

Opportunities in the Chemical Enterprise

ARRA, FY 2009, FY 2010



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American Recovery and Reinvestment Act of 2009 (ARRA) (\$M)

National Science Foundation	3,000
<i>Research & Related Activities</i>	<i>2,000</i>
<i>Academic Research Infrastructure</i>	<i>200</i>
<i>Major Research Instrumentation</i>	<i>300</i>
<i>Education and Human Resources</i>	<i>100</i>
<i>Major Res. Equip & Facil. Constr.</i>	<i>400</i>



NSF Important Notice 131, American Recovery and Reinvestment Act of 2009

Which proposals will be targeted for ARRA funding?

- Excellent proposals that are already in house and are reviewed or are under review as usual in the current fiscal year (Oct. 1, 2008-Sept. 30, 2009)
- Projects that will create and/or retain jobs.
- Projects where the money can be gotten out and activities started as quickly as possible.
- Funding of new Principal Investigators
- Funding of high-risk, high-return research
- Might involve IN A LIMITED WAY Program Director-initiated reconsideration of some excellent proposals declined since Oct. 1, 2008 due to lack of funds. PD will initiate and notify the SRO and PI.
- No supplement requests to existing awards using ARRA funds

www.nsf.gov/recovery



NSF ARRA Program Solicitations

Solicitations will be issued this spring for:

- the Academic Research Infrastructure (ARI) program (\$200 million)
- the Science Masters program (\$15 million).
- the Major Research Instrumentation Program (MRI) \$300 million.



NSF Budget: FY 2009

- FY 2009 Omnibus Appropriation – operating plan not yet final
5.9% Increase Over FY 2008 (\$6.5 billion, \$363 million above 2008); increase in R&RA is 7.4%

Areas of Emphasis

- Science & Engineering Beyond “Moore’s Law” (SEBML)
- Cyber-enabled Discovery and Innovation (CDI)
- Math and Physical Sciences-Life Sciences Interface
- Quantum Information Sciences (QIS)
- Preparing Workforce of 21st Century



NSF Budget: FY 2010

President submitted his high-level request in Feb/March

Detailed Congressional Budget Request will be forthcoming mid May (see for topics of emphasis)

- \$7B Appropriation for NSF
(7.7% Increase Over FY 2009)



NSF Budget: FY 2010

- Triple the Number of Graduate fellowships in Science
- Increases support for new faculty (CAREER)
- Increases support for the education of technicians in the high-technology fields that drive the Nation's economy.
- Encourages more novel high-risk, high-reward research proposals.
- Increases support for critical research priorities in global climate change.



Future Outlook for Science Funding

"If you want to know the agenda for this Congress, think of four words: science, science, science, science."

- Nancy Pelosi, Speaker of the House. 3/24 Coalition for NSF

"ARRA is only a down-payment"

- Jean Cottam, Assistant Director of Physical Sciences, White House Office of Science and Technology Policy, April 3, 2009



Division of Chemistry Strategic Directions 2008-2012

Advancing American Competitiveness

**Communicating the Value of Chemistry and Chemical Research to the
Public**

Increasing Global Engagement

Increasing Grand Challenge Research through Centers

Broadening Participation

**Addressing Funding Needs of Investigators
Across Career Stages**

Assessing the Broader Impacts Review Criterion

Updating the Division of Chemistry Structure



See document at:

http://www.nsf.gov/mps/che/CHE_StrategicDirections.pdf



CHE Programs in Competitiveness

Centers for Chemical Innovation NSF 09-503

Agile, virtual centers of excellence that synergistically promote:

- High risk/high gain, transformational research on Grand Challenge problems
- Connections with industry, seeking innovation
- Active and creative engagement of the public

Centers established through two stage process.

Each center geographically dispersed.

American Competitiveness in Chemistry Fellowships

NSF 08-541

Postdoctoral associates in chemistry

- (1) build ties between academic and industrial, and/or national laboratory, and/or Chemistry Division-funded center researchers (partners)
- (2) involve beginning scientists in efforts to broaden participation in chemistry.

Sponsorship of CCR Workshops and Studies



Proposed CHE Programs

Chemical Synthesis

Chemical Structure, Dynamics and Mechanisms

Chemical Measurement and Imaging

Theory, Models, and Computational Methods

Chemistry of Life Processes

Chemical Catalysis

Environmental Chemical Sciences

Macromolecular/Supramolecular/Nanochemistry

Integrative Chemistry Activities (CRIF, REU, CCI, ACC-F) not changing

Email comments to chemplans@nsf.gov



Grant Opportunities for Academic Liaison with Industry (GOALI) NSF 09-516

promotes university industry partnerships by making project funds or fellowships/traineeships available to support an eclectic mix of industry-university linkages.

EXAMPLES

- Faculty, postdoctoral fellows, and students to conduct research and gain experience in an industrial setting**
- Industrial scientists and engineers to bring industry's perspective and integrative skills to academe**
- Interdisciplinary university-industry teams to conduct research projects**

- This solicitation targets high-risk/high-gain research with a focus on fundamental research.**

CALL YOUR PROGRAM OFFICER



Other Opportunities for Academic, Industry and Government Collaboration

**Industry & University Cooperative Research
Program (I/UCRC) ENG and CISE**

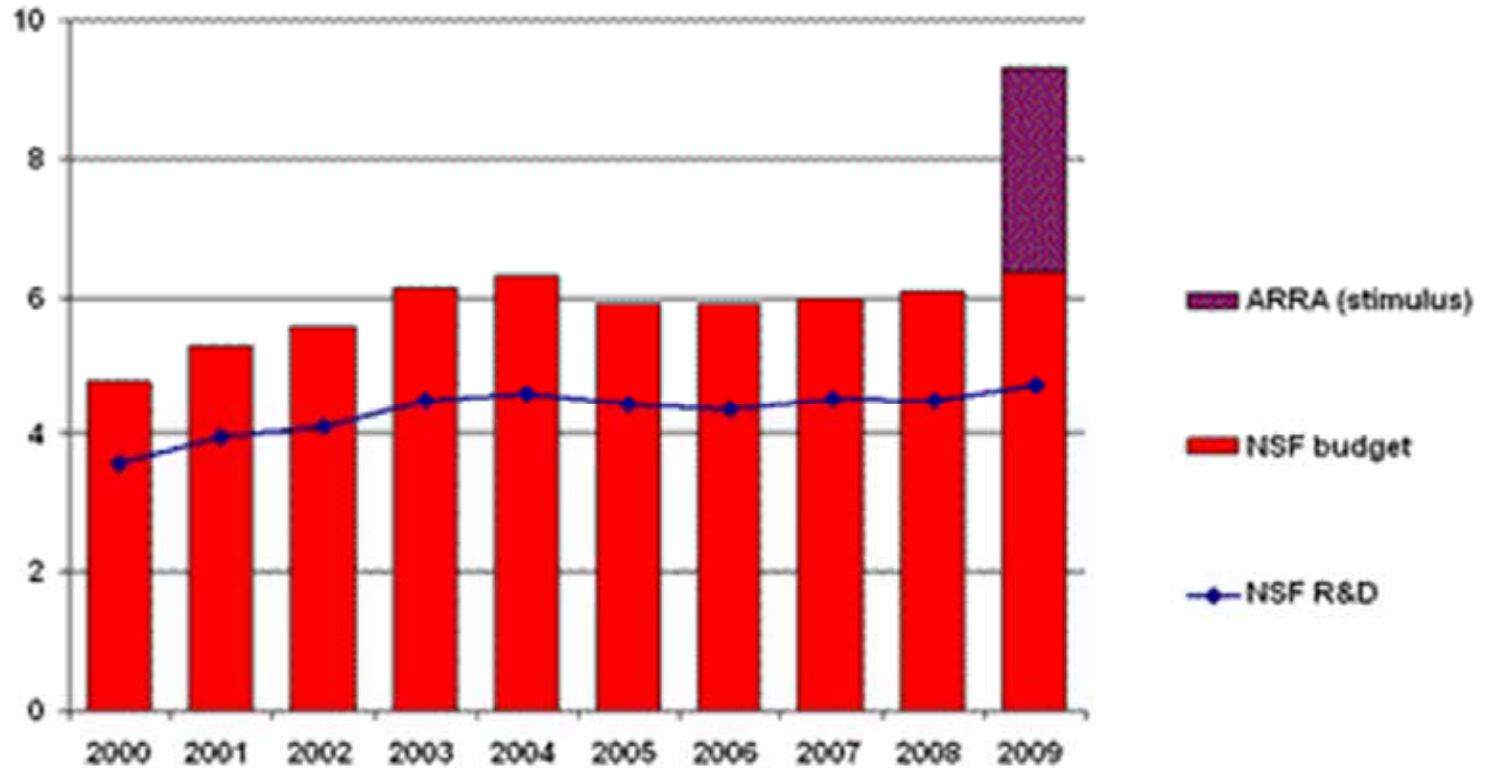
<http://www.nsf.gov/eng/iip/iucrc/>

**Small Business Innovation Research & Small
Business Technology Transfer (Program
Description) (SBIR/STTR)**

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13371&org=IIP&from=home



National Science Foundation Budget, FY 2000-2009 (as of 2/09)* (budget authority in billions of constant FY 2008 dollars)



Source: National Science Foundation, AAAS, and latest AAAS estimates of FY 2009 appropriations. Includes supplemental (stimulus appropriations) in Public Law 111-5. FY 2009 NSF R&D line excludes stimulus R&D.
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Administration S&T Priorities

<http://www.ostp.gov/cs/issues/cscience>



- **Science:** Restore science to its rightful place in America as a tool for crafting smart policies that will strengthen the nation
- Increase funding for biomedical research and physical sciences and engineering
- Increase support for high risk/high-payoff research
- Promote STEM education (science literacy to GRFs)
- **Technology:** Technological advances provide a powerful engine for promoting economic growth and new opportunity
- Develop new clean energy sources



Administration S&T Priorities

<http://www.ostp.gov/cs/issues/cscience>

- **Energy/Environment:** Address the three-pronged challenge of climate change, sustainable development, and the need to foster new and cleaner sources of energy
- Reduce greenhouse gas emissions 80% below 1990 levels by 2050
- **National Security & International Affairs:** New developments in S&T offer the best hope of predicting, preventing, and mitigating the impact of disasters
- Put basic defense research on doubling path



NSF Budget: FY 2010

- ***“Investments in science and technology foster economic growth, create millions of high-tech, high-wage jobs that allow American workers to lead the global economy, improve the quality of life for all Americans, and strengthen our national security.”***
 - **“A New Era of Responsibility: Renewing America’s Promise”**



NSF Budget: FY 2010

“Beyond clean energy, we have not kept up with investing in the basic science and research that will power this sector and the entire economy in decades to come. In fact, as a share of GDP, American Federal investment in the physical sciences and engineering research has dropped by half since 1970.”

- “Inheriting a Legacy of Misplaced Priorities”



Table. R&D and Other S&T Funding in FY 2009 Economic Recovery Act Appropriations

(budget authority in millions of dollars)

	FY 2009 House	FY 2009 Senate *	FY 2009 FINAL	FY 2008 Total
National Institutes of Health	3,900	10,400	10,400	29,607
<i>Natl. Ctr. for Research Resources</i>	1,500	300	1,300	1,149
<i>Office of the Director</i>	1,500	9,200	8,200	1,109
<i>Buildings and Facilities</i>	500	500	500	119
<i>Transfer from AHRQ 2/</i>	400	400	400	0
National Science Foundation	3,000	1,200	3,000	6,055
<i>Academic Research Infrastructure</i>	200	0	200	0
<i>Major Research Instrumentation</i>	300	0	300	94
<i>Other Res. & Related Activities</i>	2,000	1,000	2,000	4,827
<i>Education and Human Resources 3/</i>	100	50	100	726
<i>Major Res. Equip & Facil. Constr.</i>	400	150	400	205
Dept. of Energy Office of Science	1,600	330	1,600	4,036
ARPA-E (Adv. Research Projects Agency - Energy)	400	0	400	0
DOE Energy Efficiency & Renewables 1/	2,000	2,648	2,500	1,238
DOE Fossil Energy 1/	0	200	1,000	576
DOE Weapons Activities 1/	0	500	0	2,742



	FY 2009 House	FY 2009 Senate *	FY 2009 FINAL	FY 2008 Total
National Aeronautics & Space Admin.	600	1,300	1,000	17,179
<i>Science</i>	400	450	400	4,706
<i>Aeronautics</i>	150	200	150	512
<i>Cross-Agency Support Programs 3/</i>	50	200	50	3,243
<i>Exploration</i>	0	450	400	3,143
Department of Defense R&D Programs 1/	350	200	200	79,347
Natl. Inst. of Standards and Technology	520	495	600	737
<i>Scientific and Tech. Res. And Services</i>	100	168	220	441
<i>Technology Innovation Program</i>	70	0	0	46
<i>Manufacturing Extension Partnership 3/</i>	30	0	0	90
<i>Construction of Research Facilities</i>	300	307	360	160
<i>Transfer for Health IT to STRS</i>	20	20	20	0
Natl. Oceanic and Atmospheric Admin. 3/	1,000	1,022	830	3,896
U.S. Geological Survey facilities 3/	200	135	140	100
USDA CSREES Agri. and Food Res. Initiative	0	50	0	191
USDA ARS Buildings and Facilities	209	0	176	47
HHS Agency for Healthcare Res. And Quality 2/	300	300	300	0
HHS Office of the Secretary AHRQ transfer 2/	400	400	400	0
HHS Centers for Disease Control buildings 3/	462	412	0	55
HHS Office of Sec. pandemic flu 3/	420	0	0	75
HHS Office of Sec. Biodefense countermeasures	430	0	0	102
				Government wide:
AAAS estimates of R&D in items above:	13,209	17,773	21,506	144,354
<i>Conduct of R&D</i>	9,529	15,786	18,000	139,878
<i>R&D facilities and capital equipment</i>	3,680	1,987	3,506	4,476

