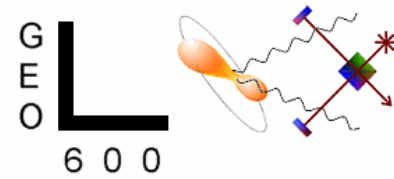


# Update on November 2003 grid-distributed wide-area CW search

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# Why grid-enable Pulsar search?

- The existing validated algorithms are single-pass coherent methods, not hierarchical.
- To search over a broad frequency band, and even a limited area of the sky, requires enormous compute resources
- Within the LSC, we currently have ~1500 CPUs that could be used – but of course they have other duties as well
- A grid-enabled search code would allow us to leverage existing grid platforms and testbeds.

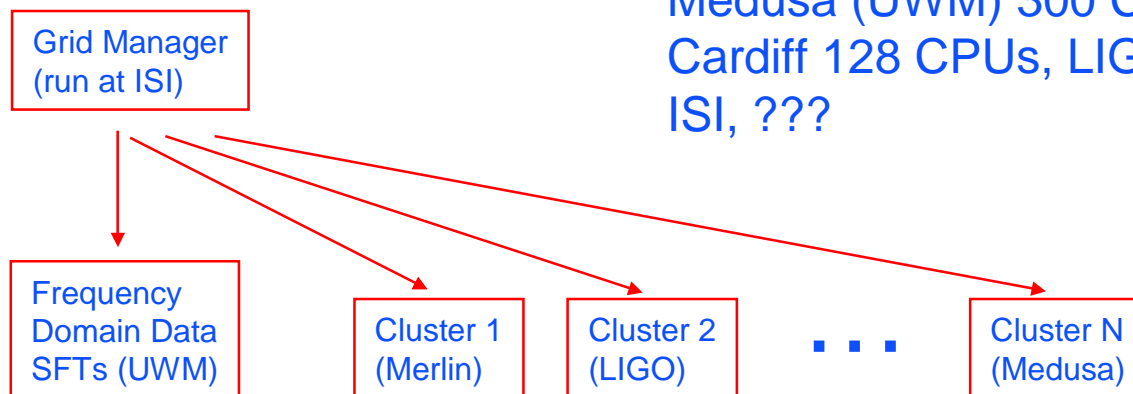


# Why SC 2003?

- The GriPhyN and iVDGL Collaborations are LIGO's pathway into the grid computing community
- The computer scientists in these collaborations work hard to demonstrate their work in the annual SuperComputing N meetings (next is November 2003 in Denver)
- Past demos for SC2001 and SC2002 have not led directly to scientific results/papers. We'd like SC2003 to change this.

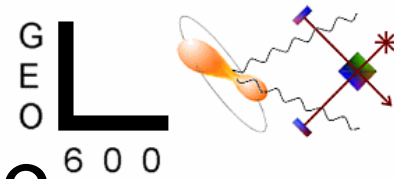
# How will it work?

Resources: Merlin (AEI) 360 CPUs,  
 Medusa (UWM) 300 CPUs,  
 Cardiff 128 CPUs, LIGO Lab 200 CPUs,  
 ISI, ???



The grid manager has a list of search parameters ( $f$ ,  $f_{dot}$ , sky positions). It sends the relevant part of the frequency-domain data to different clusters, along with a stand-alone executable, and runs these on the cluster. The executables that run on the clusters return lists of (up to, say, 10) parameter sets and the corresponding values of the F statistic. They also return some simple statistics on the F-statistic distribution that enable one to quickly determine if the data has noise which is problematic.

The manager is “intelligent” and knows what data exists already at what clusters.



# What search will we do?

- Wide parameter space search
- Wide band
- Long observation time (all of S2) so high resolution in  $f$ ,  $\dot{f}$ , and sky position
- Deep search of selected interesting areas, for example
  - » galactic core
  - » first spiral arm
  - » Gould Belt (see Greg Mendell's talk). Claims exist that @100-200Hz there might be detectable S2 sources. Gould belt is 50-400 pc away.
  - » Unidentified X-ray sources
  - » SN remnants
  - » globular clusters
- Pulgroup is working on choosing parameter space – but this has little impact on the setup of the software/grid infrastructure.