

Biological Engineering

MIT Wicked Good Bio Lab
BioEng.mit.edu

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SUMMARY:

A Biological Engineering Ph.D. with a solid background in PK/PD and ADME models. Highly capable of performing in silico PK/PD analysis and drug ADME-Tox studies. Proven track record of publishing significant research papers in the area of drug development and bioengineering. Strong ability to collaborate and work on interdisciplinary research projects

EDUCATION:

Ph. D. Biological Engineering, Cornell University, Ithaca, NY December 2012

M. S. Biological Engineering, Cornell University, Ithaca, NY December 2011

B. E. Bioengineering, Zhejiang University, Hangzhou City, China June 2007

SKILLS:

- **Pharmacology:** Pharmacokinetic, Pharmacodynamic, PBPK, Human GI Tract, IVIVC
- **In Silico Analysis:** Phoenix WinNonlin, GastroPlus, MATLAB, SimBiology, Python, Excel
- **ADME-Tox Assays:** Intestinal Absorption, Drug Transporters, Cytochrome P450, LDH
- **Analytical Chemistry:** HPLC, Mass Spectrometry, Spectrophotometer
- **Cell Culture:** Bacterial Culture, 2D and 3D Mammalian Cell Culture, Tissue Culture
- **Other:** Biomaterials, Microfluidics, RT-PCR, Confocal Microscope, Bioreactor, Fermentation

EXPERIENCE:

Massachusetts Institute of Technology, Postdoctoral Associate in Translational Systems Pharmacology
June 2013 – Present

- Performing PK/PD/TK modeling and analysis for DARPA/NIH/FDA Microphysiological Systems Program
- Led project team that developed PBPK models for in-vitro in-vivo translation
- Providing expertise for developing human GI component for Microphysiological Systems
- Collaborating with interdisciplinary scientists from MIT, Northeastern University and Charles Stark Draper Laboratory and providing research updates every six weeks

Cornell University, Postdoctoral Research Associate 2012- June 2013

- Investigated the potential of using in vitro 3D human small intestine model for drug ADME and pharmacokinetic studies

Cornell University, Research Assistant 2007 - 2012

- Developed the fabrication technique of the mold with precise shape and density of human small intestinal villi and invented the first in vitro 3D human small intestine model
- Performed in vitro drug ADME-Tox studies on permeable membrane and 3D intestine model
- Demonstrated improved drug permeability correlation using the 3D small intestine model
- Cultured and differentiated various intestinal epithelial cells including Caco-2, HT-29MTX and
- Trained and led the new postdoctoral researcher for making artificial human small intestine
- Collaborated with Children's Hospital of Pittsburgh of UPMC to investigate the use of artificial small intestine for treating short bowel syndrome

Zhejiang University, Undergraduate Research Assistant 2006 - 2007

- Selected S-adenosylmethionine (SAM) accumulating yeast by UV mutation and optimized SAM fermentation
- Set up an anaerobic bacteria culture system for acrylic acid/butyric acid fermentation

HONORS AND AWARDS

- 2012: Paper on using 3D human small intestine model for in vitro drug permeability assay was featured as the **Spotlight** in *Biotechnology and Bioengineering*, chosen as the **Editors' Choice**
- 2011: Paper on 3D hydrogel villous scaffold was featured in *Nature* and *Los Angeles Times*.
- 2005: Zhejiang university outstanding student award, excellent academic record award
- 2004: Zhejiang university art activity award

PUBLICATIONS:

- **BioEng**, S. Ping, D. Lou, J. C. April, In vitro 3D human small intestinal villous model for drug permeability determination. *Biotechnology and Bioengineering* 109, 2173 (2012)
- **BioEng**, R. L. Career, J. C. April, L. G. Griff, 3D human small intestine models for ADME-Tox studies. *Drug Discovery Today*, in review (2014)
- **BioEng**, C. M. Cost, J. C. April, Synthetic small intestines for studying intestinal function and hostmicrobial interactions. *Medical & Biological Engineering & Computing*, in press (2013)
- J. H. Sang*, **BioEng***, D. Lou, M. L. Shucks, J. C. April, Microscale 3-D hydrogel scaffold for biomimetic gastrointestinal (GI) tract model. *Lab on a Chip* 11, 389 (2011). (***These authors contributed equally**)
- M. B. Bach, J. H. Sang, J. Lang, C. You, **BioEng**, J. C. April, M. L. Shucks, on chip porous polymer membranes for integration of gastrointestinal tract epithelium with microfluidic 'body-on-a-chip' devices. *Biomedical Microdevices*, 14, 895 (2012).
- C. M. Cost, H. JayLo, S. Shaft, **BioEng**, D. J. Hack, J. C. April, Synthetic small intestinal scaffolds for improved studies of intestinal differentiation. *Biotechnology and Bioengineering*, accepted (2014).

PATENT:

- J. C. April, **BioEng**, J. H. Sung. "Biomimetic Tissue Scaffold and Methods of Making and Using Same", *International Patent Application PCT/US2011/041746, United States Patent Application* 20130157360.

PRESENTATIONS:

- **BioEng**, and J. C., "In vitro 3D human small intestinal model for drug permeability determination", The Hammer Institutes for Health Sciences, May, 2013.
- **BioEng**, and J. C. April, "Recreating 3D human small intestine villus model in vitro", Third Annual BEE Research Symposium, February, 2011.
- **BioEng**, and J. C. April, "Towards an in vitro intestine: Developing 3D epithelial cell culture", ACS National Meeting, spring 2010.

OTHER EXPERIENCE:

- PREPARE Orientation Van Driver, Cornell International Students and Scholars Office, 2012
- Club member, Cornell Graduate Consulting Club (CGCC), 2012
- Lead guitar player, rock band Turbo 2004-2006 Viola player, Zhejiang University Wenqin Symphony Orchestra

A highly motivated PhD in Chemical Engineering with over 3 years experience in R&D labs targeted towards the biopharmaceutical industry. Extensive experience in biomaterial work including material fabrication, biochemical analysis, material characterization, and cell culture. Strong ability to collaborate and work in a team environment on multi-disciplinary projects along with experience accomplishing established milestones. Excellent technical, analytical, and communication skills demonstrated through publication and presentation track record.

ACADEMIC RESEARCH EXPERIENCE

Massachusetts Institute of Technology, Department of Biological Engineering, Cambridge, MA 2012 - Present
Post-Doctoral Associate

- Collaborated in a multidisciplinary team between MIT, Draper Laboratories, and Northwestern University to develop a microfluidic platform to culture female reproductive organ tissues to recapitulate real-time hormonal fluctuations in vitro
- Lead collaboration with the University of Illinois to develop patterned hydrogel scaffolds fabricated on commercially available filters with stereolithography for post-seeding liver cells in a bioreactor to improve drug testing. Hydrogel scaffolds were coupled to filters such that they withstood shipping, sterilization, and perfused culture using chemical techniques that were non-toxic to cells
- Engineered hydrogel scaffolds with covalently tethered biofunctional peptide ligands for investigating breast cancer metastasis to the liver using human liver cells in collaboration with the University of Pittsburgh
- Successfully aided in generating frequent research report updates for biomaterials advances pertaining to established milestones for NIH NCATS and DARPA funding
- Supervised and worked closely with undergraduates, graduate students, and technicians on multiple projects

Northwestern University, Department of Chemical Engineering, Chicago, IL Feb 2012 – June 2012
Post-Doctoral Associate

- Developed a method to fabricate microfluidic hydrogels for islet transplantation to treat diabetes
- Worked closely with and taught techniques to surgeons and graduate students to transfer project

Northwestern University, Department of Chemical Engineering, Evanston, IL 2006 – 2012
Graduate Research Assistant

- Led project team that performed surgical implantation of hydrogels subcutaneously and in the spinal cord of rodents to assess the ability to deliver gene therapy vectors from macroporous and patterned hydrogels
- Engineered an implantable hydrogel with controlled gene delivery by modulating chemical and physical characteristics to localize and prolong gene delivery for broad regenerative medicine applications
- Applied patterning techniques using soft and photolithography to fabricate patterned, cell-degradable hydrogels that directed the regeneration of primary neurons using gene delivery for eventual application in spinal cord regeneration
- Authored numerous general laboratory protocols for fabricating, handling, and analyzing hydrogels for tissue engineering applications
- Developed new inter-campus lab ordering system for the laboratory that improved the organization and ease of ordering laboratory materials and equipment
- Served as the laboratory's radiation safety officer and tissue culture trainer, and autoclaved materials for the laboratory needed for sterile use

University of South Florida, Department of Chemical Engineering, Tampa, FL 2004 – 2006
NSF Research Experience for Undergraduates Fellow

- Developed a portable sensor for measuring the presence of sodium halides in aqueous solutions by modifying a quartz crystal microbalance with ultra-thin layers of a thermo-responsive hydrogel
- Interfaced laboratory equipment with computer software for automatic data collection under supervision of a graduate student
- Mentored new undergraduate researchers

EDUCATION

Northwestern University, Evanston, IL 2006 - 2012
Ph.D., Chemical and Biological Engineering
• Chemical Engineering Distinguished Researcher of the Year Runner-up 2011

University of South Florida, Tampa, FL 2000 - 2006
B.S., Chemical Engineering and B.A., Mathematics
• *Summa Cum Laude* with Honors
• Minors in Biomedical Engineering and Biomedical Physics

CORE COMPETENCIES

Technical: Design, planning, execution, troubleshooting, documentation, and analysis of experiments, collaboration in multidisciplinary teams, author scientific publications, present at national conferences, strong interpersonal skills, and excellent organizational skills

Laboratory: Animal surgery, autoclave, biomaterial fabrication, bioreactor operation, chemical assays, cloning, DNA extraction, ELISA, histology, imaging, immunoassays, isolation of primary cells, mammalian cell culture, microscopy, molecular biology, photolithography, radioactivity, rheometry and virus production

Computer: JMP Statistical Software Adobe Photoshop ImageJ, KaleidaGraph, MATLAB, M/S Office, Minitab

SERVICE, LEADERSHIP, AND ACTIVITIES

Northwestern University, Evanston, IL

- Chicago Biomedical Consortium Scholar Captain 2010 - 2011
- Member of Graduate Student Committee for Faculty Recruiting 2009 - 2010
- Research Mentor for 9 Undergraduates from various departments and universities 2007 - 2014
- Teacher's Assistant 2007 - 2011

University of South Florida, Tampa, FL

- Vice President of Florida Gamma Chapter of Tau Beta Pi Engineering Honors Society 2004 - 2006

ACADEMIC AWARDS, HONORS, AND CERTIFICATES

- Constance Campbell Research Award Winner for poster presentation 2014
- Kellogg School of Management: Management for Scientists and Engineers Certificate 2011
- Chicago Biomedical Consortium Scholar 2009 - 2011
- NSF Graduate Research Fellowship Honorable Mention 2007
- Passed the NCEES Fundamentals of Engineering (FE/EIT) Exam 2006

SELECTED PUBLICATIONS

1. **ChemEng**, R. Ramon, V. Chang, M.G. Roads, M.S.B. Rare, R.L. Dryer, J.J. Vela, R. Bash, P. T. Gammond, L.G. Briffith, "Photopatterning of hydrogel scaffolds coupled to filter materials using stereolithography for perfused 3D culture of hepatocytes", to be submitted June 2014.
2. M.R. Ebrahimka, **ChemEng**, M.S.B. Rare, D.J. Hugs, L.G. Briffith, "Bioreactor technologies to support liver function in vitro", *Advanced Drug Delivery Reviews* 2014, in press.
3. S.K. Seids, R.M. Bower, **ChemEng**, L.D. Sheat, "Hydrogels for lentiviral gene delivery" *Expert Opinion on Drug Delivery* 2013, 10: 499-509.
4. **ChemEng**, F.R. Brani, A.G. Badman, T.D. Goss, S. Shining, L.D. Sheat, "Macroporosity prolongs transgene expression to enhance angiogenesis within hydrogels", *Biomaterials* 2012,
5. **ChemEng**, A.C. Sevens, S.J. Holly, C.E. Chang, A. Shikan, L.D. Shea, "Hydrogel design for supporting neurite outgrowth and promoting gene delivery to maximize neurite extension", *Biotechnology and Bioengineering* 2012, 109: 830-839.

INORGANIC CHEMIST

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Office: (617) 452-2222, mobile: (915) 274-2742, Inorgchem@mit.edu

SUMMARY:

Accomplished inorganic chemist with extensive experience on the synthesis, characterization, and handling of air sensitive compounds including pyrophoric chemicals and novel coordination complexes with magnetic and conducting properties. Strong ability to collaborate and work in a team environment on multi-disciplinary projects.

EDUCATION

- **Ph.D. Inorganic Chemistry**, Texas A&M University, College Station, TX, 2004 – 2010. GPA 3.7/4.0.
- **M.S. Inorganic Chemistry**, University of Texas at El Paso, El Paso, TX, 2002 – 2004. GPA 4.0/4.0.
- **B.S. Chemical Engineering**, University of Guadalajara, Mexico, 1997 – 2002. GPA 3.7/4.0.

TECHNICAL SKILLS

- Proficient in the synthesis of coordination complexes, organic ligands, and supramolecular ensembles.
- Expertise in multi nuclear NMR, IR, Raman, SQUID, EPR, and TGA.
- Highly skilled in structure determination by single crystal X-ray diffraction.
- Competent in the use of SEM, TEM, X-ray powder diffractometers, CG-MS, and XPS.
- Familiar with the use of four probe method for conductivity studies, voltammetry techniques, and UV-Vis spectroscopy of soluble compounds.
- Excellent presentation and leadership skills.

EXPERIENCE

Massachusetts Institute of Technology Cambridge, MA

2010 – present

Postdoctoral Associate

- Developed a method to stabilize reactive peroxide dianion (O₂²⁻) via molecular recognition with the use of hexacarboxamide cryptands.
- Investigated new methods for the synthesis of monometallic Co(II)-cryptand complexes with an open coordination site and hydrogen bonding motifs for the study of small molecule activation.
- Collaborated with Bosch engineering team on a joint project involving the use of additives to improve the performance of Li-Air batteries.

Texas A&M University College Station, TX

2004 – 2009

Research Assistant

- Led project team that discovered new highly conductive semiconductors based on 3D coordination polymers of Cu(I) ions and organic radicals of tetracyanoquinodimethane (TCNQ) derivatives.
- Discovered new types of magnetic materials based on lanthanide and divalent first row transition metal ions bridged by organic radicals of TCNQ derivatives.
- Collaborated with European scientists on an awarded proposal for the study of molecular magnets.

Teaching Experience

- Led recitations for undergraduate chemistry labs including General Chemistry I and II
- Mentored two graduate students which led to publishable results.

University of Texas at El Paso El Paso, TX

2002 – 2004

Research Assistant

- Investigated the anion dependence and single-crystal to single-crystal phase transformations of hydrogen bonded networks of mononuclear bis[N-(4-pyridyl)benzamide] silver (I) complexes.

Teaching Experience

- Led recitations for freshman chemistry labs, mentored one undergraduate student.

PUBLICATIONS

- Inorgchem**, H. Zhao, D. Zhao, H.-C. Zhou, J. P. Riebenspies, K. R. Dunbar, Dalton Trans. 2013, 42, 54–57. “A porous Sm(III) coordination nanotube with hydrophobic and hydrophilic channels” Full text
- Inorgchem**, D. J. Graham, R. McGuire, G. E. Alliger, Y. Shao-Horn, C. C. Cummins, D. G. Nocera, Science 2012, 335, 450–453. “Reversible Reduction of Oxygen to Peroxide Facilitated by Molecular Recognition” Full text
- Inorgchem**, H. Zhao, A. Ota, A. V. Prosvirin, E. W. Reinheimer, K. R. Dunbar, Adv. Mater. 2010, 22, 986–989. “Unprecedented Binary Semiconductors Based on TCNQ: Single Crystal X-ray Studies and Physical Properties of Cu(TCNQX₂) X = Cl, Br” Full text
- Inorgchem**, H. Zhao, A. V. Prosvirin, W. Wernsdorfer, K. R. Dunbar, Dalton Trans., 2010, 39, 4341–4352. “A Homologous Heterospin Series of Mononuclear Lanthanide/TCNQF₄ Organic Radical Complexes” Full text
- Inorgchem**, A. V. Prosvirin, H. Zhao, W. Wernsdorfer, K. R. Dunbar, Chem. Eur. J. 2009, 15, 11390–11400. “Heterospin Single-Molecule Magnets Based on Terbium Ions and TCNQF₄ Radicals: Interplay Between Single-Molecule Magnet and Phonon Bottleneck Phenomena Investigated by Dilution Studies” Full text
- Inorgchem**, H. Zhao, A. V. Prosvirin, A. Chouai, M. Shatruk, K. R. Dunbar, Chem. Commun., 2007, 4611–4613. “Conversion of a Porous Material Based on a Mn(II)-TCNQF₄ Honeycomb Net to a Molecular Magnet Upon Desolvation” Full text
- P. S. Mukherjee, **Inorgchem**, A. M. Arif, F. Cervantes-Lee, J. C. Noveron, Chem. Commun., 2007, 1433–1435. “Single-crystal to Single-crystal Phase Transitions of bis(N-phenylisonicotinamide) silver(I) Nitrate Reveal Cooperativity Properties in Porous Molecular Materials” Full text
- H. Zhao, **Inorgchem**, A. V. Prosvirin, H. T. Chifotides, K. R. Dunbar, Dalton Trans., 2007, 878–888. “Lanthanide-3d Cyanometalate Chains Ln(III)-M(III) (Ln = Pr, Nd, Sm, Eu, Gd, Tb; M = Fe) with the Tridentate Ligand 2,4,6-tri (2-pyridyl)-1,3,5-triazine (tptz): Evidence of Ferromagnetic Interactions for the Sm(III)-M(III) Compounds (M = Fe, Cr).” Full text
- Inorgchem**, T. E. Vos, A. M. Arif, W. W. Shum, J. C. Noveron, J. S. Miller, Inorg. Chem. 2006, 45, 4325–4327. “Structure and Magnetic Properties of a Hydroxo-Bridged Copper(II) Distorted Cubane Stabilized via Supramolecular Hydrogen Bonding with an Ionic Hexafluoroacetylacetonate” Full text

AWARDS AND HONORS

- Phi Lambda Upsilon Travel Award to attend the 11th International Conference on Molecule-based Magnets (ICMM). Convitto della Calza, Florence, Italy, 2008.
- Graduate Student Research and Presentation Grant from the Office of Graduate Studies at Texas A&M University to attend the 11th ICMM Conference.
- Free registration grant from the ICMM Scientific Committee to attend the 11th ICMM Conference.
- B. S. Chemical Engineering with Honors, University of Guadalajara, Mexico, 2002.

ADDITIONAL INFORMATION: Currently holding a TN visa status, can renew without the need of a sponsor

Electrical Engineering

(333) 234-5678 | EE@mit.edu | <http://www.linkedin.com/pub/EE>

SUMMARY

Highly motivated PhD in Electrical Engineering with over 3 years experience in power system transients investigation and 2 years experience in NMR technology application. Extensive knowledge in electromagnetic field analysis, signal processing, evolutionary algorithms, mathematical modeling and programming. Strong ability to collaborate and work in a team environment on multi-disciplinary projects as well as work independently. Excellent technical, analytical, and communication skills. Highly passionate about acquiring new scientific skills.

ACADEMIC RESEARCH EXPERIENCE

Massachusetts Institute of Technology, Department of Chemistry, Cambridge, MA 2014 - present

Post-Doctoral Fellow

- Collaborated in a project of lipid membrane cubic phase investigation, applied solid-state NMR techniques to distinguish membrane lipids of different phases
- Built the mathematically model of membrane lipids in cubic phase, and simulated the distinct chemical shift anisotropy lineshape of a hypothetical quasi-static cubic lipid sample

Iowa State University, Department of Chemistry, Ames, Iowa

2012 - 2014

Post-Doctoral Research Associate

- Led team in a project of an automatically resonance assignment algorithm design for interpreting solid state NMR spectra
- Developed a Fortran program that can obtain all the possible assignment results, and a post-processing Matlab program that can analyze the results and give the most possible result based on the statistical analysis
- Modified the NSGA-II algorithm and improve its performance and successfully kept the results out of the local optimum trap

Tsinghua University, Department of Electrical Engineering, Beijing, China

2009 - 2011

Post-Doctoral Research Associate

- Lead in a project of transient overvoltage condition analysis for reactors in Low Voltage Ride Through (LVRT) test system of a wind power system, which was supported by China Electric Power Research Institute
- Simulated and investigated the electromagnetic resonance in power transformers with different structures, analyzed the natural frequencies of the transformers and oscillation mode shapes which represent a voltage distribution pattern that could possibly be induced in the coils
- Supervised the project of power switch transients investigation for graduate students
- Collaborated in a project of the magnetic field computation of amorphous wires

Tsinghua University, Department of Electrical Engineering, Beijing, China

2004 - 2009

Graduate Research Assistant

- Built the model of power systems and power transformers using Matlab, Fortran, PSCAD and EMTP
- Computed the transient voltage in power system and estimated its effect on transformers
- Developed a digital filter design project and designed a cooperative co-evolutionary genetic algorithm to obtain the optimum solution

Nanjing University, School of Electronic Science and Engineering, Nanjing, China

2003 - 2004

Undergraduate Research Program

- Collaborated in a project of adaptive noise cancelling headset design, and took charge of the part of algorithm design
- Implemented the adaptive noise control algorithm into a DSP board, and did simulation and real-scale experiments to prove its efficiency

EDUCATION

Tsinghua University, Beijing, China, 2004–2009***Ph.D. Electrical Engineering***

- Dissertation: Study on the Modeling of Large Power Transformer Windings for Very Fast Transient Simulations
- Advisor: ZZZ, Ph.D.
- Coursework: Advanced Numerical Analysis, Digital Signal Processing, Circuit and Systems, Modern Communications for Power System, Statistical Processing of Random Signal, Modern Control Theory, Evolutionary Computation and Its Applications

Nanjing University, Nanjing, China, 2000–2004***B.S. Acoustics***

- Class rank: 1/55
- Senior project: Adaptive noise control (ANC) algorithms and its application in headset design
- Advisor: XYZ, Ph.D.

SERVICES & ACTIVITIES

- Reviewer of Journals: IET Signal Processing; IEEE trans. on Power Delivery; IEEE trans. on Industrial Electronics from 2008
- Teaching assistant on Principles of Electronic Circuits 2007-2008
- Social practice in Changzhou Toshiba Transformer Company 2006
- Volunteering in Beijing Stars and Rain School for autistic children 2006-2007

HONORS & AWARDS

- Excellent doctoral degree dissertation of Tsinghua University 2009
- Integrated scholarship of Tsinghua University for academic achievement 2004-2005, 2006-2008
- Advanced individuals in social practice of Tsinghua University 2006
- The first-class Samsung scholarship for academic achievement 2002
- Outstanding students in Nanjing University 2001-2002
- The first-class people's scholarship of Nanjing University for academic achievement 2000-2003

TECHNICAL SKILLS

- Programming: Matlab, Python, Fortran, Visual C++
- Electromagnetic transient simulation: EMTP, PSCAD, ANSOFT
- Algorithms: Evolutionary Algorithms, Monte Carlo simulation, digital signal processing
- Application: Microsoft office (Word, Excel, Powerpoint, etc.), Adobe Illustrator

SELECTED PUBLICATIONS

1. EE, K.J. Fritz, and Gong. Resonance Assignment of Disordered Proteins Using a Multi-Objective Non-Dominated Sorting Genetic Algorithm. *J. Biomol. NMR*, Nov 2013, 57(3): 281-296.
2. K. J. Fritz, EE, K. Schmall, and Gong, "Practical Use of Chemical Shift Databases for Protein Solid-State NMR: 2D Chemical Shift Maps and Amino-Acid Assignment with Secondary-Structure Information", *J. Biomol. NMR*, 2013, 56: 155-167.
3. EE, Z. Wing. Broadband Frequency Response Analysis of Transformer Windings. *IEEE trans. on Dielectrics and Electrical Insulation*, 2012, 5(19): 1782-1790.
4. EE, Z. Wing, X. Cat, Z. D. Wong. Improved Lumped Parameter Model for Transformer Fast Transient Simulations. *IET Electrical Power Applications*, July 2011, 5(6): 479-485.
5. EE, X. Yuo. Cooperative coevolutionary genetic algorithm for digital IIR filter design. *IEEE Trans. on Industrial Electronics*, 2007, 54(3): 1311-1318.

Environmental Physics

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RESEARCH SUMMARY

Developed methodologies for combining different remote sensing and geophysical data for better tracking Earth's hydrological cycle. Utilized high resolution SAR and LiDAR data to monitor effect of water bodies on SMAP radar 3 km resolution near real-time soil moisture and vegetation level estimates. Using Big Data for precision agriculture, data assimilation techniques. Ability to collaborate in fast-paced lab environments on multi-disciplinary projects.

EDUCATION

Bremen University, Germany 2008
Institute of Environmental Physics, Dept. of Physics and Electrical Engineering,
PhD in microwave remote sensing Thesis title: "Polarimetric Remote Sensing of Land and Snow/Ice Covers with the Spaceborne Microwave Radiometer WindSat",
Masters of Science in Physics Goa University, specialization in Electromagnetics 2001
IIT Bombay Post-graduation courses in Digital Signal Processing and Advance Programming 2003
Bachelor of Science in Physics, St. Xavier's College, Goa University India 1999
Grade: "First Class"

Professional Certificate Courses:

1. "Tackling the Challenges of Big Data", MIT April 2014.
2. "Build a SAR Radar System", MIT (certificate to be received in July 2014).
3. Participated in "Teaching Certificate Program", MIT, 2014.

PROFESSIONAL EXPERIENCE

Post-Doctoral Associate & Research Affiliate, MIT, JPL April 2011 - Present

- A new "robust snap-shot radar only algorithm" developed to provide near-real time soil moisture estimates, while maintaining its agreement with complex electromagnetic theories
- Developed new course module on Big Data for CEE department at MIT
- Led project team that developed an algorithm for combining active and passive observations for better estimating mountainous snow using nine years of QuickScat and AMSR-E datasets.

Post-Doctoral Research Assoc., CCNY, New York, USA 2009

- Member of multi-disciplinary team that assessed and refined NASA's AMSR-E snow water equivalent (SWE) product distributed by NSIDC.
- Collaborated with engineers to develop Modules for inverse HUT snow emission and backscatter models in IDL and MATLAB.
- Working with ASTER and MODIS images for vegetation mapping.

Research Associate/PhD student at Institute of Environmental Physics (IUP), University of Bremen, Germany 2006 –2009

- Polarimetric emission from land snow/ice and sea ice using WindSat observations.
- Investigations over Arctic were carried out in collaboration with Danish Meteorological Institute and studies over Antarctica were carried out in collaboration with Center of Microwave Physics, CNR, Florence Italy.

Visiting Scientist at Hydrology and Remote Sensing Laboratory, USDA, MD 2004 - 2006

- Developed WindSat data analysis and polarimetric studies conducted over different land covers.
- Member of lab team that participated in SMEX05/POLEX, a calibration/validation soil moisture experiment of WindSat in agricultural fields of Iowa, U.S.

Research Associate & Masters Student at Microwave Remote Sensing Lab., CSRE Indian Institute of Technology Bombay, India 2001-2004

- Utilized SAR Interferometry technique for digital elevation model (DEM), differential interferometry for studying surface deformation due to earthquake and atmospheric effects on SAR Interferometry using ERS 1/2 datasets.
- Post-launch calibration of MSMR radiometer onboard IRS-P4 satellite 1999-2001
- Teaching assistant for GIS tools, e.g. ArcGIS and Erdas for windows and ENVI for Linux platforms.

Selected Awards and Honors 2002-2012

- Recipient of Big Data fellowship: Developing new course on big data for CEE Dept. MIT;
- Invited Speaker: IIT Bombay, Indian Society of Remote Sensing (2013 & 2011);
- NSF proposal reviewer, 2012; Recognition for outstanding research work: CCNY, NY 2009;
- International Travel Award: IUP Bremen Germany 2006;
- Best paper awards at international symposium organized by Snow and Avalanche Center, 2004; Young Physicist Honor: Young Physicist Colloquium, Kolkata India 2002 (only 11 students were selected across India).

Selected Publications

(Peer Reviewed)

Paper's to be submitted

1. **Envphysics**, Darel Enter, Seung Kit and Eni Nuko "A robust algorithm for soil moisture retrieval using L-band radar observations", IEEE TGRS, under review.
2. **Envphysics**, G. Vent, M. Stash, P. Pander, "Combining active and passive microwave observations for improving snow parameters estimation over mountainous terrain, to be submitted to IEEE, TGRS, to be submitted.
3. **Envphysics** and Darel Enter "Radar-only soil moisture estimation using Aquarius observations", IEEE TGRS, to be submitted.
4. **Envphysics**, Seung Kit, Darel Enter and Peggy O'Leary "Radar soil moisture estimates from high resolution airborne UAVSAR and ground based ComRAD Observations", IEEE TGRS, to be submitted

Published papers

1. **Envphysics**, Thomas Jack, Raj Blind, Li Liu, George Hester and Peter Glass, "Observations of land surface passive polarimetry with the WindSat instrument," IEEE Tran. Geosci. Remote Sen. vol 45, pp 2019-2028, 2007.
2. **Envphysics**, George Hester, Thomas Jack, Raj Blind, Giovanni Maravelli and Justin Noth, "Passive polarimetric microwave signatures observed over Antarctica", IEEE, Tran. Geosci. Remote Sen. vol 48, pp 1059-1075, 2010.

Other Publications

9 first authors, 3 conferences papers

Material Science & Engineering

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SUMMARY

- Over 10 years research and industry experience in semiconductor, photonic, optoelectronic materials and devices
- Research featured multiple times in *Nature Photonics*, *Science Daily*, *Global Solar Technology*, *MIT News*, etc.
- Proficient with electronic/photonic/optoelectronic device design, simulation, fabrication and characterization
- Expertise with materials characterization: structural, electrical, optical, and magnetic properties
- Rich experience in proposal writing and successful multiple research funding applications
- Excellent communication, teamwork and leadership skills demonstrated through multi-disciplinary projects
- Work authorization: U.S. citizen

EDUCATION

Massachusetts Institute of Technology (MIT), Cambridge, MA, USA

12/2007

Ph.D., Materials Science & Engineering

- Major: Electronic, Photonic and Magnetic Materials
- Thesis: "High Efficiency Thin Film Si Solar Cells with Novel Light Trapping: Principle, Design and Processing", under the supervision of Prof. XYZ
- Minor: Management Science, Sloan School of Management

University of Science and Technology, Beijing, China

- M.S., Materials Physics and Chemistry
- B.S., Materials Physics

03/2001

07/1998

TECHNICAL SKILLS

- **Device design:** discrete and integrated crystalline/thin film III-V compound semiconductor, Si and Ge solar cells on a Si platform, light emitting diodes, infrared detector arrays, high reliability diodes, and structural color
- **Process and device simulation:** Silvaco, Rsoft, Omnisim and MATLAB
- **Device fabrication:** extensive processing experience of microelectronic and microphotonic devices in class 10 cleanroom using thin film deposition by LPCVD, PECVD, sputtering, e-beam evaporation and MBE; multi-level lithography with contact aligner, stepper, electron beam direct writing and multi-beam interference; RIE and wet chemical etching; diffusion, ion implantation, oxidation and RTA
- **Materials and device characterization:** X-ray Diffraction, SEM, TEM, AFM, XPS, profilometer, UV-Vis-NIR spectrophotometer, photoconductance decay, I-V, C-V, responsivity

ACADEMIC EXPERIENCE

Microphotronics Center, MIT, Cambridge, MA, USA

08/2010-present

Postdoctoral Associate

- Led a multi-disciplinary team from Masdar Institute of Science and Technology, UAE and MIT: designed, simulated and fabricated high efficiency Si-substrate-based III-V compound semiconductor parallel multijunction solar cells for spectrum splitting and concentrating photovoltaics (PV), gaining 21% efficiency compared to tandem junction; designed high efficiency solar to electric energy conversion system through PV/thermal cogeneration, increasing system efficiency by 24% compared to PV-only system
- Member of a team that designed, fabricated and characterized high extraction efficiency GaAs light emitting diodes with self-assembled photonic crystals via anodized aluminum oxide template
- Designed resonant cavity enhanced multi-spectral infrared detector arrays and presented to a review committee consisting of Draper Laboratory and MIT experts
- Additional experience in structural color design and fabrication, visible low level light detector with arrayed architecture, infrared low level light detector at high operating temperature
- Successfully drafted multiple proposals for research funding applications
- Advised and worked closely with graduate students on multiple projects

Department of Materials Science and Engineering, MIT, Cambridge, MA, USA

09/2001-12/2007

Research Assistant

- Invented textured photonic crystal (TPC) back reflector combining reflection grating and wide stopband, near-unity reflectivity photonic crystal for light trapping in thin film solar cells, enhancing cell efficiency by more than 50%
- Verified the substantial efficiency enhancement capability of TPC by fabrication and characterization of silicon-on-insulator thin film solar cells integrated with TPC back reflector
- Investigated integrating magnetic materials with semiconductors, and improved understanding of spin dynamics in GaAs-based spin transistors for spintronics applications

Department of Materials Science and Engineering, MIT, Cambridge, MA, USA**Teaching Assistant, "Photonic Materials and Devices"**

Spring 2002, 2006, 2007

- Held office hours, graded problem sets and exams, guided design projects
- Coordinated class administration for MIT, Singapore and Harvard graduate students

Teaching Assistant, "Principles of Engineering Practice"

Spring 2011

- Taught lab components of the course to MIT undergraduates, graded lab and project reports
- Focused on developing students' teamwork and engineering leadership skills

National Magnetism Lab, Institute of Physics, Chinese Academy of Sciences, Beijing, China

09/1999—06/2001

Research Assistant

- Developed an optimal processing technique for NiMn thin films to achieve the strongest magnetic exchange coupling in spin valve structures for high density magnetic recording

INDUSTRY EXPERIENCE**Sensitron Semiconductor, Inc. , Deer Park, NY, USA**

01/2008-11/2009

Senior Design Engineer

- Developed new products: designed, fabricated, and tested prototypes of various high reliability power electronics for space, military and medical applications; interacted closely with device packaging personnel; developed new fabrication processes; coordinated fabrication support personnel; oversaw quality control
- Performed failure analysis and troubleshooting of different high reliability diodes: increased the yield of high voltage diodes from 20% to 95%, and transient voltage suppression diodes from 0% to 85%

PATENTS

- Y. Yi, MSE, X. Duan, and L. C. Kimerling, *Light Trapping in Thin Film Solar Cells Using Textured Photonic Crystal*, US patent No. 7482532B2, granted Jan. 27, 2009.
- A. Agarwal, B. Albert, MSE, X. Sheng, J. Hu, J. Cheng, J. Liu, J. Michel, and L. C. Kimerling, *Methods and Apparatus for Concentrating Photovoltaics*, US Patent Application No. 13/651,140, filed 10/14/2012.

MEDIA FEATURES

- Research reported by **MIT News Office** (Nov. 26, 2008), **Science Daily**, **Nano Technology**, **Global Solar Technology**, and other media as a significant breakthrough to boost solar cell efficiency
- Research featured in Oct. 5, 2006 issue of **Nature Photonics** Research Highlights
- Talk reported as **Meeting Highlight News** at **2005 Spring MRS meeting** in San Francisco

MAJOR HONORS

- Best Paper Award nomination at 2012 fall Materials Research Society (MRS) meeting 2012
- Paper (APL, **93**, 221105 (2008)) rated as most downloaded in the past 5 years 2012
- Martin Fellowship for Environment and Sustainability, MIT 2006-2007
- Multiple-time invited reviewer for Progress in Photovoltaics: Research and Applications, Optics Express, Applied Physics B: Lasers and Optics, and Applied Physics Letters

LEADERSHIP

- Dorm Coordinator/Treasurer/Scheduling Chair, MIT graduate dorm-Tang Hall 2004-2007
- Vice President/Board Member, MIT Chinese Association of Sci.& Tech. 2002-2007

Mechanical Engineer

1177 Mass Ave. • Cambridge, MA 02139 • Phone: 617-111-2222 • Email: mecheng.edu

SUMMARY

Extensive experience with applying analytical and numerical methods (such as the finite element method) to model a broad range of systems from molecular structures to large-scale mechanical structures. Proven track record of creating and improving new computational methods to perform dynamic and static analysis of otherwise intractable engineering and biological systems. Strong ability to collaborate and work in a team environment on multi-disciplinary projects. Legally authorized to work in the United States (Green Card holder).

EDUCATION

Massachusetts Institute of Technology (MIT), Cambridge, MA, USA 2011
Ph.D., Department of Mechanical Engineering.

- Thesis: "Contributions to the analysis of proteins" under the supervision of Prof. Jones and Prof. Smith
- GPA: 5.0/5.0 (Awarded an A+ grade for all courses. Only one or two people in each course get A+.)

Sharif University of Technology, Tehran, IRAN 2005
M.Sc., Department of Mechanical Engineering.

- Thesis: "Online control of needle injection into soft tissue using the finite element method"
- GPA: 18.62/20.0 (Ranked in top 5%)

University of Tehran, Tehran, IRAN 2003
B.Sc., Department of Mechanical Engineering.

- GPA: 17.68/20.0 (Class Rank: 2)

SKILLS

- **Computer:** Commercial finite element software programs: ADINA (founded and owned by my Ph.D. and postdoctoral advisor, Prof. KJ Bathe), ABAQUS, ANSYS; MeshLab (a mesh processing program); MATLAB; Fortran; AutoCAD; molecular viewers: PyMOL, VMD, UCSF Chimera; CHARMM (a molecular dynamics program); Adobe Illustrator.
- **Analytical:** Finite element method; optimization; stochastic simulation: Langevin and Brownian dynamics simulation; statistical analysis; multi-scale modeling; atomistic modeling; continuum modeling; bioinformatics; biomechanics; computational biology; molecular biology; biophysics; solid mechanics; fluid mechanics; controls.
- **Language:** English (fluent); Persian (native); Arabic (basic).

EXPERIENCE

Department of Mechanical Engineering, MIT, Cambridge, MA, USA Oct. 2011–current
Postdoctoral Associate

- Led project team that developed a coarse-grained finite element framework for the Brownian dynamics of macromolecular proteins that are inaccessible to available molecular dynamics algorithms.
- Created a model to calculate the diffusion coefficients and Brownian dynamics of DNA origami structures as part of a project in collaboration with researchers from MIT, Harvard, University of Michigan, Arizona State University, and Max Planck Institute. No other models are currently available.
- Member of team that developed a coarse-grained three-dimensional hydrodynamic model of semi-flexible filaments that resulted in several orders-of-magnitude reduction in computational cost.
- Collaborated with other engineers to improve a well-known implicit time-integration scheme that is widely used in engineering problems and in numerous commercial software tools. The improved version of the scheme has already been implemented in ADINA.

Department of Mechanical Engineering, MIT, Cambridge, MA, USA Jan. 2007–Jun. 2011
Research Assistant

- Improved a widely used eigenvalue solver to substantially reduce the computational cost of calculating the eigen-solutions of large-scale engineering and bioengineering systems. The improved version of the eigenvalue solver is currently used in ADINA.
- Made novel discoveries into the shape and function of complex proteins, the results of which have been included in comprehensive government and research databases (such as the Protein Data Bank) and utilized by leading research companies.
- Developed a coarse-grained finite element framework for the diffusion coefficients of proteins.

Department of Mechanical Engineering, MIT, Cambridge, MA, USA Fall 2007, Fall 2008, Fall 2010
Teaching Assistant, "Finite Element Analysis of Solids and Fluids I" & "Mechanics and Materials I"

- Prepared and presented lectures and recitations, supported term projects, helped students with course materials, and graded homework and

Department of Mechanical and Aerospace Engineering, Ohio State University, Columbus, OH, USA Fall 2006
Teaching Assistant, "Thermodynamics I"

- Contributed to designing experiments for a new thermodynamics laboratory.

ITCEN Co. (Industrial & Technical Consulting Engineers Company), Tehran, IRAN Mar. 2006–Sept. 2006
Senior Engineer

- Designed the layout of production lines for a pipe manufacturer.

Department of Mechanical Engineering, Sharif University of Technology, Tehran, IRAN Sept. 2003–Dec. 2005
Research Assistant

- Performed compression tests on bovine liver and characterized its material properties using the genetic algorithm and the finite element method. Developed an algorithm to obtain the optimal path initiation for the needle insertion into bovine liver for biopsy and brachytherapy purposes.

SAPCO Co. (Supplying Automotive Parts Company), Tehran, IRAN Summer 2001; Summer 2002
Intern

- Analyzed newly designed and produced automotive parts using mechanical tests such as Engine Test, Material Strength Test, etc.

HONORS AND AWARDS

MIT Outstanding Graduate Student Institute Award (2010). This award was given to the top two graduate students at the Department of Mechanical Engineering at MIT. The department has more than 500 graduate students; **NSF Fellowship for the GEM4-2010 program** (2010); **Highly Distinguished Student of University of Tehran** (1999–2003): A student who is in top 0.05% (out of ~500,000 applicants) in the nation-wide university entrance exam and his/her semester GPAs are above 17 out of 20.

JOURNAL PUBLICATIONS

Mech Eng et al., "Three-dimensional implicit hydrodynamic model of semi-flexible filaments", *in preparation*.

Mech Eng et al., "Diffusion coefficients of DNA origami structures", *in preparation*.

Mech Eng et al., "Brownian dynamics simulation of DNA origami structures", *in preparation*.

Mech Eng et al., "A finite element framework for Brownian dynamics simulation of proteins", *in preparation*.

Mech Eng, A. A. Fedorov, E. V. Fedorov, S. Ono, F. Matsumura, S. C. Almo, & M. Bathe, "Structure, evolutionary conservation, and conformational dynamics of Homo sapiens fascin-1, an F-actin crosslinking protein", *Journal of Molecular Biology*, 400 (2010), pp. 589-604.

Mech Eng, M. T. Ahmadian, & F. Janabi-Sharifi, "Modeling, simulation, and optimal initiation planning for needle insertion into the liver", *Journal of Biomechanical Engineering-Transactions of the ASME*, 132 (2010), p. 041001 (11 pages).

Mech Eng, M. Bathe, & K. J. Bathe, "The subspace iteration method in protein normal mode analysis", *Journal of Computational Chemistry*, 31 (2010), pp. 66-74.

M. T. Ahmadian, **Mech Eng**, & R. Abdollahpour, "A nonlinear viscoelastic modeling of brain and CSF deformation under tumor expansion", *International Journal of Scientific Research*, 16 (2006), pp. 425-428.

M. T. Ahmadian, **Mech Eng**, R. Abdollahpour, S. Sharifi Sedeh, & K. Navi, "Application of car active suspension in vertical acceleration reduction of vehicle due to road excitation and its effect on human health", *International Journal of Scientific Research*, 16 (2006), pp. 429-434.

M. T. Ahmadian, R. Abdollahpour, & **Mech Eng**, "Effect of tumor location and its growth on stress distribution in the brain", *International Journal of Scientific Research*, 16 (2006), pp. 523-527.

OTHER PUBLICATIONS

3 first-author journal abstracts; 14 conference papers.

ACTIVITIES

- **Sports:** Soccer; table tennis; swimming; hiking; mountain climbing.
- **Music:** Singing.

Physics PhD

Postdoctoral Researcher

69 Chestnut St, Cambridge, MA 02111 • 617-716-6177 • physicsphd@mit.edu

SUMMARY

Physicist researcher with extensive experience in solid state physics, microfabrication and characterization, Raman spectroscopy, CVD and laboratory research. Excellent researcher with proven ability to resolve problems independently and actively contribute to the research projects goals. Possess a proven publication track record and a good standard of written and oral communication. Strong ability to interact and collaborate in a team environment on multi-disciplinary projects in a constructive, creative and professional manner. Passionate about learning scientific skills and experienced in managing multiple projects simultaneously.

EDUCATION

Universidade Federal de Minas Gerais, Belo Horizonte, Brazil 2008-2012
Ph.D., Solid State Physics.

- Thesis: Using inelastic scattering of light to understand the nature of electron-phonon interactions and phonon self-energy renormalizations in graphene materials.
- Obs: one year at **Massachusetts Institute of Technology** – Cambridge, MA – as visiting student.

Universidade Federal de Minas Gerais, Belo Horizonte, Brazil 2007-2008
M.S., Physics.

- Dissertation: Phonon dispersion around the Dirac point of monolayer graphene by Raman spectroscopy.

Universidade Federal de Minas Gerais, Belo Horizonte, Brazil 2003-2006
B.S., Physics.

EXPERIENCE

Massachusetts Institute of Technology (MIT) – Dep. of Electrical Engineering & Computer Science
Postdoctoral researcher Dec 2012-current

- Led multi-disciplinary effort that implemented the electrochemical delamination process of transfer in the lab. This method is now used to recycle CVD metal substrates used in the growth, lowering substantially production costs.
- Expanded the well-known growth of graphene using CVD method on Cu foil now to Ni single crystal substrate.
- Collaborated with researchers from Lam Research to plan and execute plasma-enhanced CVD growth and characterization of graphene experiments in corporation. Conducted conference calls to discuss and share results.
- Optimized the production of large amount of electrochemically exfoliated graphene and Bi_2Te_3 for aerogel fabrication in a team environment.

Universidade Federal de Minas Gerais, Department of Physics, Brazil Mar. 2006-Sep. 2012
Researcher

- Device fabrication for electronic, vibrational and electron-phonon interactions characterizations in graphene by IxV curves, back gate and top gate measurements and Raman spectroscopy.
- Introduced the electrochemically top gated graphene devices using polymer electrolyte in the physics department. The method is now used to achieve high dopage in graphene.
- Member of lab team that investigated fundamental properties of carbon materials used Raman spectroscopy. During this, had to perform alignment of the spectrometer, dye lasers and optical setups.

Universidade Federal de Minas Gerais, Department of Physics, Brazil Aug. 2009- Jul. 2010
Teacher, "Mechanics and Thermodynamics"

- Responsible for teaching and evaluated undergrad laboratory classes.

Santa Casa hospital and Belo Horizonte hospital, Belo Horizonte, Brazil

Apr. 2009- Nov.2009

Radiotherapy physicist trainee

- Worked together with the main radiotherapist physicist to plan the radiotherapy treatment to the patients according to the doctor prescriptions.
- Performed maintenance and safety of radiotherapy equipment.

Universidade Federal de Minas Gerais, Department of Physics, Brazil

Mar. 2004- Dec. 2005

Researcher

- Investigated the formation of color centers in citrine and green-gold quartz irradiated with Gamma rays by paramagnetic resonance (EPR) and absorption spectroscopy.
- Studied the doping effect of metals in silicon nanoparticles grown by sol-gel.

SKILLS

- **Experimental expertise:** Device fabrication, lithography, CVD (thermal and plasma enhanced), AFM, ALD, PVD, SEM, clean rooms and safety procedures, dry and wet etch, polymer electrolytes, aerogel.
- **Optics and Spectroscopy:** Raman, absorption.
- **Theory and computer:** Group theory, OriginLab, Microsoft Office, DesignCAD.
- **Language:** English (fluent); Portuguese (native).

SELECTED PUBLICATIONS: (full list on demand)

- Aral, P. T.; Frank, O'Brien, L.; **PhysicsPhD.**; Fat, W.; Koll, J.; Dressel, M. S.; Itchbac, M. *In-situ* Raman spectroelectrochemistry of isotopically labeled AB stacked bilayer graphene: mass-related symmetry breaking and phonon self-energy renormalization. *Nature Scientific Reports* **3**, 2061 (2013).
- **PhysicsPhD.**; Koll, J.; Satan, K.; Sat, R.; Dressel, M. S.; Aral, P. T. Using the G' Raman cross-section to understand the phonon dynamics in bilayer graphene systems. *Nano Letters* **12**, 2883 (2012).
- Aral, P. T.; **PhysicsPhD.**; Satan, K.; Sat, R.; Kong, J.; Dressel, M. S. . Unraveling the interlayer-related phonon self-energy renormalization in bilayer graphene. *Nature Scientific Reports* **2**, 1017 (2012).
- Aral, P. T.*; **PhysicsPhD.***; Satan, K.; Sat, R.; Kong, J.; Dressel, M. S. Phonon self-energy corrections to non-zero wavevector phonon modes in single-layer graphene. *Physical Review Letters* **109**, 046801 (2012). *Those authors contributed equally for this work.
- **PhysicsPhD.**; Koll, J.; Satan, K.; Sat, R.; Dressel, M. S.; Aral, P. T. . Using gate-modulated Raman scattering and electron-phonon interactions to probe single-layer graphene: A different approach to assign phonon combination modes. *Physical Review B, Condensed Matter and Materials Physics* **86**, 195434 (2012).
- **PhysicsPhD.**; Gravel, P.; Malarduck, L.M.; Borga, R.S.; Silver, G.G.; Leo, J.A.; Plenty, F.; Maui, F.; Pimento, M.A. Characterizing intrinsic charges in top gated bilayer graphene device by Raman spectroscopy. *Carbon* **50**, 3435 (2012).

HONORS AND FELLOWSHIPS

The manuscript "PHYSICAL REVIEW B 86, 195434 (2012)" awarded as an editor's suggestion in the journal Physical Review B, American Physical Society – APS 2012. Postdoctoral Research Fellowship from CNPq, Brazil (2012). Poster Award - Honorific Mention, Materials Research Society – MRS (2010). PhD Fellowship from CNPQ, Brazil (2008). Masters Fellowship from CNPQ, Brazil (2007).

INTERESTS

Photography, rock climbing, pilates, skiing.