

Why ASTRA?:



Making a Case for ASTRA Policy Research and Advocacy

Prepared for U.S. Dept. of Energy

October 30, 2008



Why ASTRA?

The Alliance for Science & Technology Research in America

1. **Core mission: increasing federal funding for fundamental research in the physical sciences and engineering.**
2. **ASTRA's 120-plus members and 32,000-plus "friends" create a nationwide (and global) community of S&T professionals committed to increasing physical science & engineering budgets. Policy research support is key need.**
3. **ASTRA has succeeded in making the case, developing data, enabling larger communities of S&T professionals and membership organizations to succeed. ASTRA created original strategy for linking federal S&T funding w. workforce, competitiveness, innovation, national defense in 2000.**
4. **Advocacy materials and programs form basis for recent legislative breakthroughs and disappointments, including FY 2008 *DOD Supplemental Science Budget* Increases of \$400 million for key science agencies, the *America COMPETES Act of 2007*, American Competitiveness Initiative and annual battle over appropriations bills for key science agencies.**
5. **ASTRA creates new networks, identifies emerging issues, harnesses synergies of broader communities of interest. Provides data for Congressional testimony, Executive Branch research on competitiveness, data mining.**
6. **Key gaps in innovation metrics now involve small business, venture capital and entrepreneurial sectors to better understand "innovation vital signs."**

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ASTRA Member Organizations 10/08

Founding ASTRA Organizations

Alfred P. Sloan Foundation
American Association for the Advancement of Science
American Association of Engineering Societies
American Chemical Society
American Institute of Chemical Engineers
American Institute of Physics
American Physical Society
American Mathematical Society
Association of American Universities
Battelle
California State University System
David & Lucille Packard Foundation
Federation of Materials Societies
Florida State University
Golden Family Foundation
IBM Corporation
Lucent Technologies
Materials Research Society
National Association of Manufacturers
Optical Society of America
Rensselaer Polytechnic Institute
Sandia National Laboratories
The Science Coalition
Semiconductor Industry Association
The Minerals, Metals and Materials Society (TMS)
University Corporation for Atmospheric Research (UCAR)
University of Arkansas, Fayetteville
University of Arkansas, Little Rock
Worcester Polytechnic Institute

Pending Memberships:

Arctic Region Superconducting Center
Florida Photonics Cluster
IEEE Robotics and Automation Society
SAE International
Small Business Technology Council
University of Alaska, Fairbanks
Drexel University
University of Connecticut

Current Organizations

Agilent Technologies
Alfred P. Sloan Foundation
American Association for the Advancement of Science
American Chemical Society
American Dental Association
American Institute of Chemical Engineers*
American National Standards Institute (ANSI)
American Physical Society
American Society of Engineering Educators (ASSEE)
Applied Materials
Athena Alliance*
AVS—The Science & Technology Society
California State University System*
CABC — The Coalition for Academic Scientific Computing
Center for Accelerating Innovation*
Cleveland Medical Devices*
Computing Research Association*
Council on Competitiveness*
Dow Chemical
Ewing Marion Kauffman Foundation
ExOne Company*
Federation of Materials Societies*
FIATECH*
Florida State University*
General Atomics*
General Electric*
General Motors
Golden Family Foundation*
Hewlett-Packard
IBM Corporation
IEEE-USA
Integrated Manufacturing Technology Initiative*
Intel
IPC — Association Interconnecting Electronics Industries*
Kent State University*
Lucent Technologies*
Luna innovations*
Materials Research Society
Nanotechnology Business Alliance*
National Association of Manufacturers*
National Council of Women in Information Technology (NCWIT)*
National Center for Manufacturing Sciences (NCMS)*
National Science Teachers Association*
National Semiconductor Corporation
National Venture Capital Association
Northern Illinois University
ONAMI — Oregon Nanoscience and Microtechnologies Institute

Optical Society of America (OSA)
Optoelectronic Industry Development Association (OIDA)*
Orbital Research, Inc.*
Purdue University*
Rensselaer Polytechnic Institute
Rockwell Collins
Rohm & Haas
Sandia National Laboratories*
Semiconductor Equipment & Materials International (SEMI)
Semiconductor Industry Association (SIA)
Semiconductor Research Corporation (SRC)
Southeastern Universities Research Association (SURA)
SPIE — The International Society for Optical Engineering
Stanford University
TechVision 21*
Texas Instruments*
The Minerals, Metals and Materials Society (TMS)*
University Corporation for Atmospheric Research (UCAR)
University of Arkansas, Fayetteville
University of Arkansas, Little Rock
University of California, Los Angeles
University of California, Office of the President
University of California, Santa Barbara
University of Central Florida
University of Florida
University of Illinois, Chicago
University of Illinois, Springfield
University of Illinois, Urbana-Champaign
University of Massachusetts
University of Missouri
University of New Mexico
University of South Carolina*
US Car*

* Denotes "Friend of ASTRA"

ASTRA has made a Difference ...

“Level I” of ASTRA Plan = SUCCESS:

A. Identify proper data, enable capacity within powerful membership organizations, academe & industry to create public dialogue. ASTRA behind “doubling” of budgets for key physical science & engineering agencies. Positioning for next Administration, Congress ongoing.

B. Perform research and data mining to determine links between science funding and desired outputs for society.

C. Create proper messaging and unify diverse communities of interest, esp. bringing industry to table.

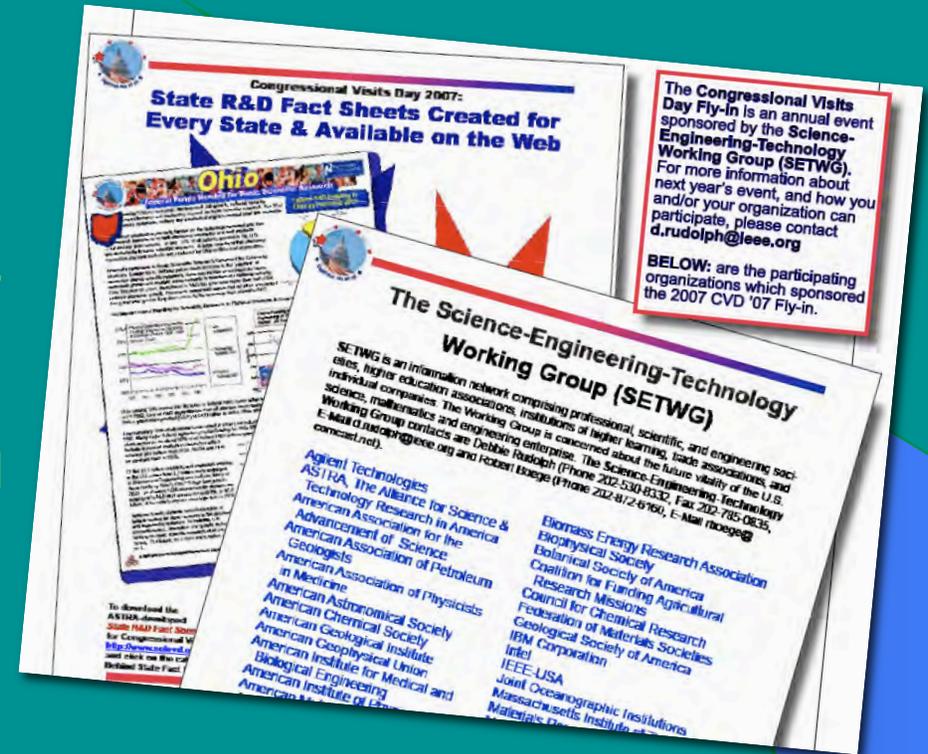
D. Foster nationwide networks and collaborations for science advocacy (key potential area for additional funding).

Making a Case — And Vetting the Data Correctly!

ASTRA has mobilized thousands of ordinary people at the grassroots level, as well as key leadership in science & engineering voluntary organizations, industry, and academe.

ASTRA creates many data products which are carefully vetted by expert volunteers, graphically appealing, and focused upon putting a “human face” to the complex relationships science funding creates with job creation, competitiveness, innovation, STEM education and national security.

Policy research is needed in many areas.



Congressional Visits Day 2008 — Success!



What's Next?

- Budget Impasse Results in Train Wreck 12/07
- 2008 campaigns accelerating
- Perception that physical science & engineering community “have been taken care of” (!) in terms of ACA, ACI ... worse now than ever!
- Expectations Game Beginning
- Innovation Policy Needs Deeper Research, Metrics
- 2009 Federal Budget introduced Feb. 4, 2008, headed for a “continuing resolution” (C.R.) for near term, until election results are in, late 2008
- Scientific Research budgets are in perpetual jeopardy of being cut as entitlement spending overwhelms government’s capacity to pay for discretionary items

ASTRA's 14-Point Policy Framework for 2008 — and Beyond ...

- *Riding the Rising Tide* Study released December 11, 2007
- Policy Framework for next ten years
- Highly praised across political spectrum
- Support of key Congressional leaders in both parties

Support of key Congressional leaders in both parties

Chairman Bart Gordon (D-TN) and Ranking Member of House Science & Technology Subcommittee Phil Gingrey (R-GA) host ASTRA and praise the *Rising Tide Policy Framework* on December 11, 2007 as ASTRA Board look on ...

ASTRA has provided this document to Congress and all Presidential Campaigns as well.

In A Nutshell: ASTRA's 14-Point Action Program

December 11, 2007 Press Briefing for launch of *Riding the Rising Tide: A 21st Century Strategy for U.S. Competitiveness and Prosperity* in the House Science & Technology Committee Hearing Room on Capitol Hill. From right: Rep. Bart Gordon (D-TN), Chairman of the House Committee on Science & Technology commends ASTRA's multi-year efforts while Rep. Phil Gingrey (R-GA), Ranking Member of the Committee's Subcommittee on Technology & Innovation and ASTRA Board Members listen.

R&D ENTERPRISE

- Balance defense/civilian share of Federal R&D Portfolio
- Increase Federal funding for physical sciences and engineering R&D
- Focus R&D on the leading edge of science and technology
- Increase focus on interdisciplinary and multi-disciplinary research, new forms of collaboration, and nurturing capacity in new geographic regions.
- Provide incentives to capture benefits of public R&D within U.S.

PRO-INNOVATION BUSINESS CLIMATE

- Review U.S. laws, regulations and policies to determine impact on innovation; address inhibitors.
- Develop innovation indicators and metrics for knowledge-based economy; use indicators to drive policy and strategy.
- Create and provide support for better government analysis of U.S. and foreign innovation systems.

INNOVATION WORKFORCE

- Examine adequacy of skills for innovation economy; educate for non-rule based, judgment-oriented problems
- Improve statistical and career information for STEM workers; companies should articulate skill needs to educators and students
- Improve higher education for scientists and engineers by focusing on global and cultural awareness, communications, business and management skills
- Strengthen efforts to attract and retain top foreign students and STEM professionals



Discussion Document

Carefully
vetted
research —
with
compelling,
easy to
understand
graphics —
makes the
case easier to
prove ...

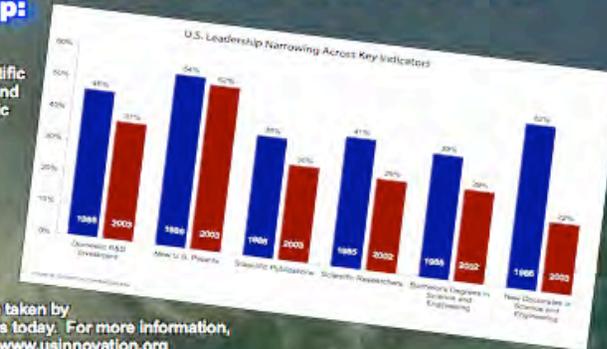
Rising Tide: Key Indicators

Key Indicators Link Federal R&D Investment to U.S. Global Economic Leadership:

America's innovation future requires more federal investment in basic scientific research. Overall scientific research and development (R&D) promotes economic development, job growth, national security, competitiveness and global leadership.

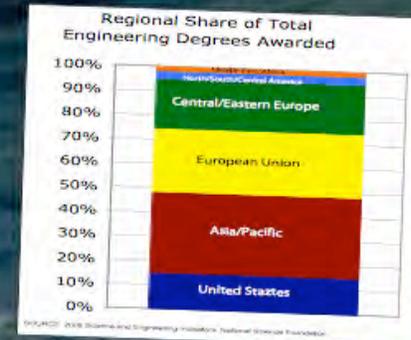
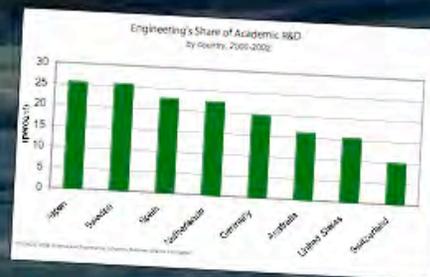
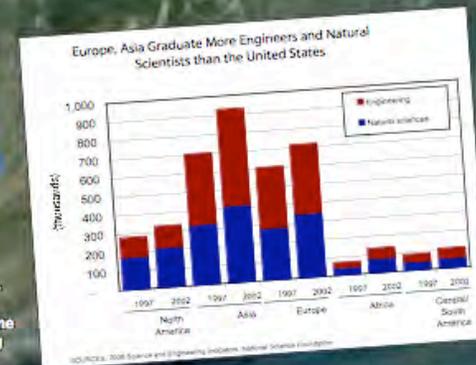
Across a wide range of indicators, the U.S. is losing relative market share, talent, and capacity to meet global competitors.

ASTRA's 14-Point Action Agenda sets forth a series of actions that need to be taken by leaders in the public and private sectors today. For more information, see Riding the Rising Tide Action Plan www.usinnovation.org



Talent Round-up — Decline in U.S.-born Citizens with Science & Engineering Degrees Masked by Foreign Talent Relocating to U.S. on Temporary Basis ...

Measuring the types and levels of scientific, engineering and technology degrees in the U.S. often lacks correlative data about participation levels of U.S.-born citizens. In many disciplines, foreign-born talent predominates in degree awards. The U.S. must welcome such individuals for permanent residence or risk losing such talent to other competitors. ASTRA has created separate State STEM Ed Report Cards for each U.S. state to help measure the progress across the nation.



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Innovation Metrics from ASTRA

ASTRA successfully launched its Innovation Vital Signs Project in 2006 — 2007. Needs to be funded for additional phases.

Only ASTRA is performing primary research AND linking such research to its advocacy programs.

Periodic Table of Innovation Elements

Innovation Element Groups (Families)										Impact		Impact		MacroEcon	
Inputs		Process		Outputs		Impact									
Macro-Economy		Policy		Infrastructure		Mindset									
R&D Expenditures	Capital	Networks	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
R&D	Patents	Capital	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Talent	Capital	Networks	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
# Researchers	ICT investment	Capital	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
No. with Higher Education	Initial Public Offerings	Capital	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Talent	Capital	Networks	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Verbal SAT	Argei Networks	Capital	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Talent	Capital	Networks	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Math SAT	SBR Funding	Capital	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Pop with Life Long Learning	Investment Risk	Capital	Networks	Networks	Management	Prod Dev.	Process	Process	Process	Product	Product	Product	Impact	Impact	MacroEcon
Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy
Corporate Tax Rate	# New Taxes, Excises, Duties	Time Required to Start Business	Foreign Ownership Restrictive	Rule of Law Governance	IP Rights	Environment Governance	Legal Rights Index	Home Affordability	Public Source of S&T Information	Mindset	Mindset	Mindset	Future	New	Metrics
Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Policy	Future	New	Metrics
Overall Tax Burden	# Procedures to Start Business	Trade Barriers	IP Protection	Judicial Independence	Infrastructure Quality	Infrastructure Quality	Infrastructure Quality	Infrastructure Quality	Future	New	Metrics				

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Egils Milbergs of the Center for Accelerating Innovation served as Master of Ceremonies for the Workshop.



Panelists delivered remarks and then facilitated discussion groups.



Six discussants per "Innovation Café" Table even used the table "cloths" to record their notes and ... doodles about innovation.

2008 Presidential Campaign Coming to Conclusion...

www.usinnovation.org

ASTRA has launched its new USInnovation.org Web Site as part of broader efforts to educate scientists and engineers AND the various campaigns themselves, over S&T policy issues.

ASTRA remains nonpartisan — and a trusted source of economic and statistical data unique to this policy area.

The screenshot shows the USInnovation.org website with the following sections:

- Innovation Resources:** Includes links for Innovation Indicators for Tomorrow, Innovation Vital Signs Workshop, Key U.S. Innovation Elements, Defining Innovation, ASTRA Side-by-Side, Podcast Downloads, and Deep Research in Innovation.
- About USInnovation.org:** A paragraph explaining that USInnovation.org is a project of ASTRA, The Alliance for Science & Technology Research in America, and is a unique collaboration of professionals and organizations from industry, research, federal funding, and education.
- Innovation Clusters:** Lists clusters such as Talent, Patent, Venture Capital, Global Innovation, Competitiveness, and Deep Research Innovation.
- Video:** Features a video player for "STS-118 - Launch" dated August 8, 2007.
- 2008 Presidential Campaign Tracking:** A section titled "Where do the Candidates Stand on U.S. Innovation and Technology?" with sub-sections for Democrat and Republican candidates, including Hillary Clinton, Barack Obama, John Edwards, Rudy Giuliani, John McCain, and Mitt Romney.
- USInnovation Blog:** Lists recent blog posts like "The Other Immigration Issue", "More than Just An Idea", "Prosperity Is Not Fairness", "Thinking Out Loud", and "A 21st Century Response".
- Search & Tech News:** A search bar and a "Yahoo! NEWS" section with headlines like "AP - Kevin Altman didn't bring out 'Second Life'... he just made it better" and "AP - People who own an HD DVD player can forget about watching 'Spider-Man 3' in high definition...".
- ASTRA Logo:** The logo for The Alliance for Science & Technology Research in America.

Making Sure the Winner “Gets It” in 2008?



ASTRA can insure that the needs of the S&T Community are factored into the next Administration planning process, starting w. Campaigns and Presidential Transition Teams ...



Mike
Huckabee