

ROSTISLAV HRUBIAK

(curriculum vitae)

PRESENT POSITION

August 2012 – present Postdoctoral researcher – Center for the Study of Matter at
Extreme Conditions (CeSMEC)
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PERSONAL

Citizenship: U.S.

EDUCATION

2012 **Ph.D., Materials Science and Engineering**
Florida International University, Miami
Thesis advisor: Surendra K. Saxena
Thesis: Exploring Thermal and Mechanical Properties of
Selected Transition Metals Under Extreme Conditions:
Experiments at High Pressures and High Temperatures
URL: <http://digitalcommons.fiu.edu/etd/696/>

2007 **B.S., Electrical Engineering, Cum Laude**
Florida International University, Miami
Specialization: Communication Systems
Minor: Mathematics

RESEARCH

Florida International University, Department of Materials Science and Engineering
Graduate Research Assistant Fall 2011 – Summer 2012
Dissertation Research Fellow Spring 2011 – Summer 2011
Graduate Research Assistant Fall 2007; Summer 2008 - Fall 2010
Undergraduate research Spring 2006 - Spring 2007
Assistant

TEACHING

Florida International University, Department of Materials Science and Engineering
Teaching Assistant and Spring 2008. Mechanics and Material Science: Introduction to
Laboratory Instructor measurements of basic mechanical properties of materials.
Experiments including tension, bending, torsion, fatigue, buckling,
strain, and stress visualization

PROCEDURAL EXPERIENCE

- X-Ray Diffraction and crystallography. Synchrotron x-ray diffraction experience at Advanced Photon Source and Cornell High Energy Synchrotron Source.
- Optical spectroscopy techniques: Raman spectroscopy, thermally activated fluorescence spectroscopy. Extensive experience with design and installation of laboratory optical systems with lasers, spectroscopy and imaging.
- Experience with optical and scanning electron microscopy, focused ion beam technique and micro-fabrication.
- Operation of high temperature and high pressure equipment; laser heating and external resistive heating in combination with high pressure devices.
- Electronic and computer automation of experimental setups. Proficient in: LabView, microcontroller

- programming, C, C++, BASIC, Visual Basic, Matlab, HTML, PHP, JavaScript, SQL
- Chemical thermodynamics modeling of materials at high pressure and temperature using the CALPHAD approach. Experience with ChemSage and FactSage calculations, experimental data assessment, optimization and database creation.
- Density Functional Theory calculations using VASP, Castep and Quantum Espresso. Computational crystal structure prediction for bulk materials, surfaces and nano clusters using an evolutionary algorithm i.e. USPEX.

PUBLICATIONS

1. S. Saxena, **R. Hrubciak**. (2013) Mapping the Nebular Condensates and the Chemical Composition of the Terrestrial Planets. *Earth and Planetary Science Letters*, (submitted, in review)
2. S. Saxena, **R. Hrubciak**, V. Drozd, A. Belonoshko, P. Shi, and G. Eriksson. (2013) Thermodynamics of the C-H-O fluid at extreme conditions, *Earth and Planetary Science Letters*, (submitted, in review)
3. Duzynska, **R. Hrubciak**, V. Drozd, H. Teisseyre, W. Paszkowicz, A. Reszka, A. Kaminska, A. Durygin, S. Saxena, J.D. Fidelus, J. Grabis, C.J. Monty, A. Suchocki. (2012) The high-pressure structural properties of ZnO bulk and nano crystals. *High Pressure Research* (32), 354-363.
4. **R. Hrubciak**, V. Drozd, Ali Karbasi, and S. K. Saxena. (2012) High P-T structure and P-V-T equation of state of Hafnium (111). *Journal of Applied Physics*
5. Karbasi, S. K. Saxena, **R. Hrubciak**. (2011) Thermodynamics of several elements at high pressures. *CALPHAD: Computer Coupling of Phase Diagrams and Thermochemistry* (35), 72-81.
6. L. George, **R. Hrubciak**, K. Rajan, S. K. Saxena. (2009) Principal component analysis on properties of binary and ternary hydrides and a comparison of metal versus metal hydride properties. *Journal of Alloys and Compounds* (478), 731-735.
7. **R. Hrubciak**, L. George, S. K. Saxena, K. Rajan. (2009) A Materials Database for Exploring Material Properties, *Journal of Materials (JOM)* (61), 59-62.

SELECTED CONFERENCE PRESENTATIONS

- March-April 2013. *C-H-O-S fluids in Earth's interior. (Poster presentations)*, Study of Matter at Extreme Conditions, SMEC 2013 meeting, Eastern Caribbean.
- February 2012. *Hafnium at high pressures and temperatures. (Poster presentation)*. Stewardship Science Academic Alliances (SSAA) Symposium, Washington, DC.
- June 2011. *High P-T structure and P-V-T equation of state of Hafnium. (Short talk and poster)*. Consortium for Materials Properties Research in Earth Sciences (COMPRES) Annual Meeting, Williamsburg, VA
- March-April 2011. *High P-T phases and P-V-T equation of state of Hafnium / Thermal conductivity of zirconium at high pressure and temperature in a laser heated DAC / High pressure X-Ray diffraction study of SrVO₃ and CaVO₃ perovskite oxides. (Three poster presentations)*, Study of Matter at Extreme Conditions, SMEC 2011 meeting, Belize and Mexico.
- February 2011. *Measuring thermal conductivity of materials under high temperatures and pressures in a laser heated diamond anvil cell. (Poster presentation)*, Advanced School on the New Developments in Field of Synchrotron Radiation School, Brazilian Synchrotron Light Laboratory (LNLS), Campinas, SP, Brazil
- December 2010. *Measuring thermal conductivity of materials under high temperatures and pressures in a laser heated diamond anvil cell. (Poster presentation)*, American Geophysical Union, AGU 2010 Fall Meeting, San Francisco, CA.
- September 2010. *2-D Radiometric temperature measurement technique for Laser Heated Diamond Anvil Cell. (Poster)*, Short Course: Synchrotron X-Ray Methods in High Pressure Research, High Pressure Collaborative Access Team (HPCAT) and Carnegie-DOE Alliance Center (CDAC), Advanced Photon Source, Argonne National Laboratory, Argonne IL
- June 2010. *Investigation of the effect of stress and other factors on melting point determination in a laser heated diamond anvil cell, application to Iron. (Short talk and poster)*. Consortium for Materials Properties Research in Earth Sciences (COMPRES) 2010 Annual Meeting, Stevenson WA.
- January 2010. *Study of high pressure and high temperature thermo-physical properties of materials by means of laser heating and radiometric temperature distribution measurement. (Poster)*, Stewardship Science Academic Alliances Program Symposium, Washington DC.
- December 2009. *Study of high pressure and high temperature thermo-physical properties of materials by means of laser heating and radiometric temperature distribution measurement. (Poster)*, Laser Heating the DAC:

Where we are and where we are going workshop. Lawrence Berkeley National Laboratory, Berkeley
February 2009. *Measurement of high-temperature thermal conductivity of materials using heat transfer analysis of the temperature gradient of a laser heated surface. (Poster)*, Carnegie/DOE Alliance Center (CDAC) winter workshop, Chicago.
January 2008. *High temperature thermo-physical property measurement using laser spot heating and inverse heat conduction analysis. (Poster)*, Stewardship Science Academic Alliances Program Symposium, Washington DC.
August 2007. *Data Science on Materials*. International Materials Institute student workshop, Tokyo, Japan.

FELLOWSHIPS, INDIVIDUAL GRANTS AND AWARDS

June 2011. Travel grant to attend the FIB/SEM training session at the FIB/SEM lab of the Geophysical Laboratory. Jointly supported by COMPRES and the Geophysical Laboratory of Washington. Washington DC.
June 2011. Travel Scholarship to attend the 2011 Annual Meeting of COMPRES in Williamsburg, VA
January 2011. Advanced School on The New Developments in Field of Synchrotron Radiation School, Student Travel Grant, Brazilian Synchrotron Light Laboratory (LNLS), Campinas, SP, Brazil
December 2010. COMPRES (Consortium for Materials Properties Research in Earth Sciences), travel grant to attend the Lujan Workshop on Neutron Scattering in UC Berkeley.
October 2010. Dissertation Evidence Acquisition (DEA) Fellowship, awarded by University Graduate School for Spring 2011 and Summer 2011.
September 2010. HPCAT/CDAC Student Travel Grant to attend the Short Course on High Pressure Synchrotron Techniques in Advanced Photon Source, Argonne National Laboratory, IL
June 2010. Travel Scholarship to attend the 2010 Annual Meeting of COMPRES in Stevenson, WA

WORKSHOPS ATTENDED

- DN-NSM 2011. International workshop. Discovery of Novel Nanoparticles Surfaces and bulk Materials: evolutionary structure prediction using the USPEX code. Poitiers, France. June 26 – July 1, 2011
- FIB/SEM training session at the FIB/SEM lab of the Geophysical Laboratory. June 2011
- Lujan Workshop on Neutron Scattering in UC Berkeley. December 2010
- HPCAT/CDAC Short Course on High Pressure Synchrotron Techniques. Advanced Photon Source, Argonne National Laboratory. September 15-18, 2010
- Facility for the Analysis of Chemical Thermodynamics (F*A*C*T) Workshop, Montreal, Canada. May 12 – 14, 2008

SERVICE

The Consortium for Materials Properties Research in Earth Sciences (COMPRES)
Student and postdoc committee member, 2011-2013

The Center for the Study of Matter at Extreme Conditions (CeSMEC) and High Pressure Science Society of America (HiPSSA)

Conference organization committee	Study of Matter at Extreme Conditions: SMEC2011 International Conference, March 2011
	Study of Matter at Extreme Conditions: SMEC2009 International Conference, March 2009

SCIENTIFIC SOCIETIES AND PROFESSIONAL MEMBERSHIPS

ACerS - The American Ceramic Society
AGU - American Geophysical Union
AIST - Association for Iron & Steel Technology
ASM International - The Materials Information Society
GS - Geochemical Society
TMS - The Minerals, Metals and Materials Society