

Donald R. Hood

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CAREER GOAL I believe that life exists elsewhere in our universe, and likely has existed in our own solar system. Using a variety of remote sensing techniques, I investigate the history of our solar system searching for past, present and future harbors of life.

EDUCATION *Bachelor of Science*, Physics, 2014
Emphasis on Condensed Matter Physics
Carnegie Mellon University, Pittsburgh, PA

Ph.D., Geology, Expected Graduation: 2019
Louisiana State University, Baton Rouge, LA

EXPERIENCE *Graduate Teaching Assistant* Aug 2014-Present
LSU Geology and Geophysics, Baton Rouge, LA

- Teach introductory-level geology courses, GEOL 1601
- Teach Sophomore level geology major courses, GEOL 2081 (Mineralogy), GEOL 3041 (Petrology)
- Develop course material (quizzes, presentations, etc.)
- Grade coursework
- Manage administration of multiple class sessions

Science Mentoring

Summer 2016, LSU Geology and Geophysics, Baton Rouge, LA

Two students, under the NASA Planetary Geology and Geophysics Undergraduate Research Program (PGGURP) worked in the LSU Planetary Science Lab in the summer of 2016. These students were tasked with many self-educational projects (i.e. producing a series of presentations on various remote sensing techniques) in addition to their primary research projects. During their summer at LSU, I served as a mentor to both students, providing guidance and technical assistance when necessary. In particular, I worked extensively with Tony Maue on his project associating grain size and chemistry in Gale Crater soil samples. This project involved several different datasets including MAHLI images, APXS-derived chemistry, and ChemCam-derived chemistry. His project culminated in a poster presented at AGU in 2016.

RESEARCH *Assessing Martian Bulk Soil Hydration through Principal Component Analysis of Regional Chemical Data* Current Project

Principle Component Analysis is a simple but powerful tool for understanding trends in data. Following up work done by Gasnault (2010) and by Karuntillake (2014), I analyzed Gamma Ray Spectrometer (GRS) data, including new Sulfur elemental maps and incorporating Ruff's (2002) Dust Cover Index to identify the source of Hydrogen and Sulfur abundance correlations in the Martian mid-latitudes.

The Martian Boulder Automatic Recognition System: MBARS Current Project

MBARS is an automatic boulder detection algorithm that is currently under development. This system, written in *Python* will automatically detect, locate, and measure boulders in HiRISE images of the martian surface. MBARS will be an open source tool designed to be customizable for experienced scientists and user friendly for untrained users. This work is funded by the Louisiana Space Consortium Graduate Student Research Assistantship.

PUBLICATIONS *Assessing the Geologic Evolution of Greater Thaumasia, Mars* 2016
D.R. Hood, T. Judice, S. Karunatillake, D. Rogers, J.M. Dohm, D. Susko, L. Carnes
Journal of Geophysical Research: Planets

Combining regional chemical data we characterize the chemical anomalies within the Thaumasia Region of Mars. In addition, mineralogical data, available at a much finer scale, are used to assess how these regional-scale anomalies are expressed locally. These results are used to collectively examine the validity of several proposed models of formation for the Thaumasia region.

LECTURES AND TALKS **Invited seminar at the Lunar and Planetary Institute, Houston, Texas** Fall 2016

Assessing the Geologic Evolution of Greater Thaumasia, Mars

Oral presentation at the ISLPS, Wuhan, China Summer 2016

International Symposium on Lunar and Planetary Science

Martian Bulk Soil Hydration Revealed by Principal Component Analysis of Regional Chemical Data

Poster Presentations

Lunar and Planetary Science Conference 2017

Semi-Automated Measurement of Boulder Clustering in the Martian Northern Plains, Abstract 2640

Don R Hood, S. Karunatillake

Lunar and Planetary Science Conference 2016

Assessing Martian Bulk Soil Hydration through Principal Component Analysis of Regional Chemical Data, Abstract 2124

Don R. Hood, S. Karunatillake, D. Susko

Assessing the Geologic Evolution of Greater Thaumasia, Mars with Chemistry and Mineralogy, Abstract 2737

Don R. Hood, T. Judice, S. Karunatillake, D. Rogers, J. Dohm, J.R. Skok

HONORS & AWARDS *Louisiana Space Consortium Graduate Student Research Assistantship* 2016
Developing the Martian Boulder Automatic Recognition System: MBARS

A \$16,000 grant from the Louisiana Space Consortium (LaSPACE) from August 2016-August 2017. This grant supports the design, development, and initial scientific work with a new boulder identification algorithm, MBARS. This is a *Python*-based algorithm that identifies and measures boulders in HiRISE images.

New Orleans Geological Society Lee H. Meltzer Memorial Scholarship 2015, 2016
Merit-based award from the New Orleans Geological Society based on performance during the 2014-2015 and 2015-2016 academic years.

**COMPUTER
SKILLS**

Languages & Software:

Python, C++, Mathematica, Seismic Unix, Office Suite, LaTeX

Analytical Methods:

Multivariate Analysis, Photoanalysis, Scanning Electron Microscopy, Optical Petrography