CURRICULUM VITAE

Timothy David Sands

Acting President
Purdue University, West Lafayette, IN
&
Basil S. Turner Professor of Engineering
School of Materials Engineering and School of Electrical & Computer Engineering

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ResearcherID site: http://www.researcherid.com/rid/D-2133-2009

Education:

B.S., Highest Honors, in Engineering Physics, University of California, Berkeley, 1980
M.S. in Materials Science, University of California, Berkeley, 1981
Ph.D. in Materials Science, University of California, Berkeley, 1984

Professional Experience:

1980: *Summer Intern*, Solar Energy Research Institute (SERI), now known as the National Renewable Energy Laboratory (NREL), Golden, CO.
1984: *Postdoctoral Fellow*, Materials and Molecular Research Division, Lawrence Berkeley Laboratory.
1984 - 86: *Industry Fellow*, Center for Advanced Materials, Lawrence Berkeley Laboratory.
1984 - 90: *Member of Technical Staff,* Bellcore, Red Bank, NJ.
1990 - 91: *Director- Thin Films and Interface Science Research Group,* Bellcore, Red Bank, NJ.
1992 - 93: *Director- Nonvolatile Memory Research Group,* Bellcore, Red Bank, NJ.
1993 - 02: *Professor*, Department of Materials Science and Engineering, University of California, Berkeley.
1997 - 99: *Chair, Executive Committee*, Applied Science & Technology Graduate Group.
2001: *Visiting Professor*, Interuniversity Microelectronics Center (IMEC) and Faculty of Engineering, Katholieke Universiteit Leuven, Belgium.
2002: *Director*, Integrated Materials Laboratory (IML).
2002 – present: *Basil S. Turner Professor of Engineering (Named University Professorship)*, School of Materials Engineering and School of Electrical & Computer Engineering, Purdue University.
2006 – 10: *Mary Jo and Robert L. Kirk Director*, Birck Nanotechnology Center, Discovery Park, Purdue University; led interdisciplinary center with 30 staff, 45 resident faculty and 200 graduate students from twelve disciplines; 187,000 asf building featuring a 25,000 sf Class 1-10-100 cleanroom (Scifres Nanofabrication Facility) and 22,000 sf of specialized lab space; ten recharge centers; $4.7M annual operating budget; $12-15M in annual extramural research awards; website: www.nano.purdue.edu
April 2010 – July 2012: *Executive Vice President for Academic Affairs and Provost* of Purdue University; Purdue University's West Lafayette campus is one of 15 public A.A.U. land-grant campuses in the U.S. and is regularly ranked among the top 25 public research institutions. Purdue's West Lafayette campus enrolls about 40,000 students, including ~9,000 professional and graduate students and

nearly 8,000 international students. Purdue's regional campuses and Statewide Technology serve another ~35,000 students. Purdue University's research expenditures exceeded $600M in FY 2011. As chief academic officer, Sands was responsible for all of Purdue's colleges and schools on the main campus (West Lafayette) and related academic activities in coordination with the Office of the President. The provost also oversees libraries, cultural centers, and enrollment management including admissions, registrar and financial aid and various student success programs in addition to the appointment and retention of faculty and academic staff. Responsibilities include coordinating with the Offices of the Treasurer and President in allocating an annual budget of ~$990M in educational and base operating funds for the West Lafayette campus, and representing Purdue University's academic enterprise with the Indiana Commission for Higher Education and state government. In 2011, Sands served as chair of the steering committee that coordinated development of Purdue's Decadal Funding Plan. Among the initiatives from that plan that are now driven from the office of the provost are 1) Purdue's first comprehensive assessment of all 330 degree-granting programs on the West Lafayette campus; 2) conversion to a balanced trimester 12-month academic calendar; and 3) development of PurdueHUB-U, a modular, simulation-rich approach to online teaching and learning.

July 2012 - Jan 2013: *Acting President*

Awards and Honors:

Tau Beta Pi
Phi Beta Kappa
Von Hippel Award for Graduate Student Research, Materials Research Society (MRS), 1983.
1988 Robert Lansing Hardy Gold Medal, The Minerals, Metals and Materials Society (TMS).
MSE Excellence in Teaching Award (Sp 1994), UC Berkeley MRS Student Chapter.
NSF Research Initiation Award (1994)
Seed for Success Award, Purdue University (2005)
Fellow of the Materials Research Society (MRS) (2009) – *"for a succession of scientific achievements of critical impact in microelectronics and nanotechnology; for formal and informal leadership; and for service to the interdisciplinary scientific community"*
Fellow of IEEE (2010) – *"for contributions to metal/semiconductor interfaces and heterogeneous integration"*

Grants and Contracts Awarded:

1. **Principal Investigator,** "Research Initiation Award: Homogenation of Magneto-optic Properties in MnBiAl Films through the Introduction of Nanoscale Artificial Crystallinity," National Science Foundation – ECS-9409730, $89,777, 8/1/94-7/31/96
2. **Principal Investigator**, "Ternary and Quaternary Rare Earth-Transition Metal Magnetic Thin Films, IBM Sponsored Research Agreement #2064, $34,072, 9/1/97-8/31/98
3. **Principal Investigator**, "Microstructure-Processing-Property-Performance Relationships in Integrated Ferroelectric Capacitors: The PLZT/Metallic Ruthenate System," National Science Foundation – ECS-9632707, $62,256, 3/1/97-2/28/98
4. **Principal Investigator** (with Co-PI Nathan Cheung), "Laser Lift-off of Gallium Nitride from Sapphire Substrates," UC MICRO Program, 98-133, $28,041 from UC MICRO and $40,000 from Hewlett-Packard Co., 7/1/98-6/30/99
5. **Principal Investigator,** "Poling of Ferroelectric Thin Films; Application to Integrated Memory, Sensing and Actuation Devices," National Science Foundation - ECS-9732847, $235,920, 7/1/98 - 6/30/01

6. **Principal Investigator,** "Assembly of Functionally-enhanced MEMS by Laser Liftoff and Transfer of Epitaxial Piezoelectric Thin Films," National Science Foundation - ECS-9812906, $100,000, 9/1/98 - 8/31/99
7. **Principal Investigator-Subaward,** "Quantum Structures for Thermoelectric Applications," Office of Naval Research (ONR/MURI) through University of California, Los Angeles - Subaward N00014-97-1-0516, $500,000, 5/1/97 – 4/30/02
8. **Principal Investigator-Subcontract,** "Development of Micropiezoelectric Actuator for Optical Module," Sung Kyun Kwan University - Subcontract M2808, $42,000, 3/1/98 - 2/28/00
9. **Principal Investigator,** "Mechanisms of Optical Damage in Fused Silica**,"** LLNL Memorandum Agreement B335894, $155,560, 2/5/97-1/31/01
10. **Co-Investigator, "**Thin Films on Metal Oxide Layers," 00562 Civilian Res. & Dev. Fdn. For Indep. Sts. Frmr. USSR – ACH 008 98, $2,700, 10/1/98 - 9/30/99
11. **Principal Investigator,** (with Co-Investigators Luke Lee and Nathan Cheung) **"**XYZ-on-a-Chip: Integration of Dissimilar Materials by Bonding and Thin-film Transfer: Application to Integrated Optical Microfluidic Systems," National Science Foundation - DMI-0088145, $818,000, 9/1/00 - 8/31/03
12. **Principal Investigator, "**Methods and Application of High Resolution Energy-Filtering Transmission Electron Microscopy," Max Kade Foundation, Inc. – 010884, $67,000, 8/1/99 – 1/31/01
13. **Co-Principal Investigator** (with lead Principal Investigator A. Majumdar and Co-Principal Investigators P. Yang, V. Narayanamurti and A. Shakouri)**, "**NIRT: Novel Energy Conversion Devices Based on Nanowire Heterostructures**,** National Science Foundation CTS-0103609**,** $1,343,226**,** 7/1/01 - 6/30/05
14. **Principal Investigator** (with Co-Investigator Nathan Cheung)**,** "Hybrid Integration and Packaging of Gallium Nitride Devices by Transient-Liquid-Phase Bonding and Laser Lift-Off", UC MICRO Program, project #01-074 and Oriol, Inc.**,** $71,719 from MICRO and $50,000 from Oriol, Inc.**,** 8/13/01-12/31/02
15. **Co-Principal Investigator** (with Principal Investigator Nathan Cheung), "Wafer-scale Laser Lift-off of Gallium Nitride LEDs", UC SMART Program, project #01-00098 and Oriol, Inc.**,** $45,082 from UC SMART and $50,000 from Oriol, Inc.**,** 8/27/02-8/26/03
16. **Investigator for Subaward** (PI S. Datta), **"**Support of Graduate Student in the Institute for Nanoelectronics and Computing (INAC)," NASA URETI Program, NCC 2-1363, $192,309 for TDS, 09/01/02-08/31/07
17. **Co-Principal Investigator for Subaward** (with A. Wei (lead) and R. Reifenberger), "Nano-Magnetics Research at Purdue," DARPA in coordination with the BNC, MDA972-03-1-0020, $240,000 ($70,000 for TDS), 05/12/03-05/11/06
18. **Principal Investigator for Purdue Subaward "**Thermionic Energy Conversion Center (TEC), ONR-DoD MURI, Lead Institution: UC Santa Cruz, Other MURI Investigators: A. Shakouri (UCSC,lead), A. Gossard (UCSB), J. Bowers (UCSB), R. Davis (NCSU), R. Nemanich (NCSU), Z. Sitar (NCSU), V. Narayanamurti (Harvard), H. Schmidt (UCSC), R. Ram, G. Bilbro (NCSU), A. Majumdar (Berkeley), $240,000 for TDS, 05/1/03-6/30/06
19. **Co-Principal Investigator** (with Hugh Hillhouse, lead PI, and others) "Acquisition and Customization of a Facility for the In-situ X-ray Characterization of Nanostructures," National Science Foundation – CTS-0321118, $531,000, 8/15/03-8/14/06
20. **Principal Investigator** "Nanoheteroepitaxy of (In,Ga)N: Toward a Phosphor-Free White LED," National Science Foundation – ECS-0424161, $212,120, 9/15/04-8/31/07
21. **Principal Investigator** "High Efficiency Thermoelectric Waste Heat Recovery Systems for Vehicle Applications," DOE subcontract 04-DOE930-125 through BSST, $10,000, 11/15/04-03/15/06
22. **Co-Principal Investigator** (P.I. Tim Fisher) "Carbon Nanotube Electrical Interfaces for Thermoelectrics" Cooling Technologies Research Center at Purdue University, $100,000, 1/1/06-12/31/07

23. **Principal Investigator** (with Co-PIs Eric Stach and Edwin Garcia) "Low-cost Substrates for High-performance Nanorod Array LEDs," DOE DE-FC26-06NT42862, $899,948 from DOE; $225,195 cost share from Purdue; 5/1/06-4/30/09
24. **Principal Investigator** "Acquisition of a Custom Reactive Sputter Deposition System for Nitride Multilayers," ONR N000140619647, $300,000, April 13th, 2006 – May 31st, 2007.
25. **Principal Investigator** "Nanowire Arrays for Thermoelectric Power Generation," ONR N000140610641, $296,114, April 13th, 2006 – May 31st, 2009
26. **Principal Investigator for Purdue Subaward "**Thermionic Energy Conversion Center (TEC)," ONR-DoD MURI, Lead Institution: UC Santa Cruz, Other MURI Investigators: A. Shakouri (UCSC,lead), A. Gossard (UCSB), J. Bowers (UCSB), R. Nemanich (NCSU), Z. Sitar (NCSU), V. Narayanamurti (Harvard), H. Schmidt (UCSC), R. Ram, G. Bilbro (NCSU), A. Majumdar (Berkeley), $233,000 for TDS, 07/1/06-6/30/08 (two-year extension of original three-year grant).
27. **Co-Principal Investigator** (PI: Tim Fisher) "Thermal and electrical characterization of carbon nanotube vias," CTRC, $100,000, 1/1/08-12/31/09.
28. **Co-Principal Investigator** (PI: Tim Fisher) "US-India Workshop: Frontiers in Scalable Nanostructured Interface Materials," NSF-OISE, $58,901, 6/15/08-6/14/10.
29. **Principal Investigator for Purdue Subaward** (with Co-PI A. Ramdas), "Nanostructured Metal/Semiconductor Materials for Thermoelectric Generators," DARPA, Lead Institution: UC Santa Cruz, Lead PI: A. Shakouri; Purdue Subaward SO182208; $430,000 for Purdue, 8/25/08-3/31/10; Phase II, $240,000 for Purdue, 7/19/10-8/24/11; extended with additional $100,000 to Purdue, with A. Shakouri as Purdue Co-PI through 8/24/12.
30. **Principal Investigator** (Co-PI: Tim Fisher) "Thermoelectric power generation from waste heat in electronic systems," CTRC, $80,000, 1/1/09-12/31/10.
31. **Principal Investigator** "Copper-copper bonding for laminated thermoelectric elements," ONR, $162,000, 1/1/09-12/31/09.
32. **Principal Investigator** "Composition modulated nanowire arrays for thermoelectric power generation," ONR, $381,442, 5/1/09-4/30/12.
33. **Principal Investigator for Purdue Subaward** "Collaborative Research: TIE: AIN High-Q MEMS FBAR (Film Bulk Acoustic Resonator) in a Liquid Environment," NSF IIP 0933592, $50,000, 7/15/09-7/14/11.
34. **Co-PI for Purdue Subaward** "NSF/DOE Thermoelectrics Partnership: Thermoelectrics for Automotive Waste Heat Recovery," NSF CBET 1048616, $446,785, 1/1/11-12/31/12.
35. **Institutional Principal Investigator** "Sustainable Energy Concepts – Professional Development Model for Rural Schools and Its Extension to a Systemic Approach for Integrating STEM Research and Education, NSF 09-63621, $502,378, 9/15/10-8/31/15.
36. **Institutional Principal Investigator** (PI as of June 2011; Co-PIs: Monica F. Cox and Christine G. Taylor) "LSAMP Indiana Alliance – Phase II", NSF HRD 07-03443, $3,040,194, 5/1/2007-4/30/2012.

Leadership in Professional Societies:

Electronic Materials Committee (EMC/TMS)
Elected member in 1989; Session organizer ((1988, 1991, 1992, 1993, 2005, 2006); Elected Officer of the EMC (Treasurer, 1991-93; Vice-Chair, 1993-95; Chair, 1995-97; Past Chair, 98-99); Technical Program Chairman for 1994 EMC (Boulder, CO) and 1995 EMC (Charlottesville, VA); Member-at-Large (2001-2010); EMC representative to Journal of Metals Advisory Committee (2003); Member, Journal of Electronic Materials Editorial Oversight Committee (TMS/IEEE) (2000-2010)

The Minerals, Metals and Materials Society (TMS/AIME)

Member, TMS Hardy & Mathewson Awards Subcommittee (1994-97); Chair, TMS Hardy & Mathewson Awards Subcommittee (1997); Member, Nominations Committee (1995-98); *Ex Officio* Member, Electronic, Magnetic and Photonic Materials Division (EMPMD)(1995-97); Member, AIME Rossiter W. Raymond Memorial Award Committee (1997-99); Member, TMS John Bardeen Award Committee (2005-08), 2008 Chair

Materials Research Society (MRS)
Symposium organizer (Spring 1989, Fall 1993, Spring 2003); Meeting Co-Chair for Fall 1994 MRS Meeting (Boston, MA); Member, MRS Meeting Quality Subcommittee (1995); Member, MRS Continuing Education Committee (1995-97); Member, Public Affairs Committee, Public Outreach Subcommittee (1998-01); Chair, Long-Range Planning Committee (1999-2000); Member, MRS Program Committee (2000-01); Member, MRS Tutorial Program Subcommittee (2000-01); Elected MRS Councillor (1997-99); Member, MRS Gateway Task Force Committee (2000-01); Judge, MRS Graduate Student Award Competition, Fall 2002; Member, Intersociety Interactions Task Force (2004); Member, Outsanding Young Investigator Award Subcommittee (2007-11); Member, Strategic Program Planning Subcommittee (2008); MRS Fellow, 2009

IEEE
Member (2002-); Senior Member (2008-); Fellow (2010-)

Principal Editor - Physical Properties - *Acta* Materialia and *Scripta* Materialia (1994-99)

Review Committees and Advisory Boards:

National Science Foundation (NSF): CAREER Award Panel, DMR-Electronic Materials (1995); ERC Panel (1997); ECS Panel (1999); CAREER Award Panel (1999); CAREER Award Panel, DMR-Electronic Materials (2003); DMII Nanomanufacturing Panel (2004); Nanoscale Exploratory Research - Nanomanufacturing Panel (2004); DMR-CER-MWN Panel (2010)

External Review Committee, Dept. of Mater. and Nucl. Engineering, U. Maryland (1999)
External Review Committee, MSE Dept., Cornell University (2004)
Science Foundation Ireland Proposal Review Panel, Cork, IRL,(2006)
Chair, Director's Review Committee, Materials Science Division, Lawrence Berkeley National Lab (2006)
Member, External Advisory Board for the Institute for Materials Research (IMR) at Ohio State University (2009-)
Member, Advisory Council for the Andlinger Center for Energy and the Environment, Princeton University (2011-15)
Member, Strategic Adisory Board, SMART-LEES, MIT-Singapore Alliance (2012-)

Postdoctoral Fellows and Visiting Researchers:

Prof. Monica Sorescu, Duquesne University (Summer 1998), "Laser Deposition of Metallic Glasses"
Prof. Jaichan Lee, SungKyunKwan U.-Korea (Summer 1998), "Integration of PZT Thin-film Actuators for MEMS"
Dr. Nilgun Ozer (1998-00), "Sol-gel Deposition of PZT"
Prof. Geun-Young Yeom (1999-01), "PZT Microcantilever Actuator"
Dr. David Taylor (2000-01), "Microactuators for the Micromechanical Flying Insect"

Prof. Jong-Lam Lee, Pohang Univ. of Sci. and Technol., Korea (2001-02), "GaN Devices"
Dr. Tau Yu, Berkeley Scholar, Nanjing University, China (2002)
Prof. Chen-Chia Chou, Natl. Taiwan Univ. of Sci. and Technol. (2002)
Dr. Marisol Martin-Gonzalez (2000-01), "Synthesis of Thermoelectric Nanowire Composites"
Dr. Placidus Amama, INAC Fellow jointly supervised with Prof. Tim Fisher (2004-07), "Fabrication of Vertical Carbon Nanotube Devices"

Graduate Student Advising:

Ph.D. – Advisory Committee Chair or Co-Chair: Prabhakar Bandaru (MSE, UCB, 98), William Wong (MSE, UCB, 99), Yaoxi Wu (MSE, UCB, 00), Joseph Behnke (MSE, UCB, 00), Loucas Tsakalakos (MSE, UCB, 00), Anu Bhat Kaul (MSE, UCB, 00), Alberto Salleo (MSE, UCB, 01), Ning Cheng (MSE, UCB, 01), Pushkar Ranade (MSE, UCB, 02), George Dougherty (MSE, UCB, 02), Woong Choi (MSE, UCB, 02), Peter Radkowski (AST, UCB, 03); Ho Gyoung Kim (Physics, Purdue, 2007); Parijat Pramil Deb (MSE, Purdue, 2007); Sangho Kim (ECE, Purdue, 2008); Vijay Rawat (MSE, Purdue, 2008); Manuel DaSilva (MSE, Purdue, 2008); Kalapi Biswas (MSE, Purdue, 2008); Isaac Wildeson (ECE, Purdue, 2011), David Ewoldt (MSE, Purdue, 2011); Rob Wortman (ECE, Purdue expected 2012); Jeremy Schroeder (MSE, Purdue, expected 2012); Polina Burmistrova (ECE, Purdue, expected 2012); Pankaj Jha (ECE, Purdue, expected 2012); Yuefeng Wang (MSE, Purdue, expected 2013), Bivas Saha (MSE, Purdue, expected 2014) – **20 completed, 6 in progress.**

M.S. – Advisory Committee Chair or Co-chair: Jordana Blacksberg (MSE, UCB, 97), Joseph Behnke (MSE, UCB, 97), Rachel Lau (MSE, UCB, 98), Alberto Salleo (MSE, UCB, 98), Loucas Tsakalakos (MSE, UCB, 98), Jacob Hernandez (MSE, UCB, 99), Peter Radkowski (AST, UCB, 99), Ning Cheng (MSE, UCB, 99), Clifford Knollenberg (MSE, UCB, 01), Juan Chediak (MSE, UCB, 01), Jeremy Schroeder (MSE, UCB, 02), Vorrada Loryuenyong (MSE, UCB, 02), Tao Su (MSE, UCB, 03), Amman Sareen (ECE, Purdue, 05); Robert Wortman (ECE, Purdue, 06); Mara Howell (MSE, Purdue, 07, with Prof. E. Garcia); Himanshu Mishra (ME, Purdue, with Prof. T. Fisher, 07); Vijay Rawat (ECE, Purdue, 08); Mark Oliver (MSE, Purdue, 08); Pankaj Jha (ECE, Purdue, 2010); Pranati Tewari (ECE, Purdue, 2010), Caitlin Burger (MSE, Purdue, with Prof. J. Appenzeller, 2011) – **22 completed.**

Undergraduate Research Advising:

Justin Gee (MSE, UCB, 94-95), Elizabeth Lyons (Harvard, Summer 95), Steve Nishimoto (MSE, UCB, 95), Dustin Gasser (MSE, UCB, 96), Nathaniel Quitoriano (MSE, UCB, 00), Ben Bowser (Erskine, Summer 03), Gage Simpson, Coriander Gobeyn, Laura McNabb, Sean Weber and Richard Scott (MSE Senior Project, Purdue, 03-04), Arjun Guha (ECE, Purdue, 03-04), Sean Liao (ECE, Purdue, 03-04), Stephanie Rothrauff (MSE, Purdue, 04), Abbey Heinlein (Michigan, Summer 04), Jonathan Winterstein (WSU, Summer 04), Paul Kapoor (MSE, Purdue, Summer 04), Jeff Ziebarth (ECE, Purdue, Summer 04), Derek Floyd, Erin Dick, Mike Koutsis, Ben Darland, Brad Allison, and Jeff Yanke (MSE Senior Project, Purdue, 04-05), Matt Schenider (MSE, Purdue, 04), Daniel Wood (MSE/Physics, Purdue, 04-06), Ben Darland (MSE, Purdue, Summer 05), In Chul Jang (ME, Purdue, 05), Zhiwei "Wes" Li (Purdue, Physics, 05), Mark Oliver (MSE, Purdue, 05-06), Shaud Tavakoli (Columbia, Summer 05), Krista Gumiela (ECE, Purdue, Summer 06), Andrew J. Martin (MSE, Purdue, Summer 2007); Mitchel Floyd (MSE, Purdue, 10). - **34 total.**

Classroom Teaching:

UC Berkeley (1993-2002)

***MSE 24**: Freshman Seminar - "The Disk Drive: Microcosm of Engineering" (2 semesters)
MSE 102: Junior-level undergraduate core course - "Bonding, Crystallography and Crystal Defects" (8 semesters)
MSE 123: Senior-level undergraduate MSE elective - "Semiconductor Processing" (1 semester)
***MSE 125**: Senior-level undergraduate MSE elective - "Thin-Film Materials Science" (4 semesters)
MSE 202: Graduate course - "Crystal Structure and Bonding" (1 semester)
***MSE 225/AS&T 225 –** Graduate course - "Thin-film Science & Technology" (4 semesters)

Purdue University (2002-present)

MSE 553/ECE 553: Ceramic Materials in Electronic Devices (S03)
***MSE 697T/ECE695T:** Principles and Methods of Nanofabrication (F03, F04, S06, S08)
MSE 430/440: Senior Design project advisor (F03-S04, F04-S05)
MSE 597V (now MSE 548): Deposition Processing of Thin Films and Coatings (S04, F05)
***MSE 595E/ECE 597G**: Materials and Devices for Solid-State Energy Conversion (S05, F06, S09)
MSE 367: Materials Processing Laboratory (S06)

**course developed by TDS*

Major Committee Assignments

UC Berkeley

Departmental:
Chair, AS&T Graduate Admissions Committee (1996; 2000)
Chair, MSE Fellowship Committee (1995)
Co-chair, MSE Graduate Admissions & Fellowship Committee (1996-97)
Chair, MSE ad hoc Faculty Workload Committee (1996-97)
Co-chair, MSE ad hoc Strategic Planning Committee (1997)

College Level:
Member, COE ad hoc Strategic Planning Committee (1994-95)
Member, Engineering Science Committee (1995-96; 2001-02)

University Level:
Chair, Integrated Vision for Materials at Berkeley ad hoc Committee (1994)
Chair, Laser Safety Committee (1995-01)
Chair, Non-Ionizing Radiation Safety Committee (2001-02)
Member, Environment, Health and Safety Policy Committee (1996-02)
Member, Chancellor's Advisory Council on Materials (1998-00)
Member, University Graduate Fellowships Committee (2002)

Purdue University:

School Committees:
Chair, ECE Internal Awards Committee (2005-2007)

Engineering-Wide:
Chair, Nanosystems Integration Search Subcommittee (2003-04)
Co-Chair, Nanotechnology and Nanophotonics Signature Area Cluster Search Committee (2005)
Member, Engineering Area Promotions Committee (05-06)
Member, COE Strategy and Strategic Oversight Committee (2005-2009)
Co-Chair, COE Faculty of 2020, Team 1b, Aligning Promotion and Tenure Strategic Planning Subcommittee (2009)

Discovery Park:
Member, ad hoc Advisory Committee for the Birck Nanotechnology Center (2003)
Member, Bindley Bioscience Center Strategic Council (2008-)
Chair, NSF NEES Mock Site Review Red Team (March 2009)
Member, DP Area Promotions Committee (2009-2010)

University-Wide:
Member of the Vice Provost/President for Research Search Committee (2003-04 and 2004-05)
Member, College of Engineering Dean Search Committee (2006)
Member, Dept. of Physics Head Search Committee (2006-07)
Member, Provost Search Advisory Committee (2007-08)
Member, Purdue Institute for Defense Innovation Review Committee (Fall 2009)

BIBLIOGRAPHY

Patents Issued and Applications Pending

Patents Issued

1. U. S. Patent No. 4,466,423; DOE case No. S 56,043, "*Rim Drive Cable Aligned Heliostat Collector System,*" James E. Dolan and Timothy D. Sands, issued Aug. 21st, 1984.
2. U. S. Patent No. 5,016,074; "*Epitaxial Intermetallic Contact for Compound Semiconductors,*"*(Epitaxial Permeable Base Transistor)* Timothy D. Sands, issued May 14th, 1991.
3. U. S. Patent No. 5,051,792; "*Epitaxial Intermetallic Contact for Compound Semiconductors,*" *(Epitaxial Gate Field-Effect Transistor)* Timothy D. Sands, issued Sept. 24th, 1991.
4. U. S. Patent No. 5,045,502; "*PdIn Ohmic Contact to GaAs,*" S. S. Lau, T. D. Sands and L. C. Wang, issued September 3rd, 1991.
5. U. S. Patent No. 5,075,755; "*Epitaxial Intermetallic Contact for Compound Semiconductors,*" *(Transition metal aluminides with B2 structure)* Timothy D. Sands, issued Dec. 24th, 1991.
6. U. S. Patent No. 5,169,485; "*Method for the Preparation of Epitaxial Ferromagnetic Manganese Aluminum Magnetic Memory Element,*" S. J. Allen, Jr., J. P. Harbison, M. L. Leadbeater, R. Ramesh, and T. D. Sands, issued Dec. 8th, 1992.
7. U. S. Patent No. 5,145,832; "*Superconducting Film on a Flexible Two-Layer Zirconia Substrate,*" K. S. Harshavardhan, S. Sampere, T. D. Sands, and T. Venkatesan, issued Sept. 8, 1992.
8. U. S. Patent No. 5,262,347; "*Palladium Welding of a Semiconductor Body,*" T. D. Sands, issued Nov. 16, 1993.
9. U.S. Patent No. 6,071,795; "*Separation of Thin Films from Transparent Substrates by Selective Optical Processing,*" N. W. Cheung, T. D. Sands and W. S. Wong, issued June 6th, 2000 (UC Ref. No. 98-018.1).

10. U. S. Patent No. 6,420,242; "*Separation of Thin Films from Transparent Substrates by Selective Optical Processing*," N. W. Cheung, T. D. Sands and W. S. Wong, issued July 17th, 2002 (UC Ref. No. B00-026-2).
11. U. S. Patent No. 6,335,263; "*Method of Forming a Low Temperature Metal Bond for Use in the Transfer of Bulk and Thin Film Materials*," N.W. Cheung, T.D. Sands and W.S. Wong, issued January 1st, 2002 (UC Ref. No. B00-026-3).
12. U.S. Patent No. 6,996,147; *"Method of Fabricating Nanostructures and Nanowires and Devices Fabricated Therefrom"* P. Yang, E. Weber, A. Majumdar, T. Sands, R. Fang, J. Kind, A. Shakouri, R. Russo, H. Feick, S. Mao, Y. Wu, H. Yan and M. Huang, issued February 7th, 2006. (UC Berkeley Case No. B01-B90-4); European Patent Application filed March 29th, 2002.
13. U.S. Patent No. 7,221,455 B2 "Integrated, Fluorescence-Detecting Microanalytical System," by J. Alex Chediak, ZhongSheng Luo, Timothy D. Sands, Nathan W. Cheung, Luke P. Lee, and Jeonggi Seo, issued May 22nd, 2007 (UCB Ref.: B03-069-2).
14. U.S. Patent No. 7,569,847 B2; *"Methods of Fabricating Nanostructures and Nanowires and Devices Fabricted Therefrom,"* A. Majumdar, A. Shakouri, T.D. Sands, P. Yang, S.S. Mao, R.E. Russo, H. Feick, E.R. Weber, H. Kind, M. Hunag, H. Yan, Y. Wu, R. Fan, issued August 4th, 2009 (continuation).
15. U.S. Patent No. 7,569,941 B2; *"Methods of Fabricating Nanostructures and Nanowires and Devices Fabricted Therefrom,"* A. Majumdar, A. Shakouri, T.D. Sands, P. Yang, S.S. Mao, R.E. Russo, H. Feick, E.R. Weber, H. Kind, M. Hunag, H. Yan, Y. Wu, R. Fan, issued August 4th, 2009 (continuation).
16. U.S. Patent No. 7,834,264 B2; *"Methods of Fabricating Nanostructures and Nanowires and Devices Fabricted Therefrom,"* A. Majumdar, A. Shakouri, T.D. Sands, P. Yang, S.S. Mao, R.E. Russo, H. Feick, E.R. Weber, H. Kind, M. Hunag, H. Yan, Y. Wu, R. Fan, issued November 16th, 2010 (continuation).
17.

Refereed Publications: Archival Journals

h-index = 45; m-index = 1.50; 212 items; total citations = 6,172 (ISI Web of Science; SCI-Expanded database; Sands T OR Sands TD; refined by subject; July 13th, 2012); ResearcherID site: http://www.researcherid.com/rid/D-2133-2009

1. T. D. Sands, J. Washburn and R. Gronsky, "High Resolution Observations of Copper Vacancy Ordering in Chalcocite (Cu_2S) and the Transformation to Djurleite ($Cu_{1.94-1.97}S$)," *physica status solidi (a)* **72** (1982) 551; (LBL-13746).
2. T. Sands, J. Washburn and R. Gronsky, "Interface Morphology and Phase Distribution in the $Cu_{2-x}S$/CdS Heterojunction: A Transmission Electron Microscope Investigation," *Solar Energy Materials* **10** (1984) 349; (LBL-17677).
3. D. K. Sadana, T. Sands and J. Washburn, "High Resolution Transmission Electron Microscopy Study of Se^+-Implanted and Annealed GaAs: Mechanisms of Amorphization and Recrystallization," *Appl. Phys. Lett.* **44** (1984) 623; (LBL-17267).
4. T. Sands, D. K. Sadana, R. Gronsky and J. Washburn, "High Resolution Structural Characterization of the Amorphous-Crystalline Interface in Se^+- Implanted GaAs," *Appl. Phys. Lett.* **44** (1984) 874; (LBL-17035).
5. T. Sands, J. Washburn, R. Gronsky, W. Maszara, D. K. Sadana and G. A. Rozgonyi, "Near-Surface Defects Formed during Rapid Thermal Annealing of Preamorphized and BF_2^+-Implanted Silicon," *Appl. Phys. Lett.* **45** (1984) 982; (LBL-18000).
6. M. F. Zhu, I. Suni, M-A. Nicolet and T. Sands, "Reaction of amorphous Ni-W and Ni-N-W Films with Substrate Silicon," *J. Appl. Phys.* **56** (1984) 2740.
7. T. Sands, J. Washburn and R. Gronsky, "Crystallographic Relationships between GaAs, As and Ga_2O_3 at the GaAs- Thermal Oxide Interface," *Materials Lett.* **3** (1985) 247; (LBL-18636).
8. D. K. Sadana, J. M. Zavada, H. A. Jenkinson and T. Sands, "High Resolution Transmission Electron Microscopy of Proton Implanted Gallium Arsenide," *Appl. Phys. Lett.* **47** (1985) 691.
9. T. Sands, J. Washburn, E. Myers and D. K. Sadana, "On the Origins of Structural Defects in BF_2^+-Implanted and Rapid-Thermally-Annealed Silicon: Conditions for Defect-free Regrowth," *Nucl. Instruments and Methods* **B7/8** (1985) 337.

10. J. M. Hong, S. Wang, T. Sands, J. Washburn, J. D. Flood, J. L. Merz and T. Low, "Selective Area Epitaxy of GaAs through Silicon Dioxide Windows by Molecular Beam Epitaxy," *Appl. Phys. Lett.* **48** (1986) 142.
11. J. M. Hong, S. Wang, J. D. Flood, J. L. Merz, T. Sands and J. Washburn, "Summary Abstract: Selective-Area Epitaxy of GaAs through Silicon Dioxide Windows by Molecular Beam Epitaxy," *J. Vac. Sci. Technol.* **B4** (1986) 629.
12. T. Banwell, M-A. Nicolet, T. Sands and P. J. Grunthaner, "Chemical Effects in Ion Mixing of a Ternary System (metal-SiO_2)," *Appl. Phys. Lett.* **50** (1987) 571.
13. T. Sands, V. G. Keramidas, R. Gronsky and J. Washburn, "Ternary Phases in the Pd-GaAs System: Implications for Shallow Contacts to GaAs," *Materials Lett.* **3** (1985) 409; (LBL-19379).
14. T. Sands, V. G. Keramidas, R. Gronsky and J. Washburn, "Initial Stages of the Pd-GaAs Reaction: Formation and Decomposition of Ternary Phases," *Thin Solid Films* **136** (1986) 105; (LBL-19133).
15. T. Sands, V. G. Keramidas, J. Washburn and R. Gronsky, "Structure and Composition of Ni_xGaAs," *Appl. Phys. Lett.* **48**, (1986) 402; (LBL-20376).
16. J. Ding, J. Washburn, T. Sands and V. G. Keramidas, "In/GaAs Reaction: Effect of an Intervening Native Oxide Layer," *Appl. Phys. Lett.* **49** (1986) 818; (TM-ARH-008173).
17. **Invited-** T. Sands, "Contacts to Compound Semiconductors," *J. of Metals (JOM)* **38** (1986) 31; (TM-ARH-002908).
18. K-M. Yu, S. K. Cheung, T. Sands, J. M. Jaklevic, N. W. Cheung and E. E. Haller, "Schottky Barrier Degradation of the W/GaAs System after High Temperature Annealing," *J. Appl. Phys.* **60** (1986) 3235; (TM-ARH-006069).
19. T. Sands, V. G. Keramidas, A. J. Yu, K. M. Yu, R. Gronsky and J. Washburn, "Ni, Pd and Pt on GaAs: A Comparative Study of Interfacial Structures, Compositions and Reacted Film Morphologies," *J. Mater. Res.* **2** (1987) 262; (TM-ARH-008064).
20. T. Sands, C. C. Chang, V. G. Keramidas, K. M. Krishnan and J. Washburn, "The Ni-InP Reaction: Formation of Amorphous and Crystalline Ternary Phases," *Appl. Phys. Lett.* **50** (1987) 1346.
21. T. Sands, V. G. Keramidas, K-M. Yu, J. Washburn and K. M. Krishnan, "A Comparative Study of Phase Stability and Film Morphology in Thin-Film M/GaAs Systems (M= Co, Rh, Ir, Ni, Pd and Pt)," *J. Appl. Phys.* **62** (1987) 2070.
22. K. M. Yu, S. K. Cheung, T. Sands, J. M. Jaklevic and E. E. Haller, "Correlation between Solid State Reactions and Electrical Properties of the Rh/GaAs Schottky Contact," *J. Appl. Phys.* **61** (1987) 1099; (LBL-21889, TM-ARH-008009).
23. Kin Man Yu, T. Sands, J. M. Jaklevic and E. E. Haller, "Interfacial Interactions of Evaporated Iridium Thin Films with (100) GaAs," *J. Appl. Phys.* **62** (1987) 1815.
24. K. M. Yu, W. Walukiewicz, J. M. Jaklevic, E. E. Haller and T. Sands, "Effects of Interface Reactions on Electrical Characteristics of Metal-GaAs Contacts," *Appl. Phys. Lett.* **51** (1987) 189.
25. **Invited-** T. Sands, "Compound Semiconductor Contact Metallurgy," *Mater. Sci. Engin. B* **1** (1988) 289; (TM-ARH-012196).
26. T. Sands, E. D. Marshall and L. C. Wang, "Solid-Phase Regrowth of Compound Semiconductors by Reaction-Driven Decomposition of Intermediate Phases," *J. Mater. Res.* **3** (1988) 914; (TM-ARH-010795).
27. L. C. Wang, B. Zhang, F. Fang, E. D. Marshall, S. S. Lau, T. Sands and T. F. Kuech, "An Investigation of a Non-Spiking Ohmic Contact to n-GaAs Using the Si/Pd System," *J. Mater. Res.* **3,** 922 (1988); (TM-ARH-011491).
28. R. Caron-Popowich, J. Washburn, T. Sands and A. S. Kaplan, "Phase Formation in the Pd-InP System," *J. Appl. Phys.* **64**, 4909 (1988); (TM-ARH-012195).
29. T. Sands, "Stability and Epitaxy of NiAl and Related Intermetallic Films on III-V Compound Semiconductors," *Appl. Phys. Lett.* **52** (1988) 197; (TM-ARH-010392).
30. T. Sands, W. K. Chan, C. C. Chang, E. W. Chase and V. G. Keramidas, "NiAl/n-GaAs Schottky Diodes: Barrier Height Enhancement by High-Temperature Annealing," *Appl. Phys. Lett.* **52** (1988) 1338; (TM-ARH-010820).
31. T. Sands, J. P. Harbison, W. K. Chan, S. A. Schwarz, C. C. Chang, C. J. Palmstrøm and V. G. Keramidas, "Epitaxial Growth of GaAs/NiAl/GaAs Heterostructures," *Appl. Phys. Lett.* **52**, 1216 (1988); (TM-ARH-010684).
32. J. P. Harbison, T. Sands, N. Tabatabaie, W. K. Chan, L. T. Florez and V. G. Keramidas, "Molecular Beam Epitaxial Growth of Ultrathin Buried Metal Layers: (Al,Ga)As/NiAl/(Al,Ga)As Heterostructures," *Appl. Phys. Lett.* **53**, 1717 (1988); (TM-ARH-012078).

33. N. Tabatabaie, T. Sands, J. P. Harbison, H. L. Gilchrist and V. G. Keramidas, "Negative Differential Resistance in AlAs/NiAl/AlAs Heterostructures: Evidence for Size Quantization in Metals," *Appl. Phys. Lett.* **53** (1988) 2528; (TM-ARH-012257).
34. J. P. Harbison, T. Sands, N. Tabatabaie, W. K. Chan, L. T. Florez, and V. G. Keramidas, "MBE Growth of AlGaAs/NiAl/AlGaAs Heterostructures: A Novel Epitaxial III-V Semiconductor/Metal System, *J. Crystal Growth* **95** (1989) 425; (TM-ARH-012077).
35. C. J. Palmstrøm, K. C. Garrison, S. Mounier, T. Sands, C. L. Schwartz, N. Tabatabaie, S. J. Allen, Jr., H. L. Gilchrist, and P. F. Miceli, "Growth of Epitaxial Rare-Earth Arsenide/(100) GaAs and GaAs/Rare-Earth Arsenide/(100) GaAs Structures," *J. Vac. Sci. Technol. B* **7**, (1989) 747; (TM-ARH-015067).
36. C. J. Palmstrøm, K. C. Garrison, B. O. Fimland, T. Sands and R. A. Bartynski, "Epitaxial CoGa and Textured CoAs Contacts to $Ga_{1-x}Al_xAs$ Fabricated by Molecular Beam Epitaxy," *J. Appl. Phys.* **65** (1989) 4753; (TM-ARH-013153).
37. S. J. Allen, Jr., N. Tabatabaie, C. J. Palmstrøm, G. W. Hull, T. Sands, F. DeRosa, H. L. Gilchrist, and K. C. Garrison, "ErAs Epitaxial Layers Buried in GaAs: Magneto-transport and Spin Disorder Scattering," *Phys. Rev. Lett.* **62** (1989) 2309; (TM-ARH-013497).
38. N. Tabatabaie, T. Sands, J. P. Harbison, H. L. Gilchrist, L. T. Florez and V. G. Keramidas, "Electrical Resistivity of Thin Epitaxial NiAl Buried in (Al,Ga)As," *Appl. Phys. Lett.* **54** (1989) 2112; (TM-ARH-013509).
39. S. J. Allen, Jr., N. Tabatabaie, C. J. Palmstrøm, S. Mounier, G. W. Hull, T. Sands, F. DeRosa, H. L. Gilchrist and K. C. Garrison, "Magneto-transport in Ultrathin ErAs layers Buried in GaAs," *Surface Science* **228**, (1990) 13; (TM-ARH-014288).
40. T. L. Cheeks, T. Sands, R. Nahory, J. P. Harbison, N. Tabatabaie, H. L. Gilchrist, B. J. Wilkens, and V. G. Keramidas, "Electrical and Optical Characterization of Back-to-Back Schottky (Al,Ga)As/NiAl/(Al,Ga)As Molecular Beam Epitaxially Grown Double Heterostructure Diodes," *Appl. Phys. Lett.* **56**, 1043 (1990); (TM-ARH-014922).
41. **Invited-** T. Sands, J. P. Harbison, N. Tabatabaie, W. K. Chan, H. L. Gilchrist, T. L. Cheeks, L. T. Florez and V. G. Keramidas, "Epitaxial Metal (NiAl)- Semiconductor (III-V) Heterostructures by MBE," *Surface Science* **228** (1990) 1; (TM-ARH-014739).
42. **Invited-** T. Sands, J. P. Harbison, R. Ramesh, C. J. Palmstrøm, L. T. Florez and V. G. Keramidas, "Interface Crystallography and Stability in Epitaxial Metal (NiAl,CoAl)/III-V Semiconductor Heterostructures," *Mater. Sci. and Engin. B***6** (1990) 147; (TM-ARH-015425).
43. **Invited-** T. Sands, C. J. Palmstrøm, J. P. Harbison, V. G. Keramidas, N. Tabatabaie, T. L. Cheeks, R. Ramesh, and Y. Silberberg, "Stable and Epitaxial Metal/III-V Semiconductor Heterostructures," *Materials Science Reports* **5**, (1990) 98-170; (TM-ARH-016940).
44. S. A. Schwarz, C. J. Palmstrøm, C. L. Schwartz, T. Sands, L. G. Shantharama, J. P. Harbison, L. T. Florez, E. D. Marshall, C. C. Han, S. S. Lau, L. H. Allen, and J. W. Mayer, "Backside Secondary Ion Mass Spectrometry Investigation of Ohmic and Schottky Contacts on GaAs, *J. Vac. Sci. Technol. A* **8** (1990) 2079; (TM-ARH-014853).
45. L. C. Wang, X. Z. Wang, S. S. Lau, T. Sands, W. K. Chan, and T. F. Kuech, "Stable and Shallow PdIn Ohmic Contacts to n-GaAs," *Appl. Phys. Lett.* **56**, 2129 (1990); (TM-ARH-016033).
46. T. Sands, J. P. Harbison, M. L. Leadbeater, S. J. Allen, Jr., G. W. Hull, R. Ramesh, and V. G. Keramidas, "Epitaxial Ferromagnetic τMnAl Films on GaAs," *Appl. Phys. Lett.* **57** (1990) 2609; (TM-ARH-017496).
47. L. C. Wang, X. Z. Wang, S. N. Hsu, S. S. Lau, P. S. D. Lin, T. Sands, S. A. Schwarz, D. L. Plumton, and T. F. Kuech, "An Investigation of the Pd-In-Ge Non-Spiking Ohmic Contact to n-GaAs using the TLM, Kelvin and the Cox and Strack Structures," *J. Appl. Phys.* **69**, 4364 (1991); (TM-ARH-018292).
48. E. Yablanovitch, T. Sands, D. M. Hwang, I. Schnitzer, T. J. Gmitter, S. K. Shastry, D. S. Hill and J. C. C. Fan, "Van Der Waals Bonding of GaAs on Pd Leads to a Permanent, Solid-Phase-Topotaxial, Metallurgical Bond," *Appl. Phys. Lett.* **59**, 3159 (1991); (TM-ARH-019566).
49. T. L. Cheeks, R. E. Nahory, T. Sands, J. Harbison, H. L. Gilchrist and V. G. Keramidas, "Design of Epitaxial Metal/AlAs/GaAs Structures for Enhancement of Schottky Barrier Heights," *J. Electron. Mater.* **20** (1991) 881.
50. S. A. Schwarz, M. A. A. Pudensi, T. Sands, T. J. Gmitter, R. Bhat, M. Koza, L. C. Wang and S. S. Lau, "Backside Secondary Ion Mass Spectrometry Study of a Ge/Pd Ohmic Contact to InP," *Appl. Phys. Lett.* **60**, (1991) 1123; (TM-ARH-020299).

51. R. Ramesh, A. Inam, D. M. Hwang, T. Sands, C. C. Chang and D. L. Hart, "The Surface Outgrowth Problem in c-axis Oriented Y-Ba-Cu-O Thin Films," *Appl. Phys. Lett.* **58** (1991) 1557.
52. K. S. Harshavardhan, R. Ramesh, T. S. Ravi, S. Sampere, A. Inam, C. C. Chang, G. Hull, T. Sands, T. Venkatesan, M. Reeves and J. E. Tkaczyk, "YBCO Films on Flexible, Partially Stabilized Zirconia Substrates with Fully Stabilized Zirconia Buffer Layers," *Appl. Phys. Lett.* **59** (1991) 1638; (TM-ARH-018607).
53. R. Ramesh, A. Inam, D. M. Hwang, T. S. Ravi, T. Sands, X. X. Xi, X. D. Wu, Q. Li, T. Venkatesan and R. Kilaas, "The Atomic Structure of Growth Interfaces in Y-Ba-Cu-O Thin Films," *J. Mater. Res.* **6** (1991) 2264.
54. M. L. Leadbeater, S. J. Allen, F. DeRosa, J. P. Harbison, T. Sands, R. Ramesh, L. T. Florez, and V. G. Keramidas, "Galvanomagnetic Properties of Epitaxial MnAl Films on GaAs," *J. Appl. Phys.* **69** (1991) 4689; (TM-ARH-017554).
55. J. P. Harbison, T. Sands, R. Ramesh, L. T. Florez, B. J. Wilkens, and V. G. Keramidas, "MBE Growth of Ferromagnetic Metastable Epitaxial MnAl Thin Films on AlAs/GaAs Heterostructures," *J. Crystal Growth* **111** (1991) 978;(TM-ARH-017851).
56. R. Ramesh, A. Inam, B. J. Wilkens, W. K. Chan, T. Sands, J. M. Tarascon, D. K. Fork, T. H. Geballe, J. Evans and J. Bullington, "Epitaxial Ferroelectric Bismuth Titanate/Superconductor (Y-Ba-Cu-O) Thin Film Heterostructures on Silicon," *Appl. Phys. Lett.* **59** (1991) 1782; (TM-ARH-018877).
57. R. Ramesh, A. Inam, W. K. Chan, F. Tillerot, B. J. Wilkens, C. C. Chang, T. Sands and J. M. Tarascon, "Ferroelectric $PbZr_{0.2}Ti_{0.8}O_3$ Thin Films on Epitaxial Y-Ba-Cu-O," *Appl. Phys. Lett.* **59**, (1991) 3542; (TM-ARH-019722).
58. T. L. Cheeks, M. J. S. P. Brasil, T. Sands, J. P. Harbison, D. E. Aspnes, V. G. Keramidas and S. J. Allen, Jr. "Magnetic and Magneto-optic Properties of Epitaxial Ferromagnetic τMnAl/(Al,Ga)As Heterostructures," *Appl. Phys. Lett.* **60** (1992) 1393; (TM-ARH-020392).
59. R. Ramesh, W. K. Chan, B. Wilkens, A. Inam, F. Tillerot, T. D. Sands, J. M. Tarascon and V. G. Keramidas, "Structure and Properties of Ferroelectric $PbZr_{0.2}Ti_{0.8}O_3/YBa_2Cu_3O_7$ Heterostructures," *J. Electronic Mater.* **21**, (1992) 513.
60. R. Ramesh, W. K. Chan, B. Wilkens, T. Sands, J. M. Tarascon, V. G. Keramidas and J. T. Evans, Jr., "Fatigue and Aging in Ferroelectric $PbZr_{0.2}Ti_{0.8}O_3/YBa_2Cu_3O_7$ Heterostructures", *Integrated Ferroelectrics* **1** (1992) 1.
61. R. Ramesh, A. Inam, W. K. Chan, B. J. Wilkens, F. Tillerot, T. Sands, J.-M. Tarascon, J. Bullington and J. Evans, "Ferroelectric $PbZr_{0.2}Ti_{0.8}O_3$ Thin Films on Epitaxial Y-Ba-Cu-O," *Integrated Ferroelectrics* **1** (1992) 205.
62. R. Ramesh, W. K. Chan, B. J. Wilkens, H. L. Gilchrist, T. Sands, J. M. Tarascon, V. G. Keramidas, D. K. Fork, J. J. Lee and A. Safari, "Fatigue and Retention in Ferroelectric Y-Ba-Cu-O/Pb-Zr-Ti-O/Y-Ba-Cu-O Heterostructures," *Appl. Phys. Lett.* **61** (1992) 1537.
63. Y. Silberberg and T. Sands, "Optical Properties of Metallic Quantum Wells," *IEEE J. of Quantum Electronics* **28,** (1992) 1663; (TM-ARH-017670).
64. L. C. Wang, Y. Z. Li, M. Kappes, S. S. Lau, D. M. Hwang, S. A. Schwarz and T. Sands, "The Si/Pd(Si,Ge) Ohmic Contact on n-GaAs," *Appl. Phys. Lett.* **60,** (1992) 3016.
65. K. S. Harshavardhan, M. Rajeswari, D. M. Hwang, C. Y. Chen, T. Sands, T. Venkatesan, J. E. Tkaczyk, K. W. Lay and A. Safari, "Dominant Pinning Mechanisms in $YBa_2Cu_3O_{7-x}$ Films on Single and Polycrystalline Yttria Stabilized Zirconia Substrates," *Appl. Phys. Lett.* **60** (1992) 1902.
66. **Invited-** R. Ramesh, A. Inam, T. Sands and C. T. Rogers, "Critical Review: Thin Film Y-Ba-Cu-O High T_c Superconductors: Structure-Property Relationships," *Mater. Sci. and Engin. B***14** (1992) 188.
67. **Invited-** T. Sands, "Nanoscale Engineering of Metal/Semiconductor Interfaces," *J. of The Minerals, Metals and Materials Society (JOM)*, February 1993, p. 61.
68. M. Tanaka, J. P. Harbison, J. De Boeck, T. Sands, B. Philips, T. L. Cheeks and V. G. Keramidas, "Epitaxial Growth of Ferromagnetic Ultrathin MnGa Films with Perpendicular Magnetization on GaAs," *Appl. Phys. Lett.* **62** (1993) 1565; (IM-BCR-000186)
69. D. H. Reitze, E. Haton, R. Ramesh, S. Etemad, D. E. Leaird, T. Sands, Z. Karim and A. Tanguay, "Electro-optic Properties of Single Crystalline, Ferroelectric Thin Films," *Appl. Phys. Lett.* **63** (1993) 596.
70. J. De Boeck, T. Sands, J. P. Harbison, A. Scherer, H. Gilchrist, T. L. Cheeks, M. Tanaka and V. G. Keramidas, "Non-Volatile Memory Characteristics of Submicrometre Hall Structures Fabricated in Epitaxial Ferromagnetic MnAl on GaAs," *Electronics Letters* **29** (1993) 421.
71. M. Tanaka, J. P. Harbison, T. Sands, B. Philips, T. L. Cheeks, J. De Boeck, L. T. Florez and V. G. Keramidas, "Epitaxial MnGa/NiGa Multilayers on GaAs," *Appl. Phys. Lett.* **63** (1993) 696.

72. J. P. Harbison, T. Sands, J. De Boeck, T. L. Cheeks, P. Miceli, M. Tanaka, L. T. Florez, B. J. Wilkens, H. L. Gilchrist and V. G. Keramidas, "MBE Growth of Ferromagnetic (Mn,Ni)Al Thin Films on AlAs/GaAs," *J. Crystal Growth* **127** (1993) 650; (IM-BCR-000243).
73. J. Lee, L. Johnson, A. Safari, R. Ramesh, T. Sands, H. Gilchrist and V. G. Keramidas, "Effects of Crystalline Quality and Electrode Material on Fatigue in Pb(Zr,Ti)O_3 Thin Film Capacitors," *Appl. Phys. Lett.* **63** (1993) 27.
74. R. Ramesh, H. Gilchrist, T. Sands, V. G. Keramidas, R. Haakenaasen and D. K. Fork, "Ferroelectric La-Sr-Co-O/Pb-Zr-Ti-O/La-Sr-Co-O Heterostructures on Silicon via Template Growth," *Appl. Phys. Lett.* **63** (1993) 3592.
75. S. Yilmaz, R. Gerhard-Multhaupt, W. A. Bonner, D. M. Hwang, A. Inam, J. A. Martinez, T. S. Ravi, T. D. Sands, B. J. Wilkens, X. D. Wu and T. Venkatesan, "Electro-optic Potassium-tantalate-niobate Films Prepared by Pulsed Laser Deposition from Segmented Pellets," *J. Mater. Res.*, **9** (1994) 1272.
76. R. Ramesh, T. Sands and V. G. Keramidas, "Effect of Crystallographic Orientation on Ferroelectric Properties of $PbZr_{0.2}Ti_{0.8}O_3$ Thin Films," *Appl. Phys. Lett.* **63** (1993) 731.
77. M. Tanaka, J. P. Harbison, T. Sands, T. L. Cheeks, J. De Boeck, D. M. Hwang, L. T. Florez and V. G. Keramidas, "Epitaxial τMnAl/NiAl Magnetic Multilayers on AlAs/GaAs," *Appl. Phys. Lett.* **63** (1993) 839.
78. S. G. Ghonge, E. Goo, R. Ramesh, T. Sands and V. G. Keramidas, "Microstructure of Epitaxial $La_{0.5}Sr_{0.5}CoO_3$ (LSCO) / Ferroelectric $Pb_{0.9}La_{0.1}(Zr_{0.2}Ti_{0.8})_{0.975}O_3$ (PLZT) / $La_{0.5}Sr_{0.5}CoO_3$ (LSCO) Heterostructures on $LaAlO_3$," *Appl. Phys. Lett.* **63** (1993) 1628.
79. M. Tanaka, J. P. Harbison, T. Sands, T. L. Cheeks, V. G. Keramidas and G. M. Rothberg, "MBE Growth of MnAs Thin Films on GaAs," *J. Vacuum Sci. and Technol.* **B 12** (1993) 1091.
80. S. G. Ghonge, E. Goo, R. Ramesh, T. Sands, and V. G. Keramidas, "Microstructure of Epitaxial Ferroelectric $YBa_2Cu_3O_{7-x}$ / $Pb_{0.9}La_{0.1}(Zr_{0.2}Ti_{0.8})_{0.975/}$/$YBa_2Cu_3O_{7-x}$ Heterostructures on $LaAlO_3$", *J. Amer. Ceram. Soc.* **76** (1993) 3141.
81. V. R. Iyer, E. P. Kvam, D. L. Perry, R. Ramesh, T. D. Sands and V. Keramidas, "Oriented Growth in Oxide Thin Film Heterostructures," *Scripta Metall. et Mater.* **29** (1993) 885.
82. R. Ramesh, T. Sands, and V. G. Keramidas, "Template Approaches to Growth of Oriented Oxide Heterostructures on SiO_2/Si", *J. Electronic Mater.* **23** (1994) 19.
83. K. S. Harshavardhan, M. Rajeswari, D. M. Hwang, C. Y. Chen, T. Sands and T. Venkatesan, "Comparison of the Critical Current Anisotropy in Epitaxial $YBa_2Cu_3O_{7-x}$ Films on (100) $LaAlO_3$ and (100) Yttria Stabilized Zirconia," *J. Mater. Res.* **9** (1994) 270.
84. R. Ramesh, J. Lee, T. Sands, V. G. Keramidas and O. Auciello, "Oriented Ferroelectric LSCO/PLZT/LSCO Heterostructures on [001] Pt/SiO_2/Si Substrates using a Bismuth Titanate Template Layer," *Appl. Phys. Lett.* **64** (1994) 2511.
85. R. Ramesh, B. Dutta, T. S. Ravi, J. Lee, T. Sands and V. G. Keramidas, "Scaling of Ferroelectric Properties in LSCO/PLZT/LSCO Capacitors", *Appl. Phys. Lett.* **64** (1994) 1588.
86. R. Ramesh, T. Sands, V. G. Keramidas, and D. K. Fork, Epitaxial Ferroelectric Thin Films for Memory Applications, *Materials Sci. & Engin. B- Solid State Mater. for Adv. Tech.* **22** (1994) 283.
87. W. S. Wong, T. Sands and N. W. Cheung, "Damage-free Separation of GaN Thin Films from Sapphire Substrates," *Appl. Phys. Lett.* **72** (1998) pp. 599-601.
88. P. R. Bandaru, T. Sands, Y. Kubota and E. Marinero, "Decoupling the Structural and Magnetic Phase Transformations in Magneto-optic MnBi Thin Films by the Partial Substitution of Cr for Mn," *Appl. Phys. Lett.*, **72** (1998) 2337-2339.
89. J. Bandaru, T. Sands and L. Tsakalakos, "A Simple Ru Electrode Scheme for Ferroelectric (Pb,La)(Zr,Ti)O_3 Capacitors Directly on Silicon," *J. Appl. Phys.*, **84** (1998) pp. 1121-1125.
90. P. Perlin, L. Mattos, N.A. Shapiro, J. Kruger, W. Wong, T. Sands, N.W. Cheung and E.R. Weber, "Reduction of the Energy Gap Pressure Coefficient of GaN due to the Presence of the Sapphire Substrate," *J. Appl. Phys.*, **85** (1999) pp. 2385-2389.
91. M. Sorescu, L. Tsakalakos and T. Sands, "Fluence Effects on the Magnetic Properties of $Fe_{81}B_{13.5}Si_{3.5}C_2$ Metallic Glass produced by Pulsed Laser Deposition," *J. Appl. Phys.* **85** (1999) pp. 6652-6654.
92. P.R. Bandaru, T. Sands, D. Weller and E.E. Marinero, "Magneto-optical Properties of Chromium-alloyed Manganese Bismuth Thin Films," *J. Appl. Phys.*, **86** (1999) pp. 1596-1603.

93. W.S. Wong, T. Sands, N.W. Cheung, M. Kneissl, D.P. Bour, P. Mei, L.T. Romano and N.M. Johnson, "Fabrication of Thin Film InGaN Light-emitting Diode Membranes by Laser Liftoff," *Appl. Phys. Lett.* **75** (1999) pp.1360-1362.
94. W.S. Wong, Y. Cho, E.R. Weber, T. Sands, K.M. Yu, J. Krüger, A. B. Wengrow and N.W. Cheung, "Structural and optical quality of GaN/metal/Si heterostructures fabricated by excimer laser liftoff," *Appl. Phys. Lett.* **75** (1999) pp. 1887-1889.
95. W.S. Wong, Y. Cho, N.J. Quitoriano, T. Sands, A.B. Wengrow and N.W. Cheung, "Integration of GaN thin films with dissimilar substrate materials by Pd-In metal bonding and laser liftoff," *J. Electronic Mater.* **28** (1999) pp. 1409-1413.
96. W. Choi, T. Sands and K.-Y. Kim, "Epitaxial Growth of Semiconducting $LaVO_3$ Thin Films," *J. Mater. Res. Rapid Comm.* **15** (2000) pp. 1-3.
97. L. Tsakalakos and T. Sands, "Epitaxial ferroelectric $(Pb,La)(Zr,Ti)O_3$ thin films on stainless steel by excimer laser liftoff," *Appl. Phys. Lett.* **76** (2000) pp.227-229.
98. E.A. Stach, M. Kelsch, E.C. Nelson, W.S. Wong, T. Sands and N.W. Cheung, "Structural and Chemical Characterization of Free-standing GaN Films Separated from Sapphire Substrates by Laser Lift-off," *Appl. Phys. Lett.* **77** (2000) pp. 1819-1821.
99. W.S. Wong, T. Sands, N.W. Cheung, M. Kneissl, D.P. Bour, P. Mei, L.T. Romano and N.M. Johnson, "$In_xGa_{1-x}N$ Light-emitting Diodes on Si Substrates Fabricated by Pd-In Metal Bonding and Laser Lift-off," *Appl. Phys. Lett.* **77**(2000) pp. 2822-24.
100. J.F., Behnke and T. Sands, "Bimodal Spatial Distribution of Pores in Anodically Oxidized Aluminum Thin Films," *J. Appl. Phys.* **88** (2000) 6875.
101. Salleo, T. Sands and F.Y. Génin, "Machining of Transparent Materials using IR and UV Nanosecond pulsed laser," *Applied Physics A – Materials Science and Processing* **71** (2000) pp. 601-608.
102. D.W. Song, W.L. Liu, T. Zeng, T. Borca-Tasciuc, G. Chen, C. Caylor and T. Sands, "Thermal Conductivity of Skutterudite Thin Films and Superlattices," *Appl. Phys. Lett.* **77** (2000) 993.
103. J. C. Caylor, A.M. Stacy, R. Gronsky and T. Sands, "Pulsed Laser Deposition of Skutterudite Thin Films," *J. Appl. Phys.* **89** (2001) 3508.
104. A. B. Kaul, T. Sands and T. Van Duzer, "High-T_c Superconducting NbN Films with Low Particulate Density grown at 25ºC using Pulsed Laser Deposition," *J. Mater. Res.- Rapid Comm.* **16** (2001) pp. 1223-6.
105. A. Salleo. F.Y. Génin, M.D. Feit, A.M. Rubenchik, T. Sands, S.S. Mao and R.E. Russo, "Energy deposition at front and rear surfaces during picosecond laser interaction with fused silica," *Appl. Phys. Lett.* **78** (2001) pp. 2840-2.
106. A.L. Prieto, M.S. Sander, M.S. Martin-Gonzalez, R. Gronsky, T. Sands and A.M. Stacy, "Electrodeposition of Ordered Bi_2Te_3 Nanowire Arrays," *J. Am. Chem. Soc. Comm.* **123** (2001) pp. 7160-7161.
107. N. Quitoriano, W.S. Wong, L. Tsakalakos, Y. Cho and T. Sands, "Kinetics of the Pd/In Thin-film Bilayer Reaction: Implications for Transient-Liquid-Phase Wafer Bonding," *J. Electronic Mater.* **30** (2001) pp. 1471-5.
108. J.C. Caylor, A.M. Stacy, R. Gronsky and T. Sands, "Epitaxial Growth of Skutterudite ($CoSb_3$) Thin Films on (100)InSb by Pulsed Laser Deposition," *J. Mater. Res. Rapid Comm.* **16** (2001) pp. 2467-70.
109. R.W. Martin, P.R. Edwards, H.-S. Kim, K.-S. Kim, T. Kim, I.M. Watson, M.D. Dawson, Y. Cho, T. Sands and N.W. Cheung, "Optical Spectroscopy of GaN Microcavities with Thickness Controlled Using a Plasma Etch-back," *Appl. Phys. Lett.* **79** (2001) pp. 3029-31.
110. P.R. Edwards, R. W. Martin, H.-S. Kim, K.-S. Kim, Y. Cho, I.M. Watson, T. Sands, N.W. Cheung and M.D. Dawson, "InGaN/GaN Quantum Well Microcavities Formed by Laser Lift-off and Plasma Etching," *phys. stat. sol.* (b) **228** (2001) pp. 91-94.
111. M. Sorescu, A. Grabias, L. Tsakalakos and T. Sands, "Comparative Study of the Crystallization Behavior of Fe-Cr-B-Si in Bulk and Thin Film Forms, *J. Mater. Synthesis and Processing*, **9** (2001) pp. 181-185.
112. M. S. Sander, A. L. Prieto, R. Gronsky, T. Sands, A. M. Stacy, "Fabrication of high-density, high aspect ratio, large-area bismuth telluride nanowire arrays by electrodeposition into porous anodic alumina templates", *Adv. Mater.* **14**, (9), (2002) pp. 665-67.
113. M.S. Martín-González, A.L. Prieto, R. Gronsky, T. Sands and A.M. Stacy, "Insights into the Electrodeposition Mechanisms of Bi_2Te_3," *J. Electrochem. Soc.*, **149** (2002) pp. C546-554.
114. Z. S. Luo, Y. Cho, V. Loryuenyong, T. Sands, N.W. Cheung, and M. C. Yoo, "Enhancement of (In,Ga)N Light-Emitting Diode Performance by Laser Lift-off and Transfer from Sapphire to Silicon," *IEEE Photonics Technology Letters*,**14** (2002) pp. 1400-02.

115. R.W. Martin, H.S. Kim, Y. Cho, P.R. Edwards, I.M. Watson, T. Sands, N.W. Cheung and M.D. Dawson, "GaN Microcavities formed by Laser Lift-off and Plasma Etching," *Mater. Sci. & Eng. B- Solid State Mater. For Adv. Technol.* **93** (2002) pp. 98-101.
116. G.M. Dougherty, A.P. Pisano and T. Sands, "Properties and Morphology of Permeable Polycrystalline Silicon Thin Films," *J. Mater. Res.* **17** (2002) pp. 2235-42.
117. H.W. Jang, J.K. Kim, J.-L. Lee, J. Schroeder and T. Sands, "Electrical Properties of Metal Contacts on Laser-irradiated n-type GaN," *Appl. Phys. Lett.* **82** (2003) pp. 580-2.
118. M.S. Sander, R. Gronsky, T. Sands, A.M. Stacy, "Structure of Bismuth Telluride Nanowire Arrays fabricated by Electrodeposition into Porous Anodic Alumina Templates," *Chem. Mater.* **15** (2003) pp. 335-39.
119. W. Choi and T. Sands, "Ferroelectric Field Effect in Epitaxial $LaVO_3$ / $(Ba,Sr)TiO_3$ / $(Pb,La)(Zr,Ti)O_3$ / $(La,Sr)CoO_3$ heterostructures" *J. Appl. Phys.* **93** (2003) pp. 4761-65.
120. M.S. Martín-González, A.L. Prieto, M.M. Knox, R. Gronsky, T. Sands and A.M. Stacy, "Electrodeposition of $Bi_{1-x}Sb_x$ Films and 200 nm Wires from a Non-aqueous Solvent," *Chem. Of Mater.* **15** (2003) 1676-1681.
121. M.S. Martín-González, A.L. Prieto, R. Gronsky, T. Sands and A.M. Stacy, "High Density 40 nm Sb-rich $Bi_{2-x}Sb_xTe_3$ Nanowire Arrays," *Adv. Mater.* **15** (2003) pp. 1003-6.
122. A.L. Prieto, M. Martín-González, J. Keyani, R. Gronsky, T. Sands and A.M. Stacy, "The Electrodeposition of High-Density, Ordered Arrays of $Bi_{1-x}Sb_x$ Nanowires, *J. Amer. Chem. Soc. Commun.* **125** (2003) pp. 2388-89.
123. M. Martín-González, G. J. Snyder, A.L. Prieto, R. Gronsky, T. Sands and A.M. Stacy, "Direct Electrodeposition of Highly Dense 50 nm $Bi_2Te_{3-y}Se_y$ Nanowire Arrays," *Nano Letters* **3** (2003) pp. 973-977.
124. W. Choi and T. Sands, "Effect of oxygen partial pressure during pulsed laser deposition on the orientation of CeO_2 thin films grown on (100) silicon," *J. Mater. Res. - Rapid Communications*, **18** (2003) pp. 1753-56.
125. G.M. Dougherty, T. Sands and A.P. Pisano, "Microfabrication Using One-Step Porous Polysilicon Films," *J Microelectromechanical Systems* **12** (2003) pp. 418-424.
126. H.W. Jang, T. Sands and J.L. Lee, "Effects of KrF Excimer Laser Irradiation on Metal Contacts to n-type and p-type GaN, *J. Appl. Phys.* **94** (2003) pp. 3529-35.
127. L. Tsakalakos, T. Sands, E. Carleton and K.M. Yu, "Modification of $(Pb,La)(Zr,Ti)O_3$ Thin Films During Pulsed Laser Liftoff from MgO Substrates, *J. Appl. Phys.* **94** (2003) pp. 4047-53.
128. A. Salleo, S.T. Taylor, M.C. Martin, W.R. Panero, R. Jeanloz, T. Sands and F. Y. Génin, "Laser-driven Formation of a High-pressure Phase in Amorphous Silica," *Nature Materials* **2** (2003) pp. 796-800.
129. J. Alex Chediak, Zhongsheng Luo, Jeonggi Seo, Nathan Cheung, Luke P. Lee and Timothy D. Sands, "Heterogeneous Integration of CdS Filters with GaN LEDs for Fluorescence Detection Microsystems," *Sensors & Actuators A* **111** (2004) pp. 1-7.
130. D.-A. Borca-Tasciuc, G. Chen, A. Prieto, M.S. Martin-Gonzalez, A. Stacy, T. Sands, M.A. Ryan and J.P. Fleurial, "Thermal properties of electrodeposited bismuth telluride nanowires embedded in amorphous alumina," *Appl. Phys. Lett.* **85** (2004) pp. 6001-3.
131. S. Sedky, J. Schroeder, T. Sands, T.J. King and R.T. Howe, "Effect of excimer laser annealing on the structural properties of silicon germanium films, *J. Mater. Res.* **19** (2004) pp. 3503-11.
132. E. Ertekin, P.A. Greaney, D.C. Chrzan and T.D. Sands, "Equilibrium Limits of Coherency in Strained Nanowire Heterostructures, " *J. Appl. Phys.*, **97** (2005) pp. 114325.
133. P. Deb, H. Kim, V. Rawat, M. Oliver, S. Kim, M. Marshall, E. Stach and T. Sands, "Faceted and Vertically Aligned GaN Nanorod Arrays Fabricated without Catalysts or Lithography," *Nano Letters*, **5** (2005) pp. 1847-51.
134. H. Kim, S. Kim, P. Deb and T. Sands, "Effect of KOH Treatment on the Schottky Barrier Height and Reverse Leakage Current in Pt/n-GaN," *J. Electron. Mater.* 35 (2006) 107.
135. S.K. Saha, M. DaSilva, Q. Hang, T. Sands and D.B. Janes, "Nanocapacitor with Giant Dielectric Permittivity," *Nanotechnology* **17** (2006) pp. 2284-88.
136. P.B. Amama, M.R. Maschmann, T.S. Fisher and T. Sands, "Dendrimer-Templated Fe Nanoparticles for the Growth of Single-walled Carbon Nanotubes by Plasma-Enhanced CVD," *J. Phys. Chem. B*, **110** (2006) 10636.
137. P. B. Amama, O. Ogebule, M. R. Maschmann, T. D. Sands, and T. S. Fisher, "Dendrimer-Assisted Low-Temperature Growth of Carbon Nanotubes by Plasma-Enhanced Chemical Vapor Deposition" *Chem. Comm.* (2006) pp. 2899-01.
138. M.R. Maschmann, A.D. Franklin, P.B. Amama, D.N. Zakharov, E.A. Stach, T.D. Sands and T.S. Fisher, "Vertical Single- and Double-walled Carbon Nanotubes Grown from Modified Porous Anodic Alumina Templates," *Nanotechnology* **17** (2006) pp. 3925-29.
139. V. Rawat and T. Sands, "Growth of TiN/GaN Metal/Semiconductor Multilayers by Reactive Pulsed Laser Deposition, *J. Appl. Phys.* **100** (2006) 064901.

140. W.-S. Chang, J.-W. Park, V. Rawat, T. Sands and G.U. Lee, "Templated Synthesis of Gold-Iron Alloy Nanoparticles by Pulsed Laser Deposition." *Nanotechnology* **17** (2006) 5131-35.
141. H.G. Kim, P. Deb and T. Sands, "High-reflectivity Al-Pt Nanostructured Ohmic Contact to p-GaN," *IEEE Transactions on Electron Devices* **53** (2006) pp. 2448-53.
142. P. Deb, H. Kim, Y. Qin, R. Lahiji, M. Oliver, R. Reifenberger and T. Sands, "GaN nanorod Schottky and p-n junction diodes," *Nano Letters* **6** (2006) pp. 2893-8.
143. M.R. Maschmann, A.D. Franklin, A. Scott, D.B. Janes, T.D. Sands and T.S. Fisher, "Lithography-free in Situ contacts to Templated Single-Walled Carbon Nanotubes", *Nano Letters* **6** (2006) pp. 2712-17.
144. A.A. Franklin, M.R. Maschmann, M. DaSilva, D.B. Janes, T.S. Fisher and T. D. Sands, "In-place Fabrication of Nanowire Electrode Arrays for Vertical Nanoelectronics on Si Substrates," *J. Vac. Sci Technol B* **25** (2007) pp. 343-47. Selected for the March 5th, 2007 issue of the *Virtual Journal of Nanoscale Science & Technology*.
145. H. Kim, P. Deb, and T. Sands, "Nanopatterned Contacts to GaN," *J. Electronic Mater.* **36** (2007) pp. 359-67.
146. P. Deb, T. Westover, H. Kim, T. Fisher and T. Sands, "Field emission from GaN and (Al,Ga)N/GaN nanorod heterostructures," *J. Vac. Sci. Technol. B* **2**5 (2007) pp. L15-18.
147. P.B. Amama, B.A. Cola, T.D. Sands, X. Xu and T.S. Fisher, "Dendrimer-assisted controlled growth of carbon nanotubes for enhanced thermal interface conductance," *Nanotechnology* **18** (2007) 385303 (online).
148. M.R. Maschmann, A.D. Franklin, T.D. Sands and T.S. Fisher, "Optimization of carbon nanotube synthesis from porous anodic Al-Fe-Al templates," *Carbon* **45** (2007) pp. 2290-96.
149. A.D. Franklin, J.T. Smith, T. Sands, T.S. Fisher, K.-S. Choi, and D.B. Janes, "Controlled Decoration of Single-walled Carbon Nanotubes with Pd Nanocubes," *J. Phys. Chem. C* **111**(2007) pp. 13756-62.
150. K. Biswas, Y. Qin, M. DaSilva, R. Reifenberger and T. Sands, "Electrical Properties of Individual Gold Nanowires Arrayed in a Porous Anodic Alumina Template," *phys stat sol (a)*, **204** (2007) pp. 3152-58.
151. A.D. Franklin, D.B. Janes, J.C. Claussen, T.S. Fisher, and T.D. Sands, "Independently Addressable Fields of Porous Anodic Alumina Embedded in SiO_2 on Si," *Appl. Phys. Lett.* , **92** (2008) 013122.
152. S. Kim, J.L. Schroeder and T.D. Sands, "Pulsed Selective Growth of Hexagonal GaN Microprisms," *J. Crystal Growth*, **310** (2008) pp. 1107-11.
153. M.H. Oliver, J.L. Schroeder, D.A. Ewoldt, I.H. Wildeson, V. Rawat, R. Colby, P.R. Cantwell, E.A. Stach and T. D. Sands, "Organometallic Vapor Phase Epitaxial Growth of GaN on ZrN/AlN/Si Substrates," *Appl. Phys. Lett.* **93** (2008) 023109.
154. J.T. Smith. Q. Hang, A.D. Franklin, D.B. Janes and T.D. Sands, "Highly Ordered Diamond and Hybrid Triangle-Diamond Patterns in Porous Anodic Alumina Thin Films," *Appl. Phys. Lett.* **93** (2008) 043108.
155. V. Rawat, Y.K. Koh, D.G. Cahill and T.D. Sands, "Thermal Conductivity of (Zr,W)N/ScN Metal/Semiconductor Multilayers and Superlattices," *J. Appl. Phys.* **105** (2009) 024909.
156. J. Baxter 1, Z. Bian, G Chen, D. Danielson, M. S. Dresselhaus, A. G. Fedorov, T.S. Fisher, C. W. Jones, E. Maginn, U. Kortshagen, A. Manthiram, A. Nozik, D. Rolison, T. Sands, L. Shi, D. Sholl, Y. Wu, "Nanoscale Design to Enable the Revolution in Renewable Energy," *Energy Environ. Sci.* **2** (2009) 559-588; DOI: 10.1039/b821698c.
157. A.D. Franklin, R.A. Sayer, T.D. Sands, T.S. Fisher and D.B. Janes, "Toward Surround Gates on Vertical Single-walled Carbon Nanotube Devices," Proc. of the 2008 Int'l. Conf. on Nanoscience + Technology, *J. Vac. Sci. Technol. B*. **27** (2009) 821-26.
158. M. Zebarjadi, Z. Bian, R. Singh, A. Shakouri, R. Wortman, V. Rawat and T. Sands, "Thermoelectric Transport in a ZrN/ScN Superlattice," *J. Electron. Mater.* **38** (2009) pp. 960-63; DOI: 10.1007/s11664-008-0639-5.
159. K.G. Biswas, T.D. Sands, B.A. Cola and X. Xu, "Thermal Conductivity of Bismuth Telluride Nanowire Array – Epoxy Composite," Appl. Phys. Lett. **94** (2009) 223116; DOI: 10.1063/1.3143221; Selected for the June 15th, 2009 issue of the *Virtual Journal of Nanoscale Science & Technology*.
160. A.D. Franklin, R.A. Sayer, T.D. Sands, D.B. Janes, and T.S. Fisher, "Vertical Carbon Nanotube Devices with Nanoscale Lengths Controlled without Lithography," *IEEE Trans. Nano.* **8** (2009) pp. 469-76 (selected for cover).
161. H. Mishra, B.A. Cola, V. Rawat, P.B. Amama, K.G. Biswas, X. Xu, T.S. Fisher and T.D. Sands, "Thermomechanical and Thermal Contact Characteristics of Bismuth Telluride Electrodeposited on Carbon Nanotubes," *Adv. Mater.* **21** (2009) pp. 4280-83.
162. V. Rawat, D.N. Zakharov, E.A. Stach and T.D. Sands, "Pseudomorphic stabilization of rocksalt GaN in TiN/GaN multilayers and superlattices," *Phys. Rev. B* **80** (2009) 024114.
163. M. DaSilva, D.S. Wood, M.M. Schneider, B.J. Kim, E.A. Stach and T.D. Sands, "An Investigation of Polyethyleneimine to Control the Growth Front Morphology of Electrochemically Deposited Gold Nanowires for Engineered Nanogap Electrodes. " *Small* **21** (2009) pp. 2387-91.

164. K.G. Biswas, H. El Matbouly, V. Rawat, J.L. Schroeder and T.D. Sands, "Self-supporting nanowire arrays templated in sacrificial branched porous anodic alumina for thermoelectric devices," *Appl. Phys. Lett.* **95** (2009) 073108.
165. X.R. Zhang, T.S. Fisher, A. Raman and T.D. Sands, "Linear Coefficient of Thermal Expansion of Porous Anodic Alumina Thin Films from Atomic Force Microscopy," *Nanoscale and Microscale Thermophysical Engineering* **13** (2009) pp. 243-52.
166. B. Saha, J. Acharya, T.D. Sands and U.V. Waghmare, "Electronic Structure, Phonons and Thermal Properties of ScN, ZrN and HfN: A First-principles Study," *J. Appl. Phys.***107** (2010) 033715.
167. R. Colby, Z. Liang, I.H. Wildeson, D.A. Ewoldt, T.D. Sands, R.E. Garcia and E.A. Stach, "Dislocation filtering in GaN Nanostructures," *Nano Letters* **10** (2010) pp. 1568-73.
168. W. Choi, S.Y. Lee and T.D. Sands, "Capacitance-Voltage Characteristics of $SrTiO_3/LaVO_3$ Epitaxial Heterostructures," *Appl. Phys. Lett.* **96** (2010) 212903.
169. I.H. Wildeson, R. Colby, D.A. Ewoldt, A. Liang, D.N. Zakharov, N.J. Zaluzec, R.E. Garcia, E.A. Stach and T.D. Sands, "III-nitride Nanopyramid Light Emitting Diodes Grown by Organometallic Vapor Phase Epitaxy," *J. Appl. Phys.* **108** (2010) 044303; Selected for the August 30th, 2010 issue of the *Virtual Journal of Nanoscale Science & Technology*.
170. Z. Liang, R. Colby, I. Wildeson, D. Ewoldt, T.D. Sands, E.A. Stach and R.E. Garcia, "GaN Nanostructure Design for Optimal Dislocation Filtering," *J. Appl. Phys.* **108** (2010) 074313.
171. I.H. Wildeson, D.A. Ewoldt, R. Colby, E.A. Stach and T.D. Sands, "Controlled Growth of Ordered Nanopore Arrays in GaN," *Nano Letters* **11** (2011) pp. 535-540.
172. W. Choi, S. Kim, Y.W. Jin, S. Y. Lee and T.D. Sands, "Capacitance-voltage modeling of metal-ferroelectric-semiconductor capacitors based on epitaxial oxide heterostructures" *Appl. Phys. Lett.* **98** (2011) 102901.
173. B. Saha, T. D. Sands and U. Waghmare, "Electronic structure, vibrational spectrum, and thermal properties of yttrium nitride: A first-priciples study," *J. Appl. Phys.* **109** (2011) 073720.
174. B. Saha, T.D. Sands and U. Waghmare, "First-principles analysis of ZrN/ScN metal/semiconductor superlattices for thermoelectric energy conversion," *J. Appl. Phys.* **109** (2011) 083717.
175. S.R. Das, C.J. Delker, D. Zakharov, Y.P. Chen, T.D. Sands and D.B. Janes, "Room temperature device performance of electrodeposited InSb nanowire field effect transistors," *Appl. Phys. Lett.* **98** (2011) 243504.
176. Z. Liang, I.H. Wildeson, R. Colby, D.A. Ewoldt, T. Zhang, T.D. Sands, E.A. Stach, B. Benes and R.E. García, "Built-In Electric Field Minimization in (In,Ga)N Nanoheterostructures," *Nano Letters* **11** (2011) pp.4515-19.
177. Y. Zhang, M. DaSilva, B. Ashall, FG. Doyle, D. Zerulla, T.D. Sands and G.U. Lee, "Magnetic Manipulation and Optical Imaging of an Active Plasmonic Single-Particle Fe-Au Nanorod," *Langmuir* **27** (2011) pp 15292-98.
178. G.V. Naik, J.L. Schroeder, X. Ni, A.V. Kildishev, T.D. Sands and A. Boltasseva, "Titanium nitride as a plasmonic material for visible and near-infrared wavelengths," *Optical Materials Express* **2** (2012) pp. 478-489.

Refereed Conference and Symposium Proceedings

83 to date – Only invited contributions listed below.

1. **Invited-** T. Sands, "Application of Cross-sectional Transmission Electron Microscopy to the Characterization of Ion-implanted Semiconductors," *Proc. 43rd Ann. Meet. Electron Microscopy Soc. of America*, Ed. G. W. Bailey (San Francisco Press, San Francisco, 1985), p. 292; (LBL-19162).
2. **Invited-** T. Sands, "Contributions of Electron Microscopy to the Understanding of Reactions on Compound Semiconductor Surfaces," *Mater. Res. Soc. Symp. Proc. Vol. 62*, Eds. L. W. Hobbs, K. H. Westmacott and D. B. Williams (MRS, Pittsburgh, 1986) p. 25; (LBL-20509).
3. **Invited-** T. Sands, "Heteroepitaxy of Stable Metallic Phases on GaAs: Identification of Candidate Phases by TEM," *Proc. 45th Ann. Meet. Electron Micros. Soc. Amer.*, Ed. G. W. Bailey (San Francisco Press, San Francisco, 1987), p. 322; (TM-ARH-008796).
4. **Invited-** T. Sands, "Intermetallic Contacts to Gallium Arsenide: Doping and Alloying by Limited Solid-Phase Reactions," *Proc. 46th Ann. Meet. Electron Micros. Soc. Amer.,* Ed. G. W. Bailey (San Francisco Press, San Francisco, 1988), p. 794; (TM-ARH-011353).
5. **Invited-** T. Sands, J. P. Harbison, N. Tabatabaie, W. K. Chan, H. L. Gilchrist, S. A. Schwarz, C. L. Schwartz, L. T. Florez, and V. G. Keramidas, "Growth and Properties of (Al,Ga)As/NiAl/(Al,Ga)As: An Epitaxial

Semiconductor/Metal/Semiconductor System," *Mater. Res. Soc. Symp. Proc. Vol. 144*, Eds.: D. K. Sadana, L. E. Eastman, and R. Dupuis, (MRS, Pittsburgh, 1989), pp. 571-582; (TM-ARH-013540).

6. **Invited-** C. J. Palmstrøm, J. P. Harbison, T. Sands, R. Ramesh, T. G. Finstad, S. Mounier, J. G. Zhu, C. B. Carter, L. T. Florez, and V. G. Keramidas, "Buried Metal/III-V Semiconductor Heteroepitaxy: Approaches to Lattice Matching," *Mater. Res. Soc. Symp. Proc. 198*, 153 (1990); (TM-ARH-017040).
7. **Invited-** T. Sands, J. P. Harbison, C. J. Palmstrøm, R. Ramesh and V. G. Keramidas, "A Template Approach to Metal/III-V Semiconductor Epitaxy," *MRS Symp. Proc. Vol. 221*, eds. R. F. C. Farrow, J. P. Harbison, P. S. Peercy and A. Zangwell, (MRS, Pittsburgh, 1991) p. 271; (TM-ARH-019578).
8. **Invited-** J. P. Harbison, T. Sands, C. J. Palmstrøm, L. T. Florez and V. G. Keramidas, "New Directions for III-V Structures: Metal/Semiconductor Heteroepitaxy," *Inst. Phys. Conf. Ser. No. 120*: Ch. 1 (1992) pp. 1-8; (TM-ARH-020111).
9. **Invited-** R. Ramesh, W. K. Chan, H. Gilchrist, B. Wilkens, T. Sands, J. M. Tarascon, V. G. Keramidas, J. T. Evans, Jr., F. D. Gealy and D. K. Fork, "Oxide Ferroelectric/Cuprate Superconductor Heterostructures: Growth and Properties," *Materials Res. Soc. Symp. Proc. Vol. 243*; *Ferroelectric Thin Films II*, A. I. Kingon, E. R. Myers and B. Tuttle, eds. (MRS, Pittsburgh, 1992) pp. 477-487.
10. **Invited-** J. P. Harbison, T. Sands, C. J. Palmstrøm, J. De Boeck, L. T. Florez and V. G. Keramidas, "MBE Growth of III-V / Metal Heterostructures," *Record of Alloy Semiconductor Physics and Electronics Symposium* (1993); (IM-BCR-000203).
11. **Invited -** J.C. Caylor, A.M. Stacy, B. Bloom, R. Gronsky, T. Sands, W.W. Fuller-Mora, A. Ehrlich, D. Song, and G. Chen, "Growth and Properties of Multilayered Skutterudite Thin Films,", *Eighteenth International Conference on Thermoelectrics. Proceedings, ICT'99*, IEEE (1999) pp. 656-61; presented by J.C. Caylor, 18th ICT, Baltimore, MD, Sept 2nd, 1999.
12. **Invited**- T. Sands, "Excimer Laser Lift-off for Packaging and Integration of GaN-based Light-emitting Devices," *Proc. of SPIE, Vol. 4977, Photon Processing in Microelectronics and Photonics* II (2003) pp. 587-601; presented by T. Sands in *International Symposium 8977 – LASE 2003, Laser-based Packaging in Microelectronics and Photonics II (LA10),* San Jose, CA, January 2003.

Non-refereed Proceedings and Technical Reports

1. T. D. Sands, "The Effects of Oxygen on the Microstructure of $Cu_{2-x}S$ Thin Films," M. S. Thesis, University of California, Lawrence Berkeley Laboratory, Nov. 1981; (LBL-13659).
2. T. D. Sands, "Formation and Degradation of $Cu_{2-x}S$/CdS Single-Crystal Heterojunctions: A Transmission Electron Microscope Study," Ph. D. Thesis, University of California, Lawrence Berkeley Laboratory, April 1984; (LBL-17684).
3. T. Sands, R. Ramesh, H. L. Gilchrist, M. Johnson, T. L. Cheeks, A. Inam and V. G. Keramidas, "Prospects for Semiconductor-based Nonvolatile Information Storage and Retrieval Systems with Gigabyte Capacity," Bellcore Technical Memorandum, Feb., 1992 (TM-ARH-021043).
4. J. Behnke, W. Ruythooren and T. Sands, "Pore Ordering in Anodically Oxidized Aluminum Thin Films," *Proceedings of the Third Symposium on Electrochemically Deposited Thin Films* , Vol. 96-10, ed. M. Paunovic and D. A. Scherson, (The Electrochemical Society, Pennington, NJ,1997) pp. 206-215.
5. W. Wong, T. Sands, N. Cheung, M. Kneissl, D. Bour, P. Mei, L. Romano and N. Johnson, "Ubiquitous Blue LEDs: The Integration of GaN Thin Films with Dissimilar Substrate Materials by Wafer Bonding and Laser Lift-off," Compound Semiconductor, Nov/Dec 1999, pp. 54-56.

Books and Book Chapters

1. **Book Chapter-** T. Sands and V. G. Keramidas, "Metal/Compound-Semiconductor Interactions," Chapter 26 in *Handbook on Semiconductors, Second Edition, Vol. 3. Materials, Properties and Preparation,* T. S. Moss and S. Mahajan, Eds. (Elsevier Science, Amsterdam, 1994), pp. 1997-2032.
2. **Book Chapter-** C. J. Palmstrøm and T. Sands, "Stable and Epitaxial Contacts to III-V Compound Semiconductors," Chapter 2 in "*Contacts to Semiconductors, - Fundamentals and Technology*" ed. L. Brillson, Materials Science and Process Technology Series (Noyes, Park Ridge, NJ, 1993).

3. **Book Chapter**- T. Sands, W.S. Wong and N.W. Cheung, “Layer Transfer by Bonding and Laser Lift-off,” Ch. 11 in “Wafer Bonding: Applications and Technology” eds. Marin Alexe and Ulrich Gösele (Springer-Verlag, Berlin 2004), pp. 377-415.

Edited Conference and Symposium Proceedings

1. **Edited Conference Proceedings-** "Chemistry and Defects in Semiconductor Heterostructures," *Materials Research Society Symposium Proceedings, Vol. 148,* M. Kawabe, T. D. Sands, E. R. Weber and R. S. Williams, Eds. (MRS, Pittsburgh, PA, 1989).
2. **Edited Journal Section-** A. Inam and T. Sands, eds., Special Section in the *Journal of Electronic Materials,* Vol. 21, May 1992 Issue, "Metal Oxide Films."
3. **Edited Conference Proceedings-** "Defect-Interface Interactions," *Materials Research Society Symposium Proceedings, Vol. 319,* E. P. Kvam, A. H. King, M. J. Mills, T. D. Sands and V. Vitek, Eds. (MRS, Pittsburgh, PA, 1994).
4. **Edited Conference Proceedings-** “Integration of Heterogeneous Thin-film Materials and Devices,” *Materials Research Society Symposium Proceedings, Vol. 768*, H.A. Atwater, M.I. Current, M. Levy and T. Sands, Eds. (MRS, Pittsburgh, PA, 2003); Proceedings of Symposium G at the 2003 MRS Spring Meeting, San Francisco, CA.

Invited Talks at Major Conferences, Symposia and Workshops

1. "High-Resolution Structural Characterization of the Amorphous-Crystalline Interface in Se^+-Implanted GaAs," Tech. Meeting of SPIE, Los Angeles, CA, Jan. 1984.
2. "Application of Cross-sectional Transmission Electron Microscopy to the Characterization of Ion-implanted Semiconductors," 43rd Ann. Meeting of the Electron Microscopy Soc. of America, Louisville, KY, Aug. 1985.
3. "Contributions of Electron Microscopy to the Understanding of Reactions on Compound Semiconductor Surfaces," presented by U. Dahmen, 1985 Fall Meeting of Mater. Res. Soc., Boston, MA, Nov. 1985.
4. "Electron Microscopy of Reaction Products at Reacted Metal/Gallium Arsenide Interfaces," AIME Annual Meeting, New Orleans, LA, March 1986.
5. "Stable Phases at Reactive Metal/Compound Semiconductor Interfaces," Workshop on 3-5 Semiconductor: Metal Interfacial Chemistry and Its Effect on Electrical Properties, Stanford University, Palo Alto, CA, Nov. 1986.
6. V.G. Keramidas and T. Sands, "Contact Metallizations to Compound Semiconductors, " presented by V. G. Keramidas at the 1986 Fall Meeting of TMS/AIME, Orlando, FL, Oct. 1986.
7. "Heteroepitaxy of Stable Metallic Phases on GaAs: Identification of Candidate Phases by TEM," 45th Ann. Meet. Electron Micros. Soc. Amer., Baltimore, MD, Aug. 1987.
8. "Compound Semiconductor Contact Metallurgy," Symposium on Solid-State Materials for Advanced Technology: Unresolved Issues, sponsored by the Office of Naval Research, Mellon Institute, Pittsburgh, PA, Dec. 1987.
9. "Intermetallic Contacts to Gallium Arsenide: Doping and Alloying by Limited Solid-Phase Reactions," 46th Ann. Meet. Electron Micros. Soc. of America, Milwaukee, WI, Aug. 1988.
10. T. Sands, J. P. Harbison, N. Tabatabaie, L. T. Florez, H. L. Gilchrist, and V. G. Keramidas, "Epitaxial Intermetallic Films Buried in III-V Semiconductor Heterostructures; Growth, Processing and Device Prospects, “presented at the 1988 Fall Meeting of The Electrochemical Society, State-of-the-art Program on Compound Semiconductors (SOTAPOCS IX), Chicago, IL, Oct. 1988.
11. T. Sands, J. P. Harbison, N. Tabatabaie, W. K. Chan, H. L. Gilchrist, S. A. Schwartz, L. T. Florez and V. G. Keramidas, "Growth and Properties of (Al,Ga)As/NiAl/(Al,Ga)As: An Epitaxial Semiconductor/Metal/Semiconductor System," 1988 Fall Meeting of the Mater. Res. Soc., Boston, MA, Dec. 1988.
12. "Intermetallic Contacts to Gallium Arsenide," presented in the Hume-Rothery Memorial Symposium at the 1989 Annual Meeting of the Minerals, Metals and Materials Society (TMS/AIME), Las Vegas, March 1989.

13. J. P. Harbison, T. Sands, C. J. Palmstrøm, N. Tabatabaie, W. K. Chan, L. T. Florez, H. L. Gilchrist, K. C. Garrison, S. Mounier and V. G. Keramidas, "Epitaxial Metals on Compound Semiconductors," presented by J. P. Harbison, DOE Workshop on "Materials Science for Epitaxial Heterostructures," Monterey, CA, Jan., 1989.
14. T. Sands, J. P. Harbison, N. Tabatabaie, H. L. Gilchrist, T. L. Cheeks, V. G. Keramidas, and L. T. Florez, Epitaxial Metal (NiAl)-Semiconductor (AlGaAs) Heterostructures by MBE." 4th International Conf. on Modulated Semiconductor Structures, Ann Arbor, MI, July, 1989.
15. T. Sands, J. P. Harbison, C. J. Palmstrøm, N. Tabatabaie, T. L. Cheeks, H. L. Gilchrist, L. T. Florez, W. K. Chan, and V. G. Keramidas, "Stable and Epitaxial Metal/III-V Semiconductor Heterostructures Grown by Molecular Beam Epitaxy," 1989 Electronic Materials Conf., Cambridge, MA, June, 1989.
16. T. Sands, J. P. Harbison, C. J. Palmstrøm, L. T. Florez and V. G. Keramidas, "Interfaces in Epitaxial Metal/Compound Semiconductor Heterostructures," 1989 American Crystallographic Assoc. Ann. Meeting, Seattle, WA, July, 1989.
17. J. P. Harbison, T. Sands, C. J. Palmstrøm, N. Tabatabaie, H. L. Gilchrist, L. T. Florez, T. L. Cheeks, R. E. Nahory, W. K. Chan and V. G. Keramidas, "Stability of Metal Layers Embedded in Semiconductors," presented by J. P. Harbison, 1989 MRS Fall Meeting, Boston, MA, Nov., 1989.
18. C. J. Palmstrøm, K. C. Garrison, S. Mounier, N. Tabatabaie, S. J. Allen, Jr., T. Sands, and C. L. Schwartz, "Metallic Compound/ Compound Semiconductor Structures and Heterostructures," presented by C. J. Palmstrøm, 1989 Spring MRS Fall Meeting, San Diego, CA, April, 1989.
19. C. J. Palmstrøm, S. A. Schwarz, T. Sands, J. P. Harbison, L. T. Florez, E. D. Marshall, L. C. Wang, C. C. Han, and S. S. Lau, "Stability of Metallizations on III-V Semiconductors: A Look at Some of the Fundamental Issues," Spring 1990 Materials Research Soc. Meeting, Symposium on Degradation Mechanisms in III-V Compound Semiconductor Devices and Structures, San Diego, CA, April, 1990, presented by C. J. Palmstrøm.
20. T. Kim, D. D. L. Chung, S. Mahajan, J. P. Harbison, and T. Sands, "Correlation between Electrical Behavior and Interfacial Phases in Au/Ge/Ni Contacts to n-GaAs," TMS Annual Meeting, Symposium on Metallizations for Electronics, February, 1990, Anaheim, CA., presented by S. Mahajan.
21. T. Sands, J. P. Harbison, T. L. Cheeks, R. E. Nahory, H. L. Gilchrist, L. T. Florez, R. Ramesh, V. G. Keramidas, and L. C. Wang, "Stable and Single-Phase Ohmic and Schottky Contacts to III-V Semiconductors," 1990 Annual Meeting of TMS, Symposium on Metallizations for Electronics Applications, February, 1990, Anaheim, CA.
22. L. C. Wang, C. C. Han, S. S. Lau, T. Sands, S. A. Schwarz, and C. J. Palmstrøm, T. F. Kuech, R. M. Potemski, and M. Tischler, "Non-Spiking Ohmic Contacts by Solid Phase Regrowth," Fall Meeting of the Electrochemical Society, Symposium on Metallization of III-V Compound Semiconductors, October, 1990, Seattle, WA; presented by S. S. Lau.
23. "Stable Contacts to III-V Semiconductors," 3rd Electronic Materials and Processing Congress of ASM International, San Francisco, CA, August, 1990.
24. T. Sands, J. P. Harbison, C. J. Palmstrøm, and V. G. Keramidas, "III-V Semiconductor/Metal/III-V Semiconductor Heterostructures: Initial Stages of Epitaxial Growth," Workshop on "Microstructural Processes in Nucleation and Initial Growth on Semiconductor Surfaces," sponsored by The International Union of Vacuum Science, Techniques and Applications (IUVSTA), Obertraun, Austria, February, 1990.
25. J. P. Harbison, T. Sands, C. J. Palmstrøm, R. Ramesh, L. T. Florez, T. L. Cheeks, and V. G. Keramidas, "Buried Metal/III-V Semiconductor Heteroepitaxy: Approaches to Lattice Matching," 1990 Spring Meeting of the Materials Research Society, Symposium V: Epitaxial Heterostructures, San Francisco, CA, April, 1990, presented by J. P. Harbison.
26. J. P. Harbison, T. Sands, C. J. Palmstrøm, N. Tabatabaie, R. Ramesh, H. L. Gilchrist, L. T. Florez, T. L. Cheeks, R. E. Nahory, W. K. Chan, and V. G. Keramidas,"Buried Intermetallics in III-V Semiconductor Heterostructures: Novel Properties and Device Prospects," 1990 Annual Meeting of TMS, February, 1990, Anaheim, CA, presented by J. P. Harbison.
27. T. L. Cheeks, T. Sands, R. E. Nahory, J. P. Harbison, C. J. Palmstrøm, H. L. Gilchrist, and V. G. Keramidas, "Electrical and Optical Characterization of MBE Grown Metal/III-V Semiconductor Heterostructure Schottky Diodes," Fall Meeting of the Electrochemical Society, Symposium on Metallization of III-V Compound Semiconductors, October, 1990, Seattle, WA; presented by T. L. Cheeks.
28. T. Sands, Y. Silberberg, and J. P. Harbison, "Electronic and Optical Properties of Semiconductor-Clad Metallic Quantum Wells," Fall Meeting of the Electrochemical Society, Symposium on Nonlinear Optics and Materials, October 1990, Seattle, WA.
29. S. J. Allen, F. DeRosa, H. L. Gilchrist, J. P. Harbison, M. Leadbeater, P. F. Miceli, C. J. Palmstrøm, R. Ramesh, T. Sands, and A. Zrenner, "Magneto-Transport in Magnetic Epitaxial Metal Layers Buried in

(Ga,Al)As Heterostructures," 35th Annual Conference on Magnetism & Magnetic Materials, October, 1990, San Diego, CA.

30. T. Sands, V. G. Keramidas and L. C. Wang, "Limited Solid-Phase Metal/III-V Semiconductor Reactions; Implications for Advanced Contact Metallizations," Fall Meeting of the Mater. Res. Soc., Boston, MA, Dec., 1991.
31. T. Sands, J. P. Harbison, C. J. Palmstrøm, R. Ramesh and V. G. Keramidas, "A Template Approach to Metal/III-V Semiconductor Epitaxy," Spring Meeting of the Materials Research Society, Anaheim, CA, April, 1991.
32. C. J. Palmstrøm, T. Sands, J. P. Harbison, S. J. Allen, Jr., T. L. Cheeks, P. F. Miceli, B. J. Wilkens, H. L. Gilchrist, L. T. Florez, K.Moyers, V. G. Keramidas, J. G. Zhu, C. B. Carter, J. Rhyne and D. Newman, "Growth and Properties of Thermodynamically Stable Epitaxial Buried Metallic Layers in Compound Semiconductors," International Conf. on Metallurgical Coatings and Thin Films, San Diego, CA, April, 1991, presented by C. J. Palmstrøm.
33. C. J. Palmstrøm, T. G. Finstad, T. Sands, J. P. Harbison, P. F. Miceli, B. J. Wilkens, J. G. Zhu and C. B. Carter, "Heteroepitaxial Metal III-V Semiconductor Systems," Scanning Microscopy Conf., Bethesda, MD, May 1991, presented by C. J. Palmstrøm.
34. J. P. Harbison, T. Sands, C. J. Palmstrøm, L. T. Florez and V. G. Keramidas, "New Directions for III-V Structures: Metal/Semiconductor Heteroepitaxy," 18th International Symp. on GaAs and Related Compounds, Seattle, WA, Sept. 1991, presented by J. P. Harbison.
35. T. Tsakalakos, G. C. Joo, S. P. Chen, T. Sands, J. P. Harbison, C. J. Palmstrøm and V. G. Keramidas, "Modeling the Growth of Constrained Intermetallic Phases," Fall Meeting of The Minerals, Metals and Materials Society (TMS), Cincinnati, OH, Oct., 1991, presented by T. Tsakalakos.
36. R. Ramesh, A. Inam, W. K. Chan, B. J. Wilkens, F. Tillerot, C. C. Chang, T. Sands and J. M. Tarascon, "Cuprate Superconductor/Oxide Ferroelectric Heterostructures: Growth and Properties," Fall Meeting of the Mater. Res. Soc., Boston, MA, Dec., 1991, presented by R. Ramesh.
37. R. Ramesh, A. Inam, W. K. Chan, B. Wilkens, T. Sands and J. M. Tarascon, "Epitaxial Oxide Ferroelectric/Cuprate Superconductors: A Study in Oxide Heteroepitaxy," Fall Meeting of the American Ceramics Soc., Arlington, VA, October, 1991, presented by R. Ramesh.
38. R. Ramesh, A. Inam, W. K. Chan, B. Wilkens, M. Rajeswari, C. C. Chang, H. Gilchrist, T. Sands, J. M. Tarascon and V. G. Keramidas, "Cuprate Superconductor/Oxide Ferroelectric Heterostructures: Growth and Properties, 1992 Electronic Materials Conf., Boston, MA, June 1992, presented by R. Ramesh.
39. "The Role of Storage Technology in the Emerging Public Information Network", presented in a Plenary Session on "*Information Technology for the 21st Century*" at the International Magnetics Conference (INTERMAG), Stockholm, Sweden, April 1993.
40. "Nanoscale Engineering of Metal/Semiconductor Interfaces," 1993 Fall Meeting of TMS/ASM, Pittsburgh, PA., October, 1993.
41. T. L. Cheeks, J. P. Harbison, M. Tanaka, D. M. Hwang, T. Sands and V. G. Keramidas, "Magnetic Properties of Epitaxial τMnAl/NiAl Magnetic Multilayers Grown on GaAs Heterostructures," 38th Annual Conf. on Magnetism and Magnetic Materials (MMM), Minneapolis, MN, November, 1993.
42. "Integrated Ferroelectrics for Information Storage," 23rd Annual Electronic Materials Symposium (sponsored by TMS and IEEE), San Jose, CA, March 20, 1995.
43. "Solid-Phase Regrowth of Compound Semiconductors at Low Temperatures: Application to Shallow, Low-resistance Ohmic Contacts," 125th Annual TMS Meeting, Anaheim, CA, February 4-8, 1996.
44. "Integration of Dielectric Ceramic Thin Films with Silicon: Memory to Micromachines," Meeting of The American Ceramics Society - Northern California Section, Oakland, CA, May 21, 1996.
45. "Bimodal Spatial Distribution of Pores in Anodically Oxidized Aluminum Thin Films," J. Behnke and T. Sands, presented by J. Behnke at the 1997 Joint International Meeting (the 192nd Meeting of The Electrochemical Society, Inc. and the 48th Annual Meeting of the International Society of Electrochemistry), September 5, 1997, Paris, France.
46. "Microstructure and Texture Effects on the In-plane Properties of Polycrystalline PZT Thin Films for MEMS," L. Tsakalakos, T. Sands, J. Blacksberg, U. Dahmen and F. M. Ross, presented by L. Tsakalakos at the Fall 1997 Meeting of the Materials Research Society, Boston, MA, December, 4th, 1997.
47. "Crystallographic Texture in Electroceramic Thin Films on Silicon", T. Sands, L. Tsakalakos and W.S. Wong, presented by T. Sands at the 1998 MRS Fall Meeting, Boston, MA, December 2nd, 1998.
48. "Excimer Laser Liftoff of Thin Films," T. Sands, W.S. Wong and L. Tsakalakos, presented by T. Sands at the American Physical Society Centennial Meeting, Atlanta, GA, March 20-26, 1999.

49. "Crystallographic Texture and Magneto-optic Properties of (Mn,Cr)Bi Thin Films," T. Sands and P. Bandaru, presented by T. Sands at the 1999 MRS Spring Meeting, San Francisco, CA, April 1999.
50. "Optical Properties of Sol-gel Deposited PZT Films," N. Ozer and T. Sands, presented by N. Ozer at the 10th International Workshop on Glasses, Hybrids and Nanocomposites from Gels," Sept., 1999, Yokohama, Japan.
51. "Integration of Epitaxial Heterostructures by Laser Liftoff," T. Sands, W.S. Wong, L. Tsakalakos and N.W. Cheung, presented by T. Sands in *Symposium O: Substrate Engineering - Paving the Way to Epitaxy*1999 MRS Fall Meeting, Boston, MA, December 1999.
52. "Integration of Epitaxial Oxide and Nitride Heterostructures with Dissimilar Substrates by Pd-In Wafer Bonding and Laser Lift-Off," T. Sands, W.S. Wong, L. Tsakalakos and N.W. Cheung, presented by T. Sands at the American Vacuum Society 47th International Symposium, Session on Integration of Dissimilar Materials, Boston, MA, Oct. 2, 2000.
53. "Transfer of Nitride Device Heterostructures from Sapphire Growth Substrates to Silicon by Metal Bonding and Laser Lift-Off," T. Sands, W.S. Wong, L. Tsakalakos, A. Salleo, Y. Cho, N. Quitoriano and N.W. Cheung, presented by T. Sands in Symposium G: GaN and Related Alloys, MRS Fall 2000 Meeting, Boston, MA, Nov. 28th, 2000.
54. "Excimer Laser Lift-off for Packaging and Integration of GaN-based Light-emitting Devices," SPIE International Symposium – LASE 2003, Laser-based Packaging in Microelectronics and Photonics II (LA10), San Jose, CA, January 2003.
55. "Morphological Evolution of Compositionally Modulated Nanowires," 132nd Annual Meeting of The Minerals Metals and Materials Society (TMS), San Diego, CA, March 4th, 2003.
56. "Assembly of Heterogeneous Nano- and Microsystems at Low Ambient Temperatures," 2004 ASME International Mechanical Engineering Congress and RD&D Expo (IMECE), Anaheim, CA, Nov. 14th, 2004.
57. "Epitaxial Layer Transfer by Excimer Laser Liftoff," Timothy D. Sands and Jeremy L. Schroeder, Photonics West, Conference 5713A, Laser Applications in Microelectronic and Optoelectronic Manufacturing X, San Jose, CA, January 24th, 2005, presented by T. Sands.
58. "Prospects for white light-emitting diodes based on (In,Ga)N nanorod arrays," Timothy Sands and Parijat Deb, presented by T. Sands at Nanotech 2005, Anaheim, CA, 5/9/05.
59. "Bi_2Te_3 nanowire array/epoxy composites for thermoelectric power generation and microcoolers," K. Biswas, V. Rawat, M. DaSilva and T. Sands, 2nd Energy Nanotechnology International Conference (ENIC); presented by K. Biswas in Santa Clara, CA, September 2007.
60. "InGaN-based Nanostructures for High-Performance Light Emitting Devices," R.E. Garcia, T.D. Sands and E.A. Stach, Amer. Soc. Ceramics Meeting; presented by R.E. Garcia in Daytona Beach, FL, Jan. 21st, 2008
61. "Nanoheteroepitaxy: An approach toward a monolithic phosphor-free white LED," Timothy D. Sands, Nanomaterials Symposium, TMS 2008, New Orleans, LA, March 10th, 2008.
62. "Bi_2Te_3 Nanowire Composites for Thermoelectric Devices," K. Biswas and T. Sands, 2008 Spring MRS Meeting, presented by K. Biswas, paper LL6.2, San Francisco, CA, March 27th, 2008; Kalapi Biswas received a **Graduate Student Research Silver Award**.
63. Panelist on operating micro/nanofabrication user facilities at the 17th Biennial University, Government, Industry Micro/Nano Symposium, IEEE UGIM, Lousiville, KY, July 13th, 2008.
64. "Active Nanotechnologies – The Benefits and Risks of the Next Wave," Nanotechnology and the Environment Conference, Indianapolis, IN, August 5th, 2008.
65. "Metal/Semiconductor Superlattices as Thermoelectric Metamaterials," T. Sands and V. Rawat, Keynote talk at the ASME 3rd Energy Nanotechnology International Conference, presented by T. Sands, Jacksonville, FL, August 13th, 2008.
66. "Nanoheteroepitaxy: An Approach Toward a Monolithic, Phosphor-free White LED," Joint India-US Workshop on Scalable Nanomaterials for Enhanced Enery Transport, Conversion and Efficiency, J.F. Welch Technology Centre, GE Global Research, Bangalore, India, August 21st, 2008.
67. "Will Nanotechnology Enable Efficient Thermoelectric Refrigerators and Waste Heat Generators," Keynote talk at the 5th International Congress of Nano-Bio Clean Tech 2008, San Francisco, CA, October 28th, 2008.
68. "Metal/Semiconductor Superlattices: Metamaterials for Solid-State Energy Conversion," Plenary session speaker at the Fourth International Conference on Advanced Materials and Nanotechnology (AMN-4), Otago University, Dunedin, NZ, February 9th, 2009.
69. "Metal/Semiconductor Superlattices as Thermoelectric Metamaterials for Solid-State Energy Conversion," Deutsche Physikalische Gesellschraft Spring Meeting 2009, Dresden, Germany, March 26th, 2009.
70. "Nano- (and Micro-) Technology at Purdue" Keynote presentation at the Indiana Chapter of the International Microelectronics and Packaging Society Meeting, Indianapolis, IN, April 27th, 2009.

71. "The Birck Nanotechnology Center – A Case Study for Promoting Academic-Industry Relationships," XVIII International Materials Research Congress 2009, Cancún, Mexico, August 17th, 2009.
72. "Nanowire Arrays for Thermoelectric Devices," Hatem El Matbouly, Kalapi Biswas, Pranati Tiwari, Yuefeng Wang, Jeremy Schroeder and Timothy Sands, M3.4, 2009 Fall MRS Meeting, Boston, MA, December 1st, 2009, presented by T. Sands.
73. "Nanoscale Design for Scalable Sustainable Energy Technologies," Keynote Talk at NSF Nanoscale Science & Engineering Grantees Conference, Arlington, VA, December 8th, 2009.
74. "Lessons Learned as a Director of a University Nanotechnology Center," Keynote Talk at the 1010 ESTECH Conference, Reno, NV, May 5th, 2010.
75. "Nanostructured (In,Ga)N LEDs for Solid-State Lighting: Opportunities and Obstacles," T.D. Sands, I.H. Wildeson, D.A. Ewoldt, R. Colby, Z. Liang, D.N. Zakharov, R.E. Garcia and E.A. Stach, 5th Forum on New Materials, 2010 International Conferences on Modern Materials & Technologies (CIMTEC), Montecatini Terme, Tuscany, Italy, June 2010, presented by I. Wildeson.

Seminars and Colloquia

1. "Interface Morphology and Phase Distribution in the $Cu_{2-x}S$/CdS Heterojunction: A Transmission Electron Microscope Investigation," Hewlett-Packard Laboratories, Palo Alto, CA, April 1984 and Bell Communications Research, Inc., Murray Hill, NJ, May 1984.
2. "Influence of Preamorphization Parameters on Defect Generation in BF_2^+-Implanted Silicon: Implications for Shallow Junction Technology," Department of Materials Science and Engineering, Stanford University, Stanford, CA, May 1984.
3. "Detection of Microscopic Interfacial Phases by High-Resolution TEM," Department of Electrical Engineering, California Institute of Technology, Pasadena, CA, Oct. 1984.
4. "Identification of Microscopic Interfacial Phases: The First Step toward Understanding the Structure-Property Relationships of Electronic Interfaces," National Center for Electron Microscopy, Lawrence Berkeley Laboratory, Berkeley, CA, Nov. 1984.
5. "Application of HREM to Semiconductor Technology," Philips Research Laboratory, Sunnyvale, CA March 1985.
6. "Initial Stages of the Pd-GaAs Reaction: Formation and Decomposition of Ternary Phases," Center for Advanced Materials, Lawrence Berkeley Laboratory, Berkeley, CA, March 1985.
7. "Compound Formation at Metal/GaAs Interfaces," Department of Materials Science and Engineering, Cornell University, Ithaca, NY, Oct. 1985.
8. "Electron Microscopy of Reaction Products at Reacted Metal/Gallium Arsenide Interfaces," Department of Metallurgical Engineering, The Ohio State University, Columbus, OH, April 1986.
9. "Stable Phases at Reactive Metal/Compound Semiconductor Interfaces," Electrical Enginneering and Computer Science Department, University of California, San Diego, La Jolla, CA, Nov. 1986.
10. "Intermetallic Phases as Contacts to Compound Semiconductors: Heteroepitaxy and Heterojunction Formation," IBM Thomas J. Watson Research Center, Yorktown Heights, NY, Oct. 1987.
11. "Intermetallic Contacts to GaAs," Solid State Electronics Seminar, Lehigh University, Bethlehem, PA, Sept. 1988.
12. "(Al,Ga)As/NiAl/(Al,Ga)As: An Epitaxical Semiconductor / Metal / Semiconductor System," Materials Science Seminar, University of Wisconsin, Madison, WI, March 1988.
13. "Epitaxial Intermetallic Films Buried in III-V Semiconductor Heterostructures; Growth, Processing and Device Prospects," Center for Thin Film Sciences, Carnegie Mellon University, Oct. 1988.
14. J. P. Harbison, T. Sands, N. Tabatabaie, W. K. Chan, L. T. Florez, H. L. Gilchrist and V. G. Keramidas, "Ultrathin Buried NiAl Metal Layers Grown by Molecular Beam Epitaxy within GaAs/AlAs Heterostructures," presented by J. P. Harbison at AT&T Bell Laboratories, Holmdel, NJ, Oct. 1988; AT&T Bell Laboratories, Murray Hill, NJ, Nov. 1988; Heterostructure Device Seminar, M.I.T., Cambridge, MA, Jan. 1989; and The University of Pennsylvania, Philadelphia, PA, April 1989.
15. T. Sands, J. P. Harbison, N. Tabatabaie, H. L. Gilchrist, L. T. Florez, W. K. Chan and V. G. Keramidas, "Stable and Epitaxial Metal/Compound Semiconductor Heterostructures," Brown University, Providence, RI, March, 1989.

16. N. Tabatabaie, T. Sands, J. P. Harbison, C. J. Palmstrøm, H. L. Gilchrist, F. DeRosa, L. T. Florez, K. C. Garrison, S. J. Allen, Jr., and V. G. Keramidas, "Electrical Transport and Device Applications of Monocrystalline Semiconductor/Metal/Semiconductor Heterostructures," presented by N. Tabatabaie, Texas Instruments Research Colloquium, Dallas, TX, April, 1989.
17. J. P. Harbison, T. Sands, N. Tabatabaie, H. L. Gilchrist, T. L. Cheeks, R. Ramesh, W. K. Chan, L. T. Florez, R. Nahory, and V. G. Keramidas, "Growth of Metallic Quantum Wells within Semiconductor Heterostructures by Molecular Beam Epitaxy," presented by J. P. Harbison, Electronic Materials and Devices Seminar, Princeton University, Princeton, NJ, Dec., 1989; Carnegie Mellon University, Pittsburgh, PA, March, 1990.
18. T. Sands, J. P. Harbison, T. L. Cheeks, H. L. Gilchrist, R. Ramesh, and L. C. Wang, "Stable and Shallow Schottky and Ohmic Contacts to III-V Semiconductors," Department of Materials Science Seminar, University of California, Los Angeles, Los Angeles, CA, February, 1990.
19. "Metal-Compound Semiconductor Epitaxial Heterostructures," Materials Science Seminar, Rutgers University, New Brunswick, NJ, April, 1990.
20. J. P. Harbison, T. Sands, C. J. Palmstrøm, N. Tabatabaie, Y. Silberberg, R. Ramesh, H. L. Gilchrist, L. T. Florez, T. L. Cheeks, R. E. Nahory, and V. G. Keramidas, "Metal-Semiconductor Epitaxy," Materials Seminar, University of California, Santa Barbara, Santa Barbara, CA, February, 1990, presented by J. P. Harbison.
21. "Nonvolatile Memory Materials Research at Bellcore," IBM Almaden Research Center, San Jose, CA, May 1992.
22. "Hysteretic Materials for Nonvolatile Memories," Joint Seminar of the Department of Electrical & Computer Engineering and the Microelectronic Research Laboratory, Rutgers University, March, 1993.
23. "Engineering of Metal / Semiconductor Interfaces at the Nanometer Scale - A Regime between Surface Science and Bulk Metallurgy," Electrical Engineering Seminar, U. C. Davis, May 1994.
24. "Microstructure Engineering of Ferroelectric Capacitors for Information Storage Applications," Materials Science & Engineering Department Seminar, Stanford University, Stanford, CA, February 24, 1995.
25. "Integrating Ferroelectric Capacitors with Silicon: Problems and Possibilities," School of Materials Engineering Seminar, Purdue University, West Lafayette, IN, March 1, 1995.
26. "Integrating Ferroelectric Capacitors with Silicon: Problems and Possibilities," Electronic Materials Laboratory Seminar Series at Xerox Palo Alto Research Center (PARC), Palo Alto, CA, March 10, 1995.
27. "Excimer Laser Liftoff of GaN Thin Films from Sapphire Substrates," H-P Laboratories, Palo Alto, CA, 5/8/98.
28. "Excimer Laser Liftoff of GaN Thin Films from Sapphire Substrates," Xerox PARC, Palo Alto, CA, 5/29/98.
29. "Magnetism, Magneto-optical Properties and Phase Transformations in (Mn,Cr)Bi Thin Films," T. Sands, Advanced Magnetic Materials Seminar, IBM Almaden Research Center, San Jose, CA, 2/24/99.
30. "Excimer Laser Liftoff of Epitaxial Thin Films," Stanford University MSE Colloquium, Stanford, CA, May 14th, 1999.
31. "Integration of Epitaxial Thin Films by Laser Liftoff," T. Sands, California Institute of Technology Materials Research Lecture, October 20th, 1999.
32. "Integration of Epitaxial Thin Films by Wafer Bonding and Laser Lift-off," Materials Science & Engineering Colloquium, University of Michigan, Ann Arbor, MI, April 7th, 2000.
33. "Heterogeneous Integration by Transient-Liquid-Phase Bonding and Pulsed-Laser Film Transfer," Interuniversity Microelectronics Center (IMEC), Leuven, Belgium, June 11th, 2001.
34. "Heterogeneous Integration of Ferroelectric Epitaxial Thin Films and Single Crystals." Document Handling Laboratory Seminar, Xerox PARC, Palo Alto, CA, Oct. 3rd, 2001.
35. "Heterogeneous Integration by Transient-Liquid-Phase Bonding and Pulsed-Laser Film Transfer," Electrical and Computer Engineering (ECE) Dept. Seminar, University of California, San Diego, La Jolla, CA, October 26th, 2001.
36. "Piezoelectric Actuation and the Micromechanical Flying Insect," School of Engineering and Computer Science Seminar, San Francisco State University, San Francisco, CA, Nov.14th, 2001.
37. "Heterogeneous Materials Integration: From Functionally Enhanced Microsystems to Nanocomposites," Joint Electrical & Computer Engineering - Materials Engineering Distinguished Seminar, Purdue University, Jan. 18th, 2002.
38. "Heterogeneous Integration by Layer Transfer" Ceramics Seminar, University of Illinois, Urbana-Champaign, November 20th, 2003.
39. "Heterogeneous Integration by Layer Transfer," Department of Chemical Engineering and Materials Science Seminar, University of Minnesota, Minneapolis, MN, April 13th, 2004.

40. "Assembly and Integration of Nanowire, Nanorod and Nanotube Arrays: Challenges and Opportunities," GE Global Research Nanotechnology Seminar, Schenectady, NY, April 11th, 2005.
41. "Designing Nitride Nanostructures for Solid-state Energy Conversion," Nanotechnology Seminar Series, ECE, Carnegie Mellon University, Pittsburgh, PA, September 29th, 2005.
42. "Nanoheteroepitaxy: An Approach Toward Phosphor-free Monolithic White LEDs," IMEC, Leuven, Belgium, May 15th, 2007.
43. "Metal/Semiconductor Superlattices as Thermoelectric Metamaterials," Hitachi Global Storage Technology, San Jose Research Laboratory, July 16th, 2008.
44. "Metal/Semiconductor Superlattices as Thermoelectric Metamaterials," Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, August 22nd, 2008.
45. "Nano@Purdue," GM Tech Centre, Bangalore, India, August 25th, 2008; Vellore Institute of Technology, Vellore, India, August 26th, 2008.
46. "Metal/Semiconductor Superlattices as Thermoelectric Metamaterials," Institute for Materials Research Colloquium, The Ohio State University, Columbus, OH, February 3rd, 2009.
47. "Energy Conversion Research at the Birck Nanotechnology Center," Institut für Angewandte Physik, University of Hamburg, Hamburg, Germany, March 27th, 2009.
48. "Metal/Semiconductor Superlattices: Thermoelectric Metamaterials for Solid-State Energy Conversion," Solid-State Seminar, University of Notre Dame, Notre Dame, IN, April 22nd, 2009.
49. "Towards Yellow-Green Nanostructured LEDs on Metallized Silicon Substrates," Philips Lumileds Lighting, San Jose, CA, May 18th, 2009.
50. "Metal/Semiconductor Superlattices: Thermoelectric Metamaterials for Solid-State Power Generation," Materials Research Center, Indian Institute of Science, Bangalore, India, August 23rd, 2010.

Contributed Presentations at Conferences and Workshops

156 to date – Award winning presentations listed below

1. "Separation of GaN Thin Films from Sapphire Substrates using Pulsed Laser Processing" W. S. Wong, T. Sands and N. W. Cheung, presented by W.S. Wong at the 1998 Spring MRS Meeting, April 1998, San Francisco, CA; 1998**, Winner of the Best Poster Award.**
2. "Bonding and Laser Liftoff of GaN Thin Films from Sapphire onto Si and GaAs Substrates," W.S. Wong, A.B. Wengrow, Y. Cho, E.R. Weber, N.W. Cheung and T. Sands, presented by W.S. Wong at the 1998 MRS Fall Meeting, Boston, MA, November 30th, 1998; **W.S. Wong received the MRS Graduate Student Silver Award**.
3. "Pulsed Laser Deposition of Thin Film Skutterudite Thermoelectrics," J.C. Caylor, A.M. Stacy, R. Gronsky and T. Sands, presented by J.C. Caylor in *Symposium Z: Thermoelectric Materials 2000*, MRS Spring 2000 Meeting, San Francisco, CA, April 24th, 2000; **J.C. Caylor received the MRS Graduate Student Gold Award**.
4. "Electrodeposition of Thermoelectric Nanowire Composites," A.L. Prieto, M. Martín-González, J.F. Behnke, M.S. Sander, A.M. Stacy, R. Gronsky, and T. Sands, presented by A.L. Prieto in Symposium C, MRS Fall 2000 Meeting, Boston, MA, Nov. 29th, 2000 - **Winner of the Best Poster Award**.
5. "Metal/Semiconductor Multilayers for Thermionic Energy Converters," V. Rawat and T. Sands, ASME Energy Nanotechnology International Conference (ENIC 2006), MIT, Cambridge, MA, June 26-28, 2006; poster presented by Vijay Rawat; **Winner of the Best Poster Award**.
6. "Lithography-free In Situ Ohmic Contacts to Single-Walled Carbon Nanotubes," A.D. Franklin, J.T. Smith, M.R. Maschmann, D.B. Janes, T. Sands and T.S. Fisher, Symposium Q, 2006 Fall MRS Meeting, Boston, MA; presented by A.D. Franklin, Boston, MA, 11/28/06; **Aaron Franklin received the MRS Graduate Student Silver Award**.
7. "Semi-Vertical SWNT FETs: Steps towards Verticality and Manufacturability," A.D. Franklin, J.T. Smith, T.D. Sands, T.S. Fisher and D.B. Janes Nano and Giga Challenges in Electronics and Photonics (NGC2007), Phoenix, AZ; presented by A.D. Franklin, 3/15/07; **Awarded First Place Poster Prize.**
8. "Schottky, p-n Junction and Light Emitting Diodes Employing (In,Ga)N Nanorod Heterostructures," by P.P. Deb, H. Kim, Y. Qin, R. Lahiji, M. Oliver, D. Ewoldt, R. Reifenberger and T. Sands, 2007 MRS Spring

Meeting, San Francisco, CA; paper DD13.8 presented by Parijat Deb, San Francisco, CA, April 12th, 2007**; Parijat Deb received the MRS Graduate Student Silver Award.**

Presentations to Lay Audiences

1. "High-Resolution Imaging of Interfaces in Semiconductor Devices," Regents Oversight Committee, Lawrence Berkeley Laboratory, Berkeley, CA, April 1984.
2. "Storage Technology Trends: 1980-2000," Telco Computer Maintenance and Operations Meeting, St. Louis, MO, October, 1992.
3. "Network Information Access Technology Program - A BCC Resource," Telco Computer Operations and Maintenance Workshop, East Brunswick, NJ, April, 1992.
4. "Nanotechnology: Far-fetched or Just around the Corner?" International Truck and Engine Company, Fort Wayne, IN, Sept. 22nd, 2004.
5. "Nanomaterials: Quantum Dots, Nanowires and Nanotubes," NCLT Nanotechnology 101 Series, presented July 15th, 2005 (on the web at https://www.nanohub.org/education/nanotechnology101)
6. "Designing Nanocomposite Thermoelectric Materials," NCN Nanotechnology 501 Series, presented 11/8/05. (on the web at https://www.nanohub.org/education/nanotechnology501)
7. "Designing Nanocomposite Materials for Solid-state Energy Conversion" NCLT tutorial, presented 11/10/05.
8. "Nanostructured Semiconductors: The Key to Efficient Solid-State Energy Conversion Devices", Purdue Silicon Valley Symposium, Palo Alto, CA, February 22nd, 2006.
9. Panelist for Purdue University Student Pugwash on "Alternative Energy", April 12th, 2006
10. "Nanowires and Nanotubes – One-dimensional Nanomaterials," NCLT Nanotechnology 101 Series, presented July 13th, 2006 (on the web at https://www.nanohub.org/resources/?id=1639)
11. Speaker for Purdue University Student Pugwash on "Nanotechnology," September 19th, 2006.
12. "Solid-State Lighting: An Opportunity for Nanotechnologists to Address the Energy Challenge," NCN Nanotechnology 501 tutorial, presented April 4th, 2007 (on the web at https://www.nanohub.org/resources/2647/
13. Moderator for a Faculty Symposium on "Tiny Technologies for Huge Impacts on Health," in honor of the France A. Córdova Inauguration, Purdue University, April 11th, 2008.
14. "Nanotechnology – Far-fetched or Just Around the Corner?" Elderhostel seminar, Purdue University, June 16th, 2008; Michigan City Rotary, September 11th, 2008; Boswell Rotary, October 23rd, 2008.
15. "Tutorial on Solid-State Lighting," Purdue Energy Club, December 4th, 2008.
16. "Nanotechnology@Purdue," Lafayette Kiwanas Club, West Lafayette, IN, July 2nd, 2009.
17. "Nanomaterials: Quantum Dots, Nanowires and Nanotubes," NCLT Teacher Workshop, Purdue University, July 20th, 2009.
18. "Nano-enabled Future of Solid-State Energy Conversion," Nanobusiness Conference, Chicago, IL, September 9th, 2009.
19. "Nanotechnology@Purdue," Purdue Alumni Club of Anderson/Madison County, October 21st, 2009.
20. "Nanotechnology – Far-fetched, Just Around the Corner, or All Around You Today? Tippecanoe/Benton/Carroll Retired Teachers Assoc. Meeting, West Lafayette, IN, November 19th, 2009.
21. "Nanotechnology@Purdue," The Alliance, Indianapolis, IN, February 19th, 2010.
22. "Nanotechnology: Problems, Perils and Promises," 2010 Purdue Student Pugwash Conference, April 10th, 2010, Purdue University, West Lafayette, IN.

National Presentations on Higher Education

1. Panelist for "University Technology Transfer: Challenges and Opportunities," AAU Chief Academic Officers Meeting, September 14th, 2010, Laguna Beach, CA.
2. Panelist for the "Provost's Roundtable," NSF Innovation through Institutional Innovation (I3) Meeting of Principal Investigators and Project Leaders; Institutional Innovation in a Time of Accountability and Economic Challenge, Nov. 9th, 2010, Arlington, VA.

3. Speaker, "The Military Family Research Institute at Purdue; Leveraging the Extension Infrastructure," Session on Higher Education and the U.S. Military: Partnering to Benefit Military Families and Their Communities," 123rd Annual APLU Meeting, Nov. 15th, 2010, Dallas, TX.
4. Panelist, "Making the Case to Our Funders: The Unique Qualities of Research University Undergraduate Education," 123rd Annual APLU Meeting, Nov. 15th, 2010, Dallas, TX.
5. Speaker, "What Next for Public Research Universities?" 2011 HUBbub, April 5th, 2011, Indianapolis, IN.

Entrepreneurship Activities

Technical Advisor to *SiMetal* team, 1st Place winner of the Global Venture Challenge Idea to Product Competition at Oak Ridge National Laboratory (March 2009); 3rd place in Gold Division of the Burton Morgan Business Plan Competition (March 2009).