

ACADEMIC, RESEARCH AND INDUSTRIAL EXPERIENCE

<i>Position Held</i>	<i>Organization</i>	<i>Department</i>	<i>Period</i>
Independent Researcher	CONICET, Argentina	LAFISO, UNT	2006-pres.
Research Associate Academic	McMaster University, Canada	Engineering Physics	2004-2006
Associate Professor	State University of Campinas (UNICAMP), Campinas, SP, Brazil	Applied Physics, Physics Inst.	2001-2004
Assistant Professor	State University of Campinas (UNICAMP), Campinas, SP, Brazil	Applied Physics, Physics Inst.	1997-2001
Associate Researcher	Conselho Nacional de Pesquisa (CNPq), Brazil	Applied Physics, Physics Inst.	1994-1997
Invited Professor	State University of Campinas (UNICAMP), Campinas, SP, Brazil	Applied Physics, Physics Inst.	1994-1997
Visiting Researcher	State University of Campinas (UNICAMP), Campinas, SP, Brazil	Applied Physics, Physics Inst.	1993-1994
Postdoctoral Fellow	McMaster University, Canada	Centre for Electrophotonic Materials and Devices	1990-1993

Highly Qualified Personnel

Name	Type of training	Years Supervised	Title of project
Iñiguez Calero, Ana Carola	Doctorate	4	<i>Study of Sputtered TiO_x Thin Films for Photoelectrochemical Applications</i>
Champi Farfán, Ana Melva	Master	2.5	<i>Pinhole Time Evolution in a-$Ge_{0.9}Si_{0.1}H$ and a-$Ge_{0.9}Si_{0.1}$ Thin Films</i>
Burmeister, Florian	Master (co-sup.)	2	<i>Bismuth doping of hydrogenated amorphous germanium</i>
Dondeo Origo, Fábio	Master (co-sup.)	3	<i>Optostructural Properties of a-Ge:H Thin Films Deposited by Ion-Beam Assisted Sputtering</i>
Luis Augusto Perles	Undergraduate	1	<i>Computer Control of IV Characteristic Measurements</i>
Fernando Rey	Undergraduate	1	<i>Computer Simulation and Study of the Foucault Pendulum</i>
Conrado Augustus de Melo	Undergraduate	1	<i>Study of Friction of Bodies on an Inclined Plane</i>
Carlos Luciano de Danieli	Undergraduate	1	<i>Screening of EM Waves by the Use of a Faraday Cage</i>
Ednilson F. da Silva	Undergraduate	1.5	<i>Visual Basic Code for Data Acquisition and Instrument Control in Photocurrent Measurements</i>

Major contributions

Ion-Solid Interactions and Ion Processing of Semiconductors: I did pioneering studies of ion channeling and ion-induced characteristic X-ray emissions in compound zinc-blende crystals (D. Comedi et al., Phys. Rev. Lett. . **61**, 2125 (1988); Phys. Rev. B **46**, 15844 (1992), radiation effects in Si particle detectors (Nucl. Instrum. Methods B **67**, 93-97 (1992)) and ion assisted growth (Journal of Non-Crystalline Solids (Part B) **266**, 713-716 (2000)).

Amorphous and microcrystalline Semiconductor Physics: My work has been of key importance to determine the doping mechanism in amorphous germanium and Ge-rich a-GeSi alloys. My expertise on the Physics of disordered semiconductors is reflected in several papers and a review article on the properties of amorphous silicon and germanium (I. Chambouleyron and D. Comedi, *Amorphous Silicon and Germanium* (Review), Encyclopedia of Materials: Science and Technology Vol. **2**, Ed. Cahn, R.W. Elsevier Science, UK, (2001), Burmeister, F., Comedi, D., Chambouleyron, I., *Bismuth Doping of Hydrogenated Amorphous Germanium Thin Films*, Thin Solid Films **515**, 242 (2006) and references therein.

Si Nanostructure Fabrication and Characterization: Significant achievements in the understanding of Si nano-crystal formation and photoexcited electron recombination processes in light-emitting substoichiometric silicon oxides and increase of luminescence efficiency (D. Comedi, et al., Appl. Phys. Lett. **87**, 213110 (2005), J. Appl. Phys. **99**, 023518 (2006); J. Vac. Sci. Technol. A **24**, 817-820 (2006); IEEE J. Sel. Top. Quantum Electron.: "Si Photonics" (In press)).

Current Submitted Projects

- 1) Coordinator in Argentina of the "New Semiconductor Nanostructures for Applications in Nanotechnology" Inter-American Collaboration in Materials Research project with teams directed by Ray LaPierre (McMaster Univ., Canada, and Yuri Pusep (USP-Sao Carlos, Brazil) for the preparation and characterization of semiconductor nanowires by the Vapor-Liquid-Solid method [submitted to CONICET (Argentina), CNPq(Brazil) and NSERC (Canada)]
- 2) Member of the responsible researchers group for the "Semiconductor Oxides with non-volatile Electric Field Memory, PICT project coordinated by Silvia Perez de Heluani (UNT, Argentina), and participation of Pablo Esquinasi (University of Leipzig, Germany) and Manuel Villafuerte (UNT, Argentina), submitted to FONCyT.
- 3) Member of the proposed *ad-hoc* association of researchers for the IP-PAE ("Multidisciplinary Applied Research in Biomimetics") coordinated by Elisa M. Colombo (UNT, Argentina), submitted to FONCyT.

Scholarships and Awards

2005-	Re-insertion Scholarship CONICET (Res. D Nº 1750) and Selection for the Researcher Career (Res. D Nº 2124), CONICET , Buenos Aires, Argentina.
2001-	Promotion to MS-5 Category , UNICAMP, Campinas, SP, Brazil.
2001-	"Livro docência" Title in Condensed Matter Physics: Electronic Structure and Electrical, Magnetic and Optical Properties, UNICAMP, Campinas, SP Brazil.
1996-2003:	Productivity in Research Scholarship (level 2B) granted by Conselho Nacional de Desenvolvimento e Pesquisa do Brasil (CNPq), Brazil. .
1994-1997:	Associated Researcher Scholarship , granted by Conselho Nacional de Desenvolvimento e Pesquisa do Brasil (CNPq), Brazil.
1993-1994:	Visiting Researcher Scholarship granted by Fundação de Amparo à Pesquisa em São Paulo (FAPESP), SP, Brazil.
1990-1993:	Post-doctoral Scholarship , McMaster University, Hamilton, Ontario, Canada.
1990:	The Miriam and Aaron Gutwirth Excellency Award Technion, Haifa, Israel.

Languages

Spanish, Portuguese, English and Hebrew (writes, reads and speaks)

Other Activities

- CNPq, Physics committee *ad-hoc* consultant, Brazil (1997-2001).
- *Humanus* Magazine, Brazil, Editorial Board (200-2003).
- PIBIC (Programa Institucional de Becas de Iniciação Científica, UNICAMP, Brasil), Reviewer (2002-2003)
- Member of the Applied Physics Department Council, IFGW, Unicamp (2001-2004).
- Applied Surface Science Journal, Regular Reviewer.
- CONICET, Physics committee consultant, Argentina.

Publications in Refereed Journals

1988-2001: 32 Publications

- 33) Santos, P.V., Zanatta, R., Dondeo, F., Trampert, A., Jahn, U., **Comedi, D.**, Pudenzi, M., Chambouleyron, I., *Pulsed Laser Crystallization and Structuring of Amorphous Germanium on GaAs*, J. Non-Cryst. Solids **299**, 137-142 (2002).
- 34) Champi, A., and **Comedi, D.**, *Study of the Pinhole Density in a-Ge:H and a-Ge_{0.9}Si_{0.1}:H Thin Films*, J. Non-Cryst. Solids **299**, 318-322 (2002).
- 35) F. Dondeo, P. V. Santos, M. Ramsteiner, **D. Comedi**, M. A. A. Pudenzi, and I. Chambouleyron., *Pulsed Laser Crystallization of SiGe alloys on GaAs*, Braz. J. Phys. **32**, 376-378 (2002).
- 36) Iñiguez, A.C., Campomanes, R.R., Tabacniks, M.H., **Comedi, D.**, *Influence of O₂ Flow Rate on Growth Rate, Composition and Structure of rf-Sputtered TiO_x Films*, Rev. Bras. Aplic. Vác. **22**, 22-24 (2003).
- 37) **Comedi, D.**, Zalloum, O.H.Y., and Mascher, P., *H-sensitive radiative recombination path in Si-nanoclusters embedded in SiO₂*, Appl. Phys. Lett. **87**, 213110 (2005) (3 pages).
- 38) **Comedi, D.**, Zalloum, O.H.Y., Irving, E.A., Wojcik, J., Roschuk, T., Flynn, M.J., and Mascher, P., *X-ray Diffraction Study of Crystalline Si Nanocluster Formation in Annealed Silicon-Rich Silicon Oxides*, J. Appl. Phys. **99**, 023518 (2006) (8 pages).
- 39) **Comedi, D.**, Zalloum, O.H.Y., Irving, E.A., Wojcik, J., and Mascher, P., *H-Induced Effects in Luminescent Silicon Nanostructures Obtained from PECVD Grown Si_yO_{1-y}:H (y>1/3) Thin Films Annealed in (Ar+5%H₂)*, J. Vac. Sci. Technol. A **24**, 817-820 (2006).
- 40) Pusep, Yu., de Giovanni Rodriguez, A., Galzerani, J.C., **Comedi, D.**, LaPierre, R.R., *Evidence of the Miniband Formation in InGaAsP/InP Superlattices*, Braz. J. Phys. **36**, 905-907(2006).
- 41) Pusep, Yu.A., de Giovanni Rodrigues, A., Galzerani, J.C., Cornet, D.M., **Comedi, D.**, LaPierre, R.R., *Miniband Effect on Optical Vibrations in Short-Period InGaAs/InP Superlattices*, Phys. Rev. B **73**, 235344 (2006) (6 pages).
- 42) Burmeister, F., **Comedi, D.**, Chambouleyron, I., *Bismuth Doping of Hydrogenated Amorphous Germanium Thin Films*, Thin Solid Films **515**, 2442-2446 (2006).
- 43) Cornet, D.M., LaPierre, R.R., Pusep, Y.A., **Comedi, D.**, *High Resolution X-Ray Diffraction Analysis of InGaAs/InP Superlattices*, J. Appl. Phys. **100**, 043518 (2006) (6 pages).
- 44) **Comedi, D.**, Zalloum, O.H.Y., Wojcik, J. and Mascher, P., *Light Emission from Hydrogenated and Unhydrogenated Si-nanocrystal/Si Dioxide Composites Based on PECVD-Grown Si-Rich Si Oxide Films*, IEEE J. Sel. Top. Quantum Electron.: "Si Photonics" (In Press).

Publications in Refereed Conference Proceedings

1988-2001: 5 Publications

- 6) Roschuk, T., **Comedi, D.**, Zalloum, O.H.Y., Irving, E.A., Wojcik, J., and Mascher, P., *Optical Properties of Nanostructures based on Silicon Rich Silicon Oxide Thin Films*, Invited paper Proc. of the 207th Electrochemical Society Meeting, Quebec city, Canada, May 15-20, 2005 (Invited).
- 7) **Comedi, D.**, Zalloum, O.H.Y., Irving, E.A., Wojcik, J., and Mascher, P., *Enhanced Photoluminescence from Nano-structured Silicon-Rich-Silicon-Oxide (SRSO) Films Fabricated*

- by ECR-PECVD and Thermally Annealed in (Ar+5% H_2), 13th Int. Conf. "Nanostructures: Physics and Technology", St Petersburg, Russia, June, 20-25, 2005.
- 8) Roschuk, T., Wojcik, J., Flynn, M., Irving, E.A., **Comedi, D.**, Zalloum, O., and Mascher, P., *A Comparison of Luminescent Silicon Nanocrystals Formed in Silicon Rich Silicon Oxide Thin Films Deposited by ECR-PECVD and ICP-CVD*, 13th Int. Conf. "Nanostructures: Physics and Technology" St Petersburg, Russia, June, 20-25, 2005.
 - 9) **D.Comedi**, M. Villafuerte, G. Juarez, and S. P. Heluani, *Structure and Electrical Properties of Reactively rf Sputtered nc-TiO_{2-δ} (-0.04 ≤ δ ≤ 0.2)*, *Thin Films, Science and Technology of Dielectrics for Active and Passive Photonic Devices*, ECS Trans. **3**, (11) 135 (2006).
 - 10) **D. Comedi**, O. H. Y. Zalloum, D. E. Blakie, J. Wojcik, and P. Mascher, *Formation of and Light Emission from Si nanocrystals Embedded in Amorphous Silicon Oxides*, *Science and Technology of Dielectrics for Active and Passive Photonic Devices* (Invited), ECS Trans. **3**, (11) 3 (2006).
 - 11) Y.A.Pusep, A. de Giovanni Rodrigues, J.C.Galzerani, D.M.Cornet, **D.M.Comedi**, R.R.LaPierre, *Miniband Effects in Short-period InGaAs/InP superlattices*, 28th Int. Conf. Phys. Semicond., July 28-28, 2006, Vienna, Austria (Accepted).

Oral and Poster Presentations at Conferences and Meetings

1988-2001: 22 presentations

- 23) X Congresso Interno de Iniciação Científica, September 25 and 26, 2002, UNICAMP, Campinas, SP, Brazil. Augustus de Melo, C., **Comedi, D.**, *Caracterização de dispositivo baseado em TiO₂ para a detecção de matéria orgânica em água* (Poster).
- 24) 20th Int. Conference on Amorphous and Microcrystalline Semiconductors, Campos de Jordão, SP, Brazil, July, 25-29 2003. Dondeo, F., **Comedi, D.**, Chambouleyron, I., *Ge-rich a-SiGe:H films deposited by Ion Beam Sputtering with Ar and Kr* (Poster).
- 25) XXIV Congresso Brasileiro de Aplicações de Vácuo na Indústria e na Ciência, July 28-30 2003, Bauru, SP Brazil. Iñiguez, A.C., Campomanes, R.R., Tabacniks, M.H., **Comedi, D.**, *Influence of O₂ Flow Rate on Growth Rate, Composition and Structure of rf-Sputtered TiO_x Films* (Poster).
- 26) 12th Canadian Semiconductor Technology Conference, a ser realizada en Ottawa, Canadá, August 16 – 19, 2005. Comedi, D., Zalloum, O.H.Y., Irving, E.A., Wojcik, J., Roschuk, T., Flynn, M.J., and Mascher, P., *X-ray diffraction study of silicon nanocrystals embedded in SiO₂ obtained by thermal annealing of silicon-rich silicon oxide thin films* (oral).
- 27) 12th Canadian Semiconductor Technology Conference, a ser realizada en Ottawa, Canadá, August 16 – 19, 2005. **Comedi, D.**, Zalloum, O.H.Y., Irving, E. A., Wojcik, J., and Mascher, P., *H-induced effects on the photoluminescence from silicon nanostructures obtained from PECVD-grown Si_yO_{1-y} (y < 1/3) thin films annealed in (Ar+5% H_2)* (poster).
- 28) 12th Canadian Semiconductor Technology Conference, a ser realizada en Ottawa, Canadá, August 16 – 19, 2005. Comedi, D., *Structure and morphology of reactively rf-sputtered nc-TiO_{2-δ} (-0.04 < δ < 0.2) thin films* (poster)
- 29) 12th Canadian Semiconductor Technology Conference, a ser realizada en Ottawa, Canadá, August 16 – 19, 2005. Cornet, D., Pusep, Y., **Comedi, D.**, LaPierre, R., *Analysis of InGaAs/InP Superlattice Structures Grown By Molecular Beam Epitaxy* (poster).
- 30) XXII Congreso Latinoamericano de Ciencias de la Superficie y Sus Aplicaciones (CLACSA 2005), Rio de Janeiro, Brazil, December 2 – 7, 2005. Pusep, Yu.A., de Giovanni Rodrigues, A., Galzerani, J.C., **Comedi, D.**, LaPierre, R.R., *Evidence of the Miniband Formation in InGaAs/InP Superlattices* (poster) .
- 31) 209th Electrochemical Society Meeting, Denver, Colorado, EEUU, 7 - 12 May , 2006, Roschuk, T., **Comedi, D.**, Zalloum, O.H.Y., Wojcik, J., Chelomentsev, E., Flynn, M., and Mascher, P., *Properties of Si Nanocrystals Formed in Inductively Coupled Plasma CVD Grown SiO_x Thin Films* (oral).

- 32) 91^o Reunión Nacional de Física, September 25-29, 2006, Merlo, San Luís, Argentina. **Comedi, D.**, Villafuerte, M., Heluani, S.P., Arce, R., Koropecki, R., *Decaimiento de la Fotoconductividad en $TiO_{1-\delta}$ ($-0.04 < \delta < 0.2$)*, (Poster).
- 33) 91^o Reunión Nacional de Física, Septiembre 25-29, 2006, Merlo, San Luís, Argentina. Juárez, G., **Comedi, D.**, Villafuerte, M., Heluani, S.P., Sandoval, C., *Mecanismos de Conducción Eléctrica en Láminas Delgadas de $TiO_{1-\delta}$ con $-0.04 < \delta < 0.2$* , (Poster).
- 34) 210th Electrochemical Society Meeting, Cancun, Mexico, , Oct.29-Nov. 3, 2006, **D. Comedi**, O. H.Y. Zalloum, J. Wojcik, and P. Mascher, *Light Emission from Hydrogenated and Unhydrogenated Si-nanocrystal/Si Dioxide Composites Based on PECVD-Grown Si-Rich Si Oxide Films*, (Oral, Invited Talk).
- 35) 210th Electrochemical Society Meeting, Cancun, Mexico, Oct.29-Nov. 3, 2006, **D.Comedi**, M. Villafuerte, G. Juarez, and S. P. Heluani, *Structure and Electrical Properties of Reactively rf Sputtered nc- $TiO_{2-\delta}$ ($-0.04 \leq \delta \leq 0.2$)*, (Poster).
- 36) 2006 Materials Research Society (MRS) Fall Meeting, Nov. 27 – Dec. 1, 2006, Boston MA, USA, T. Roschuk, **D. Comedi**, O. H. Y. Zalloum, J. Wojcik and P. Mascher, *Structural, Electronic, and Optical Analysis of Luminescent Si-nanocrystal Systems*, (Poster).
- 37) At the Frontiers of Condensed Matter III, December 11-15, 2006, Buenos Aires, Argentina. Heluani, S.P, **Comedi. D.**, Villafuerte, M., Juárez, G., *Electron Transport in $TiO_{2-\delta}$ ($-0.04 \leq \delta \leq 0.2$) Thin Films*, (Poster).
- 38) At the Frontiers of Condensed Matter III, December 11-15, 2006, Buenos Aires, Argentina. Villafuerte, M., Juárez, G., Heluani, S.P., **Comedi, D.**, *Hysteretic Current – Voltage Characteristics in RF-Sputtered $TiO_{2-\delta}$ ($-0.04 \leq \delta \leq 0.2$) Thin Films*, (Poster)

David Mario Comedi, November, 2006.