

NSF SUPPORT FOR LHC OPERATIONS PROGRAM AND DETECTOR UPGRADES: A SUMMARY



❑ **Purpose:** Support is for university groups operations activities in U.S. ATLAS and CMS Collaborations (following detector construction for **\$81M**)

[NSF also provides core program support for LHCb (Syracuse) and TOTEM initial phase (Penn State/Case Western)]

❑ **Operations Funding Profile (equally divided for ATLAS & CMS)**

FY	03	04	05	06	07	08	09	10	11
\$M	5.0	7.0	10.5	13.6	18.0	18.0	18.0	18.0	18.0

❑ **Ops support coordinated with that of DOE**

❑ **Includes support for Tier- 2 computing facilities (\$2.4M for ATLAS, \$2.7M for CMS)**

Budgets for FY 12-16 depend on the development of new 5-year cooperative agreement proposals for approval by the National Science Board. The process is to begin shortly.

NSF support (cont'd) -- II



- ❑ **Base Support for Universities from EPP Program ~\$14M/yr**
- ❑ **Funding from other NSF-wide sources** (i.e., non-EPP core), examples :
 - Major Research Instrumentation (MRI):
 - FY09: \$500K for LHCb
 - FY 10: \$1.7M for US CMS, \$4.1for US ATLAS, \$0.8M for US LHCb computing with LIGO
 - Partnerships for International Research and Education (PIRE): US CMS- \$2.5 M over 5 years
- ❑ **Funding from other Physics Division sources and partnerships with other NSF Offices :**
 - Open Science Grid (OSG), with DOE, \$13.9 M over 5 years (NSF part)
 - DISUN initiative for campus computing for CMS (\$1M/yr for 5 years)
 - ATLAS/CMS graduate student awards at CERN (e.g., \$365K in FY 10)
 - Education with research (e.g., QuarkNet [with DOE], CHEPREO, I2U2,..)
- ❑ **Upgrade R&D Strategy:**
 - decision reaffirmed to keep the R&D funding support in the Ops program to stimulate a focused R&D effort by a closer coupling between actual operating experience and perceived upgrade goals ;
 - possible other support from NSF-wide programs such as MRI.
- ❑ **Upgrade Construction Strategy:**
 - totally changed because of the change and remaining uncertainty in the LHC run plan and upgrade schedule. Now focused only on the “initial” upgrades. **Possible funding support no sooner than FY 2013.** Meanwhile, possible earlier (but limited) support from other sources may be from the MRI program.