

# Resume

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## Cinthia Piamonteze (PhD)

### Contact Information

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### Personal Information

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Date of birth: November 14<sup>th</sup> 1975  
Nationality: Brazil

### Education

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#### PhD in physics

**Institution:** Instituto de Física 'Gleb Wataghin', UNICAMP, Campinas, Brazil and Laboratório Nacional de Luz Síncrotron, Campinas, Brazil

**Concluded:** March 2004

**Subject:** Electronic and Structural properties of nickel oxides with perovskite structure studied by X-ray absorption spectroscopy

**Adviser:** Dr. Hélio César Nogueira Tolentino

#### MSc in physics

**Institution:** Instituto de Física 'Gleb Wataghin', UNICAMP, Campinas, Brazil.

**Concluded:** March 2000

**Subject:** Local environment of Er in a-Si:H studied by EXAFS

**Adviser:** Dr. Leandro R. Tessler

#### Graduated in physics

**Institution:** Instituto de Física 'Gleb Wataghin', UNICAMP, Campinas, Brazil

**Concluded:** December 1997

### Work Experience

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- **August 2006 until present moment**
- **Post-Doctoral fellow in Physics**
- **Institution:** Lawrence Berkeley National Laboratory, Berkeley, CA, USA.
- **Supervisor:** Dr. Elke Arenholz (earenholz@lbl.gov)
- Work developed/responsibilities:
  - Develop own research line establishing collaborations. Main interest: understanding of electronic and magnetic properties of complex oxides materials by use of X-ray Absorption Spectroscopy technique.
  - Work in different XMCD end-stations using a bending magnet and elliptically polarized undulator beamlines.
  - Give assistance to users in these different end-stations.
  - Theoretical simulations of the X-ray absorption, XMCD and RIXS spectra using atomic multiplet theory.
  
- **Nov 6<sup>th</sup>-10<sup>th</sup> 2006**
- **Visit to Utrecht University, Department of Inorganic Chemistry and Catalysis, Utrecht, Netherlands**
- **Host:** Dr. Frank de Groot (f.m.f.degroot@chem.uu.nl)
- **Research developed:** Theoretical Simulations of resonant inelastic X-ray scattering (RIXS) spectra using Charge TransferLigand Field Multiplet Theory.

- **June 2004 - July 2006**
- **Post-Doctoral fellow in Physics**
- **Institution:** **Lawrence Berkeley National Laboratory**, Berkeley, CA, USA.
- **Supervisor:** Prof. Dr. Stephen P. Cramer ([spjcramer@mac.com](mailto:spjcramer@mac.com))
- **Work developed/responsibilities:**
  - Main research: identifying the valence and spin states of transition metal centers in metalloproteins by use of XAS and XMCD techniques
  - Use of XMCD chamber equipped with a 6T super-conducting magnet and a low energy Ge fluorescence detector.
  - Use of soft X-ray fluorescence detector of high energy resolution based on the principle of super-conductor tunnel junction (STJ).
  - Participated in testing soft X-ray fluorescence detectors performance under high magnetic fields.
  - EXAFS measurements at transition metal K-edges in metalloproteins.
  - Manipulation of oxygen sensitive samples using glove box.
  - Developing better systems for sample preparation and manipulation that allow an oxygen free environment or a controlled atmosphere.
  - Theoretical simulations of X-ray spectra using multiplets theory for transition metal edges and density functional theory for ligand edges.
  
- **March 2000 – March 2004**
- **PhD in Physics**
- **Institution:** **Universidade Estadual de Campinas**, Campinas, SP, Brazil.
- **Supervisor:** Dr. Hélio César Nogueira Tolentino ([helio.tolentino@grenoble.cnrs.fr](mailto:helio.tolentino@grenoble.cnrs.fr))
- **Work developed/responsibilities:**
  - Study the temperature driven electronic metal-insulator transition exhibited by  $\text{RNiO}_3$  systems by use of X-Ray Absorption Spectroscopy.
  - Techniques employed: XAS in both soft and hard X-ray energy range.
  - Use of different beamlines, including two standard spectroscopy beamlines for hard and soft X-rays and an energy dispersive monochromator beamline in the hard X-ray range.
  - Theoretical simulations of X-ray spectra using multiplets theory. Simulations of XAS spectra at hard X-ray range by use of Feff8 software.
  - Give user support at the EXAFS beamline.
  
- **July 24<sup>TH</sup> - August 4<sup>TH</sup> 2000, August 6<sup>th</sup>-18<sup>th</sup> 2001, September 24<sup>th</sup>-28<sup>th</sup> 2001**
- **Visit to Universidad Nacional de La Plata, Departamento de Quimica de la Facultad de Ciencias Exactas – Cequinor, La Plata, Argentina**
- **Host:** Prof. Dr. Néstor E. Massa ([neemassa@gmail.com](mailto:neemassa@gmail.com))
- **Research developed:** Infrared spectroscopy (including far, mid and near IR ranges) in nickel and vanadium oxides with perovskite structure.
  
- **May 20<sup>TH</sup> - June 22<sup>ND</sup> 2002**
- **Visit to Laboratoire de Mineralogie-Cristallographie, Université Pierre et Marie Curie, Paris, France**
- **Host:** Dra. Marie-Anne Arrio ([arrio@impmc.jussieu.fr](mailto:arrio@impmc.jussieu.fr))
- **Research developed:** Simulations of X-ray absorption spectra using the Ligand Field Multiplet Theory.
  
- **June 16<sup>TH</sup> - 20<sup>th</sup> 2003**
- **Visit to Utrecht University, Department of Inorganic Chemistry and Catalysis, Utrecht, Netherlands**
- **Host:** Dr. Frank de Groot ([f.m.f.degroot@chem.uu.nl](mailto:f.m.f.degroot@chem.uu.nl))
- **Period:** June 16<sup>TH</sup>- 20<sup>th</sup> 2003
- **Institution:** Utrecht University, Department of Inorganic Chemistry and Catalysis
- **Research developed:** Simulations of Ni X-ray absorption spectra in  $\text{RNiO}_3$  systems using Ligand Field Multiplet Theory.

- **March 1998 – February 2000**
- **MSc in Physics**
- Institution: **Universidade Estadual de Campinas**, Campinas, SP, Brazil.
- Supervisor: Prof. Dr. Leandro R. Tessler ([tessler@ifi.unicamp.br](mailto:tessler@ifi.unicamp.br))
- Work developed/responsibilities:
  - Study of the local structural arrangement around erbium in erbium doped amorphous silicon samples systems by use of EXAFS.
  
- **April 19<sup>TH</sup>- May 21<sup>ST</sup> 1999**
- **ICTP, Trieste, Italy**
- *“School on Synchrotron Radiation”*

### **Invited Talks**

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*“XAS in Transition Metal Systems: from Bulk Materials to Molecules”*, April 11<sup>th</sup> 2006. Advanced Light Source, Berkeley, CA, USA

*“Structural and Electronic Studies on RNiO<sub>3</sub> systems using X-Ray Absorption Spectroscopy”*, June 18<sup>th</sup> 2003.  
Utrecht University, Department of Inorganic Chemistry and Catalysis, Utrecht, Netherlands.

*“Local environment of Er in a-Si:H”*, August 3<sup>rd</sup> 2000.  
Universidad Nacional de La Plata, Departamento de Química de la Facultad de Ciencias Exactas – Cequinor, La Plata, Argentina

### **Didactic experience**

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Assistant in the TT-MULTIPLETS course given by Frank de Groot in the Advanced Light Source, Berkeley, CA, USA, September 27<sup>th</sup>-30<sup>th</sup> 2005.

Teaching Experimental Course in Basics in Electronics for undergraduate students in UNICAMP, Campinas, Brazil, Summer/2001

Lecturer in the LNLS X-ray Absorption Course, LNLS (Brazilian Synchrotron Light Source), Campinas, Brazil in 1999, 2001, 2002

### **Language Skills**

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Portuguese (native language), English (proficient), French (communicate), Spanish (communicate), German (basic).

### **List of Publications (Reverse Chronological order)**

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Simon J. George, Robert Y Igarashi RY, Cinthia Piamonteze, Basem Soboh, Stephen P. Cramer, Luis M. Rubio *“Identification of a Mo-Fe-S cluster on NifEN by MoK-edge extended X-ray absorption fine structure”* J. Am. Chem. Soc. **129**, 3060 (2007)

Cinthia Piamonteze, Helio C. N. Tolentino, Aline Y. Ramos, *“The phase derivative method in EXAFS applied to the study of rare-earth nickel perovskites”*, Nucl. Instr. Meth, Nucl. Instr. Meth, B **246**, 151 (2006).

C. Piamonteze, F. M. F. de Groot, H. C. N. Tolentino, A. Y. Ramos, N. E. Massa, J. A. Alonso, and M. J. Martínez-Lope, *“Spin-orbit-induced mixed-spin ground state in RNiO<sub>3</sub> perovskites probed by x-ray absorption spectroscopy: Insight into the metal-to-insulator transition”* Phys. Rev. B **71**, 020406(R) (2005)

Cinthia Piamonteze, Hélio C. N. Tolentino, Aline Y. Ramos, Nestor E. Massa, Jose A. Alonso, Maria J. Martínez-Lope, and Maria T. Casais, *“Short-range charge order in RNiO<sub>3</sub> perovskites (R=Pr, Nd, Eu, Y) probed by x-ray-absorption spectroscopy”*, Phys. Rev. B **71**, 012104 (2005)

Néstor E. Massa, Cíntia Piamonteze, Hélio C. N. Tolentino, José Antonio Alonso, María Jesús Martínez-Lope, María Teresa Casais, "Phonon activity and intermediate glassy phase of  $YVO_3$ ", Phys. Rev. B **69**, 54111 (2004)

C. Piamonteze, H. C. N. Tolentino, A. Y. Ramos, N. E. Massa, J. A. Alonso, M. J. Martinez-Lope and M. T. Casais, "Evolution of Ni local structure in  $NdNiO_3$  perovskite across the metal-insulator transition", Physica Scripta **T115**, 648 (2005)

C. Piamonteze, H. C. N. Tolentino, A. Y. Ramos, N. E. Massa, J. A. Alonso, M. J. Martinez-Lope and M. T. Casais, "Local structural Distortion and Electronic Modifications in  $PrNiO_3$  across the Metal-Insulator Transition", Proceedings of 19<sup>th</sup> International Conference on X-Ray and Inner-Shell Processes, AIP Conference Proceedings 652, p.450 (2003)

Fernando P. de La Cruz, Cíntia Piamonteze, Néstor Massa, Horácio Salva, "Possible common ground for the metal-insulator phase transition in the rare-earth nickelates  $RNiO_3$  ( $R=Eu, Ho, Y$ )", Phys. Rev. B **66**, 153104 (2002)

C. Piamonteze, H. C. N. Tolentino, A. Y. Ramos, N. E. Massa, J. A. Alonso, M. J. Martinez-Lope, M. T. Casais, "Structural changes in  $RNiO_3$  perovskites ( $R =$  rare earth) across the metal-insulator transition", Physica B **320**, 71 (2002)

Cíntia Piamonteze, Hélio C.N. Tolentino, Flávio C. Vicentin, Aline Y. Ramos, Nestor E. Massa, Jose A. Alonso, Maria J. Martinez-Lope, M. T. Casais, "Electronic changes related to the metal to insulator phase transition in  $RNiO_3$ ", Surface Review Letters **9**, 1121 (2002).

Cíntia Piamonteze, Leandro R. Tessler, Hélio Tolentino, Maria do Carmo Martins Alves, Gerhard Weiser, Eugeny Terukov, "Er environment in  $a-Si:H<Er>$  prepared by PECVD", Mat. Res. Soc. Symp. Proc., **609**, A11.2.1 (2000)

Leandro R. Tessler, Cíntia Piamonteze, Ana Carola Iñiguez, Abner de Siervo, Richard Landers, and Jonder Moraes, "UPS of  $a-Si:H<Er>$ : what is the energy of Er 4f states?", Mat. Res. Soc. Symp. Proc., **609**, A11.1.1 (2000)

L. R. Tessler and C. Piamonteze, M. C. Martins Alves and H. Tolentino, "Evolution of the Er environment in  $a-Si:H$  under annealing: ion implantation versus co-deposition", J. Non-Cryst. Solids, **266-269**, 598 (2000)

Cíntia Piamonteze and Leandro R. Tessler, M. C. Martins Alves and H. Tolentino, "Environment of Er in  $a-Si:H$ : co-sputtering versus ion implantation", Braz. J. Phys., **29**, 756 (1999)

C. Piamonteze, A. C. Iñiguez, L. R. Tessler, M. C. Martins Alves and H. Tolentino, "Environment of erbium in  $a-Si:H$  and  $a-SiO_x:H$ ", Phys. Rev. Lett. **81**, 4655 (1998).

L. R. Tessler, C. Piamonteze, A. C. Iñiguez, M. C. Martins Alves and H. Tolentino, "The chemical environment of  $Er^{3+}$  in  $a-Si:Er:H$  and  $a-Si:Er:O:H$ ", Mat. Res. Soc. Proc. **524**, pp. 327-332. (1998)