HISTORICAL TRENDS IN US ANTARCTIC METEORITE ALLOCATIONS, WITH A CLOSE LOOK AT CR CHONDRITES.

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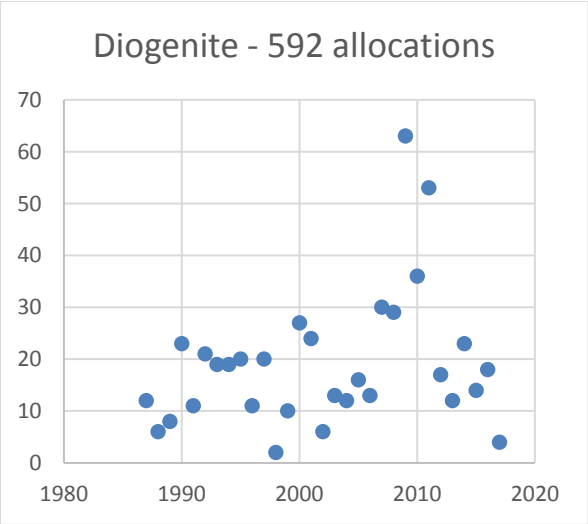
Introduction: ANSMET samples have been housed at and allocated from NASA-JSC since 1978 [1]. This nearly 40 year history of allocations from the collection has been contemporaneous with many major milestones such as the discovery that we have meteorites from Moon and Mars, missions to S-type asteroids (NEAR, Hayabusa, Dawn), and C-type asteroids (Dawn, Hayabusa 2, and OSIRIS-REx). We look for the possible influence of these major milestones on historical trends in the meteorite allocations, identify other factors that might contribute to allocation trends, and focus on the allocation history of a few select meteorites.

HED meteorites: Howardite, eucrite, and diogenite meteorites were allocated at a steady rate of ~20 per year since 1987. However, each group shows increased numbers of allocations starting in 2008 or 2009, peaking in 2011, and then by 2014 dropping back down to average levels again (Fig. 1). This peak activity may be tied to the arrival of the Dawn spacecraft at 4 Vesta, the likely parent asteroid of the HED meteorites [2].

Lunar meteorites: >700 lunar meteorites have been allocated since 1987. Higher allocation numbers are associated with the discovery and initial studies of new lunar meteorites in 1988, 2002-2004, and 2009.

Martian meteorites: 1840 martian meteorite splits have been allocated to research scientists since 1987. Research on the origin of and possible biochemical signatures in ALH 84001 [3] influenced the allocation of all US Antarctcic martian meteorites between 1996-2003. A good example is shergottite EET 79001, with allocations during that timeframe of between 40 and 70 samples per year, well over the average of 15-20 in prior and subsequent years.

Carbonaceous chondrites: Allocations of most carbonaceous chondrites (CO, CR and CV) increased substantially after 2007 (Fig. 2), perhaps related to increasing worldwide interest in C-rich asteroids. In comparison, CM chondrites show steady levels of allocation throughout the history of the program, but do not show the sustained levels exhibited by CV, CR and CO the last 8 years. CR chondrites, in particular, have been scientifically rich offering presolar grains, organic compounds, nebular metal grains, chondrules, hydrated matrix, and unusual foreign clasts containing, for example, hydrated minerals, garnet, and graphite (e.g., [4-6]). Many CR chondrites of the highest scientific interest have been small. Continued recovery efforts by ANSMET teams will hopefully lead to recovery of new CR and other carbonaceous chondrites as well as martian, lunar, and other rare meteorite types.



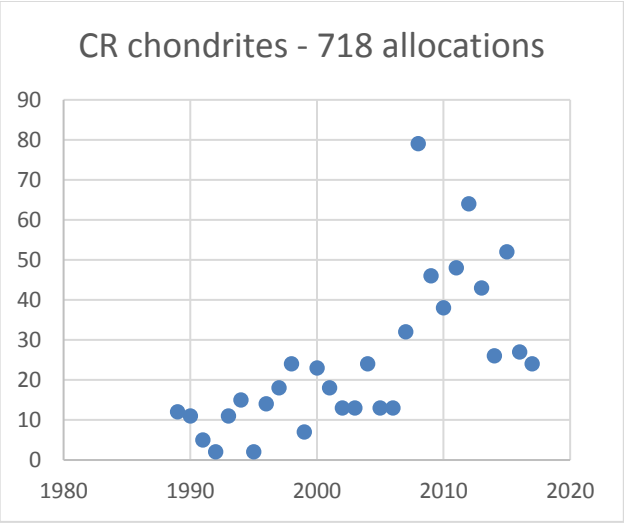


Figure 1 (left): Allocations of US Antarctic diogenites since 1987, showing peak levels in 2009-2011, perhaps influenced by Dawn arrival at 4 Vesta in August 2011.
Figure 2 (right): Allocations of US Antarctic CR chondrites since 1987, showing exceptionally high levels since 2007.

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