

Name: Julio A.N.T. Soares.

Research fields of interest and experience:

- General materials characterization with emphasis on optical methods of characterization.
- Optical spectroscopy.
- Photonic materials.

I have been involved in many aspects of materials characterization and growth (solid and gas phase MBE), in special on semiconductor epitaxial thin films and heterostructures (III-V and group IV). My main research interests cover several fields of materials fabrication and characterization. photonic materials and structures, semiconductor heterostructure-based devices and systems. I have interest in new 2D materials, soft materials for device and technological applications and biological material applications, especially as study platforms for the understanding of the fundamental physical and biological processes involved in those applications. Other areas that interest me is the application of optical methods of materials characterization in geology, archeology, food sciences, environmental sciences, to cite a few. I have considerable experience on many optical spectroscopies and imaging analysis techniques, applied to materials systems encompassing hard and soft materials, superlattices, heterostructures, superconducting structures, oxides, nitrides, and bio materials. Multi-technique characterization methods, issues involving technique development, and cross-technique analysis are of particular interest to me.

Instrumentation/core of responsibility within the MRL:

- All instruments in the Laser and Spectroscopy Facility; Malvern Zetasizer (DLS – particle characterization)

Other instruments qualified to operate:

- X-Ray reflectivity; Hysitron Triboindenter; SEM

Education:

Universidade de Sao Paulo, Sao Paulo, Brazil	Physics	B.Sc. (1990)
Universidade de Sao Paulo, Sao Paulo, Brazil	Solid State Physics	M.Sc. (1993)
Universidade de Sao Paulo, Sao Paulo, Brazil	Solid State Physics	Ph.D. (1997)

Appointments (Professional experience):

2012 - present	Senior Research Scientist, Central Research Facilities, Frederick Seitz Materials Research Laboratory, University of Illinois, Urbana, IL
2004 – 2012	Research Scientist Engineer, Frederick Seitz Materials Research Laboratory, University of Illinois, Urbana, IL
2004	Postdoctoral Associate Research Scientist, Materials Science and Engineering, University of Illinois, Urbana, IL
2002 – 2004	Postdoctoral Associate Research Scientist, Universidade de Sao Paulo, Sao Paulo, Brazil
1998 – 2002	Postdoctoral Associate Research Scientist, Materials Science and Engineering, University of Illinois, Urbana, IL

Selected publications (if applicable):

- "Hierarchically structured zirconia reinforced by hybrid graphene/alumina nanofibers", Irina Hussainova, Maria Drozdova, Domingo Pérez-Coll, Fernando Rubio-Marcos, Iwona Jasiuk, Julio A.N.T. Soares, Miguel A. Rodríguez, J. European Ceramic Society, submitted.
- ""Self-Assembled, Nanostructured, Tunable Metamaterials via Spinodal Decomposition", Chen, Zuhuang; Wang, Xi; Qi, Yajun; Yang, Sui; Soares, Julio A. N. T.; Apgar, Brent; Gao, Ran; Xu, Ruijuan; Lee, Yeonbae; Zhang, Xiang; Yao, Jie; Martin, Lane, ACS Nano, in press.
- "Barite from the Linwood Mine, Scott County, Iowa", Jared T. Freiburg, Julio A. N. T. Soares, Pingfan Hu, Rocks and Minerals 92, 18 (2017).

- “Low temperature photoluminescence spectroscopy studies on sputter deposited CdS/CdTe junctions and solar cells” Mohit Tuteja, Prakash Koirala, Julio Soares, Robert Collins, Angus Rockett., Journal of Materials Research 31, 186 (2016).
- “Introduction to Optical Characterization of Materials”, Julio A. N. T. Soares in “Practical Materials Characterization”, Ed. Mauro Sardela, Springer, New York, NY (2014).
- “Photoluminescence and Photoluminescence Excitation Spectroscopy of Cu(In,Ga)Se₂ Thin Films”, Damon N. Herbert, Julio A. N. T. Soares, and Angus A. Rockett, THIN-FILM COMPOUND SEMICONDUCTOR VOLTAICS-2009 Book Series: Materials Research Society Symposium Proceedings Volume: 1165 Pages: 93-100 (2010).
- “Synthesis of linked carbon monolayers: Films, balloons, tubes, and pleated sheets”, Mitchell J. Schultz, Xiaoyu Zhang, Sakulruk Unarunotai, Dahl-Young Khang, Qing Cao, Congjun Wang, Changhui Lei, Scott MacLaren, Julio A. N. T. Soares, Ivan Petrov, Jeffrey S. Moore, and John A. Rogers, Proceedings of the National Academy of Sciences 105, 7353 (2008).
- “Optically tuned resonant optical reflectance filter”, Fuchyi Yang, Gary Yen, Gilles Rasigade, Julio A. N. T. Soares, and Brian T. Cunningham, Applied Physics Letters 92, 091115 (2008).
- “Enhanced fluorescence emission from quantum dots on a photonic crystal surface”, Nikhil Ganeshi, Wei Zhang, Patrick C. Mathias, Edmond Chow, J. A. N. T. Soares, Viktor Malyarchuk, Adam D. Smith, Brian T. Cunningham, Nature Nanotechnology 2, 515 (2007).
- “Quantitative multispectral biosensing and 1D imaging using quasi-3D plasmonic crystals”, M. E. Stewart, N. H. Mack, V. Malyarchuk, J. A. N. T. Soares, T.-W. Lee, S. K. Gray, R. G. Nuzzo, J. A. Rogers, Proceedings of the National Academy of Sciences 103, 17143 (2006).
- “Apparatus for the imaging of infrared photoluminescence, transmittance, and phototransmittance with high spatial and spectral resolutions”, R. Furstenberg, J. A. Soares, J. O. White, Review of Scientific Instruments 77, 073101 (2006).
- “Photoluminescence of CdSe quantum dots and rods from buffer-layer-assisted growth”, V. N. Antonov, P. Swaminathan, J. A. N. T. Soares, J. S. Palmer, J. H. Weaver, Applied Physics Letters 88, 121906 (2006).
- “Cd-based II-VI semiconductor nanostructures produced by buffer-layer-assisted growth: Structural evolution and photoluminescence”, P. Swaminathan, V. N. Antonov, J. A. N. T. Soares, J. S. Palmer, J. H. Weaver, Physical Review B 73, 125430 (2006).
- “Vapor-Phase Growth and Characterization of Luminescent Silicon Layers”, E. A. de Vasconcelos, J. B. da Silva Jr., B. E. C. A. dos Santos, E. F. da Silva Jr., W. M. de Azevedo, J. A. K. Freire, J. A. N. T. Soares, J. R. Leite, Proceedings of the 27th International Conference on Physics of Semiconductors, ed. José Menéndez and Chris G. Van de Walle, Flagstaff, AZ p. 837 (2005).
- “Near band-edge optical properties of cubic GaN with and without carbon doping”, J.R.L. Fernandez, F. Cerdeira, E.A. Meneses, J.A.N.T. Soares, O.C. Noriega, J.R. Leite, D.J. As, U. Köhler, D.G.P. Salazar, D. Schikora, K. Lischka, Microelectronics Journal 35, 73 (2004)
- “Optical and x-ray diffraction studies on the incorporation of carbon as a dopant in cubic GaN”, J. R. L. Fernandez, F. Cerdeira, E. A. Meneses, and M. J. S. P. Brasil, J. A. N. T. Soares, A. M. Santos, O. C. Noriega, and J. R. Leite, D. J. As, U. Köhler, S. Potthast, and D. G. Pacheco-Salazar, Physical Review B 68, 155204 (2003).

- “Mechanism for epitaxial breakdown during low-temperature Ge(001) molecular beam epitaxy”, K. A. Bratland, Y. L. Foo, J. A. N. T. Soares, T. Spila, P. Desjardins, and J. E. Greene, *Physical Review B* 67, 125322 (2003).
- “C incorporation and segregation during Si_{1-y}Cy/Si(001) gas-source molecular beam epitaxy from Si₂H₆ and CH₃SiH₃”, Y. L. Foo, K. A. Bratland, B. Cho, J. A. N. T. Soares, P. Desjardins, and J. E. Greene, *Surface Science* 513, 475 (2002).
- “Near band-edge optical properties of cubic GaN”, J. R. L. Fernandez, O. C. Noriega, J. A. N. T. Soares, F. Cerdeira, E. A. Meneses, J. R. Leite, D. J. As, D. Schikora, and K. Lischka, *Solid State Communications* 125, 205 (2002).
- “Carbon incorporation pathways and lattice sites in Si_{1-y}Cy alloys grown on Si(001) by molecular-beam epitaxy”, S. Y. Park, J. D’Arcy-Gall, D. Gall, J. A. N. T. Soares, Y.-W. Kim, H. Kim, P. Desjardins, J. E. Greene, and S. G. Bishop, *Journal of Applied Physics* 91, 5716 (2002).
- “Temperature-modulated Si(001):As gas-source molecular beam epitaxy: Growth kinetics and As incorporation”, H. Kim, G. Glass, J. A. N. T. Soares, Y. L. Foo, P. Desjardins, and J. E. Greene, *Applied Physics Letters* 79, 3263 (2001).
- “Arsenic incorporation during Si(001):As gas-source molecular-beam epitaxy from Si₂H₆ and AsH₃ : Effects on film-growth kinetics”, H. Kim, G. Glass, J. A. N. T. Soares, P. Desjardins, and J. E. Greene, *Journal of Applied Physics* 88, 7067 (2000).
- “Arsenic-doped Si(001) gas-source molecular-beam epitaxy: Growth kinetics and transport properties”, J. A. N. T. Soares, H. Kim, G. Glass, P. Desjardins, and J. E. Greene, *Applied Physics Letters* 74, 1290 (1999).
- “Lineshape analysis of photoreflectance spectra from InGaAs/GaAs quantum wells”, N. M. S. Choque, D. Beliaev, J. A. N. T. Soares, L. M. R. Scolfaro, A. L. Sperandio, A. A. Quivy, J. R. Leite, *Superlattices and Microstructures* 26, 243 (1999).
- “Photoreflectance spectra from GaAs HEMT structures reinvestigated: Solution of an old controversy”, J. A. N. T. Soares, R. Enderlein, D. Beliaev, J. R. Leite, and M. Saito, *Semiconductor Science and Technology* 13, 1418 (1998).
- “Photoreflectance investigations of semiconductor device structures”, J. A. N. T. Soares, D. Beliaev, R. Enderlein, L. M. R. Scolfaro, M. Saito, and J. R. Leite, *Materials Science and Engineering B* 35, 267 (1995).
- “A new method for calculating photo- and electroreflectance spectra from semiconductor heterostructures”, R. Enderlein, D. Beliaev, J. A. N. T. Soares, L. M. R. Scolfaro, and J. R. Leite, *Physical Review B* 52, 2814 (1995).