

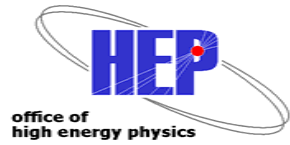
Department of Energy



DOE Office of High Energy Physics

HEPAP Meeting February 14, 2008

Dennis Kovar
Acting Associate Director for the
Office of High Energy Physics,
Office of Science, DOE

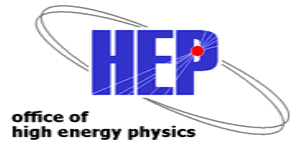


Outline

Department of Energy



- **FY 2008 Appropriations**
- **FY 2009 Budget Request**
- **The HEP Office**



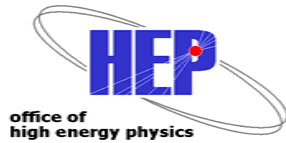
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FY 2008 Appropriations

FY 2008 Appropriations

- **Funding for DOE Office Science (SC) increased by 4.6% compared to FY 2007**
 - This included “earmarks” so funding going to peer-review SC program +2.5%
 - There were winners and losers
 - Computing/biological/environmental – increased from request
 - High energy/nuclear physics/basic energy science – decreased from request
 - Funding was zeroed for the ITER project (fusion energy sciences (FES))
 - High Energy was only one (except for FES/ITER) that decreased from FY 2007
- **DOE SC funding was reduced by \$503M (-11%) from FY 2008 President’s Request**
 - Does not support President’s American Competitive Initiative (ACI) - amount
 - Is at great variance with President’s FY 2009 Request that support ACI - priorities
- **HEP funding was reduced by \$93 Million (-12.5%) from FY 2008 President’s Request**
 - FY 2008 funding is a -8.4% (-\$63M) reduction from FY 2007
 - Looking back to FY 2005 – HEP program has lost the operating funds of the B-Factory



Office of Science



FY 2008 Appropriation (dollars in thousands)

	FY 2005 Enacted Approp.*	FY 2006 Enacted Approp.*	FY 2007 Enacted Approp.*	FY 2008 Request	FY 2008 Enacted Approp.*	FY 2008 Enacted Approp. vs.			
						FY 2007 Enacted Approp.		FY 2008 Request	
Basic Energy Sciences.....	1100805	1134557	1250250	1498497	1269902	+19,652	+1.6%	-228,595	-15.3%
Advanced Scientific Computing Res.....	231649	234684	283415	340198	351173	+67,758	+23.9%	+10,975	+3.2%
Biological & Environmental Research.....	500503	451131	483495	531897	544397	+60,902	+12.6%	+12,500	+2.4%
High Energy Physics.....	733622	716694	751786	782238	688317	-63,469	-8.4%	-93,921	-12.0%
Nuclear Physics.....	403320	367034	422766	471319	432726	+9,960	+2.4%	-38,593	-8.2%
Fusion Energy Sciences.....	272754	287644	318950	427850	286548	-32,402	-10.2%	-141,302	-33.0%
Science Laboratory Infrastructure.....	41902	41684	41986	78956	64861	+22,875	+54.5%	-14,095	-17.9%
SC Program Direction.....	154031	159118	166469	184934	177779	+11,310	+6.8%	-7,155	-3.9%
Workforce Development.....	7571	7120	7952	11000	8044	+92	+1.2%	-2,956	-26.9%
Safeguards & Security.....	72773	73630	75830	76592	75946	+116	+0.2%	-646	-0.8%
SBIR/STTR (SC).....	0	0	0	0	0	—	—	—	—
Subtotal, SC.....	3518930	3473296	3802899	4403481	3899693	+96,794	+2.5%	-503,788	-11.4%
SBIR/STTR (DOE).....	0	0	0	0	0	—	—	—	—
Congressional Directed Projects**.....	91608	128700	0	0	123623	+123,623	—	+123,623	—
Subtotal, SC.....	3610538	3601996	3802899	4403481	4023316	+220,417	+5.8%	-380,165	-8.6%
Coralville, IA project rescission.....	0	0	0	0	-44569	-44,569	—	-44,569	—
Security charge to reimbursable cust.....	-5605	-5605	-5605	-5605	-5605	—	—	—	—
General reduction.....	0	0	0	0	0	—	—	—	—
Use of prior year balances.....	-5062	0	0	0	0	—	—	—	—
Total, SC.....	3599871	3596391	3797294	4397876	3973142	+175,848	+4.6%	-424,734	-9.7%

* The enacted appropriation column reflects the original appropriation amount before the SBIR/STTR reprogramming and appropriation transfer and other approved reprogrammings. It includes enacted rescissions, whether the rescission was part of the original appropriations bill or enacted subsequently

The DOE HEP Budget in FY 2008

- **FY 2008 Omnibus Bill provides \$63M less than FY 2007 (-8.5%)**
 - Language specifies:
 - no funding for NOvA
 - ILC R&D and SRF infrastructure funding capped at ~1/4 requested
 - Large fraction of this reduction supported people
 - Fermilab and SLAC (because of ILC/SRF funding) impacted most severely
- **Magnitude of reduction and occurring ~1/4 through the Fiscal Year limited options**
 - One cannot layoff people immediately (takes time)
 - Layoffs alone could not meet the bottomline (nor does it make sense)
 - Needed to look at large non-salary costs (i.e.; facility operations)
 - But even with significant layoffs – each facility could run <1/2 planned weeks
- **Decision had to be made quickly – delay in layoffs – decreases running weeks**
- **Came to choice of running the Fermilab or B-Factory**
- **Operation of the Tevatron in FY 2008 was judged more important**
 - Scientific priority
 - Preserves options for the future U.S. program

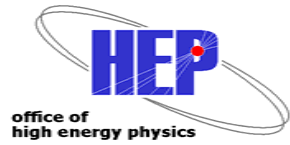
The DOE HEP Program in FY 2008

- **The Decision:**
 - Tevatron runs its planned 42 weeks
 - With 200 RIFs and “rolling furloughs” at Fermilab
 - B-Factory would run 2 months
 - With 125 RIFs at SLAC (in addition to 100 RIFs planned – total 225 FTEs)
 - Activities of remainder of program are largely preserved
 - LHC program, on-going projects, etc. supported

- **Decision was not made easily**
 - It is a loss of science and investments
 - It is failure to live up to expectations of our collaborators and partners

- **B- Factory’s last run should be as productive as possible**
 - After consulting with SLAC and BaBar Collaboration and agencies – funding was provided for additional two months for measurements at 3S and 2S resonances

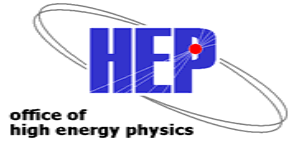
	<u>FY 2007</u>	vs FY07	<u>FY08 Plan</u>	vs Plan	vs FY07	<u>FY08 Jan</u>
Fermilab	344.3	15.1	359.4	-40.1	-25.0	319.2
SLAC	145.8	-22.0	123.8	-28.3	-50.3	95.5
NOvA (Minnesota)	1.0	12.3	13.3	-10.3	2.0	3.0
Rest of Program	<u>260.7</u>	25.0	<u>285.7</u>	-15.2	9.8	<u>270.6</u>
	751.8	30.5	782.2	-93.9	-63.5	688.3



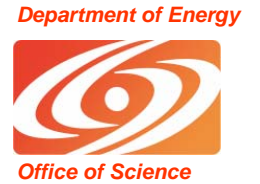
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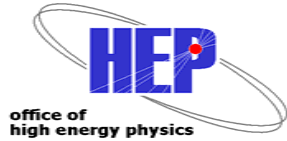
FY 2009 Budget Request



FY 2009 President's Budget Request



- **The DOE SC Budget Request is \$ 4,721 Million**
 - It is a +21% (+\$819 Million) increase compared to FY 2008 Appropriations
 - It is a +24% (+\$909 Million) increase compared to FY 2007 Appropriations
- **The DOE SC HEP Budget Request is \$ 805 Million**
 - It is a +16.8% (+\$115.6 Million) increase compared to FY 2008 Appropriations
 - It is a + 7.1% (+\$53.1 Million) increase compared to comparable FY 2007 Appropriations



FY 2009 Budget Request

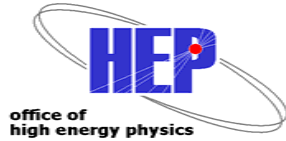


Office of Science FY 2009 Budget Request to Congress

(dollars in thousands)

	FY 2007 Approp.	FY 2008 Approp.	FY 2009 Request to Congress	FY 2009 Request to Congress vs. FY 2008 Approp.	
Basic Energy Sciences.....	1,221,380	1,269,902	1,568,160	+298,258	+23.5%
Advanced Scientific Computing Research.....	275,734	351,173	368,820	+17,647	+5.0%
Biological and Environmental Research.....	480,104	544,397	568,540	+24,143	+4.4%
High Energy Physics.....	732,434	689,331	804,960	+115,629	+16.8%
Nuclear Physics.....	412,330	432,726	510,080	+77,354	+17.9%
Fusion Energy Sciences.....	311,664	286,548	493,050	+206,502	+72.1%
Science Laboratories Infrastructure.....	41,986	66,861	110,260	+43,399	+64.9%
Science Program Direction.....	166,469	177,779	203,913	+26,134	+14.7%
Workforce Dev. for Teachers & Scientists.....	7,952	8,044	13,583	+5,539	+68.9%
Safeguards and Security (gross).....	75,830	75,946	80,603	+4,657	+6.1%
SBIR/STTR (SC funding).....	86,936	—	—	—	—
Subtotal, Office of Science.....	3,812,819	3,902,707	4,721,969	+819,262	+21.0%
Adjustments*.....	23,794	70,435	—	-70,435	—
Total, Office of Science.....	3,836,613	3,973,142	4,721,969	+748,827	+18.8%

* Adjustments include SBIR/STTR funding transferred from other DOE offices (FY 2007 only), a charge to reimbursable customers for their share of safeguards and security costs (FY 2007 and FY 2008), Congressionally-directed projects and a rescission of a prior year Congressionally-directed project (FY 2008 only), and offsets for the use of prior year balances to fund current year activities (FY 2007 and FY 2008).



FY 2009 HEP Budget



(Dollars in Thousands)	FY 2007 Actual	FY 2008 Appropriation	FY 2009 Request	vs FY 2008
High Energy Physics				
Proton Accelerator-Based Physics	343,633	368, 825	419,577	+ 14 %
Electron Accelerator-Based Physics	101,284	65,594	48,772	- 25 %
Non-Accelerator Physics	60,655	74,199	86,482	+ 17 %
Theoretical Physics	59,955	60,234	63,036	+ 5 %
Advanced Technology R&D	166,907	102,826	166,705	+ 62 %
High Energy Physics	732,434	671,678^b	784,572	+17 %
SBIR/STTR^a	19,352	17,653	20,388	
Total, High Energy Physics	751,786	689,331	804,960	+17 %
Stanford Linear Accelerator Center (SLAC)				
Linac Operations (non-add)	(51,300)	(19,817)	(--)	

The SLAC linear accelerator (linac) supports operations of the B-factory (funded by HEP) and will also support operations of the Linac Coherent Light Source (currently under construction and funded by Basic Energy Sciences (BES)). With the completion of B-factory operations in FY 2008, SC has been transitioning funding of the SLAC linac from HEP to BES, with FY 2008 representing the third and final year of joint funding with BES.

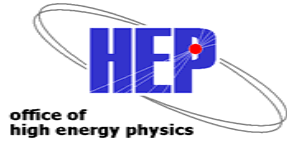
^aTotal includes funds transferred to SBIR and STTR programs.

^b includes an approved reprogramming of prior year balances of \$1,014,000

DOE HEP Request for FY 2009

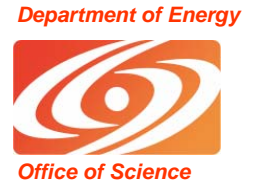
There are a number of significant program shifts

- Some are driven by FY2008 reductions
 - Reduced and re-focused ILC R&D program
 - NOvA profile delayed one year
- Others reflect the evolution of a HEP Strategic plan in the LHC era
 - B-Factory run completed
 - begin ramp-down and D&D. Data analysis will continue for a few years
 - Tevatron running full-out
 - either discovery or significant limits on New Physics in advance of LHC
 - U.S. researchers playing leading roles at LHC
 - increased funding to support efforts
 - Joint Dark Energy Mission R&D ramping up
 - to complete conceptual design and select a mission concept
 - Accelerator R&D efforts modified in light of ILC developments
 - to address near-term, mid-term and long-term opportunities



FY2009 HEP Budget Details

(\$ in Millions)



High Energy Physics	<u>FY 2007</u>	<u>FY 2008</u>	<u>FY 2008</u>	
Tevatron Operations	150.7	166.7	179.3	8%
B-Factory Operations	77.0	42.0	24.8	-41%
Facility Operations	<u>227.7</u>	<u>208.7</u>	<u>204.1</u>	-2%
LHC Support	56.8	63.6	72.5	14%
Universities Research	108.4	109.9	115.1	5%
National Lab Research	135.8	133.0	138.7	4%
Core EPP Research	<u>244.1</u>	<u>242.9</u>	<u>253.8</u>	4%
University Advanced Tech R&D	12.8	12.0	15.3	28%
Laboratory Advanced Tech R&D	112.5	76.0	108.4	43%
Core Advanced Tech R&D	<u>125.2</u>	<u>88.0</u>	<u>123.7</u>	41%
LHC	3.2	0.0	0.0	
GLAST	0.0	0.0	0.0	
NOvA	8.0	6.0	37.0	
DES	1.4	5.5	8.7	
Daya Bay	1.0	5.9	13.0	
T2K	0.0	2.0	1.0	
CDMS II	0.0	0.0	0.5	
AARD	0.0	0.0	8.0	
Projects	<u>13.6</u>	<u>19.4</u>	<u>68.2</u>	252%
JDEM R&D	6.4	9.4	10.0	6%
ILC R&D	41.7	14.8	35.0	136%
Initiatives	<u>48.1</u>	<u>24.2</u>	<u>45.0</u>	86%
Other	<u>36.3</u>	<u>41.5</u>	<u>37.7</u>	-9%
Total, High Energy Physics	<u>751.8</u>	<u>688.3</u>	<u>805.0</u>	17%

A central challenge for the U.S. and international HEP community is defining and executing a balanced scientific program that includes a collider at the energy frontier.

The International Linear Collider (ILC) is widely viewed as that collider, but:

- It is a complex, challenging, multi-billion \$ investment
- It requires international commitments
- The ILC physics case and some design parameters will depend on results from the LHC that will probably not be available for at least a few years

In FY 2009, we will:

- Continue support for a U.S. role in the global ILC R&D effort, but focused on areas where the U.S. is the acknowledged leader
- Maintain a balanced scientific program that will preserve options for U.S. leadership in targeted areas, both in the LHC era and whatever comes next

HEP Technical R&D Plan

The overall strategy for accelerator technology R&D has both near- and long-term components to provide options for the U.S. program over the next decade:

- Short-term R&D focused on development of a high intensity proton source for an enhanced scientific program in neutrinos and rare decays at Fermilab
- Mid-term R&D directed at developing superconducting RF (SRF) technology and infrastructure, for both the HEP program and wider scientific applications of SRF accelerators
- The focused ILC R&D program (as discussed before)
- Long-term R&D directed at advanced accelerator technologies that hold the promise of transformational change. A new test facility for Advanced Accelerator R&D concepts is included in the FY2009 President's Request.

We are at a pivot point in the U.S. for the HEP program

- Also for the DOE SC programs and physical sciences basic research in general
- There is support for research and development – but there is a debate about how much should go for short-term, mid-term and long-term (basic) research
- The Administration is strongly supporting long-term basic research
 - FY 2009 Budget Request provides funding for doubling funding for SC
- There is the expectation that Congress will not pass a funding bill until President leaves
 - So expectation of a Continuing Resolution (funding at previous level) for 6 months
- For HEP in the US – it can go in a couple of directions
 - The U.S. community has to develop a compelling realistic vision for the a U.S. program - then they need to support it
 - I believe that this is essential if we are to change the direction of the U.S. program that was implied in the FY 2008 Omnibus Bill.
 - The vision needs to be a part of a coordinated international plan

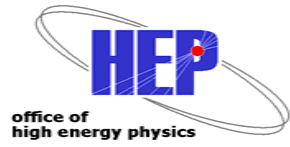
DOE/NSF have asked HEPAP for prioritized scientific recommendations that are consistent with current budgetary guidance.

Options and scientific priorities for 10-year plans consistent with four budget scenarios:

- Constant effort at the FY 2008 (Omnibus) funding level
- Constant effort at the FY 2007 funding level
- Doubling of funding starting in FY 2007
- Additional funding above the previous level, in priority order, associated with specific activities needed to mount a leadership program that addresses the scientific opportunities identified in the National Academy (“EPP2010”) report.

Preliminary Comments – March 15, 2008

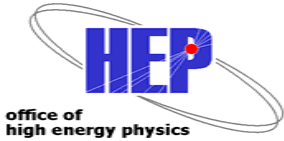
Final Report – May, 2008



Department of Energy



The High Energy Physics Office



DOE HEP Office



HEP Office is implementing a new organizational structure

- Organized according to scientific and technical campaigns
- Managed by a program manager that is empowered and accountable
- Programs contain universities and national laboratories

HEP Office is implementing a new review process for national laboratories

- Annual S&T Reviews of User Facilities (i.e.; Fermilab and SLAC in FY 2008)
- Reviews of all national laboratories research groups on a rotating basis
- Reviews of specific activities/initiatives annually (similar to before but expanded)
- Institutional reviews on a rotating schedule

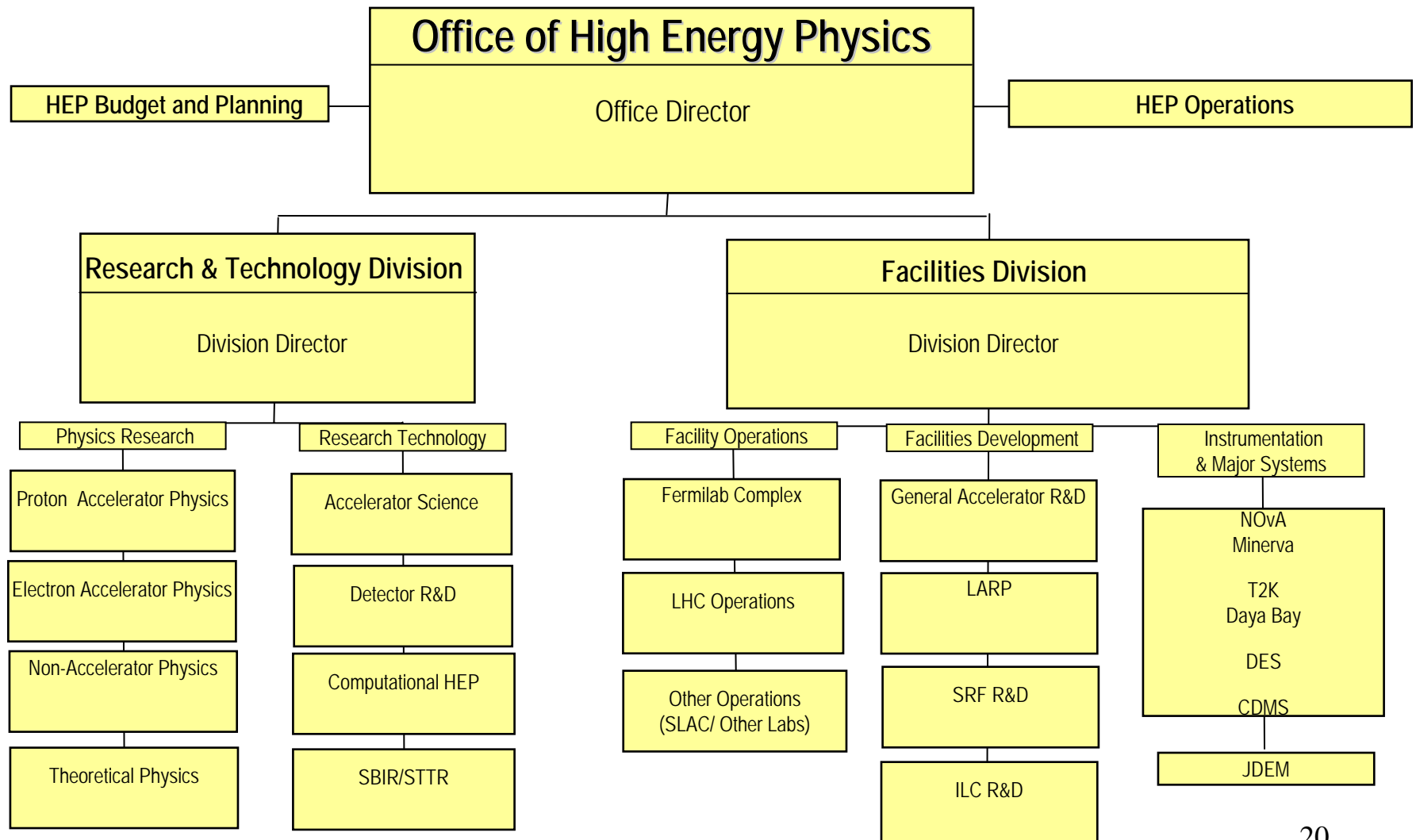
HEP Office has obtained approval to fill/advertise positions in the new organization

- Positions include Division Director plus 12 permanent federal positions
- Includes program/project managers; scientific/technical advisors; support positions
- Positions are in the process of being prepared to be advertised
- Anyone interested should contact me or anyone in the Office to get information

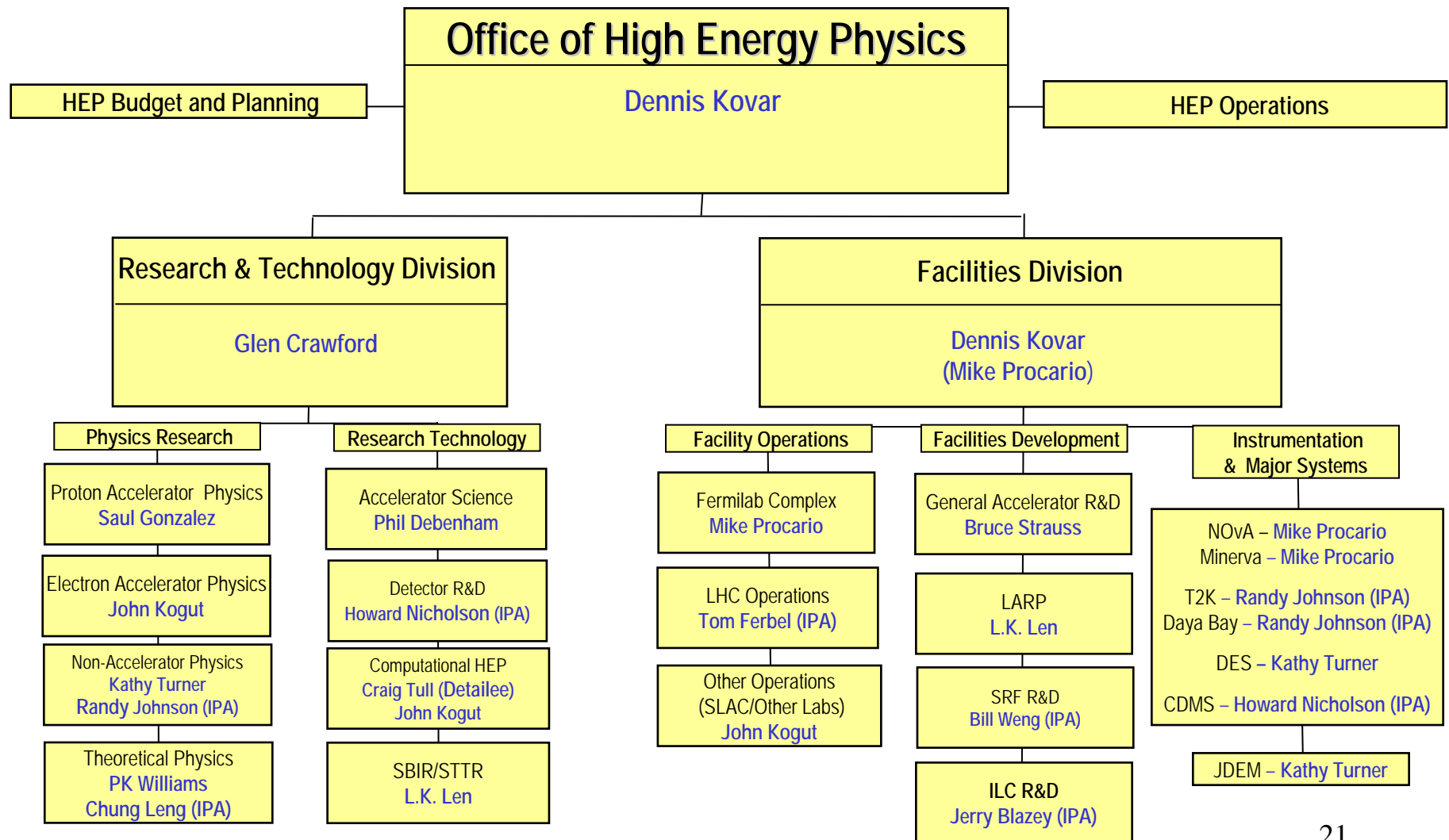
HEP Office has operated for a number of years with IPAs/Detailees

- These individuals has provided invaluable expertise, experience and wisdom to the Office
- It is envisioned that such appointments are needed in the future
- Anyone interested should contact me or anyone in the Office

New HEP Organization Chart



New HEP Organization Chart



FY 2008 Execution

- Most significant decisions made in February Financial Plan
- Fermilab and SLAC Reviews - summer
- Laboratory Group Reviews – Theory and Accelerator Science – this summer
- Decisions: OJI, Dark Energy solicitation, ADR, etc.
- Project and targeted Reviews
- Last University actions end of July

FY 2009 Request/Appropriations

- SC Congressional Hearings in March / Response of Questions
- Working with NASA for MOU for participation on JDEM
- Impacts of Continuing Resolution

FY 2010 Budget Process

- Laboratory Managers Budget Briefings – February
- P5 Interim Report - mid-March
- HEP Retreat – consensus on strategic plan/priorities for FY 2010 - March
- Submit and defend HEP Budget to SC – April
- SC submits and defends SC Budget to DOE – May/June
- DOE submits DOE Budget to OMB – August
- OMB Passback – November
- DOE submits DOE Congressional Budget - December/January