

To serve as the focal point for program development and research aimed at fostering improvements, innovations, and reforms in science, mathematics, and technology instruction and curriculum at all levels, K-16.

### Professional Development

CSMATE promotes “best practices” in teaching, learning, and assessment. We use a wide range of instructional methodologies and technologies to promote enhanced teaching and learning in field, classroom, laboratory, and online environments. Our courses and workshops support hands-on, inquiry-based investigations of core concepts in science and mathematics, tied to national, state, and district standards. We honor K-16 teachers as professionals and believe that mathematics, science, and technology can and should be accessible to all students.

### Research on Teaching and Learning

CSMATE staff and associated graduate and post-doctoral fellows engage in collaborative research investigations to advance our understanding of theory and practice affecting classroom instruction and student achievement in science, mathematics, and technology. Areas of current focus include student cognition, development and use of assessments, applications of distance and visualization technologies, and differences in achievement between and within diverse student populations.

### Curriculum and Materials

CSMATE staff develop innovative, standards-based curriculum materials in science and mathematics for secondary and post-secondary classrooms. Our materials encourage students to pose questions, develop experiments, collect, analyze and interpret data, and apply their learning to new situations. Of particular note is our Small-Scale Chemistry curriculum which has been incorporated into secondary and post-secondary chemistry classrooms across the country.

### Innovative Use of Technology

CSMATE develops and tests innovative technologies to improve teaching and learning. Our current efforts focus on developing powerful digital images and models of key science concepts, creating high-quality online courses, and improving K-16 teacher and student access to the wealth of scientific and mathematics resources that exist on the Internet.

### National Small-Scale Chemistry Center



Small-Scale Chemistry is an innovative, holistic, digital, user-friendly, transparent, quantitative, and cutting edge approach to engage students in experimental chemistry. It is an inquiry-based method that reduces costs without sacrificing effective pedagogy. The production of chemical waste is reduced dramatically, disposal costs are almost zero, and safety is increased while institutional liability is decreased.

**Colorado  
State**  
University

*Knowledge to Go Places*

## Recent Activities

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### The Center for Learning and Teaching in the West (CLT West)

CSMATE is a major partner in this unique, multi-state/multi-institutional consortium that is working to develop the next generation of leaders in mathematics and science education. CLT West's mission is to better serve students who have traditionally not benefited from science and mathematics education reform and to provide on-site and online support for their teachers.

### Bachelor of Science in Natural Sciences

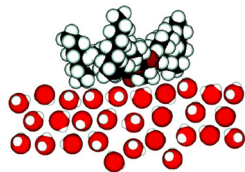
CSMATE is the home of the Bachelor of Science in Natural Sciences, BSNS, degree which provides undergraduates with the subject matter, the education classes, and the classroom experience required for secondary science education licensure in Colorado. These graduates have the background required for graduate science education programs. Concentrations in the natural sciences major include: biology education; chemistry education; geology education; and physics education.

### Colorado Science and Engineering Fair (CSEF)

CSEF is a state-level competition for Colorado students in grades 6-12, which encourages students to do quality scientific investigations, develop an appreciation for science and technology careers, and learn how science, mathematics, and technology affects their communities. The top two individual and team winners earn the chance to compete at the Intel International Science and Engineering Fair each year.

### Annenberg Media Teacher Workshops

Through the use of media and telecommunications, the Annenberg Media is able to offer teacher professional development workshops. Over 1,800 teachers across the nation have enrolled for graduate credit through CSMATE since the program's inception in 1995. Educational video programs with coordinated Web and print materials provide nationwide opportunities to reform mathematics and science education.



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## Recent Funders

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- Annenberg Media
- Colorado Commission on Higher Education: Eisenhower Professional Development Program
- Colorado Department of Education
- Department of Education: Fund for the Improvement of Post-Secondary Education (FIPSE)
- Gates Corporation
- Harvard Smithsonian Center for Astrophysics
- Hewlett-Packard Foundation
- Hewlett-Packard Philanthropy and Education
- Intel Foundation
- Korean National Institute for International Education and Development (NIIED)
- LSI Logic
- MacArthur Foundation/American Association for the Advancement of Science
- National Aeronautic and Space Administration (NASA)
- National Science Foundation (NSF)
- U.S. Environmental Protection Agency (EPA)
- Numerous Colorado businesses, professional organizations, and government agencies

## History

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CSMATE at Colorado State University is widely recognized for its high quality teacher professional development programs, innovative curricula, and effective applications of technology. CSMATE began in 1989 as a shared vision of administration and faculty in the Colleges of Natural Sciences and Applied Human Sciences at Colorado State University, and since 1991 has aggressively campaigned to raise programmatic funds from public and private sources to supplement the operational support provided from Colorado State University to fulfill our mission. To that end, with funding from the National Science Foundation, U.S. Department of Education, and other government and foundation sources, CSMATE has planned and conducted over 33 major science, mathematics, and technology education projects. These projects have ranged from one to five years in duration and have directly benefited 150 university faculty in Colorado, 200 community college faculty nationwide, 240 inservice teachers nationwide, and 575 preservice teachers. Through these individuals and associated curricula CSMATE has improved the science, mathematics, and technology education of hundreds of thousands of K-16 students nationwide.