



Network-enabled access to globally distributed data:

LIGO-India

Roy Williams

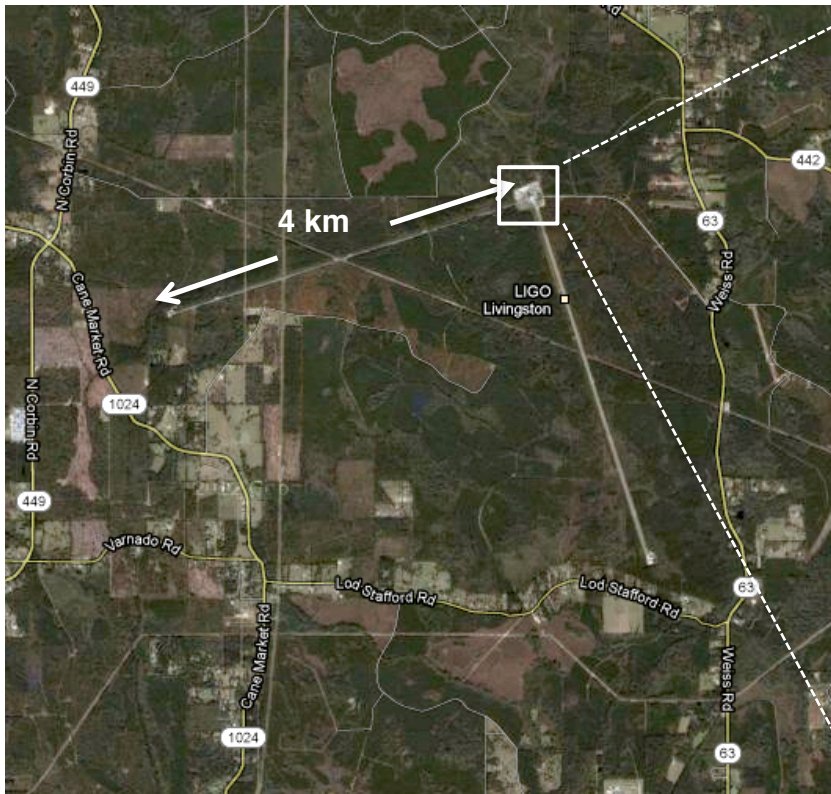
California Institute of Technology



LIGO Observatory

searching for gravitational waves

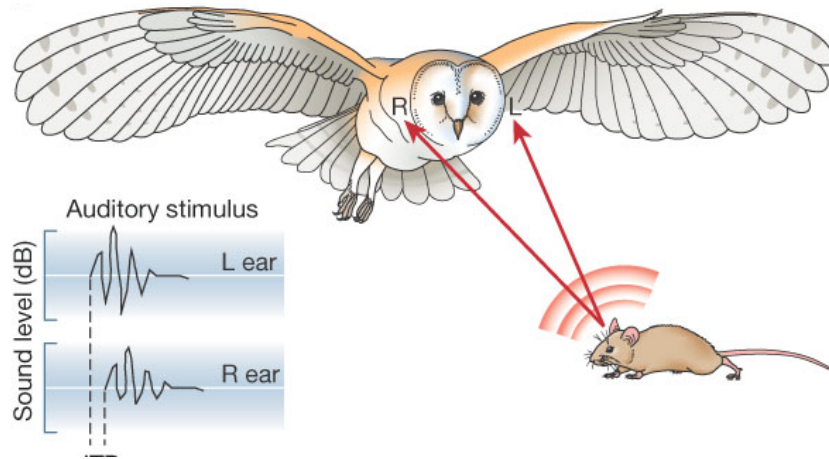
Perfect mirrors, perfect lasers, and ultimate noise suppression



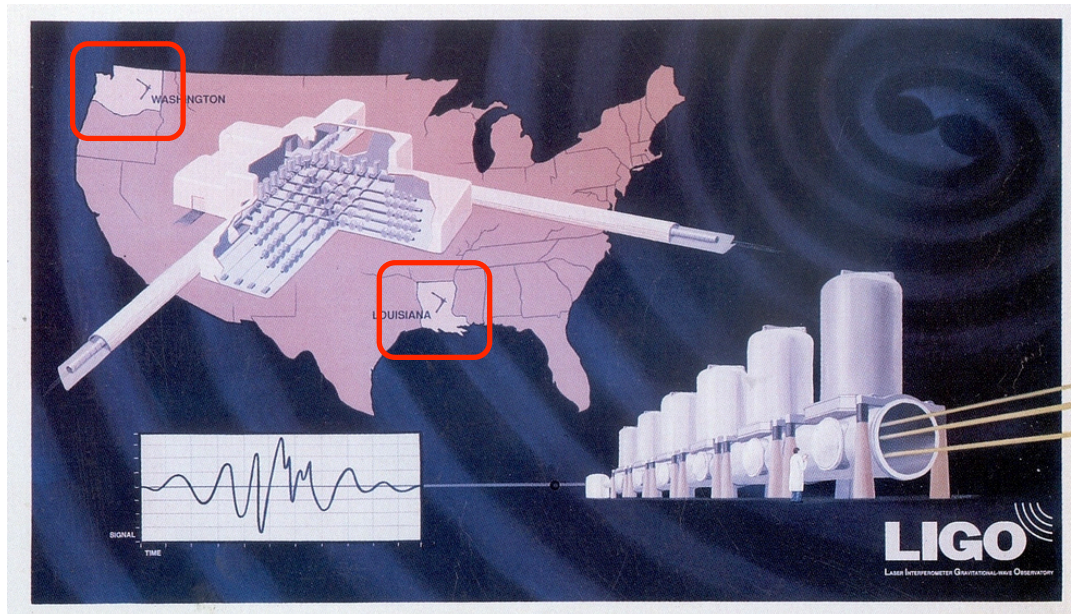


GW Localization “by ear”

Image courtesy Eric I. Knudsen

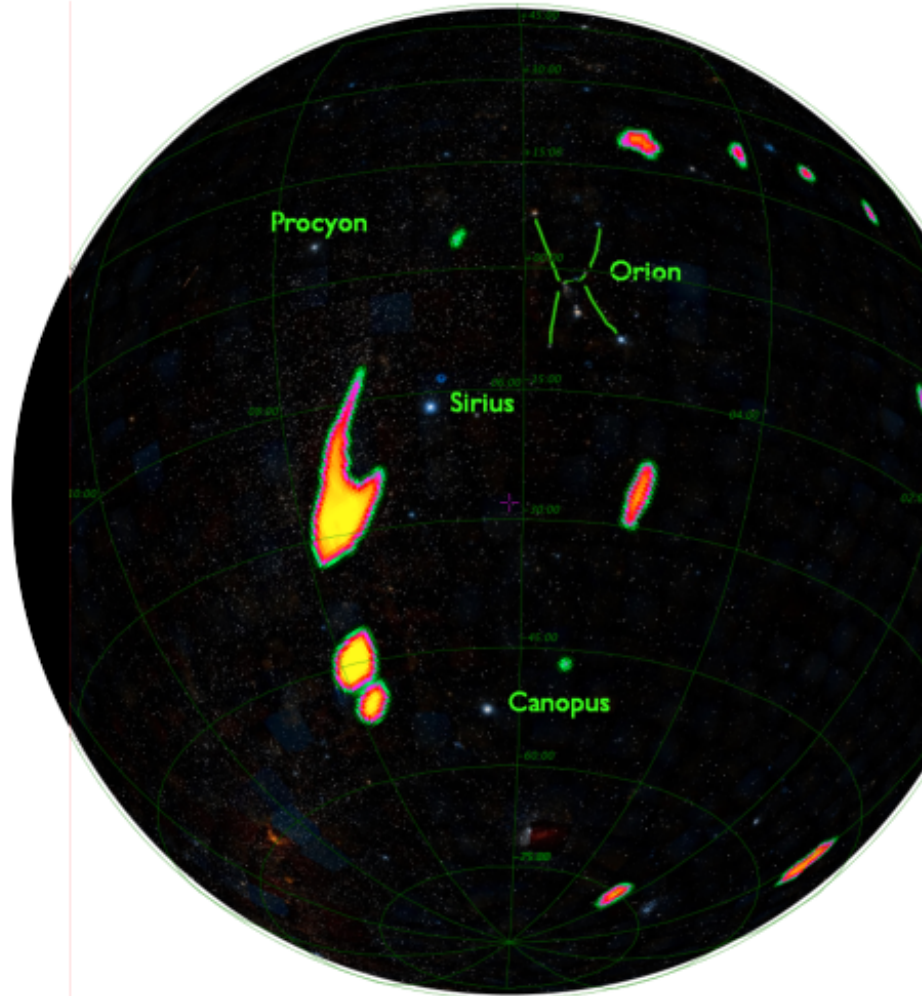


Time differences provide localization
The more ears the better
Everything better with optical identification



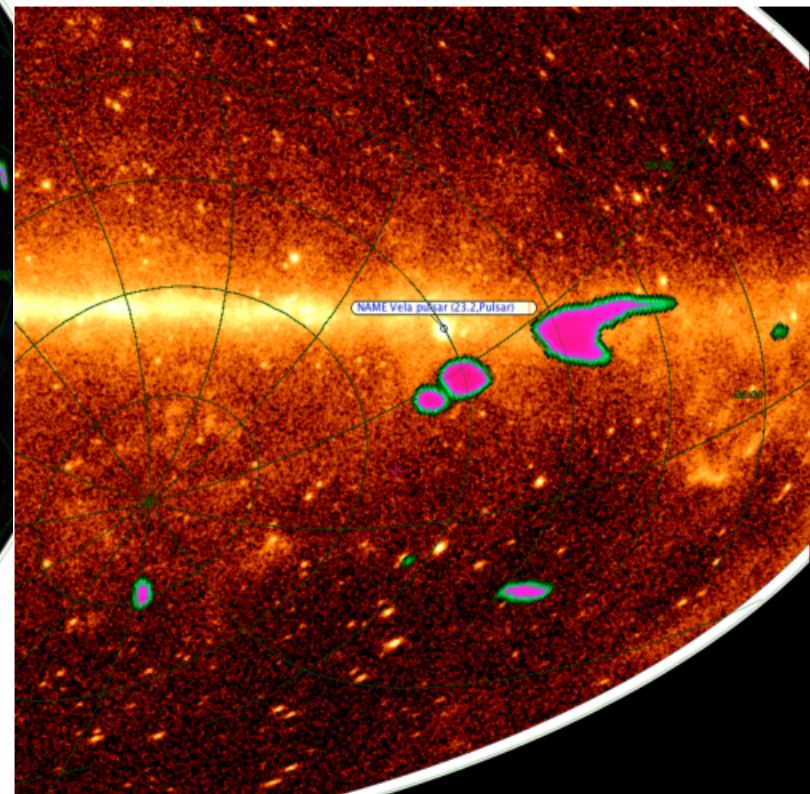
Localization

Bigdog injection



On human sky

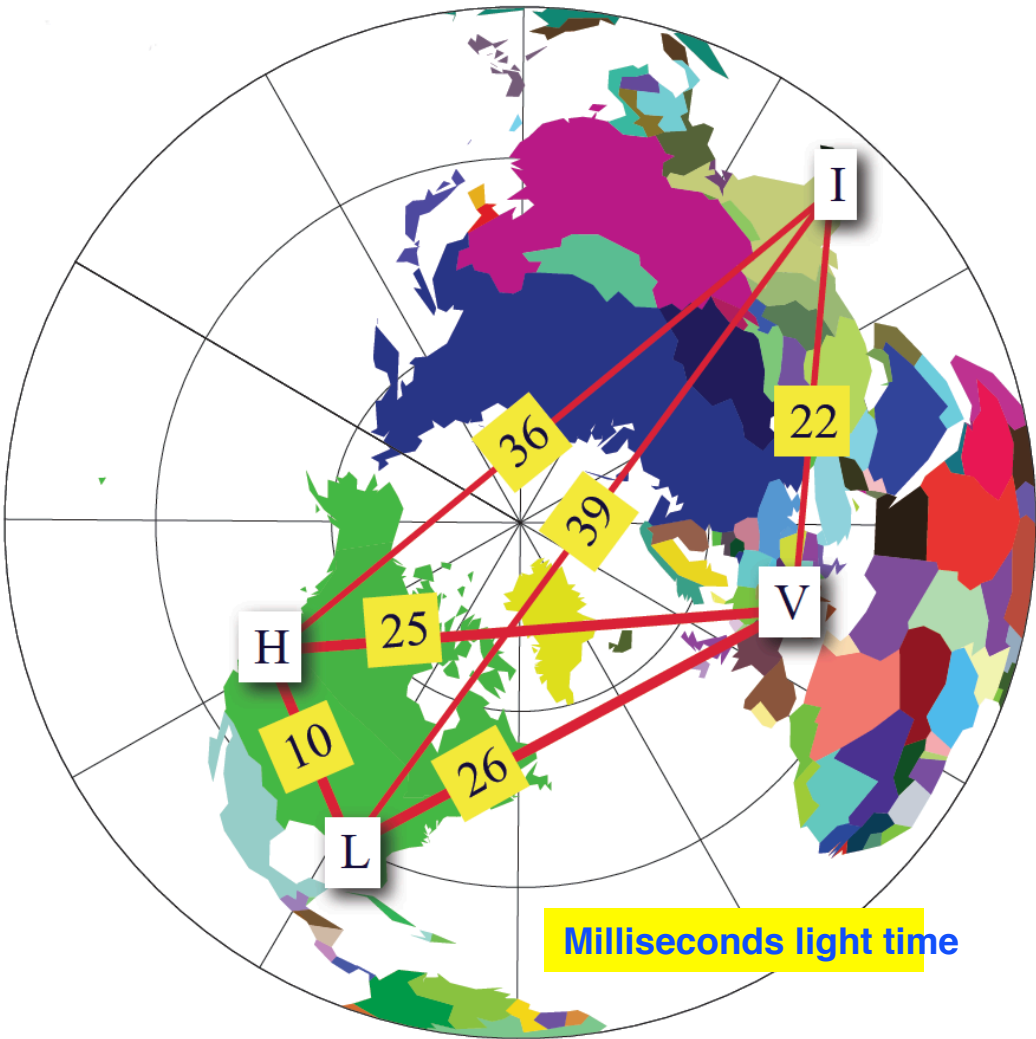
On Fermi gamma sky



Data courtesy LIGO/SC <http://www.ligo.org/science/GW100916/>



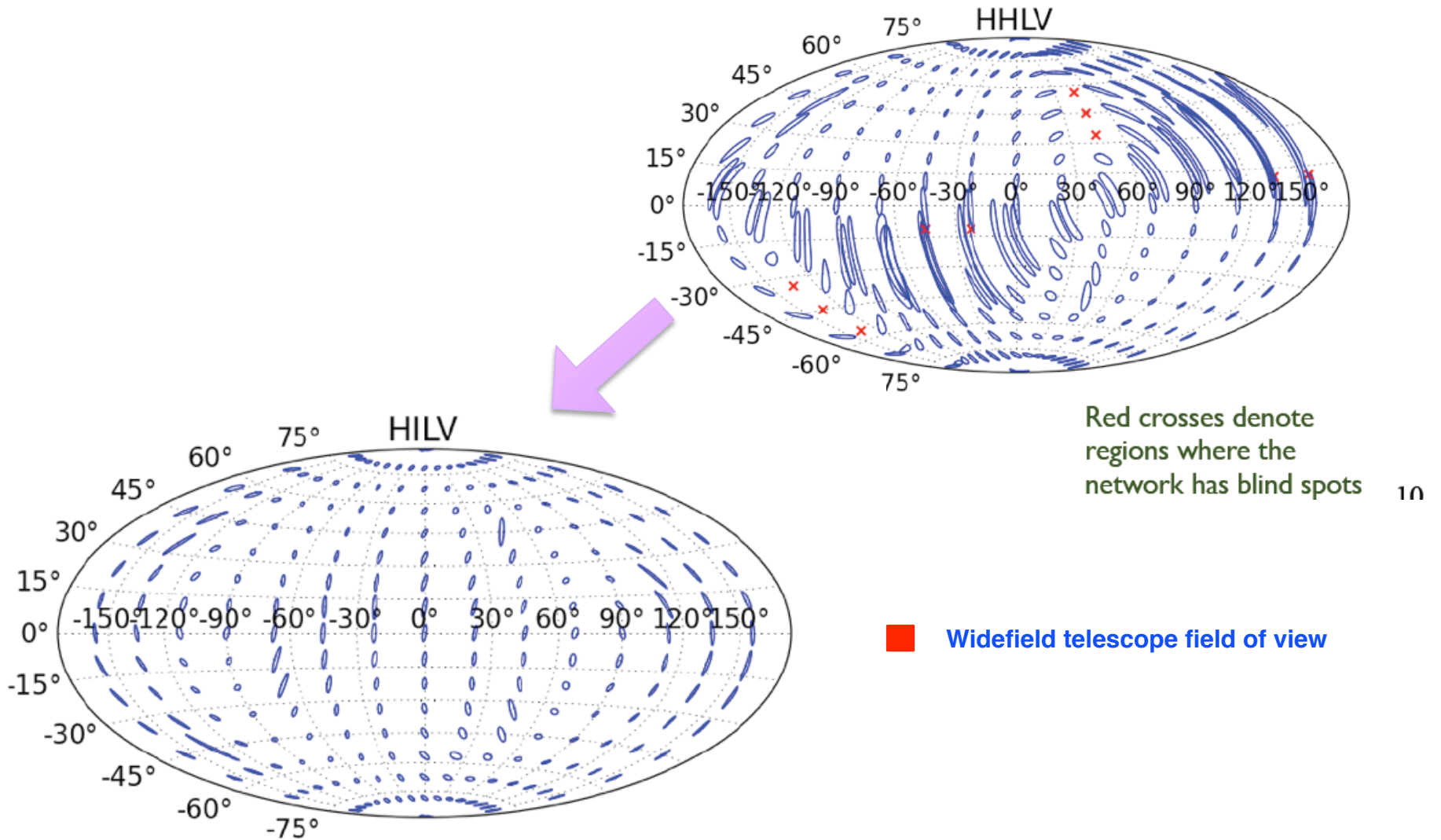
Global GW Observatory



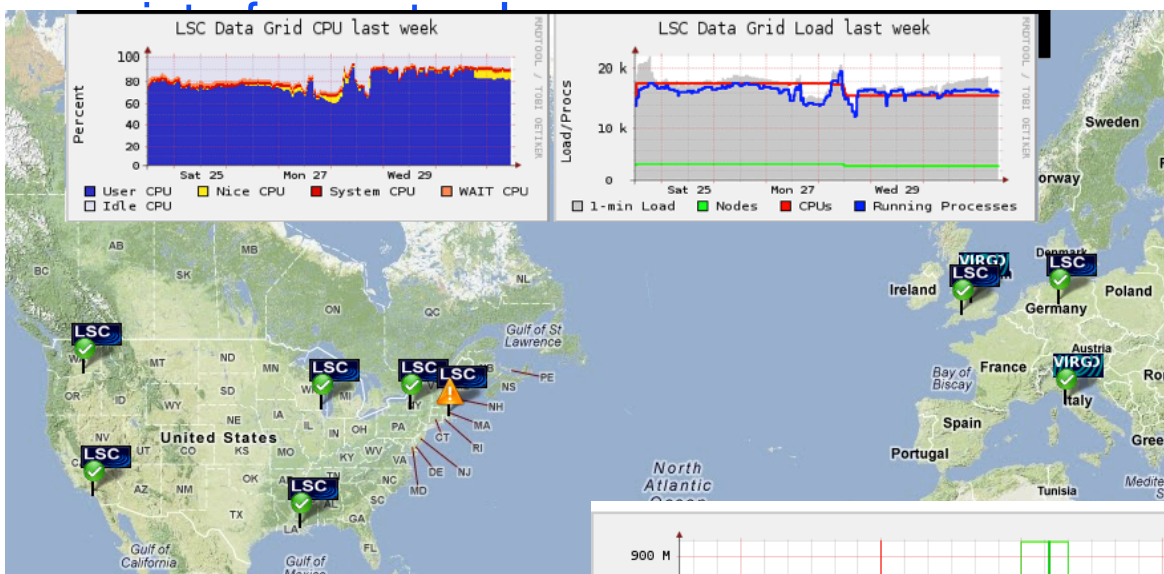
The GW community is hoping for LIGO-India!



Localization capability: India makes the difference

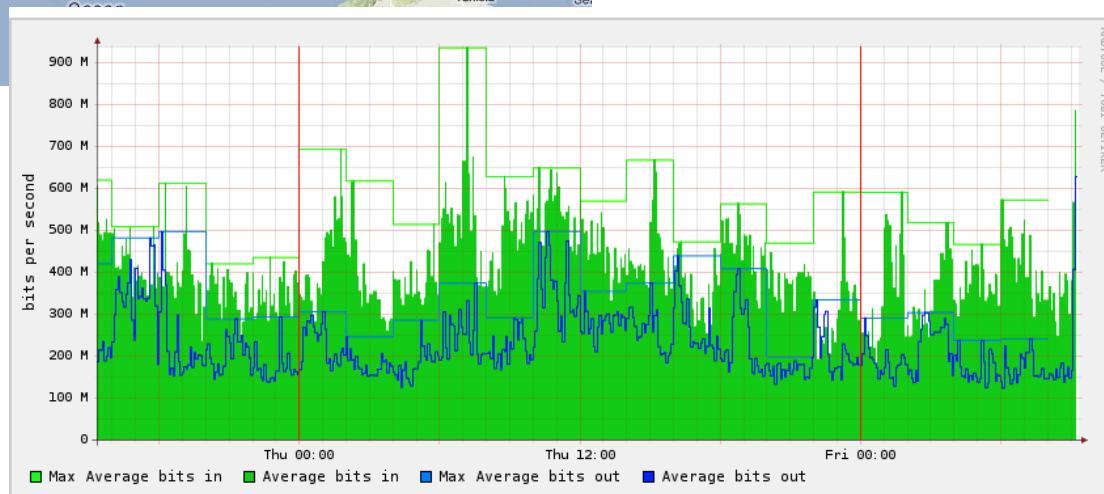


- Computing and networking just as important as the



Need Low latency
Need bulk replication

Each ifo makes ~80 Mbit/sec
Network connectivity ~1 Gbit/sec
Total 1 Pbyte/year





Networking and LIGO

- Global observatory by 2017
 - 2 US sites + FR/IT + India(?) + Japan
 - Much better resolution in sky
 - Much better astrophysics
- Computing and networking is part of it
 - Reliability and Bandwidth are key



Benefits to India of big-science & fast networks

- Ways of work
 - Video meetings
 - Virtual organizations
- Culture of big data
 - Data-mining experts wanted worldwide