

Graduate Program in Advanced Macromolecular Chemistry and Engineering

ABSTRACT

This proposal requests fellowships for nine U.S. graduate students, with outstanding ability and financial need, to pursue PhD degrees in Chemical Engineering or Chemistry at the University of Colorado at Boulder. An additional three fellowships will be provided through new institutional matching funds. The Fellows will be trained in interdisciplinary science and engineering principles and practices to prepare them for teaching and research careers which address critical national needs in *advanced polymer chemistry and engineering*.

The Departments of Chemical Engineering and Chemistry are uniquely positioned to meet the identified need, with 17 full-time faculty members having research expertise in various aspects of polymeric materials, defined broadly to include biological, organic, and inorganic polymers. Collectively, they have published over 600 research articles in this area. The Departments are also host to four research and training centers on biological, organic, and inorganic polymers: The Colorado Institute for Research in Biotechnology (funded since 1987 with state and industrial funds), the Membrane Applied Science and Technology Center (funded since 1990 with industrial, federal, and state support), the Center for Pharmaceutical Biotechnology (funded since 1997 with industrial and university support), and the Center for Fundamentals and Applications of Photopolymerizations (funded since 1999 with industrial and federal support). The faculty and their industrial associates are committed to providing first-rate training to an expanded group of PhD students in modern materials chemistry and engineering. The proposed project addresses the national need for interdisciplinary training in chemistry and engineering, with the following general objectives:

- *To provide a unique educational and research program in advanced polymer chemistry and engineering, which will be sustained beyond the duration of the requested support.*
- *To help the United States retain economic competitiveness in biotechnology and chemical technologies which impact polymeric materials.*
- *To help the United States practice responsible polymer manufacturing processes which do not release contaminants to the environment.*
- *To address current and anticipated shortages of engineers and scientists who are trained for teaching and research careers related to advanced polymers, by increasing the number of U.S. students who pursue and complete PhD degrees in this critical area.*
- *To provide adequate financial support to talented students with demonstrated financial need that would otherwise prevent them from full-time graduate study.*
- *To enlarge the pool of qualified PhD students in science and engineering by making special efforts to recruit and retain women and underrepresented minorities*