PHYSICAL PROPERTIES OF NEAR-EARTH OBJECTS AND METEORITES ONLINE DATABASE. D. R. Ostrowski[1,2] and J. Dotson[2], [1]Bay Area Environmental Research Institute, Ames Research Center, Moffett Field, CA, USA, [2]NASA Ames Research Center, Moffett Field, CA, USA.

Introduction: Data about asteroids and meteorites are an essential resource to the planetary science and planetary defense communities. Asteroid Threat Assessment Project (ATAP) at NASA ARC has built the near-Earth Object Properties online database (neoproperties.arc.nasa.gov) to provide an easily accessible repository of aggregated data about meteorite and asteroid properties. The focus of the recorded data is on physical properties relevant to asteroid threat assessment but can be useful for other planetary science studies.

The meteorite data set contains one or more measurements of over 900 meteorites and more than 2300 unique samples. Tabulated physical properties include densities, porosity, acoustic velocity, elastic mechanical properties, electrical resistivity, magnetic susceptibility, and thermal properties. The database includes taxonomies for about 690 NEOs and thermally determined diameter for close to 2300 NEOs.

A literature-based mapping between asteroid taxonomic classes and related meteorite classes is provided. This consolidated database can be used to support investigations into the properties of single asteroids and their likely meteorite analogs as well as facilitating analyses of the properties of the overall near-Earth asteroid population.

Asteroid Diameter and Albedos: Values of the diameter and geometric albedo (p_V) derived from thermal infrared measurements for 2348 Near Earth Asteroids (NEAs) have been aggregated from the resources shown in the reference table. In the situation where there is more than one measurement for a specific asteroid, if eta was allowed to vary (rather than be assumed), the resulting values of D and p_V were chosen as the preferred values. Otherwise, the value with the highest precision was chosen [1,2,3,4,5].

Meteorite Physical Properties: Over 1000 measurements of bulk density, grain density, porosity and magnetic susceptibility are included. Other properties generally have ~ 100 or fewer measurements. The meteorite names and types in the neoproperties database are consistent with standards set by the Meteoritical Society. While the bulk of meteorites in the database are Ordinary Chondrites, numerous other types are represented [6].

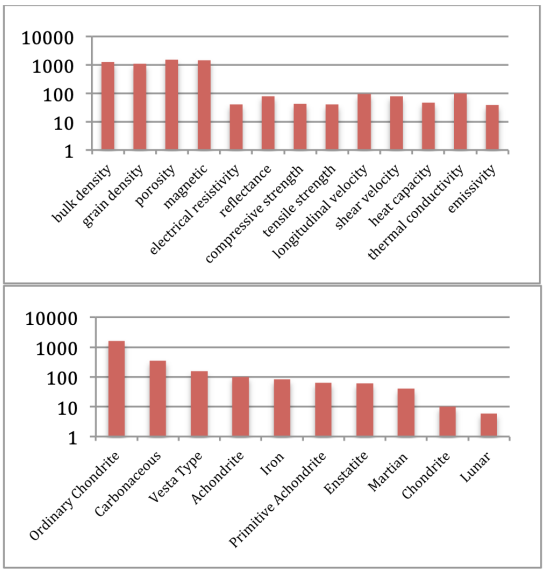

Figure 1. *Number of measurements of each physical parameter (A). The distribution by meteorite type (B).*

Connecting Asteroids and Meteorites: Meteorite classes are preceded by a "c:" and meteorite groups are preceded by a "g:". Asteroid complexes (&) are mapped to meteorite classes and/or groups based on identifications from the literature. The derived rules are shown in Table 1: *Mapping between asteroids complexes and meteorite/groups.*

Asteroid Complex	Meteorite Classes								Meteorite Groups							
&S	c:ANG[1]	c:ACA-LOD[1]	c:R[1]	c:PA[1]	c:K[4]	c:A[1]	c:OC[1,2,3]	c:URE[1]	g:WIN[1]							
&Q	c:OC[2,3]	c:K[4]														
&V	c:HED[1,2,3]	c:A[1,2]														
&A	c:PAL[1,2]	c:BRA[1,2]	c:R[1,2]	c:A[1,2]	c:PA[1,3]											
&K	c:URE[3]	c:PA[3]	c:K[4]						g:CK[3]	g:CV[1,2,3]	g:CO[1,2]	g:CM[3]	g:CC			
&L	c:K[4]								g:CI[3]	g:CC						
&C	c:PA[3]	c:K[4]	c:URE[3]						g:CB[2]	g:CH[1,2]	g:CR[1,2]	g:CK[1,2]	g:CO[2]	g:CM[1,2]	g:CI[1,2]	g:CC
&C/X	c:K[4]								g:CB	g:CH	g:CR	g:CK	g:CO	g:CM	g:CI	g:CC
&X	c:Iron[1,2]	c:MES[1,2]	c:ENS[1,2]	c:AUB[1,2,3]	c:K[4]	c:A[1,2]			g:CB[2]	g:CH[1,2]	g:CR[2,3]	g:CK[1,2]	g:CO[2,3]	g:CM[2,3]	g:CI[2]	g:CC
&B									g:CK[3]	g:CV[3]	g:CM[3]	g:CI[3]	g:CC			
&B;&C	c:PA	c:K	c:URE						g:CB	g:CH	g:CR	c:CK	g:CO	g:CM	g:CI	g:CV	g:CC
&Q;&S	c:ANG	c:ACA-LOD	c:R	c:PA	c:K	c:A	c:OC	c:URE	g:WIN							
&K;&U	c:URE	c:PA	c:K						g:CK	g:CV	g:CO	g:CM	g:CC			

Acknowledgments: This work was funded by NASA's Planetary Defense Coordination Office (PDCO) and is conducted under the Asteroid Threat Assessment Project at NASA Ames Research Center.

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