

Ali M. Bramson

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EDUCATION

University of Arizona, Tucson, AZ, 2012-present

PhD Candidate, Planetary Sciences with a minor in Geosciences
M.S. Planetary Sciences (awarded December 2015)

University of Wisconsin-Madison, Madison, WI, 2007-2011

B.S. in Physics and Astronomy-Physics, certificate (minor) in Computer Science
Cumulative GPA: 3.815 / 4.0 GPA in physical science/math courses: 3.72 / 4.0
Graduated with distinction (honor's thesis); named on UW's Dean's List 6 semesters

HONORS AND AWARDS (Total amount awarded: \$406,242)

Graduate (\$349,642):

- LPI Career Development Award (2017) - \$1,000
- NASA Earth and Space Science Fellowship (NESSF) (awarded 2016) - \$30,000/year for up to 3 years
- LPL Shirley D. Curson Travel Award in Planetary Science (2015) - \$1,500
- UofA Graduate and Professional Student Council Travel Grant (2015) - \$739
- Student Travel Grant from NASA's MEPAG (Mars Exploration Program Analysis Group) to attend the Eighth International Conference on Mars (2014) - \$1,000
- Roy P. Drachman Galileo Scholarship for the College of Science Outstanding Graduate Student Teaching Award (2014) - \$1,000
- College of Science Teaching Award for the Lunar and Planetary Laboratory (2014)
- University of Arizona Galileo Circle Scholarship (2014, 2017) - \$2,000
- Outstanding Student Paper Award at the American Geophysical Union (AGU) Fall Meeting (2013)
- National Science Foundation (NSF) Graduate Research Fellowship (2013-2016) - \$194,859
- Lieutenant Colonel Kenneth Rondo Carson and Virginia Bryan Carson Graduate Fellowship (2012-2013)
- Arizona Space Grant Consortium Assistantship (2012-2013); combined with Carson - \$57,544

Undergraduate (\$56,600):

- UW-Madison Astronomy Dept. Lowell Doherty Award for Excellence in Astronomy recognizing a graduating senior's exceptional performance in astronomical research and in the classroom (2012) - \$500
- Phi Beta Kappa Honor Society (joined 2011)
- NSF Undergraduate Research and Mentoring (URM) Fellow at UW-Madison (2008-2011) - \$36,000
- Wisconsin Space Grant Consortium Undergraduate Research Grant (2011) - \$3,500
- David H. Durra Scholarship for undergraduates pursuing degrees in the physical sciences (2011) - \$2,000
- Wisconsin Space Grant Consortium Undergraduate Scholarship (2010-2011) - \$1,500
- SETI Institute's 2010 Research Experiences for Undergraduates (REU) in Astrobiology - \$5,600
- Bernice Durand Undergraduate Scholarship for undergraduate women or minorities majoring in Physics or Astronomy (2009) - \$1,900
- Arecibo Observatory's 2009 Research Experiences for Undergraduates (REU) - \$4500
- William F. Vilas Scholarship (2007) to freshman who demonstrate strong academic performance based on class rank and GPA - \$400
- Verona Area Community Theater Fine Arts Scholarship (2007) - \$700

RESEARCH EXPERIENCES

Graduate Research Associate: Planetary Science Department, University of Arizona, Aug. 2012-current

Advisor: Prof. Shane Byrne

- Investigations of excess ice in the Martian mid-latitudes using terraced craters, radar and modeling

Undergraduate Research Assistant: Astronomy Department, University of Wisconsin, Dec. 2008-May 2012

Advisor: Prof. Eric M. Wilcots

- Senior Thesis Project: Using networking algorithms to assess the environments of galaxy groups

REU Student: SETI Institute, June 2010-Aug. 2010

Advisor: Dr. Cynthia Phillips

- Searching for ongoing geologic activity on Jupiter's satellites

REU Student: Arecibo Observatory/Cornell University, May 2009-Aug. 2009

Advisors: Dr. Ellen Howell and Dr. Michael Nolan

- Modeling of 25143 Itokawa to improve radar-based shape estimation methods

Undergraduate Research Assistant: Nanoscale Science and Engineering Center (NSEC), University of Wisconsin, June 2007-May 2009

Advisors: Dr. Kevin M. Metz and Prof. Joel A. Pedersen

- Environmental transformations of metal nanoparticles and solution-based growth of nanoparticles

SKILLS

Spacecraft:

- Participant of the 2016 Planetary Science Summer School at NASA's Jet Propulsion Laboratory
 - Role: Project/Proposal Manager
 - Mission Concept: New Frontiers-class mission to orbit Uranus
- Analysis of data from the *High Resolution Imaging Science Experiment* (HiRISE), *Context Camera* (CTX) and *Shallow Radar* (SHARAD) instruments onboard the Mars Reconnaissance Orbiter; *Solid State Imager* (SSI) onboard Galileo; the *Long-Range Reconnaissance Imager* (LORRI) onboard New Horizons; Hayabusa and Arecibo spacecraft shape models of asteroid 25143 Itokawa
- Produced 11 HiRISE Digital Terrain Models archived on the Planetary Data System (PDS)
- Attended science team meetings for the HiRISE, CaSSIS, SHARAD, MARSIS, and Dawn missions/instruments
- Attended and presented at the Project Science Group meeting for the Mars Reconnaissance Orbiter
- Attended the Navigation and Ancillary Information Facility (NAIF)'s SPICE training workshop

Remote Sensing:

- Esri's geospatial ArcGIS software
- SeisWare seismic software
- USGS's image processing software ISIS (Integrated Software for Imagers and Spectrometers)
- Socet Set digital mapping software
- HiRISE Digital Terrain Model (DTM) creation
- SHAPE asteroid shape modeling software

Computer:

- Microsoft, Mac and Linux OS
- Languages: Java, Matlab, Maple, MIPS R2000 Assembly Language, BASIC, Visual Basic, C, C++ and IDL

Field Work:

- Ground Penetrating Radar (GPR) at 200, 350 and 900 MHz and ice coring of the Langjökull glacier, Iceland with Dr. Lynn Carter and colleagues
- Differential GPS of lava flow margins, surface roughness and stereophotogrammetric ground control points at:
 - Craters of the Moon, Idaho with NASA's 2016 FINESSE (Field Investigations to Enable Solar System Science and Exploration) field campaign
 - Iceland's Nornahraun 2014-2015 lava flow and the Laki lava flow with Dr. Christopher Hamilton's 2015 field workshop on active lava-water interactions
- Participated in 9 semesters of Planetary Geology Field Studies to study the local geology and planetary analogs in Tucson, Flagstaff, the Mojave Desert, Northern New Mexico and the K/T Boundary, Hawaii, Southern New Mexico, Southeastern Utah and Canyonlands, the Salton Sea, the Chiricahua Mountains and San Bernardino Valley, Southwestern Utah and Bryce and Zion Canyons
- Participated in field trips to explore Mars analogs at the HiRISE team meetings to Utah, Idaho, Iceland and Flagstaff

Lab:

- Aqueous synthesis of metal nanoparticles
- Scanning electron microscopy
- Dynamic light scattering
- UV-Visible spectroscopy

PROFESSIONAL ACTIVITIES AND DEPARTMENTAL INVOLVEMENT

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- Served on NASA Review Panels
 - Reviewer for *Geophysical Research Letters & Icarus*
 - *UofA Graduate and Professional Student Council*: Travel Grant Reviewer 2015
 - *University of Wisconsin-Madison Alumni Association- Tucson Chapter*: President Fall 2014-present
 - *LPL Graduate Student Activities*:
 - Representative to the faculty (2016-present)
 - Prospective graduate student visit weekend coordinator (2014, 2015)
 - Grad student website webmaster (2014-2017)
 - Lunar and Planetary Laboratory Conference (LPLC) session chair (2014, 2016)
 - LPL Bratfest coordinator (2012-2017)
 - *Society of Physics Students, UW-Madison chapter*: President (2010-2011); Vice President (2009-2010); Events Coordinator (2008-2009); Member (2007-2012)
 - *The Ogg Association at UW-Madison*: Educational Programs Coordinator 2007-2008

TEACHING AND MENTORING

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- *LASC/SCI 397B & C: Entering Research I & II* (U. Arizona) Fall 2013-present
 - Instructor of Record; founded this 2-semester workshop for undergraduate researchers at the UA
 - Coordinates and mentors other graduate student facilitators on learner-centered teaching practices and experiential learning involved with teaching this course
 - *PTYS 554: Evolution of Planetary Surfaces* (U. Arizona) Fall 2015
 - Guest Lecturer (graduate level course)
 - *Astronomy 340: Planetary Astrophysics* (UW-Madison) Fall 2011
 - Guest lecturer (undergraduate astronomy majors course)
 - *Undergraduate Research and Mentoring (URM) Program* (UW-Madison) Spring 2008-Spring 2011
 - Mentored students in the younger classes of fellows
 - *EAGLE Middle School Science Mentor Program* (Fitchburg, WI) Spring 2011

- Mentored an 8th grade science student
- Biology 260 & 261: Entering Research I & II* (UW-Madison) Fall 2010- Spring 2011
- Co-facilitated this class for undergraduates beginning independent research projects
- Astronomy 104: Our Exploration of the Solar System* (UW-Madison) Fall 2010
- Guest lecturer and reviewer of students' final projects on designing a solar system mission (undergraduate general education course)
- Physics Learning Center* (UW-Madison) 2009-2010
- Peer Mentor Tutor (PMT): led 2+ small group sessions/week for introductory physics classes
 - Participated in weekly training seminars on basic teaching strategies

OUTREACH

- Summer Science Saturday at LPL*
- Discussed craters and the HiRISE camera with the public July 2017
- Core Knowledge Charter School*
- Talked to 44 third-graders about life as a planetary scientist December 2016
- Deep Astronomy, Live*
- Panelist for the "Footsteps to Mars" live web broadcast about water on Mars November 2016
- Glacier Edge Elementary School*
- Talked to 174 fourth and fifth-graders about life as a planetary scientist October 2016
- Tucson Festival of Books* March 2013, 2015, 2016
- Ran activities on comparative planetology, meteorite hunting, exoplanet discovery and characterization, and science art for the public
- The Art of Planetary Science* Dec. 2013, Oct. 2015, Feb. 2017
- Volunteered with and submitted "data art" to this exhibition to bring together scientists and artists in Tucson
- Space Drafts Public Talk Series, Borderlands Brewery* February 2015
- Gave public lecture on "Crazy Craters!!! Windows into Martian Ice"
- Astronomy Ambassador for the American Astronomical Society* November 2014
- <http://aas.org/outreach/aas-astronomy-ambassadors-program>
- Arizona Science and Astronomy Expo* November 2012
- Impact cratering demo for the public
- Sugar Creek Elementary School* November 2011
- Read books about the Moon and the Mars rovers and explained various astronomical phenomena to three second-grade classes.
- Universe in the Park* Summer 2010 & 2011
- Gave 30-minute astronomy presentations at WI state parks, preceded by telescope viewings
- "SETI Gurls"* Summer 2010
- Co-created this fun YouTube video about the SETI REU program. It has over 11,000 views on YouTube, and was featured on NPR's Science Friday, the Huffington Post and Astronomy Magazine.
- SETIcon* August 2010
- Ran planetarium shows and helped with a Build-Your-Own Galileoscope workshop
- Wonders of Physics* February 2008 & 2009
- Volunteered at this program for the public and supervised/explained topics in the physics museum

PRESS

- 2017 GRL paper on *The Vanishing Cryovolcanoes of Ceres* picked up by:
 - Space.com, Astronomy.com, UA News and others
- Arizona Sonora News interview for the article, "*The Space Race of the past launched astronomy's future in Tucson*"

- Profiled for a “*Women in Science*” article in the Daily Wildcat
- 2015 GRL paper results on *Widespread Excess Ice in Arcadia Planitia* picked up by:
 - CBS News, Space.com, UA News and others
- NASA’s JPL Martian Diaries Blog Post about Subsurface Ice and Terraced Craters
- Planetary Society Blog Post about Terraced Craters
- UW Alumni Magazine's Class of 2011 Feature
- Profiled in The Washburn Observer (UW-Madison Astronomy Department Newsletter)
- SETI Gurls mentioned on NPR's Science Friday and in the Huffington Post

INVITED TALKS

Planetary Lunch Colloquium Series, Earth, Atmospheric and Planetary Sciences Department;
 Massachusetts Institute of Technology, Cambridge, MA, March 2017
Lunch Seminar, Department of Astronomy; University of Wisconsin-Madison, Madison, WI, October 2015
Colloquium, Planetary Science Directorate; Southwest Research Institute, Boulder, CO, September 2015

PEER-REVIEWED PUBLICATIONS

C. M. Dundas, **A. M. Bramson**, L. Ojha, J. J. Wray, M. T. Mellon, S. Byrne, A. S. McEwen, N. E. Putzig, D. Viola, and S. Sutton (in review), *Exposed massive ground ice in the Martian mid-latitudes*.

Bramson, A.M., S. Byrne, J. Bapst (under revision with JGR-Planets), *Preservation of Mid-Latitude Ice Sheets on Mars*.

Smith, I.B., S. Diniega, D.W. Beaty, T. Thorsteinsson, P. Becerra, **A.M. Bramson**, S.M. Clifford, C.S. Hvidberg, G. Portyakina, S. Piqueux, A. Spiga and T.N. Titus (2017), *Introduction to the Special Issue on Mars Polar Science and Exploration: Conference Summary and Five Top Questions*. Icarus, in press, [doi:10.1016/j.icarus.2017.06.027](https://doi.org/10.1016/j.icarus.2017.06.027).

Sori, M.M., J.N. Bapst, **A.M. Bramson**, S. Byrne, and M.E. Landis (2017), *A Wunda-full world? Carbon dioxide ice deposits on Umbriel and other Uranian moons*. Icarus, 290, 1-13, [doi:10.1016/j.icarus.2017.02.029](https://doi.org/10.1016/j.icarus.2017.02.029).

Sori, M.M., S. Byrne, M. Bland, **A.M. Bramson**, A. Ermakov, C. Hamilton, K. Otto, O. Ruesch, C.T. Russell (2017), *The vanishing cryovolcanoes of Ceres*. Geophys. Res. Lett., 44, [doi:10.1002/2016GL072319](https://doi.org/10.1002/2016GL072319).

Bramson, A.M., S. Byrne, N.E. Putzig, S. Sutton, J.J. Plaut, T.C. Brothers, and J.W. Holt (2015), *Widespread excess ice in Arcadia Planitia, Mars*. Geophys. Res. Lett., 42, [doi:10.1002/2015GL064844](https://doi.org/10.1002/2015GL064844).

SELECTED CONFERENCE ABSTRACTS/PRESENTATIONS

A.M. Bramson, S. Byrne, and J. Bapst (March 2017), *Survival Of Mid-Latitude Ground Ice On Mars*. Oral presentation at the 48th Lunar and Planetary Science Conference (LPSC), The Woodlands, TX.

A.M. Bramson, C.M. Elder, L.W. Blum, H.T. Chilton, A. Chopra, C. Chu, A. Das, A. Davis, A. Delgado, J. Fulton, L. Jozwiak, A. Khayat, M.E. Landis, J.L. Molaro, M. Slipski, S. Valencia, J. Watkins, C.L. Young, C.J. Budney, and K.L. Mitchell (March 2017), *OCEANUS: A Uranus Orbiter Concept Study From The 2016 NASA/JPL Planetary Science Summer School*. 48th LPSC.

E.I. Schaefer, C.W. Hamilton, C.D. Neish, M.M. Sori, **A.M. Bramson**, S.P. Beard, S.I. Peters, T.A. Miller, and E. L. Rader (March 2017), *Seeing Pāhoehoe From Orbit (Without Squinting)*. 48th LPSC.

- M.M. Sori, M.E. Landis, J. Bapst, **A.M. Bramson**, S. Byrne, V. Reddy, and M.K. Shepard (March 2017), *Ice Stability On Psyche And Implications For The Planetary Core Hypothesis*. 48th LPSC.
- N.R. Williams, M.P. Golombek, **A.M. Bramson**, D. Viola, S. Byrne, and A.S. McEwen (March 2017), *Surface Morphologies Of Arcadia Planitia As An Indicator Of Past And Present Near-Surface Ice*. 48th LPSC.
- I.B. Smith, S. Diniega, D.W. Beaty, T. Thorsteinsson, P. Becerra, **A.M. Bramson**, S.M. Clifford, C.S. Hvidberg, G. Portyankina, S. Piqueux, A. Spiga, and T.N. Titus (March 2017), *The 6th International Conference on Mars Polar Science and Exploration: State of knowledge and Top Five Questions*. 48th LPSC.
- M.M. Sori, S. Byrne, M.T. Bland, **A.M. Bramson**, A.I. Ermakov, C.W. Hamilton, K.A. Otto, O. Ruesch, and C.T. Russell (March 2017), *The Vanishing Cryovolcanoes Of Ceres*. 48th LPSC.
- E.I. Schaefer, C. Hamilton, C. Neish, S.P. Beard, **A.M. Bramson**, M. Sori, and E.L. Rader (December 2016), *Decoding the Margins: What Can the Fractal Geometry of Basaltic Flow Margins Tell Us?* AGU Fall Meeting 2016, San Francisco, CA.
- A.M. Bramson**, S. Byrne and J.N. Bapst (September 2016), *Preservation of Excess Ice in the Northern Mid-Latitudes of Mars*. Oral presentation at the 6th Mars Polar Science Conference, University of Iceland, Reykjavik, Iceland.
- A.M. Bramson**, S. Byrne (March 2016), *Implications of Martian Excess Ground Ice Stability*. 47th LPSC, The Woodlands, TX.
- M.M. Sori, S. Byrne, J.N. Bapst, P. Becerra, **A.M. Bramson**, M.E. Landis (March 2016), *A Wunda-Full World? Testing the Plausibility of Carbon Dioxide Frost on Umbriel*. 47th LPSC, The Woodlands.
- A.M. Bramson** (November 2015), *Widespread Excess Ice in Arcadia Planitia, Mars*. Oral presentation at the 2015 SHARAD (NASA's Mars Reconnaissance Orbiter) and MARSIS (ESA's Mars Express) radar science team meetings, University of Iowa, Iowa City, IA.
- A.M. Bramson** (September 2015), *Terraced craters: Windows into widespread excess ice across Arcadia Planitia*. Oral presentation at the 2015 HiRISE (NASA's Mars Reconnaissance Orbiter) and CaSSIS (ESA's ExoMars Trace Gas Orbiter) camera science team meetings, Lake Myvatn, Iceland.
- E. Martellato, G. Cremonese, A. Lucchetti, **A.M. Bramson**, S. Byrne (September 2015), *Modeling of Terraced Craters on Mars*. Bridging the Gap III, Freiburg, Germany.
- A.M. Bramson**, S. Byrne, S. Sutton, N.E. Putzig, E. Martellato, G. Cremonese, J.J. Plaut, J.W. Holt (March 2015), *A Study of Martian Mid-Latitude Ice Using Observations and Modeling of Terraced Craters*. 46th LPSC, The Woodlands, TX.
- A.M. Bramson**, S. Byrne, N.E. Putzig, S. Mattson, J.J. Plaut, J.W. Holt (November 2014), *Distribution and Compositional Constraints on Subsurface Ice in Arcadia Planitia, Mars*. Oral presentation at the 46th Division of Planetary Sciences (DPS) Conference, Tucson, AZ.
- E. Martellato, G. Cremonese, A. Lucchetti, M. Massironi, F. Marzari, **A.M. Bramson**, S. Byrne, S. Mattson (November 2014), *Ground Ice on Mars: Numerical Modelling of a Terraced Crater in Arcadia Planitia*. Oral presentation at the 46th DPS Conference, Tucson, AZ.
- M. Nolan, **A.M. Bramson**, C. Magri (July 2014), *Radar Scattering Functions Using Itokawa as Ground Truth*. Asteroids, Comets, Meteors 2014, Helsinki, Finland.
- A.M. Bramson**, S. Byrne, N.E. Putzig, S. Mattson, J.J. Plaut, J.W. Holt (July 2014), *Thick, Excess Water Ice in Arcadia Planitia*. 8th International Conference on Mars, Pasadena, CA.
- A.M. Bramson**, S. Byrne, N.E. Putzig, S. Mattson, J.J. Plaut, J.W. Holt (March 2014), *Thick, Excess Water Ice in Arcadia Planitia, Mars*. Oral presentation at the 45th LPSC, The Woodlands, TX.
- A.M. Bramson**, S. Byrne, N.E. Putzig, J.J. Plaut, S. Mattson, J.W. Holt (December 2013), *Thick Subsurface Water Ice in Arcadia Planitia, Mars*. Oral presentation at the 2013 American Geophysical Union (AGU) Fall Meeting, San Francisco, CA.
- A.M. Bramson**, S. Byrne, N.E. Putzig, S. Mattson, J.J. Plaut (March 2013), *Terraced Craters and Subsurface Ice in Arcadia Planitia, Mars*. 44th LPSC, The Woodlands, TX.

- A.M. Bramson**, K. Hess, and E.M. Wilcots (January 2012), *Applying Social Networking and Clustering Algorithms to Galaxy Groups in ALFALFA*. Oral presentation at the 219th American Astronomical Society (AAS) Conference, Austin, TX.
- A.M. Bramson** and E.M. Wilcots, (August 2011), *Using Networking Algorithms to Assess the Environment of Galaxy Groups*. Oral presentation at the 21st Annual Wisconsin Space Conference, La Crosse, WI.
- A.M. Bramson**, C.B. Phillips and J.P. Emery, (March 2011). *A Search for Ongoing Geologic Activity on Jupiter's Satellites*. 42nd LPSC, The Woodlands, TX.
- A.M. Bramson** and E.M. Wilcots, (January 2011), *Using Networking Algorithms to Assess the Environment of Galaxy Groups*. 217th AAS Conference, Seattle, WA.
- A.M. Bramson**, C.B. Phillips and J.P. Emery, (August 2010). *A Search for Ongoing Geologic Activity on Jupiter's Satellites*. Oral presentation at the SETI Institute colloquium, Mountain View, CA.
- A.M. Bramson**, C. Magri, E.S. Howell, M.C. Nolan, P.A. Taylor, (October 2009), *The Hayabusa Spacecraft Model of Itokawa: Lessons Learned for Radar Shape Models*, 41st DPS Conference, Fajardo, Puerto Rico.
- A.M. Bramson**, J.A. Pedersen, (April 2009), *Stability of Nanoparticles Under Simulated Environmental Conditions*, Oral presentation at the 11th Annual UW-Madison Undergraduate Research Symposium, Madison, WI.
- A.M. Bramson**, K.M. Metz, and J.A. Pedersen, (January 2009), *Stability of Metal Nanoparticles Under Simulated Environmental Conditions*, 2nd Ann. Undergrad. Conf. for Women in Physics, Urbana, IL.
- A.M. Bramson**, K.M. Metz and J.A. Pedersen, (April 2008), *Stability of Palladium Nanoparticles Under Simulated Environmental Conditions*, 235th American Chemical Society (ACS) Conference, New Orleans, LA.
- A.M. Bramson**, K.M. Metz and J.A. Pedersen, (August 2007), *Solution Based Growth of Shaped Gold Nanoparticles*, UW-Madison NSEC REU Poster Session, Madison, WI.