



Charles Lieber

Lieber Receives 1993 Outstanding Young Investigator Award

“For exceptional initiative, leadership, and accomplishment in materials research, with pioneering contributions to the understanding of novel materials through synthesis and elegant determination of complex local structure and electronic properties.”

Charles Lieber, a professor at Harvard University, is the 1993 recipient of the Materials Research Society's Outstanding Young Investigator Award for “exceptional initiative, leadership, and accomplishment in materials research, with pioneering contributions to the understanding of novel materials through synthesis and elegant determination of complex local structure and electronic properties.”

Lieber has made many significant contributions to the understanding of complex materials, among them layered metal dichalcogenides, high-temperature superconductors, donor-acceptor inorganic complexes, and doped fullerenes. He works closely with theoretical physicists to define appropriate problems to pursue, and is eager to interact with people in disciplines outside his own specialty of chemistry. His synthetic chemistry expertise allows him to test specific theoretically made predictions.

Lieber used solid-state synthesis to prepare metal-atom-doped TaS₂ and used STM to visualize the resulting local perturbations to the electronic structure, giving the first direct view of the charge density wave domains in this material.

He also used solid-state synthesis to prepare metal-substituted high-temperature superconductors and investigated the structural and electronic effects of substitution at the atomic level by STM. Lieber elucidated the controversial structural questions in Pb-substituted Bi-based materials by showing the specific-

ity of electron-state perturbation by Pb incorporation—results that suggest new substitutions that might further increase T_c in these systems. He also used chemical doping to introduce controlled defects into the Bi-based materials and demonstrated how these defects increased the critical current density in the materials more than one order of magnitude. He defined the magnitude and temperature dependence of the superconducting energy gap in BiSrCaCuO, using high-resolution electron energy loss spectroscopy (HREELS).

More recently, Lieber carried out incisive experiments that illuminated the

mechanism of superconductivity in metal-doped fullerenes. His detailed tunneling spectroscopy measurements defined the energy scale for pair-binding in the fullerene superconductors. He also developed a synthetic technique to prepare well-defined ¹³C substituted fullerenes, and used these materials to define the isotope effect on superconductivity.

Lieber earned his BA degree in chemistry from Franklin and Marshall College in 1981. In 1985, he received his PhD degree in chemistry from Stanford University, having done research on photoelectrochemistry. He performed postdoctoral research on photoinduced electron transfer reactions at the California Institute of Technology until 1987, when he joined Columbia University as assistant professor of chemistry. He became an associate professor in 1990. At Columbia, Lieber created a new field of structural inorganic chemistry which combines solid-state synthesis and scanning tunneling microscopy (STM). In 1991, he became a full professor of chemistry at Harvard University.

Lieber has more than 60 publications to his name. Among his awards are the 1992 American Chemical Society Pure Chemistry Award, the 1992 Kinkewalter Prize, and a Presidential Young Investigator Award for the years 1988-1993. Lieber is a member of the American Chemical Society, the American Physics Society, the American Association for the Advancement of Science, and the Materials Research Society. □

MRS Outstanding Young Investigator Award

Purpose: To recognize outstanding, interdisciplinary scientific work in materials research by a young scientist or engineer. The awardee must also show exceptional promise as a developing leader in the materials area.

Nomination deadline for the 1994 Award is **October 1, 1993**.

For information about eligibility and nomination procedures, contact: Anne Wagner (OYI-B), Materials Research Society, 9800 McKnight Road, Pittsburgh, PA 15237; phone (412) 367-3003; fax (412) 367-4373.

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- New Materials Development
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- New Process Technology

The 1993 Fall Program and Registration Materials book will be available in mid-September. If you would like a copy mailed to you, fax your request to: MRS 1993 Fall Program, (412) 367-4373.

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Courses on advanced materials characterization, preparation, and processing/diagnostic techniques have been designed for scientists, engineers, managers, and technical staff who wish to update their knowledge and skills in the research, development and processing of materials. These up-to-date courses are at the forefront of science and technology and complement Fall Meeting symposia. Class sizes are limited. Early preregistration is encouraged.

EQUIPMENT EXHIBIT AND TABLE-TOP DISPLAY

A major exhibit and table-top display of the latest analytical and processing equipment which closely parallels the nature of the technical symposia will be located in the Boston Marriott Hotel, convenient to the technical session rooms. For information, contact Merry Geil, Director of Meeting Activities, Materials Research Society, 9800 McKnight Road, Pittsburgh, PA 15237 • Telephone (412) 367-3003; Fax (412) 367-4373.

PROCEEDINGS

Many symposia from this meeting will publish proceedings. MRS members and meeting attendees may purchase copies of these proceedings at special prepublication prices and receive priority shipment upon publication. Prices will be higher following the meeting. To take advantage of these special prices, order your proceedings while registering for the meeting. For information on nonmember proceedings prices and ordering procedures, contact the MRS Publications Department.

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