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## BIOGRAPHICAL SKETCH

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NAME Camata, Renato Penha	POSITION TITLE Associate Professor of Physics		
eRA COMMONS USER NAME			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of São Paulo, Brazil	B.S.	1990	Physics
University of São Paulo, Brazil	M.S.	1992	Condensed Matter Physics
California Institute of Technology	M.S.	1995	Applied Physics
California Institute of Technology	Ph.D.	1998	Applied Physics
RIKEN - The Institute of Physical and Chemical Research, Japan	Postdoc	1998-1999	Materials Science
University of São Paulo, Brazil	Postdoc	1999-2000	Materials Physics

### A. Positions and Honors.

#### Positions and Employment

1988-1989 Research Intern, University of São Paulo, Brazil  
1989-1990 Research Intern, Pirelli Co., Research Center, São Paulo, Brazil  
1990-1992 Research Assistant, University of São Paulo, Brazil  
1992 Instructor, São Paulo School of Engineering (FESP), Brazil  
1992-1997 Research Assistant, California Institute of Technology  
1996-1997 Teaching Assistant, California Institute of Technology  
1997-1999 Postdoctoral Associate, Institute of Physical and Chemical Research, Japan  
1999-2000 Postdoctoral Associate, University of São Paulo, Brazil  
1999-2000 Instructor, University of São Paulo, Brazil  
2000-2007 Assistant Professor, Dept. of Physics, University of Alabama at Birmingham  
2007-present Associate Professor, Dept. of Physics, University of Alabama at Birmingham

#### Other Experience and Professional Memberships

2000-present Formed the Nanomaterials Laboratory in the UAB Department of Physics which is dedicated to the creation and investigation of advanced nanostructured materials. Current research directed to fabrication and properties of nanocrystalline bioceramics for biomedical applications.  
2000-present Thesis Advisor of 5 doctoral students  
Directed research efforts of 3 M.S. students, 15 undergraduates, and 23 high school students  
2005-present Member UAB Center for Optical Sensors and Spectroscopies (COSS) An effort to develop nanocrystalline and nanocomposite materials exhibiting optical phenomena for laser source and sensor media to probe and analyze dangerous chemical and biological agents. Funded by NSF/EPSCoR.  
2007-present Member UAB Center for Nanoscale Materials and Biointegration (CNMB)  
2007-present Member UAB BioMatrix Engineering and Regenerative Medicine Center (BERM)  
1997-present Refereeing Activities: Applied Physics Letters, Journal of Physics D, Physica Status Solidi, Journal of Colloidal & Interface Sciences, Aerosol Science & Technology, Industrial & Engineering Chemistry Research, Plasma Processes and Polymers, Oceanologia, NSF, ACS, MRS, U.S. Civilian Research & Development Foundation, OK Center for Advancement of Science & Technology.

#### Honors

1996 Charles Lee Powell Foundation Graduate Fellowship  
1997 Japan Science & Technology Agency Postdoctoral Fellowship  
2002 Birmingham City Schools Service to Education Award  
2007 UAB President's Award for Excellence in Teaching

## B. Selected peer-reviewed publications (in chronological order).

(Publications selected from 29 peer-reviewed publications)

1. L. M. R. Scolfaro, **R. P. Camata**, J. M. V. Martins, J. R. Leite, "Influence of electric fields in the Si delta-doped GaAs self-consistent potential profile," *Superlattices and Microstructures*, **12** (2), 203 (1992).
2. H. A. Atwater, K. J. Vahala, R. C. Flagan, **R. P. Camata**, R. B. Lee, K. V. Shcheglov, C. S. Tsai, C. M. Yang; "Group III-V and group IV quantum dot synthesis," in *Low Dimensional Structures prepared by Epitaxial Growth or Regrowth on Patterned Substrates*, 69-80, Kluwer Academic Publishers (1995).
3. **R. P. Camata**, H. A. Atwater, K. J. Vahala, R. C. Flagan; "Size classification of silicon nanocrystals," *Applied Physics Letters* **68**, 3162 (1996).
4. **R. P. Camata**, M. Hirasawa, K. Okuyama, K. Takeuchi; "Low pressure DMA studies of laser ablation aerosols," *Journal of Aerosol Science* **29**, S529 (1998).
5. K. S. Seol, **R. P. Camata**, and K. Takeuchi, "Study on the formation of silicon nanoparticles during laser ablation using a low-pressure differential mobility analyzer," *Journal of Aerosol Science* **30**, S467 (1999).
6. **R. P. Camata**, M. Hirasawa, K. Okuyama, and K. Takeuchi; "Observation of aerosol formation during laser ablation using a low-pressure differential mobility analyzer," *Journal Aerosol Science* **31**, 391-401 (2000).
7. K. S. Seol, Y. Tsutatani, **R. P. Camata**, J. Yabumoto, S. Isomura, Y. Okada, K. Okuyama, and K. Takeuchi; "A differential mobility analyzer and a Faraday cup electrometer for operation at 200-930 Pa Pressure," *Journal of Aerosol Science* **31**, 1389-1395 (2000).
8. **R. P. Camata**, H. A. Atwater, and R. C. Flagan; "Space charge effects in nanoparticle processing using the differential mobility analyzer," *Journal of Aerosol Science* **32**, 583-599 (2001).
9. H. Kim, Y. K. Vohra, **R. P. Camata**, and W. R. Lacefield; "Mechanical properties of pulsed laser-deposited hydroxyapatite thin films for applications in biomedical implants," in *Surface Engineering 2002: Synthesis, Characterization and Applications*. (Mater. Res. Soc. Symp. Proc. vol. **750**, A. Kumar, W.J. Meng, Y-T. Cheng, J. Zabinski, G.L. Doll, S. Veprek, editors (2003), 71-76 (ISBN: 1-55899-687-7).
10. H. Kim, **R. P. Camata**, Y. K. Vohra, and W. R. Lacefield; "Control of phase composition in hydroxyapatite/tetracalcium phosphate biphasic thin coatings for biomedical applications," *Journal of Materials Science: Materials in Medicine* **16**, 961-966 (2005).
11. H. Kim, Y. K. Vohra, P. J. Louis, W. R. Lacefield, J. E. Lemons, and **R. P. Camata**; "Biphasic and Preferentially Oriented Microcrystalline Calcium Phosphate Coatings: In-vitro and In-vivo Studies," *Key Engineering Materials* **284-286**, 207-210, (2005).
12. S. Brown, H. Kim, **R. P. Camata**, "A Hybrid Laser/Aerosol Method for the Synthesis of Porous Nanostructured Calcium Phosphate Materials for Bone Tissue Engineering Applications," in *Nanoscale Materials Science in Biology and Medicine*, edited by Cato T. Laurencin and Edward A. Botchwey (Mater. Res. Soc. Symp. Proc. **845**, Warrendale, PA, 2005), AA5.35.
13. H. Kim, **R. P. Camata**, S. Lee, G. S. Rohrer, A. D. Rollett, S. L. Bellis, Y. K. Vohra "Calcium Phosphate Bioceramics With Tailored Crystallographic Texture For Controlling Cell Adhesion" in *Mechanotransduction and Engineered Cell-Surface Interactions*, edited by M. P. Sheetz, J. T. Groves, D. Discher (Mater. Res. Soc. Symp. Proc. **925E**, Warrendale, PA, 2006), BB.2.7.
14. H. Kim, **R. P. Camata**, S. Lee, G. S. Rohrer, A. D. Rollett, Y. K. Vohra "Crystallographic Texture in Pulsed Laser Deposited Hydroxyapatite Bioceramic Coatings," *Acta Materialia*, **55**, 131- 139 (2007).
15. M. Bulut and **R. P. Camata**, "A Generalized Cell Method for Hard Disk Molecular Dynamics Simulation of Polydisperse Systems," *Int. J. Mod. Phys. C* **18**, 1407-1416 (2007).
16. J. E. Williams, **R. P. Camata**, V. V. Fedorov, and S. Mirov, "Pulsed Laser Deposition of Chromium-doped Zinc Selenide Thin Films for Mid-Infrared Applications," *Appl. Phys. A* **91**, 333-335 (2008).
17. J. M. Anderson, M. Kushwaha, A. Tambralli, S. L. Bellis, **R. P. Camata**, H. Jun "Osteogenic differentiation of human mesenchymal stem cells directed by extracellular matrix-mimicking ligands in a biomimetic self-assembled peptide amphiphile nanomatrix," *Biomacromolecules (in press)* Published online September 11, 2009 (DOI: 10.1021/bm9007452).

## C. Research Support

### Ongoing Research Support

ECS-0901376      Mirov (PI)      6/01/09-5/31/12  
NSF/ Division of Electrical, Communications and Cyber Systems

*“New class of broadly tunable middle infrared electrically pumped solid state lasers”*

This on-going grant supports the creation of nanostructured wide-bandgap materials doped with transition metal ions for electrically pumped mid-infrared laser sources.

Role: Co-PI

### Pending Research Support

DMR-0960129      Camata (PI)      1/1/10-12/31/11

NSF/Division of Materials Research

*“MRI-R<sup>2</sup>: Development of a Molecular Beam Epitaxy System for the Fabrication of Doped Nanostructured Mid-Infrared Laser Materials”*

This grant is for the development of a molecular beam epitaxy system to expand the fabrication capabilities of the Department of Physics at UAB in the area of mid-infrared materials.

Role: PI

NA      Mirov (PI)      4/01/09-11/30/10

Photonics Innovation, Inc.

*“High power broadly tunable middle-infrared laser sources”*

This grant will support the creation of bulk binary and ternary wide-bandgap materials doped with transition metal ions for high-power mid-infrared laser sources.

Role: Co-PI

### Completed Research Support

ECS-0424310      Mirov (PI)      2/01/05-1/31/08

NSF/Electrical and Communication Systems

*“En route to broadly tunable middle-infrared optically and electrically pumpable Cr<sup>2+</sup> and Fe<sup>2+</sup> doped II-VI semiconductor lasers”*

This grant supported the creation of bulk and nanostructured wide-bandgap materials doped with transition metal ions for optically pumped mid-infrared laser sources.

Role: Co-PI

UAB/BERM 2007      Jun (PI)      05/01/07 -04/30/08

University of Alabama at Birmingham/Center for BioMatrix Engineering and Regenerative Medicine (BERM)

*“BERM: ECM Mimic Organic/Inorganic Composite Nano Matrix for Bone Tissue Regeneration”*

This on-going grant supports the development of Organic/Inorganic mimics of extra-cellular matrix by combining inorganic nanoparticles and organic molecules in novel nanostructured architectures for bone tissue engineering.

Role: Co-PI

DMR-0243640      Vohra (PI)      3/15/03-2/28/07

NSF/Division of Materials Research

*“REU Site: Regional Initiative to Promote Undergraduate Participation in Experimental and Computational Materials Research”*

This grant has supported the Research Experiences for Undergraduates (REU) site at the Department of Physics at UAB. The program includes a RET (Research Experiences for Teachers). Camata was involved in recruitment, selection, and mentoring of students and teachers in this program 2003-07. Camata continues to serve as a mentor in this program.

Role: Co-PI

DMR-0116098 Camata (PI) 09/01/01 – 2/28/05

NSF/Division of Materials Research

*“Development of a Multi-purpose Laser Deposition Facility for Research and Education in Nanostructured Materials”*

This grant led to the development of a novel laser-based deposition technique known as Nanoparticle Beam Pulsed Laser Deposition (NBPLD). Through planned collaborations the PI has enabled access to this facility by four other research groups besides his own. The research on this facility since it started operations in August 2002 has led to 1 patent application, 9 publications, 3 publications under review, and 28 conference presentations. The facility has so far been used by 6 graduate students, 8 undergraduates, 1 high school teacher. In addition, 23 high school students performed hands-on activities on this facility during Physics Career and Research Workshop in summer 2004 and 2005

Role: PI

NCC5-580 Camata (PI) 12/01/01 -7/31/04

NASA/EPSCoR

*“Novel Carbon-Based Nanostructured Materials for Low-Weight, High Strength, and High-Temperature Applications”*

This grant focused on feasibility studies on how the nanostructuring of carbon-based materials could be used in low-weight, high-strength and high-temperature aerospace applications.

Role: PI

NCC5-580 Camata (PI) 08/01/04 -1/30/07

NASA/EPSCoR

*“Anisotropy Design in Carbon-based Coatings using Nanoparticle Beams”*

This renewal of the above grant after external review led to the development of amorphous carbon films with modulated electrical properties through embedded metal nanoparticle populations.

Role: PI

UAB/FRG 2001 Camata (PI) 06/01/01 -05/31/02

University of Alabama at Birmingham/ Faculty Research Grant

*“Nanotechnology: Spatially resolved deposition of metal nanoparticle ensembles for nanomaterials engineering”*

This grant led to research in the investigation of gas phase dynamics of charged nanoparticles produced by laser ablation and in their deposition on solid substrates.

Role: PI