

PERSONAL DATA RÉSUMÉ
Last updated October 20, 2010

Personal information:

- Name: **Leonardo Martin Hillkirk**
- E-mail (personal): leonardo.hillkirk@yahoo.com

Keywords:

- **Semiconductor Electronic Device Engineer**
- **Power Electronic Devices: SiC (Silicon Carbide), Silicon**
- **TCAD (Technology Computer Aided Design): Physical, Numerical Modeling and Design of Semiconductor Electronic Devices and circuits (MEDICI, Mixed-Mode simulations)**
- **Semiconductor Electronic Devices: Physics, Characterization, Reliability Testing and Failure Analysis**
- **Pulsed - Power Electronics: Pulsed - Power Thyristors, PiN Power Diodes, Power MOSFETs**
- **ESD (Electrostatic Discharge): Computer - Assisted Physical Modeling**
- **Thermal Modeling of Semiconductor Electronic Devices: Power Losses, Heat Generation and Transport**
- **IR Microscopy (Infra Red Microscopy): Design and Development of Instrumentation and Techniques**
- **Electromagnetic – Mechanical - Thermal Compact Circuit Design (SABER)**
- **Development of Micro - Processing Techniques for exotic superconductor materials**
- **Fabrication of novel micro - electromagnetic metal and semiconductor structures**
- **Material Physics: Semiconductors, Metals, Superconductors**
- **Low Temperature and High Vacuum Techniques and Physics**
- **IEEE (Institute of Electrical and Electronics Engineers) Senior Member**
- **NIST - DARPA (Defense Advanced Research Projects Agency) Researcher**
- **Languages: Fluent English, Spanish, Swedish, French, Italian. Understanding of Norwegian, Danish, some Russian, and some German**

Work experience:

- **Barclays Bank Technology Center, Vilnius, Lithuania, April 2010 to present: IT analyst, worldwide IT support**
- **Lingua Perfecta Language School, Vilnius, Lithuania, December 2009 to present: foreign language consultant**
- **National Institute of Standards and Technology (NIST), Gaithersburg, MD, USA, February 2005 – November 2009: researcher (consultant), DARPA (Defense Advanced Research Projects Agency) Wide-Bandgap Semiconductor Technology - High Power Electronics Program (WBST-HPE), Electronics and Electrical Engineering Laboratory, Semiconductor Electronics Division**
- **University of Manchester, Manchester, UK, July 2003 - September 2004: research associate, Department of Physics, Condensed Matter Physics group (Nobel Prize in Physics 2010 Winner Group)**
- **Stanford University, Stanford, CA, USA, fall - winter 2002: visiting scholar, Center for Integrated Systems (CIS, Professor Robert Dutton)**
- **Royal Institute of Technology (KTH), Stockholm, Sweden, April 2001 - June 2003: researcher, Department of Microelectronics and Information Technology, Laboratory of Materials and Semiconductor Physics. I have also assisted in several courses lectured at KTH at undergraduate and graduate level (see “Academic Teaching Experience” below)**
- **Royal Institute of Technology (KTH), Stockholm, Sweden, November 1997 - March 2001: researcher, Department of Electronics, Laboratory of Solid State Electronics**
- **Royal Institute of Technology (KTH), Stockholm, Sweden, May - October 1997: research engineer, Department of Electronics, Laboratory of Solid State Electronics**
- **University of Umeå, Umeå, Sweden, 1993: laboratory assistant, Department of Physical Chemistry**

Academic Teaching Experience:

- **University of Manchester**, Manchester, **UK**, Fall 2003-Spring 2004: laboratory tutor, physics laboratory course, 3rd year physics students (optics, quantum mechanics, particle physics)
- **Royal Institute of Technology (KTH)**, Stockholm, **Sweden**, Spring 2003: laboratory tutor, semiconductor materials and devices course for electrical engineering students (one course)
- **Royal Institute of Technology (KTH)**, Stockholm, **Sweden**, 2002: course and laboratory tutor, semiconductor devices and amplifying circuits course for electrical engineering students (one course); laboratory tutor, semiconductor materials and devices course for physics students (one course)
- **Royal Institute of Technology (KTH)**, Stockholm, **Sweden**, 2001: laboratory tutor, semiconductor materials and devices course for physics students (one course)
- **Royal Institute of Technology (KTH)**, Stockholm, **Sweden**, 2000: laboratory tutor, semiconductor materials and devices courses for electrical engineering (one course) and physics students (one course)
- **Royal Institute of Technology (KTH)**, Stockholm, **Sweden**, 1999: laboratory tutor, semiconductor materials and devices courses for electrical engineering (one course) and physics students (one course); electronic devices numerical simulation course for electrical engineering and physics students (one course)
- **Royal Institute of Technology (KTH)**, Stockholm, **Sweden**, 1998: laboratory tutor, semiconductor materials and devices courses for electrical engineering (one course) and physics students (one course)

Participated Conferences:

- **IEEE 2007 International Semiconductor Device Research Symposium (ISDRS 2007)**, Washington DC, **USA**
- **IEEE 12th International Conference on Simulation of Semiconductor Processes and Devices 2007 (SISPAD 2007)**, Vienna, **Austria**
- **International Conference on Silicon Carbide and Related Materials 2003 (ICSCRM'03)**, Lyon, **France**
- **IEEE 8th International Conference on Simulation of Semiconductor Processes and Devices 2003 (SISPAD 2003)**, Boston, Cambridge, MA, **USA**
- **Fourth European Conference on Silicon Carbide and Related Materials 2002 (ECSCRM'02)**, Linköping, **Sweden**
- **International Conference on Silicon Carbide and Related Materials 2001 (ICSCRM'01)**, Tsukuba, **Japan**
- **IEEE 11th International Symposium on Power Semiconductor Devices and ICs 2000 (ISPSD 2000)**, Toulouse, **France**

Awarded distinctions:

- **IEEE (Institute of Electrical and Electronics Engineers) Senior Member (USA, April 2007)**
- **JOHN OCH KARIN ENGBLOMS STIPENDIEFOND, SWEDEN, 2001**: scholarship awarded to finance the time as visiting scholar at the Center for Integrated Systems, Stanford University, Stanford, CA, **USA**

Education:

- **Ph.D. candidate** at the Department of Microelectronics and Information Technology, Laboratory of Materials and Semiconductor Physics, **Royal Institute of Technology, Stockholm, Sweden** (April 2001 - June 2003). Main areas of research: physics of semiconductor electronic devices, numerical modeling of semiconductor electronic devices, measurement instrumentation and circuit development, and IR microscopy. The project was carried out in cooperation with ABB Corporate Research and SEMIKRON ELEKTRONIK GmbH
- **Licentiate candidate** at the Department of Electronics, Division of Solid State Electronics, **Royal Institute of Technology, Stockholm, Sweden** (November 1997 - March 2001). Main areas of research: physics of semiconductor electronic devices, numerical modeling of semiconductor electronic devices, measurement instrumentation and circuit development, and IR microscopy. The

project was carried out in cooperation with ABB Corporate Research and SEMIKRON ELEKTRONIK GmbH

- **M. Sc. in Engineering Physics** at the **Royal Institute of Technology, Stockholm, Sweden** (August 1996 - April 1997)
- **B. Sc. in Physics and Chemistry** at the **University of Umeå, Umeå, Sweden** (January 1993 - June 1996)
- **Mathematic, Physics, Chemistry**, Faculty of Mathematics and Natural Sciences, **University of Buenos Aires, Argentina** (June 1989 - December 1989)

Languages skills:

- **Spanish:** Native language
- **English:** Fluently spoken, excellent written level
- **Swedish:** Fluently spoken, very good written level
- **French:** Fluently spoken, good written level
- **Italian:** Fluently spoken, satisfactory written level
- **Russian:** Basic level
- **Lithuanian:** Notions
- **German:** Notions
- Understanding of **Norwegian, Danish and Portuguese**

Additional scientific skills:

- Proficiency in physical modeling of semiconductor electronic devices, including extensive experience with the computer program MEDICI
- Proficiency in computer modeling of electromagnetic, mechanical, and thermal compact circuits
- Extensive experience in characterization of semiconductor devices, including electrical and optical methods of characterization and testing
- Design and manufacture of advance physical and electronic measuring instrumentation, including mechanical, electronic and optical design and manufacture
- Fabrication and characterization of micro and nano metal and semiconductor structures, including photolithography, development of etching and surface polishing techniques for exotic materials, film deposition, and use of AFM and STM
- Experience in low temperature (Helium) and high vacuum techniques

Management skills:

- Several years of experience in conceiving and executing goal-oriented projects
- Direct supervision of M.Sc. and Ph.D. students

Computer skills:

- Operating systems: UNIX-Linux, MS DOS, Windows XP, 98, NT
- Programming languages: C++, Matlab, Pascal, Basic
- UNIX-PC communication programs, including FTP programs
- PDE solvers, such as MEDICI, SUPREME and ACE
- Data processing programs such as MS Excel, KaleidaGraph, and Origin
- Several document editors such as MS Words, MS Power Point, MS Works, Word Perfect, etc
- Diverse CAD and image editing programs such as ACAD, Corel Draw, Adobe Photo editor and others
- Several e-mail programs including Eudora, MS Outlook, Pine, etc
- A wide variety of other computer programs for diverse purposes
- Ability to identify and solve complex software and hardware related problems

Other certified skills:

- US driver's license, Swedish driver's license, Swedish glider pilot certificate

Research Interests:

- Physical, numerical computer modeling of semiconductor electronic devices and circuits
- Semiconductor electronic device design
- Thermal generation and transport in condensed matter, specially semiconductor materials
- Semiconductor device physics including power semiconductor devices and ULSI MOSFETs
- Fabrication of novel micro and nano electromagnetic structures
- Semiconductor materials physics, including novel materials such as SiC
- Superconductor materials physics
- Optics, specially IR generation, microscopy and spectroscopy
- AFM and STM microscopy
- Quantum and transport physics
- Low temperature and high vacuum physics and techniques

Other personal interests:

- **Economics:** the rules of the game that shape the way we live; specially modeling of derivatives trading and pricing (Black-Sholes PDE; T. F. Crack and J. C. Hull books) and risk analysis.
- **History:** the foundation for the understanding of present events
- **Sports and outdoors life:** body-building, beach volleyball, running, skiing, swimming, driving, flying, cycling, paddling, climbing, hiking, soccer, badminton
- **People:** their history, languages, art and traditions. As a result, I also like...
- **Traveling:** I have been to Argentina, Brazil, Uruguay, Paraguay, USA, Japan, Cape Verde, Spain, Andorra, France, Monaco, Italy, San Marino, the City of Vatican, Austria, Germany, Belgium, The Netherlands, England, Wales, Scotland, Ireland, Switzerland, Slovenia, Croatia, Yugoslavia, Macedonia, Greece, Hungary, Czech Republic, Estonia, Latvia, Lithuania, Poland, Russia, Denmark, Finland, Sweden and Norway. I have covered almost the entire distance from the Mediterranean Sea to the North Cape by bicycle, and completed several tours of Europe by train and car. I have also been traveling extensively and climbing in the Patagonian Andes
- **Cars, planes, boats** and their related mechanics and dynamics

References: available upon request