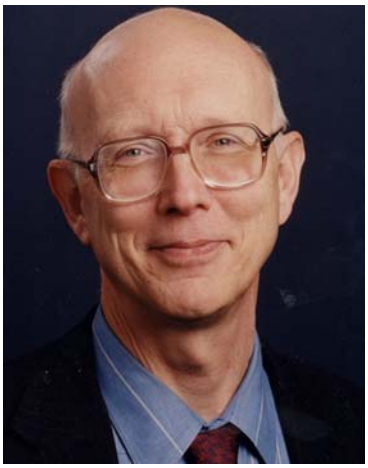

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George M. Whitesides was born August 3, 1939 in Louisville, KY. He received an A.B. degree from Harvard University in 1960 and a Ph.D. from the California Institute of Technology (with J.D. Roberts) in 1964. He was a member of the faculty of the Massachusetts Institute of Technology from 1963 to 1982. He joined the Department of Chemistry of Harvard University in 1982, and was Department Chairman 1986-89. He is now Mallinckrodt Professor of Chemistry at Harvard University.

Awards:
Alfred P. Sloan Fellowship (1968)
American Chemical Society (ACS) Award in Pure Chemistry (1975)
Harrison Howe Award (Rochester Section of the ACS) (1979)
Alumni Distinguished Service Award (California Institute of Technology) (1980)
Remsen Award (ACS, Maryland Section) (1983)
Arthur C. Cope Scholar Award (ACS) (1989)
James Flack Norris Award (ACS, New England Section) (1994)
Arthur C. Cope Award (ACS) (1995)
Defense Advanced Research Projects Agency Award for Significant Technical Achievement (1996)
Madison Marshall Award (ACS) (1996)
National Medal of Science (1998)
Sierra Nevada Distinguished Chemist Award (Sierra Nevada Section of the ACS) (1999)
The Wallac Oy Innovation Award in High Throughput Screening (Society for Biomolecular Screening) (1999)
Award for Excellence in Surface Science (Surfaces in Biomaterials Foundation) (1999)
Von Hippel Award (Materials Research Society) (2000)
World Technology Award for Materials from the World Technology Network (2001)
Doctorate Honoris Causa, University of Twente (The Netherlands) (2001)
Small Times Magazine's Researcher of the Year award (2002)
Pittsburgh Analytical Chemistry Award (Society for Analytical Chemists of Pittsburgh) (2003)
Kyoto Prize for Advanced Technology (Inamori Foundation) (2003)

Memberships and Fellowships:
American Academy of Arts and Sciences, National Academy of Sciences, American Philosophical Society, Royal Netherlands Academy of Arts and Sciences, Fellow of the American Association for the Advancement of Science, New York Academy of Sciences, World Technology Network, Foreign Fellow of the Indian National Science Academy, Honorary Member of the Materials

Research Society of India, Honorary Fellow of the Chemical Research Society of India, and the Royal Netherlands Academy of Arts and Sciences.

Recent advisory positions include:

• *National Research Council:* Board on Chemical Sciences and Technology (1984-89; Chairman, 1986-99); Naval Studies Board (1989-97; Vice Chairman, 1992-97); Committee on Bioprocess Engineering (1991-92); Board on Science, Technology and Economic Policy (1991-97); Visiting Committee on Advanced Technology (1994-97); Board on Physics and Astronomy (1997-2001) Committee on Science and Technology for Countering Terrorism (2002); Committee on Nanotechnology for the Intelligence Community (2003)

- *National Science Foundation*: Chemistry Advisory Committee (1984-86; Chairman, 1986), Materials Research Advisory Committee (1991-93; Chairman, 1993), Review Panel for the Materials Research Laboratories (1993, co-Chairman); Advisory Committee for Mathematics and Physical Sciences (1993-96); NSF Senior Assessment Panel: International Assessment of U. S. Mathematical Sciences (1997); Workshop on Chemical Bonding Centers, (2003)

- *Department of Defense*: Defense Advanced Research Projects Agency Defense Science Research Council (1984-); Defense Science Board (1993-2003); Threat Reduction Advisory Committee to the Defense Threat Reduction Agency (1998-)

- *National Aeronautics and Space Administration (NASA)*: Biological and Physical Research Maximization and Prioritization (REMAP) Task Force (2002)

- *Other*: M.I.T. Advisory Committee for Lincoln Laboratory (1985- ; Chairman 2000-); Scientific Advisory Committee for the Scripps Research Institute (1993-); Sandia Science and Technology Advisory Board (2002-); Intelligence Science Board (2003-)

Editorial Boards:

Journal of Applied Biochemistry and Biotechnology, Bioorganic and Medicinal Chemistry Letters, Chemistry of Materials, Angewandte Chemie, Chemistry & Biology, Langmuir, Nanotechnology, Colloids and Surfaces B: Biointerfaces, Sensors and Actuators, and Electrophoresis.

Present research interests include: physical and organic chemistry, materials science, biophysics, complexity, surface science, microfluidics, self-assembly, micro- and nanotechnology, and cell-surface biochemistry.

Dynamic Self-Assembly, Complexity, and Emergence

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Complex, emergence, and dynamical self-assembly are related, and controversial, subjects. Many important systems—from the living cell to power distribution systems to the weather—are complex, and the importance of complex systems—systems of components interacting non-linearly—is unarguable. It is, however, unclear if there is a *science* of complexity, or if different types of complex systems share common characteristics. Complex systems may show also show so-called *emergent* (that is, "new" or simply, perhaps, unexpected) behavior. This seminar will outline some of the problems in complexity and emergence, and summarize studies in "synthetic complexity"—that is, studies of systems of multiple components interacting with one another by relatively simple rules. Designing these systems is a challenge in its own right, but once designed, they are both illuminating in their relevance to complexity, and stimulating in their propensity to show unexpected behaviors.