	C	C	23	19
PCA 91015	3965.9	L-5 CHONDRITE	B/Ce	B/C	23	19
PCA 91019	1172.5	L-5 CHONDRITE	C	A	23	19
PCA 91020	1748.6	E-3 CHONDRITE	Ce	A	0.1	0.2-3
PCA 91022~	718.2	L-6 CHONDRITE	A/B	A		
PCA 91023	1402.3	LL-6 CHONDRITE	A/B	A	31	25
PCA 91025	711.0	H-5 CHONDRITE	B	A	19	17
PCA 91026	702.0	H-6 CHONDRITE	C	A	19	17
PCA 91027	521.2	L-5 CHONDRITE	A/Be	B/C	24	20
PCA 91028	594.2	L-5 CHONDRITE	B/Ce	A	24	20
PCA 91030	334.5	L-5 CHONDRITE	B/C	A	23	19
PCA 91031	418.6	H-6 CHONDRITE	C	B/C	18	16
PCA 91032	426.6	L-5 CHONDRITE	B	A	24	20
PCA 91033	419.2	L-5 CHONDRITE	B	A	24	20
PCA 91034~	341.0	H-6 CHONDRITE	B/C	B/C		
PCA 91036	280.4	L-5 CHONDRITE	B/Ce	A	24	20
PCA 91038	521.3	LL-4 CHONDRITE	B/C	A	27	21-24
PCA 91039~	492.7	L-6 CHONDRITE	B/C	A		
PCA 91040	528.9	H-5 CHONDRITE	C	B/C	19	17
PCA 91041	502.6	H-5 CHONDRITE	B	A	19	17
PCA 91043	367.8	H-5 CHONDRITE	B	A	17	15
PCA 91044	375.0	L-5 CHONDRITE	B/Ce	A	24	20
PCA 91046	298.7	L-5 CHONDRITE	B/Ce	A	24	20
PCA 91050	186.3	L-5 CHONDRITE	B	A	23	19
PCA 91051	365.7	H-5 CHONDRITE	B	A/B	17	15
PCA 91052~	290.9	L-6 CHONDRITE	B/C	A/B		
PCA 91053	238.1	L-5 CHONDRITE	B/C	A	23	19
PCA 91054~	437.9	L-6 CHONDRITE	B	A		
PCA 91055	209.2	L-5 CHONDRITE	B/C	A	24	20
PCA 91056	314.6	L-5 CHONDRITE	Be	B	24	20
PCA 91057~	386.6	L-6 CHONDRITE	B	A		
PCA 91059	258.7	L-5 CHONDRITE	B/C	A	25	21

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
PCA 91060	352.4	L-5 CHONDRITE	B/C	A	25	21
PCA 91062~	332.0	L-6 CHONDRITE	B	A		
PCA 91063	182.8	L-5 CHONDRITE	B/C	A	26	21
PCA 91065~	267.3	L-6 CHONDRITE	A/B	A		
PCA 91066	180.0	L-5 CHONDRITE	C	A	23	19
PCA 91067	276.5	L-5 CHONDRITE	B/C	A	24	20
PCA 91069	260.4	L-5 CHONDRITE	B/C	A	25	21
PCA 91071	376.0	H-5 CHONDRITE	C	C	18	16
PCA 91072~	238.8	L-6 CHONDRITE	B/C	A		
PCA 91073	231.6	L-5 CHONDRITE	B/C	A	24	20
PCA 91074	176.9	H-6 CHONDRITE	B/C	B/C	19	17
PCA 91075	331.7	L-6 CHONDRITE	B/C	A	25	21
PCA 91076	276.8	L-6 CHONDRITE	B/C	A/B	24	20
PCA 91077	18.3	DIOGENITE	A	A	25	
PCA 91078	20.9	EUCRITE	A/B	A/B	26-55	
PCA 91079	3.7	EUCRITE	B	A	31-48	
PCA 91080	37.1	H-4 CHONDRITE	C	A/B	19	11-17
PCA 91081	37.8	EUCRITE	Be	A	40-62	
PCA 91082	37.9	CARBONACEOUS C2R	Be	A/B	1-5	1-8
PCA 91083	26.9	EUCRITE	Be	A	40-62	
PCA 91084	34.4	CARBONACEOUS C2	Be	A	1-59	1-6
PCA 91085	79.6	E-4 CHONDRITE	B/Ce	A/B	2	0.8
PCA 91086	61.3	H-5 CHONDRITE	B/C	B	19	17
PCA 91088	25.0	H-6 CHONDRITE	B/C	A	19	17
PCA 91090	4.6	H-6 CHONDRITE	B/C	A	19	17
PCA 91091	26.4	H-6 CHONDRITE	B/C	A	19	17
PCA 91092	23.7	H-5 CHONDRITE	B/C	A	18	16
PCA 91093	16.1	H-5 CHONDRITE	B/C	A	18	16
PCA 91094	18.8	H-5 CHONDRITE	B/C	A	18	16
PCA 91097	18.7	H-5 CHONDRITE	B/C	A	19	17
PCA 91098	41.4	H-6 CHONDRITE	B/C	A	18	16
PCA 91100	14.7	L-5 CHONDRITE	A/B	A	24	20
PCA 91101~	74.5	L-6 CHONDRITE	A/B	A		
PCA 91103	17.4	H-6 CHONDRITE	B/Ce	A	18	16
PCA 91104~	120.3	H-6 CHONDRITE	B/C	A		
PCA 91106~	201.1	L-6 CHONDRITE	A/B	A		
PCA 91107~	164.6	L-6 CHONDRITE	A/B	A		
PCA 91108~	44.7	L-6 CHONDRITE	B/Ce	A		
PCA 91109	80.2	H-5 CHONDRITE	B/C	A	19	17
PCA 91111	10.7	H-5 CHONDRITE	B/C	A	19	17
PCA 91114	18.0	E-4 CHONDRITE	B	A	0.6	
PCA 91115	5.8	H-5 CHONDRITE	B/C	A	17	15
PCA 91116	131.5	H-5 CHONDRITE	B/C	B	19	17
PCA 91117	72.2	L-6 CHONDRITE	B/C	A	25	21
PCA 91118	15.8	H-5 CHONDRITE	B/C	A	18	16
PCA 91119	0.3	E-4 CHONDRITE	C	A	1.2	
PCA 91120~	3.9	L-6 CHONDRITE	B/C	A		
PCA 91121	14.5	H-5 CHONDRITE	B/C	A/B	18	16
PCA 91124	32.3	LL-6 CHONDRITE	A/B	A	30	24
PCA 91125	3.3	E-4 CHONDRITE	B/C	A	0.9	
PCA 91126	30.8	L-4 CHONDRITE	B	A	24	20
PCA 91127	0.3	E-4 CHONDRITE	B/C	A	0.8	
PCA 91132~	215.0	L-6 CHONDRITE	Be	A		
PCA 91135~	13.6	L-6 CHONDRITE	B/C	A		
PCA 91139	2.7	H-5 CHONDRITE	B/C	A	19	17

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
PCA 91147	2.8	CARBONACEOUS C2	A	A	1-49	1-9
PCA 91148~	27.0	L-6 CHONDRITE	B	A		
PCA 91150~	18.9	L-6 CHONDRITE	B	A		
PCA 91152~	11.0	H-6 CHONDRITE	Ce	A		
PCA 91156~	19.7	H-6 CHONDRITE	B/C	A		
PCA 91159	8.4	EUCRITE	B	A	18-46	
PCA 91160~	6.9	L-6 CHONDRITE	B/C	A		
PCA 91162~	11.0	L-6 CHONDRITE	B/C	A		
PCA 91163~	7.7	H-6 CHONDRITE	B/C	A		
PCA 91173~	33.4	H-6 CHONDRITE	B/C	A		
PCA 91176~	31.6	L-6 CHONDRITE	B/C	A		
PCA 91179	41.1	EUCRITE	A	A	25-55	
PCA 91180~	18.9	L-6 CHONDRITE	B/C	A		
PCA 91181~	8.6	L-6 CHONDRITE	B/C	A		
PCA 91182~	10.4	L-6 CHONDRITE	B/C	A/B		
PCA 91185~	11.5	L-6 CHONDRITE	B/C	A		
PCA 91186~	43.2	L-6 CHONDRITE	B	A		
PCA 91187~	25.0	L-6 CHONDRITE	C	A		
PCA 91191~	7.6	L-6 CHONDRITE	A/B	A		
PCA 91192~	53.1	L-6 CHONDRITE	B/C	A		
PCA 91193	12.3	EUCRITE	A/Be	A	34-45	
PCA 91194~	13.2	H-6 CHONDRITE	B/C	A		
PCA 91196	15.1	L-4 CHONDRITE	B/C	A	25	17-20
PCA 91199~	7.2	L-6 CHONDRITE	B/C	A		
PCA 91203	4.2	CARBONACEOUS C2	Ae	A	1-11	1-9
PCA 91204	23.4	H-5 CHONDRITE	B/C	A	19	17
PCA 91205	6.2	H-6 CHONDRITE	C	A	18	16
PCA 91206~	2.3	L-6 CHONDRITE	B/C	A		
PCA 91207	10.9	H-5 CHONDRITE	B/C	A	18	16
PCA 91208~	1.3	H-6 CHONDRITE	B/C	A		
PCA 91210	5.4	H-5 CHONDRITE	B/C	A	18	16
PCA 91211	215.1	L-5 CHONDRITE	B	A	25	21
PCA 91212~	179.9	L-6 CHONDRITE	B/C	A		
PCA 91213~	161.4	H-6 CHONDRITE	B	A		
PCA 91215~	54.0	H-6 CHONDRITE	B	A		
PCA 91216~	130.1	L-6 CHONDRITE	B	A		
PCA 91217~	155.4	L-6 CHONDRITE	B/C	B/C		
PCA 91218~	68.0	L-6 CHONDRITE	B	A		
PCA 91219~	272.4	L-6 CHONDRITE	B	B		
PCA 91221~	46.0	L-6 CHONDRITE	B/C	A		
PCA 91222~	6.9	L-6 CHONDRITE	C	A		
PCA 91223~	36.6	L-6 CHONDRITE	C	A		
PCA 91224~	7.0	L-6 CHONDRITE	B/C	A		
PCA 91225~	1.4	L-6 CHONDRITE	B/C	A		
PCA 91226	20.7	L-4 CHONDRITE	B	A	26	15-21
PCA 91227	5.9	H-6 CHONDRITE	B/C	A		
PCA 91228~	5.2	H-6 CHONDRITE	B	A		
PCA 91229~	19.6	L-6 CHONDRITE	B/C	B		
PCA 91230~	0.5	H-6 CHONDRITE	B	A		
PCA 91231	60.9	H-5 CHONDRITE	B/C	A	19	17
PCA 91232	26.0	H-5 CHONDRITE	C	A	19	17
PCA 91233~	37.6	L-6 CHONDRITE	B/C	A		
PCA 91234~	20.5	L-6 CHONDRITE	B/C	A		
PCA 91235~	57.1	L-6 CHONDRITE	B	A		
PCA 91236~	25.3	L-6 CHONDRITE	B/C	A		

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
PCA 91237~	11.8	L-6 CHONDRITE	B/C	A		
PCA 91238	96.2	E-4 CHONDRITE	Be	A	1.1	
PCA 91239	105.9	H-5 CHONDRITE	B	A	19	17
PCA 91240~	83.9	LL-6 CHONDRITE	A/B	A		
PCA 91241	75.0	CHONDRITE (UNGR)	Be	A	20-38	
PCA 91242	21.9	H-5 CHONDRITE	B/Ce	A	18	16
PCA 91243~	2.8	H-6 CHONDRITE	B/C	A		
PCA 91244~	35.7	L-6 CHONDRITE	B	A		
PCA 91246~	6.0	H-6 CHONDRITE	B/C	A		
PCA 91247	12.7	H-6 CHONDRITE	B/C	A	19	17
PCA 91248~	4.7	L-6 CHONDRITE	B/C	A		
PCA 91249~	16.2	L-6 CHONDRITE	B/Ce	A		
PCA 91252	68.1	H-5 CHONDRITE	B/C	A	18	16
PCA 91253	103.7	H-6 CHONDRITE	A/B	A	19	17
PCA 91254	20.8	E-4 CHONDRITE	B/C	A	0.5	
PCA 91255	83.9	L-5 CHONDRITE	A/B	A	23	19
PCA 91256	12.4	H-5 CHONDRITE	B/C	A	19	17
PCA 91257~	53.8	L-6 CHONDRITE	A/B	A		
PCA 91258	10.4	E-4 CHONDRITE	B/C	A	0.9	
PCA 91259~	21.0	L-6 CHONDRITE	B/C	A		
PCA 91260~	6.2	L-6 CHONDRITE	B/C	A		
PCA 91261	40.5	H-5 CHONDRITE	C	A/B	19	17
PCA 91262~	15.8	L-6 CHONDRITE	B	A		
PCA 91263	17.3	H-5 CHONDRITE	B	A	18	16
PCA 91264	46.6	H-5 CHONDRITE	B/Ce	B	18	16
PCA 91265~	52.7	L-6 CHONDRITE	B/C	A		
PCA 91266	27.8	H-6 CHONDRITE	C	A	18	16
PCA 91267	112.9	H-6 CHONDRITE	B	A	18	16
PCA 91268	23.8	H-6 CHONDRITE	B/C	A	18	16
PCA 91269~	19.2	H-6 CHONDRITE	C	B/C		
PCA 91270~	31.2	H-6 CHONDRITE	B	A		
PCA 91271	107.7	H-5 CHONDRITE	B	A	18	16
PCA 91272	10.1	LL-6 CHONDRITE	A/B	A	30	24
PCA 91274~	32.2	L-6 CHONDRITE	B	A		
PCA 91277~	71.4	L-6 CHONDRITE	B	A		
PCA 91280~	57.6	L-6 CHONDRITE	B/C	A/B		
PCA 91287~	70.2	H-6 CHONDRITE	C	A/B		
PCA 91289~	26.2	L-6 CHONDRITE	B	A		
PCA 91295~	4.6	L-6 CHONDRITE	B/C	A		
PCA 91296~	4.7	H-6 CHONDRITE	Be	A		
PCA 91298~	1.6	E-4 CHONDRITE	C	A		
PCA 91300~	4.5	E-4 CHONDRITE	Be	A		
PCA 91301~	2.4	L-6 CHONDRITE	B	A		
PCA 91302~	2.3	L-6 CHONDRITE	B	A		
PCA 91303~	0.8	E-4 CHONDRITE	C	A		
PCA 91304~	6.1	L-6 CHONDRITE	C	A		
PCA 91305~	5.2	L-6 CHONDRITE	Ce	A		
PCA 91309~	63.0	L-6 CHONDRITE	C	A		
PCA 91312~	21.7	L-6 CHONDRITE	B	A/B		
PCA 91317~	162.8	L-6 CHONDRITE	B/C	A		
PCA 91319~	10.1	L-6 CHONDRITE	C	A		
PCA 91388~	6.7	PALLASITE	B/C	A		
STE 91800~	140.3	L-6 CHONDRITE	A/B	A		

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
TIL 91700	256.1	L-4 CHONDRITE	B	A	23	18-21
TIL 91701~	1086.0	L-4 CHONDRITE	B/C	A		
TIL 91702	304.7	L-4 CHONDRITE	B	A	24	18-24
TIL 91703	264.9	L-4 CHONDRITE	B	A	24	18-24
TIL 91704	234.7	L-4 CHONDRITE	B/C	A	24	15-25
TIL 91705	158.5	L-4 CHONDRITE	B	A	24	19-23
TIL 91706~	82.5	H-6 CHONDRITE	C	A/B		
TIL 91707	207.4	H-5 CHONDRITE	B	B	19	17
TIL 91708	310.4	L-4 CHONDRITE	B/C	A	25	19-24
TIL 91709~	660.1	L-4 CHONDRITE	C	A		
TIL 91710	514.7	L-5 CHONDRITE	A/B	A	24	20
TIL 91711	276.3	L-4 CHONDRITE	B	A	25	16-20
TIL 91712~	491.5	L-4 CHONDRITE	B/C	A		
TIL 91713	63.8	H-5 CHONDRITE	B	A	17	15
TIL 91714	163.9	E-5 CHONDRITE	C	A/B	0.4	
TIL 91717	16.5	H-5 CHONDRITE	B/C	A	17	15
TIL 91718	165.5	L-4 CHONDRITE	B	A	23	19
TIL 91719~	15.7	L-6 CHONDRITE	B/Ce	A		
TIL 91720	127.2	L-4 CHONDRITE	B	A	23	19
TIL 91721	233.6	L-4 CHONDRITE	B	A	24	17-21
TIL 91722	47.4	CARBONACEOUS C2	B/Ce	A/B	1-24	1-5
TIL 91723	264.6	L-4 CHONDRITE	B	A	23	18-23
TIL 91724	253.7	H-6 CHONDRITE	B/C	A	18	16
WIS 91600	184.1	CARBONACEOUS C2	A/Be	A	1-39	1-15
WIS 91601	587.7	LL-5 CHONDRITE	A/B	A	29	23
WIS 91602	83.3	L-5 CHONDRITE	A/B	A	26	21
WIS 91603	1092.4	L-4 CHONDRITE	A/B	A	26	16-23
WIS 91604	58.4	L-4 CHONDRITE	B	A	26	17-20
WIS 91605	748.6	L-4 CHONDRITE	A/B	A	26	16-23
WIS 91606	29.1	L-5 CHONDRITE	B	A	24	20
WIS 91607	106.7	L-4 CHONDRITE	B/C	A	24	20
WIS 91608	0.3	CARBONACEOUS C2	A/B	A	1-44	1-15
WIS 91609	11.1	H-4 CHONDRITE	B	A	18	16
WIS 91610	77.3	H-6 CHONDRITE	B/C	A	18	16
WIS 91611	1.5	L-5 CHONDRITE	B	A	26	21
WIS 91612~	501.0	L-6 CHONDRITE	A/B	A		
WIS 91613	66.2	H-5 CHONDRITE	B	A	18	16
WIS 91615~	13.9	LL-6 CHONDRITE	A	A		
WIS 91616	217.7	L-4 CHONDRITE	B	A	23	18-20
WIS 91617	82.9	H-5 CHONDRITE	B	A	18	16
WIS 91618	197.6	LL-4 CHONDRITE	A/B	A	28	17-27
WIS 91619	150.3	H-5 CHONDRITE	B/C	A	19	17
WIS 91620	37.3	L-4 CHONDRITE	B	A	26	12-21
WIS 91621	86.5	H-5 CHONDRITE	A/B	A	17	15
WIS 91622	440.9	H-5 CHONDRITE	A/B	A	19	16
WIS 91623~	1180.5	L-6 CHONDRITE	A/Be	A		
WIS 91624	71.1	LL-5 CHONDRITE	B/C	A	27	22
WIS 91625	149.2	L-4 CHONDRITE	B/C	A	23	16-19
WIS 91626~	163.2	L-6 CHONDRITE	B/C	A		
WIS 91627	107.0	H-3 CHONDRITE	B/C	A	8-26	2-22
WIS 91628~	150.1	L-6 CHONDRITE	B/C	A		

~Classified by using refractive indices.

TABLE 2

Newly Classified Specimens Listed By Type**

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
		Achondrites				
LEW 87056~	0.1	AUBRITE	B	A/B		
PCA 91077	18.3	DIOGENITE	A	A	25	
PCA 91078	20.9	EUCRITE	A/B	A/B	26-55	
PCA 91079	3.7	EUCRITE	B	A	31-48	
PCA 91081	37.8	EUCRITE	Be	A	40-62	
PCA 91083	26.9	EUCRITE	Be	A	40-62	
PCA 91159	8.4	EUCRITE	B	A	18-46	
PCA 91179	41.1	EUCRITE	A	A	25-55	
PCA 91193	12.3	EUCRITE	A/Be	A	34-45	
LEW 88772	7.4	UREILITE	C	A	11-18	11
LEW 88774	3.1	UREILITE	B/C	A	21-25	10-21
		Carbonaceous Chondrites				
PCA 91084	34.4	CARBONACEOUS C2	Be	A	1-59	1-6
PCA 91147	2.8	CARBONACEOUS C2	A	A	1-49	1-9
PCA 91203	4.2	CARBONACEOUS C2	Ae	A	1-11	1-9
TIL 91722	47.4	CARBONACEOUS C2	B/Ce	A/B	1-24	1-5
WIS 91600	184.1	CARBONACEOUS C2	A/Be	A	1-39	1-15
WIS 91608	0.3	CARBONACEOUS C2	A/B	A	1-44	1-15
PCA 91082	37.9	CARBONACEOUS C2R	Be	A/B	1-5	1-8
		Chondrites (Ungrouped)				
PAT 91546	17.9	CHONDRITE (UNGR)	B/C	A	1-2	1-5
PCA 91241	75.0	CHONDRITE (UNGR)	Be	A	20-38	
		Chondrites - Type 3				
WIS 91627	107.0	H-3 CHONDRITE	B/C	A	8-26	2-22

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
		E Chondrites				
PCA 91020	1748.6	E-3 CHONDRITE	Ce	A	0.1	0.2-3
PCA 91085	79.6	E-4 CHONDRITE	B/Ce	A/B	2	0.8
PCA 91114	18.0	E-4 CHONDRITE	B	A	0.6	
PCA 91119	0.3	E-4 CHONDRITE	C	A	1.2	
PCA 91125	3.3	E-4 CHONDRITE	B/C	A	0.9	
PCA 91127	.3	E-4 CHONDRITE	B/C	A	0.8	
PCA 91238	96.2	E-4 CHONDRITE	Be	A	1.1	
PCA 91254	20.8	E-4 CHONDRITE	B/C	A	0.5	
PCA 91258	10.4	E-4 CHONDRITE	B/C	A	0.9	
PCA 91298~	1.6	E-4 CHONDRITE	C	A		
PCA 91300~	4.5	E-4 CHONDRITE	Be	A		
PCA 91303~	0.8	E-4 CHONDRITE	C	A		
TIL 91714	163.9	E-5 CHONDRITE	C	A/B	0.4	
		Stony-Irons				
PCA 91388~	6.7	PALLASITE	B/C	A		

~Classified by using refractive indices.

***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.

TABLE 3

Tentative Pairings for New Specimens

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).

PALLASITE:

PCA 91388 with PCA 91004.

AUBRITE:

LEW87056 with LEW87007.

EUCRITE:

PCA 91081, 91083 with PCA 82502.

PCA 91079, 91159, 91193.

CARBONACEOUS C2:

PCA 91084, 91147, 91203.

CHONDRITE (UNGROUPED):

PCA 91241 with PCA 91002.

E4 CHONDRITE:

PCA 91085, 91114, 91119, 91125, 91127, 91238, 91254, 91258, 91298, 91300, 91303 with PCA 82518.

L4 CHONDRITE:

TIL 91700, 91701, 91702, 91703, 91704, 91705, 91708, 91709, 91711, 91712, 91718, 91720, 91721, 91723.

L6 CHONDRITE:

EET 90651, 90652, 90654, 90655, 90656, 90658, 90660, 90661, 90662, 90663, 90664, 90665, 90667, 90668, 90669 with EET 90053.

LAP 91901, 91902.

PAT 91503, 91504, 91505, 91507, 91510, 91511, 91513.

Sample No.: **LEW88772**
Location: Lewis Cliff
Dimensions (cm): 2.4 x 2.0 x 1.1
Weight (g): 7.4
Meteorite Type: Ureilite

Macroscopic Description: Cecilia Satterwhite
The fusion crust, which covers 95% of the exterior of the meteorite, is black and contains abundant oxidation haloes. The interior of LEW88772 is browish-black in color with small light gray inclusions in the crystalline matrix. Some areas are weathered to an orangish-brown.

Thin Section (,2) Description: Brian Mason
The section shows a coarse-grained aggregate of anhedral olivine and minor pyroxene (maximum grain size 2.4) rimmed by black carbonaceous material. Well-preserved fusion crust is present along one edge. Under cross polars the olivine and pyroxene grains are seen as a mosaic of tiny grains averaging 0.05 mm across, evidently a shock effect. Microprobe analyses show olivine of variable composition, Fa_{11-18}, mean $Fa_{1\ 6}$; pyroxene composition is $Wo_{11}Fs_{11}$. The meteorite is a ureilite.

Sample No.: **LEW88774**
Location: Lewis Cliff
Dimensions (cm): 1.2 x 1.3 x 0.8
Weight (g): 3.1
Meteorite Type: Ureilite

Macroscopic Description: Cecilia Satterwhite
Approximately half of the exterior of LEW88774 is covered with weathered brown fusion crust. Weathering of this stone has masked most of its characteristics, but its crystalline nature is still preserved.

Thin Section (,2) Description: Brian Mason and Glenn MacPherson
Visual inspection of the thin section shows a very uneven polish, owing to the presence of millimeter-sized opaque black regions that stand out in positive relief next to the silicate matrix.

Petrographic examination shows that this stone is dominated by large (up to ~4mm) twinned low-Ca pyroxene grains with coarse exsolution lamellae of augite, accompanied by subordinate opaque-fringed olivine crystals (up to ~1mm), abundant red-brown translucent Cr-spinel crystals, some interstitial metal associated with the spinel, and large carbonaceous areas that apparently consist of graphite (bireflective) enclosing diamond. Light reddish-yellow staining in thin section indicates mild terrestrial weathering; iron oxide was identified in interstitial veins.

Analyses of the constituent phases gave the following compositions: olivine crystals have cores of Fa_{21-25} rimmed by narrow zones of Fa_{4-6} plus iron metal; Low-Ca pyroxene grains have cores of $Wo_{4-5}Fs_{20-21}$ mantled by narrow zones of $Wo_{6-10}Fs_{10-16}$ plus metal; augite is $Wo_{33-35}Fs_{13-14}$; spinel contains 42-59% Cr_2O_3, 16-31% Al_2O_3, and <3% FeO. The spinels are surrounded by complex zones consisting of Cr-Fe metal, brezinaite (Cr-sulfide), and skeletal crystals of corundum-Cr_2O_3(-CrO?) solid solution (up to ~82% Al_2O_3, MgO <<1%) embedded in Na-Ca-bearing aluminosilicate glass. This meteorite is a highly unusual ureilite.

Oxygen Isotope Composition: Robert Clayon
LEW88774,3 has $\delta^{18}O$ = +7.62 per mil; $\delta^{17}O$ = +3.03 per mil. This composition falls within the field of ureilites of Group I of Berkley et al. (Geochim. Acta 44, 1579, 1980). The mean of 10 Group I meteorites is $\delta^{18}O$ = +7.52 per mil, $\delta^{17}O$ = +3.12 per mil (Clayton and Mayeda, Geochim. Acta 52, 1313, 1988).

Sample No.: **PAT91504**
Location: Patuxent Range
Dimensions (cm): 6.0 x 5.5 x 5.5
Weight (g): 350.4
Meteorite Type: (Black) L6 Chondrite

Macroscopic Description: Carol Schwarz
This polished rounded specimen has thin shiny remnant fusion crust covering about 40% of the exterior. There are some exterior fractures, causing the specimen to exfoliate while attempting to cleave it. The interior is dark gray to black, fine-grained, and has abundant metal. Several <1mm white rusty inclusions were observed.

Thin Section (,2) Description: Brian Mason
The section shows a finely granular aggregate of olivine and pyroxene, with minor amounts of nickel-iron and troilite; traces of chondritic structure can be discerned. The section is gray from finely dispersed troilite, probably the result of severe shock. Microprobe analyses show the following compositions: olivine, Fa_{25}; pyroxene, Fs_{21}; plagioclase (maskelynite), An_{12}. The meteorite is a black L6 chondrite, similar to Farmington (Geochim. Cosmochim. Acta, v. 30,

1-8, 1966). The following PAT 91XXX meteorites are paired with PAT91504: 91503, 91505, 91507, 91510, 91511, 91513.

Sample No.: **PAT91546**
Location: Patuxent Range
Dimensions (cm): 2.0 x 2.0 x 1.6
Weight (g): 17.9
Meteorite Type: Ungrouped Chondrite

Macroscopic Description: Robbie Marlow
Dull dark brown fusion crust covers most of the exterior of PAT91546. The specimen is extremely coherent. The interior is dark brown and contains several chondrules that are <1mm in size. Several light and dark inclusions were also noted.

Thin Section (,2) Description: Brian Mason
The section shows a few chondrules (up to 0.3 mm across), abundant pyroxene and minor olivine grains, and a considerable amount of nickel-iron (about 25%). The silicate grains are small, averaging 0.03 mm. The meteorite is considerably weathered, with limonitic staining through out the section. Pyroxene composition ranges from Fs_1 to Fs_5, with a mean of Fs_2; olivine composition ranges from Fa_1 to Fa_2. The metal contains no Si. The meteorite is classified as an ungrouped chondrite; it is essentially identical with ALH85085, a unique meteorite which has been intensively investigated (Earth Planet. Sci. Letters, v. 91, p. 1-54, 1988).

Sample No.: **PCA91020**
Location: Pecora Escarpment
Dimensions (cm): 14.4 x 12.0 x 4.8
Weight (g): 1748.6
Meteorite Type: E3 Chondrite

Macroscopic Description: Robbie Marlow
This considerably weathered specimen is ~50% covered with dull black fusion crust. Areas devoid of fusion crust are reddish-brown and have a polished appearance. Cleaving this coherent meteorite in half revealed a brown/black fine-grained matrix. A green colored evaporite deposit is present. Abundant dark gray inclusions/chondrules were noted. Metal is abundant.

Thin Section (,2) Description: Brian Mason
Chondrules are abundant, ranging up to 1.8 mm across; they consist of granular or radiating pyroxene, sometimes with a little olivine. The matrix consists of pyroxene grains, with 25-30% nickel-iron and a lesser amount of sulfides. Most of the pyroxene is close to $MgSiO_3$ in composition: mean Fs_1, range $Fs_{0.2-3}$, with CaO 0.1-0.8%; olivine is fosterite (FeO 0.1%, CaO 1.5%). The metal contains 0.3-0.7% Si. The meteorite is tentatively classified as an E3 chondrite.

Sample No.: **PCA91077**
Location: Pecora Escarpment
Dimensions (cm): 3.5 x 3.5 x 0.8
Weight (g): 18.3
Meteorite Type: Diogenite

Macroscopic Description: Carol Schwarz
This dome-shaped fragment has very black fusion crust covering about 60% of its surface. Small areas have been physically plucked out. One exterior surface shows a light gray-green matrix with small darker clasts. The material exposed by chipping of this meteorite is gray with darker gray clasts.

Thin Section (,2) Description: Brian Mason
The section consists almost entirely of orthopyroxene clasts, up to 1.5 mm in maximum dimension, in a matrix of comminuted orthopyroxene. The pyroxene is uniform in composition, Wo_3Fs_{25}. The meteorite is a diogenite.

Sample No.: **PCA91078**
Location: Pecora Escarpment
Dimensions (cm): 3.5 x 2.5 x 2.0
Weight (g): 20.9
Meteorite Type: Unbrecciated Eucrite

Macroscopic Description: Carol Schwarz
About 35% of this achondrite has very shiny black fusion crust. The exterior devoid of fusion crust has large white and dark grains. The interior is coarse-grained consisting of white plagioclase grains and black grains with some yellowish oxidation. This meteorite is moderately friable.

Thin Section (,2) Description: Brian Mason
The meteorite is a coarse-grained intergrowth of plagioclase and pyroxene with a gabbroic texture; individual grains are up to 3 mm in maximum dimension. Accessory tridymite is also present. Most of the pyroxene has the composition Wo_5Fs_{55} but some calcic pyroxene, $Wo_{33}Fs_{33}$ - $Wo_{40}Fs_{26}$, was also analysed. Plagioclase

composition is An_{75-92}. The meteorite is an unbrecciated eucrite.

Sample No.: **PCA91079; 91159; 91193**
Location: Pecora Escarpment
Dimensions (cm): 2 x 1 x 0.8; 2.5 x 1.5 x 1.0; 2.5 x 2.0 x 1.2
Weight (g): 3.7; 8.4; 12.3
Meteorite Type: Eucrite

Macroscopic Description: Carol Schwarz and Celicia Satterwhite
All three of these specimens are ~80% covered with thin shiny black fusion crust. The interior matrices are gray in color with numerous <0.5 mm white and tan clasts. PCA91159 contains a large area of dark (glassy ?) matrix, and 91193 has evaporite deposits.

Thin Section (91079,2; 91159,2; 91193,2) Description: Brian Mason
These sections are so similar that a single description suffices; the meteorites are probably paired. They show clasts of plagioclase and pyroxene, up to 2.4 mm in maximum dimension, in a comminuted matrix of these minerals. Plagioclase composition is An_{85-90}. Pyroxene compositions cluster around Wo_2Fs_{46}, with some more calcic grains, ranging up to $Wo_{38}Fs_{18}$. The meteorites are monomict eucrites.

Sample No.: **PCA91081**
Location: Pecora Escarpment
Dimensions (cm): 3.4 x 3.9 x 2.0
Weight (g): 37.8
Meteorite Type: Eucrite

Macroscopic Description: Cecilia Satterwhite
Thirty percent of this meteorite is covered with black fusion crust that is shiny in some areas. Areas devoid of fusion crust have a rough texture, and are medium gray. The interior is light to medium gray with abundant light and dark gray inclusions. Minor amount of evaporite deposit is present.

Thin Section (,2) Description: Brian Mason
The section shows a fine-grained ophitic intergrowth of pyroxene and plagioclase (average length of plagioclase laths is about 0.1mm). Small areas of somewhat coarser material may be partly digested clasts of similar composition. Microprobe analyses show pyroxene compositions ranging fairly continuously from Wo_3Fs_{62} to $Wo_{27}Fs_{40}$, the range in En content being quite limited. Plagioclase composition is An_{86-91}. The meteorite is a eucrite; it is very similar to PCA82502, and the possibility of pairing should be considered. PCA91083 is paired with 91081.

Sample No.: **PCA91082**
Location: Pecora Escarpment
Dimensions (cm): 4.0 x 2.5 x 1.7
Weight (g): 37.9
Meteorite Type: C2R Chondrite

Macroscopic Description: Cecilia Satterwhite
The fusion crust on this sample is black, fractured, and shiny in areas. The interior is made up of jet black matrix with abundant light inclusions. The inclusions are very small but can be discerned with the naked eye. Some evaporite deposit was noted as was oxidized matrix.

Thin Section (,2) Description: Brian Mason
The section shows a close-packed aggregate of large chondrules (maximum diameter 3 mm) rimmed with black matrix. About 10% of nickel-iron is present, in part concentrated as rims to the chondrules; troilite is present in small amount; about 1%. Chondrule types include granular olivine, barred olivine, and granular clinoenstatite (polysynthetically twinned). The matrix includes some pale green phyllosilicate. Weathering is indicated by pervasive limonitic staining. Microprobe analyses show Mg-rich olivine and pyroxene of somewhat variable composition; olivine, Fa_{1-5}; pyroxene, Fs_{1-8}. The meteorite is tentatively classified as a C2 chondrite of Renazzo subtype, although the amount of carbonaceous matrix is unusually low.

Sample No.: **PCA91084; 91147; 91203**
Location: Pecora Escarpment
Dimensions (cm): 4.5 x 3.2 x 1.5; 1.6 x 1.0 x 0.8; 2.1 x 1.5 x 1
Weight (g): 34.4; 2.8; 4.2
Meteorite Type: C2 Chondrite

Macroscopic Description: Cecilia Satterwhite and Robbie Marlow
Less than half of the exterior of these specimens are covered with black shiny fusion crust. The interior matrices are jet black and contain numerous small inclusions/chondrules. Evaporite deposits are present on the interior surfaces of 91084 and 91203.

Thin Section (91084,2; 91147,2, 91203,2)
Description: Brian Mason
These sections are so similar that one description suffices; the meteorites are probably paired. They show numerous chondrules, up to 0.6 mm across, irregular aggregates, and mineral grains in a black carbonaceous matrix. The minerals are mainly olivine, with minor pyroxene. Olivine compositions are mostly near Mg_2SiO_4, but occasional iron-rich grains are analysed, up to Fa_{59}. Pyroxene compositions range from Fs_1 to Fs_9. The meteorites are C2 chondrites.

Sample No.:	**PCA91085; 91114; 91119; 91125; 91238**
Location:	Pecora Escarpment
Dimensions (cm):	4.5 x 3.5 x 2.0; 1.5 x 2.8 x 1.6; 0.5 x 0.7 x 0.2; 1.5 x 1.2 x 1.0; 4.5 x 2.5 x 3.3
Weight (g):	79.6; 18.0; 0.3; 3.3; 96.2
Meteorite Type:	E4 Chondrite

Macroscopic Description: Robbie Marlow and Cecilia Satterwhite
The fusion crust present on these specimens range from 0 to 90%; is dark brown in color, and has large oxidation haloes. Chondrules have weathered out and are protruding from the surface of 91114. The interior matrices have weathered to a dark brown color. Abundant chondrules are present in all specimens. Evaporite deposits are present on interior and exterior surfaces of 91085, and 91238.

Thin Section (91085,2; 91114,2 ; 91119,2; 91125,2; 91238,2) Description: Brian Mason
These sections are so similar that a single description suffices. Chondrules are abundant, ranging up to 0.9 mm across; they consist of granular or fine-grained pyroxene. The groundmass consists largely of granular pyroxene, with lesser amounts of nickel-iron and sulfides, and a little feldspar and an SiO_2 phase, probably cristobalite. Microprobe analyses show that the pyroxene is almost pure $MgSiO_3$ (FeO up 1.7%, CaO up to 0.4%). The feldspar is almost pure albite (K_2O up to 0.6%, CaO up to 0.7%). One grain of forsteritic olivine (FeO 1.6%) was analysed in 91085. The nickel-iron contains 2.3-2.9% Si. The meteorites are classified as E4 chondrites; they are very similar to PCA82518, and the possibility of pairing should be considered. The following PCA 91XXX meteorites also belong to this pairing group: 91127, 91254, 91258, 91298, 91300, 91303.

Sample No.:	**PCA91179**
Location:	Pecora Escarpment
Dimensions (cm):	4.0 x 3.5 x 2.0
Weight (g):	41.1
Meteorite Type:	Eucrite

Macroscopic Description: Cecilia Satterwhite
Shiny black fusion crust covers 50% of PCA91179. Light gray matrix with abundant small white and gray inclusions make up the interior. A few areas show heavy oxidation.

Thin Section (,2) Description: Brian Mason
The section shows a brecciated structure, with doleritic and gabbroic clasts up to 2.4 mm in maximum dimension in a groundmass of comminuted pyroxene and plagioclase. Pyroxene compositions cluster around Wo_4Fs_{55}, but occasional grains of calcic pyroxene, $Wo_{38}Fs_{25}$, were analysed. Plagioclase composition is An_{82-88}. An SiO_2 phase, probably tridymite, is present in accessory amounts. The meteorite is a eucrite.

Sample No.:	**PCA91241**
Location:	Pecora Escarpment
Dimensions (cm):	4.5 x 4.0 x 1.6
Weight (g):	75.0
Meteorite Type:	Ungrouped Chondrite

Macroscopic Description: Cecilia Satterwhite
Frothy, brown, and black fusion crust covers 50% of the exterior of this meteorite. The interior of PCA91241 consists of medium gray matrix. A thin discontinuous weathering rind is present as are areas of heavy oxidation. Numerous small inclusions that are white to light gray in color are visible. Evaporite deposit is present on the interior surfaces.

Thin Section (,2) Description: Brian Mason
The section shows numerous polycrystalline silicate clasts (up to 1.8 mm in maximum dimension), some small chondrules (up to 0.5 mm across), and mineral grains in a finely-granular gray matrix. A moderate amount of sulfides (both troilite and pentlandite) is present, much of it as minute grains disseminated through the matrix. No nickel-iron was seen. The meteorite appears to be unweathered. Microprobe analyses show olivine compositions with a prominent peak at Fa_{38}, with a few more magnesian grains. The meteorite can be confidently paired with PCA91002, an ungrouped chondrite belonging to the Carlisle Lakes grouplet (Geochim. Cosmochim. Acta, v. 55, p. 2657, 1991).

Sample No.:	**TIL91700; 91702; 91703; 91704; 91708; 91711; 91721; 91723**
Location:	Thiel Mountains
Dimensions (cm):	6.0 x 5.0 x 3.5; 9 x 7 x 3; 9.5 x 5.5 x 5.3; 7 x 4 x 3 ; 8 x 6 x 3.5; 8.5 x 5 x 3; 7 x 6 x 3; 11 x 5.5 x 2
Weight (g):	256.1; 304.7; 264.9; 234.7; 310.4; 276.3; 233.6; 264.6
Meteorite Type:	L4 Chondrite

Macroscopic Description: Robbie Marlow and Carol Schwarz

Between 25% and 95% of the exteriors of these meteorites are covered with thin black fusion crust. The interiors show dark gray to black matrix with large oxidation haloes and heavy oxidation in places. Numerous inclusions range in size from <1 mm to 2mm, many larger clasts were noted, one in particular is 0.9 x 0.5 cm in 91704.

Thin Section (91700,2; 91702,2; 91703,2; 91704,2; 91708,2; 91711,2; 91721,2; 91723,2) Description: Brian Mason

The textures, mineral compositions, and degree of weathering shown by these sections are so similar that the meteorites can confidently be paired. The sections show a close-packed aggregate of chondrules, chondrule fragments, and occasional clasts, with minor subequal amounts of nickel-iron and troilite. Minor weathering is indicated by brown limonitic staining throughout the sections. Microprobe analyses show fairly uniform olivine compositions (Fa_{23-25}) and variable pyroxene compositions (Fs_{15-25}). The meteorites are classified as L4 chondrites, although the nickel-iron content appears to be higher than the normal for L-group chondrites. Additional members of this pairing group are: TIL91705, 91718, and 91720. Optical examination shows that TIL91701, 91709, and 91712 are also paired with these meteorites.

Sample No.:	**TIL91714**
Location:	Thiel Mountains
Dimensions (cm):	6.5 x 4.8 x 4.9
Weight (g):	163.9
Meteorite Type:	E5 chondrite

Macroscopic Description: Cecilia Satterwhite

Despite the fact that this meteorite is heavily weathered, some brown fusion crust exists and metal is still obvious in the red-brown to orange matrix.

Thin Section (,2) Description: Brian Mason

The section shows a few poorly defined chondrules in a matrix of granular orthopyroxene, with minor nickel-iron and sulfides. Fusion crust is present along one edge. Weathering is extensive, with brown limonitic staining throughout the section. The pyroxene is almost pure $MgSiO_3$ (FeO 0.1-0.7%, CaO 0.7-0.8%). The nickel-iron contains 0.6-0.8% Si. The meteorite is classified as an E5 chondrite.

Sample No.:	**TIL91722**
Location:	Thiel Mountains
Dimensions (cm):	4.0 x 2.5 x 2.5
Weight (g):	47.4
Meteorite Type:	C2 Chondrite

Macroscopic Description: Cecilia Satterwhite

Fifty percent of the exterior of TIL91722 is covered with black, frothy, and fractured fusion crust. The interior is jet black and contains abundant gray inclusions. A few areas have weathered to a yellowish-brown. The abundant evaporite deposit present has a bluish color.

Thin Section (,2) Description: Brian Mason

The section shows numerous chondrules, up to 1.1 mm across, mineral aggregates, and small mineral grains in a black carbonaceous matrix. The minerals are mainly olivine, with minor pyroxene. The composition of most olivine grains is near Mg_2SiO_4, but a few more iron-rich grains are present, up to Fs_{24}. Pyroxene compositions range from Fs_1 to Fs_5. The meteorite is a C2 chondrite.

Sample No.:	**WIS91600; 91608**
Location:	Wisconsin Range
Dimensions (cm):	6.5 x 6.0 x 5.0; 1 x 0.3 x 0.5
Weight (g):	184.1; 0.3
Meteorite Type:	C2 Chondrite

Macroscopic Description: Carol Schwarz

Seventy-five percent of these carbonaceous chondrite fragments are covered with black, fractured, and rusty fusion crust. The fusion crust is frothy on 91608. The interior is black with numerous small dark gray chonrules/clasts. A minor amount of evaporite deposit is present on the exterior and interior surfaces of 91600.

Thin Section (91600,2; 91608,2) Description: Brian Mason

These sections are so similar that a single description suffices; the meteorites are probably paired. They show chondrules, up to 1.2 mm in diameter, irregular aggregates, and mineral grains, in a black carbonaceous matrix. The minerals are mainly olivine, with minor pyroxene. Olivine compositions are mostly near Mg_2SiO_4, but occasional iron-rich grains were analysed, up to Fa_{44}. Pyroxene compositions range from Fs_1 to Fs_{15}. The meteorites are C2 chondrites.

Sample No.: **WIS91627**
Location: Wisconsin Range
Dimensions (cm): 5.0 x 4.2 x 3.0
Weight (g): 107.0
Meteorite Type: H3 Chondrite

Macroscopic Description: Cecilia Satterwhite

Oxidation haloes are present in the black fusion crust which covers 75% of WIS91627. Light gray and white inclusions/chondrules are visible in the mostly brown colored interior. Metal is obvious.

Thin Section (.2) Description: Brian Mason

The section shows numerous chondrules and chondrule fragments, up to 1.2 mm across, in a granular matrix consisting largely of olivine and pyroxene, with a moderate amount of nickel-iron and minor troilite. Some weathering is indicated by brown limonitic staining throughout the section. Microprobe analyses show olivine and pyroxene of variable composition: olivine, $Fa_{8\text{-}26}$, mean Fa_{18} (CV FeO is 28); pyroxene, $Fs_{2\text{-}22}$. The variability of olivine and pyroxene compositions indicates type 3, and the amount of nickel-iron H group, hence the meteorite is classified as an H3 chondrite (estimate H3.7).

TABLE 4

NATURAL THERMOLUMINESCENCE (NTL) DATA FOR ANTARCTIC METEORITES

Paul Benoit, Joyce Roth, Hazel Sears, and Derek Sears
Cosmochemistry Group
Dept. Chemistry and Biochemistry
University of Arkansas
Fayetteville, AR 72701 USA

The measurement and data reduction methods were described by Hasan et al. (1987, Proc. 17th LPSC, E703-E709; LPSC XX, 383-384). For meteorites whose NTL lies between 5 and 100 krad, the natural TL is related primarily to terrestrial age. Samples with NTL <5 krad have TL below that which can reasonably be ascribed to long terrestrial ages. Such meteorites have had their TL lowered by heating within the last million years or so (by close solar passage or shock heating). We suggest that meteorites with NTL >100 krad are candidates for an unusual history involving high radiation doses and/or low temperatures (January, 1993 data set).

Sample	Class	NTL [krad at 250 deg. C]	Sample	Class	NTL [krad at 250 deg. C]
EET90229	H5	73.4 +- 0.1	EET90362	L6	13.4 +- 0.1
EET90372	H5	237.0 +- 2	EET90364	L6	9.1 +- 0.1
			EET90366	L6	9.1 +- 0.1
EET90051	H6	31.0 +- 0.3	EET90367	L6	8.4 +- 0.1
EET90238	H6	58.8 +- 0.1	EET90377	L6	15.7 +- 0.1
QUE90223	H6	30.0 +- 0.1	EET90391	L6	22.3 +- 0.1
QUE90255	H6	42.2 +- 0.2	EET90394	L6	7.7 +- 0.1
			EET90414	L6	9.1 +- 0.1
EET90053	L6	7.1 +- 0.1	EET90441	L6	11.7 +- 0.1
EET90054	L6	0.3 +- 0.1	EET90443	L6	28.5 +- 0.1
EET90071	L6	32.6 +- 0.1	EET90454	L6	33.8 +- 0.1
EET90076	L6	10.0 +- 0.1	EET90455	L6	6.6 +- 0.1
EET90115	L6	7.3 +- 0.1	EET90457	L6	14.8 +- 0.5
EET90121	L6	15.4 +- 0.1	EET90458	L6	25.9 +- 0.1
EET90138	L6	35.7 +- 0.2	EET90459	L6	17.4 +- 0.1
EET90152	L6	17.1 +- 0.1	EET90465	L6	8.4 +- 0.1
EET90156	L6	27.3 +- 0.1	EET90466	L6	30.9 +- 0.2
EET90157	L6	10.7 +- 0.1	EET90468	L6	6.4 +- 0.1
EET90158	L6	19.8 +- 0.1	EET90470	L6	11.4 +- 0.1
EET90159	L6	33.4 +- 0.1	EET90471	L6	23.7 +- 0.1
EET90175	L6	9.1 +- 0.1	EET90472	L6	7.4 +- 0.1
EET90177	L6	37.8 +- 0.1	EET90477	L6	33.3 +- 0.1
EET90204	L6	33.1 +- 0.1	EET90479	L6	12.3 +- 0.5
EET90207	L6	7.2 +- 0.2	EET90483	L6	30.4 +- 0.1
EET90230	L6	26.6 +- 0.1	EET90487	L6	28.1 +- 0.1
EET90266	L6	34.2 +- 0.1	EET90488	L6	0.1 +- 0.1
EET90300	L6	10.5 +- 0.1	EET90490	L6	13.6 +- 0.1
EET90316	L6	8.1 +- 0.1	EET90491	L6	9.6 +- 0.1
EET90350	L6	19.5 +- 0.1	EET90492	L6	29.2 +- 0.1
EET90351	L6	57.6 +- 0.3	EET90493	L6	14.6 +- 0.1
EET90353	L6	33.0 +- 0.1	EET90494	L6	11.2 +- 0.1
EET90354	L6	7.4 +- 0.1	EET90496	L6	26.7 +- 0.1
EET90355	L6	32.6 +- 0.1	EET90498	L6	9.9 +- 0.1
EET90356	L6	32.3 +- 0.1	EET90499	L6	25.8 +- 0.1
EET90358	L6	7.1 +- 0.1	EET90500	L6	7.7 +- 0.1
EET90359	L6	12.9 +- 0.1	EET90504	L6	8.7 +- 0.1

Sample	Class	NTL [krad at 250 deg. C]	Sample	Class	NTL [krad at 250 deg. C]
EET90505	L6	13.9 +- 0.1	EET90619	L6	6.7 +- 0.1
EET90506	L6	9.5 +- 0.1	EET90645	L6	6.2 +- 0.1
EET90597	L6	27.8 +- 0.1			
EET90599	L6	7.4 +- 0.1	EET90452	LL6	32.5 +- 0.1

The quoted uncertainties are the standard deviations shown by replicate measurements of a single aliquot.

COMMENTS: The following comments are based on natural TL data, TL sensitivity, the shape of the induced TL glow curve, classifications and JSC and Arkansas group sample descriptions.

1. Pairings (Confirmations of pairings suggested in AMN 15(2)):

   L6: EET90053, EET90358, EET90619.

   L6: EET90076, EET90115, EET90300, EET90316, EET90367, EET90455, EET90472, EET90498, EET90500, EET90504.

   L6: EET90207, EET90645.

   L6: EET90157, EET90175, EET90354, EET90364, EET90366, EET90394, EET90414, EET90465, EET90470, EET90491, EET90494, EET90506, EET90599 and possibly EET90362, EET90468 and EET90479.

   L6: EET90490, EET90505.

   L6: EET90152, EET90377,EET90459.

   L6: EET90156, EET90230, EET90499 and tentatively EET90477.

   L6: EET90071, EET90159, and possibly EET90177.

   L6: EET90204, EET90266, EET90353, EET90355, EET90443, EET90466, EET90483, EET90487, EET90597 and possibly EET90138.

   L6: EET90356, EET90454, EET90492.

   Pairing of the EET90076 with the EET90157 group and the EET90156 with the EET90204 group is possible.

2. TL data do not confirm pairing suggested in Newsletter:

   L6: EET90054, EET90121, EET90158, EET90350, EET90351, EET90359, EET90391, EET90441, EET90457, EET90458, EET90471, EET90488, EET90493, and EET90496 with EET90053 group (AMN 15(2)).