

Jonathan P. Pelz

Professor of Physics
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Professional Preparation

Massachusetts Institute of Technology, Physics, B. S. degree (1981).
University of California, Berkeley, Physics, Ph. D. (1987).
IBM Research, Yorktown Heights NY, post-doctoral research in surface physics, (1988-1990).

Appointments

Professor of Physics, The Ohio State University (2001 – present)
Associate Professor of Physics, The Ohio State University (1996 – 2001)
Assistant Professor of Physics, The Ohio State University (1990 - 1996)

Awards and Distinctions

Apker Award Finalist, for undergraduate research (1981)
NSF Fellowship (1981-1984)
IBM Pre-Doctoral Fellowship (1986-1987)
NSF National Young Investigator Award (1993-1999)
Over 30 invited conference presentations (6 at APS meetings and 1 Gordon Research Conference)

Synergistic Activities

- *Aided/mentored local Elementary school teacher for school projects and State Proficiency tests; performed physics demonstrations/discussions.
- *Led successful effort to acquire Variable Temperature STM/BEEM and X-ray photoelectron spectroscopy characterization facilities for cross-disciplinary materials research.
- *Chaired the Center for Materials Research (CMR) Scholar Search committee and Physic Ohio Eminent Scholar Search Committee. Served on the Center for Materials Research Advisory Committee, and the Institute for Materials Research Faculty Advisory Committee.
- *Mentored 9 undergraduates, including 3 underrepresented group members.
- *Member of recent (funded) multi-university MURI program (16 PI's, \$7.5M/ 5 years), and recent a recent (pending) multi-PI NSF MRSEC program (25 PI's, \$18.2M/ 6 years).

Selected Recent Publications (out of 70 published)

- (1) W. Cai, K.-B. Park, and J. P. Pelz, *Nanometer-resolution measurement and modeling of lateral variations of the effective work function at the bilayer Pt/Al/SiO₂ interface*, Phys. Rev. B **80** (2009).
- (2) W. Cai, S. E. Stone and J. P. Pelz, L. F. Edge and D. G. Schlom, *Conduction band energies and hot-electron transport characteristics of epitaxial Sc₂O₃/Si (111) studied by ballistic electron emission microscopy and internal photoemission*, Appl. Phys. Lett., **91**, 042901 (2007).
- (3) H. Haick, J. P. Pelz, M. Ambrico, D. Cahen, W. Cai, T. Ligonzo, C. Marginean, C. Tivarus, and R. T. Tung, *Controlling Au/n-GaAs Junctions by Partial Molecular Monolayers*, Phys. Stat. Sol. (A) **203**, 3438 (2006).
- (4) C. Tivarus, J.P. Pelz, M.K. Hudait, and S.A. Ringel, *Direct Measurement of Quantum Confinement Effects at Metal to Quantum-Well Nanocontacts*, Phys. Rev. Lett. **94**, 206803 (2005).

- (5) C. Tivarus, J.P. Pelz, M.K. Hudait, and S.A. Ringel, *Spatial resolution of ballistic electron emission microscopy measured on metal/quantum-well Schottky contacts*, Appl. Phys. Lett. **87**, 182105 (2005).
- (6) D. T. Lee, J. P. Pelz, and B. Bhushan, *Scanning Capacitance Microscopy for Thin Film Measurements*, Nanotechnology **17**, 1484 (2006). Patent Granted.
- (7) K.-B. Park, Y. Ding, J. P. Pelz, P. G. Neudeck, and A. J. Trunek, *Valence band structure and band offset of 3C- and 4H-SiC studied by ballistic hole emission microscopy*, Appl. Phys. Lett. **89**, 042103 (2006).
- (8) K.-B. Park, J. P. Pelz, J. Grim, and M. Skowronski, *Quantum Well Behavior of Single Stacking Fault 3C Inclusions in 4H-SiC p-i-n diodes studied by Ballistic Electron Emission Microscopy*, Appl. Phys. Lett., **87**, 232103 (2005).
- (9) K. Park, Y. Ding, J. Pelz, M. Mikhov, Y. Wang, and B. Skromme, *Effect of inclined quantum wells on macroscopic capacitance-voltage response of Schottky contacts: cubic inclusions in hexagonal SiC*, Appl. Phys. Lett., **86**, 222109 (2005).
- (10) B.J. Gibbons, S. Schaepe, and J.P. Pelz, *Evidence for diffusion-limited kinetics during electromigration-induced step bunching on Si(111)*, Surf. Sci. **600**, 2417 (2006).
- (11) M. Ternes, C. Weber, M. Pivetta, F. Patthey, J. P. Pelz, T. Giamarchi, F. Mila, and W. D. Schneider, *Scanning-Tunneling Spectroscopy of Surface-State Electrons Scattered by a Slightly Disordered Two-Dimensional Dilute 'Solid': Ce on Ag(111)*, Phys. Rev. Lett. **93**, 146805 (2004).
- (12) F. Silly, M. Pivetta, M. Ternes, F. Patthey, J. P. Pelz, and W. D. Schneider, *Creation of an Atomic Superlattice by Immersing Metallic Adatoms in a Two-Dimensional Electron Sea*, Phys. Rev. Lett. **92**, 016101 (2004).
- (13) E. R. Heller and J. P. Pelz, *Avalanche ballistic electron emission microscopy with single hot-electron sensitivity*, Appl. Phys. Lett. **83**, 2841 (2003).

Collaborators During the Past 48 Months

L. Lauhon (Northwestern University), L. J. Brillson (Ohio State University), E. R. Heller (Wright Patterson AFB), M.S. Mazzola (Mississippi State University), P. Neudeck (NASA Lewis), S. A. Ringel (Ohio State University), W.-D. Schneider, (EPFL, Switzerland), M. Skowronski (Carnegie Mellon University), D. Cahen (Weizmann Institute, Israel), H. Haick (Technion, Israel), S. Lehman (College of Wooster), D. Schlom (Pennsylvania State University), J. G. Cederberg (Sandia National Laboratories).

PI's own advisors

Prof. John Clarke, University of California, Berkeley (Ph. D. Advisor).

Dr. Roger Koch, IBM Research, Yorktown Heights NY (Deceased-Postdoctoral Advisor).

Graduate students advised over the last five years

E. R. Heller, D. Lee, Y. Ding, C. Tivarus, B. Gibbons. K. Park, W. Cai, C. Marginean, Y. Che, J. Beardsley, D. Cardwell. A total of 11 graduate students advised (four current) during the past five years.

Undergraduate students advised over the last five years

Miriam Sekki, Adam Champion, Jesse Noffsinger, Sylvia Schaepe, Corey Campbell, Steven Stone.

Funding Record

Total Grants and Contracts:	\$4.9 M
As PI:	\$3.4 M
As Co-PI:	\$1.5 M