



COST539 Action :
Electroceramics from Nanopowders Processed by
Innovative Methods (ELENA)

6th Workshop
***"Advanced Functional Characterization of
Nanostructured Materials"***

24 - 25 February, 2009

Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC)
Cantoblanco. 28049-Madrid (Spain)



PROGRAMME

**COST is an intergovernmental framework for European Cooperation in Science and
Technology, allowing the coordination of nationally-funded research
on an European level**

Advanced Functional Characterization Techniques of Nanostructured Materials COST539 Action ELENA 6th Workshop

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and

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Preface

The co-organizers of the 6th Workshop of ELENA COST539 Action welcome you to this new edition of collaborative activities that the COST framework has allowed since the beginning of the activities in June 2005.

The 6th Workshop was organized together with the 2nd Training School of the Action, within the activities of Working Group 3 (Functional Characterisation of Electroceramics and Films) and covers a topic that aims to provide links between two communities of materials scientists, one more devoted to the development of new functional materials processed by innovative methods, and the other one more to their characterization and study of their potential industrial application. These two communities are necessarily linked to get the objective of gaining knowledge to make Europe competitive in the worldwide market of electroceramics.

Many of the contributions to the workshop are focussed on the processing and study of ferroelectric materials and their applications, clearly demonstrating the impact of nanosciences and nanotechnologies on this field of research. Equally important applications are also collected in the workshop presentations, as it is the case of ionic conductors and multiferroics. These share with ferroelectrics the needed basic knowledge in the design of their properties from the construction of given microstructures at atomic level for specific applications.

This event reflects indeed the activities of WG3 that by means of active collaboration among action partners, and also supported by the knowledge developed on WG1 (Novel fabrication methods of nanopowders) and WG2 (Compositional, microstructural and morphological characterization and control) of ELENA action, has gained progress in both advanced aspects of nanofabrication and understanding, mainly on polar materials, but also on, multiferroic materials.

The relationship between the Spanish and the Portuguese co organizers groups dates back to the time of COST514 Action on Electroceramic Thin Films (1993-1999). Within COST514, R&D activities started among members of these two groups and were since then strengthened with numerous scientific interchanges, bilateral cooperation projects, etc. We really know the value of COST cooperation and we are especially proud to be the co-organizers of this Workshop.

We sincerely wish you a profitable time and to consolidate or establish long lasting research interest in Madrid.

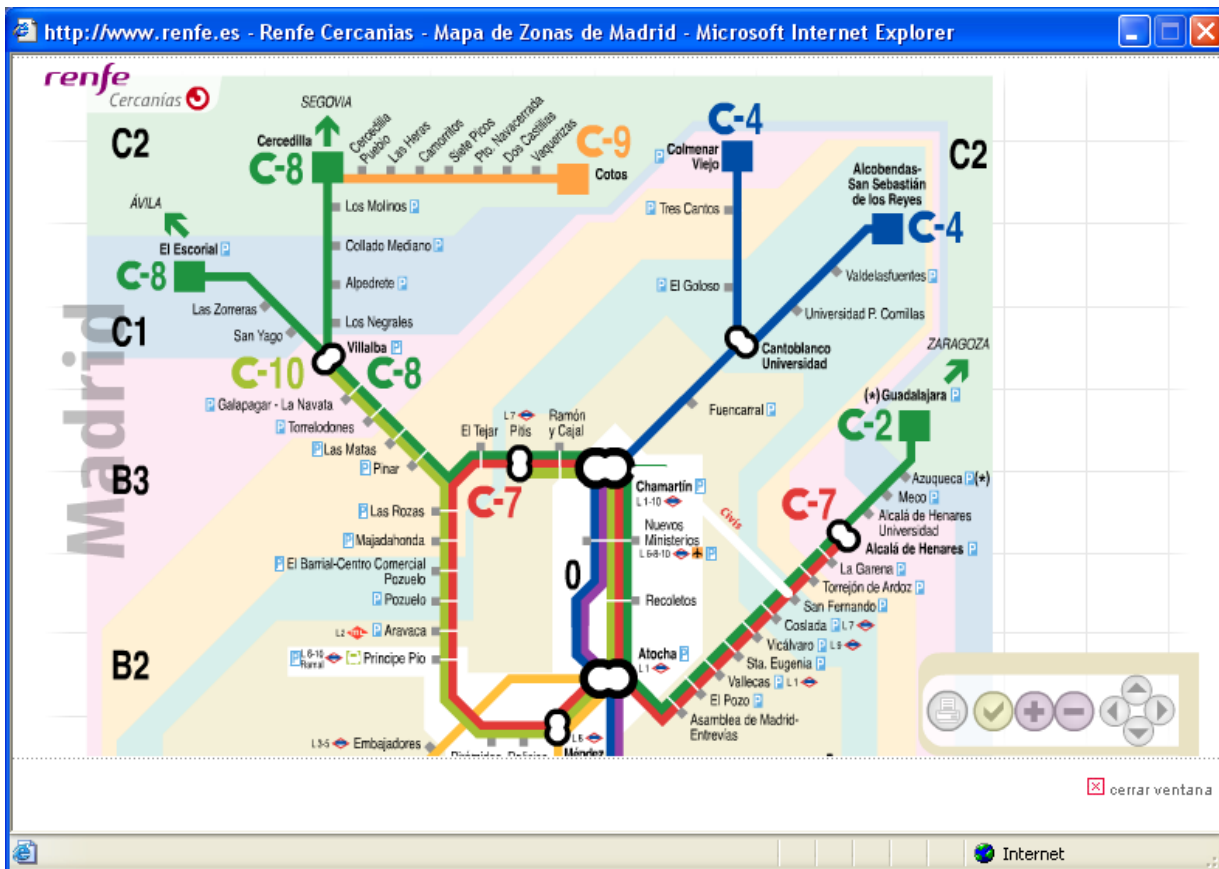
Lorena Pardo and Paula Vilarinho

PRACTICAL INFORMATION

How to arrive

ICMM is located within the Campus of the Autonomous University of Madrid, some 16 Km North of the city.

The best way to arrive is the use of “Cercanías” train line C4 (see attached document). For scheduled trains and prices you can check: <http://www.renfe.es/cercanias/madrid/>
From “Atocha” station the trip takes some 25 minutes.

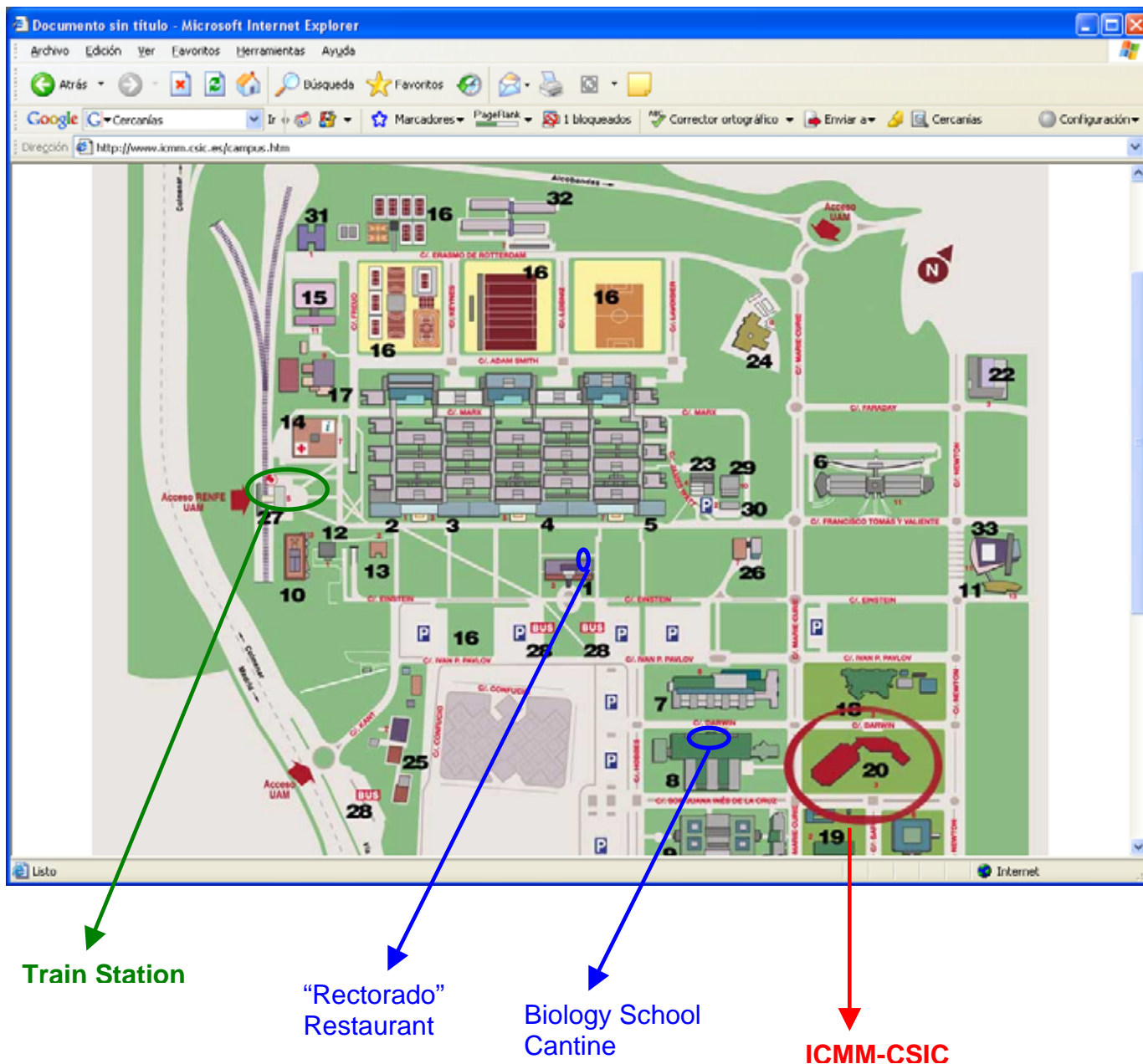


By car the ICMM can be reached via road M-607 (to Colmenar Viejo) exit to Autonomous University (Camino de Valdelatas) at Km 16.

By bus use Line 714 from Plaza de Castilla (terminal, andén 13) that ends at Cantoblanco Universidad.

From the train station of “Cantoblanco Universidad” there is a 15 minutes walk to ICMM crossing the Campus.

The following map shows the ICMM location marked with a red circle, the train station with a green one and the places selected for lunch during the Workshop in blue.



At the Workshop

There is a **wireless internet connection** available in the area of the Lecture rooms. If you want to connect to it, select ssid="portal-csic". IP will be automatically given to your computer by the system.

Coffee breaks are free of charge for Workshop attendees and will be served twice a day.

There are two options for **lunch** in the Campus (see map):

University Cantine at Biology School :

Self-service menu, consisting of an entrance, main dish and fruit or dessert, cost 4.85 euros (including bread), there are several choices for each item in the menu every day.

Sandwich and single dishes can also be purchased at a lower price.

"Rectorado" Restaurant:

There will be a special menu prepared for the Workshop attendees and these will be served at the price of 13,5 euros. There will be 3 choices (soup, pasta, vegetables) for the first course and 2 choices (fish or meat) for the second course of the meals. The price includes also bread, dessert, beverages and coffee.

To be able to use this service, you shall indicate it at the registration desk at your arrival.

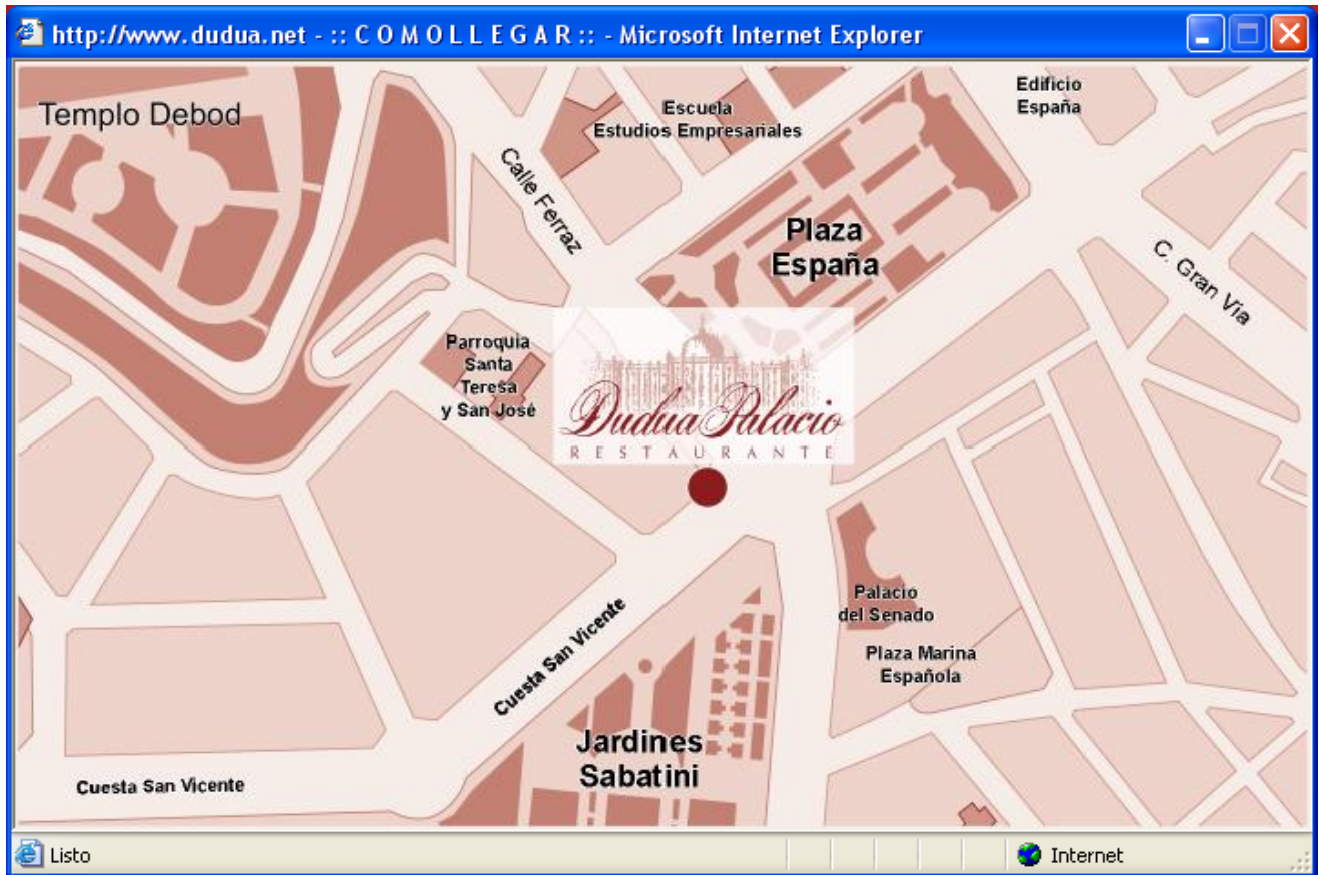
There will be a **Official Dinner** in downtown Madrid at 21:00 on Tuesday 24th February, 2009, free of charge for the Workshop attendees (the price of an extra ticket for the dinner is 30 euros) at the :

"Restaurante Dudua Palacio" , at walking distance from "Plaza de España" (see map in the next page)

c / Cuesta de San Vicente, 2. 28008 – Madrid

For information on the place, please, check: <http://www.dudua.net>.

Please, notify at the registration desk if you wish to attend the Official Dinner.



Advanced Functional Characterization Techniques of Nanostructured Materials
COST539 Action ELENA 6th Workshop

Tuesday 24 February

Morning

09:00-09:15 Introduction to the Workshop by COST539 Action Chairperson and Workshop Organizers

Session FP: Ferroelectric and Piezoelectric Characterization

Chair: Carmen Aragón (Autonomous Univ. Madrid)/Paula M.S.Vilarinho (Univ.Aveiro)

09:15-09:45 INVITED TALK 1:

“Measurement systems for nonlinear dielectric and elastic characterization”

Alfons Albareda

Polytechnic University of Catalonia, Barcelona, Spain

09:45-10:15 INVITED TALK 2 :

“Dielectric Peaks in Ferroelectric Nanostructures”

Marina Tyunina

Microelectronics and Materials Physics Laboratories, University of Oulu, PL 4500, FI-90014 Oulun yliopisto. Finland

10:15-10:30 Contributed Talk 1FP

“FEA Evaluation of the Piezoelectric Coupling in Odd Ceramic Shapes”

Amador M. Gonzalez and P. Ochoa

Escuela Técnica de Ingenieros de Telecomunicaciones. UPM. Madrid, Spain

10:30 – 11:30 Coffee break (Please, authors install posters in place).

Session SO: Spectroscopic and Optical Characterization

Chair: Rafael J. Jiménez-Rioboó (ICMM-CSIC)/Fernando Agulló (ICMM-CSIC)

11:30-12:00 INVITED TALK 3:

“Infrared and THz Spectroscopy of Nanostructured Materials”

Jan Petzelt

Institut of Physics. Academy of Sciences. Prague, Czech Republic

12:00-12:30 INVITED TALK 4:

“Raman Spectroscopy of Solids: Peeping into the Nanoworld”

Ivan Gregora

Institut of Physics. Academy of Sciences, Prague, Czech Republic

12:30-12:45 Contributed Talk 2SO:

“Electrical characterization of Bismuth Scandate Lead Titanate thin films”

Paula M.Vilarinho, Jingzhong Xiao, Aiyong Wu

Department of Ceramics and Glass Engineering. University of Aveiro. 3810-193. Aveiro, Portugal

12:45-13:00 Contributed Talk 3SO:

“The Effect of Density and Purity on Infrared Reflectivity Spectra of EuTiO₃ Magnetoelectric Ceramics”

Karel Maca¹, Martin Kachlik¹, Stanislav Kamba², Veronica Goian²

¹Brno University of Technology, Technicka 2, 616 69 Brno, Czech Republic

²Institute of Physics ASCR - v.v.i. Na Slovance 2, 182 21 Prague 8, Czech Republic

13:00 -15:00 Lunch

Tuesday 24 February

Afternoon

Session D: Dielectric Characterization

Chair: Ricardo Jiménez (ICMM-CSIC) / Vladimir Sdric (Univ. Novi Sad)

15:00 - 15:30 INVITED TALK 5:

“Thermally Stimulated Depolarization Currents”

Joaquim Agostinho Moreira.

Porto University. Porto, Portugal

15:30 - 16:00 INVITED TALK 6:

“Dielectric spectroscopy of relaxor ceramics - comparison with dipolar glasses”

Juras Banys

Vilnius University. Vilnius, Lithuania

16:00 - 16:15 Contributed Talk 4D:

“Relations between stoichiometry and dielectric response of strontium titanate ceramics”

Luis Amaral, A. M. R. Senos, P. M. Vilarinho

Department of Ceramics and Glass Engineering. University of Aveiro. 3810-193 Aveiro, Portugal.

16:15 - 16:30 Contributed Talk 5D:

“Low-frequency dielectric characterization of thin and ultrathin films”.

Marina Tyunina

Microelectronics and Materials Physics Laboratories, University of Oulu, PL 4500, FI-90014 Oulun yliopisto. Finland

16:30-17:00 Coffee break

Session AP: Characterization of Multiferroics and other Electroceramic Materials processed by Innovative Methods

Chair: Bjljana Stojanovic (Inst.Multidiciplinary Res.)

17:00 - 17:30 INVITED TALK 7:

“In-situ preparation of multiferroic composite with core-shell structures”

L. P. Curecheriu¹, M.T. Buscaglia², V. Buscaglia², A. Ianculescu³, P. Postolache¹, Liliana Mitoseriu¹, and P.Nanni^{2,3}

¹ Department Physics, Al. I. Cuza Univ., 11 Bv. Carol I, 700506 Iasi, Romania

²Inst. for Energetics & Interphases - CNR, Via de Marini no. 6, Genoa I-16149, Italy

³Dept. Chem. & Proc. Eng., Univ. of Genoa, P-le Kennedy no. 1, I-16129 Genoa, Italy

17:30 - 17:45 Contributed Talk 6EC

“Aerosol synthesis and functional characterization of rare earth based luminescent materials”

K.Marinkovic¹, L.Mancic¹, L.Gomez², M.E.Rabanal², J.M.Torralba², Olivera Milosevic¹,

¹*Institute of Technical Sciences of Serbian Academy of Sciences and Arts, Belgrade, K.Mihajlova 35/IV, Serbia*

²*University Carlos III of Madrid, Avda. Universidad 30, 28911 Leganes, Madrid, Spain*

17:45 – 18:00 Contributed Talk 7EC

“Development of Technology of Nanocomposition Formation on the Basis of Nanostructured Calcogenide Semiconductors and Silicon Dioxide”

Mustafa B.Muradov, G.M.Eyvazova, I.D.Akhmedov, N.V.Huseynova

NanoCenter, Baku State University, Z.Khalilov 23, Baku, Azerbaijan

Poster Session

Chair: Jesús Ricote (ICMM-CSIC)/M.E. Rabanal (Univ. Carlos III, Madrid)

18:00-18:40 Two minutes summary oral presentations of poster contributions.

18:40-19:30 Poster discussion.

Poster Session

P1. “Dipolar Glass Behaviour of BaBi₂Nb₂O₉ Relaxor Evidenced from Dielectric Spectroscopy”

P. Keburis^a, J. Banys^a, A. Brilingas^a, A. Kholkin^b and M. E. V. Costa^b

^aFaculty of Physics, Vilnius University, Sauletekio 9, 2040 Vilnius, Lithuania;

^bDepartment of Ceramics and Glass Engineering / CICECO, University of Aveiro, Portugal

P2. “PZT Nanowires: PFM and TEM Characterization”

J. Wang, E. Colla, C. Sandu and N. Setter

Ceramics Laboratory, EPFL – Swiss Federal Institute of Technology, 1015 Lausanne Switzerland

P3. “Microstructure and Dielectric Properties of Lanthanum Doped Barium Titanate”

M.M. Vijatović¹, J.D. Bobić¹, T. Ramoska², B.D. Stojanović¹

¹Institute for Multidisciplinary Researches, Kneza Višeslava 1, 11000 Belgrade, Serbia

²Faculty of Physics, Vilnius University, Sauletekio al. 9, Vilnius, Lithuania

P4. “LaGaO₃ based material prepared via citrate sol-gel method as a promising electrolyte for IT-SOFC”

Ivan Stijepović¹, Nikolina Pavlović¹, Vladimir Srdić¹, Cristian Andronesco², Victor Fruth²

¹Department of Material Engineering, Faculty of Technology, University of Novi Sad, Bulevar Cara Lazara 1, Novi Sad, Serbia

²Institute of Physical Chemistry "Ilie Murgulescu", Splaiul Independentei 202, Bucharest, Romania

P5. “Influence of the Bottom Electrode on Epitaxial Na_{0.5}Bi_{0.5}TiO₃ Thin Films Grown by Pulsed Laser Deposition”

M. Bousquet¹, J.-R. Duclere¹, C. Champeaux¹, A. Boulle¹, P. Marchet¹, A. Wu², P. M. Vilarinho², A. Catherinot¹

¹Laboratoire de Science des Procédés Céramiques et de Traitements de Surface, UMR 6638 CNRS, Université de Limoges, Faculté des Sciences, 123, avenue Albert Thomas, 87060 Limoges Cedex, France

²Centre for Research in Ceramics and Composite Materials, Department of Ceramics and Glass Engineering, Campus Universitário, 3810-193 Aveiro, Portugal

P6. “Effect of Synthesis Route on the Microstructure of SiO₂ doped Bismuth Titanate Ceramics”

E. Kashchieva, M. Krapchanska, S. Slavov, Y. Dimitriev

University of Chemical Technology and Metallurgy, 8 Kl. Ohridski Blvd., 1756 Sofia, Bulgaria

P7. “Study of The Solid State Synthesis of Sodium Niobate”

Koruza Jurij, Malič Barbara, Kosec Marija

Institut Jožef Stefan – Electronic Ceramics Department, Jamova 39, 1000 Ljubljana, Slovenija.

P8. “Morphological and functional characterization of cathodic materials in lithium batteries prepared by aerosol synthesis”

L.Gomez¹, I. Mena¹, J.M.Torralba¹, O.Milosevic², M.E.Rabanal¹

¹University Carlos III of Madrid, Avda. Universidad 30, 28911 Leganes, Madrid, Spain

²Institute of Technical Sciences of Serbian Academy of Sciences and Arts, Belgrade, K.Mihajlova 35/IV, Serbia

P9. "Dielectrics investigations of Barium titanate with 0,5% Antimony"

Tadas Ramoška, M.M.Vijatovic, B.Stojanovic and J.Banys,
Faculty of Physics, Vilnius University, Sauletekio str. 9, Vilnius, Lithuania

P10. "Flux Growth of Potassium Tantalate Single Crystals and Their Characterization"

S. Zlotnik, P. M. Vilarinho, M. E. V. Costa
Department of Ceramics and Glass Engineering. University of Aveiro. 3810-193 Aveiro, Portugal.

P11. "Relaxor Behaviour in Nanostructured $Pb(Zn_{1/3}Nb_{2/3})O_3$ - $Pb(Fe_{1/2}Nb_{1/2})O_3$ - $PbTiO_3$ Ceramics"

H.Amorín¹, R. Jiménez¹, T. Hungría¹, J. Galy², A. Castro¹, M. Algueró¹

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² Centre d'Elaboration de Matériaux et d'Etudes Structurales (CEMES, CNRS), 29 Jeanne Marvig, BP 94347, 31055 Toulouse, Cedex 4, France

P12. "Study of Ferroelectric Barium Bismuth Titanate Prepared by the Mechanochemical Synthesis"

Zorica Ž. Lazarević¹, Nebojša Ž. Romčević¹, Jelena D. Bobić², Novica Paunović¹, Witold D. Dobrowolski³, Biljana D. Stojanović²

¹ Institute of Physics, Belgrade, Serbia

² The Institute for Multidisciplinary Research, Belgrade, Serbia

³ Institute of Physics, Polish Academy of Sciences, Warsaw, Poland

P13. "High Frequency Study of $BiFeO_3$ Multiferroic Thin Films"

R. Sobiestianskas¹, J. Banys¹, B. Vengalis², A. Hardy³, M.K. Van Bael³

¹ Faculty of Physics, Vilnius University, Vilnius, Lithuania

² Semiconductor Physics Institute, Vilnius, Lithuania

³ Institute for Materials Research, Hasselt University, Diepenbeek, Belgium

P14. "Electrical Properties of Barium Bismuth Titanate"

J.D.Bobić¹, M.M.Vijatović¹, S. Greičius², B.D.Stojanović¹

¹ Institute for Multidisciplinary Researches, Kneza Visislava 1, 11000 Belgrade, Serbia

² Faculty of Physics, Vilnius University, 9 Sauletekio str., 10222 Vilnius, Lithuania

P15. "Magnetic and Electric Properties of Multiferroic $BiFeO_3$ Ceramics Obtained from Mechanochemically Synthesized Powders"

Z. Marinković Stanojević¹, E. Markiewicz², B. Andrzejewski², B. Stojanović¹, B. Hilczer²

¹ Institute for Multidisciplinary Research, Belgrade, Serbia

² Institute of Molecular Physics, Polish Academy of Sciences, Poznań, Poland

P16. "Method for the FORC data acquisition"

Fabio Fochi¹, L. Mitoseriu², Matteo Fagnocchi¹, C. Capiani¹, Carmen Galassi¹

¹ Institute of Science and Technology of Ceramics-CNR, Via Granarolo no. 64, I-48018, Faenza, ITALY E-mail: carmen.galassi@istec.cnr.it

² Department of Solid State and Theoretical Physics, Al. I. Cuza Univ., Bv. Carol I no. 11, Iasi 700506, ROMANIA

P17. "Electrical and mechanical characterisation of piezoelectric actuators"

Matteo Fagnocchi, Fabio Fochi, Carmen Galassi

Institute of Science and Technology of Ceramics-CNR, Via Granarolo no. 64, I-48018, Faenza, ITALY

P18. "Dielectric Properties of Titanium Tellurite ($TiTe_3O_8$) Thick Film"

Xinming Su, Aiyong Wu, Paula M. Vilarinho

Department of Ceramics and Glass Engineering. University of Aveiro. 3810-193 Aveiro, Portugal.

P19. “Functional properties of BaTiO₃ @ Mag (Mag= α Fe₂O₃ and (Ni,Zn)Fe₂O₄) multiferroic composites with core-shell structures”

L.P. Curecheriu¹, M.T. Buscaglia², V. Buscaglia², P. Postolache¹, L. Mitoseriu¹ and P. Nanni^{2,3}

¹Dept. of Physics, Al. I. Cuza Univ., 11 Bv. Carol I, 700506 Iasi, Romania

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³Dept. Chem. & Proc. Eng., Univ. of Genoa, P-le Kennedy no. 1, I-16129 Genoa, Italy

P20. “Vanishing of correlations between polar nanoregions in nanograin PMN ceramics evidenced from the distribution of relaxation times”

J. Banys¹, R. Grigalaitis¹, M. Ivanov¹, J. Carreaud², J.M. Kiat^{2,3}

¹Laboratory of Phase Transitions Dielectric Spectroscopy, Faculty of Physics, Vilnius University, 9 Sauletekio str., 10222 Vilnius, Lithuania

²Laboratoire Structures, Propriétés et Modelisation des Solides, Ecole Centrale Paris, Grande Voie des Vignes 92295 Chatenay-Malabry Cedex, France

³Laboratoire Léon Brillouin, CE Saclay, 91191 Gif-sur-Yvette Cedex, France

Wednesday 25 February

Morning

Session SPM: Local Electrical Characterization of Electroceramics from Nanopowders and Nanosystems

Chair: Arturo Baró (ICMM-CSIC)

09:30-10:00 INVITED TALK 8:

“Polarization switching in nanoscale ferroelectrics”

Marin Alexe.

Max Planck Institute of Microstructure Physics, Weinberg 2, D-06120 Halle, Germany

10:00-10:15 Contributed Talk 8SPM

“Nanostructure Characterization of Ferroelectric thin films by ScanningProbe Microscopy²”

Aiying Wu and Paula M. Vilarinho

Department of Ceramics and Glass Engineering, University of Aveiro, 3810-193 Aveiro, Portugal.

10:15-10:30 Contributed Talk 9SPM

“Piezoresponse Force Microscopy on Doubly Clamped KNbO₃ Nanowires”

Jing Wang¹, C. Stampfer², C. Roman², W. H. Ma¹, N. Setter¹ and C. Hierold²

¹*Ceramics Laboratory, EPFL-Ecole Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland*

²*Micro and Nanosystems, Department of Mechanical and Process Engineering, ETH Zurich-Eidgenössische Technische Hochschule Zürich, 8092 Zurich, Switzerland*

10:30 - 11:00 Coffe break (Please, authors remove displayed posters).

11:00 - 11:30 INVITED TALK 9:

“Piezoresponse Force Microscopy of Ferroelectric Nanostructured Ceramics and Films”

Jesús Ricote

ICMM Consejo Superior de Investigaciones Científicas. Cantoblanco. 28049 – Madrid. Spain

11:30 - 11:45 Contributed Talk 10SPM:

“SPM studies in ferroelectric nanostructures prepared by a microemulsion assisted method onto substrates”

Maria Torres¹ M.L. Calzada¹, M. Alexe², B. Rodriguez³ and L. Pardo¹

¹*Instituto de Ciencia de Materiales de Madrid, CSIC. Sor Juana Inés de la Cruz, 3, Cantoblanco, 28049 Madrid, Spain*

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³*Conway Institute of Biomolecular and Biomedical Research, University College Dublin, Belfield, Dublin 4, Republic of Ireland*

11:50- 12:30 RUMP SESSION Chaired by P. S. Vilarinho, L. Pardo and B. Stojanovic.

12:30 Final Remarks by Chairperson of COST 539, B. Stojanovic, and Closure of the Workshop

Afternoon

14:00 -18:00 The Core Group of The COST539 Action Meeting will take place at ICMM-CSIC

List of Attendees

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