David James Gundlach

441 West Side Drive Apt. 03, Gaithersburg, MD 20878
Home: (240) 476-8013, Office: (301) 975-2048, Email: david.gundlach@nist.gov

Education

- Ph.D. in E. E. (GPA 3.8/4.0), Penn State University, University Park, PA — Aug. 2001
- M. S. in E. E., Penn State University, University Park, PA — May 1997
- B. S. in Physics, Penn State University, University Park, PA — May 1992

Career Interests

Primary career interest is working in a challenging and creative research environment. Research areas of particular interest include: organic electronic and electroluminescent devices, molecular/nano scale devices, silicon-based devices and processing, novel device/system integration, and display technology.

Professional Experience

- *Research Staff Member*, Semiconductor Electronics Division — Nov. 2005-present
  National Institute of Standards and Technology, Gaithersburg, MD 20899-8120
  - Project Leader: organic thin film transistor devices
- *Research Staff Member,* Laboratory for Solid State Physics — Mar. 2003-Oct. 2005
  Department of Physics, Eidgenössische Technische Hochschule (ETH) Zürich, 8093 Zürich, Switzerland
  - Project Leader: organic thin film and single crystal device research
  - Supervision of graduate student research and management of laboratory facilities
  - Fabrication and characterization of organic electronic devices
- *Post Doctoral Researcher*, IBM Research — Sep. 2001-Feb. 2003
  IBM Zürich Research Laboratory, 8803 Rüschlikon, Switzerland
  - Fabrication, characterization, and optimization of small-molecule organic electroluminescent devices
- *Research Assistant*, Center for Thin Film Devices — Jan. 1995-Aug. 2001
  Department of Electrical Engineering, Penn State University, University Park, PA 16802
  - Fabrication, characterization, and optimization of small-molecule organic thin film transistors
- *Teaching Assistant*, Electronic Materials Processing and Research Lab — Aug. 1995-May 1996
  Department of Electrical Engineering, Penn State University, University Park, PA 16802
  - Undergraduate lecture/laboratory course in silicon process technology

Professional Accomplishments and Activities

- Author/co-author: more than 25 refereed journal publications
- Author/co-author: more than 75 conference/workshop publications
- Inventor/co-inventor: 3 patents/patent applications
- Technical Program Committee Member, IEEE Device Research Conference (2006)
- Co-chair: organic field effect transistor conference, SPIE, 50th and 51st Annual Meetings (2005-2006)
- Co-chair: organic field effect transistor symposium, TMS Electronic Materials Conference (2002-2006)
- Co-chair: organic photovoltaic device symposium, TMS Electronic Materials Conference (2006)
- Co-chair: Winter School on Organic Electronics, Donnersbach, Austria (2004)
- Member: Institute of Electrical and Electronics Engineers (IEEE), Society for Information Display (SID), The International Society for Optical Engieering (SPIE), The Minerals, Metals, and Material Society (TMS), and Materials Research Society (MRS)

Technical Skills

- Semiconductor materials processing – wet etching, reactive ion etching, photomask fabrication, photolithography, wafer cleaning, thermal processing, and physical vapor deposition
- Organic materials processing – purification, sublimation, evaporation, solution, and vapor processing.
- Materials and device characterization – X-ray diffraction, scanning electron microscopy, atomic force microscopy, ellipsometry, radiometry and photometry, fluorescence and UV/Vis/NIR spectroscopy, current-voltage, capacitance-voltage, and capacitance-frequency
- Computer – word processing, presentation, and data processing software, computer-aided design, semiconductor process design and simulation, circuit and device simulation, photomask and VLSI design

Personal Information

- Hobbies: hiking, backpacking, running, racquetball, squash, music, and reading
- Non-Commissioned Officer, US Army Reserves (1992-2001) - Microwave radio systems repairer/operator
- Licensed amateur radio operator (1994-present) - N3RJN

Patents and Patent Applications

- Patent: No. US 6,528,816: Integrated Inorganic/Organic Complementary Thin-Film Transistor Circuit and a Method for its Production
- Patent Pending: CH 920030057EP1 & US 10/985,093: Device with Switchable Capacitance
- Patent Pending: CH 920030058EP1 & US 10/987,749: Field Effect Device with a Channel with a Switchable Conductivity

Supervised Graduate Research

- Daniel Oberhoff (Dipl.), "*Modeling and Parameter Extraction on Pentacene Organic Thin Film Transistors,*" ETH Zürich, Switzerland (2004)
- Cornelius Krellner (Dipl.), "*Transport and Defects in Organic Single Crystals,*" TU Dresden, Germany (2005)
- Arne Kloke (Dipl. candidate), "*Single Crystals of Functionalized Acenes: Growth and Characterization,*" ETH Zürich, Switzerland (2005)
- Claudia Goldmann (Ph.D. candidate), ETH Zürich, Switzerland (expected graduation February 2006)
- Kurt Pernstich (Ph.D. candidate), ETH Zürich, Switzerland (expected graduation August 2006)

Selected Publications

- D. J. Gundlach, M. Shur, and T. N. Jackson, In: "*Printed Organic and Molecular Electronics*," ed. by P. Brazis, D. Gamota, and J. Zhang, Kluwer Academic Publishers, New York 2004
- D. J. Gundlach, K. P. Pernstich, G. Wilckens, M. Grüter, and B. Batlogg, "High Mobility n-channel Organic Thin Transistors and Complementary Inverters," Journal of Applied Physics, vol. 98, 064502, September 2005.
- C. Goldmann, S. Haas, C. Krellner, K. Pernstich, D. J. Gundlach, and B. Batlogg, "High Mobility in Organic Single Crystals Measured by a "Flip-Crystal" Field-Effect Technique," Journal of Applied Physics, vol. 96, n. 4, pp. 2080-2086, August 2004.
- D. J. Gundlach, L. Zhou, J. A. Nichols, and T. N. Jackson, "Thin Film Transistors Based on Well-Ordered Thermally Evaporated Naphthacene Films," Applied Physics Letters, vol. 80, n. 16, pp. 2925-2927, April 2002
- D. J. Gundlach, L.L. Jia, and T. N. Jackson, "Pentacene Thin Film Transistors With Improved Linear Region Characteristics Using Chemically Modified Source And Drain Electrodes," IEEE Electron Device Letters, vol. 22, n. 12, pp. 571-573, December 2001
- P. V. Necliudov, M. S. Shur, D. J. Gundlach, and T. N. Jackson, "Modeling of Organic Thin Film Transistors of Different Designs," Journal of Applied Physics, vol. 88, n. 11, pp. 6594-6597, December 2000
- S. F. Nelson, Y. Y. Lin, D. J. Gundlach, T. N. Jackson, "Temperature-Independent Transport in High-Mobility Pentacene Transistors," Applied Physics Letters, vol. 72, n. 15, pp. 1854-1856, April 1998
- D. J. Gundlach, Y. Y. Lin, T. N. Jackson, S. F. Nelson, D. G. Schlom, "Pentacene Organic Thin Film Transistors - Molecular Ordering and Mobility," IEEE Electron Device Letters, vol. 18, n. 3, pp. 87-89, March 1997