

The 2006 Macro Group UK Medal for Outstanding Achievement

***Awarded to Professor Jean Fréchet
(University of California at Berkeley, USA)***



Jean was educated at the Lyon Institut de Chimie et Physique Industrielles in France where he gained degrees in Chemistry and Chemical Engineering in 1967. He continued his studies in the USA at the State University of New York College of Forestry and Syracuse University, where he obtained his MS in 1969 and PhD in 1971 for research into organic and polymer chemistry. In 1973 he began a long and productive period at the University of Ottawa in Canada where he was Vice-Dean from 1983 to 1987. During this time he had two periods as a visiting scientist at IBM's San Jose Research Laboratory. This led to his appointment in 1987 as the IBM Professor of Chemistry at Cornell University, where he succeeded to the Peter Debye Chair of Chemistry in 1995. Two years later he became Professor of Chemistry at the University of California, Berkeley, where he was appointed to the Henry Rapoport Chair of Organic Chemistry in 2003. Additionally, at the E.O. Lawrence Berkeley National Laboratory, he is Head of Materials Synthesis in the Materials Science Division and Director of the Organic and Macromolecular Facility of the Molecular Foundry.

Jean's research is at the interface of organic and polymer chemistry with emphasis on design, synthesis and applications of functional macromolecules. He has published well over 600 scientific papers and more than 60 patents. He has also been a tremendous role model for young researchers and anyone who has listened to his lectures at conferences will know that he presents his research in a delightfully clear and inspirational way.

His first major contribution was in the development of polymer-supported reagents and catalysts, and their use in solid-phase organic syntheses. These methodologies are used routinely nowadays and have been crucial to the successful evolution of high-throughput strategies. In collaborative research with IBM whilst he was at Ottawa, Jean was instrumental in helping to develop the concept of chemically-amplified polymer photoresists with major impact for the imaging, microlithography and microelectronics industries; indeed most of today's microprocessors and memory chips are produced using resists based on these concepts. More recently, he was one of the pioneers in recognising the potential of branched polymer architectures, such as dendrimers, and has contributed enormously to the continuing developments in this field.

These are only three examples of the many important contributions Jean has made, but they characterise his research philosophy, which sees the innovative application of fundamental and rigorous science to the development of new materials for important applications. His remarkable record of continuous achievement is well into its fourth decade and progresses with undiminished enthusiasm. Jean's present research is extensive and includes new synthetic approaches to macromolecules with controlled architecture, engineered polymer systems and molecular machines, the design, synthesis and applications of dendritic and other functional polymers, novel imaging materials for nanoscale lithography, energy harvesting and conversion, catalysis with dendrimers as enzyme mimics, polymers in separation and molecular recognition, combinatorial approaches to new materials, biosensing, and functional macromolecules in targeted drug, vaccine and DNA delivery.

Jean's list of awards is long and distinguished and includes Membership of the US National Academy of Sciences, Membership of the US National Academy of Engineering, Fellowship of the American Association for the Advancement of Sciences and Fellowship of the American Academy of Arts and Sciences, together with ten other awards from North America and other countries around the world. So it is with great pleasure, therefore, that Macro Group UK can now honour Jean with award of the 2006 Macro Group UK Medal for Outstanding Achievement.