

Graduate Program in Microparticle and Nanoparticle Technology

ABSTRACT

This proposal requests fellowships for nine U.S. graduate students, with outstanding ability and financial need, to pursue PhD degrees in Chemical Engineering 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 *microparticle and nanoparticle technology*.

The Department of Chemical Engineering is uniquely positioned to meet the identified need, with 14 full-time faculty and two part-time faculty having research expertise in various aspects of organic and inorganic particles, defined broadly to include applications in biotechnology, environmental engineering, materials, multiphase flows, and separations. Collectively, they have published over 600 research articles in this area. The Department is also host to four related research and training centers. The Interdisciplinary Biotechnology Program (funded since 1987 with state, federal, 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 science and engineering principles. The proposed project addresses the national need for specialized training in particle technology, with the following general objectives:

- *To provide a unique educational and research program in advanced particle technology, 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 particulate systems.*
- *To help the United States practice responsible particulate 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 microparticle and nanoparticle technology, by increasing the number of U.S. students who 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.*