Workshop on Oxide Materials: Novel Multifunctional Properties

The Physics Department of Universidad del Valle, Cali, Colombia invites the academic and scientific community to participate in the Workshop on Oxide Materials: Novel Multifunctional Properties, at Universidad del Valle, Cali Colombia, from September 15th to 19th, 2014. This is a oportunity to discuss about oxide materials and their applications in the development of multifunctional materials and devices using the novel properties of such compounds.

Scope

Oxides appear as unique smart materials because they are rich in the physical, chemical, and structural properties point of view, exhibiting a vast range of controllable and novel capabilities based on their electric, magnetic, dielectric, piezoelectric, semiconducting, superconducting, thermal, mechanical, optical, photo electrochemical, thermoelectric, optical transparency and catalytic properties among others, besides their ferroic and multiferroic behavior. These exceptional functionalities of oxides have motivated a big research effort focused on the use of integration of oxide materials for novel devices and other specific applications. This includes the design and fabrication of engineered heterostructures—multilayers, nanostructures, and composites —showing either enhanced properties or multiple functionalities.

The workshop will provide a forum for discussion about the latest progress in research and development of multifunctional oxides highlighting the processing-structure-property relationships of the heterostructures, thin film oxides and applications. The aim of this workshop is to bring together scientists in order to exchange information and expertise on the state of the art in the field.

The workshop will address fundamental and applied aspects of physics, chemistry, and engineering of oxide-based advanced multifunctional hetero-, nanostructures and thin films achieving enhanced and/or novel functionalities for applications in electronics, sensors, actuators, photo catalysis, electrochemical cells, storage devices, spintronics, optoelectronics, etc., emphasizing structure -property correlation, integrated functionalities, interface effects as well as size-dependent effects and nanoscale phenomena. Some invited presentations will be selected from the received abstracts.

Topics to be addressed:

- Synthesis of multifunctional oxide films nanocomposites / nanomaterials, heteroepitaxial thin films and multilayered systems from epitaxy to self-assembled nanostructures

- Interfaces and nanoscale effects
- Mechanical, electric, ferroelectric, and magnetic properties of oxide meso-, micro-, nanostructures
- Advances in characterization techniques for probing multifunctional oxide materials
- Theoretical modeling of epitaxial growth, interfaces and microstructures / nanostructures

Important Dealines

Opening of abstract submission: May 1st, 2014

Submission of extended abstracts: **August 1st, 2014**

Accepted abstracts: August 15th, 2014

Registration: September 1st, 2014

Workshop: September 15th to 19th, 2014

Invited Speakers

Ivan K. Schuller, Director Center for Advanced Nanoscience, University of California San Diego, USA.

- Simple oxides
- Strongly correlated degrees of freedom in complex oxides and the discovery of new physics.

Axel Hoffmann, Argonne National Lab., Illinois, USA.

- Properties of magnetic heterostructures, spin-transport in novel geometries, and biomedical applications of magnetism.

Ricardo Ibarra, Director *Instituto de nanociencia de Aragón*, University of Zaragoza, Spain

- Functional magnetic oxides nanostructures.
- Anomalous Hall, Nerst and thermo-spin effect in epitaxial magnetite
- Magnetic oxide based nanoparticles for hyperthermia induced cell dead

Juan C. Nino, Department of Materials Science and Engineering, University of Florida at Gainesville, USA

- The Unique Role of Oxides in the Advancement of Energy Technologies
- Crystallography of Oxides for Electronic Applications
- Recent Developments in Ionic and Protonic Conduction in Ceramics

Gabriel Ramirez, Department of Physics, University of California at San Diego, USA

- Metal-to-insulator transition in VO_2 thin film: structural evolution and long –range correlation

- Dynamics and magnetics in high quality V_2O_3 thin films

Sara Aldabe Bilmes, *Departamento de Química Inorgánica, Analítica y Química Física, Universidad de Buenos Aires*, Argentina

- Chemistry of precursors, nucleation and growth
- Particles in suspension: stability, surface, surface functionalization
- Applications: catalysis, encapsulation of biomolecules, cells and microorganisms, sensors

Juan Muñoz Saldaña, *Senior Researcher, Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Naciona (CINVESTAV), Queretaro, Mexíco*

- Reconstruction of domains in ferroelectric perovskite ceramics by piezoresponse microscopy.
- Ferroelasticity and redirect domains in multifunctional ceramic (zirconia and perovskites based ceramic).
- Lead Free Ferroelectric Bismuth basis.

Anderson Dussan Cuenca, Physics Department, Universidad Nacional de Colombia

- Solar Cells and
- Semiconductors Magnetic Diluted

Karem Rodríguez, *Departamento de Física, Universidad de Valle, Colombia*
- Quantum magnetism
- Strongly correlated systems

Pedro A. Prieto, *Department of Physics, Universidad del Valle, Colombia*
- Novel oxides from superconductor, magnetic and multiferroic.

Organizing

Chair **María Elena Gómez**
Full Professor
Thin Film Research Group´s LeaderDepartment of Physics

Scientific Committee

Ricardo Ibarra, Instituto de Nanociencia de Aragón (INA), University of Zaragoza, Spain
Axel Hoffmann, Argonne National Lab., Illinois, USA.
Jairo Roa, Department of Physics, Universidad Nacional de Colombia, Bogotá, Colombia
Carlos Duque, Department of Physics, Universidad de Antioquia, Medellín, Colombia
Walter Torres, Department of Chemistry, Universidad del Valle, Cali, Colombia
Germán Pérez, Department of Physics, Universidad del Valle, Cali, Colombia
Gustavo Zambrano, Department of Physics, Universidad del Valle, Cali, Colombia
Pedro Antonio Prieto, Center of Excellence for Novel Materials, Universidad del Valle, Cali

Organizing Committee

Wilson Lopera
William Sánchez
Claribel Domínguez Ordoñez
Mario Quiñonez
Oscar Sánchez
Isabel Arango

More Information

For more information please contact us:

e-mail: wksp.oxide.materials@gmail.com
web page: www.cenm.org/wksp_oxma
Tel.-Fax. (57 2) 3153564
Calle 13, No. 100-00
Edificio 320 Espacio 1026