Antarctic Meteorite Newsletter

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

Edited by Cecilia Satterwhite and Marilyn Lindstrom, Code SN2, NASA Johnson Space Center, Houston, Texas 77058

Program News

New Meteorites

Marilyn Lindstrom

This newsletter contains classifications of 274 new meteorites from the 1997 and 1998 ANSMET collections. Descriptions are given for 9 meteorites; 3 eucrites, 2 aubrites, 2 carbonaceous chondrites and 2 unequilibrated or unusual ordinary chondrites. The most interesting are GRA98098, an unbrecciated eucrite with cross-cutting veins, and QUE97186, a CV3 chondrite. The two aubrites, while not particularly small (50 g each), are unfortunately quite weathered. More new meteorites from the 1998 collection will be described next newsletter, as well as numerous LL5 chondrites from the 1997 collection.

Smithsonian's Dept. of Mineral Sciences Relocates

Tim McCoy

In 2000, the Smithsonian's Dept. of Mineral Sciences will move into temporary quarters to allow renovation of the heating, ventilation and air conditioning systems in the department. We anticipate that the move out of our department will occur during Jan.-Feb., 2000, and the return move in Jan.-Feb., 2001. We will move the entire meteorite collection and the electron microprobe. Description of Antarctic meteorites should occur without noticeable disruption. During the time the collection is being physically moved between the department and our temporary quarters, no meteorites will be distributed from the Smithsonian collection. Any requests for meteorites which will be needed before March 31, 2000, including those for the Lunar and Planetary Science Conference, must be received by November 15, 1999. Any requests received after that date will likely not be filled until well into 2000.

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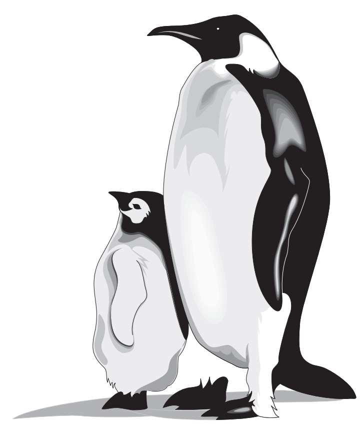

Sample Request Deadline
September 3, 1999

MWG Meets
September 17-18, 1999

Upcoming ANSMET Field Season Update

Ralph Harvey

Several icefields in the Walcott Névé region are the major target of the 1999-2000 ANSMET season. This region, between the Beardmore and Law Glaciers, has produced numerous meteorites from the Lewis Cliff, MacAlpine Hills, and Queen Alexandra icefields. In addition to systematic searches of these areas, the team will conduct recon-naisance of the Geologists and Miller Ranges to discover whether they are suitable choices for future searches.

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New MWG Chair and Secretary

Marilyn Lindstrom

In March Ursula Marvin stepped down as MWG chair after two terms of superb leadership of the committee. Her association with the Antarctic Meteorite Program began with helping to establish the unique collaboration between three government agencies (NSF-NASA-SI) and included early service as a MWG committee member. She also participated in two ANSMET expeditions to collect meteorites. As MWG chair she deftly guided the committee through numerous debates and assisted NASA and NSF in the programs that responded to the announcement of possible fossil life in one of our martian meteorites. Her gentle but firm guidance will be missed. Meanwhile Greg Herzog has taken over as the new chairman whose experience and humor will lead us into the new millennium.

Further changes occurred as Faith Vilas recently resigned as MWG secretary and was replaced by Kinberly Cyr, a planetary scientist from the University of Arizona who studied water in the solar nebula.

NIPR Collects 4100 Meteorites!

Marilyn Lindstrom

Our colleagues in the meteorite department at NIPR in Tokyo resumed Antarctic meteorite collection in a big way by recovering 4100 meteorites. The field party led by Hideyasu Kojima left Japan late in 1997, wintered at Syowa Station in Antarctica, then collected meteorites beginning in October 1998. The team returned in spring of 1999. The 4100 meteorites were collected mostly from the Yamato Mountains, with another 21 from the Belgica Mountains. NIPR will return to Antarctica this fall for another extended expedition led by Dr. Naoya Imae.

Initial results of the collection were presented in June at the NIPR Symposium on Antarctic Meteorites at which the Smithsonian and NASA curators and the new MWG Chairman were guests of NIPR. Although the new meteorites are not yet available, watch for classifications and instructions on how to request meteorites in future issues of *Meteorites News* which is published by NIPR. Inquiries and requests for all Japanese Antarctic meteorites should be addressed to:

Dr. Hideyasu Kojima
Antarctic Meteorite Research Center
National Institute of Polar Research
9-10 Kaga 1-chome, Itabashi-ku, Tokyo 173-8515, Japan
Ph (81) 03-3962-2938; FAX (81) 03-3962-5711

New Meteorites

From 1997-1998 Collection

Pages 4-12 contain preliminary descriptions and classifications of meteorites that were completed since publication of issue 22(1), Feb. 1999. 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
Antarctic Meteorite Laboratory
NASA Johnson Space Center
Houston, Texas

Brian Mason 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
DAV — David Glacier
DEW — Mt. DeWitt
DOM — Dominion Range
DRP — Derrick Peak
EET — Elephant Moraine
GEO — Geologists Range
GRA — Graves Nunataks
GRO — Grosvenor Mountains
HOW — Mt. Howe
ILD — Inland Forts
LAP — LaPaz Ice Field
LEW — Lewis Cliff
LON — Lonewolf Nunataks
MAC — MacAlpine Hills
MBR — Mount Baldr
MCY — MacKay Glacier
MET — Meteorite Hills
MIL — Miller Range
OTT — Outpost Nunatak
PAT — Patuxent Range
PCA — Pecora Escarpment
PGP — Purgatory Peak
PRE — Mt. Prestrud
QUE — Queen Alexandra Range
RKP — Reckling Peak
STE — Stewart Hills
TIL — Thiel Mountains
TYR — Taylor Glacier
WIS — Wisconsin Range
WSG — Mt. Wisting

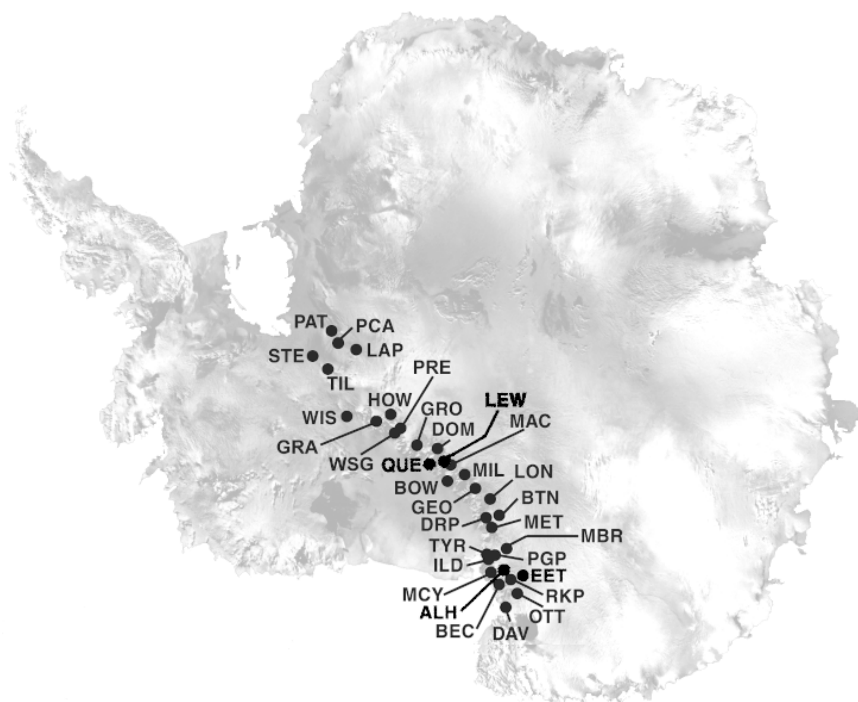

Table 1: List of Newly Classified Antarctic Meteorites**

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
GRO 95 659	6.9	H6 CHONDRITE	B	B	19	17
QUE 97 150 ~	0.6	LL5 CHONDRITE	B	A/B		
QUE 97 151 ~	1.6	LL5 CHONDRITE	B	A/B		
QUE 97 152 ~	0.3	LL5 CHONDRITE	B	A/B		
QUE 97 153 ~	7.5	LL5 CHONDRITE	B	A/B		
QUE 97 154 ~	9.1	LL5 CHONDRITE	B	B		
QUE 97 155 ~	27.2	LL5 CHONDRITE	A	A		
QUE 97 156 ~	6.2	LL5 CHONDRITE	B	B		
QUE 97 157 ~	4.8	LL5 CHONDRITE	B	B		
QUE 97 158 ~	45.2	LL5 CHONDRITE	B/C	A/B		
QUE 97 159 ~	0.7	LL5 CHONDRITE	B	B		
QUE 97 160 ~	32.3	LL5 CHONDRITE	B	B/C		
QUE 97 161 ~	1.4	LL5 CHONDRITE	B	B		
QUE 97 162 ~	4.8	LL5 CHONDRITE	A/B	A/B		
QUE 97 163 ~	8.7	LL5 CHONDRITE	A/B	A		
QUE 97 164 ~	11.9	LL5 CHONDRITE	B	B		
QUE 97 165 ~	7.3	LL5 CHONDRITE	B	B		
QUE 97 166 ~	5.6	LL5 CHONDRITE	A/B	B		
QUE 97 167 ~	2.4	LL5 CHONDRITE	B	B		
QUE 97 168	24.8	H3 CHONDRITE	C	B	9-23	1-25
QUE 97 169	15.2	H5 CHONDRITE	C	A/B	18	17
QUE 97 170 ~	11.8	LL5 CHONDRITE	A	A		
QUE 97 171 ~	43.5	LL5 CHONDRITE	A	A		
QUE 97 172 ~	44.6	LL5 CHONDRITE	A/B	B/C		
QUE 97 173 ~	70.2	LL5 CHONDRITE	B	B		
QUE 97 174 ~	58.8	LL5 CHONDRITE	B	B		
QUE 97 175 ~	29.8	LL5 CHONDRITE	A	A		
QUE 97 176 ~	2.8	LL5 CHONDRITE	A	A		
QUE 97 177 ~	41.4	LL5 CHONDRITE	A	A		
QUE 97 178 ~	53.8	LL5 CHONDRITE	A	A		
QUE 97 179 ~	13.7	LL5 CHONDRITE	B	B		
QUE 97 180 ~	232.5	LL5 CHONDRITE	B	B/C		
QUE 97 181 ~	89.8	LL5 CHONDRITE	A/B	A/B		
QUE 97 182 ~	109.7	LL5 CHONDRITE	A	A		
QUE 97 183 ~	83.9	LL5 CHONDRITE	A	A		
QUE 97 184 ~	134.9	LL5 CHONDRITE	B	A/B		
QUE 97 185 ~	37.8	LL5 CHONDRITE	B	B/C		
QUE 97 186	72.7	CV3 CHONDRITE	B	B	0-31	1-2
QUE 97 187 ~	2.4	LL5 CHONDRITE	A/B	A/B		
QUE 97 188 ~	5.5	LL5 CHONDRITE	A	A/B		
QUE 97 189 ~	3.3	LL5 CHONDRITE	A/B	A/B		
QUE 97 190 ~	59.2	LL5 CHONDRITE	A/B	A/B		
QUE 97 191 ~	7.1	LL5 CHONDRITE	A/B	A/B		
QUE 97 192 ~	3.9	LL5 CHONDRITE	A/B	A/B		
QUE 97 193 ~	36.8	LL5 CHONDRITE	C	B		
QUE 97 194	4.6	H5 CHONDRITE	C	B	19	16
QUE 97 195 ~	0.8	LL5 CHONDRITE	B	A/B		
QUE 97 196 ~	4.0	LL5 CHONDRITE	A/B	A/B		

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
QUE 97 197	20.7	H5 CHONDRITE	C	A/B	19	17
QUE 97 198 ~	1.2	LL5 CHONDRITE	B	B		
QUE 97 199 ~	3.3	LL5 CHONDRITE	A/B	A/B		
QUE 97 200 ~	20.6	LL5 CHONDRITE	A/B	A/B		
QUE 97 201 ~	0.9	LL5 CHONDRITE	B	B		
QUE 97 202 ~	30.4	LL5 CHONDRITE	A/B	A/B		
QUE 97 203 ~	17.2	LL5 CHONDRITE	B/C	B/C		
QUE 97 204 ~	14.1	LL5 CHONDRITE	A/B	A/B		
QUE 97 205 ~	14.6	LL5 CHONDRITE	B	A/B		
QUE 97 206 ~	17.0	LL5 CHONDRITE	B	B		
QUE 97 207 ~	38.0	LL5 CHONDRITE	B	B		
QUE 97 208	38.2	H5 CHONDRITE	C	CE	19	17
QUE 97 209 ~	17.6	LL5 CHONDRITE	A/B	A/B		
QUE 97 210 ~	85.0	LL5 CHONDRITE	A/B	A		
QUE 97 211	53.6	H5 CHONDRITE	B	A/B	18	17
QUE 97 212 ~	4.8	LL5 CHONDRITE	A/B	A		
QUE 97 213 ~	57.9	LL5 CHONDRITE	A/B	A		
QUE 97 214 ~	8.1	LL5 CHONDRITE	A/B	A		
QUE 97 215	10.9	H5 CHONDRITE	C	B/C	19	17
QUE 97 216 ~	9.6	LL5 CHONDRITE	A/B	A		
QUE 97 217 ~	9.9	LL5 CHONDRITE	A/B	A		
QUE 97 218	18.6	L5 CHONDRITE	A/B	A	25	21
QUE 97 219 ~	8.1	LL5 CHONDRITE	B	B		
QUE 97 220 ~	4.8	LL5 CHONDRITE	B	B		
QUE 97 221 ~	10.0	LL5 CHONDRITE	B	B		
QUE 97 222 ~	8.9	LL5 CHONDRITE	B	B		
QUE 97 223 ~	4.6	LL5 CHONDRITE	B	B		
QUE 97 224	11.0	H6 CHONDRITE	CE	C	19	17
QUE 97 225 ~	14.3	LL5 CHONDRITE	B	B		
QUE 97 226	34.9	H5 CHONDRITE	B/C	B	18	16
QUE 97 227 ~	9.8	LL5 CHONDRITE	B	B		
QUE 97 228 ~	1.5	LL5 CHONDRITE	B	B		
QUE 97 229 ~	5.0	LL5 CHONDRITE	A/B	A/B		
QUE 97 230 ~	11.2	LL5 CHONDRITE	B	B		
QUE 97 231 ~	47.6	LL5 CHONDRITE	B	B		
QUE 97 232	86.3	H5 CHONDRITE	C	CE	18	16
QUE 97 233 ~	39.3	LL5 CHONDRITE	A/B	A		
QUE 97 234 ~	3.0	LL5 CHONDRITE	A/B	A		
QUE 97 235 ~	17.2	LL5 CHONDRITE	A/B	A		
QUE 97 236 ~	9.5	LL5 CHONDRITE	A/B	A		
QUE 97 237 ~	1.1	LL5 CHONDRITE	A/B	A		
QUE 97 238 ~	32.3	LL5 CHONDRITE	A/B	A/B		
QUE 97 239 ~	1.2	LL5 CHONDRITE	C	B		
QUE 97 240 ~	12.0	LL5 CHONDRITE	A/B	A/B		
QUE 97 241 ~	2.3	LL5 CHONDRITE	A/B	A/B		
QUE 97 242	26.9	H5 CHONDRITE	C	A/B	18	16
QUE 97 243 ~	46.9	LL5 CHONDRITE	B/C	B/C		
QUE 97 244 ~	9.6	LL5 CHONDRITE	B	B/C		
QUE 97 245 ~	7.0	LL5 CHONDRITE	B	A/B		
QUE 97 246 ~	0.4	LL5 CHONDRITE	B	A/B		
QUE 97 247 ~	50.7	LL5 CHONDRITE	A/B	A/B		
QUE 97 248 ~	26.0	LL5 CHONDRITE	B	B		

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
QUE 97 249 ~	43.6	LL5 CHONDRITE	A	A		
QUE 97 250 ~	8.4	LL5 CHONDRITE	B	B		
QUE 97 251 ~	0.9	LL5 CHONDRITE	B	A/B		
QUE 97 252 ~	8.9	LL5 CHONDRITE	A/B	A/B		
QUE 97 253 ~	31.9	LL5 CHONDRITE	B/C	B/C		
QUE 97 254 ~	3.6	LL5 CHONDRITE	B	B		
QUE 97 255 ~	0.4	LL5 CHONDRITE	B	A/B		
QUE 97 256 ~	0.4	LL5 CHONDRITE	A/B	A/B		
QUE 97 257 ~	6.6	LL5 CHONDRITE	A/B	A/B		
QUE 97 258 ~	2.8	LL5 CHONDRITE	B	B		
QUE 97 259 ~	0.6	LL5 CHONDRITE	A/B	A/B		
QUE 97 260 ~	23.2	LL5 CHONDRITE	B	B		
QUE 97 261 ~	47.2	LL5 CHONDRITE	B	B		
QUE 97 262 ~	31.2	LL5 CHONDRITE	A/B	B		
QUE 97 263 ~	23.4	LL5 CHONDRITE	B	B		
QUE 97 264 ~	37.4	LL5 CHONDRITE	A/B	B		
QUE 97 265 ~	15.5	LL5 CHONDRITE	B/C	B/C		
QUE 97 266 ~	28.4	LL5 CHONDRITE	B	B		
QUE 97 267 ~	19.4	LL5 CHONDRITE	B	B		
QUE 97 268 ~	36.9	LL5 CHONDRITE	B	B		
QUE 97 269 ~	21.5	LL5 CHONDRITE	B	B		
QUE 97 270	4.9	H5 CHONDRITE	B/C	A	18	16
QUE 97 271 ~	1.8	LL5 CHONDRITE	A/B	A		
QUE 97 272 ~	13.9	LL5 CHONDRITE	A/B	A/B		
QUE 97 273 ~	2.8	LL5 CHONDRITE	A/B	A		
QUE 97 274 ~	15.6	LL5 CHONDRITE	A/B	A/B		
QUE 97 275 ~	61.0	LL5 CHONDRITE	A/B	A/B		
QUE 97 276 ~	9.3	LL5 CHONDRITE	A	A		
QUE 97 277 ~	22.0	LL5 CHONDRITE	A	A		
QUE 97 278 ~	32.7	LL5 CHONDRITE	A	A		
QUE 97 279 ~	27.3	LL5 CHONDRITE	A	A		
QUE 97 280 ~	10.2	LL5 CHONDRITE	B	B		
QUE 97 281 ~	23.1	LL5 CHONDRITE	B	B		
QUE 97 282 ~	1.8	LL5 CHONDRITE	B	B		
QUE 97 283 ~	37.2	LL5 CHONDRITE	B	B		
QUE 97 284 ~	23.9	LL5 CHONDRITE	A/B	A/B		
QUE 97 285	20.9	H6 CHONDRITE	B/C	C	20	17
QUE 97 286 ~	58.2	LL5 CHONDRITE	B	B		
QUE 97 287 ~	23.0	LL5 CHONDRITE	B	B		
QUE 97 288 ~	100.4	L6 CHONDRITE	B/CE	B		
QUE 97 289	51.9	AUBRITE	C	C		0.1
QUE 97 290 ~	129.8	L6 CHONDRITE	B	A/B		
QUE 97 291 ~	14.1	LL5 CHONDRITE	A/B	B		
QUE 97 292	104.0	H5 CHONDRITE	C	A/B	18	16
QUE 97 293	3.6	LL6 CHONDRITE	B/C	B	30	26
QUE 97 294	14.9	H5 CHONDRITE	B	A/B	20	17
QUE 97 295	2.2	H6 CHONDRITE	C	A/B	19	17
QUE 97 296 ~	2.4	LL5 CHONDRITE	B	B		
QUE 97 297 ~	2.5	LL5 CHONDRITE	B	B		
QUE 97 298 ~	4.3	LL5 CHONDRITE	B	B		
QUE 97 299	1.8	H5 CHONDRITE	C	B	19	17
QUE 97 300 ~	24.7	LL5 CHONDRITE	A/B	B		

~Classified by using refractive indices.

Sample Number	Weight (g)	Classification	Weathering	Fracturing	% Fa	% Fs
QUE 97 301 ~	4.7	LL5 CHONDRITE	A/B	B		
QUE 97 302 ~	4.7	LL5 CHONDRITE	A/B	B		
QUE 97 303 ~	18.8	LL5 CHONDRITE	A/B	B		
QUE 97 304 ~	0.8	LL5 CHONDRITE	A/B	B		
QUE 97 305 ~	29.5	LL5 CHONDRITE	A/B	B		
QUE 97 306 ~	3.8	LL5 CHONDRITE	A/B	B		
QUE 97 307 ~	13.4	LL5 CHONDRITE	A/B	B		
QUE 97 308 ~	5.8	LL5 CHONDRITE	A/B	B		
QUE 97 309 ~	0.7	LL5 CHONDRITE	A/B	B		
QUE 97 310 ~	7.4	LL5 CHONDRITE	B	B		
QUE 97 311 ~	25.3	LL5 CHONDRITE	B	B		
QUE 97 312 ~	4.2	LL5 CHONDRITE	B/C	B		
QUE 97 313 ~	20.1	LL5 CHONDRITE	B/C	B		
QUE 97 314 ~	2.0	LL5 CHONDRITE	B	B		
QUE 97 315 ~	7.5	LL5 CHONDRITE	B	B		
QUE 97 316	23.4	LL6 CHONDRITE	A/B	B	30	24
QUE 97 317	7.6	H5 CHONDRITE	C	B	19	17
QUE 97 318 ~	7.8	LL5 CHONDRITE	B	B		
QUE 97 319 ~	2.0	L6 CHONDRITE	C	B		
QUE 97 320	12.1	H5 CHONDRITE	C	A	18	16
QUE 97 321 ~	96.4	LL5 CHONDRITE	A/B	A/B		
QUE 97 322 ~	0.7	LL5 CHONDRITE	B	A/B		
QUE 97 323 ~	20.1	LL5 CHONDRITE	B	B		
QUE 97 324 ~	46.9	LL5 CHONDRITE	A/B	A/B		
QUE 97 325 ~	43.3	LL5 CHONDRITE	B	A/B		
QUE 97 326 ~	12.2	LL5 CHONDRITE	B	A/B		
QUE 97 327 ~	5.8	LL5 CHONDRITE	B	B		
QUE 97 328 ~	6.3	L6 CHONDRITE	B	B		
QUE 97 329 ~	70.4	LL5 CHONDRITE	A/B	A/B		
QUE 97 330 ~	27.8	LL5 CHONDRITE	A/B	A/B		
QUE 97 331	36.7	L5 CHONDRITE	B/C	B	26	22
QUE 97 332 ~	36.5	LL5 CHONDRITE	A/B	A/B		
QUE 97 333 ~	11.5	LL5 CHONDRITE	A/B	B		
QUE 97 334 ~	43.5	LL5 CHONDRITE	B	B		
QUE 97 335 ~	9.7	LL5 CHONDRITE	B	B		
QUE 97 336 ~	1.9	LL5 CHONDRITE	B	B		
QUE 97 337	16.7	L6 CHONDRITE	C	B	25	21
QUE 97 338 ~	23.0	L6 CHONDRITE	C	B		
QUE 97 339 ~	7.5	LL5 CHONDRITE	A/B	A/B		
QUE 97 340 ~	9.7	LL5 CHONDRITE	B	A/B		
QUE 97 341 ~	21.7	LL5 CHONDRITE	B	A/B		
QUE 97 342	177.0	H5 CHONDRITE	C	B	17	15
QUE 97 343	76.2	H5 CHONDRITE	B/C	B	18	16
QUE 97 344 ~	31.9	LL5 CHONDRITE	B	B		
QUE 97 345 ~	40.8	LL5 CHONDRITE	B	B		
QUE 97 346 ~	130.2	L6 CHONDRITE	B/C	B		
QUE 97 347 ~	98.0	L6 CHONDRITE	B/C	A/B		
QUE 97 348	50.7	AUBRITE	C	C		0.2
QUE 97 349 ~	24.8	LL5 CHONDRITE	B	B		
QUE 97 350	71.2	L6 CHONDRITE	B	A/B	24	21
QUE 97 351 ~	47.5	LL5 CHONDRITE	A/B	A		
QUE 97 352 ~	9.1	LL5 CHONDRITE	A/B	B		

~Classified by using refractive indices.