

On the Highlights of the 4th International Conference on Superconductivity and Magnetism-ICSM2014, Antalya, Turkey

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1 Preface

The 4th Edition of International Conference on Superconductivity and Magnetism-ICSM2014 was held at Kervansaray Lara Hotel and Convention Center in Antalya, at the very heart of touristic and historical places between 27th April and 2nd May, 2014. The 1st edition of the ICSM was held in 2008 in a small town called Side, about 70 km away in the southern part of greater city—Antalya. The second ICSM was held at the city center of Antalya; Porto Bello Hotel was the venue in 2010. The 3rd one (previous), ICSM2012 was held in Istanbul.

ICSM has become a large conference with over thousand contributions from internationally recognized reputable research institutions from over 65 countries. With these values, ICSM has grown to be the largest gathering with a truly international level as one of the most prominent conferences on superconductivity and magnetism with focusing on fundamental matters of interest in materials and applications together with the interplay of superconductivity and magnetism and the new addition of enabling technologies based on “cryogenics and engineering materials & applications”.

The wide range of ICSM2014 topics varies from fundamentals, materials to applications. Cryogenics materials and engineering aspects were included in the topics and attracted many worldwide scientists. Over 1200 abstracts were

submitted to the database of the conference, and 1050 of them were accepted for presentation at the conference and 947 were presented. Oral presentations were given in nine parallel symposia/sessions. The conference is a well-attended one with around 1200 participants being as 935 delegates, 50 organizers and over 200 companions. ICSM has become a prestigious platform for international scientific, engineering and associated technological communities together with the international R&D Research Companies and Suppliers.

The excellent success of the conference relies on the major contributions both in the organization of fully focused sessions and in the scientific issues and debates. We, as all organizers, are therefore most grateful to the worldwide community of superconductivity and magnetism. The program committee consisted of all focused session chairs/moderators/organizers as similarly to the past conferences in the series, who participated actively for the selection of works presented at the conference. The program composed of eight plenary and eight half-plenary talks (given in Tables 1 and 2), 217 invited talks, 230 selected talks and 500 poster presentations. As organizers, we really appreciate to the efforts of all delegates for their cutting edge research works and to the session chairs for the selection of the high level presentations within harmony of the sessions.

The conference started on Sunday, 27th April, with the official opening ceremony with the participation of Deputy Governor of Antalya, Mr. Recep Yüksel; Executive Member of Higher Education Council, Prof. Dr. Durmuş Günay; Nobel Laureate Prof. Dr. Alex Mueller; Dr. Arnaud Devred Director of Superconductivity Division at ITER project gave opening plenary talks. Professor Dr. Annette Bussmann-Holder gave an overview talk on the major

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Table 1 Plenary Talks presented at ICSM 2014

Presenter	Title
Karl Alex Müller Nobel Laureate, 1987, Univ. of Zurich, Switzerland	Over Half a Century of Research in Oxides
Arnaud Devred ITER, France	ITER: The Way to Fusion Energy
Börje Johansson Appl. Mat. Physics, Sweden	Structural and Electronic Relationships between the Lanthanide and Actinide Elements
Yuh Shiohara SRL-ISTEC, Japan	Basic Materials Research Challenges for Medical Applications of HTS and R&D of 3 G Coated Conductors
Bartłomiej A. Glowacki University of Cambridge, UK	Hydrogen Cryomagnetism
Wolfgang Wernsdorfer Institut Neel, CNRS, France	Reading Quantum States of Single Spins
Bernhard Holzapfel KIT, Germany	Fe-Based Superconducting Thin Films: Basic Properties and Potential Applications
Brian Maple University of California, USA	Materials Trends in Different Classes of Superconductors from Heavy Fermion Compounds to Iron Pnictides and Beyond

contributions from Prof. Dr. Alex Mueller and Prof. Dr. Vladimir Kresin.

The program committee preferred to arrange the opening with the fundamentals of Research in Oxides with Prof. Dr. Alex Mueller, then continued with Dr. Arnaud Devred to remark the large scale applications of superconductors in the biggest fusion energy project ITER. The presentations at the

opening ceremony have been posted at <https://vimeo.com/album/3150464> at a password-protected site, please contact to Dr. Mustafa Akdoğan at info@supermag.com.tr for a full view.

As a custom with all ICSM conferences, we have had a school program prior to the conference between 21st and 26th of April 2014 at the same venue, and 30 internationally

Table 2 Half-Plenary Talks at ICSM 2014

Presenter	Title
Maria Vallet-Regi Universidad Complutense de Madrid, Spain	Biomaterials Design: from Macro to Nano
Paul C. Canfield Iowa State University and Ames Laboratory, USA	Fe-based Superconductors: What We Hope We've Learned and Where We Hope We Are Going
Anthony Bollinger Brookhaven National Laboratory, USA	Atomic Layer Engineering and Physics of Cuprate Superconductors
Antonio H. Castro Neto Graphene Research Center, Singapore	Two Dimensional Crystals: Superconductivity, Magnetism and Applications
Ronny Stolz Institute of Photonic Technology, Germany	The Aspects of Electronic Applications of Superconductors
Tae Won Noh Seoul National Univ., South Korea	Optical Investigations on Novel Spin Phenomena in Transition-Metal-Oxides
Wai-Kwong Kwok Argonne National Laboratory, USA	Vortex Pinning in High Performance, High Temperature Superconductors
Bilal Tanatar Bilkent University, Turkey	Interplay of Disorder and Binding Energy for Two-Dimensional Unitary Fermi Gas

selected students have attended the intensive courses. We are grateful to Prof. Dr. Ibrahim Belenli for the very effective coordination of the lectures and the school program. It has been a good opportunity to exchange the advancements with their pioneers in their specialized fields for their careers.

Around 230 papers were submitted for the special issue of the proceedings, and 171 were accepted after reviewing to be included in the special issue. These papers were roughly classified into fundamentals, materials and applications for both superconductivity, magnetism and their interplay. We appreciate the active support from the publishing editors and the journal's staff. Some of the papers were transferred to SpringerPlus open access journal, as all the papers were impossible to fit into the same issue. We are confident that the booming research and highlights of the conference have been included in the special issue as a good reflection. We express our special thanks to Prof. Vladimir Kresin and Prof. Stuart Wolf. We are also most grateful to the plenary and half-plenary speakers for their invaluable contributions, without their active involvement and support, this conference could have been a real success.

The organizing committee and international advisory board members appreciate the efforts of all invited speakers, reviewers and the authors with contributions. I would like to extend my sincere thanks to Prof. Mehmet Ali Aksan and Dr. Ali Bozbey for the very hard work for both conference layout and the efforts in the review process. We also thank to the financial committee for the successful budget management.

For the logistics of the conference, we are very happy to cooperate with Professors Yıldırım Aydoğdu, Ekrem Yanmaz, Dr. Ahmet Kılıç, Dr. Hakan Güngüneş, Dr. Haluk Koralay, Dr. Serap Safran, Dr. Özlem Çiçek, Dr. Şükrü Çavdar, Dr. Hakan Yetiş, Dr. Mustafa Akdoğan, Dr. Hasan Ağıl, Mr. Barış Güner, Ms. Duygu Gökdaı, Mrs. Ebru Şimşek, Mr. Ercan Ertekin, Ms. Esra Baydilli, Mr. Fırat Karaboğa, Mr. Mustafa Eren Çelik, Mr. Gökhan Kılıç, Ms. Merve Tuğçe İncel, Mr. Musa Sevinçhan, Mr. Özkur Kuran, Mr. Reza Gjarenagh, Mr. Salih Gençer, Mr. Utkan Alp, Mr. Yiğitcan Uzun, Mr. Hamit Öztürk, Ms. Meryem Alp, Mrs. Zeliha Ertekin, Mr. Sasan Razmkhah, and Mr. Zafer Çetin.

The immensely rich and diverse program composed of special sessions and regular sessions. The special sessions are all focused on the specific subject with an organizer in charge (names given in the parenthesis), while regular sessions have broader range of subjects.

- Strongly Correlated Electrons/Systems (Tuson Park, Sungkyunkwona University/South Korea)

- First Principles Magnetism (Matt Probert, University of York/UK)
- Functional Oxide Thin Films (Chang Uk Jung, Hankuk University of Foreign Studies/South Korea)
- High Tc Cuprates (Ivan Bozovic, Brookhaven National Laboratory/USA; Xerman de la Fuente Leis, ICMA (CSIC-University of Zaragoza)/Spain)
- HTS Wires, Tapes, and Coated Conductors (Wilfried Goldacker, Karlsruhe Institute of Technology/Germany; Yuh Shiohara, SRL-ISTEC/Japan)
- Magnetization Dynamics and Resonance (Farkhad Aliev, Universidad Autonoma de Madrid/Spain)
- Nanomagnetism in Biological and Bio-inspired Systems (Tanya Prozorov, Ames Laboratory/USA)
- Superconductor Circuits and Systems (Deepnarayan Gupta, HYPRES/USA)
- Vortex Matter: In Memory of Prof. John R. Clem (Rudolf Huebener, University of Tuebingen/Germany; Ali Gencer, Ankara University/Turkey)
- The Coexistence of Superconductivity and Magnetism (Alexander Buzdin, University of Bordeaux/France)
- HTS Superconducting Thin Films, Proximity Effects, and Interface Superconductivity (Davor Pavuna, Ecole Polytechnique Federale de Lausanne (EPFL)/Switzerland)
- Low Temperature Superconductors (Moderator: Alberto Martinelli, CNR-SPIN/Italy)
- MgB₂ Materials and Mechanisms (Hiroaki Kumakura, National Institute for Materials Science/Japan)
- MgB₂ Wires, Tapes and Cables (Hiroaki Kumakura, National Institute for Materials Science/Japan)
- Multiband Superconductivity and Superfluidity (Milorad Milosevic, Universiteit Antwerpen/Belgium)
- Unconventional Superconductors (General Session, İman Askerbeyli, Ankara University/Turkey)
- Novel Functional Magnetic Materials: Basic Approach and Applications (Arcady Zhukov, UPV/EHU/Spain)
- Magnetic Shape Memory Alloys and Applications (Lluis Manosa, Universitat de Barcelona/Spain)
- Iron-Based Superconductors: Properties of Materials in Crystal and Film Forms (Athena Safa-Sefat, Oak Ridge National Laboratory/USA)
- Medical, Scientific, and Energy Applications of Superconductors (Naoyuki Amemiya, Kyoto University/Japan)
- Application potential of HTS devices in the grid (Mathias Noe, Karlsruhe Institute of Technology (KIT)/Germany)
- Motor and Generators (Tim Coombs, Cambridge University/UK)

- Spintronics and Magneto-Transport (Eugene Chudnovsky, The City University of New York/USA)
 - Bulk Superconductors (Andres Sotelo, ICMA (CSIC-Universidad de Zaragoza)/Spain)
 - Dilute Magnetic Semiconductors and Interfacing Ferromagnetism with Spin Hall Materials (Tomasz Dietl, Polish Academy of Sciences/Poland)
 - Essential Heterogeneities in Layered Superconductors (Annette Busmann-Holder, Max-Planck-Institute for Solid State Research/Germany)
 - Fundamental Technologies of Superconductors for Large Scale Applications (Fedor Gömöry, Slovak Academy of Sciences/Slovakia)
 - Iron-Based Superconductors: Materials and Properties (Carlo Ferdeghini, CNR-SPIN/Italy)
 - Low-Dimensional Magnetism (Vladislav Kataev, Leibniz Institute of Solid State and Materials Research IFW Dresden/Germany)
 - Carbon-Based and Organic Superconductors (Isrel Felner, Racah Institute of Physics/Israel)
 - Magnetism and Spin Effects in Graphenes (Junji Haruyama, Aoyama Gakuin University/Japan)
 - Theory of Superconductivity (Vladimir Kresin, University of California/USA)
 - Iron - Based Superconductors: Their Role in Understanding Unconventional Superconductivity (Ruslan Prozorov, Ames Laboratory/USA)
 - Junctions and SQUIDS (Francesco Tafuri, CNR-SPIN/Italy)
 - Superconductor-Insulator Transition (Valeri Vinokur, Argonne National Laboratory/USA)
 - Vortices and Nanostructured Superconductors (Adrian Crisan, University of Birmingham/UK)
 - Magnetism of Nanoparticles, Nanowires and Nanostructures (Dino Fiorani, National Research Council (CNR) of Italy/Italy)
 - Frustrated Magnetism (Hakan Köçkar, Balıkesir University/Turkey)
 - Advances In Thin Films, Multi-Layers and Patterned Nanostructures (Selçuk Kervan, Gazi University/Turkey)
 - Magnetic Recording, Sensors and Microwave Devices (Uğur Topal, TUBITAK UME/Turkey)
 - Magnetic Applications in a BIO World (Maria-Vallet Regi, Universidad Complutense de Madrid/Spain)
 - Large Scale Applications of Superconductors (Mehmet Ertuğrul, Ataturk University/Turkey)
 - Theory of Magnetism (Ali Zaoui, University of Lille1 Sciences and Technologies/France)
 - Magnetocaloric Effect (Bariş Emre, Ankara University/Turkey)
 - Multiferroics and Magnetic Oxides (Reinhard Kremer, MPI fuer Festkoerperforschung/Germany)
 - Artificial Pinning and High Energy Irradiation in Superconductors (René Flukiger, University of Geneva/Switzerland)
 - Ferrites and Rare Earth Materials (Muhammed Anis-ur Rehman, COMSATS Institute of Information Technology/Pakistan)
 - Heavy Fermion Superconductivity and Experimental Aspects on Quantum Criticality (Sergey Bud'ko, Iowa State University/USA)
 - Iron-Based Superconductors: Fundamentals and Mechanisms (Laura Greene, University of Illinois at Urbana-Champaign/USA)
 - Cryogenics Materials, Engineering and Applications (Yasuharu Kamioka, ColdTech Associates/Japan)
 - Disorder Effects in Topological Insulators and Superconductors (Lia-Krusin-Elbaum, The City College of New York - CUNY/USA)
 - 50th Anniversary of the W. Little Seminal Paper - Special Session (Vladimir Kresin, University of California/USA; Lev Mazov, Russian Academy of Sciences/Russia)
- The conference with the above-named sessions has been a platform for the debate for the most matters of interest from fundamentals, materials to applications, to superconductivity and magnetism community in general. The fruitful discussions and exchanges gave a pave to the success in bridging the gap between the delegates to meet the necessities of the conference with a concept “The Bridge between East and West in scientific and technological excellence of quality”. The delegates and companions have also enjoyed the beautiful weather and the social program in the touristic and historical places of Antalya.
- It is really difficult to give an objective overview of the conference, it will be subjective. Instead of making very technical summary of the conference, it is decided to refer the presentations at the closure. Closing remarks have been made by the following eminent speakers about various mainstreams of the ICSM2014. The closing session videos will be kept online for ICSM2014 participants until ICSM2016 from the address: <https://vimeo.com/album/3148037>. The is a password-protected site, only the permitted videos are released to be watched. For eligibility, please contact with Dr. Mustafa Akdoğan and Dr. Hakan Yetiş whom we appreciate for the efforts of in editing so many videos of presentations at ICSM2014 in Antalya (Table 3).
- The list of supporters and exhibitors is as follows:
- SuperMag Ltd.
 - CESUR
 - THY(Turkish Airlines)
 - TUBITAK
 - Republic of Turkey Ministry of Development

Table 3 Presentations as Closing remarks

Speaker	Topic
Athena Safa Sefat	Superconducting Materials and Pnictides
Bartłomiej A Glowacki	Energy and Superconductivity
Igor Zutic	Magnetic Materials, Magnetism and Applications
Naoyuki Amemiya	Large and Small Scale Applications of Superconductors
René Flukiger	Highlights on MgB ₂ and HTS cables
Wilfried Goldacker	General Comments about ICSM2014 from the view point of attendees

- LOT Quantum Design
- BRUKER
- Eti Maden
- Zenotek Cryogenics
- Boren
- Nanomagnetism Instruments
- American Elements
- Lake Shore
- Nanosan Instruments
- Pavezyum Ltd.
- SHI Cryogenics Group
- Springer
- Vaksis R&D and Engineering

It is a great pleasure for us to thank them all for their pivotal role in the organization of the conference. We would also like to thank the speakers, the participants, the exhibitors, Ankara University staff and students

from universities all around Turkey for their efforts. I owe a lot to the family and special thanks for Şadiye, Emine Begüm and Metehan for their understanding and devotion.

More information about the conference can be found at <http://icsm2014.org/>. The next edition of International Conference on Superconductivity and Magnetism (ICSM2016) is scheduled in the spring of 2016, in Fethiye. Fethiye is a historical town with many attractions, will be a very good venue for the 5th ICSM2016. For the most international delegates, Fethiye is about 60 kms away from the Dalaman, which is the international airport with either direct flights and/or via connections from Istanbul airports. Further details together with venue will be announced. For updates on ICSM2016, you may visit the website <http://icsm2014.org/>. We hope to see you again at the next conference ICSM2016.