Dr. Karl D. Hirschman, Micron Professor, Rochester Institute of Technology

Electrical and Microelectronic Engineering Department
82 Lomb Memorial Drive
Rochester, New York 14623
Tel: (585) 475-5130
Email: kdhemc@rit.edu

DOB: 10/11/1967
Home: 38 Bitternell Lane
Henrietta, NY 14467
Tel : (585) 321-1453

Experience: Rochester Institute of Technology, Rochester, NY

Director, Semiconductor & Microsystems Fabrication Laboratory, ***2001.02~Present***
Associate Professor, Department of Microelectronic Engineering, ***2002.09~Present***
Assistant Professor, Department of Microelectronic Engineering, ***1997.09~2002.08***
Instructor, Department of Microelectronic Engineering, ***1993.05~1997.08***

IBM Microelectronics, East Fishkill, NY ***1990.06~1993.04***
Process Development Engineer, Advanced Semiconductor Technology Center,
CMOS logic & DRAM process development

Education: **Ph.D., Electrical and Computer Engineering, University of Rochester,** ***1994.09~2000.05***
Advisor: Philippe M. Fauchet
Thesis: "Fabrication and Characterization of Oxide-Passivated Nanocrystalline Silicon Light Emitting Devices"

M.S., Electrical Engineering, Rochester Institute of Technology, ***1990.09~1992.08***
B.S., Microelectronic Engineering, Rochester Institute of Technology, ***1985.09~1990.05***

Bio: Karl D. Hirschman received the B.S. degree in Microelectronic Engineering in 1990 and the M.S. degree in Electrical Engineering in 1992 from the Rochester Institute of Technology, Rochester, NY. He received the Ph.D. degree in Electrical Engineering in 2000 from the University of Rochester, Rochester, NY. Dr. Hirschman has published over 50 technical papers in refereed journals and conference proceedings. He is an active member in the IEEE, MRS and SID. He has served as an officer of the Rochester IEEE Electron Device Society local chapter for the last fifteen years, and he coordinates the IEEE Annual EDS Activities in Western NY Conference.

Teaching: Microelectronic Process & Device Technology, Process & Device Modeling

- **Undergraduate (freshman –senior level):** IC Technology, Silicon Processes, VLSI Design, Device Physics, Design of Experiments, Senior Design (coordinator & project advisor)
- **Graduate:** Semiconductor Process & Device Simulation, Elective courses: SOI device technology, silicon-based photonics

Current Research Interests:

- Silicon device integration on non-traditional substrates
- Integration of novel device structures in silicon technology
- Si-based optoelectronics

Current Funded Research:

1. Carestream Health, Inc. Research Grant, *"Medical Imaging Sensor Technology"* (Oct 2009 – Dec 2010). 2010 Funding amount: $60K
2. Corning, Inc. Research Grant, *"CMOS TFT Development at RIT"* (Jan 2005 – Dec 2010). 2010 Funding amount: $156K
3. New York State (NYSTAR) CEIS matching grants for CHI and Corning projects listed (Jan 2010 – Dec 2010, July 2010 – June 2011).
4. Semitool, Inc., *"Development and Characterization of Porous Silicon Technologies,"* (2-year award, Oct 2007 – Sept 2009). 2010 Funding amount: $60K
5. Spectrum Devices, Inc., Hatfield, PA *"Development of Bipolar and MOS Processes for Power Device Applications,"* (March 2008 – present).

Graduate Student Advisees - Current: Robert Manley (Ph.D. student), Germain Fenger, Bharat Veeramachaneni, Ryan Rettmann, Andrew McCabe, Christopher Shea, Shaoting Hu, Daiji Kawamura; **Degree Awarded:** Siddhartha Singh (M.S. 2009, currently at Micron), Patrick Whiting (M.S. MatSci, 2009, currently at U.Florida), Kazuya Tokunaga (M.S. 2008, currently at SanDisk), Amy Huang (M.S. 2007, currently at TI), Vee Chee Hwang (M.S. 2007, currently at Micron), Jeremiah Hebding (M.S. 2007, currently at IBM), G. Robert Mulfinger (M.S. 2006, currently at AMD), Eric Woodard (M.S. 2006, currently at IBM), Reinaldo Vega (M.S. 2006, currently at UC Berkeley), Deoram Persaud (M.S. 2006, currently at IBM), Vimilan Rajalingam (M.S. 2006, currently at Analog Devices), Robert Saxer (M.S. 2006, currently at RF Microdevices), Jeffrey Clarkson (M.S. 2005, currently at University of Rochester), Christopher Harvey (M.S. 2005, currently at Freescale), Joanna Kiljan (M.S. 2004), Charles F. Faisst, (M.S. 2002)

Undergraduate Senior Project Advisees: Patrick Whiting (2009), Brian Silkey (2009), Andrew McCabe (2009), Christopher Shea (2008), Danny Yang (2008), Hamza Shahid (2008), Isaac Onigman (2008), Ryan Rettmann (2008), Sara Gottermeier (2007), Tiffany Hoover (2005), Robin Joyce (2005), G. Robert Mulfinger (2005), Eric Woodard (2005), Steven Kirby (2003), Tejas Jhaveri (2003), Donald Hamilton (2003), Robert Saxer (2003), Jeremiah Hebding (2003), Erik Dolatowski (2002), Joseph Miceli (2000), Burcay Gurcan (1999), Tina Wheaton (1999)

Current Undergraduate Advisees: James Driscoll, Aaron Chadwick, Justin Delmonte

Collaborators (over the Past 48 months): Larry L. Gadeken (Betabatt, Inc.), Z. Ninkov, A.D. Raisanen, F. Sahin, W. Walter, T.G. Brown (UR), J.D. Neiser (UR), P.R. Berger (Ohio State), L.F. Fuller, S.K. Kurinec, S.L. Rommel, R.J. Bowman, P.M. Fauchet (UR), D.F. Dawson-Elli (Corning, Inc.), J.G. Couillard (Corning, Inc.), C.A. Kosik Williams (Corning, Inc.), Jeffrey Clarkson (UR), Kevin Witt (Semitool), Jere Hohmann (Spectrum Devices), Timothy Treadwell (Carestream Health, Inc.)

Synergistic Activities:

1) Director of the RIT Semiconductor & Microsystems Fabrication Laboratory (SMFL), which supports research and undergraduate teaching in microelectronics and microsystems.
2) Core faculty member of the Microsystems Engineering Ph.D. program at RIT.

Selected Publications:

1) B. Veeramachaneni, J. Winans, P.M. Fauchet, K. Witt and K.D. Hirschman, *"A New Technique for Localized Formation of SOI Active Regions,"* IEEE SOI Conference, Foster City, CA, Oct 2009.
2) R.G. Manley, G.L. Fenger, P.M. Meller, C.A. Kosik Williams, D.F. Dawson-Elli, J.G. Couillard, J.S. Cites, and K.D. Hirschman, *"Development of integrated electronics on silicon-on-glass (SiOG) substrate,"* ECS Transactions, **16**, 371 (2008).
3) J.P. Clarkson, P.M. Fauchet, V. Rajalingam, and K.D. Hirschman, *"Solvent Detection and Water Monitoring With a Macroporous Silicon Field-Effect Sensor,"* IEEE Sensors Journal **7**, 329 (2007).
4) W. Sun, N.P. Kherani, K.D. Hirschman, L.L. Gadeken and P.M. Fauchet, *"Three Dimensional Porous Silicon p-n Diode for Betavoltaics and Photovoltaics,"* Adv. Matter. **17**, 1230 (2005).
5) K.D. Hirschman, N.E. Wescott, J. Neiser and T.G. Brown, *"Silicon-on-Insulator Based Modulators and Switches for High Speed Optical Telecommunications,"* IEEE UGIM Symp. Proc. **14**, 64 (2001).
6) K.D. Hirschman, L. Tsybeskov, S.P. Duttagupta and P.M. Fauchet, *"Silicon-based Visible Light-Emitting Devices Integrated Into Microelectronic Circuits,"* Nature **384**, 338 (1996).

Honors and Awards:

- IEEE Senior Member (2009)
- RIT Million Dollar PI Award (2007)
- Micron Professorship (2005-present)

Professional Activities:

- IEEE (local EDS chapter officer)
- Materials Research Society (MRS)
- Society for Information Display (SID)