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# *SiD Workshop*

***SLAC, March 2-4 ,2009***

***The EPP (Elementary Particle Physics) Team***

***M. Goldberg, D. Lissauer, M. Pripstein***

***J. Reidy, J. Whitmore, J. Kotcher,***

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# *P5 Panel Report*



“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 DOE/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.**”



# *ILC Detector R&D*

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- ✓ *DOE/OHEP and NSF are planning to execute the ILC Detector R&D following the example of the successful joint R&D done for the Large Hadron Collider (LHC) experiments.*
- ✓ *We encourage that proposals be organized by detector collaborations, and that each of the LOI's collaborations prepare a common and coherent R&D proposal.*
- ✓ *The proposals will be jointly reviewed by OHEP and NSF. The results of the reviews will be used to set the funding priorities.*
- ✓ *Where appropriate, the support for ILC detectors R&D follows the "LHC model." This means a joint university and laboratory leadership and oversight for the activities.*
- ✓ *For NSF proposals we encourage you to consult the NSF Grant Proposal Guide of Jan 08:  
[http://www.nsf.gov/publications/pub\\_summ.jsp?ods\\_key=gpg](http://www.nsf.gov/publications/pub_summ.jsp?ods_key=gpg)*



# *ILC Detector R&D*

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- ✓ *The body of the proposal and the people/Institutions involved should be the same for both agencies.*
- ✓ *The 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 DOE & NSF as a single focused proposal, in which a single award is being requested (with sub-awards administered by the lead organization).*
- ✓ *A collaborative proposal must clearly describe the roles to be played by each organization, specify the managerial arrangements, and explain the advantages of the multi-organizational effort within the project description.*
- ✓ *The Principle investigator bears primary responsibility for the administration of the grant and discussions with OHEP and 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.*



# *ILC Detector R&D*

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- ✓ *Thus, each proposal is expected to have at least one PI from a University (NSF requirement). Alternatively the proposal can have two Co-Pi's. (A University and a National Lab. Co-PI's)*
- ✓ *Priority list for the R&D to be supplies by the LOI leadership.*
- ✓ *The proposals will be reviewed by a Panel appointed by OHEP and NSF. The panel will set the priorities for the R&D that needs to be performed. Note that the panel may give different priorities to the different R&D elements in each of the proposals.*
- ✓ *This structure should allow for better and stronger management, for better understanding of the costs and schedules, and for more efficient reviews. This structure will naturally lead to prioritized detector activities within the collaborations, and minimize duplication. It allows for accountability, starting now. It allows for some flexibility by allowing for the shifting of funds among detector components as needed. In short, it is a step to projectizing R&D.*
- ✓ *Funding in the out-years will be subject to agency review, regular status reports by the PI's.*



# *Collaborative Proposal*

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- ✓ *A collaborative proposal is a multi-institutional collaboration working on a unified research project.*
- ✓ *Collaborative proposals may be submitted to NSF:*
  - ➔ *a single proposal, in which a single award is being requested (with sub-awards administered by the lead organization). This is preferred.*
  - ➔ *by simultaneous submission of proposals from different organizations, with each organization requesting a separate award.*

*In either case, the lead organization's proposal must contain all of the requisite sections as a single package to be provided to reviewers.*

- ✓ *All collaborative proposals must clearly describe the roles to be played by all the organizations, specify the managerial arrangements, and explain the advantages of the multi-organizational effort within the project description. PIs are strongly encouraged to contact the cognizant NSF Program Officer prior to submission of a collaborative proposal.*



# *Collaborative Proposal*

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- ✓ *Submission of a collaborative proposal from one organization*
- ✓ *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.*
- ✓ *Please note, however, that if awarded, a single award would be made to the submitting organization, with any collaborators listed as sub-awards.*
- ✓ *By submission of the proposal, the organization has determined that the proposed activity is administratively manageable. NSF may request a revised proposal, however, if it considers that the project is so complex that it will be too difficult to review or administer as presented. (See GPG Chapter II.C.2.g.(vi)(e) for additional instructions on preparation of this type of proposal.)*



## *Often Asked Questions:*

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✓ *1. Which National Lab. do you expect the Lab PI's to come from?*

*The PI is expected to come from any of the DOE Labs –but most probably from one of the following:*

*FNAL, SLAC, BNL, LBNL, Argonne, LNNL, Los-Alamos, TJNAF.*

✓ *2. Is the funding strictly for university groups?*

*The NSF is expected to fund strictly Univ. groups.*

*The DOE funds can be used for either Labs and or Univ.*

✓ *3. LoI-based proposal submission: Is there a preference or wish that the proposal be submitted through a university institution or national lab?*

*The proposals to the NSF should have a Univ. PI (Or Co-PI) and be in the correct format. The proposals however will be reviewed jointly.*

*Thus each proposal is expected to have at least one PI from a University (NSF requirement). Alternatively the proposal can have two Co-Pi's. (A PI from a University and the Co PI could be from a National Lab.)*





## *Often Asked Questions:*

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✓ *4. When might it become clear whether funding will be available?*

*Both agencies are hopeful that funds will be available in FY 09. The availability of funds will depend on the budget situation and the results of the review process.*

*We expect the Budget situation to clarify by April/May and that the review process will be completed soon after that.*

✓ *5. What is the time-lines for receiving the partial awards?  
(Particularly for universities, funding)*

*Summer will be tight – but not out of the question. (See Ans. Above).*

✓ *6. What is the expected range of funding for the Detector related R&D? Is 300k\$ - 2M\$ a range for FY09 funding?*

*Yes. (Total for all the ILC R&C) The exact amount will depend on the Budget situation and the results of the reviews.*



# Base + Allied Funding - \$M (NSF)

	FY03	FY04	FY05	FY06	FY07	FY08
Base						
EPP	25.31	19.75	18.19	19.03	18.91	20.45
PNA+IceCube Ops	11.7	12.68	14.69	15.85	16.33	17.33
CESR	19.49	18	16.62	14.62	14.71	13.71
LHC OPS	3.08	7	10.51	13.65	18	18
Accel + ILC Det R&D)+TA	0.29	0.34	0.78	1.55	2.16	9.72
RSVP	0	6.00	2.65	0.99		
DUSEL					6.00	6.96
EPP+Astro/Cosmo Thy	12.07	9.23	10.05	10.82	11.82	11.68
<b>Total Base</b>	<b>71.93</b>	<b>73</b>	<b>73.5</b>	<b>76.24</b>	<b>87.94</b>	<b>97.85</b>
EPP Allied Funding						
MRI	1.7	0	0.75	1.66	1.05	0.77
PFC	4	5.02	5.56	5.77	5.93	
OCI/CISE	6.3	6.5	5.65	3.63	1.61	
PIF/OMA/ESIE/OISE	0.7	0.29	0.55	3.72	4.45	
<b>Total Allied</b>	<b>12.7</b>	<b>11.81</b>	<b>12.51</b>	<b>14.78</b>	<b>13.05</b>	
<b>Overall Total</b>	<b>84.63</b>	<b>84.81</b>	<b>86.01</b>	<b>91.02</b>	<b>101</b>	
MREFC						
LHC construction	9.69					
IceCube 3/4/2009	24.54	41.75	47.62	49.85	28.65	10*

D. Lissauer, NSF/EPP

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## ***FY 09***

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- **The FY 2009 Omnibus Appropriations Bill that was released Monday following an agreement by House and Senate appropriators give the NSF 5.9% budget increase.**
- **EPP will stay well aligned with P5 Advice**
- **Our review process (with OHEP):**
  - **Expect to convene a review Panel for all ILC related proposals.**
  - **We will than blend the advice with fiscal realities.**
- **CESR TA is funded for FY '09.**
- **Detector R&D for Lepton Collider should continue.**
- **Also see NSF “Major Research Instrumentation Program” (MRI) solicitation.**



## *Future Plans*

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**EPP hopes to get significant amount of stimulus money. The money that will arrive will be used to fund mainly approved and ongoing projects that are ready to spend money now and reduce future obligations.**

**Will need to avoid taking on new long term obligations.**



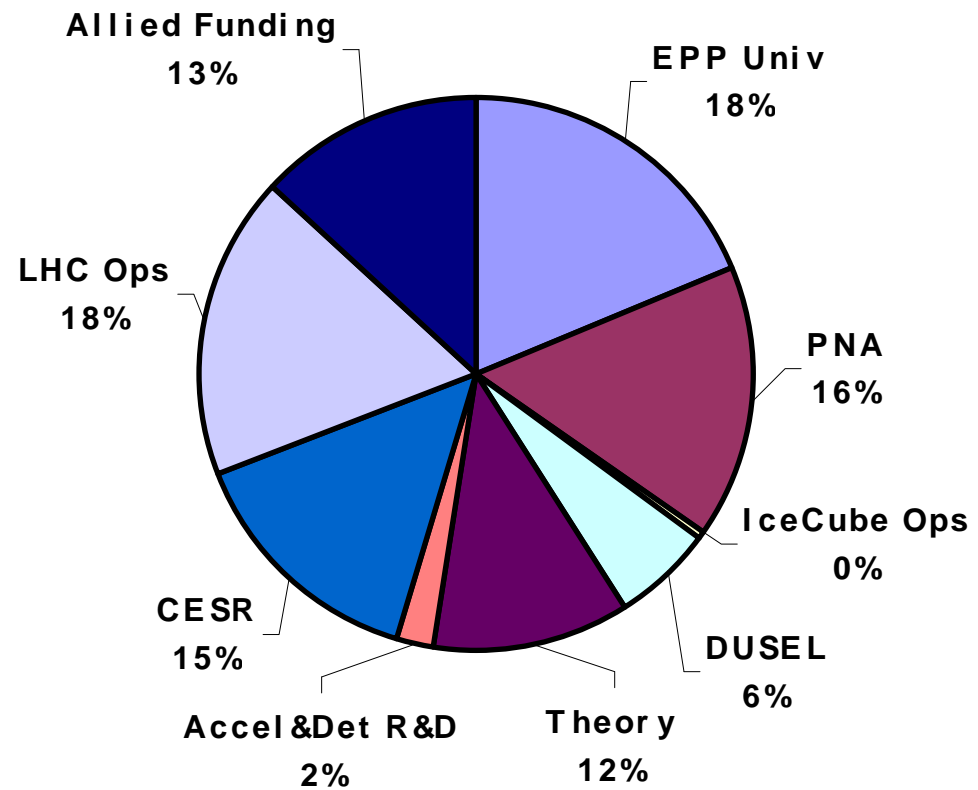
# *BACKUP*

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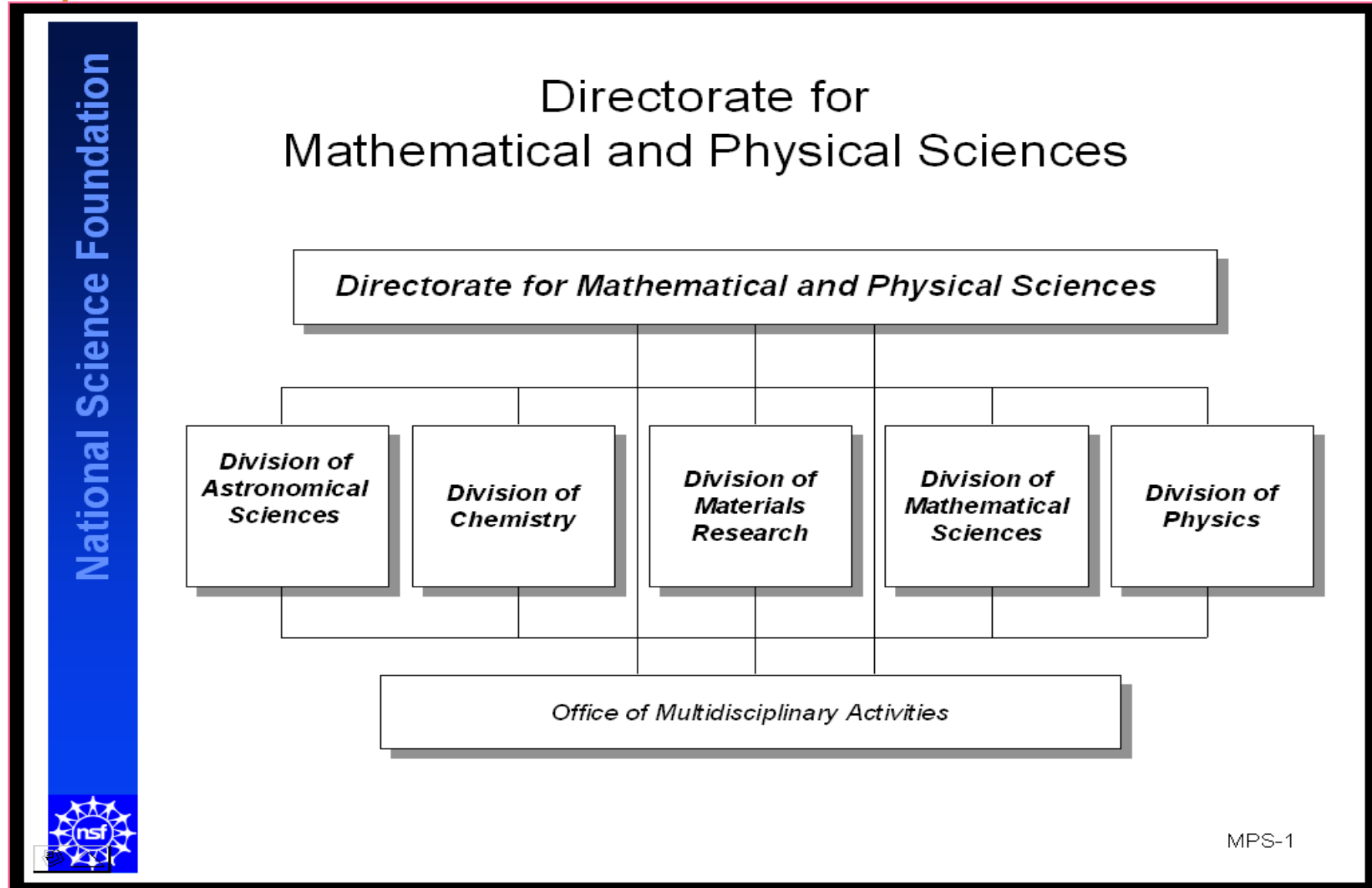
# EPP+PNA Funding Distribution FY07

	\$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
<b>Total</b>	<b>100.99</b>



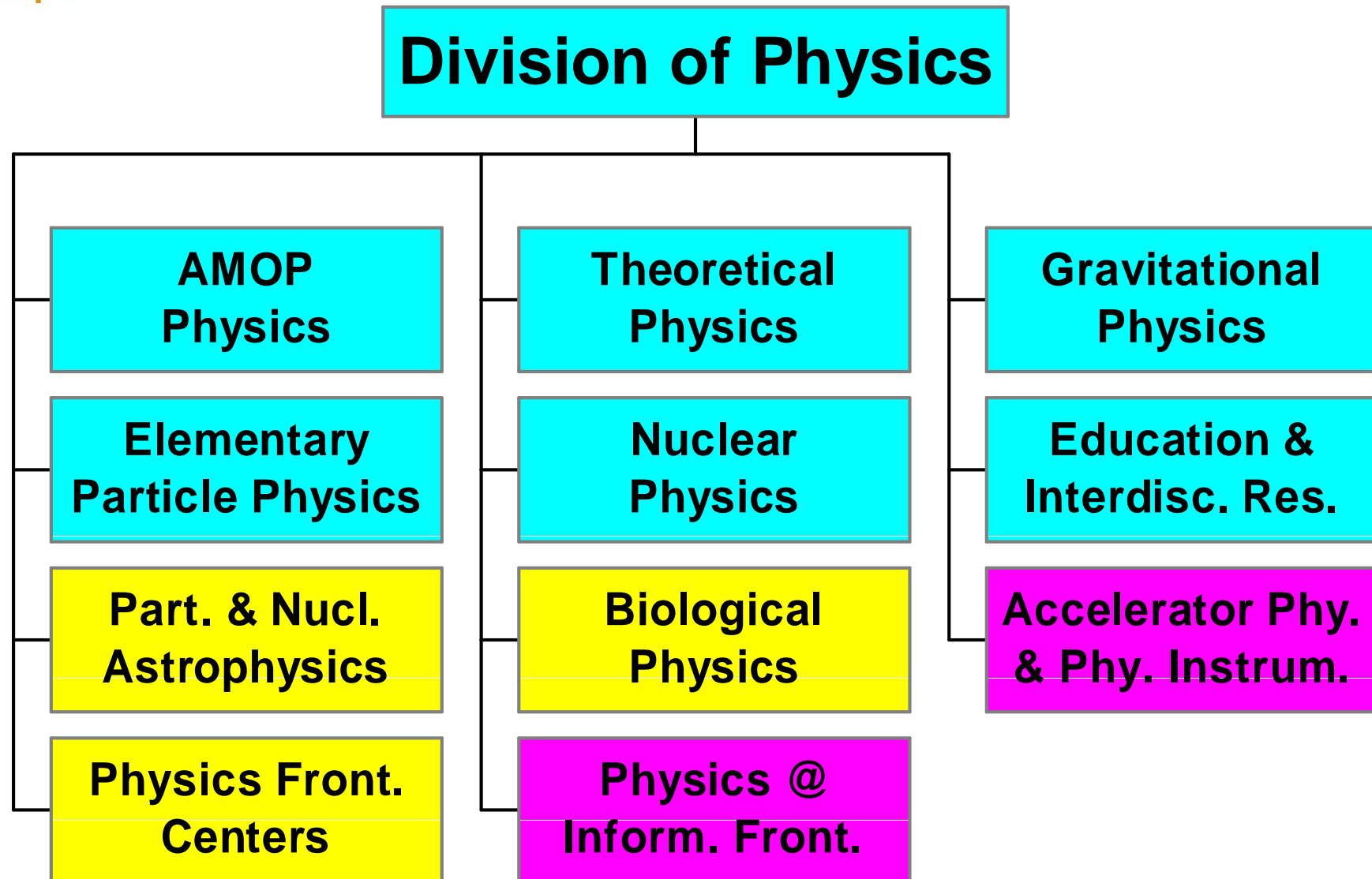


# MPS Organizational Chart





# *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 Should we change this to CESR-TA?? Mainly ILC??*
- ✓ *Accelerator and Detector R&D*
  - *ILC Accelerator and Detector R&D*
  - *MICE*
  - *Advanced Technologies*
  - *LHC Upgrade??* ?????????
- ✓ *Partnerships & Broader Impacts*



# *Exciting Time for MPS/PHY*

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## ✓ *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*

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- ✓ *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

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## ✓ *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 Research Equipment and Facilities Construction				



# Acronyms - II

NA	Nuclear Astrophysics				
OCI	Office of CyberInfrastructure				
OISE	Office of International Science and Engineering				
OMA	Office of Multidisciplinary Activities				
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*

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- ✓ *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](http://www.nsf.gov)