# Particle and Nuclear Astrophysics Program at the Physics Division NSF

Presented to HEPAP
by
Eugene C. Loh
Physics Division, MPS
Program Director
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eloh@nsf.gov

# Science Strategy

- Science
  - As the title of the Program indicates, this Program supports research activities at the intersection of astronomy, cosmology, nuclear physics, and particle physics
  - SAGENAP, Scientific Assessment Group for Experiments in Non-accelerator Physics, serves as the interagency experiment review group
  - A brief survey of the program will be given in context of some of the 11 “most profound questions of the cosmos” – ***Turner NRC Report***

# Funding Strategy & Management

- Project funding strategy – funding adequate to accomplish proposed and approved goals
  - Proven review process (Peer, SAGENAP, NSB)
  - Appropriate oversight
  - Partnership
    - International partnership
    - Nationally, DOE is a strong partner
    - Within NSF, Astronomy Division and the Office of Polar Programs are strong funding partners of the PNA Program
- Program managed by E. Loh and Richard Boyd

# Experiments that could answer the question, "What is dark matter?"

- CDMS II
  - International
  - DOE, NSF
    - AST, OMA, PHY
- Xenon
  - DOE, NSF
    - PHY
- Drift
  - International
  - NSF
    - PHY
- ZEPLIN II
  - International
  - DOE, NSF
    - PHY

# “How do cosmic accelerators work and what are they accelerating?”

- AUGER
  - International
  - DOE, NSF
    - AST, OMA, PHY
- HiRes
  - International
  - DOE, NSF
    - PHY
- Milagro
  - NSF, DOE
- STACEE
  - International
  - NSF
    - PHY
- VERITAS
  - International
  - DOE, NSF
    - AST, OMA, PHY

# “Are protons stable?” Matter/Antimatter

- AMS
  - International
  - DOE, NSF
    - PHY
- SuperK
  - International
  - DOE, NSF
    - PHY
- 3M (Exploratory)
  - NSF
    - PHY

# Neutrino Astrophysics

- AMANDA
  - International
  - DOE, NSF
    - Office of Polar Programs, PHY
- IceCube
  - International
  - DOE, NSF
    - Office of Polar Programs, PHY
- Borexino
  - International
  - DOE, NSF
    - PHY

# Education and Outreach Projects

- **ASPIRE** (Astrophysics Science Project Integrating Research & Education)
  - Attached to HiRes

- **CROP** (Cosmic Ray Observatory Project)
  - Attached to AUGER

# Future Directions: Opportunities identified

- Turner NRC Report (2003)
  - ***Connecting Quarks with the Cosmos***
- Barish NRC Report (2003)
  - ***Neutrinos and Beyond***
- Nuclear Science Advisory Committee (2002)
  - ***Opportunities in Nuclear Science***
- HEPAP (2002)
  - ***Subpanel Report on Long Range Planning for US High Energy Physics***