EFTHIMIOS KAXIRAS

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Education

Ph.D. in Physics — 1987
Massachusetts Institute of Technology

B.S. in Physics — 1981
Massachusetts Institute of Technology

Electrical Engineering (transferred to MIT) — 1977–78
National Technical University of Athens, Greece

Appointments

John Hasbrouck Van Vleck Professor of Pure and Applied Physics — 2010–
Department of Physics and School of Engineering and Applied Sciences, Harvard University

Gordon McKay Professor of Applied Physics and Professor of Physics — 1998–09
Department of Physics and School of Engineering and Applied Sciences, Harvard University

Associate Professor of Physics and Applied Physics — 1995–98
Department of Physics and School of Engineering and Applied Sciences, Harvard University

Assistant Professor of Physics and Applied Physics — 1991–95
Department of Physics and School of Engineering and Applied Sciences, Harvard University

Director-Institute for Applied Computational Science — 2010-2013
Harvard University

Professor of Materials Science — 2009–10
Laboratory for Multiscale Modeling of Materials, Institute of Materials,
Swiss Federal Institute of Technology, Lausanne (EPFL)

Director - Initiative in Innovative Computing — 2008–09
Harvard University

Director - Biomedical Research Institute — 2002–04
FORTH Ioannina, Greece

Acting Department Chair and Visiting Professor — 2002–04
Department of Materials Science and Technology, University of Ioannina

Associate Director — 2001–02
Materials Research Science and Engineering Center, Harvard University

Consulting Research Physicist — 1989–91
Complex Systems Theory Branch, Naval Research Laboratory, Washington

Postdoctoral Research Associate — 1987–89
IBM Research Division, T.J. Watson Research Center, Yorktown Heights

Honors

Fellow of the American Physical Society — Elected 2003

Chartered Physicist and Fellow of the Institute of Physics, London — Elected 1999

IBM Research Division Award — 1991
For contributions to the development of a new mechanism for Si/Ge heterosexuality

IBM Predoctoral Fellowship — 1985–87

Professional Activities

Member of: American Physical Society, Materials Research Society, American Chemical Society, Sigma Xi - Scientific Research Society, Institute of Physics, Society of Industrial and Applied Mathematics.

Editorial Board of: Modelling and Simulation in Materials Science and Engineering, Computational Science and Engineering, SIAM Book Series, Journal of Computer Aided Materials Design, Surface Review and Letters, International Journal for Multiscale Computational Engineering, Computing in Science and Engineering

Organization of Scientific Meetings (Co-Organizer)

International Forum on Clean Energy, University of Science and Technology of China
Hefei, China — August 2010

IC4N-2008 "1st International Conference from Nanoparticles and Nanomaterials to Nanodevices and Nanosystems".
Halkidiki, Greece — June 2008

Conference on"Synergy Between Experiment and Computation in Nanoscale Science", National Nanoscale Infrastructure Network
Harvard University, Cambridge, Massachusets — May 2006

Focus Session on "Steps, Growth and Smoothing", American Physical Society March Meeting.
Baltimore — March 2006

Focus Session on "Multiscale Simulations in Materials Scienc", SIMU- European Physical Society Workshop on Bridging the Scales
Genova, Italy — August 2004

Workshop on "Multiscale Modeling and Simulation", sponsored by ETH-Z Computational Laboratory
Lugano, Switzerland — August 2003

Workshop on"Multiscale Modeling of Materials: Methods, Algorithms and Unsolved Problem", sponsored by Centre Europeen pour le Calcul Atomique et Moleculaire (CECAM)
Heraklion, Greece — July 2001

Symposium on "New Advances in Materials Prediction", Meeting of the Materials Research Society
Boston, Massachusets — Fall 1999

Symposium on "Multiscale Modeling of Materials", Meeting of the Materials Research Society
Boston, Massachusets — Fall 1998

Workshop on "Multiscale Modeling and Grand Challenge Problems in Materials Research", CECAM
Lyon, France — October 1997

Workshop on "Quantitative Methods in Materials Research", Institute of Theoretical Physics
U.C. Santa Barbara — January - June 1997

Symposium on "Epitaxial Growth: Principles and Applications", Meeting of the Materials Research Society
San Francisco — Spring 1997

Symposium on "Materials Theory, Simulations and Parallel Algorithms", Meeting of the Materials Research Society
Boston — Fall 1995

Research Interests:

The research of Prof. Kaxiras encompasses computational materials and condensed matter physics, and has covered a wide range of topics; examples include: the electronic properties of crystalline and amorphous solids and their dependence on the atomic structure; the physics and chemistry of covalently bonded nano-clusters; growth and catalytic behavior of nano-structured surfaces and interfaces; the nature of electronic states in biomolecules and the function of enzymes; the microscopic origin of brittle or ductile response of solids; the physics of dislocations in metallic and covalent solids and their interaction with chemical impurities; blood flow dynamics in realistic arterial geometries, incorporating cell motion and the effect on endothelial shear stress. A core theme is a multiscale point of view, which aims to realistically capture the behavior of complex physical systems by starting at a fundamental level, with a first-principles quantum mechanical description, and reaching to macroscopic scales.