Taking Advantage of Division of Undergraduate Education and NSF Funding Opportunities

Community Colleges of Appalachia 15th Annual Conference

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Division of Undergraduate Education (DUE)

ADVANCED TECHNOLOGICAL EDUCATION

Our nation's status as the world leader in science and technology depends on our ability to equip U.S. workers with the skills they need to compete in the global economy. ATE centers develop the innovative curricula, teaching methods, and partnerships needed to achieve this goal.

David Price, *U.S. Representative, Fourth District of North Carolina*
Author of Legislation That Created ATE

ADVANCED TECHNOLOGICAL EDUCATION

The ATE program promotes improvement in the education of science and engineering technicians at the undergraduate and secondary school level and the educators who prepare them, focusing on technicians for high-technology fields that drive the nation's economy.

ADVANCED TECHNOLOGICAL EDUCATION

The ATE program focuses on two-year colleges and expects two-year colleges to have a leadership role in all projects.

ADVANCED TECHNOLOGICAL EDUCATION

ATE grants include partnerships with:

- 2-year schools
- business and industry
- 4-year schools and universities
- secondary schools
- government agencies

ADVANCED TECHNOLOGICAL EDUCATION

ATE is in its 14th year of funding community colleges, having started with the Science and Advanced Technology Act of 1992 (SATA).

FY2008-FY2010

Preliminary Proposals	April 26, 24, 23 respectively (tentative)
Formal Proposals	October 11, 16, 15 respectively (tentative)

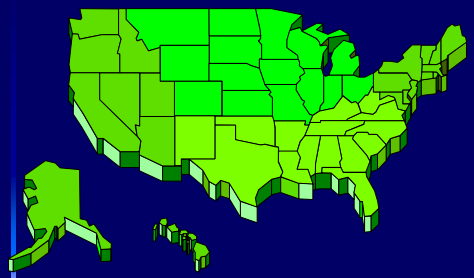
ADVANCED TECHNOLOGICAL EDUCATION

- Deliver well-qualified technicians to the workforce
- Influence changes in the hiring practices of key companies
- Improve STEM curricula at 2-year colleges and high schools
- Create new curricula/programs for emerging technologies
- Include the latest research about how people learn
- Inform middle and high school students of technical careers
- Encourage students in math and science courses that prepare them for careers in advanced technology fields

ADVANCED TECHNOLOGICAL EDUCATION

ATE grantees engage in collaborative activities, primarily with business, industry, and other educational institutions

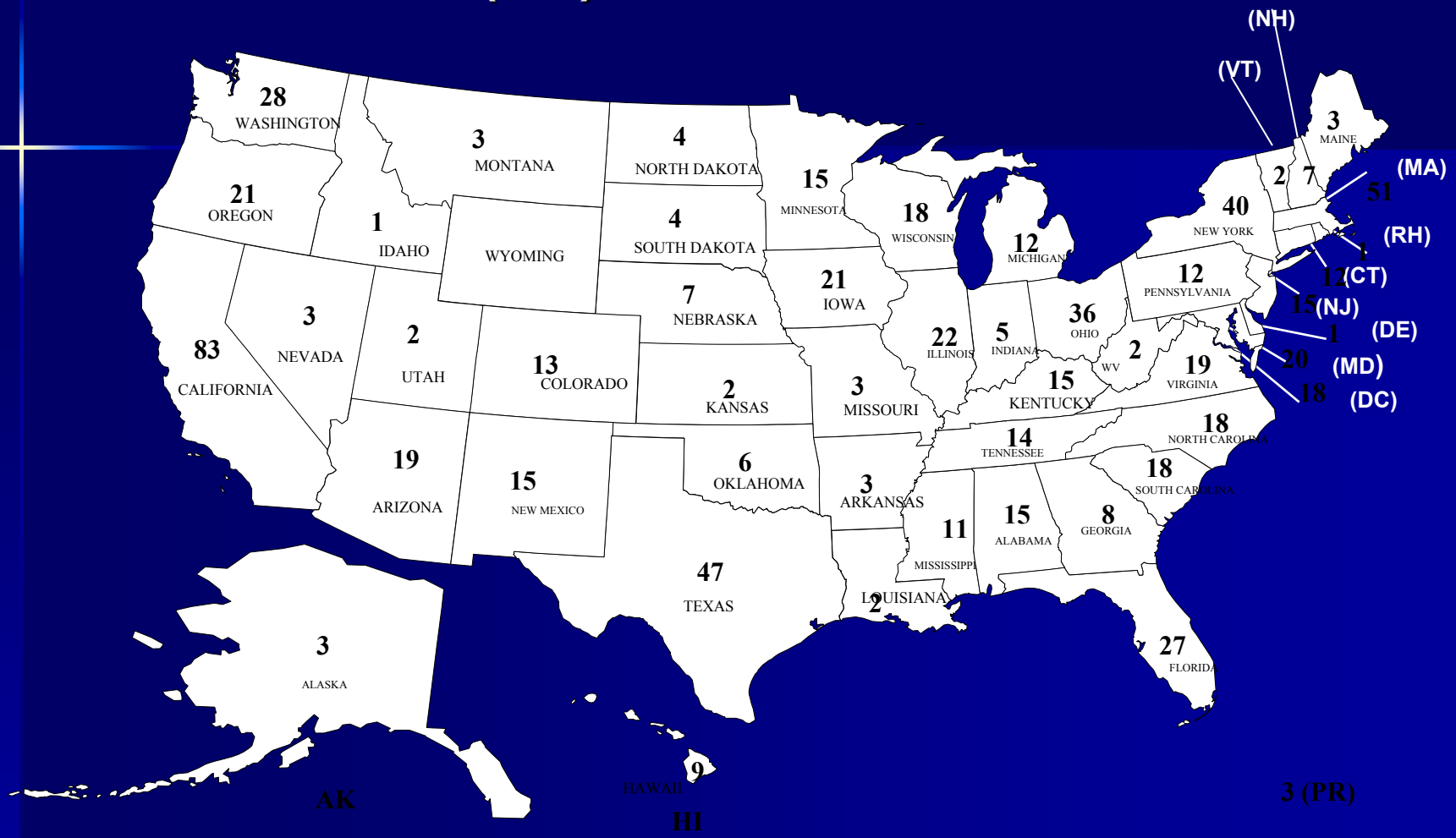
- External collaborators (mostly business and industry) provided $34 million of additional support in the form of monetary donations or in-kind support in 2005
- 100 on-the job- technician education programs started in 2004 and 2005



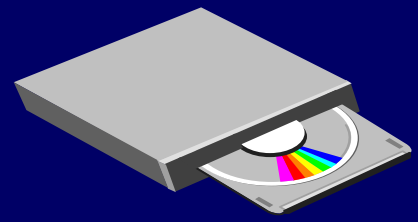
Advanced Technological Education Program

- Projects which focus on:
  - Program Improvement;
  - Professional Development for Educators;
  - Curriculum and Educational Materials Development;
  - Teacher Preparation
  - Small Grants for Institutions New to the ATE Program
- Centers of Excellence – National, Regional, Resource
  - http://www.ATECenters.org
- Targeted Research on Technician Education

Number of Awards per State in ATE's 13 Year History
Total number of Awards (739)

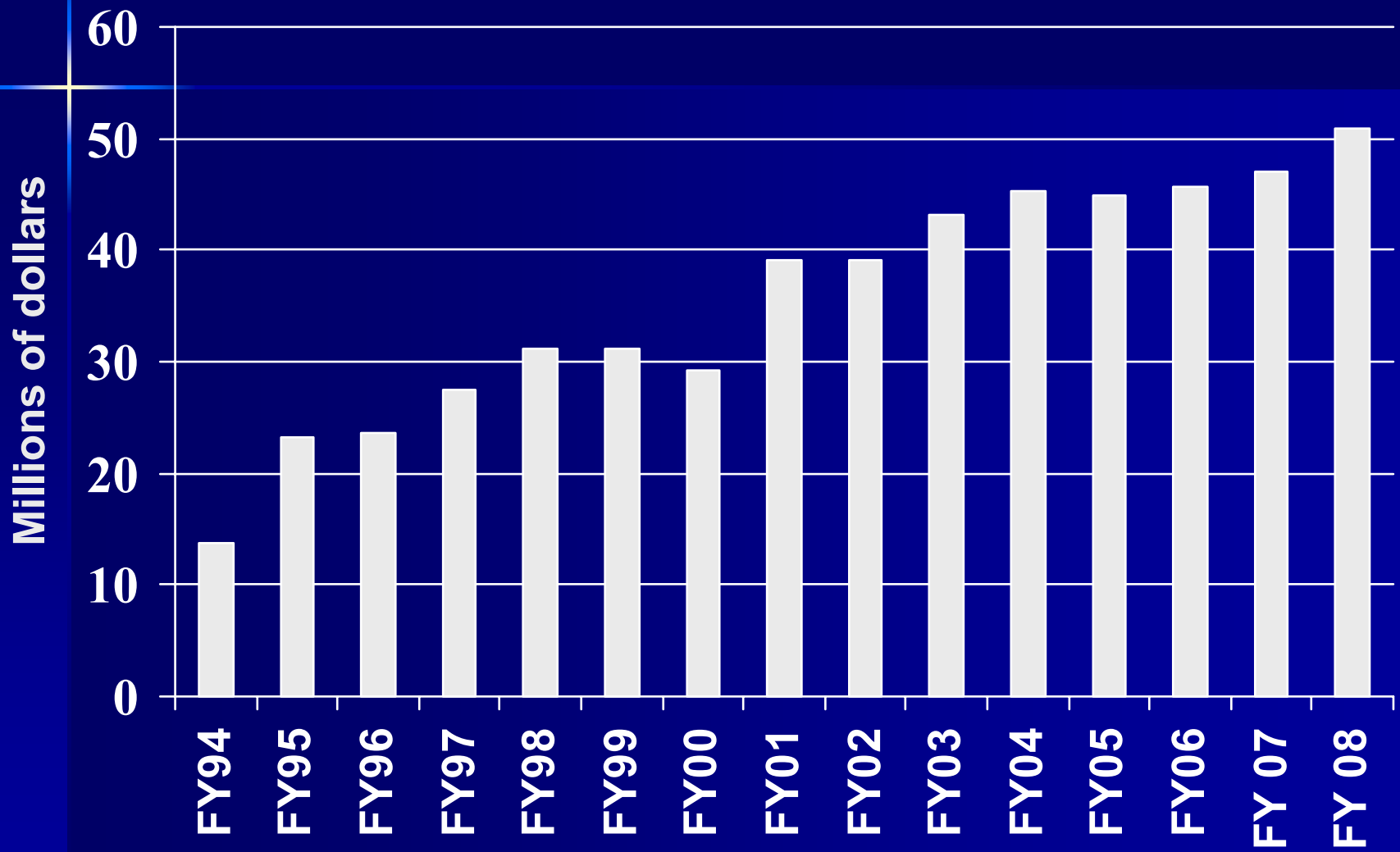


Foci of ATE Awards



	FY 96-01	FY 02-05	FY 2006
Biotechnology	24	14	9
Chemical Technology/Pulp & Paper	15	12	0
Multidisciplinary	30	6	4
Electronics/Microelectronics/Nanotech	12	7	4
Other Engineering Technology	30	38	7
Environmental	22	8	1
Geographic Information Systems	13	10	5
Manufacturing	52	33	7
Math/Physics	25	13	2
Computer/Information Systems/ Cybersecurity/Telecommunications	72	58	9
Marine/Agriculture/Aquaculture/Nat. Res.	11	6	3
Teacher Preparation	10	23	1
Multimedia	0	6	1
Energy Technology	0	3	3
Research	0	1	4
Recruitment/Retention	0	2	5
Institution Reform	0	3	0
Totals	306	243	65

ATE Program Budget



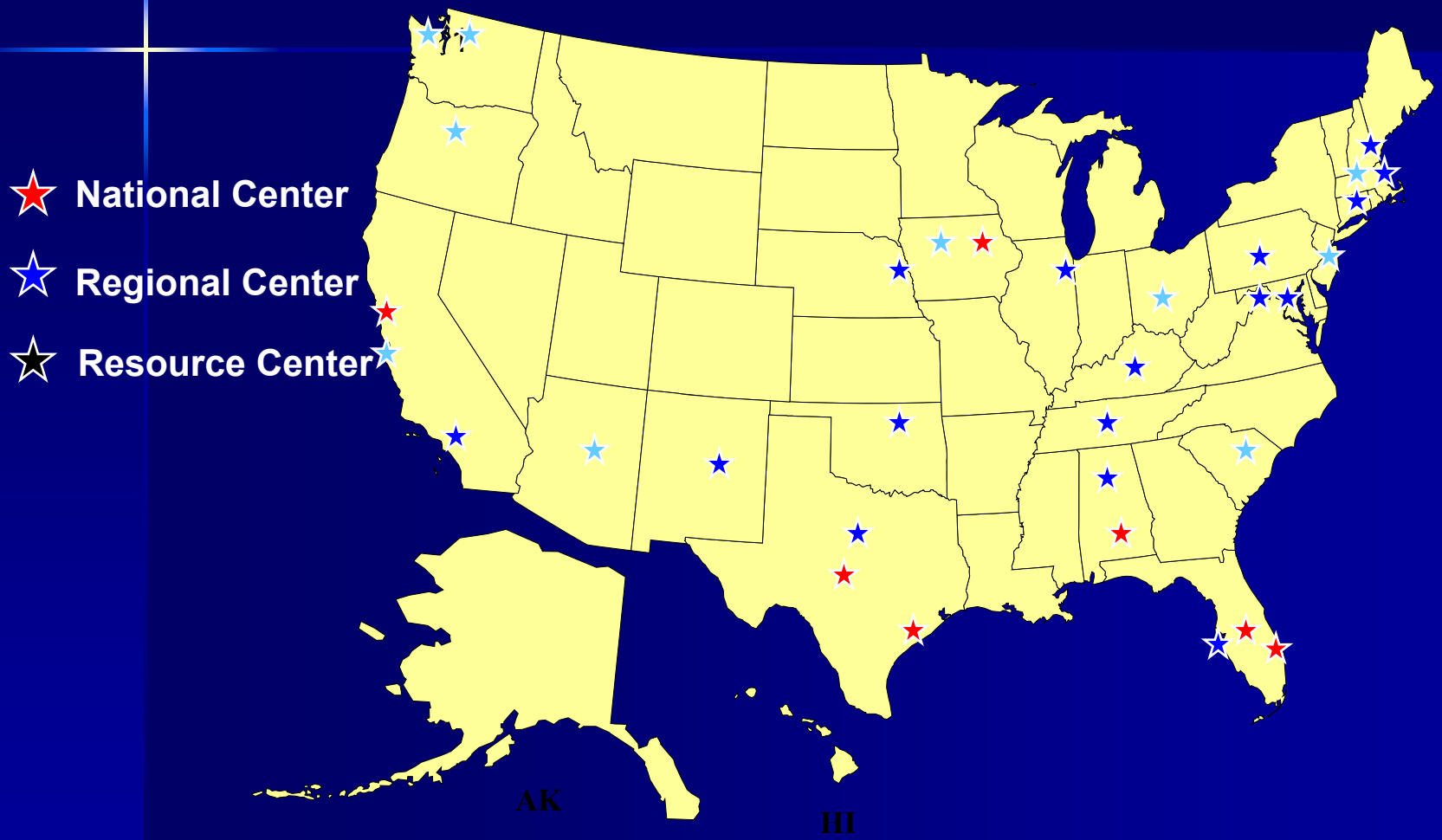
ATE Centers

http://www.ATECenters.org

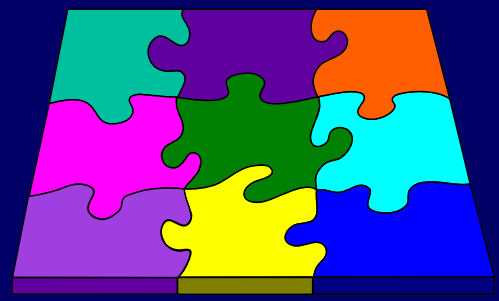
Advanced Technological Education Centers

Advanced Technological Education Centers

ATE Centers of Excellence (33)



ATE National Centers of Excellence



- **Usually in a disciplinary field (e.g., Information Technology, Biotechnology)**
- **National resource for the particular technology**
- **Comprehensive reform of technological education**
- **Broad national network of academic institutions and industrial entities**

Center for the Advancement of Process Technology

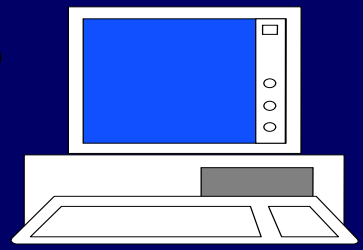
College of the Mainland, Texas
DUE-0202400

- **Partners with major petrochemical and refining industries, 2-year colleges, and universities in TX and LA with links to other states and builds on accomplishments of the Gulf Coast Process Technology Alliance**
- **Include curriculum development and improvement, instructional materials development, faculty enhancement, dissemination, and collaboration efforts**
- **Serves industry sectors including chemical and refining, exploration and production, pharmaceuticals, and power generation**

Regional Centers

- **Regional focus – serves the needs of industry in a region**
- **Collaboration among colleges and secondary schools**
- **Collaboration with industry in the region**
- **Activities include curriculum adaptation, faculty and teacher development, establishment of partnerships, and recruitment and retention strategies, all directed toward regional workforce needs**
- **Clear, measurable impacts on quantity and quality of students for the workforce**

Center for the Advancement of Systems Security and Information Assurance (CASSIA)



Moraine Valley Community College DUE 0302612

- **Focusing on homeland security in a 5-state region**
- **Collecting, adapting, and enhancing curricula in cybersecurity**
- **Offering AAS degrees and certificates in IT security and data assurance and a BS program in computer science**
- **Providing professional development for college faculty and internships for students**

ATE Resource Centers

- Constitute a highly visible source of educational materials, ideas, contacts, and mentoring in a particular field of technological education
- Led by those who have already made substantial, high-quality contributions in an area of technological education.
- Serve as clearinghouses for, and broadly distribute, the exemplary materials, curricula, and pedagogical practices adapted or designed by previously funded ATE centers and projects
- Provide support and mentoring for institutions that wish to start or improve educational programs in a particular field of technology.

ATE Projects

- Program Improvement : These projects increase the relevance of technician education to modern practices and assure an increased number of students entering the high performance workplace with enhanced competencies. They are more focused than centers.

Program Improvement

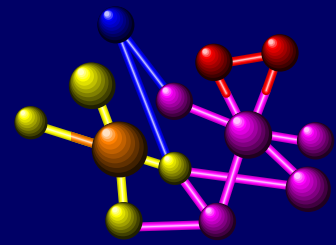
Activities might include:

- Integrating industry standards and workplace competencies into the curriculum
- Adapting educational materials or courses developed elsewhere
- Adding rigorous STEM content to programs and courses
- Providing professional development to educators
- Developing articulation agreements between two-year colleges and secondary schools or four-year institutions
- Improving recruitment or retention of students

ATE Projects -- Others

- **Professional Development for Educators**
- **Curriculum and Educational Materials Development**
- **Teacher Preparation**
- **Research on Technician Education**

SLCC Contract Research Organization for Biotechnology



Salt Lake City Community College DUE 0402497

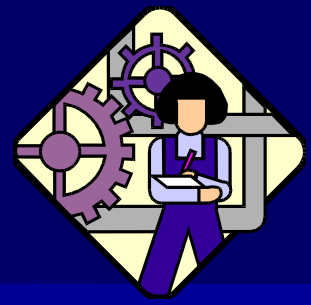
- Provides working internships for college and high school students where students can translate concepts and techniques from the classroom to a working environment
- Uses research projects from companies where companies provide consumable costs and in return have access to a highly trained workforce to offset personnel costs
- Helps to meet the demand for a challenging next step for high school seniors and more flexible college internships

Digital Interactive Entertainment and Simulation Technology Project

Wake Technical Community College
($858,000 ATE Project 0602801)

- Developing an associate degree in digital gaming technology
- An interdisciplinary program that integrates humanities and the arts with sciences and advanced mathematics
- Involves more than 30 companies in the region that need technicians

Rapid Prototyping Instructional Delivery Support



Saddleback College DUE 0501527

- Expands the curriculum model in rapid prototyping through trainer workshops and development of instructional support material
- Involves project leads from Saddleback, Central Maine CC, Cuyahoga CC, Tennessee Tech, San Diego St., and Rochester Institute of Technology
- Includes incorporation of rapid prototyping in integrated design processes for manufacturing and maintenance procedures for purchased rapid prototyping equipment

New ATE Project Opportunity: Small Grants for Institutions New to ATE

- Purpose
  - Simulates implementation, adaptation, and innovation in all areas supported by ATE.
  - Broaden the base of participation of community colleges in ATE.
  - Strengthen the role of community colleges in meeting needs of business and industry
- Proposers are encouraged to include resources of ATE and other NSF awardees and to include those people as consultants and sub awardees.
- Available only to community college campuses that have not an an ATE award within the last 10 years
- Limited to $150,000 with a maximum of 10% indirect

Expanded ATE Opportunity Track 3: Targeted Research in Technician Education

- Supports research on technician education, employment trends, changing role of technicians in the workplace, and other topics that make technician programs more effective and forward looking.
- Represents a TRUE collaboration reflected in activities, leadership, and budget between well-qualified researchers and two-year college educators and others as appropriate.

Expanded ATE Opportunity Track 3: Targeted Research in Technician Education

Examples:

- ✓ For specific high-technology fields, what works and what doesn't work and why? What educational strategies are most effective in improving student learning in specific fields and how do you know?
- ✓ Across multiple technology fields, what are the impacts of strategies such as problem based learning and remote laboratories?
- ✓ How can the stakeholders in technician education (community colleges in collaboration with all types of others) develop meaningful and mutually beneficial partnerships?
- ✓ What model educational program and industry partnerships prepare students for sustained success in a technician career? What are the characteristics of students who best adapt?

ATE Impact: 2006 Survey at a Glance Part I

- Reporting — 163 out of about 250 active awards *
- Taking at Least One ATE Supported Course
  - 37,576 secondary school students
  - 124,872 associate degree students
  - 6138 baccalaureate degree students
  - 10896 on-the-job workers
- Program Enhancement Specifically- 67 awards
  - 302 programs being changed
  - 283 institutions involved
  - 956 courses changes
  - Serving 28,200 students.

* **Must be active more than a year to report** – 178 surveyed

ATE Impact: 2006 Survey at a Glance Part II

- Participated in an ATE professional development opportunity – 66 projects
  - 5265 secondary school teachers
  - 5575 associate degree faculty
  - 3018 baccalaureate degree faculty
- Partnerships
  - 5517 businesses and industries, public institutions, and other educational institutions
  - Provide an additional $13 million in support
- Assessments
  - 98% of projects have an industry advisory board
  - 73% have conducted a needs assessment recently
  - 87% have external evaluations.

Some Best Practices in Working with Industry Identified by ATE PIs

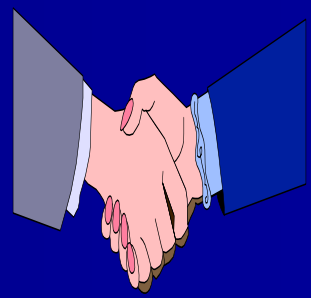
- **Get industry involved early and be flexible**
- **Assure persistence and critical mass of partners**
- **Use industry experts to help with curriculum development and project evaluation**
- **Have joint membership of industry and academia on Workforce Development Boards**

Some Best Practices in Working with Industry Identified by ATE PIs

- **Focus on needs for the high performance workplace**
- **Get decision makers involved**
- **Link company research and colleges in training of technicians**
- **Provide flexible pathways for students**

WAYS TO PARTICIPATE

- **Grant Holder**
  - **Principal Investigator**
  - **Member of Project Team**
  - **Member of a coalition**
  - **Member of an Advisory Board**
  - **Test Site**
- **User of Products**
- **Participant in Workshops and Symposium**
- **Reviewer of Proposals**

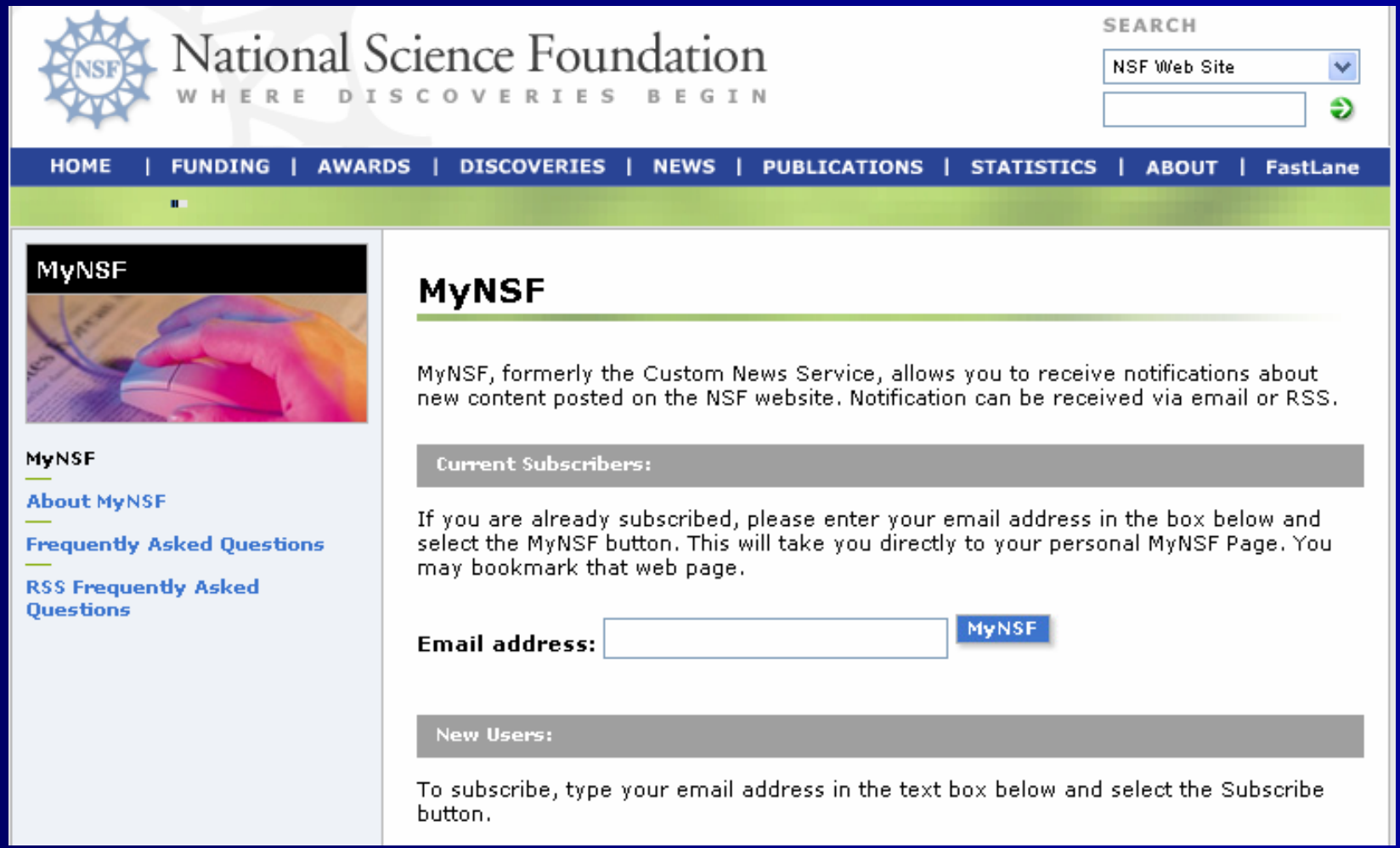


Practical Aspects of Review Process

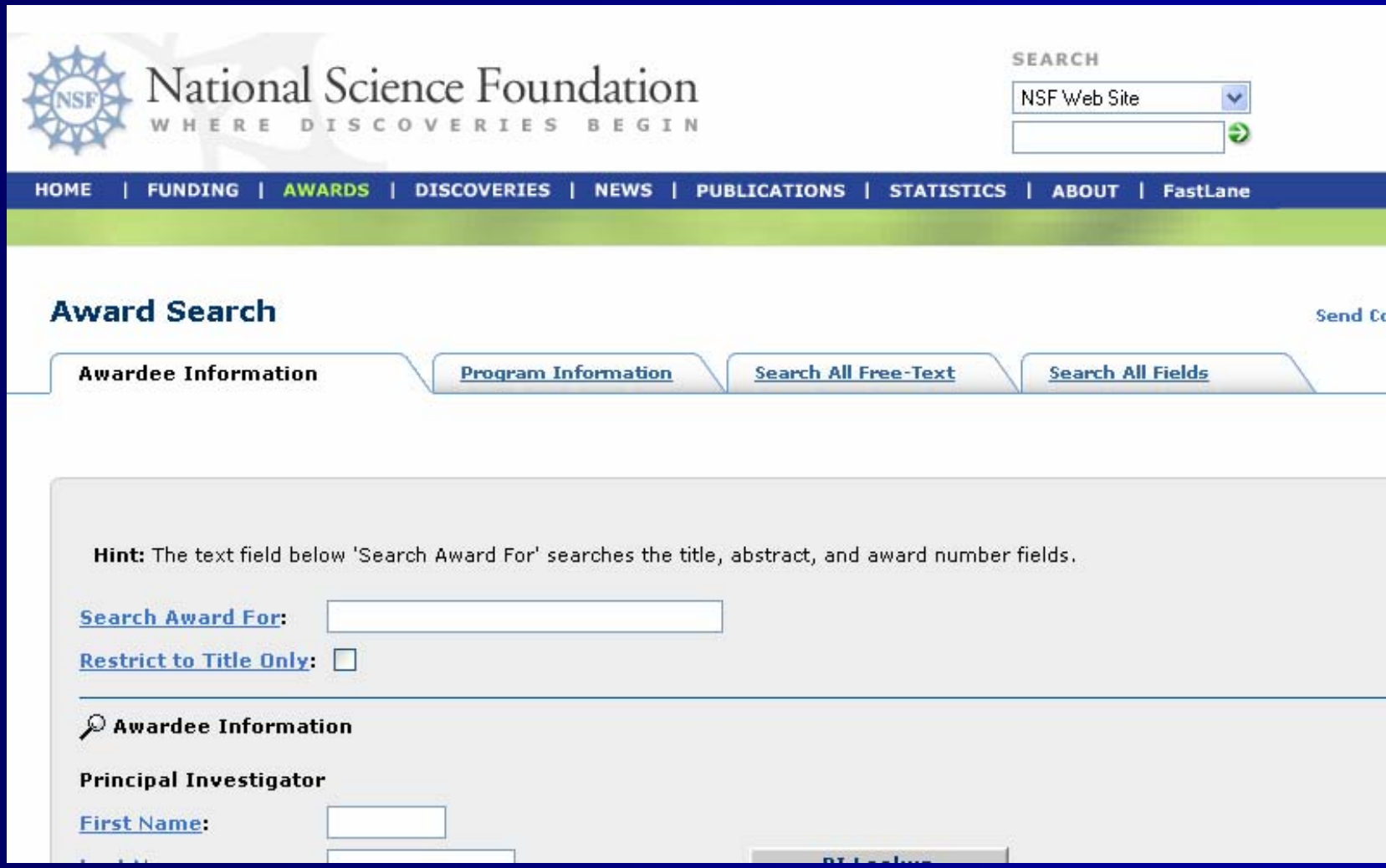
Reviewers have:

- Many proposals
  - Ten or more from several areas
- Limited time for your proposal
  - 20 minutes for first read
- Different experiences in review process
  - Veterans to novices
- Different levels of knowledge in proposal area

My NSF
http://www.nsf.gov/mynsf/



NSF Awards Search:
http://www.nsf.gov/awardsearch/



Division of Undergraduate Education
http://www.nsf.gov/div/index.jsp?div=DUE

Project Information Resource System

Other DUE Programs

- STEM Talent Expansion Program (STEP)
- Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)
- Noyce
- Course, Curriculum, and Laboratory Improvement (CCLI)
- Scholarships for Service (SFS)
- National Science Digital Library (NSDL)

STEP
(STEM Talent Expansion Program)

Type 1 Projects

Goal: to increase the number of students (U.S. citizens or permanent residents) *RECEIVING* associate or baccalaureate degrees in established or emerging fields within science, technology, engineering, and mathematics (STEM)

www.nsf.gov/pubs/2006/nsf06502/nsf06502.htm/

Deadline: September
Optional Letters of Intent: August

STEP – Type 1

- **Bridge programs that enable additional preparation for students**
- **Programs that focus on the quality of student learning**
  - **high-caliber teaching in smaller classes**
  - **new pedagogical approaches**
  - **training of teaching assistants**
- **Programs to encourage undergraduate research**
- **Programs that provide financial incentives to students**
- **MANY others**

GRANTS FOR UP TO FIVE YEARS, AMOUNT RELATES TO INSTITUTIONAL SIZE (S)

STEP – Type 2 Projects

Support educational research on factors affecting associate or baccalaureate degree attainment

GRANTS 1-3 YEARS AND UP TO $500K/YR

NSF Scholarships in Science, Technology, Engineering, and Mathematics (S-STEM)

- **Goal: Provides institutions funds to provide scholarships to academically talented, but financial needy, students. Students can be pursuing associate, baccalaureate, or graduate degrees.**
  http://www.nsf.gov/pubs/2006/nsf06527/nsf06527.htm
- **H1B Visa Funds**

- **Letter of Intent** **October 10, 2007**
- **Full Proposal** **November 13, 2007**

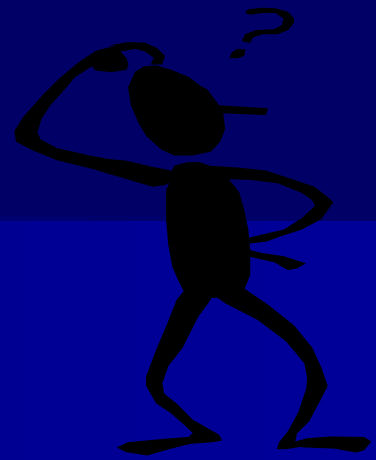
S-STEM

- **Major Features**
  - **Eligible disciplines extended to include biology, physical and mathematical sciences, computer and information sciences, geosciences, and engineering**
  - **Maximum scholarships increased to $10,000 (but still based on financial need)**
  - **Grant size increased to $600,000 with 7% allowed for administration and 8% for student support**
  - **One proposal per constituent school or college that awards degrees (also schools within institutions)**
  - **About $50 million available**

S-STEM

- **Special Program Features**
  - **Has a faculty member in a STEM discipline as the PI.**
  - **Involves cohorts of students.**
  - **Provides student support structures.**
  - **Includes optional enhancements such as research opportunities, tutoring, internships, etc.**
  - **Enrolls students full time.**

Information and Inquiries



- **DUE Information System**
- **Email undergrad@nsf.gov**
  - **Phone 703-292-8670**
  - **Fax 703-292-9015**
- **DUE Web Site**

  http://www.nsf.gov/div/index.jsp?div=DUE
- **DUE Project Information Resource System**
  https://www.ehr.nsf.gov/pirs_prs_web/search/
- **DUE Mailing Address**
  - **NSF, Division of Undergraduate Education, 4201 Wilson Boulevard, Room 835, Arlington, VA 22230**