



---

## Hydrogen-Metals Interactions: Making the Hydrogen Economy Work - New Developments and Recent Applications

July 16 - 21, 2017

---

### Chairs

Jacques Huot and Bernard Dam

### Vice Chairs

Ned T. Stetson and Michael Hirscher

---

### Stonehill College

320 Washington Street

Easton, MA, US

### Conference Description

---

Since 1981, the "Hydrogen-Metal Systems" conference aim has been to give an opportunity for researchers and students to be exposed to the latest developments in all aspects of metal-hydrogen interactions. The openness and format of the conference makes it an ideal environment for exchange of ideas and establishment of collaborations. All talks are invited but all attendees are welcome to submit a poster. All presentations including the ensuing discussions are considered as private, with the restriction that the given information is not for public use. As there are no parallel sessions, attendees will attend every invited talk. The attendees are invited to present posters on novel and unpublished results in order to stimulate discussions during the evening sessions. A limited number of poster presenters will have the option of presenting a short oral summary of their poster before their respective session. Free afternoons are ideal periods for networking, group discussions, and informal one-on-one interactions. This is a good opportunity for young researchers and students to meet and speak to experts in the field of metal-hydrogen interactions. The 2017 Conference on Hydrogen-Metal Systems will focus on "Fundamental aspects of hydrogen interaction with materials and novel energy applications", addressing the research topics noted in the sessions below.

### Related Meeting

---



This GRC will be held in conjunction with the "Hydrogen-Metal 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>The Role of Hydrogen in Superconductivity: Theory and Experimentation</b> Discussion Leader: <b>Mikhail Eremets</b> (Max Planck Institute for Chemistry, Germany)
7:40 pm - 8:20 pm	<b>Viktor Struzhkin</b> (Carnegie Institution of Washington, USA) "Putting Pressure on Metals to Make Unconventional Hydrides"
8:20 pm - 8:35 pm	Discussion
8:35 pm - 9:15 pm	<b>Yanming Ma</b> (Jilin University, China) "Hydrogen-Rich Metal Hydrides Stabilized at High Pressures: Enroute to Room-Temperature Superconductivity"
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>Advanced Computational Methods</b> Discussion Leader: <b>Joerg Neugebauer</b> (Max Planck Institute for Iron Research, Germany)

9:00 am - 9:40 am	<b>Brandon Wood</b> (Lawrence Livermore National Laboratory, USA) "Complex Dynamics in Metal Borohydrides: From Hydrogen Storage to Solid-State Batteries"
9:40 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:10 am	<b>Jean-Marc Joubert</b> (Institut de Chimie et des Matériaux Paris-Est (ICMPE), France) "Thermodynamic Modeling of Metal-Hydrogen Systems"
11:10 am - 11:30 am	Discussion
11:30 am - 12:10 pm	<b>Heine Hansen</b> (Technical University of Denmark, Denmark) "Materials Optimization Using Advanced Computational Methods"
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> Organizer: <b>Astrid Pundt</b> (University of Goettingen, Germany)
4:00 pm - 6:00 pm	<b>Poster Session</b>
6:00 pm - 7:00 pm	Dinner
7:30 pm - 9:30 pm	<b>Selected Poster Presentations</b> Discussion Leader: <b>Etsuo Akiba</b> (Kyushu University, Japan)
7:30 pm - 7:40 pm	<b>Rafael Balderas-Xicohtencatl</b> (Max Planck Institute for Intelligent Systems, Germany) "Solid-Like High-Density Hydrogen Layer Formation at Low Temperatures in Mesoporous Materials"

7:40 pm - 7:45 pm	Discussion
7:45 pm - 7:55 pm	<b>Viney Dixit</b> (Université du Québec à Trois-Rivières, Canada) "Effect of Zr and Zr <sub>7</sub> Ni <sub>10</sub> on Hydrogenation Kinetics of Ti-V-Cr System"
7:55 pm - 8:00 pm	Discussion
8:00 pm - 8:10 pm	<b>Masanori Fujinami</b> (Chiba University, Japan) "The Crucial Defects Induced in Alpha-Iron and Stainless Steel on Hydrogen Embrittlement by Positron Annihilation Spectroscopy"
8:10 pm - 8:15 pm	Discussion
8:15 pm - 8:25 pm	<b>Angelina Gigante</b> (University of Geneva, Switzerland) "A Cheap Approach to the Synthesis of Borohydride Clusters for Electrolyte Applications"
8:25 pm - 8:30 pm	Discussion
8:30 pm - 8:40 pm	<b>Magnus Hamm</b> (University of Goettingen, Germany) "Grain Boundary Diffusion Measurements in the Magnesium-Hydrogen System"
8:40 pm - 8:45 pm	Discussion
8:45 pm - 8:55 pm	<b>Chen-Wei Liu</b> (National Dong Hwa University, Taiwan) "Copper Hydrides: Synthetic Advances, Structural Diversity, and Nanocluster-to-Nanoparticle Conversion Exchange in Porous Magnesium Borohydride"
8:55 pm - 9:00 pm	Discussion
9:00 pm - 9:10 pm	<b>Patrick Ward</b> (Savannah River National Laboratory, USA) "Thermal Energy Storage in Calcium Aluminum"
9:10 pm - 9:15 pm	Discussion
9:15 pm - 9:25 pm	<b>Nicholas Weadock</b> (California Institute of Technology, USA) "High Capacity Vanadium-Based Metal Hydride Electrodes for MH-Air and MH/Ni Batteries"
9:25 pm - 9:30 pm	Discussion

## Tuesday

7:30 am - 8:30 am Breakfast

9:00 am - 12:30 pm **Borohydrides for Batteries**  
Discussion Leader: **Didier Blanchard** (Technical University of Denmark, Denmark)

9:00 am - 9:40 am **Petra De Jongh** (Utrecht University, The Netherlands)  
"Exploring Supported Light Metal Hydrides as Catalysts"

9:40 am - 10:00 am Discussion

10:00 am - 10:30 am Coffee Break

10:30 am - 11:10 am **Wan Si Tang** (University of Maryland / National Institute of Standards and Technology, USA)  
"Characterizing Alkali Complex Anionic-Clusters with Fast-Ion Conduction"

11:10 am - 11:30 am Discussion

11:30 am - 12:10 pm **Eric Majzoub** (University of Missouri-St. Louis, USA)  
"Functionalized Nanoporous Carbon Frameworks for Hydrogen Storage and Electrochemical Applications"

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 **Poster Session**

6:00 pm - 7:00 pm Dinner

7:30 pm - 9:30 pm **Development of Characterization Techniques**  
Discussion Leader: **Mark Conradi** (ABQMR, USA)

7:30 pm - 8:10 pm **Anibal Ramirez-Cuesta** (Oak Ridge National Laboratory, USA)  
"Studying the Dynamics of Hydrogen with VISION and VirtuES"

8:10 pm - 8:30 pm Discussion

8:30 pm - 9:10 pm	<b>Katsuyuki Fukutani</b> (University of Tokyo, Japan) "Absorption and Desorption of Hydrogen in Pd and PdAu Investigated by Nuclear Reaction Analysis Combined with Thermal Desorption Spectroscopy"
9:10 pm - 9:30 pm	Discussion
<b>Wednesday</b>	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Action of Catalysts in Hydrogenation Reactions</b> Discussion Leader: <b>Hans Geerlings</b> (Shell Global Solutions International B.V., The Netherlands)
9:00 am - 9:40 am	<b>Tom Autrey</b> (Pacific Northwest National Laboratory, USA) "Accelerating Rates and Controlling Reaction Pathways in the H <sub>2</sub> Release from Complex Hydrides"
9:40 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:10 am	<b>Ping Chen</b> ( Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China) "The Role of Alkali and Alkaline Earth Hydrides in Catalytic Ammonia Synthesis and Decomposition"
11:10 am - 11:30 am	Discussion
11:30 am - 12:10 pm	<b>Andreas Züttel</b> (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland) "Hydrogen Storage on Carbon"
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>Basic Features of Hydrogen Embrittlement and Permeation</b> Discussion Leader: <b>Ryan Sills</b> (Sandia National Laboratories, USA)
7:30 pm - 8:10 pm	<b>Dierk Raabe</b> (Max Planck Institute for Iron Research, Germany) "Seeing Hydrogen"
8:10 pm - 8:30 pm	Discussion
8:30 pm - 9:10 pm	<b>Andreas Goldbach</b> (Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China) "Pd Alloy Membranes - Recent Trends, Systematic Correlations and Operation Ranges"
9:10 pm - 9:30 pm	Discussion
<b>Thursday</b>	
7:30 am - 8:30 am	Breakfast
9:00 am - 12:30 pm	<b>Hydrogen Mobility</b> Discussion Leader: <b>Andreas Borgschulte</b> (Swiss Federal Laboratories for Materials Science and Technology, Switzerland)
9:00 am - 9:40 am	<b>Genki Kobayashi</b> (Institute for Molecular Science, Japan) "Study on Hydride Ion Conductive Oxyhydrides"
9:40 am - 10:00 am	Discussion
10:00 am - 10:30 am	Coffee Break
10:30 am - 11:10 am	<b>Robert Kolasinski</b> (Sandia National Laboratories, USA) "Direct Detection of Chemisorbed Hydrogen on Metal Hydride Surfaces Using Low Energy Ion Scattering"
11:10 am - 11:30 am	Discussion

11:30 am - 12:10 pm	<b>Chiara Milanese</b> (University of Pavia, Italy) "Exploring H and Li Dynamics and Hydrogen Absorption Mechanism in Lithium Fullerides"
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>Industrial Aspects of Metal Hydrides</b> Discussion Leader: <b>Andreas Züttel</b> (Ecole Polytechnique Federale de Lausanne (EPFL), Switzerland)
7:30 pm - 8:10 pm	<b>Thomas Klassen</b> (Helmut Schmidt University / Helmholtz-Zentrum Geesthacht, Germany) "Light Metal Hydrides: From Basic Science Towards Application"
8:10 pm - 8:30 pm	Discussion
8:30 pm - 9:10 pm	<b>Katsuhiko Hirose</b> (Kyushu University, Japan) "Hydrogen, Potential for Energy Transition Toward the Sustainable Society Industrial Approach"
9:10 pm - 9:30 pm	Discussion
<b>Friday</b>	
7:30 am - 8:30 am	Breakfast
9:00 am	Departure

## Contributors
