

# LIGO/CMS/ATLAS Computing Proposal to the NSF

**LSC General Meeting  
Stanford University  
July 19, 1999**

# Quick History

- **Spring 99 LIGO approached by the CMS and ATLAS High Energy Physics Collaborations**
- **LIGO invited to explore the idea of obtaining MRE (Major Research Equipment) funding for data analysis facilities**
- **Baseline: \$50 million (three years)**

# Major Concern of LIGO

- **Any MRE proposal for data analysis must not weaken or preempt the Advanced LIGO MRE proposal**

# Who are CMS and ATLAS?

- **The major LHC (Large Hadron Collider) scientific experiments**
- **LHC start: 2005**
- **Goals: discover and study the Higgs particle, CP violation, supersymmetry**
- **CMS = Compact Muon Solenoid: 31 countries, 1800 researchers**
- **ATLAS: 33 countries, 1700 researchers**
- **CMS/ATLAS have significant NSF support**

# CMS and ATLAS needs

- **Widely distributed collaboration**
- **Very large data sets (Petabyte early, 100 Petabyte later)**
- **CMS: cutting-edge national and international network bandwidths**
- **ATLAS: training/development to create reconstruction/simulation software & tools**
- **Network-distributed analysis environment**

# Initial Exploration

- **LIGO/ATLAS/CMS prepared short talking papers describing data analysis needs/vision.**
- **A one-day meeting at NSF took place in early June to explore the possibility of a combined MRE proposal.**

# LIGO Talking Paper Summary

- **Proposed creation of “five” LIGO data analysis centers**
- **Centers networked with Gbps networking links**
- **Each center: 1 Tflop Beowulf compute engine, 10 Tbytes on-line disk, tape robot, user facilities**
- **Entire LIGO-I science run on spinning media**

# Cost of LIGO Component

- **\$12.5 million total**
- **Five analysis centers: \$2 million each**
- **Common networking infrastructure  
\$2 million**
- **Year 2002: set up two of five centers**
- **Year 2003: set up remaining three  
centers**



# ATLAS/CMS/LIGO Common Needs and Problems

- **Need facilities for University-based research community**
- **Very large data sets**
- **“Event independence” often permits parallel analysis**
- **Beowulf-type computational architectures**

# Potential Funding Prospects

- **MRE program is only one of the funding possibilities**
- **IT2/Information Technology for the 21st Century program may be a better alternative**
- **NSF may receive significant new funding for High Performance Computing**

# Outcome of NSF Meeting

- **Write short white paper laying out a basic plan**
- **Circulate within NSF Directorates**
- **If possible, submit a full-scale proposal (perhaps late summer) for review**

## Current Status

- **Paul Avery agreed to take charge of drafting white paper/proposal**
- **Representatives of ATLAS/CMS/LIGO will meet next week to finish work on the white paper**
- **More information on web site:  
[www.phys.ufl.edu/~avery/mre/](http://www.phys.ufl.edu/~avery/mre/)**

*Note 1, Linda Turner, 08/17/99 07:40:04 PM*  
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