

## Mark A. Reed

Harold Hodgkinson Professor of Engineering and Applied Science  
Professor of Electrical Engineering and Applied Physics  
Associate Director of the Yale Institute for Nanoscience and Quantum Engineering  
Yale University

### ADDRESS

Dept. Electrical Engineering, Yale University, 15 Prospect Street, New Haven, CT 06520-8284  
tel: (203) 432-4306, fax: (203)432-6420, email: mark.reed@yale.edu. url: www.eng.yale.edu/reedlab

### PERSONAL DATA

Born 4 Jan 1955, U.S. citizen

### EDUCATION

Syracuse University, Physics, B. S. Honors, 5/77

Syracuse University, Physics, M. S., 5/79

Syracuse University, Solid State Physics, Ph.D., 12/83.

### EMPLOYMENT

Associate Director of the Yale Institute for Nanoscience and Quantum Engineering, 2/07 - present

Professor of Electrical Engineering and Applied Physics, Yale Univ, 7/90 – present

Chairman of Electrical Engineering, Yale University, 7/95 – 6/01

Central Research Laboratories, Texas Instruments, 9/83 - 6/90

### HONORS, AWARDS, PROFESSIONAL SERVICE:

**Honors:** Fellow, IEEE (2009), IEEE Pioneer Award in Nanotechnology (2007), Fellow, Canadian Institute for Advanced Research (2006); Fellow, American Physical Society (2003), YSEA Award for Advancement of Basic and Applied Science (2002), Fujitsu ISCS Quantum Device Award (2001). Syracuse University Distinguished Alumni Award (2000), Harold Hodgkinson Professor of Engineering and Applied Science, Yale U. (1999), DARPA ULTRA Most Significant Technical Achievement Award (1997), Connecticut Academy of Science and Engineering (1996-present), Who's Who in the World (2000-present); in America (2000-present); in American Science and Engineering (1995-present), Kilby Young Innovator Award (1994), Senior Member IEEE, Fortune Magazine's 12 most promising young scientists (1990), Senior Member Technical Staff, TI (1988).

### Professional Activities:

Editorships: IEEE Transaction Electron Devices (2005-present); Divisional Associate Editor, *Physical Review Letters* (1996-99), *Nanotechnology*. Editorial board: *Superlattices and Microstructures*; *Supermolecular Science and Technology*; *Small*.

Conference Chair: 27<sup>th</sup> International Symposium on Compound Semiconductors (ISCS) (2001); Silicon Nanoelectronics Workshop (1996); Ordered Molecular and Nanoscale Electronics (1994); International Conference on Nanostructures and Mesoscopic Systems (1991); International Conference on Nanostructure Physics and Fabrication (1989).

Program Chair: 24<sup>th</sup> International Symposium on Compound Semiconductors (ISCS) (1997).

Publications Chair, NANOMES 1996.

Program committees: IEDM (2004-2006), AHW (1998, 1996, 1994); Silicon Nanoelectronics (1997); Cornell Conference (1997, 1993); AVS and NANO III (1995); Superlattices & Microdevices (1994); Mesoscopic Devices (1994); Secretary, 21<sup>st</sup> ISCS (1994); 15th & 18th GaAs Symposium; EP2DS-10 (1993); DRC (1992).

Other: Numerous NSF, DARPA, ONR, and government workshops. PCAST member, ITRS advisor.

Scientific Advisory Boards: UPenn NSEC, Sandia/LANL CINT

Over 155 publications in journals such as *Physical Review Letters*, *Physical Review*, *Applied Physics Letters*, *Nano Letters*, and *Science*. 6 books. 25 patents. Nineteen plenary and >260 invited talks.  
Professional Memberships: APS (Fellow), Senior Member IEEE, ΣΞ.

**TOTAL PUBLICATIONS AND PATENTS:** ~160 papers, (*h*-index: 33);  
6 books, 20 book chapters, 25 patents.

#### TEN MOST IMPORTANT PUBLICATIONS

1. M. A. Reed, J. N. Randall, R. J. Aggarwal, R. J. Matyi, T. M. Moore, and A. E. Wetsel, "Observation of discrete electronic states in a zero-dimensional semiconductor nanostructure", *Phys. Rev. Lett.* **60**, 535 (1988). **(ISI citations (3/09): 579)**
2. M. A. Reed, W. R. Frensley, R. J. Matyi, J. N. Randall, and A. C. Seabaugh, "Realization of a Three-Terminal Resonant Tunneling Device : The Bipolar Quantum Resonant Tunneling Transistor," *Appl. Phys. Lett.* **54**, 1034 (1989).
3. M.R. Deshpande, J.W. Sleight, M.A. Reed, R.G. Wheeler, and R.J. Matyi, "Spin splitting of single 0D impurity states in semiconductor heterostructure quantum wells", *Phys. Rev. Lett.* **76**, 1328 (1996).
4. M.A. Reed, C. Zhou, C.J. Muller, T.P. Burgin, and J.M. Tour, "Conductance of a molecular junction", *Science* **278**, 252 (1997). **(ISI citations (3/09): 1577)**
5. J. Chen, M. A. Reed, A. M. Rawlett, and J. M. Tour, "Large On-Off Ratios and Negative Differential Resistance in an Electronic Molecular Switch", *Science*, **286**, 1550 (1999). **(ISI citations (3/09): 1293)**
6. M. A. Reed, J. Chen, A. M. Rawlett, D. W. Price, and J. M. Tour, "Molecular Random Access Memory Cell", *Appl. Phys. Lett.* **78**, 3735 (2001).
7. Wenyong Wang, Takhee Lee, and M. A. Reed, "Mechanism of Electron Conduction In Self-Assembled Alkanethiol Monolayer Devices", *Phys. Rev.* **B 68**, 035416 (2003).
8. W. Wang, T. Lee, I. Kretschmar, and M.A. Reed, "Inelastic Electron Tunneling Spectroscopy of Alkanedithiol Self-Assembled Monolayers", *Nano Lett.* **4**, 643 (2004).
9. W. Wang, T. Lee, and M.A. Reed, "Elastic and Inelastic Electron Tunneling in Alkane Self-Assembled Monolayers", *J. Phys. Chem. B.* **108**, 18398 (2004). **(cover, feature article)**.
10. E. Stern, J.F. Klemic, D.A. Routenberg, P.N. Wyrembak, D.B. Turner-Evans, A.D. Hamilton, D.A. LaVan, T.M. Fahmy, and M.A. Reed, "Label-free immunodetection with CMOS-compatible semiconducting nanowires", *Nature*, **445**, 519 (2007).

**TOTAL STUDENTS/POSTDOCS SUPERVISED:** PhD=12, Post-doc=10

Ph.D. thesis advisor: Jeffery Sleight (1995; IBM), Rachel Lombardi (1997; Yale F&ES), John Huber (1997; Freescale), Mandar Deshpande (1998; Micrel), Chong-Wu Zhou (1999; USC), Gabel Chong (2000; Intel), Jia Chen (2000; IBM), Laurie Calvet (2001; Paris), Wenyong Wang (2004; U. Wyoming), Frank Li (2006; startup); Eric Stern (2007; Yale), Aric Sanders (2007; NIST)

Postdoc research advisor: Chris Muller (Phillips), Mark Amman (LBL), James Klemic (MITRE), Menno deJong (BioMaDe), Takhee Lee (Gwangju), Ilona Kretschmar (CCNY), Nilay Pradhan (Intel), Elena Cimpoiasu (USNA), Marleen van der Veen (IMEC), Laetitia Bernard (EMPA)