UC SANTA BARBARA

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Praise for Polymer Science

UC Santa Barbara engineer Glenn Fredrickson has received the 2016 William H. Walker Award for Excellence in Contributions to Chemical Engineering Literature from the American Institute of Chemical Engineers (AIChE). Presented annually since 1936, the award is named for William H. Walker, one of the American pioneers of chemical engineering practice and principles.

“This major award from the American Institute of Chemical Engineers recognizes Glenn Fredrickson’s immense and impactful contributions to the chemical engineering literature, particularly with respect to polymer theory and simulations,” said Rachel Segalman, the Edward Noble Kramer Professor and chair of the Department of Chemical Engineering. “We are incredibly proud of Glenn’s achievements and thrilled that they go so much further than the literature contributions recognized by this award to contributions to UCSB, where he is an incredible colleague and a cornerstone of many exciting collaborations.”

Fredrickson’s computational field theory techniques have revolutionized the study of soft materials and complex fluids, most notably in self-assembling polymers and block copolymers. Known as field-theoretic simulations (FTS), these techniques are significant not only for their importance to molecular thermodynamics but also for their engineering impact on directed self-assembly — an emerging lithographic technology for semiconductor devices. Companies such as Intel and Samsung are developing their next-generation lithographic processes based on FTS software tools developed by the Fredrickson Research Group.

After contributing an influential 2002 article to the journal Macromolecules that explained the full framework of FTS, Frederickson, the Mitsubishi Chemical Chair in Functional Materials, four years later published the Oxford University Press monograph “The Equilibrium Theory of Inhomogeneous Polymers.” The book, which unified the field of nonhomogeneous polymer theory and simulation, has become the standard reference for both self-consistent field theory and Fredrickson’s more powerful FTS.

Fredrickson earned his bachelor’s degree from the University of Florida in 1980 and his master’s degree and doctorate from Stanford University in 1981 and 1984, respectively. He worked at AT&T Bell Laboratories before joining the faculty in 1990. In 2014, Fredrickson was appointed chief technology officer and member of the board of Mitsubishi Chemical Holdings Corporation in Tokyo.

He is a member of the National Academy of Engineering and a fellow of the AIChE, the American Physical Society, the American Association for the Advancement of Science and the American Academy of Arts and Sciences. His other honors include the Collaboration Success Award from the Council for Chemical Research, the Cooperative Research Award in Polymer Science and Engineering from the American Chemical Society, and the Polymer Physics Prize from the American Physical Society.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.