Overview of Laser Interferometers for Gravitational Wave Detection

David Shoemaker
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- Nature of gravitational radiation
- Some likely GW sources
- How to detect GWs
- Specific optics and sensing problems and solutions
- Other limits to sensitivity and approaches
- LIGO project

LIGO Project

(Laser Interferometer Gravitational-wave Observatory)

- Two institutions
  - California Institute of Technology
  - Massachusetts Institute of Technology
- Two sites
  - Hanford, Washington
  - Livingston Parish, Louisiana
  - 3000 km separation (triangulation)
- multi-use installations at each site
  - 4km arm, 1m diameter vacuum tube
  - can accommodate up to 9 interferometers at the two sites
- 20 year lifetime
  - initial discoveries
  - technology evolution
  - astronomy using GWs as unique probe
- On-track and in construction
  - ground clearing at both sites underway
  - major design contracts let or about to be
  - plan first light in early 2000