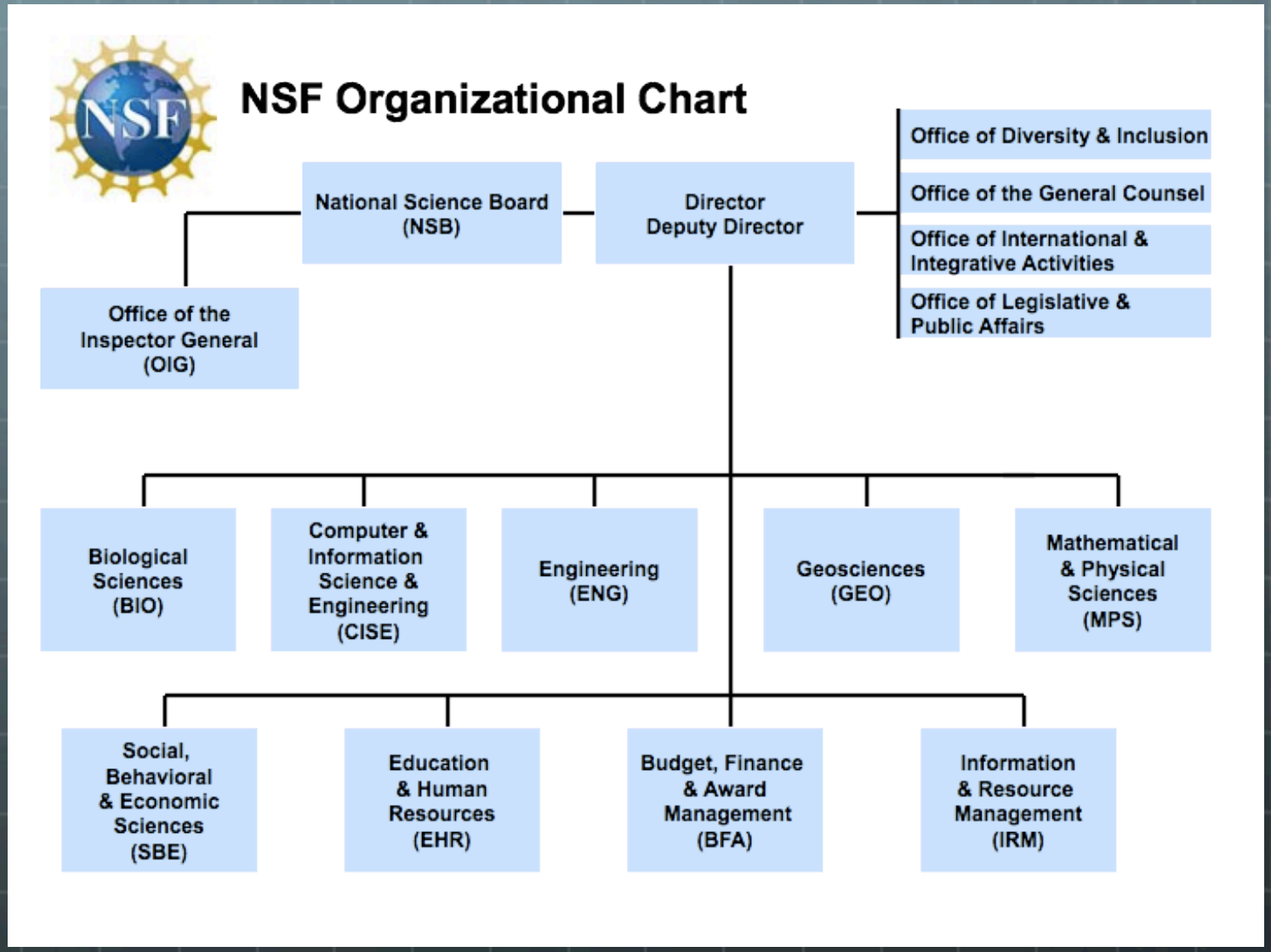
The funding process and what young folks need to know about the NSF

- Elementary Particle Physics
  - Saul Gonzalez, Randy Ruchti
- Particle Astrophysics
  - Jean Cottam Allen, Jim Whitmore
- EPP/PA/Cosmology Theory Program
  - Keith Dienes

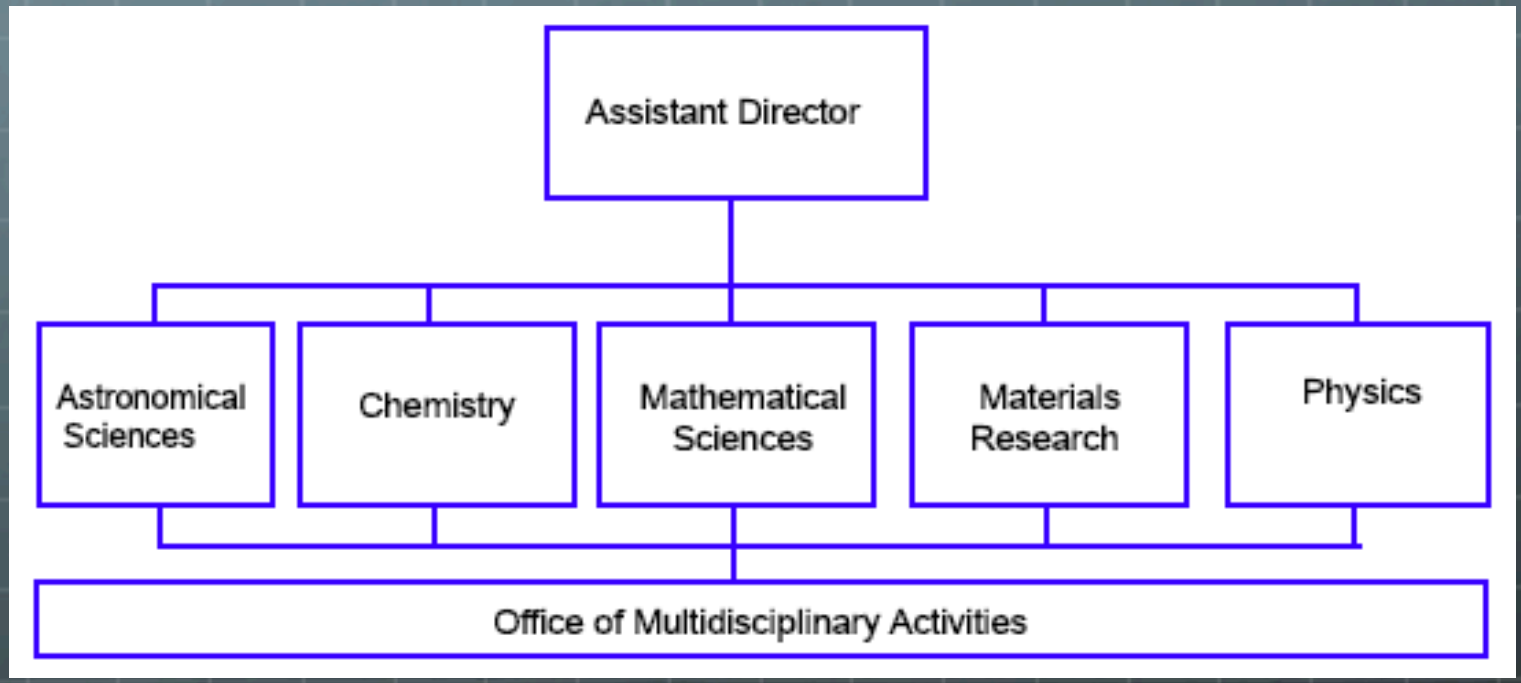
NSF Perspective

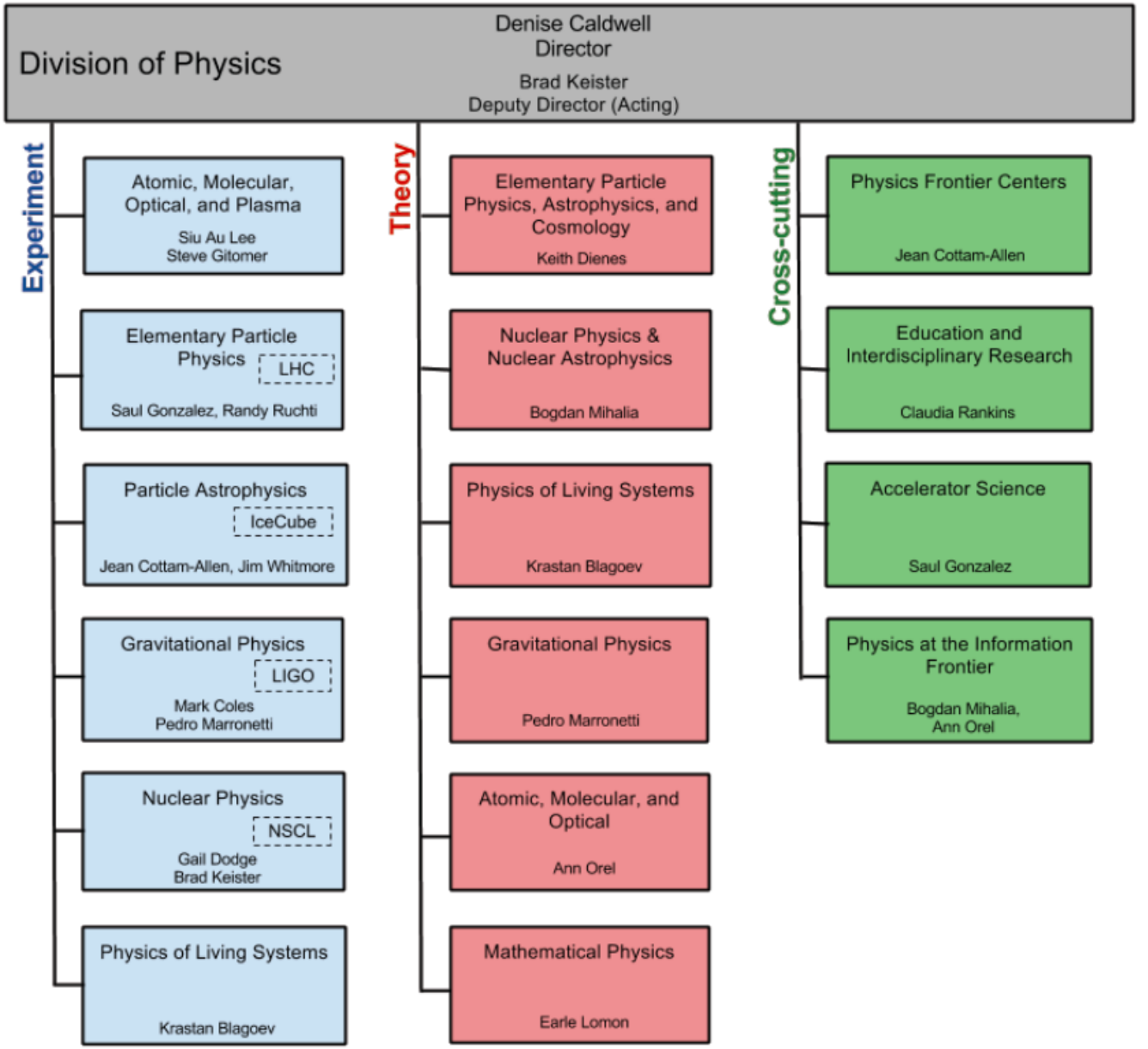
- NSF Mission: "*to promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes*"
  - Empowering university-based investigators
  - Educate and train an exceptional and diverse scientific workforce
  - Adding value through partnerships and broadening participation
- Program Coordination and Execution
  - Programs are coordinated with other U.S. and non-U.S. agencies and organizations
  - Solicit advice and strategic direction from advisory committees such as HEPAP, P5, AAAC, NSAC and from the National Academy of Sciences
- Guiding Principles – NSB review criteria
  - What is the Intellectual Merit?
  - What are the Broader Impacts?

FY2013 Current Structure



MPS Organization




Division of Physics
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Steve Gitomer
Elementary Particle Physics
LHC
Saul Gonzalez, Randy Ruchti
Particle Astrophysics
IceCube
Jean Cottam-Allen, Jim Whitmore
Gravitational Physics
LIGO
Mark Coles
Pedro Marronetti
Nuclear Physics
NSCL
Gail Dodge
Brad Keister
Physics of Living Systems
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Elementary Particle Physics, Astrophysics, and Cosmology
Keith Dienes
Nuclear Physics & Nuclear Astrophysics
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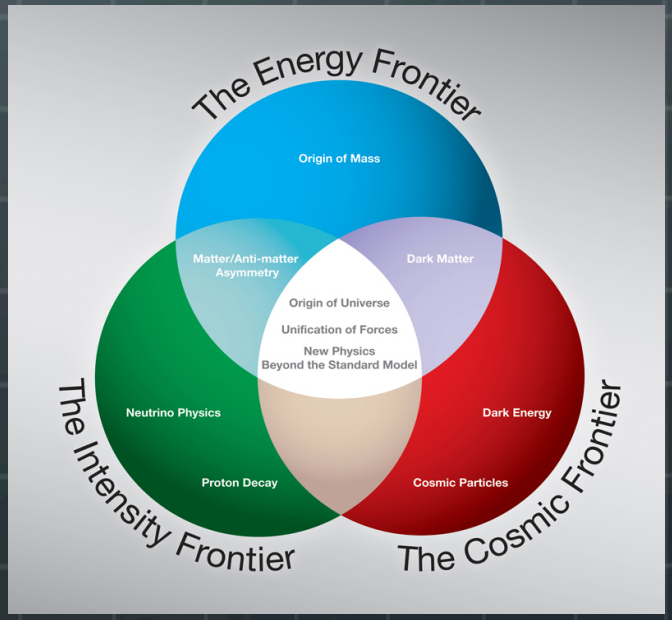
Earle Lomon
Cross-cutting
Physics Frontier Centers
Jean Cottam-Allen
Education and Interdisciplinary Research
Claudia Rankins
Accelerator Science
Saul Gonzalez
Physics at the Information Frontier
Bogdan Mihalia,
Ann Orel

Particle Physics at the NSF

- Scientific Frontiers:
  - Energy Frontier - Elementary Particle Physics (EPP, THY)
  - Intensity Frontier - Elementary Particle Physics, Particle Astrophysics (EPP, PA, THY)
  - Cosmic Frontier - Particle Astrophysics (PA, THY)

- Applications and Broader Impacts:
  - Accelerator Science, R&D
  - Detector R&D
  - Computing / Data
  - Education and Outreach



EPP Program Elements

- **Energy Frontier**
  - Hadrons
    - LHC
      - ATLAS, CMS
    - Tevatron
      - CDF, DØ
  - e+e-
    - ILC
- **Intensity Frontier**
  - Neutrinos
    - MINERvA
    - Minos/NOvA
    - MiniBooNE/MicroBooNE
  - Hadrons
    - LHCb
  - e+e-
    - BES-III
    - Belle-II
    - BaBar
    - CLEO-c

Program Elements

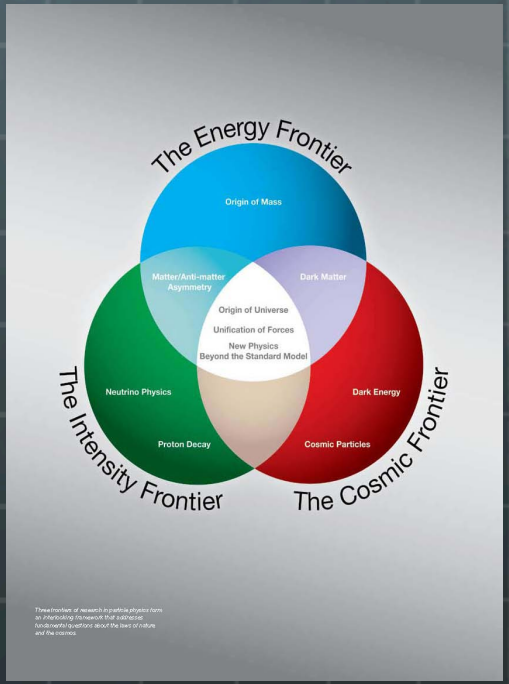
- **Detector R&D**
  - LHC Upgrades
  - Diamond Detectors
  - ILC
  - LAr TPC (LBNE)
  - Large Optical Array
- **Computing**
  - OSG
  - Tier 2, Tier 3, UltraLight
  - Anydata, Anytime, Anywhere
  - DASPOS
  - ISGTW
- **Accelerator Science and R&D**
  - CESR TA
  - ILC
  - Muon Colliders (MuCOOL, MICE)
  - Plasma Acceleration
  - Project X (SRF, CESR TA)
  - SRF

PHY Division PA Program

PHY funds projects in both the Cosmic Frontier and the Intensity Frontier fields

Cosmic Frontier:
Dark Matter, Dark Energy, Cosmology, High Energy Particles (CR, γ-rays, ν)

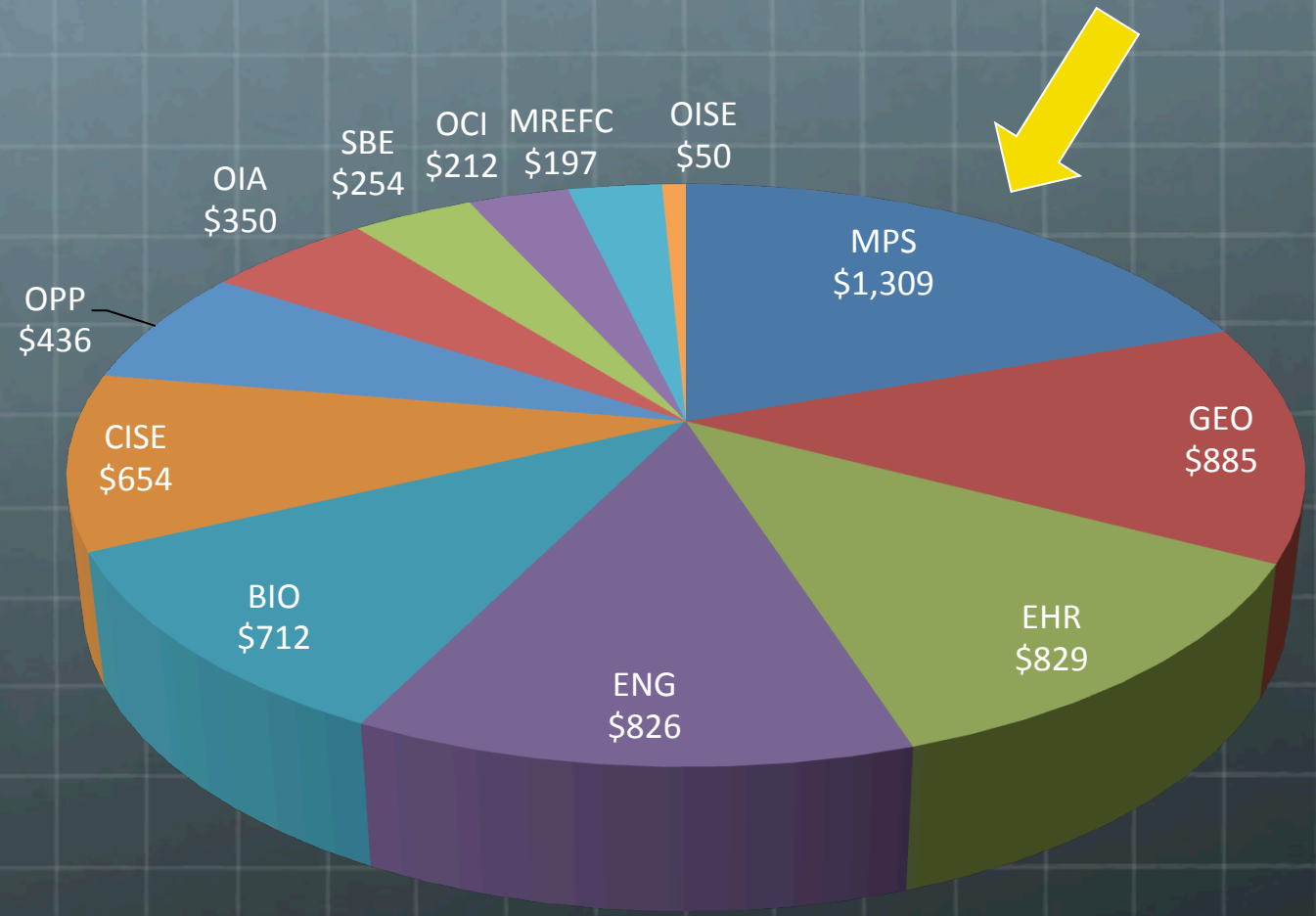
Intensity Frontier:
Neutrino mass, Neutrino-less Double Beta Decay non-accelerator (and solar) neutrinos



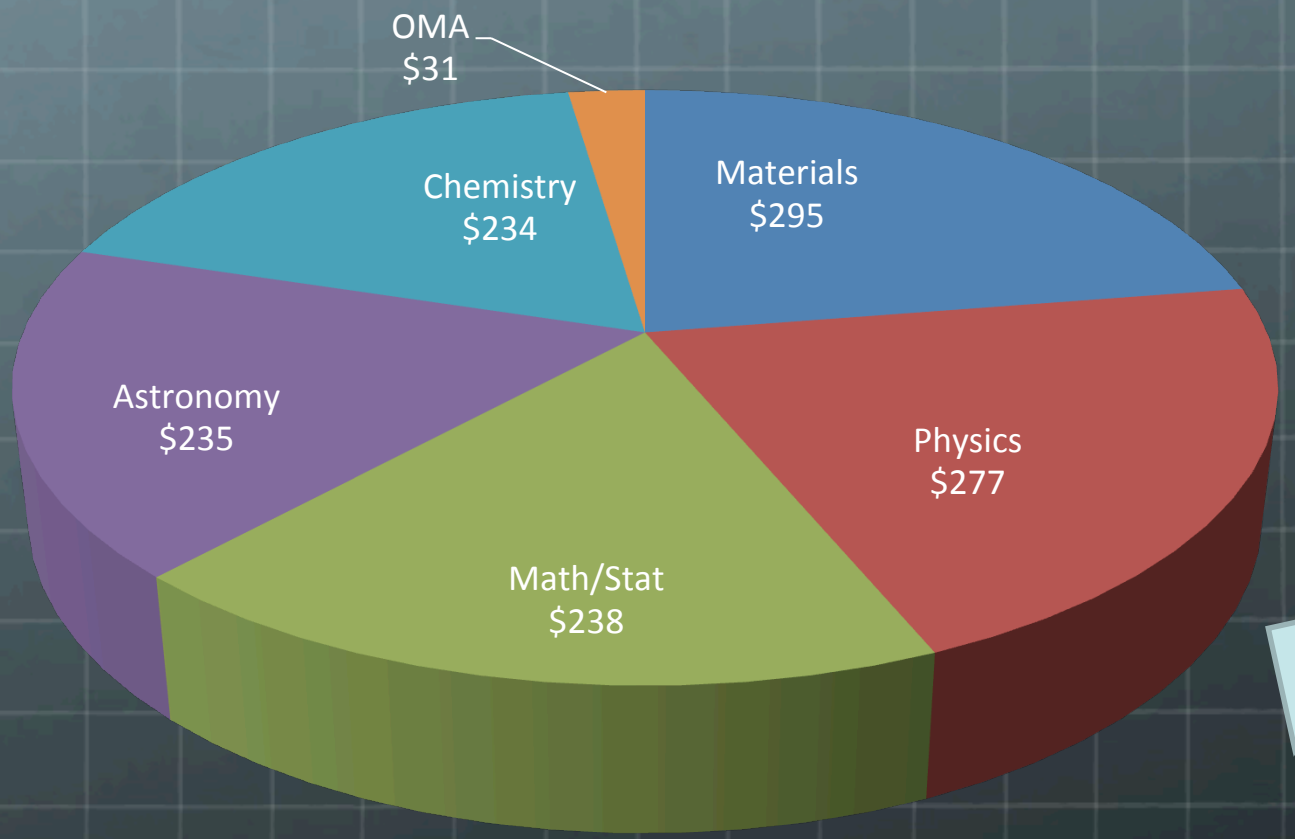
Theory Program in Particle Physics Particle Astrophysics and Cosmology

- The NSF Theory Program funds theoretical research in all of the research areas across the three frontiers:
  - From string Theory and Grand Unification to neutrinos and proton decay to cosmic rays and dark matter/dark energy.
  - The program is completely cross-cutting.

NSF 2012 Budget ($7,034M)



MPS 2012 Budget ($1,309M)



Impact of Adding Value
EPP/PA/THY Program Funding FY 12

EPP Base Program	$24.7M
LHC Research Program	$18M
PA Base Program	$11.47M
Underground Science	$17.29M
IceCube Ops	$3.45M
THY Base Program	$13.59M
Physics Frontier Centers	$6.04M
Subtotal	$94.54M
Allied Funding - Added Value (EPP, PA and THY)	$30.3M
EPP/PA/THY Total	$124.84M

Partnering/Adding Value

- From discussion at Snowmass 2013/CPM2012…
  - The General Public
  - Policy Makers and Opinion Leaders
  - The Science Community
  - Teachers 5-16
  - Students 5-16
- At the agencies…
  - Physics
    - BP - Broadening Participation
    - EIR - Education and Interdisciplinary Research
    - PIF - Physics at the Information Frontier
  - OMA - Multidisciplinary Activities
  - OCI – Cyberinfrastructure
  - OISE – International
  - EHR - Education and Human Resources
  - With other agencies

Engagement: Some Examples
Adding Value – Programs/Projects

- **Interdisciplinary Research and Education**
  - QuarkNet
  - CHEPREO
  - Planetarium Show
  - Feature-length Video Program
  - REU programs
- **Cyber Infrastructure**
  - Open Science Grid
  - DASPOS
  - ISGTW
- **Multidisciplinary Activity – Broadening Participation**
  - AGEP Graduate Supplements
- **International**
  - Partnerships in International Science and Engineering
  - Particle Physics School
  - Grid School
  - Accelerator School
- **Partnering with other Agencies**
  - DOE

NSF Calendar – Items/Dates of Interest

- July 24, 2013 – CAREER Proposal Deadline (MPS) for FY14
- July 29 – Aug 7, 2013 – Snowmass on the Mississippi
- October 30, 2013 – FY14 Target Date - EPP and PA Proposals
- November 13, 2013 – Application Deadline for NSF Graduate Fellowship Program
- November 29, 2013 – FY14 Target Date - Accelerator Research Proposals
- December 5, 2013 – FY14 Target Date - EPP/PA/Cosmology Theory Proposals
- January 23, 2014 – MRI Proposal Deadline
  - Note that universities will have their pre-selection much earlier

Summary

- Cautionary note…
  - We are in for some challenging funding years
- Nevertheless…
  - It is an extraordinarily exciting time for Particle Physics.
  - You have enthusiastic support from those of us at NSF!