

Dr. Matthew B. Weller

Lunar and Planetary Institute
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Research Interests

Analytical, theoretical, and numerical modeling of global scale geodynamic and tectonic processes; Numerical experiments and theory exploring fundamental physics of convective systems in order to understand the nature of heat loss, material transport, rheology, and evolution of terrestrial and extrasolar planets; Theory and numerical experiments exploring climate, tectonic, and interior interactions in order to understand global volatile cycling, climatic stability, and the potential for habitability.

Education

- Rice University (Houston, TX)** 2015
Department of Earth, Environmental and Planetary Sciences
Doctor of Philosophy in Geophysics and Planetary Science;
Advisor: Prof. Adrian Lenardic; Co-Advisors: Prof. Julie Morgan and Dr. Patrick McGovern
Thesis: "On the Evolution of Planets: From Convective Bi-stability to Volcanic Edifice Instability."
- University of Nevada, Reno (Reno, NV)** 2010
Department of Geological Sciences and Engineering
Master of Science in Remote Sensing and Geology; Advisor: Prof. James Taranik
Thesis: "Comparing remote sensing of materials on the Earth with their analogs on Mars using multiband and hyperspectral thermal image data."
- University of Toledo (Toledo, OH)** 2007
Department of Earth, Ecological and Environmental Sciences
Bachelor of Science in Earth Science (Honors, Math minor); Advisor: Prof. Timothy Fisher
Thesis: "Feasibility Study of Mapping Continuous Strandlines Across the Southeast Lake Agassiz Basin."
Department of Physics and Astronomy
Bachelor of Science in Physics (Honors, Math minor); Advisor: Prof. S. Thomas Megeath
Thesis: "Debris Disks Candidates around A type Stars in the Orion Nebula."

Professional Appointments

- Lunar and Planetary Institute (Houston, TX)** 2021 –
Urey Fellow
- Brown University, Dept. of Earth, Env. and Plan. Sci. (Providence, RI)** 2019 – 2021
Postdoctoral Research Associate; Advisor: Prof. Alexander Evans
- Institute for Geophysics, University of Texas at Austin (Austin, TX)** 2016 – 2019
Institutional Postdoctoral Fellow; Mentors: Prof. Thorsten Becker and Dr. Krista Soderlund

Lunar and Planetary Institute and Rice University (Houston, TX) <i>Postdoctoral Research Associate; Advisor: Director Steve Mackwell and Prof. Adrian Lenardic</i>	2016 – 2016
ExxonMobil, Upstream Research Company (Houston, TX) <i>Rock Fracture group (Intern)</i>	2013
Truckee Meadows Community College (Reno, NV) <i>Adjunct Faculty</i>	2010
Nevada Geodetic Laboratory, University of Nevada, Reno (Reno, NV) <i>Research Scientist; Advisor: Res. Prof. Corné Kreemer</i>	2010
NASA Jet Propulsion Laboratory (Pasadena, CA) <i>Outer Planets Research (Intern); Advisor: Dr. Robert Pappalardo</i>	2006

Selected Fellowships, Honors, and Awards

- Lunar and Planetary Institute, *Urey Postdoctoral Fellow* 2021
- European Commission, *Marie Skłodowska-Curie Fellow** 2019
- Institute for Geophysics, University of Texas at Austin, *Institutional Postdoctoral Fellow* 2016
- Rice University, *The ExxonMobil Outstanding Graduate Student Award* 2016
- AGU's Study of Earth's Deep Interior (SEDI), *AGU Graduate Research Award* 2015
- Rice University, *Sam Worden Endowed Memorial Award in Geophysics* 2015
- CIG division of the CIG-CGU-CSSS Meeting, *Best Student-Presenter, Banff, Alberta, Canada* 2014
- Rice University, *Departmental Service Award* 2012
- University Rover Challenge, *1st Place Science Team Lead* 2008

* Declined due to Covid-19

Submitted, Selected, and Funded Grants

- **NASA Solar System Workings Program** 2020 – 2023
*Temporal Evolution in the Style of Mantle Convection on Venus:
The Role of Mantle, Lithosphere, and Atmospheric Coupling (\$312K*)*
PI Matthew B. Weller; Co-I Walter S. Kiefer (Lunar Planetary Institute);
Collaborator Paul K. Byrne (N.C. State University)
- **European Commission Marie Skłodowska-Curie Call**** *Selected/Declined*
*The Evolution of Terrestrial Planets: Insights from Models of Planetary
Evolution with Coupled Internal, Atmospheric/Surface Development (\$240K*)*
PI Matthew B. Weller; Co-I Huw Davies (Cardiff University)
- **NASA Solar System Workings Program** 2017 – 2018
Coupling interior and surface deformation of ice shells (\$163K)*
P.I. Krista Soderlund (UT), Co-I Matthew B. Weller, Co-I Thorsten W. Becker, Co-I Lukas Fuchs
- **Cooperative Institute for Dynamic Earth Research (CIDER-II) research grant** 2014
Mars Thermal History: Core, Atmosphere, Mantle, Phobos and Surface (\$5K)*
- **University of Toledo Summer Undergraduate Research Grant** 2006
Mapping Glacial Lake Agassiz (\$2K)*
- **University of Toledo Sullivan Honors Research Grant** 2006
Mapping Glacial Lake Agassiz (\$1K)*

*all values in U.S. Dollars

** Declined due to Covid-19

Press about Research

- EGU: Regarding evidence and probability for a mobile lid Venus at 0.5 to 1 Ga 2020
<https://blogs.egu.eu/divisions/gd/2020/09/23/venus-science-today/>
- Daily Texan: Regarding the possibility that Venus may have once been habitable 2018
<http://dailytexanonline.com/2018/04/19/venus-may-have-been-more-friendly-to-life-in-the-past>
- Cosmos Magazine: Regarding the possibility of a habitable early Venus 2018
<http://cosmosmagazine.com/space/venus-may-have-hosted-life-researchers-say>
- Science News: Regarding the special Venus session I was apart of 2018
www.sciencenews.org/article/venus-may-be-home-new-kind-tectonics
- EOS: Regarding recent advances in understanding Venus 2017
<https://eos.org/editors-vox/why-its-time-for-a-new-mission-to-venus>
- AGU: Regarding link between climate and tectonic states over time 2016
<http://blogs.agu.org/geospace/2016/12/27/random-temperature-fluctuations-may-made-earth-habitable/>
- Phys.org: Regarding work on random fluctuations and tectonic evolution of planets 2016
<https://phys.org/news/2016-07-lush-venus-searing-earth.html>

Book Chapters/Review Papers in Preparation

- **Weller, M. B.** and Rolf, T. (*co-leads*) et al., Venus mantle convection and tectonic style, Volume: 83: Venus: Evolution through Time. Spohn, T., et al. (Eds.), ISSI Workshop held in January/August 2021, to be published in 2023.
- Way, M., and Gillmann, C. (*co-leads*), et al. (**Weller, M. B.**), Atmosphere-interior evolution of Venus and evolution of the core, Volume: 83: Venus: Evolution through Time. Spohn, T., et al. (Eds.), ISSI Workshop held in January/August 2021, to be published in 2023.
- Way, M., and Ostberg, C. (*co-leads*), et al. (**Weller, M. B.**), Venus as a case study for exoplanets, Volume: 83: Venus: Evolution through Time. Spohn, T., et al. (Eds.), ISSI Workshop held in January/August 2021, to be published in 2023.
- Herrick, R. and Izenberg, N. (*co-leads*), et al. (**Weller, M. B.**), Resurfacing history and volcanic activity of Venus, Volume: 83: Venus: Evolution through Time. Spohn, T., et al. (Eds.), ISSI Workshop held in January/August 2021, to be published in 2023.
- Gilmore, M. and Westhall, F. (*co-leads*), et al. (**Weller, M. B.**), The Habitability of Venus. Spohn, T., et al. (Eds.), ISSI Workshop held in January/August 2021, to be published in 2023.

Publications in Preparation/Submitted (Submitted PDFs available upon request)

- Jones, M. J., A. J. Evans, B. C. Johnson, **M. B. Weller**, J. T. Keane, S. M. Tikoo, and J. C. Andrews-Hanna, The South Pole–Aitken Impact Origin of the Lunar Compositional Asymmetry (*Submitted, Science*)

- **Weller, M. B.**, L. Fuchs, T. W. Becker, and K. M. Soderlund, Geodynamics of Icy Satellites: Effects of Latitudinal Surface Temperature Variations and Yielding in Thin Shells (*in preparation: Geophys. Res. Lett.*)
- **Weller, M. B.**, and Kiefer, W.S., Venus: Punctuated Evolution of Venus' Atmosphere Through Outgassing and Tectonic Regime Transitions (*submission imminent: Science Advances*)

Refereed Publications

- Lenardic, A., J. Seales, W. B Moore, **M. B. Weller** (2020), Convective and Tectonic Plate Velocities in a Mixed Heating Mantle, *Geochemistry, Geophysics, Geosystems*, 22(2), 15 pages, <https://doi.org/10.1029/2020GC009278>
- **Weller, M. B.**, and W. S. Kiefer (2020), The Physics of Changing Tectonic Regimes: Implications for Venus, *J. Geophys. Res. Planets*, 125, 22 pages, doi:10.1029/2019JE005960
- **Weller, M. B.**, Fuchs, L., Becker, T. W., & K. M. Soderlund (2019), Convection in thin shells of icy satellites: Effects of latitudinal surface temperature variations. *J. Geophys. Res. Planets*, 124, 25 pages, doi:10.1029/2018JE005799
- Lenardic, A., **Weller, M. B.**, Höink, T., & J. Seales (2019), Toward a Boot Strap Hypothesis of Plate Tectonics: Feedbacks Between Plates, The Asthenosphere, and The Wavelength of Mantle Convection, *Phys. Earth Planet*, 18 pages, doi: 10.1016/j.pepi.2019.106299
- **Weller, M.B.**, A. Lenardic (2018), On the evolution of terrestrial planets: bi-stability, stochastic effects, and the non-uniqueness of tectonic states, *Geoscience Frontiers*, 13 pages, doi: 10.1016/j.gsf.2017.03.001
- **Weller, M. B.**, A. Lenardic (2016), The Energetics and Convective Vigor of Mixed-mode Heating: Scaling and Implications for the Tectonics of Exoplanets, *Geophys. Res. Lett.*, 43, 6 pages, doi:10.1002/2016GL069927
- **Weller, M. B.**, Lenardic, A., and W.B. Moore (2016), Scaling Relationships and Physics for Mixed Heating Convection in Planetary Interiors: Isoviscous Spherical Shells, *J. Geophys. Res. Solid Earth*, 121, 20 pages, doi:10.1002/2016JB013247
- Lenardic, A., Crowley, J.W., and A. M. Jellinek, **Weller, M. B.** (2016), The Solar System of Forking Paths: Bifurcations in Planetary Evolution and the Search for Life Bearing Planets in our Galaxy, *Astrobiology* 16(7), 9 pages, doi: 10.1089/ast.2015.1378
- O'Neill, C., Lenardic, A., **Weller, M.**, Moresi, L., and Quenette, S., & S. Zhang (2016), A window for plate tectonics in terrestrial planet evolution?, *Physics of the Earth and Planetary Interiors*, 255, 12, 13 pages, doi:10.1016/j.pepi.2016.04.002
- **Weller, M. B.**, Lenardic, A., and C. O'Neill (2015), The Effects of Internal Heating and Large Scale Climate Variations on Tectonic Bi-Stability in Terrestrial Planets, *Earth Planet. Sci. Lett.* 420, 10 pages, doi:10.1016/j.epsl.2015.03.021
- **Weller, M. B.** (2014), Basal Scarp, *Encyclopedia of Planetary Landforms*, edited by H. Hargitai and A. Kereszturi, Elsevier, Amsterdam, 6 pages
- **Weller, M. B.**, McGovern, P. J., Fournier, T. and J.K. Morgan (2014), Eastern Olympus Mons Basal Scarp and Aureole lobes: Structural Evidence for a Landslide, *J. Geophys. Res. Planets*, 119, 21 pages, doi:10.1002/2013JE004524

- **Weller, M. B.** and A. Lenardic (2012), Hysteresis in mantle convection: Plate tectonics systems, *Geophys. Res. Lett.*, 39, L10202, 5 pages, doi:10.1029/2012GL051232
- **Weller, M.B.** and T.G. Fisher (2009) Feasibility Study of Mapping Continuous Strandlines Along the Southeast Lake Agassiz Basin, *Journal of Maps*, v2009, 14 pages, doi:10.4113/jom.2009.1056

Mentoring and Teaching Experience

- Assisting in mentoring graduate students (Brown): Evan Bjonnes (PhD); Matthew Jones (PhD)
- Mentored undergraduate student Zel Hurewitz (UT Austin)
- Co-Advised a summer intern Katie Bell (LPI)
- Co-Advised undergraduate Graham Eldridge (Rice)
- Physics of Planetary Evolution (Brown University, 2020, **Guest lecturer**)
- Introduction to Geophysics (Western Washington University, 2020, **Guest lecturer**)
- Mineralogy Lecture Series, Geodynamics (Johns Hopkins University, 2018, **Guest lecturer**)
- Planetary Science (Northwestern University, 2017, **Guest lecturer**)
- Department Research Seminar (Rice University, Fall 2014, Spring 2015, **Co-organizer**)
- Putting Earth Science into Action (Rice University, Fall 2011, Spring 2012, **Teaching Assistant**)
- Putting Earth Science into Action (Rice University, Spring 2012, **Lecturer, four lectures**)
- Humans & Environment (Truckee Meadows Community College, Spring 2010, **Adjunct Faculty**)
- Introduction to Geology (University of Nevada, Reno, Fall 2008, **Teaching Assistant**)

Field Experience and Workshops

- Geology and Evolution of Turkey Field Course, Turkey 2015
- Summer Cooperative Institute for Dynamic Earth Research (CIDER), Santa Barbara CA 2014
- Subduction Zone and Andean Orogeny Field Course, Chile 2012
- Meteor Crater Field Course on Impact Processes, Barringer Meteor Crater, AZ 2011
- Meteor Crater Field Guide, Barringer Meteor Crater, AZ 2011
Kring, D. A., O. Abramov, M. G. Galenas, K. H. Joy, G. Y. Kramer, C. N. Mercer, A. L. Nahm, T. Niihara, T. Öhman, J. F. Rapp, A. J. Shaner, S. Simmons, **M. B. Weller**, and O. L. White (2011), Lunar Analogue Training at Meteor Crater, Arizona & the San Francisco Volcanic Field, AZ (Field trip guide), O. Abramov (editor), 113 p., Lunar and Planetary Institute contribution 1618, Houston, TX
- Sample Collection and Remote Sensing Ground Truth, Cuprite, NV 2010
- Mars Rover Science and Engineering Challenge, Hanksville, UT 2009
- Mars Rover Science and Engineering Challenge, Hanksville, UT 2008
- Extensional Faulting and Graben Mars Analog Field Course, Canyon Lands, UT 2008
- Volcanism, Faulting and Field Mapping Field Camp, Sardinia, Italy 2007
- Glaciology and Field Mapping, Lake Agassiz Strandlines, MN, ND, SD 2006

Academic Community Service

- Brown University, Planetary Workplace Climate Council Committee Member 2020 –
- Rice University, Geounion Film Outreach Producer 2011 – 2015
- Rice University, Geounion Departmental Liaison 2012 – 2013

- Rice University, Chief Planner and Organizer of Annual Crawfish Boil (1K + people) 2011 – 2014
- Rice University, Geounion President 2011 – 2012
- University of Nevada Reno, Science lead for the Universities Rover Challenge 2008 – 2009
- University of Toledo, Society of Physics Students Outreach Coordinator 2006 – 2007
- University of Toledo, Geological Society Student Chapter Fundraiser 2006 – 2007

Professional Service

- Session organizer and lead: Venus Science Today conference, 2020
- NASA ROSES Program (various): Panel Member/Reviewer, 2017 – Current
- NASA Postdoctoral Program: Panel Member/Reviewer, 2016 – Current
- American Geophysical Union Outstanding Student Paper Awards Judge, 2016 – Current
- Dwornik Award Judge: Lunar and Planetary Science Conferences, 2016 – Current
- Goldschmidt Conference Session: Geochemical and Geodynamical Constraints on the Origin and Evolution of Planetary Bodies, *Primary Convener and Chair*, 2018
- 48th annual Lunar and Planetary Science Conference (LPSC) *Program Committee Member*, 2017
- American Geophysical Union (AGU) Session: An integrated view of planetary bodies: insights from geochemistry, petrology, geophysics and modelling, *Primary Convener and Chair*, 2016
- American Geophysical Union (AGU) Session: From Core to Crust, the Evolution of Planetary Interiors, *Primary Convener and Chair*, 2014

Selected Invited Lectures and Presentations

- **Weller, M. B.**, (2021*), Title TBD, International Space Science Institute Venus Workshop, Bern, Switzerland (**Rescheduled*)
- **Weller, M. B.**, (2021), Tectonic regimes and regime changes for Venus, Decadal Survey Venus Panel | Venus Geodynamics session
- **Weller, M. B.**, (2020), Venus, Can We Judge a Book by its Cover?, Venus Science Today 2020 conference, NASA Goddard Institute for Space Studies
- **Weller, M. B.** (2020), Upside Down and Inside Out: Linking the Mantle, Tectonics, Atmosphere, and the Evolution of Terrestrial Planets, Western Washington University, Bellingham, WA
- **Weller, M. B.** (2020), Evolution in the Style of Mantle Convection on Venus: The Role of Coupling Between the Mantle, Lithosphere, and Atmosphere, EnVision Conference, Paris, FR
- **Weller, M. B.** (2019), A Story of Planetary Evolution and Bi-Stability: The Critical Dependence of Initial Conditions and Evolutionary Histories on Terrestrial Planets, Massachusetts Institute of Technology, Cambridge, MA
- **Weller, M. B.** (2019), The Upside Down: Dynamics and Transport Under Variable Lid States and Conditions, Interior of the Earth Gordon Research Conference, Mt. Holyoke, MA
- **Weller, M. B.** (2019), A Story of Planetary Evolution and Bi-Stability: The Critical Dependence of Initial Conditions and Evolutionary Histories on Terrestrial Planets, California Institute of Technology, Pasadena, CA
- **Weller, M. B.** (2019), A Story of Planetary Evolution and Bi-Stability: The Dependence of Initial Conditions and Specific Evolution on Terrestrial Planets, Academia Sinica, Taipei, Taiwan
- **Weller, M. B.** (2018), Cracking up: a geodynamics prospective on the deep interior, tectonic state, and planetary evolution over time, Johns Hopkins University, Baltimore, MD
- **Weller, M. B.** (2018), The relationship between the deep interior, tectonic state, surface, atmosphere, and habitability, University of Glasgow, Glasgow, UK

- **Weller, M. B.** (2018), Dynamics of Ice Shells Convection and Tectonics, University of Texas at Austin, Austin, TX
- **Weller, M. B.** (2018), Evolving Worlds: A Story of Planetary Evolution and Bi-Stability, University of Hong Kong, HK
- **Weller, M.B.** (2017), A New Framework for The Evolution of Terrestrial Planets: Bi-stability, Stochastic Effects, and the Non-Uniqueness of Tectonic States, Fall AGU, San Francisco, CA
- **Weller, M. B.** (2017), Evolving Worlds: A Story of Planetary Evolution and Bi-Stability, Geophysical Laboratory, Carnegie, Washington DC
- **Weller, M. B.** (2017), The Evolution of Worlds: Planetary Change and Bi-Stability, Utrecht University, Utrecht, Netherlands
- **Weller, M. B.** (2017), Bi-Stability and the Evolution of Planets, University of Connecticut, Storrs, CT
- **Weller, M. B.** (2017), A Story of Planetary Evolution and Bi-Stability: The Dependence of Initial Conditions and Specific Evolution on Terrestrial Planets, Northwestern University, Chicago, IL
- **Weller, M. B.** (2016), Planetary Evolution and Bi-Stability: The Dependence of Initial Conditions and Specific Evolution on Terrestrial Planets, University of Texas at Austin, Institute of Geophysics, Austin, TX
- **Weller, M. B.** (2016), Evolving Worlds: Models Constraining the Critical Dependence of Initial Conditions and Evolutionary Histories on Terrestrial Planets, Lunar and Planetary Institute, Houston, TX
- **Weller, M. B.** (2015), On the Evolution of Terrestrial Planets: Implications of Evolutionary Paths and Evolving Lid-States, Fall AGU, San Francisco, CA
- **Weller, M. B.** (2015), Evolving Lid-States, Bi-Stability, and the Evolution of Terrestrial Planets: Pathways and Divergences in Planetary Evolution, AGU Joint Assembly, Montreal, Canada
- **Weller, M. B.** (2015), Evolving Worlds: A Story of Planetary Evolution and Bi-Stability, Princeton University, Princeton, NJ

Selected Scientific Presentations and Abstracts

- **Weller, M. B.***, Kiefer, W. S., (2021) Punctuated Evolution of the Venusian Atmosphere from Mantle Outgassing, 52nd Lunar and Planetary Science Conference, abstract # 1555
- Kiefer, W. S., **Weller, M. B.**, (2021) Venus, Earth's Divergent Twin: Observations Constraining the Transition from a Mobile Lid Planet to a Stagnant Lid Planet, 52nd Lunar and Planetary Science Conference, abstract # 1792
- Parman, S.W., Evans, A.J., Alvarez, E.G. †, **Weller, M. B.**, Reinhard, C.T., Ibarra, D.E., Anzures, B.A., (2021) Assessing the Abundance of Super-Mercuries and Their Habitability, 52nd Lunar and Planetary Science Conference, abstract # 2477
- McGroarty, F.C. ‡, Duncan, M. S., **Weller, M. B.**, (2021) Modeling the Thermal and Chemical Evolution Of the Martian Lithosphere Through Time, 52nd Lunar and Planetary Science Conference, abstract # 2672
- **Weller, M. B.***, Evans, A. J., Ibarra, D. E., Johnson, A.V, Kukla T.J., (2021) Early (In)Habitability Among Exoplanets: A 1D Parameterized Approach Linking the Mantle-Tectonics-Atmospherics System, AAS Habitable Worlds 2021 workshop
- McGroarty, F.C. ‡, Duncan, M. S., **Weller, M. B.**, (2020) Evaluating the Thermal and Geochemical Evolution of Mars, American Geophysical Union, Fall Meeting
- **Weller, M. B.***, Duncan, M. S., Kiefer, W. S. (2020) Venus, Can We Judge a Book by its Cover?, Venus Science Today 2020 conference, NASA Goddard Institute for Space Studies

- **Weller, M. B.***, Evans, A. J., Ibarra, D. E., Johnson, A.V, Kukla T.J., (2020) Exploring the Evolution and Habitability of Planets: Coupling of the Mantle-Atmosphere System, 51st Lunar and Planetary Science Conference, abstract # 1509
- Parman, S.W., Evans, A.J., **Weller, M. B.**, Reinhard, C.T., Ibarra, D.E., First, E.C., Anzures, B.A., (2020) Abundance and Habitability of super-Mercuries, 51st Lunar and Planetary Science Conference, abstract # 1999
- McGroarty, F.C.‡, Duncan, M. S., **Weller, M. B.**, (2020) Thermal Evolution of the Martian Crust Through Time, 51st Lunar and Planetary Science Conference, abstract # 2928
- Jones, M. J.‡, Evans, A. J., Johnson, B. C., **Weller, M. B.**, Keane, J. T., Tikoo, S. M., (2020) An Impact Origin of the Lunar Procellarum KREEP Terrane, 51st Lunar and Planetary Science Conference, abstract # 1318
- Kiefer, W. S., **Weller, M. B.**, (2020) From Mobile Lid to Stagnant Lid Mantle Convection: Variations in Solar Luminosity, Climate Evolution, and the Temporal Variability in Tectonic Style on Venus, Exoplanets in our Backyard 2020, abstract # 2195
- **Weller, M. B.**, Kiefer, W. S., (2020) Evolution in the Style of Mantle Convection on Venus: The Role of Coupling Between the Mantle, Lithosphere, and Atmosphere, EnVision Conference, Paris, FR
- **Weller, M. B.***, Evans, A. J., Johnson, A.V., (2019) Exploring the evolution of the coupled mantle-atmosphere system: A 1D parameterized approach, American Geophysical Union, Fall Meeting
- Soderlund, K. M., **Weller, M. B.***, Fuchs, L., Becker, T. W., and Schmidt, B., (2019) Plastic Yielding and Tectonic Regimes in Thin Ice Shells: Effects of Latitudinal Surface Temperature Variations, American Geophysical Union, Fall Meeting
- **Weller, M.B.***, Wicks, J., (2019) On the Concept of Multi-Stable Tectonic States: The Un/Inevitability of Plate Tectonics, Extreme Solar Systems IV, Reykjavik, IS
- **Weller, M. B.***, Fuchs, L., Becker, T. W., Soderlund, K. M., (2019) Geodynamics of Icy Satellites: Effects of Latitudinal Surface Temperature Variations and Yielding in Thin Shells, 50th Lunar and Planetary Science Conference, abstract # 2792
- **Weller, M. B.***, Fuchs, L., Becker, T. W., Soderlund, K. M., (2018) Convection and Deformation in Thin Shells of Icy Satellites Affected by Surface Temperature Variations, American Geophysical Union, Fall Meeting
- **Weller M. B.***, Lenardic, A., Jellinek, M., Seales, J., Way, M., (2018) Venus' Early Potential for Habitability: Connecting Climate and Geologic Histories, Comparative Climatology III, Houston, TX.
- Duncan, M., **Weller, M.***, Wicks, J., Knezek, N., (2018) Mars: From Core to Mantle, Goldschmidt, Boston, MA
- **Weller, M. B.***, Lenardic, A., Jellinek, M., (2018) Life Potential on Early Venus Connected to Climate and Geologic History. 49th Lunar and Planetary Science Conference, abstract # 2808
- Duncan, M. S., Schmerr, N. C., **Weller, M. B.**, Bertka, C. M., Fei, Y., (2018) The Solidus of Mars: Melting the Insides of Our Next Door Neighbor. 49th Lunar and Planetary Science Conference, abstract # 2774
- **Weller, M. B.***, Fuchs, L., Becker, T. W., Soderlund, K. M., (2018) Towards Understanding Hemispheric variations in Enceladus' Ice Shell: Variable Surface Temperatures, Convection, and Yielding. 49th Lunar and Planetary Science Conference, abstract # 2336
- Jellinek, M., Lenardic, A., **Weller, M. B.**, (2017) How did Earth not end up as Venus? American Geophysical Union, Fall Meeting

- **Weller, M. B.***, Fuchs, L., Becker, T. W., Soderlund, K. M., (2017) Effects of Variable Surface Temperatures on the Dynamics of Convection within Enceladus' Ice Shell, American Geophysical Union, Fall Meeting
- **Weller, M. B.***, Lenardic, A., (2017) A New Framework For The Evolution of Terrestrial Planets: Bi-stability, Stochastic Effects, and the Non-Uniqueness of Tectonic States, American Geophysical Union, Fall Meeting [INVITED]
- **Weller, M. B.***, Lenardic, A., (2017) The energetics of evolving convective systems: Internal heating, mixing, and Earth's evolution, Goldschmidt, Paris, FR
- **Weller, M. B.***, Fuchs, L., Becker, T. W., Soderlund, K. M., (2017) Convection and Dichotomies within Enceladus' Ice Shell: Effects of Variable Surface Temperatures. 48th Lunar and Planetary Science Conference, abstract # 1676
- **Weller, M. B.***, Kiefer, W. S., (2017), Physics of Transitions in Global Tectonic Regimes: A New Paradigm for Venus? 48th Lunar and Planetary Science Conference, abstract # 1663
- Kiefer, W. S., **Weller, M. B.**, (2017), What Causes the Relationship Between Large Impact Basin rims and Volcanism on Mars? 48th Lunar and Planetary Science Conference, abstract # 1918
- Bell, K. L.†, Kiefer, W. S., **Weller, M. B.**, (2017), Thermal Support of the Devana Chasma Rift, Venus. 48th Lunar and Planetary Science Conference, abstract # 1400
- Duncan, M. S., **Weller, M. B.**, (2017) Determining Planetary Tectonic State Through Time Using Observations of the Terrestrial Planets, Planetary Science Vision 2050 Workshop, abstract # 8222
- Kiefer, W. S., **Weller, M. B.**, (2016), What Causes the Relationship Between Large Impact Basin Rims and Volcanism on Mars? American Geophysical Union, Fall Meeting
- Lenardic, A., **Weller, M. B.***, Jellinek, M., (2016) Coupled Tectonic and Climatic Shifts in Planetary Evolution, American Geophysical Union, Fall Meeting
- **Weller, M. B.***, Lenardic, A., (2016) The Energetics of Mixed-Mode Heating in Convective Systems: Internal Heating Rates, Plate Speeds, and Implications For the Earth's Thermal Evolution, American Geophysical Union, Fall Meeting
- **Weller, M. B.***, (2016) The Thermal Evolution of Mars and Mars-Type Planets: Geodynamic and Geochemical Potential for Early Mobility, 47th Lunar and Planetary Science Conference, abstract # 2666
- **Weller, M. B.***, Lenardic, A., (2016) Venus and Earth: Is the Divergence a (Natural) Consequence of Planetary Evolution?, International Venus Conference , Oxford, UK
- **Weller, M. B.***, Lenardic, A., (2015) On the Evolution of Terrestrial Planets: Implications of Evolutionary Paths and Evolving Lid-States, American Geophysical Union, Fall Meeting [INVITED]
- **Weller, M. B.***, Duncan, M. S., (2015) Can Mantle Potential Temperatures be Used to Infer the Tectonic Evolution of Terrestrial Planets?, American Geophysical Union, Fall Meeting
- Jellinek, M., Jackson, M., Lenardic, A., **Weller, M.**, (2015) How do Early Impacts Modulate the Tectonic, Magnetic and Climatic Evolutions of Terrestrial Planets? American Geophysical Union, Fall Meeting
- **Weller, M. B.***, Lenardic, A., (2015) On Evolving Lid-States, Bi-Stability, and the Evolution of Terrestrial Planets: Pathways and Divergences in Planetary Evolution, 14th International Workshop on Modeling of Mantle and Lithosphere Dynamics, Olerons, FR
- **Weller, M. B.***, Lenardic, A., (2015) Mantle Mixing and Evolving Lid States: An Optimal Phase?, Goldschmidt, Prague, CZ
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