Astromaterials Research Office (KR)
Overview

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http://ares.jsc.nasa.gov/ares/indexkr.cfm

The staff of the Astromaterials Research Office conducts peer-reviewed astromaterials research. Scientists are funded through basic science disciplines of the NASA Research Opportunities in Space and Earth Sciences (ROSES) NASA Research Announcement (NRA) (link below), which include Cosmochemistry, Origins of Solar Systems, Astrobiology & Exobiology, Planetary Geology & Geophysics, Mars Fundamental Research and Mars Data Analysis, Planetary Mission Data Analysis, Lunar Advanced Science and Exploration Research, Laboratory Analysis of Returned Samples, Moon and Mars Analogue Mission Activities, Planetary Instrument Concepts for the Advancement of Solar System Observations, Near-Earth Object Observations, and Planetary Astronomy. Further funding comes from planetary missions and their allied programs.

http://nspires.nasaprs.com/external/solicitations/summary.do?method=init&solId={AEF75D0F-2272-7DE7-D52A-295B47C8F5CF}&path=open

The fundamental goal of our research is to understand the origin and evolution of the solar system, particularly the terrestrial, “rocky” bodies. Our research involves analysis of, and experiments on, astromaterials in order to understand their nature, sources, and processes of formation. Our state-of-the-art analytical laboratories include four electron microbeam laboratories for mineral analysis, four spectroscopy laboratories for chemical and mineralogical analysis, and four mass spectrometry laboratories for isotopic analysis. Other facilities include the experimental impact laboratory and both 1-atm gas mixing and high-pressure experimental petrology laboratories. Recent research has emphasized a diverse range of topics, including

- Study of the solar system’s primitive materials, such as carbonaceous chondrites and interplanetary dust
- Study of early solar system chronology using short-lived radioisotopes and early nebular processes through detailed geochemical and isotopic characterizations
- Study of large-scale planetary differentiation and evolution via siderophile and incompatible trace element partitioning, magma ocean crystallization simulations, and isotopic systematics
- Study of the petrogenesis of Martian meteorites through petrographic, isotopic, chemical, and experimental melting and crystallization studies
- Interpretation of remote sensing data, especially from current robotic lunar and Mars missions, and study of terrestrial analog materials
- Study of the role of organic geochemical processes in the evolution of astromaterials and the extent to which they constrain the potential for habitability and the origin of life