Biographical Sketch – Matthew Chojnacki

Planetary Science Institute (PSI)
405 Urban Street, Suite 300, Lakewood, CO 80228

Education:

Ph.D. in **Planetary Science** (2013), *University of Tennessee*, Knoxville, TN. Advisers: Devon Burr and Jeffrey Moersch
B.A. in **Planetary Science** (*Magna Cum Laude*) & B.A. in **Physics** (2004), *University of Colorado*, Boulder, CO. Advisers: Bruce Jakosky and Brian Hynek

Profile:

Dr. Matthew Chojnacki is Research Scientist working with the High Resolution Imaging Science Experiment (HiRISE) mission at the Planetary Science Institute. He is a planetary geologist who has been involved with the scientific exploration of Mars for over a decade. His recent research has focused on the geologic, morphologic, and climatic evolutions of Mars, particularly: aeolian transport and sand dune dynamics, the thermophysical and spectral properties of the Martian surface, aqueous alteration and weathering of planetary crusts, and terrestrial analog studies. He has participated and led several focused studies, which involve geologic mapping and constraining contemporary dynamic surface processes (Recurring Slope Linea, active sand dunes). As a HiRISE Co-Investigator, he co-manages the HiRISE Operations Center (HiROC) photogrammetry lab, participates in HiRISE-related targeting and Uplink, and initial science assessments. Most recently he has joined the Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx) mission team by leading their stereo photogrammetry preparation and production effort.

Research Interests:

- Surface composition, thermal properties, and geology of planetary crusts
- Thermophysical and spectral properties of the Martian surface
- Surface morphology gained from DTM-derived topography
- Remote and laboratory reflectance and emission spectroscopy
- Aqueous alteration and weathering of planetary crusts
- Active surficial processes and their role in landscape evolution
- Aeolian transport and induration processes, dune dynamics and morphology
- Terrestrial analog studies and comparative planetology

Grants:

- 2022 NASA Planetary Data Archiving, and Restoration, Archiving and distribution of high-quality Context Camera (CTX) digital terrain models – PI (2023-2026)
- 2020 NASA Mars Data Analysis Program, Multi-spatial and -temporal sand flux trends – PI (2021-2024)

- 2019 NASA Mars Data Analysis Program, Characterizing the Dynamic Activity of Martian Mega-ripples and Transverse Aeolian Ridges – PI (2020-2022)
- 2016 NASA Mars Data Analysis Program, The Distribution, Properties, and Implications of Ancient Paleo-Bedforms on Mars – PI (2017-2021)
- 2016 NASA Mars Data Analysis Program, Martian Dust Devil Tracks in HiRISE and CRISM (PI Ingrid Daubar) – Co-I (2017-2020)
- 2016 NASA Mars Data Analysis Program, Characterization of Layered Deposits at the Valles Marineris Plateau (PI Isaac Smith) – Co-I (2017-2020) – Completed.
- 2015 NASA Mars Data Analysis Program, Studies of Dune Dynamics and Temporal Flux Variations on Mars (PI Nathan Bridges) – Co-I (2016-2019) – Completed.
- 2014 NASA Mars Data Analysis Program, Characterizing Global Sand Flux for Martian Bedform Construction Times and Erosion Rates – PI (2015-2018) – Completed.
- 2013 NASA Planetary Geology and Geophysics Program, Geologic Map of the Coprates Chasma, Valles Marineris, Mars (PI Brian Hynek) – Co-I (2015-2017) – Completed.
- 2012 NASA Mars Data Analysis Program, Characterizing the Current Aeolian Transport Environment for Sediment in Greater Meridiani Planum – Co-I (2014-2016) – Completed.

Professional Experience:

- Planetary Science Institute, Research Scientist, 12/2019 – present
- MRO High Resolution Imaging Science Experiment (HiRISE), Co-Investigator, 1/2013 – present
    - HiRISE Operations Center (HiROC) Photogrammetry Lab Co-Manager, 6/2015 – present
    - HiROC Photogrammetry Lab Co-manager and DTM Validator
    - Aeolian – Science Theme Lead (STL) 8/2017 – present
    - Composition & Photometry – Science Theme Lead (STL), 3/2014 – 8/2017
- Lunar and Planetary Laboratory, University of Arizona, Postdoctoral Research Associate (Alfred McEwen), 1/2013 – 6/2015 and Associate Staff Scientist, 6/2015 – 8/2020
- Origins Spectral Interpretation Resource Identification Security REgolith Explorer (OSIRIS-REx) Image Processing Working Group (IPWG), Photogrammetry Specialist, 1/2015 – 8/2020
- Department of Earth and Planetary Sciences, University of Tennessee, Graduate Teaching and Research Assistant, 8/2007 – 5/2012
- Laboratory for Atmospheric and Space Physics, University of Colorado, Professional Research Assistant, 5/2004 – 6/2007
- MER PanCam Student Team Member, Downlink Lead; via J. Moersch, 2009 – 2014
- MO THEMIS Student Team Member, B. Jakosky / J. Moersch, 2004 – 2013
- NASA's 24th Annual Planetary Science Summer School, 2012
- Lunar and Planetary Institute: Field Training and Research Program at Meteor Crater, 2010
- USGS/NASA Planetary Photogrammetry Guest Facility (participant), 2009-2012
- NASA Volcanology Field Workshop (Hawaii), 2005
- U.S. Olympic Team, 1998; U.S. Ski Team, 1995-2001; Guinness World Record Holder, 2001
- U.S. World Championship Team, 1995, 1997 & 1999
- Argentinean Olympic Ski Team Coach, 2002
- Flying Ace Production at the Utah Olympic Park, Performer, 1998–2014

Professional Organizations:

- Geological Society of America, 2016 – present
- American Geophysical Union, 2006 – present
- Planetary Society, 1997 – present
- American Astronomical Society / Division for Planetary Sciences, 2012 – 2015
    - Federal Relations Subcommittee, 2012 – 2015

Technical Skills:

- Computer experience includes: extensive experience with ENVI/IDL, ESRI ArcMap, stereo processing with SOCET SET (®BAE Systems) photogrammetry software, Integrated Software for Imagers and Spectrometers (ISIS), JMARS, Google Earth, ISIS, Adobe Photoshop/Illustrator, Word, Excel, with both Macintosh and PC. Programing writing experience with IDL, Perl, and ISIS.
- Remote geologic mapping using multiple data sets (visible-wavelength images, composition, thermophysical, topography), thermophysical modeling (TES and THEMIS), and standard data processing (Mars: MOC, MOLA, TES, THEMIS, PanCam, HRSC, HiRISE, CTX, and CRISM; Earth: AVIRIS, MASTER, SRTM).
- Geology field work: Experience with stratigraphic, geologic, and morphologic field mapping, Differential Global Positioning System (DGPS) mapping, and high-resolution LIDAR (light detection and ranging) survey equipment.

Service:

- Aeolian Research *Special Issue for the Fourth International Planetary Dunes Workshop* (Lead Guest Editor): 2015 – 2016
- Journal or Geophysical Research – Planets special Issue for the *Investigations of the Bagnold Dune Field, Gale Crater* (Associate Editor): 2016 – 2017
- NASA R&A Panel (Subpanel member; Chief*): 2015*, 2016*, 2017, 2018*, 2019*
- NASA Mission Instrument Panel (Subpanel member): 2015
- Peer Review Service (Icarus, JGR-Planets, Aeolian Research, Science): 2009 - present
- American Astronomical Society / Division for Planetary Sciences, 2012 – 2014
    - Federal Relations Subcommittee, 2012 – 2014

Teaching Competencies:

- GTA for several different introductory Earth and planetary geology courses (2007–*2012*)
- *Spring and Fall 2010:* GTA for *Process Geomorphology* (designed and led lab exercises for Undergraduate/Graduate students)
- *Fall 2010 and Fall 2011*: guest lecturer at Univ. Tennessee for GEO 380 *Geomorphology*
- *Spring 2011*: guest lecturer at Univ. Tennessee for GEO 102 (Earth, Life, and Time)
- *Spring 2012*: guest lecturer at Univ. Tennessee for GEO 104 (Exploring the planets)
- *Fall* 2007 – *2012*: volunteer at McClung Museum teaching basic concepts of geology to local primary/high schools