



Preface

The International Symposium on Metal-Hydrogen Systems (MH2010) for the first time in the history of these Symposia, was held in Moscow, Russia. It was organised by the oldest university in the country – Lomonosov Moscow State University – and took place from July 19 to 23, 2010.

This was the twelfth Symposium of a biannual series that started in 1988. Eleven countries have hosted the earlier Symposia: Germany (Stuttgart, 1988); Canada (Banff, 1990); Sweden (Uppsala, 1992); Japan (Fujiyoshida, 1994); Switzerland (Les Diablerets, 1996); China (Hangzhou, 1998); Australia (Noosa, 2000); France (Annecy, 2002); Poland (Krakow, 2004); USA (Hawaii, 2006), and Iceland (Reykjavik, 2008). The MH Systems Symposia originated from the merger of two earlier series of conferences, the Hydrogen in Metals Symposia (first held in Germany in 1968) and the International Symposia on Hydrides for Energy Storage (first held in Norway in 1977).

The International Symposia on Metal-Hydrogen Systems are among the most representative forums for scientists, engineers, doctoral students and postdoctoral researchers from all over the world who devote their work to the physics, chemistry and applications of metal hydrides.

The program of the MH2010 Symposium included 3 plenary, 24 invited and keynote lectures, and 80 oral and 179 poster presentations. World experts, scientists and young researchers presented their latest scientific developments on various fundamental and applied topics in the following Symposium areas:

- Thermodynamics and phase diagrams
- Crystal structure and hydrogen induced transformations
- Diffusion, tunnelling, trapping and transport of hydrogen
- Surface and phase effects
- Catalysis and kinetics of reactions
- Electric, optical and magnetic properties of hydrides
- New materials – prediction, design and synthesis
- Hydrogen storage and properties of hydrides
- Hydrogen storage and properties of amorphous, porous, composite and nanomaterials
- Storage of hydrogen at high pressures
- Application in batteries and fuel cells
- Electric, optical and magnetic applications
- Separation and membrane applications
- Hydrogen treatment of materials

MH2010 was attended by 289 registered participants from 35 countries with the biggest delegations coming from Japan – 59, Russia – 38 and France – 26. We were happy to see, for the first time, a large attendance from the Russian scientific community, and we enjoyed the active contribution from many young scientists and their interactions with experienced colleagues.

Among the other 32 countries, the following participation took place: Germany – 17, Italy – 15, Poland – 14, China – 12, The Netherlands – 12, USA – 12, Norway – 9, Israel – 8, Switzerland – 7, United Kingdom – 7, Ukraine – 5, Australia – 4, Spain – 4, Sweden – 4, Brazil – 3, Canada – 3, Denmark – 3, Slovenia – 3, Turkey – 3, Argentina – 2, Costa Rica – 2, Greece – 2, Serbia – 2, Singapore – 2 and South Africa – 2. Individual participants represented Armenia, Austria, Bulgaria, Czech Republic, Hungary, India and Taiwan.

This volume of the Proceedings includes 84 papers presented at the Symposium, which cover all main topics of the Conference. A considerable fraction of the presentations was devoted to comprehensive investigations of the synthesis and properties of light-metal and complex hydrides, as well as nanostructured hydrides. The more fundamental research presentations focused on the search for novel metal-hydride materials, high-pressure studies, and the characterisation of the crystal structures and magnetic properties of hydrides. These fundamental studies were directed mostly toward assisting in the development of practical applications for hydrides in different fields of the hydrogen economy, with a primary emphasis on hydrogen storage for vehicular applications.

The MH2010 Symposium was preceded by a Summer School, “Materials for the Hydrogen Society” (Chairpersons: V.V. Kveder, V.E. Antonov and V.A. Yartys), organised for the young researchers. The School was hosted by the Institute of Solid State Physics RAS in the Research Centre of the Russian Academy of Sciences in Chernogolovka, a small town near Moscow, from July 14th to July 18th, 2010. The lectures were given by leading researchers in the field of metal-hydride systems and provided the 30 attending students, postgraduates and young scientists coming from 13 countries a unique opportunity to communicate and benefit from the discussions on the topics of their research.

The organisers sincerely hope that all participants enjoyed visiting Moscow and Russia, despite the terrible wave of heat, which lasted for the entire event and even beyond it.



The Editors are thankful to the members of the International Steering Committee for their helpful advice in planning the Symposium and for their valuable assistance with timely, positive and highly professional refereeing of the manuscripts. We would also like to thank all the reviewers who devoted their time and efforts aiding with the assessment and improvement of the papers.

We are looking forward to the next meeting to be held in October 2012, which will be hosted by Japan. Let us meet again at the MH2012 in Kyoto!

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