

U.S. Department of Energy



Office of Science

Nuclear Physics Program Activities

Nuclear Science Advisory Committee

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for Nuclear Physics**

December 3, 2007



Outline

- Budgets
- Program Activities
- Upcoming solicitations
- Status of projects
- Upcoming Reviews
- Staffing



Nuclear Physics Program in FY 2008

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FY 2008 Budget Request for NP (\$471.3M) allows for effective utilization of the program's scientific facilities and makes important investments for the future

- University and Laboratory research efforts brought back to FY 2005 levels.
- User Facilities (RHIC, CEBAF, ATLAS and HRIBF) operate near optimum levels.
- Important instrumentation projects are continued and started.
- The 12 GeV CEBAF Upgrade Project receives last installment for Project Engineering Design (PED).
- Solicitation for design/site of a rare isotope beam facility is planned for FY 2008.
- R&D that addresses next generation capabilities supported.



Office of Nuclear Physics

FY 2008 Congressional Budget Request

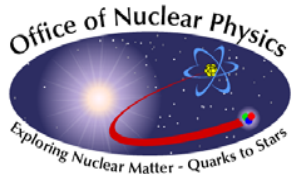
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	(millions)			vs FY07
	FY06	App FY07	Request FY08	
Research Operating	125.1	139.6	150.4	+ 8 %
Research Cap. Equip.	<u>8.5</u>	<u>11.7</u>	<u>19.2</u>	+ 64 %
<Research>	133.6	151.3	169.6	+ 12 %
RHIC	116.4	135.7	146.5	+ 8 %
CEBAF	65.3	70.4	78.2	+ 11 %
HRIBF	10.9	12.9	13.9	+ 8 %
ATLAS	9.0	11.7	13.8	+ 17 %
88-Inch Cyclotron	3.0	3.1	3.3	+ 5 %
MIT/Bates	<u>2.5</u>	<u>2.0</u>	<u>2.0</u>	
<Facility Operations>	207.1	235.8	257.7	+ 9 %
12 GeV Upgrade R&D/PED	4.5	9.5	14.5	
EBIS (RHIC)	<u>2.0</u>	<u>5.1</u>	<u>4.2</u>	
<Construction>	6.5	14.6	18.7	+ 28 %
Other (GPP/SBIR/etc)	<u>19.8*</u>	<u>21.1</u>	<u>25.3</u>	
<Stewardship>	19.8	21.1	25.3	+ 19 %
Nuclear Physics Total	367.0	422.8	471.3	+ 11 %

* Includes SBIR/STTR



FY 2008 Budget Request Research

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<u>Research</u>	millions			
	<u>FY06</u>	<u>FY07</u>	<u>FY08</u>	<u>vs FY07</u>
Universities	55.3	62.7	65.6	+ 5 %
Laboratories	64.1	70.4	75.2	+ 7 %
SciDAC & LQCD	2.0	2.7	3.1	+ 15 %
Rare Isotope R&D	4.0	3.8	4.0	+ 5 %
Enhanced R&D for AFC	-	-	2.5	
Operating Subtotal	125.4	139.6	150.4	+ 8 %
 <u>Research Capital Equipment</u>				
GRETINA	3.0	3.7	4.4	
FNPB	1.9	1.5	1.5	
STAR TOF	2.4	2.4	-	
PHENIX Silicon VTX	-	1.0	2.0	
PHENIX Forward Vertex Detector	-	-	1.4	
PHENIX Nose Cone Calorimeter	-	-	1.0	
HI LHC	-	1.0	2.0	
nEDM	-	0.8	3.0	
CUORE	-	-	0.5	
University CE	0.8	1.0	0.9	
Laboratory CE	0.4	0.3	2.5	
Capital Equip Subtotal	8.5	11.7	19.2	+ 64 %
Research Subtotal	133.9	151.3	169.6	+ 12 %

Impacts of FY 2008 Continuing Resolution



Both the House of Representatives Appropriation and Senate Markup provide the President's Request for NP

Continuing resolution through December 14th, 2007

- **Facility Operations are negatively impacted**
 - CEBAF operations are reduced ~ 1 week per month of CR
 - HRIBF operations reduced up to one week
 - Impacts plans for transitions of 5 day/week operations to 7 day/week operations at HRIBF and ATLAS
- **Projects**
 - No New Starts: CUORE, PHENIX NCC, PHENIX FWD VTX
 - Decision on reprogramming of funds out of RHIC support to restore funding for Electron Beam Ion Source (\$ 2.4 million) delayed
- **Delays in new research initiatives**
 - Solicitation for theoretical topical collaborations delayed

FY 2007-2017 Nuclear Physics Program



In FY 2007 SC developed a plan assuming a doubling of SC funding in 10 years

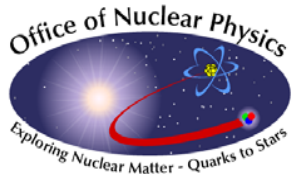
In SC's 10-year plan NP would be able to implement a world-class program

- Operate/implement capabilities of the user facilities to achieve their scientific goals
 - 12 GeV CEBAF Upgrade project is completed
 - Upgrades of RHIC accelerator/detectors with luminosity upgrade
 - At ATLAS, HRIBF and elsewhere research capabilities developed for forefront programs
 - Proceed with construction of a rare isotope beam facility compatible with available funds
- Pursue promising high impact scientific opportunities
 - Participate in heavy ion studies at the higher energies of LHC
 - Start studies of nuclear structure with GRETINA
 - Start measurements of fundamental neutron properties at the FNPB at SNS
 - Participate in neutrinoless Double Beta Decay measurements
 - Utilize leading edge computers to make progress in nuclear physics
 - Accelerator R&D performed for next-generation nuclear physics research capabilities

SC's plan is revisited each year in budget formulation process

- Address changing out-year projections
- Address new projects/programs added/eliminated in that years budget formulation
- Address new high priorities established by SC/DOE/Administration
- Incorporate advisory committee input

Depends upon Congressional Appropriations



Recent History

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Funding for Nuclear Physics has been basically constant (eroded by inflation) over the last ten years

In FY 2006 the Nuclear Physics program experienced a -9.4% reduction

- User facility operations were significantly reduced
- There were reductions in researchers and graduate students supported

NSAC was charged to assess the impacts and options for a US NP program at FY 2006 levels in the out-years

- Found that only one major facility (either RHIC or CEBAF) could be supported
- Made recommendations of priorities at various funding levels

In FY 2007 the Administration announced American Competitive Initiative (ACI)

- Double funding for the physical sciences (DOE SC, NSF and NIST) over ten years
- The Office of Science's plan for the 10-year period includes the major elements of NP's plan

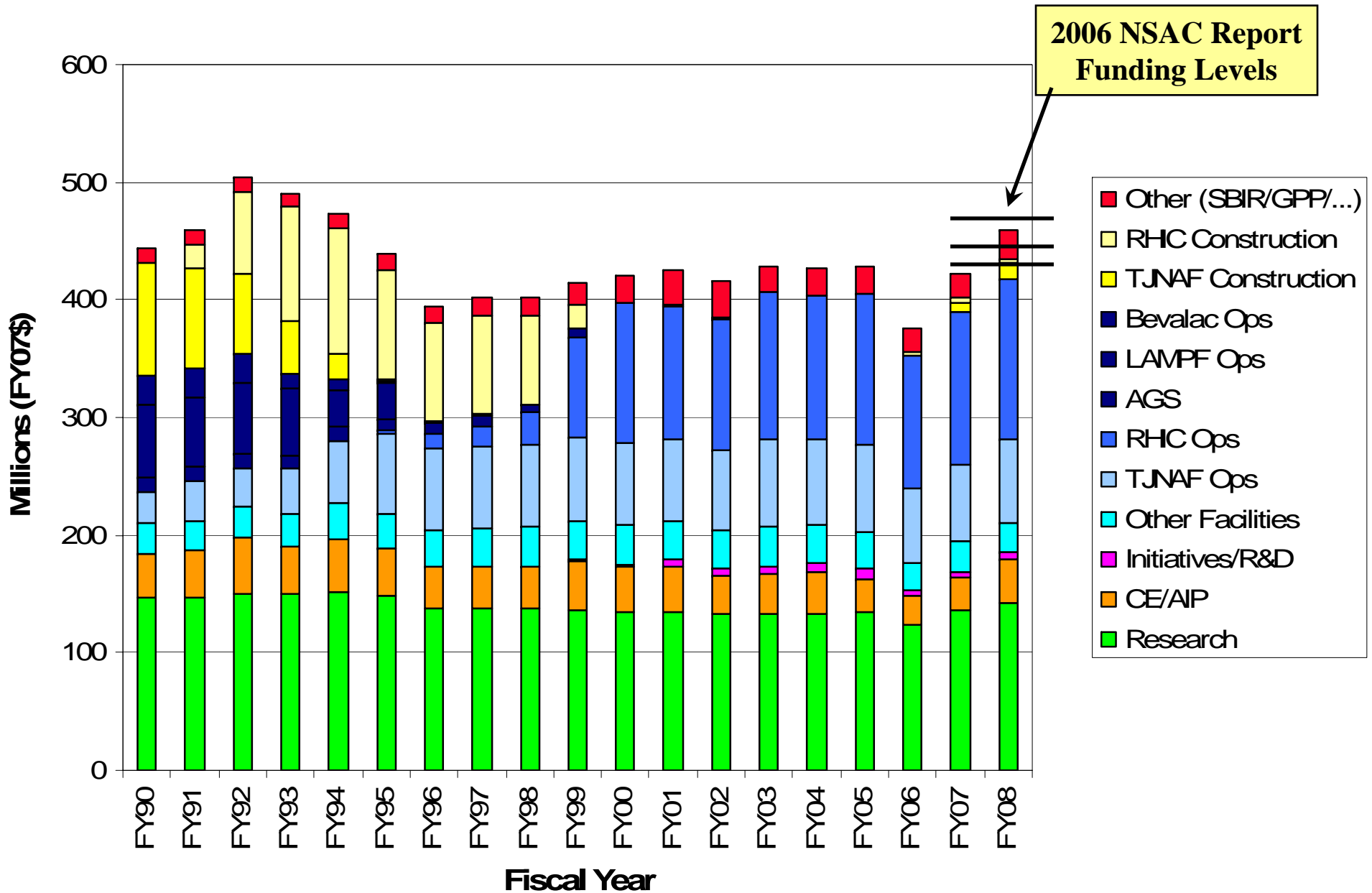
Both the FY 2007 and FY 2008 Budget Requests support implementation of SC's (and NP's) plan

The FY 2007 App. fell significantly short of President's Request - impacting facility operations and projects

FY 2008 Request program has been impacted by FY 2007 App. and uncertainties for FY 2008 App.



DOE Nuclear Physics Funding



Recent Program Management Activities



Completed reports of two significant DOE Reviews 1Q 2008

- Completed Report of Facility Operations Efficiencies Review that reviewed the cost drivers and efficiencies of NP user facilities - findings being used in budget formulation
- Completed the reports for the Low Energy Laboratory Research Program Review (every four years)

OSTP/Physics of the Universe (POU) High Energy Density Physics (HEDP) Taskforce

- HEDP Taskforce Report completed outlining Federal Plan for a U.S. HEDP program (Sept 2007)

OECD Global Science Working Group on Nuclear Physics (WGNP)

- Document what efforts/facilities/plans/collaborations exist for nuclear physics world-wide
- Identify opportunities for enhanced coordination and collaborations (Report Spring 2008)
- Fourth and final meeting November 5-6, 2007 in Paris, France



FY 2008 Solicitations

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Planned FY 2008 Solicitations

- Annual new/normal University Grant Solicitation
- Outstanding Junior Investigators (OJI)
- Proposals for Generic Rare Isotope Beam (RIB) R&D
- Notice of interest in DUSEL R&D in cooperation with NSF/HEP
- Proposals for theoretical topical collaborations
- Proposals for design/site of Facility for Rare Isotope Beams (FRIB)
- Pre-proposals for rare isotope beam investments for forefront research

Deadlines

November/anytime
November
November
December
Mid 2008
Mid 2008
Mid 2008

Decisions on Advanced Fuel Cycle (AFC) R&D in FY 2008

- FY 2007 submitted proposals will be evaluated for FY 2008 funding decisions



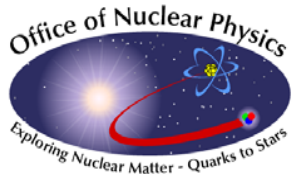
Rare Isotope Beam (RIB) Experiments

Planned process for proceeding with Rare Isotope Beam Experiments

- Initiative to allow U.S. researchers to participate in forefront rare isotope beam studies while FRIB is being constructed. (~\$50M over ~ 8 years)
- NSAC was asked to identify opportunities made available by research facilities operating and planned abroad for rare isotope beam studies – in their development of a U.S. Long Range plan.
 - Representatives from various countries were invited to discuss their capabilities
- **NP will issue a solicitation for pre-proposals in FY 2008**
- Plan to issue a proposal solicitation in FY 2009

Criteria will be based on traditional considerations plus whether:

- There is some particular outstanding scientific opportunity afforded by facility and U.S. investments
 - There is the opportunity for significant role by U.S. participants
 - The activity has relevance/impact on the planned U.S. FRIB facility and program
- The facilities with existing or planned forefront rare isotope beam capabilities include (but not limited to):
 - RIBF/RIKEN (Japan), ISAC/TRIUMF (Canada), FAIR/GSI (Germany), SPIRAL II/GANIL (France), etc.
 - As well as facilities in the U.S., such as the NSCL/MSU (NSF), HRIBF and ATLAS.



Solicitation for Facility for Rare Isotope Beams

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- Funding Opportunity Announcement for U.S. Facility for Rare Isotope Beams is anticipated in FY 2008
- Contents of draft FOA are confidential
- Follows overall approach of the successful FOA for the GTL BioCenters tailored to the needs of the scope associated with the establishment of a facility (<http://www.pr.doe.gov/>; then “Browse Opportunities”; then browse button under “DOE Financial Assistance”; then click on DE-PS02-06ER64304)
 - **Proposal request and contents of proposal were specified**
 - **Merit Review Criteria identified**
 - **Peer review process identified. (The peer review process of an FOA can include electronic review, panel review and site visits)**
- Anticipate making a single award in FY 2008
- There is no FY 2008 funding associated with the award - identifies a site that can proceed with facility establishment. Future funding depends on Appropriation.
- A web site will be available that will manage questions related to the FRIB FOA process



Status of NP Projects



Project	TPC	Start	Complete	Status
GRETINA MIE	\$18.8 million	FY 2004	FY 2011	CD2b/3b
FNPB MIE	\$9.3 million	FY 2004	FY 2010	CD3
STAR TOF *	\$4.8 million	FY 2006	FY 2009	NA
nEDM MIE (NSF)	\$17-19 million	FY 2007	FY 2015	CD1
PHENIX SVT MIE *	\$4.7 million	FY 2007	FY 2010	NA
HI LHC ALICE MIE *	\$13 -16 million	FY 2007	FY 2012	CD1 (CD2/3 2Q08)
PHENIX FVTX	\$4.95 million	FY 2008	FY 2011	NA
PHENIX NCC *	\$4.7 million	FY 2008	FY 2011	NA
CUORE (NSF) *	\$8-10 million	FY 2008	FY 2012	CD0 (CD1 2Q08)
EBIS (NASA)	\$14.8 million	FY 2006	FY 2010	CD2/CD3
12 GeV Upgrade*	\$310 million	FY 2004	TBD	CD2

* International

All projects are reviewed monthly, quarterly, annually



Nuclear Physics Office Reviews

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Planned Reviews and Meetings

Dates

- Rare Isotope Beam Capabilities Research & Development Research & Development Review
December 5-7, 2007
- High Intensity Gamma-ray Source Facility Review
December 11-12, 2007
- Small Business Innovation & Research Panel Review
December 17-19, 2007
- LHC EMCAL CD2/CD3 Review
December 18-19, 2007
- Advanced Fuel Cycle Initiative Review
*January 14-18, 2008
- California Rare Ion Beam Upgrade Review
January 24-25, 2008
- Outstanding Junior Investigator Proposal Review
January/February 2008
- STAR HFT Science Review
January/February 2008
- Fundamental Neutron Physics Beam-line Review
February 11-12, 2008
- Injector for Radioactive Ion Species 2
April
- Heavy Ion Laboratory Research Review
*April 21-25, 2008
- PHENIX NCC Science and project reviews
TBD

*Days to be determined



Changes in Office of Nuclear Physics (NP)

- New Acting Associate Director
- Technical Advisor position to be advertised in FY 2008
- Program Manager Positions:
 - **Program Manager for NP Instrumentation: Helmut Marsiske**
 - **Low Energy Program Manager position advertised – assessing applications**
 - **Theory Program Manager position vacant in February**
 - **Facility Operations and Major Projects to be advertised in FY 2008**
- Detailee/IPA positions
 - **LE Detailee filled: Cyrus Baktash**
 - **Theory Detailee filled: Ted Barnes**
 - **Facility Operations Detailee (Wlodek Guryn) open in January – replacement identified**

