Curriculum Vitae
September 09, 2023

Jonathon Ryan Hill

1111 E. University Dr., Unit 112
Tempe, AZ 85288-4259
jonathon.ryan.hill@gmail.com

EDUCATION

Geological Sciences (Ph.D.) **2010 - 2022**
ARIZONA STATE UNIVERSITY TEMPE, AZ

Geological Sciences (M.S.) **2010 - 2016**
ARIZONA STATE UNIVERSITY TEMPE, AZ

Aerospace Engineering (M.S.) **2005 - 2009**
ARIZONA STATE UNIVERSITY TEMPE, AZ

Aerospace Engineering (B.S.E.)
Russian (B.A.) **2000 - 2005**
ARIZONA STATE UNIVERSITY TEMPE, AZ

Russian Language Certificate **2005**
ST. PETERSBURG STATE UNIVERSITY ST. PETERSBURG, RUSSIA

PROFESSIONAL EXPERIENCE

Mission Planner **August, 2006 – Present**
MARS SPACE FLIGHT FACILITY – ARIZONA STATE UNIVERSITY TEMPE, AZ

THEMIS Mission Planner August, 2006 – Present

My primary responsibility is planning observations for ASU's Thermal Emission Imaging System (THEMIS) onboard NASA's Mars Odyssey spacecraft. I have commanded over 2,210 (Earth) days of THEMIS operations, which have included more than 398,000 visible and infrared images. My secondary responsibilities include assembling and updating the THEMIS Infrared Global Mosaics, leading the planning process for Phobos and Deimos observations, and working with student groups through the "Walk on Mars" program.

E-THEMIS Mission Planner January, 2017 – Present

My primary responsibility is contributing to early mission operations planning for the Europa Thermal Emission Imaging System (E-THEMIS) on the Europa Clipper mission.

OTES Mission Operations Engineer May, 2015 – May, 2021

My responsibilities have included operating the OSIRIS-REx Thermal Emission Spectrometer (OTES) engineering model and flight instrument during thermal vacuum testing and calibration, developing scripts to analyze OTES telemetry, supporting OTES operations during the OSIRIS-REx mission's Earth Gravity Assist (EGA), and serving as a backup instrument engineer during Proximity Operations.

Mini-TES Payload Uplink Lead December, 2006 – June, 2011

My primary responsibility was planning observations for ASU's Miniature Thermal Emission Spectrometer (Mini-TES) onboard NASA's Mars Exploration Rovers Spirit and Opportunity. I commanded over 1,100 Martian days (sols) of Mini-TES operations, which included more than 2,200 individual observations.

Assistant to Dr. Philip Christensen **August, 2005 – August, 2006**
MARS SPACE FLIGHT FACILITY - ASU TEMPE, AZ

My responsibilities included initial daily processing of data from ASU's Thermal Emission Spectrometer (TES) aboard NASA's Mars Global Surveyor spacecraft, generating daily atmospheric dust maps from TES data, which were used by NASA's Mars Reconnaissance Orbiter during their aerobraking phase, and preparing materials for Dr. Christensen's classes.

Mars Satellite Intern **May, 2004 – December, 2004**
NASA SPACE GRANT PROGRAM TEMPE, AZ

My responsibilities as the Communications Subsystem Lead for the MIMIC (Magnetic Investigation of Mars by Interacting Consortia) student-led Mars satellite design project included coordinating work between team members at multiple universities and working with our communications engineering mentors at NASA's Jet Propulsion Laboratory.

SELECTED COURSEWORK

Planetary & Geological Sciences (Graduate Level)

- MINERALOGY
- VOLCANOLOGY
- REMOTE SENSING
- GEOLOGY OF MARS
- FUNDAMENTALS OF PLANETARY GEOLOGY
- PLANETARY FIELD GEOLOGY: MSL MISSION
- ASTROBIOLOGY
- GEOMORPHOLOGY
- ANALYTICAL INSTRUMENTS
- ADVANCED REMOTE SENSING
- GEOPHYSICAL PLANETARY EXPLORATION
- SCIENCE, TECHNOLOGY AND PUBLIC AFFAIRS

Aerospace Engineering (Graduate Level)

- STRESS ANALYSIS
- POLYMERS AND COMPOSITES
- ADVANCED ROCKET PROPULSION
- LINEAR ALGEBRA IN ENGINEERING
- HIGH TEMPERATURE GAS DYNAMICS

Aerospace Engineering (Undergraduate Level)

- PROPULSION
- AERODYNAMICS
- THERMODYNAMICS
- VIBRATION ANALYSIS
- AEROSPACE LABORATORY
- AEROSPACE STRUCTURES
- ENGINEERING MECHANICS: STATICS
- ENGINEERING MECHANICS: DYNAMICS
- SPACE VEHICLE DYNAMICS AND CONTROL
- PROJECTS IN ASTRONAUTICS
- AEROSPACE SYSTEMS DESIGN
- DYNAMIC SYSTEMS AND CONTROL
- AIRCRAFT DYNAMICS AND CONTROL
- MEASUREMENTS AND DATA ANALYSIS
- DESIGN OF AEROSPACE STRUCTURES
- INTRODUCTION TO DEFORMABLE SOLIDS
- FUNDAMENTALS OF AEROSPACE DESIGN
- STRUCTURE AND PROPERTIES OF MATERIALS

Mathematics (Undergraduate Level)

- ELEMENTARY DIFFERENTIAL EQUATIONS
- CALCULUS WITH ANALYTICAL GEOMETRY 1
- CALCULUS WITH ANALYTICAL GEOMETRY 2
- CALCULUS WITH ANALYTICAL GEOMETRY 3
- ELEMENTARY LINEAR ALGEBRA
- INTRODUCTORY APPLIED STATISTICS
- NUMERICAL METHODS FOR ENGINEERS

Russian (Undergraduate Level)

- ELEMENTARY RUSSIAN 1 & 2
- INTERMEDIATE RUSSIAN 1 & 2
- BASIC RUSSIAN CONVERSATION 1 & 2
- COMPOSITION AND CONVERSATION 1 & 2
- COMPUTATIONAL LINGUISTICS
- LITERATURE OF DOSTOYEVSKY
- MODERN RUSSIAN LITERATURE
- SCIENTIFIC & TECHNICAL TRANSLATION

Russian (Study Abroad – St. Petersburg State University)

- RUSSIAN GRAMMAR
- RUSSIAN PHONETICS
- NEWSPAPER READING IN RUSSIAN
- RUSSIAN LITERATURE
- RUSSIAN COMPOSITION
- RUSSIAN CONVERSATION

PUBLICATIONS

Hill, J. R. (2019), Walk to Mars: Our Path to the Red Planet, Proceedings of the 70th International Astronautical Congress, IAC-19-E1.6.1.

Hill, J. R. and P. R. Christensen (2017), Well-preserved low thermal inertia ejecta deposits surrounding young secondary impact craters on Mars, J. Geophys. Res. Planets, 122, 1276–1299, doi:10.1002/2016JE005210.

Bennett, K. A., **Hill, J. R.**, Murray, K. C., Edwards, C. S., Bell, J. F., III, & Christensen, P. R. (2018). THEMIS-VIS investigations of sand at Gale crater. Earth and Space Science, 5, 352–363. https://doi.org/10.1029/2018EA000380.

Edwards, C. S., K. J. Nowicki, P. R. Christensen, **J. R. Hill**, N. Gorelick, and K. Murray (2011), Mosaicking of global planetary image datasets: 1. Techniques and data processing for Thermal Emission Imaging System (THEMIS) multi-spectral data, J. Geophys. Res., 116, E10008, doi:10.1029/2010JE003755.

Edwards, C. S., P. R. Christensen, and **J. R. Hill** (2011), Mosaicking of global planetary image datasets: 2. Modeling of wind streak thicknesses observed in Thermal Emission Imaging System (THEMIS) daytime and nighttime infrared data, J. Geophys. Res., 116, E10005, doi:10.1029/2011JE003857.

PUBLICATIONS IN-PREP

Hill, J. R. and P. R. Christensen (2023), Chloride Salt Dome in Ares Vallis [*in prep, to be submitted to GRL*]

Hill, J. R. and P. R. Christensen (2023), Martian Chloride Salts: 1. Visualizing the Maximum Compositional Variation within the THEMIS Multispectral Thermal Infrared Dataset [*in prep, to be submitted to JGR*]

Hill, J. R. and P. R. Christensen (2023), Martian Chloride Salts: 2. A Principle Component Index for Identifying Chloride Minerals using THEMIS Multispectral Thermal Infrared Images [*in prep, to be submitted to JGR*]

***NOTE**: These three papers represent the core of my doctoral dissertation.*

CONFERENCE PRESENTATIONS

(Lead Author)

Hill, J. R. and P. R. Christensen (2019), Mars on the Mall: Walking on Mars on the U.S. National Mall, *invited talk*, presented at the American Geophysical Union Fall Meeting, San Francisco, CA, 9-13 Dec.

Hill, J. R. and P. R. Christensen (2019), Walk to Mars: Our Path to the Red Planet, IAC-19-E1.6.1, presented at the 70th International Astronautical Congress, Washington, DC, 21-25 Oct.

Hill, J. R. and P. R. Christensen (2019), Applying the THEMIS Quasi-Spectral Chloride Index to the Martian Southern Highlands. Lunar Planet. Sci. L, Abstract 3213.

Hill, J. R. and P. R. Christensen (2015), Western Noachis Terra Chloride Deposits: Aqueous Minerals with High Astrobiological Preservation Potential, Abstract 1021, First Landing Site and Exploration Zone Workshop for Human Missions to the Surface of Mars, Houston, TX, 27-30 Oct.

CONFERENCE PRESENTATIONS

(Contrib. Author)

Edwards, C.S., Piqueux, S., Glotch, T.D., Hamilton, V.E., Duxbury, T.C., **Hill, J.R.**, Christensen, P.R., Haberle, C.W., Smith, N.M., and Bandfield, J.L., 2021, The Thermophysical Properties of Phobos from TES and THEMIS Observations. Geological Society of America Abstracts with Programs, Vol 53, No 6, https://doi.org/10.1130/abs/2021AM-366995.

Hare, T. M., R. M. Davis, R. B. Collum, D. H. Day, **J. R. Hill**, and E. S. Law (2018), Mars Human Exploration Zones (MarsGIS) Spatial Data Infrastructure. Lunar Planet. Sci. XLIX, Abstract 1699.

Bandfield, J. L., S. Piqueux, T. D. Glotch, K. A. Shirley, T. C. Duxbury, **J. R. Hill**, C. S. Edwards, J. J. Plaut, V. E. Hamilton, and P. R. Christensen (2018), Mars Odyssey THEMIS Observations of Phobos: New Spectral and Thermophysical Measurements. Lunar Planet. Sci. XLIX, Abstract 2643.

Bennett, K. A., **J. R. Hill**, K. C. Murray, C. S. Edwards, J. F. Bell III, and P. R. Christensen (2017), THEMIS-VIS Color and Morphologic Investigations at Gale Crater. Lunar Planet. Sci. XLVII, Abstract 2153.

CONFERENCE POSTERS

(Lead Author)

Hill, J. R. and P. R. Christensen, (2019), New Constraints on the Formation Ages of the Chloride-Bearing Deposits in the Martian Southern Hemisphere. Ninth International Conference on Mars, Pasadena, CA, Abstract 6115.

Hill, J. R. and P. R. Christensen, (2019), Mars on the Mall: Walking on Mars in the Nation's Capital. Lunar Planet. Sci. L, Abstract 2219.

Hill, J. R. and P. R. Christensen (2018), A Quasi-Spectral Index for Identifying Chloride Minerals using THEMIS Multispectral Thermal Infrared Images, Abstract P53F-3026, presented at 2018 Fall Meeting, AGU, Washington, DC, 10-14 Dec.

Hill, J. R. and P. R. Christensen, (2018), Walk on Mars: Program Overview and Initial Lessons Learned. Lunar Planet. Sci. XLIX, Abstract 1615.

Hill, J. R. and P. R. Christensen (2017), A Basketball Court-Size Global Map of Mars for Education and Public Outreach, Abstract ED53H-0229, presented at 2017 Fall Meeting, AGU, New Orleans, LA, 11-15 Dec.

Hill, J. R., J. J. Plaut, and P. R. Christensen (2016), The Western Noachis Terra Chloride Deposits: An Improved Characterization of the Proposed Human Exploration Zone, Abstract P53C-2215, presented at 2016 Fall Meeting, AGU, San Francisco, CA, 12-16 Dec.

Hill, J. R. and P. R. Christensen, (2016), Global Distribution of Low Thermal Inertia Halos Surrounding Small Young Martian Impact Craters. Lunar Planet. Sci. XLVII, Abstract 2964.

Hill, J. R. and P. R. Christensen, (2016), A Quality Constrained THEMIS Daytime Infrared Global Mosaic. Lunar Planet. Sci. XLVII, Abstract 2326.

Hill, J. R. and P. R. Christensen (2014), Identification and Characterization of Well-Preserved Impact Ejecta Deposits Using THEMIS Global Infrared Mosaics, Abstract P33A-4028, 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 Dec.

Hill, J. R., C. S. Edwards, and P. R. Christensen (2014), Mapping the Martian Surface with THEMIS Infrared Global Mosaics, Eighth International Conference on Mars, Pasadena, CA, Abstract 1141.

CONFERENCE POSTERS

(Contrib. Author)

Ashley, J. W., S. W. Ruff, P. R. Christensen, M. D. Smith, and **J. R. Hill**, (2019), Evidence for Martian Dust Penetration into Closed Surface Assets: Implications for Particle Size and Behavior in the Martian Environment. Lunar Planet. Sci. L, Abstract 2545.

McConnochie, T. H., M. J. Wolff, M. D. Smith, S. W. Lee, K. C. Bender, **J. R. Hill**, and K. Murray (2018), Measuring Early-Morning Cloud and Haze Opacity on Mars with THEMIS-VIS on Mars Odyssey: Identifying Diurnal Changes by Reference to MRO's MARCI, Abstract P43K-3893, presented at 2018 Fall Meeting, AGU, Washington, DC, 10-14 Dec.

Adler, J.B., **J. R. Hill**, J. L. Mitchell, P. R. Christensen, S. Anwar, S. Dickenshied, and S. Carter (2016), JMARS Software Development for NASA's 2035 Human Landing Site Assessment. Lunar Planet. Sci. XLVII, Abstract 2981.

Bennett, K. A., **J. R. Hill**, C. S. Edwards, J. F. Bell III, and P. Christensen (2014), THEMIS-VIS Color Mosaic and Multispectral Investigation of Gale Crater, Eighth International Conference on Mars, Pasadena, CA, Abstract 1029.

Christensen, P. R., R. L. Fergason, C. S. Edwards, and **J. R. Hill** (2013), THEMIS-derived thermal inertia mosaic of Mars: Product description and science results, Lunar Planet. Sci. XLIV, Abstract 2822.

INVITED LECTURES

Spitzer Seminar Series **October, 2018**
CALIFORNIA STATE UNIVERSITY – EAST BAY, DEPARTMENT OF PHYSICS

EDUCATIONAL AWARDS

Graduate Excellence Award **2019**
ASU - SCHOOL OF EARTH AND SPACE EXPLORATION

Summer Exploration Graduate Fellowship **2017**
ASU - SCHOOL OF EARTH AND SPACE EXPLORATION

Boy Scouts of America – Eagle Scout **1999**
TROOP 148, GRAND CANYON COUNCIL

PROFESSIONAL AWARDS

NASA Group Achievement Award **2023**
ODYSSEY SAFE MODE EFFICIENCY TEAM

NASA Group Achievement Award **2019**
OSIRIS-REX ASTEROID APPROACH AND PRELIMINARY SURVEY TEAM

NASA Group Achievement Award **2015**
MARS ODYSSEY COMET SIDING SPRING OPERATIONS TEAM

NASA Group Achievement Award **2014**
MER SCIENCE AND OPERATIONS TEAM

NASA Group Achievement Award **2008**

MER 3RD AND 4TH EXTENDED MISSION TEAM