

## Gary Rubloff - FUNDING

- National Science Foundation, Emerging Frontiers in Research and Innovation, "Biofunctionalized Devices - On Chip Signaling and "rewiring" Bacterial Cell-Cell Communication", \$1,968,984, 10/1/07-9/30/11, NSF-SC03524414, PI's G. W. Rubloff, W. E. Bentley, R. Ghodssi, and G. F. Payne.
- Robert W. Deutsch Foundation, "Controlling Biology at the Nanoscale: Next-Generation BioChips for Drug Discovery", \$1,050,050., 8/31/06-8/30/10, PI's G. W. Rubloff, W. E. Bentley, R. Ghodssi, and G. F. Payne.
- Laboratory for Physical Sciences, National Security Agency, "ALD-AAO Nanotemplated Capacitors for Energy Storage", \$99,890., 10/1/06-9/31/07, PI G. W. Rubloff.
- MKS Instruments, "Sensors and Control Systems for Advanced Process Control (APC) in Atomic Layer Deposition (ALD)", \$170,000, 7/17/06-7/16/08, PI G. W. Rubloff
- National Institute of Standards and Technology, "Center for Nanoparticle Risk, Impact, and Assessment", \$1,483,800 10/1/06-9/30/08, PI G. W. Rubloff, co-PI M. Zachariah.
- NSF, "The Nearest Uniformity Producing Profile (NUPP): A Generalized optimization Criterion for Thin-Film Processing Applications", \$307,272., 2/1/06-1/31/09, PI R. Adomaitis, co-PI G. W. Rubloff.
- NSF REU Site "Introducing the Systems Engineering Paradigm to Young Researchers and Future Leaders, co-PI G. W. Rubloff, \$689,000, 2/1/03-5/3/08.
- State of Maryland Department of Business and Economic Development, "FabLab Leadership and Outreach Initiative in Nano and Nano-Bio Technology and Manufacturing", \$3,650,000., 12/15/06-12/15/07.
- National Institute of Standards and Technology, "Development of Techniques for Measurement of the Elastic, Viscoelastic, and Plastic Properties of Advanced Materials at the Nanoscale", \$330,603, 8/1/05-7/31/08, PI G.W. Rubloff.
- NSF, International Materials Institute (IMI) Program, "IMI for Materials Informatics and Combinatorial Materials Science: an Information Portal for Materials Discovery and Design", DMR0231291, \$3,550,000., 2/1/03-1/31/08, UMD part \$1,470,055, PI G. W. Rubloff, co-PI I. Takeuchi.
- Northrop Grumman, "Atomic Layer Deposition of High-K Dielectrics for CNT Transistors", PI G. W. Rubloff, \$100,000, 1/1/05-12/31/07.
- Istituto Trentino di Cultura and Autonomous Province of Trentino, "Exploring New Materials by Combinatorial and Artificial Intelligence Methods", 348,000 Eu, 10/1/04-9/30/07, PI G. W. Rubloff, co-PI I. Takeuchi.
- W. M. Keck Foundation, "Keck Laboratory for Combinatorial Nanosynthesis and Multiscale Characterization", \$750,000, 6/1/04-5/31/07, PI's G. W. Rubloff, I. Takeuchi, and E. Williams.
- MKS Instruments, Vision 1000-C Quadrupole RGA Process Monitor, \$50,110., 8/1/06, PI G. W. Rubloff
- Laboratory for Physical Sciences, National Security Agency, "Nano-bio Technology", \$280,948., 8/6/04-9/30/06, PI G. W. Rubloff.
- National Aeronautics and Space Administration, "UMD-NIST Center for Nanomanufacturing and Metrology", \$1,600,000 10/1/05-9/30/06, PI M. Zachariah, co-PI G. W. Rubloff.
- MKS Instruments, InDuct FTIR Sensor System, \$30,000, 1/20/05, PI G. W. Rubloff.
- NSF, Information Technology Research (ITR) Program, "Spatially Programmable Equipment: A New Design Paradigm for Semiconductor Manufacturing Enabled by Information Technology", \$499,247., 8/1/02-7/31/05, PI R. Adomaitis, co-PI G. W. Rubloff.
- Northrop Grumman, "GaN MOCVD Sensing and Modeling", PI G. W. Rubloff, \$410,308, 10/15/01-12/31/05.

- National Institute of Standards and Technology, "Metal CVD Metrology for Cu/low-K Interconnects and Integration", \$175,000, 3/15/02-2/29/04. PI G.W. Rubloff.
- Toshiba Corporation, "Advanced Process Control", \$36,467., 1/1/03-6/30/03, PI G. W. Rubloff.
- Laboratory for Physical Sciences, National Security Agency, "Nano-bio Technology", \$80,000., 6/1/03-9/30/03, PI's G. W. Rubloff and R. Ghodssi.
- NSF Materials Research Science and Engineering Center (MRSEC), NSF-DMR-00-80008, U. Maryland, "Deposition and Characterization of Biopolymer Surfaces for BioMEMS", \$68,000, PI G. W. Rubloff.
- National Science Foundation/Semiconductor Research Corporation Center for Environmentally Benign Semiconductor Manufacturing, "Integrated ESH Assessment", \$100,000., 4/1/01-3/31/04, PI G. W. Rubloff.
- National Science Foundation, "Simulator-Based Learning Systems for Environmentally Benign Semiconductor Manufacturing", EEC9528813, \$399,996, 9/15/99-8/31/03. PI G. W. Rubloff, co-PI F. Shadman (U. Arizona).
- Inficon, donation of CIS Mass Spectrometry Analysis system configured for Tungsten Deposition monitoring, market value \$38,000., 2002.
- National Science Foundation, "Enhancing Collaborative Research in Industrial Engineering", \$1,300,000, 9/1/98-8/31/02. PI E. H. Park (North Carolina A&T), Co-PI's B. Ram, H. D. Ratcliff, G. W. Rubloff (Rubloff/UMCP subcontract \$390,015.).
- Army Research Office, "Acquisition of a Chemical Mechanical Planarizer (CMP) Equipment for Research and Education in Microelectronics and MEMS", \$180,000, 2002, PI R. Ghodssi, co-PI's G. W. Rubloff and E. Smela.
- National Institute of Standards and Technology, "Chemical Sensing for Real-Time Semiconductor Process Metrology", \$204,537, 6/19/00-2/28/02. PI G.W. Rubloff.
- National Science Foundation, "Simulation-based Design and Prototype Testing of a Programmable Chemical Vapor Deposition Reactor", \$84,634, 8/1/00-7/31/02. PI R. Adomaitis, co-PI G.W. Rubloff.
- Inficon, "Chemical Sensing and Metrology in Semiconductor Manufacturing", \$70,000, 9/20/00-9/19/01. PI G.W. Rubloff.
- National Science Foundation, "Integrated Hierarchical Life Cycle Approach to the Design & Operation of a Semiconductor Fabrication Factory", DMI9713720, \$801,000, expected about 10/1/97-9/30/01. PI M. Fu, co-PI's S. Marcus, J. Herrmann, and G. W. Rubloff.
- Semiconductor Research Corporation, "Integrated Hierarchical Life Cycle Approach to the Design and Operation of a Semiconductor Fabrication Factory", \$401,333, 10/1/97-9/30/00. PI M. Fu, co-PI's S.I. Marcus, J.W. Herrmann, and G.W. Rubloff.
- National Institute of Standards and Technology, "Advanced Model-Based Control Techniques", \$138,663, 9/15/00 - 9/14/01. PI G.W. Rubloff.
- National Institute of Standards and Technology, "Advanced Model-Based Control Techniques", \$263,437, 7/1/97-9/30/00. PI G.W. Rubloff.
- National Science Foundation, "Student Support for 2000 Int'l Conference on Characterization and Metrology for ULSI Technology", NIST June 26-29, 2000, \$4,999, 7/1/00-6/30/01. PI G.W. Rubloff.
- National Science Foundation, "Sensor-Integrated Intelligent Control for Rapid Thermal Chemical Vapor Deposition (RTCVD)", \$550,000, 10/1/95 - 9/30/99. PI P. S. Krishnaprasad, Co-PI's E. Zafiriou, R. Adomaitis, G. W. Rubloff.
- National Science Foundation, "Simulator-Based Manufacturing Education and Training for Microelectronics Processing", EEC9526147, \$528,692, 8/15/1996-8/31/00. PI G.W. Rubloff (originally granted 9/15/95-8/31/00 at \$600,148.).

- Texas Instruments, SRC Research Customization program, "Sensor-Based Process Control", \$150,000, 10/1/97 - 9/31/00. PI G. W. Rubloff.
- National Institute of Standards and Technology, "Semiconductor Process Metrology through Real-Time Mass Spectrometry", \$180,308, 9/1/97-2/28/00. PI G. W. Rubloff.
- Lam Research, donation of TCP 9100 A2 Alliance cluster tool system to G. W. Rubloff and G. S. Oehrlein, approx. value \$1,200,000, Aug., 1998.
- Ulvac Corporation, donation of ERA-1000 W CVD cluster tool to G. W. Rubloff, approx. value \$1,000,000, Jan. 1997.
- National Science Foundation Engineering Research Center, Institute for Systems Research program, \$4,237,000, 9/1/94-8/31/98. PI G. W. Rubloff.
- Semiconductor Research Corporation, "Theoretical Foundations and Tools for Concurrent Engineering for Run-to-Run Control in Semiconductor Manufacturing", approx. \$ 102,000, 3/1/97-7/31/98. PI E. Zafiriou, Co-Investigators J. S. Baras and G. W. Rubloff.
- National Science Foundation Research Experiences for Undergraduates, Institute for Systems Research program, \$102,500, 9/1/94-8/31/98. PI G. W. Rubloff.
- NSF Engineering Research Center for Advanced Electronic Materials Processing, "Diagnostics, Modeling, & Control", NSF Grant CDR 8721505, Year 8, \$104,562, 10/1/95-9/30/96. PI G. W. Rubloff.
- Leybold Inficon, donation of Transpector AGM sensing system, approx. value \$25,000, 1994.
- Semiconductor Research Corporation, Task 3, "Real-Time Reaction Sensing", \$235,222, Principal Investigator G. W. Rubloff, as part of SRC Contract #95-MP-132, "Single-Wafer Manufacturing for Submicron Technologies", \$400,940, 2/1/94-1/31/96.
- Semiconductor Research Corporation, "Real-Time, In-Situ Gaseous Product Sensing and Reaction Modeling of Environmental Aspects of Silane-Based CVD of Si and SiO<sub>2</sub>", SRC Contract #94-MJ-563, \$121,634, 7/1/94-10/31/95. PI G. W. Rubloff.
- NSF Engineering Research Center for Advanced Electronic Materials Processing, "Diagnostics, Modeling, & Control", NSF Grant CDR 8721505, Year 7, \$113,200, 10/1/94-9/30/95. PI's G. W. Rubloff and G. N. Parsons.
- NSF Engineering Research Center for Advanced Electronic Materials Processing, "Diagnostics, Modeling, & Control", NSF Grant CDR 8721505, Year 6, \$51,394 (\$76,394 including university support), 10/1/93-9/30/94. PI G. W. Rubloff.
- Principal Investigator, Office of Naval Research, 15 years (1975-1987, 1989-1991), with research covering passivation in microelectronics, CVD process science, chemistry of thermal SiO<sub>2</sub> and MOS processes, silicide/Si and Schottky barrier interfaces, time-resolved surface reactions, surface chemical bonding/reactions, and new techniques for surface studies.
- Principal Investigator, "Growth and Chemistry of Thin Insulators", DOD Independent Research and Development Program, 1988.