



## Making a Habitable Planet

June 18 - 23, 2017

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### Chair

Edwin A. Bergin

### Vice Chair

Larry R. Nittler

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### Mount Holyoke College

50 College Street

South Hadley, MA, US

### Conference Description

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The Gordon Conference on Origins of Solar Systems brings together a diverse group of scientists to discuss research at the frontier of understanding how planets and planetary systems form. Invited speakers from the fields of astronomy, astrophysics, cosmochemistry, planetary science, and geochemistry will present their latest findings. At this meeting discussions will take place with a focus on how the Earth and its analogs received their inventory of volatile compounds that provide the basis for a habitable world. Particular topics of discussion include the following. How new astronomical facilities, such as the Atacama Large Millimeter Array and infrared imaging systems, are transforming our knowledge of the evolution of gas and dust in protoplanetary disks and debris systems. How planetary building blocks are assembled and whether volatiles implanted during early phases survive inside their interior. Exploring the fate of volatiles supplied to a young terrestrial planet during the epoch of impacts and core formation. How the architecture of a solar system influences planetary assembly and volatile supply. What constraints meteorites and solar system bodies provide on the chemical and physical evolution during the phase of planet formation. Within this framework we will also discuss the growing knowledge of the exoplanet inventory with emphasis on what they might tell us about their formation and subsequent evolution.

### Related Meeting

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This GRC will be held in conjunction with the "Origins of Solar Systems (GRS)" Gordon Research Seminar (GRS). Those interested in attending both meetings must submit an application for the GRS in addition to an application for the GRC. Refer to the [associated GRS program page](#) for more information.

## Conference Program

Sunday	
2:00 pm - 9:00 pm	Arrival and Check-in
6:00 pm - 7:00 pm	Dinner
7:30 pm - 7:40 pm	Introductory Comments by GRC Site Staff / Welcome from the GRC Chair
7:40 pm - 9:30 pm	<b>Tracing Initial Conditions of the Solar System and in Interstellar Space</b> Discussion Leader: <b>Stefanie Milam</b> (Goddard Space Flight Center, NASA, USA)
7:40 pm - 7:50 pm	Introduction by Discussion Leader
7:50 pm - 8:25 pm	<b>Andrew Davis</b> (The University of Chicago, USA) "Cosmochemical Constraints on the Early Solar System"
8:25 pm - 8:40 pm	Discussion
8:40 pm - 9:15 pm	<b>Alycia Weinberger</b> (Carnegie Institution of Washington, USA) "Astronomical Constraints on Planet Formation"
9:15 pm - 9:30 pm	Discussion
Monday	
7:30 am - 8:30 am	Breakfast
8:30 am - 9:00 am	Group Photo
9:00 am - 12:30 pm	<b>Volatiles in Protoplanetary Disks</b> Discussion Leader: <b>Joel Kastner</b> (Rochester Institute of Technology, USA)
9:00 am - 9:15 am	Introduction by Discussion Leader

9:15 am - 9:50 am	<b>Lauren Cleeves</b> (Harvard-Smithsonian Center for Astrophysics, USA) "Recent Advances with ALMA on the Formation and Evolutionary History of Volatiles in Protoplanetary Disks"
9:50 am - 10:10 am	Discussion
10:10 am - 10:40 am	Coffee Break
10:40 am - 11:15 am	<b>Bernard Marty</b> (Centre de Recherches Pétrographiques et Géochimiques (CRPG), CNRS, France) "Volatile Composition of Protoplanetary Disks: the Stable Isotope Perspective"
11:15 am - 11:35 am	Discussion
11:35 am - 12:10 pm	<b>Nami Sakai</b> (RIKEN, Japan) "Chemical Diversity in Protostellar Disks and Its Future"
12:10 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
3:00 pm - 4:00 pm	<b>Power Hour</b> <i>The GRC Power Hour is an optional informal gathering open to all meeting participants. It is designed to help address the challenges women face in science and support the professional growth of women in our communities by providing an open forum for discussion and mentoring.</i> Organizers: <b>Alycia Weinberger</b> (Carnegie Institution of Washington, USA) and <b>Hilke Schlichting</b> (University of California, Los Angeles / Massachusetts Institute of Technology, USA)
4:00 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>Volatile Survival in Parent Bodies and Planets</b> Discussion Leader: <b>Conel Alexander</b> (Carnegie Institution of Washington, USA)
7:30 pm - 7:40 pm	Introduction by Discussion Leader

7:40 pm - 8:15 pm	<b>Gregor Golabek</b> (Bayerisches Geoinstitut, Germany) "Magma Dynamics and Devolatilization of Planetesimals During Planet Formation"
8:15 pm - 8:35 pm	Discussion
8:35 pm - 9:10 pm	<b>Hilke Schlichting</b> (University of California, Los Angeles / Massachusetts Institute of Technology, USA) "Volatile Delivery and Atmospheric Erosion by Impacts During Planet Formation"
9:10 pm - 9:30 pm	Discussion
<b>Tuesday</b>	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>From Pebbles to Planetesimals</b> Discussion Leader: <b>Anders Johansen</b> (Lund Observatory, Sweden)
9:00 am - 9:15 am	Introduction by Discussion Leader
9:15 am - 9:50 am	<b>Alessandro Morbidelli</b> (CNRS, France) "Pebble-Accretion and Jupiter-Barrier: The Basic Recipes for the Solar System"
9:50 am - 10:10 am	Discussion
10:10 am - 10:40 am	Coffee Break
10:40 am - 11:15 am	<b>Paola Pinilla</b> (Steward Observatory, University of Arizona, USA) "Linking Models of Dust Evolution with Multi-Wavelength Observations of Protoplanetary Disks"
11:15 am - 11:35 am	Discussion
11:35 am - 12:10 pm	<b>Ghyslaine Quitte</b> (IRAP-OMP, CNRS, France) "Timescales from Pebbles to Planetesimals in the Protoplanetary Disk"
12:10 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch

1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>Solar System Architecture and Volatile Supply</b> Discussion Leader: <b>Karen Meech</b> (University of Hawaii, USA)
7:30 pm - 7:40 pm	Introduction by Discussion Leader
7:40 pm - 8:15 pm	<b>Yann Alibert</b> (University of Bern, Switzerland) "Planet Formation, Water Delivery and Habitability"
8:15 pm - 8:35 pm	Discussion
8:35 pm - 9:10 pm	<b>Scott Gaudi</b> (Ohio State University, USA) "Constraining the Architectures of Planetary Systems Beyond the Snow Line"
9:10 pm - 9:30 pm	Discussion

## Wednesday

7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>The Composition of Exoplanets and Exoplanetary Materials</b> Discussion Leader: <b>Denton Ebel</b> (American Museum of Natural History, USA)
9:00 am - 9:15 am	Introduction by Discussion Leader
9:15 am - 9:50 am	<b>Caroline Moreley</b> (Harvard University, USA) "Using Spectra to Shed Light on Exoplanet Compositions"
9:50 am - 10:10 am	Discussion
10:10 am - 10:40 am	Coffee Break
10:40 am - 11:15 am	<b>Leslie Rogers</b> (University of Chicago, USA) "Glimpsing the Distribution of Exoplanet Bulk Compositions"
11:15 am - 11:35 am	Discussion

11:35 am - 12:10 pm	<b>Siyi Xu</b> (European Southern Observatory, Germany) "Compositions of Exoplanetary Materials from Polluted White Dwarf Studies"
12:10 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:00 pm - 7:30 pm	<b>Business Meeting</b> <i>Nominations for the Next Vice Chair; Fill in Conference Evaluation Forms; Discuss Future Site and Scheduling Preferences; Election of the Next Vice Chair</i>
7:30 pm - 9:30 pm	<b>Planet Formation in Action</b> Discussion Leader: <b>David Wilner</b> (Smithsonian Astrophysical Observatory, USA)
7:30 pm - 7:40 pm	Introduction by Discussion Leader
7:40 pm - 8:15 pm	<b>Carsten Dominik</b> (University of Amsterdam, The Netherlands) "The Structure of Planet-Forming Disks"
8:15 pm - 8:35 pm	Discussion
8:35 pm - 9:10 pm	<b>Mark Wyatt</b> (University of Cambridge, United Kingdom) "The Evolution of Dust and Gas in Debris Disk Systems"
9:10 pm - 9:30 pm	Discussion
<b>Thursday</b>	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Geophysics and Geochemistry of a Young Earth</b> Discussion Leader: <b>Marc Hirschmann</b> (University of Minnesota, USA)

9:00 am - 9:15 am	Introduction by Discussion Leader
9:15 am - 9:50 am	<b>Brad Foley</b> (Pennsylvania State University, USA) "Controls on the Tectonic Evolution of Terrestrial Planets"
9:50 am - 10:10 am	Discussion
10:10 am - 10:40 am	Coffee Break
10:40 am - 11:15 am	<b>Zoe Leinhardt</b> (University of Bristol, United Kingdom) "Compositional Changes to Embryos and Planets Due to Collisions"
11:15 am - 11:35 am	Discussion
11:35 am - 12:10 pm	<b>Frederic Moynier</b> (Institut de Physique du Globe de Paris, France) "Late Accretion History of the Terrestrial Planets"
12:10 pm - 12:30 pm	Discussion
12:30 pm - 1:30 pm	Lunch
1:30 pm - 4:00 pm	Free Time
4:00 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>The Solar System Record</b> Discussion Leader: <b>Cecile Engrand</b> (Centre de Sciences Nucléaires et de Sciences de la Matière (CSNSM), France)
7:30 pm - 7:40 pm	Introduction by Discussion Leader
7:40 pm - 8:15 pm	<b>Jessica Barnes</b> (Johnson Space Center, NASA, USA) "History and Evolution of Lunar Volatiles"
8:15 pm - 8:35 pm	Discussion
8:35 pm - 9:10 pm	<b>Dale Cruikshank</b> (Ames Research Center, NASA, USA) "The Chemistry of Pluto and Its Satellites"
9:10 pm - 9:30 pm	Discussion

**Friday**

7:30 am - 8:30 am	Breakfast
9:00 am	Departure

**Contributors**

 <p><b>Gordon Research Conferences</b></p>	 <p><b>Carl Storm Underrepresented Minority Fellowship</b></p>	