SiD Workshop

Boulder, Sept 17,2008

The EPP (Elementary Particle Physics) Team

M. Goldberg, M. Pripstein, J. Reidy

J. Whitmore, J. Kotcher, S. Meador,

F. Cooper

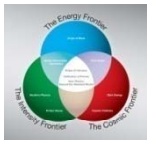
View from Arlington

EPP BUDGET PROCESS 9/17

1. **We Remember: “Prediction is very difficult, especially if it’s about the future.”**
- Niels Bohr

2.

P5 Panel Advice



"The panel recommends for the near future a broad accelerator R&D program for lepton colliders that includes continued R&D on ILC at roughly the proposed FY2009 level in support of the international effort. This will allow a significant role for the US in the ILC wherever it is built. The panel also recommends R&D for alternative accelerator technologies, to permit an informed choice when the lepton collider energy is established."

NSF EPP (with OHEP) is providing support for high priority lepton collider damping ring R&D—CESR TA

"The panel also recommends an R&D program for **detector technologies to support a major US role in preparing for physics at a lepton collider."**

Support For Detector Technologies

PREPARING FOR PHYSICS AT A LEPTON COLLIDER.

NSF EPP (working with OHEP) hopes to continues providing support for (now generic) lepton collider detector R&D (note that NSF initially supported R&D generically for detectors at hadron colliders,

We assume here that we will continue to jointly review proposals with OHEP, and agree on funding priorities. NSF will, as before, fund proposals through universities. *NO SOLICITATIONS at NSF*

We prefer, where appropriate, that support for lepton detector R&D follow the "LHC model." This would suggest both university and laboratory leadership and oversight.

The scope of some proposals may include detector R&D for LHC upgrade as well as for a future linear collider R&D if these are synergistic..

NSF EPP now encourages single Collaborative Proposals for Future Lepton Detectors. This proposal type may be found in the NSF Grant Proposal Guide of Jan 08:

SINGLE COLLABORATIVE PROPOSAL SUMMARY

See http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg

A Collaborative Proposal is one in which investigators from two or more organizations wish to collaborate on a unified research project. Collaborative proposals may be submitted to NSF as a single focused proposal, in which a single award is being requested (with subawards administered by the lead organization).

All collaborative proposals must clearly describe the roles to be played by the other organizations, specify the managerial arrangements, and explain the advantages of the multi-organizational effort within the project description.

A single investigator bears primary responsibility for the administration of the grant and discussions with NSF, and, at the discretion of the organizations involved, investigators from any of the participating organizations may be designated as co-PIs. By submission of the proposal, the organization has determined that the proposed activity is administratively manageable.

Features of Collaborative Proposals

And Remember "Broader Impacts"

- More complete .
- Stronger management.
- More Accountability.
- Costs and Schedules should be better described and thus more easily reviewed.
- Will naturally lead to prioritized detector activities within the collaborations, and eliminate duplication.
- Allows for the shifting of funds among detector components when needed.
- Better match to end game.

NSF would establish a "Cooperative Agreement" as a requirement for funding, and this would describe in detail the interactions of the collaboration with EPP.

Base + Allied Funding - $M

	FY03	FY04	FY05	FY06	FY07	FY08
Base						
EPP	25.31	19.75	18.19	19.03	18.91	
PNA+IceCube Ops	11.70	12.68	14.69	15.85	16.33	
CESR	19.49	18.00	16.62	14.62	14.71	
LHC OPS	3.08	7.00	10.51	13.65	18.00	* 18.00
Accel + ILC Det R&D)+TA	0.29	0.34	0.78	1.55	2.16	* 9.72
(RSVP)/DUSEL, R&D	0	(6.00)	(2.65)	(0.99)	6.00	
EPP+Astro/Cosmo Thy	12.07	9.23	10.05	10.82	11.82	
Total Base	71.93	73.00	73.50	76.24	87.94	
EPP Allied Funding						
MRI	1.70	0.00	0.75	1.66	1.05	
PFC	4.00	5.02	5.56	5.77	5.93	
OCI/CISE	6.30	6.50	5.65	3.63	1.61	
PIF/OMA/ESIE/OISE	0.70	0.29	0.55	3.72	4.45	
Total Allied	12.70	11.81	12.51	14.78	13.05	
Overall Total	84.63	84.81	86.01	91.02	100.99	
MREFC						
LHC construction	9.69					
IceCube	24.54	41.75	47.62	49.85	28.65	** 22.38

** FY08 Request * Anticipated

FY 09

EPP is well aligned with P5 Advice

Our review process (with OHEP) will blend this advice with fiscal realities.

CESR TA and Detector Lepton Collider R&D should continue.

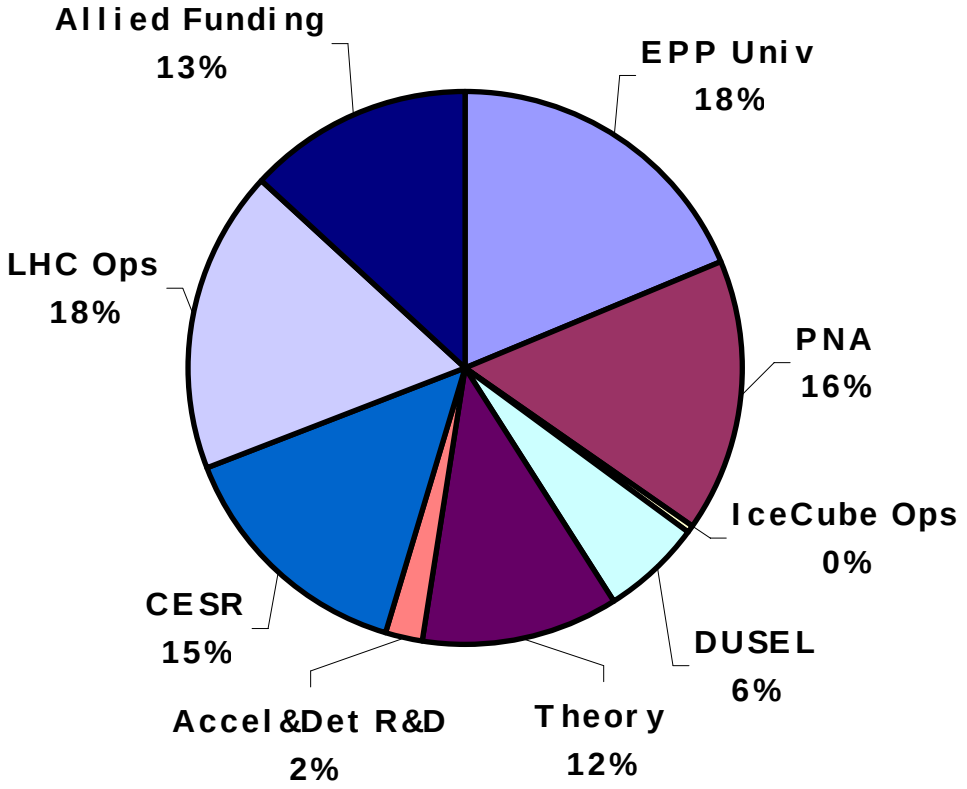
We await the perfect budget.

Also see NSF “Major Research Instrumentation Program” (MRI) solicitation.

BACKUP

EPP+PNA Funding Distribution FY07

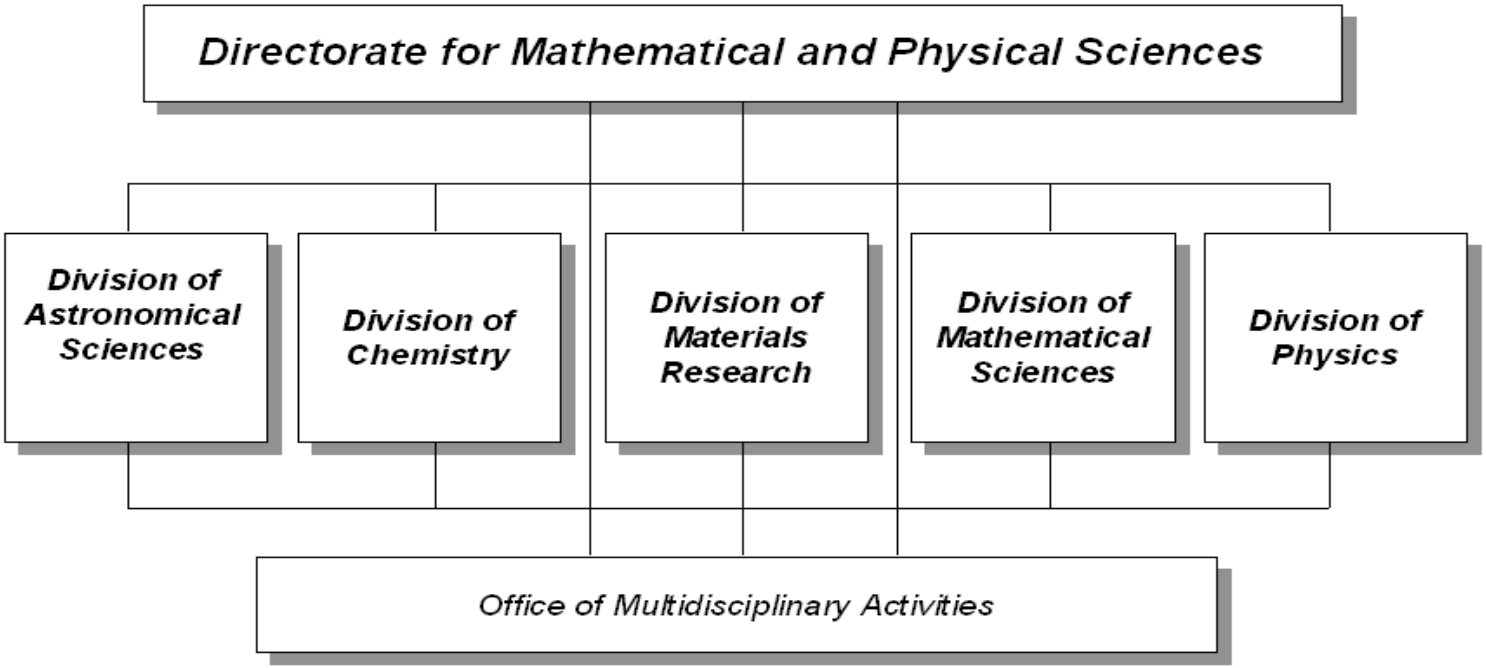
	$M
EPP	18.91
PNA	16.08
IceCube Ops	0.25
DUSEL	6.00
Theory	11.82
Accel & Det R&D	2.16
CESR	14.71
LHC Ops	18.00
Allied Funding	13.05
Total	100.99



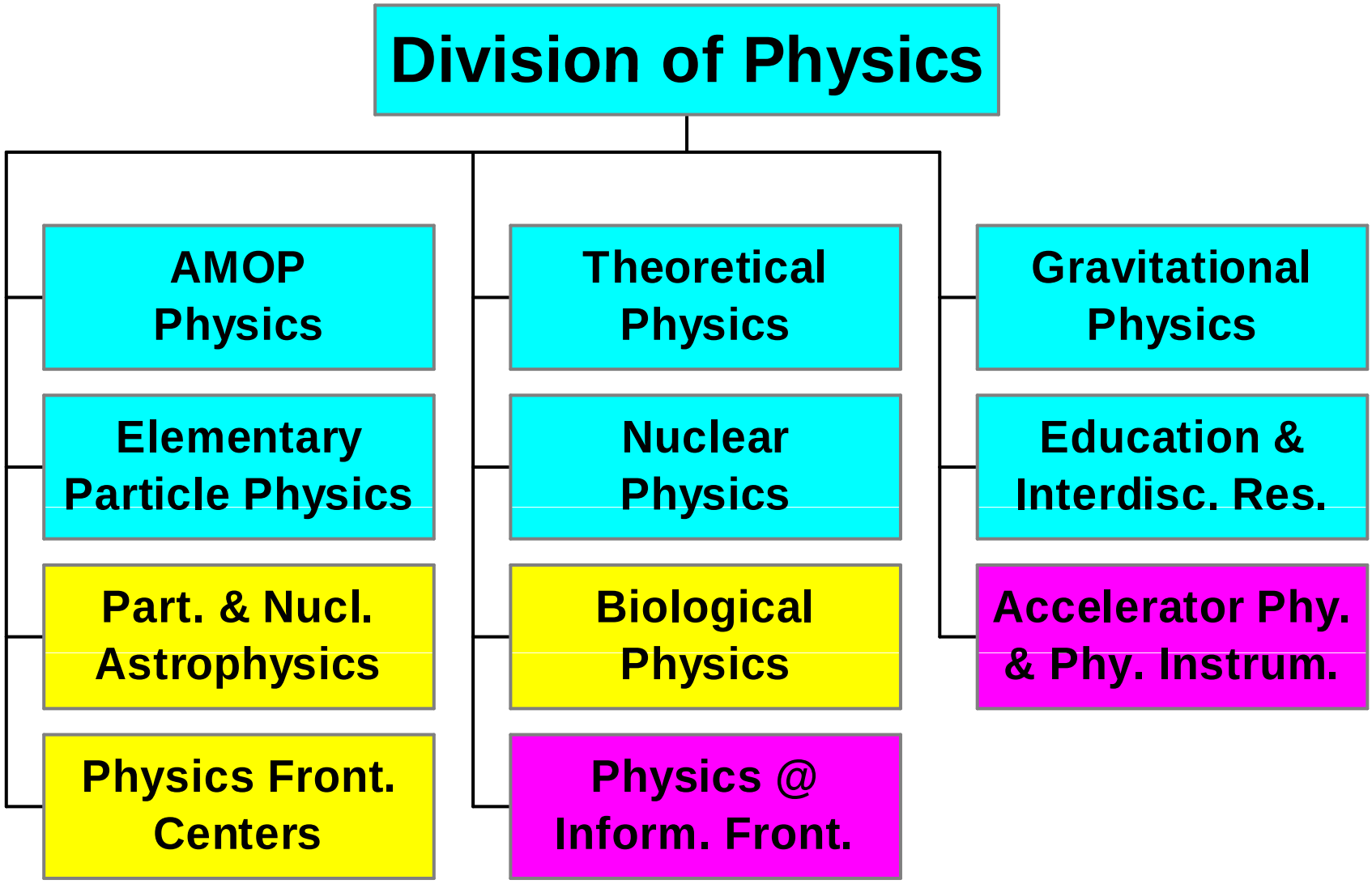
MPS Organizational Chart

National Science Foundation

Directorate for Mathematical and Physical Sciences



Physics Division Organization



EPP + PNA Portfolio

- University Program
  - EPP Accelerator based physics
    - Hadron Colliders: CDF, DØ, CMS, ATLAS, LHCb
    - Electron Positron Colliders: CLEO-c, BaBar,…
    - Neutrinos: MINOS, NOvA, MINERvA, MiniBooNE
  - Particle and Nuclear Astrophysics
    - Dark Matter: CDMS, COUPP, XENON10, DRIFT-II, ZEPLIN-II
    - UltraHigh Energy Universe: HiRes/TA, Pierre Auger, VERITAS, MILAGRO
    - Neutrinos: Double Chooz, Super-K, Borexino, CUORE
    - Other
  - Theory
  - Computational physics
- LHC Experiments: Maintenance and Operations
- DUSEL and DUSEL R&D
- CESR/CLEO-c
- Accelerator and Detector R&D
  - ILC Accelerator and Detector R&D
  - MICE
  - Advanced Technologies
- Partnerships & Broader Impacts

Exciting Time for MPS/PHY

- Deep Questions:
  - TeraScale
  - Dark Energy, Dark Matter
  - Neutrinos
  - Proton Decay
  - CMB,…
- Powerful Facilities:
  - Existing
    - Tevatron (CDF, DØ, Neutrino Expts,...)
    - LHC (ATLAS, CMS, LHCb,..)
  - Planning
    - DUSEL (NSF leads, DOE supports)
    - ILC (DOE leads, NSF supports)

Program Guidance

- HEPAP
  - P5
  - NUSAG, DETF, CMB, DMSAG
  - AARD
  - UGPS
- Other External
  - EPP2010 and other Reports
  - Laboratory PACs and Resource Review Boards
  - MUFAC
  - FALC
  - Visits from Experimenters and Programs
  - Site Visits, Reverse Site Visits
- Internal
  - Committee of Visitors (3 year interval, most recent in 2006)

Partnerships

- Cyberscience
  - Tier 2c – with OCI
  - UltraLight – with OCI
  - OSG – with OCI and DOE (http://www.opensciencegrid.org)
  - CDI – with NSF (http://www.nsf.gov/crssprgm/cdi/)
- Education with research
  - QuarkNet – with OMA, EHR and DOE/HEP
  - CHEPREO – with OMA, OCI, EHR, OISE
  - I2U2 – with OMA, EHR, PHY
  - Mariachi – OCI funded
  - CyberBridges – OCI funded
  - PIRE (UK,KSU,UNL,UIC, UPRM) – with OISE
  - ILC Outreach – with OISE

Acronyms - I

AP Physics	Advanced Placement Physics (for High School Students)
APPI	Accelerator Physics and Physics Instrumentation
AST	Astronomy Division
CDI	Cyber-enabled Discovery and Innovation
CHE	Chemistry Division
CHEPREO	Center for High Energy Physics Research and Education Outreach
CI-TEAM	CyberInfrastructure Training Education Advancement and Mentoring
COV	Committee of Visitors
CyberBridges	Grid Computing and Science Disciplines Interdisciplinary Research and Education
DDDAS	Dynamically Data Driven Applications Systems
DMR	Division of Materials Research
DMS	Division of Mathematical Sciences
DUSEL	Deep Underground Scientific Laboratory
EHR	Education and Human Resources Directorate
EPP	Elementary Particle Physics
ESIE	Elementary, Secondary and Informal Education
GK12	Graduate Teaching Fellows in K12 Education
GOALI	Grant Opportunities for Academic Liaison with Industry
I2U2	Interactions in Understanding the Universe (Research and Formal and Informal Education Program)
IPSE	Internships in Public Science Education
Mariachi	Mixed Apparatus for Radar Investigation of Cosmic-rays of High Ionization
MPS	Mathematical and Physical Sciences Directorate
MREFC	Major Reseach Equipment and Facilities Construction

Acronyms - II

NA	Nuclear Astrophysics
OCI	Office of CyberInfrastructure
OISE	Office of International Science and Engineering
OMA	Office of Multidisciplinary Activites
OSG	Open Science Grid (Funded Jointly by DOE and NSF)
PA	Particle Astrophysics
PFC	Physics Frontier Centers
PHY	Physics Division
PhysTEC	Physics Teacher Education Coalition
PIF	Physics at the Information Frontier
PIRE	Partnerships for International Research and Education
PNA	Particle and Nuclear Astrophysics
QuarkNet	National Education and Outreach in Particle Physics (Funded Jointly by DOE and NSF
R&RA	Research and Related Activities
RET	Research Experiences for Teachers
REU	Research Experiences for Undergraduates
RIBF	Rare Isotope Beam Factory
SBE	Social, Behavioral and Economic Sciences Directorate
SBIR	Small Business Innovation Research
SGER	Small Grant for Exploratory Research
Tier 2c	Tier 2 Computing Center - DISUN (Data Intensive Science University Network)
Trillium	The trio of SCIDAC (DOE), GriPhyN (NSF/OCI), and iVDGL (NSF/PHY)

Programs of Interest

- MREFC: Major Research Equipment & Facilities Construction
- MRI: Major Research Instrumentation
- CDI: Cyber-enabled Discovery and Innovation
- CI-TEAM: Cyberinfrastructure and Education
- PIF: Physics at the Information Frontier
- PIRE: Partnerships for International Research and Education
- SBIR: Small Business Innovation Research
- GOALI: Grant Opportunities for Academic Liaison with Industry
- GK12: Graduate Teaching Fellowships in K12 Education
- IPSE: Internships in Public Science Education

- See NSF website for opportunities
  - www.nsf.gov