Maria Baldini

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EDUCATION

Dec. 2007: Ph.D in Material Science at University Sapienza, Roma, Italy (Thesis: "Lattice, electronic, and magnetic properties of doped La-manganites under pressure"; supervisor Prof. P.Postorino)

2004-2007: Ph.D. fellowship at University Sapienza, Roma, Italy

Sept. 2004: Physic degree (physic of matter) at University Sapienza, Roma, Italy (Thesis:"Spettroscopia Raman su manganiti di Sr nella fase esagonale e cubica" Supervisor Prof. P.Postrorino)

PROFESSIONAL ACTIVITIES

May 2010: SNAP Instrument Development Team, Spallation Neutron Source (Oakridge National Lab).

Apr. 2008 –Dec 2010: Post-doctoral researcher in Geological & Environmental Sciences Dpt., Stanford University (Supervisor: Prof. Wendy Mao)

RESEARCH EXPERIENCE and INTERESTS

Manganites: Study of the effects of induced structural modifications on the physical properties (insulator to metal transition, magnetic properties, orbital order, phase separation) of rare-earth manganites.

- High- Pressure (HP) dependence of magnetic order in $La_{0.75}$ $Ca_{0.25}MnO_3$ studied by neutron diffraction (Laboratoire Leon Brillouin: LLB, Saclay, France)
- HP X-ray diffraction measurements as a function of T on $La_{1.4}(SrCa)_{1.6}Mn_2O_7$ bilayer manganite (European Syncroton radiation facility: ESRF, Grenoble, France)
- Characterization and strain effects in $La_{0.7}Sr_{0.3}MnO_3$ thin films by Raman spectroscopy (Sapienza University, Rome, Italy).
- HP behavior of $LaMn_{1-x}Ga_xO_3$ on varying x studied by Raman (Sapienza university) and Infrared (DAFNE-LNF beamline, Frascati Italy) spectroscopy, neutron (LLB, Saclay, France), and X-ray diffraction (ESRF, Grenoble, France).
- High P and low T Raman measurement on $LaMnO_3$ (Carnegie Inst., Washington DC, USA). High pressure X-ray absorption measurements on $LaMnO_3$ (APS, Argonne, Chicago USA)

- HP X-ray diffraction measurement on $Nd_{0.47}Sr_{0.53}MnO_3$ (Advanced Light Source: ALS, Berkeley, CA USA)

Rare-earth tritellurides: HP Raman spectroscopy and X-ray diffraction measurements were performed on $LaTe_3$, $CeTe_3$ and $NdTe_3$ samples (Sapienza University, Rome Italy; ESRF, Grenoble France).

Earth materials: HP Raman and EXAFS measurements on Ge, GeO_2 glass, $FeGeO_3$ were studied as a function of pressure using EXAFS and Raman spectroscopy (ESRF, Grenoble France; Stanford University). HP X-ray diffraction measurements on $Fe2O_3$ and $FeCO_3$ (ALS Berkeley, CA)

PUBLICATIONS

- **M. Baldini**, W. Yang, M. Vaccari, H-K. Mao, S. Pascarelli, W. L. Mao, "First high-pressure EXAFS investigations on Ge using nano-polycrystalline diamond anvils", in preparation
- **M. Baldini**, L. Capogna, M.Capone, E. Arcangeletti, C.Petrillo, I. Goncharenko, and P.Postorino, "Pressure induced magnetic phase separation in $La_{0.75}Ca_{0.25}$ MnO_3 manganite", submitted
- **M. Baldini**, V. V. Struzhkin, A. F. Goncharov, P.Postorino, W. L. Mao, "Persistance of Jahn Teller distortion up to the insulator to metal transition in $LaMnO_3$", Phys. Rev. Lett. 106, 066402 (2011)
- C. Marini, L. Baldassare, **M. Baldini**, A. Perucchi, D. Di Castro, L. Malavasi, S. Lupi, P. Postorino, "Pressure induced phase transition in monoclinic VO_2", High Press. Res. 30, 55 (2010)
- L. Malavasi, **M. Baldini**, D. Di Castro, A. Nucara, W. Chricton, M. Mezouar, J. Blasco, P. Postorino, "High pressure behaviour of Ga-doped $LaMnO_3$: a combined x-ray diffraction and Raman spectroscopy study", J. Mater. Chem. 20, 1304 (2010)
- **M. Baldini**, G. Aquilanti, H-k. Mao, W. Yang, G. Shen, S. Pascarelli and W. L. Mao, "High-pressure EXAFS study of vitreous GeO_2 up to 44 GPa", Phys. Rev. B. 81, 024201 (2010)
- Sacchetti, C.L. Condron, S.N. Gvasaliya, F. Pfuner, M. Lavagnini, **M. Baldini**, M.F. Toney, M. Merlini, M. Hanfland, J. Mesot, J.-H. Chu, I.R. Fisher, P. Postorino, and L. Degiorgi, "Pressure-induced quenching of the charge-density-wave state observed by x-ray diffraction experiments", Phys. Rev. B 79, 201101 (2009)
- **M. Baldini**, D. Di Castro, M. Cestelli-Guidi, J. Garcia, and P. Postorino, "Phase-separated states in high-pressure $LaMn_{1-x}Ga_xO_3$ manganite", Phys. Rev. B 80, 045123 (2009)
- L. Malavasi, **M. Baldini**, I. Zardo, M. Hanfland and P. Postorino, "Pressure Induced Phase Separation in Optimally Doped Bilayer Manganites", Appl. Phys. Lett. 94, 061907 (2009)
- M. Lavagnini, **M. Baldini**, A. Sacchetti, D. Di Castro, B. Delley, R. Monnier, J.-H. Chu, N. Ru, I. R. Fisher, P. Postorino, and L. Degiorgi, "Evidence for coupling between charge density waves and phonons in two-dimensional rare-earth tritellurides ", Phys. Rev. B. 78, 201101(R) (2008)

- Sacchetti, **M. Baldini**, P.Postorino, C. Martin, A. Maignan, "Raman spectroscopy on cubic and hexagonal $SrMnO_3$", J. Raman Spectrosc. 37, n 5, 591 (2006)
- Aruta, M. Angeloni G. Balestrino, N. G. Boggio, P. G. Medaglia, A. Tebano, B. Davidson, **M. Baldini**, D. Di Castro, P. Postorino, P. Dore, A. Sidorenko, G. Allodi, R. De Renzi, "Preparation and characterization of $LaMnO_3$ thin films grown by pulsed laser deposition", J. Appl. Phys. 100, 023910 (2006)
- Sacchetti, **M.Baldini**, F. Crispoldi, P.Postorino, P. Dore, A. Nucara, C. Martin, A. Maignan, "Temperature dependence of the optical phonons in $SrMnO_3$ manganite: evidence of a low-temperature structural transition in the hexagonal compound", Phys. Rev. B 72, 172407 (2005)
- P Dore, P. Postorino, A. Sacchetti, **M. Baldini**, R. Giambelluca, M. Angeloni, G. Balestrino, "Raman measurements on thin films of the $La_{0.7}Sr_{0.3}MnO_3$ manganite: a probe of substrate-induced effects" Eur. Phys. J.l B 48, n 2, 255 (2005)

CONFERENCES AND WORKSHOPS

February 2005: Coherentia workshop on magnetic oxides University of Naples "Federico II", Italy. Talk "Raman spectroscopy on cubic and hexagonal $SrMnO_3$",

July 2006: Coherentia workshop on magnetic oxides, University of Naples "Federico II", Italy. Talk "High pressure effects on Ga doped manganites".

July 2007 Coherentia workshop on magnetic oxides, University of Naples "Federico II", Italy. Talk: High pressure Raman measurements on Ga doped manganites"

February 2009: EDXAS: Energy dispersive X-ray absorption spectroscopy workshop ESRF, Grenoble, Fr.

July 2009: International Workshop on Advanced Crystallography at High Pressure, Harbin, China. Talk: High pressure EXAFS study of amorphous GeO_2 up to 44 GPa. I was awarded of travel support as young scientist.

July 2009: AIRAPT-22 & HPCJ-50 Conference, Tokyo, Japan. Poster: High pressure EXAFS study of amorphous GeO_2 up to 44 GPa.

March 2010: "APS March Meeting", Portland OR, USA. Talk: High pressure investigation of Ge bearing compounds.

August 2010: "Kick-off conference on Pressure effects on Materials" Santa Barbara CA, USA. Poster: Persistence of Jahn Teller distortion in high pressure metallic phase of $LaMnO_3$

TEACHING ACTIVITY

Summer 2010: Mentoring 2 summer students for: 1) Earth Sciences High School Internship Program, 2) RISE (Raising Interest in Science and Engineering) Summer Internship at Stanford CA USA

Spring 2009: I taught laboratory on Raman spectroscopy for freshman senior "Diamonds" class at Stanford University

January-May 2007: Progetto lauree scientifiche: Raising Interest in Science. Teaching activity sponsored by Sapienza University at "Kennedy" high school in Roma with Prof. Francesco Poli.

2005-2007: Teaching support for Prof. P. Postorino class: Physics I: mechanics and thermodynamic, School of Engineering, Sapienza University, Roma (Italy)

SUMMER SCHOOLS

June 2005: "Polarons in bulk materials and systems with reduced dimensionality" The School of Physics "Enrico Fermi" Varenna, ITALY.

August 2008: "Synchrotron Radiation & its application in physical science", Stanford-Berkeley Summer school.

EXPERIMENTAL TOOLS

- High pressure techniques
- Cryogenic techniques,
- Raman and infrared spectroscopy
- Neutron and X-ray diffraction
- X-ray Raman spectroscopy
- EXAFS
- X-ray absorption spectroscopy