

Plan to Commission and Operate LIGO

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LIGO Operations: 1997-2001

- LIGO Operations commence at Joint Occupancy as Construction activities wind down
- initial activities focus on installation, integration and commissioning of the initial detector, including all control and data system hardware
- the initial detector is commissioned at a sensitivity of $h_{\text{rms}}=10^{-20}$ in triple-coincidence mode
- after commissioning commence normal LIGO operations:
 - ›› gravitational-wave searches and analyses
 - ›› sensitivity improvement to $h_{\text{rms}}=10^{-21}$
 - ›› detector upgrades and associated R&D

Detector Systems Integration and Commissioning

- comprised of interferometers, physics environmental monitors, and control and data system
- involves repeated build-up of similar subsystems
- plan earliest integration of as many detector subsystems as possible with control and data system
- performance to be verified for each major subsystem at the earliest possible time.
- early shakedown results will identify any issues to be addressed before continuing with the integration of additional subsystems

Significant LIGO Commissioning Events

<i>Event</i>	<i>Hanford Date</i>	<i>Livingston Date</i>
Joint Occupancy	09/97	03/98
Beneficial Occupancy	03/98	09/98
Accept Vacuum Equipment	03/98	09/98
Initiate Facilities Shakedown	03/98	09/98
Initiate IFO Installation	04/98	01/99
First PSL operational	06/98	04/99
First light on beam splitter	08/98	06/99
First recycled Michelson resonance	11/98	08/99
First full interferometer resonance	03/99	11/99
Detector Commissioned ($h_{\text{rms}} \leq 10^{-20}$)	07/00	Common
Begin Normal Operations	07/00	Common
Detector Design Sensitivity Achieved ($h_{\text{rms}} \leq 10^{-21}$)	11/01	Common

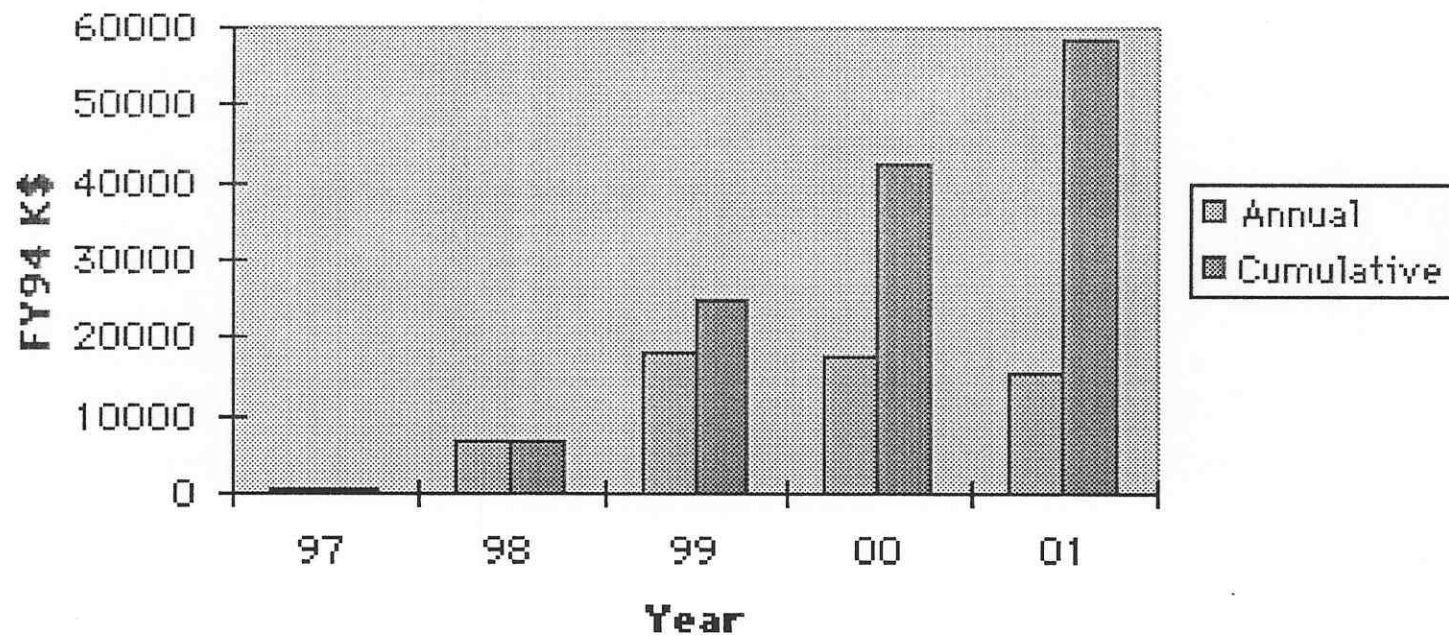
Observatory Activities During Normal Operations

- gravitational-wave searches
- detector characterization & sensitivity improvement
- data analysis
- maintenance, repair and calibration of observatory equipment
- providing liaison to visitors, ensuring the safety of the facilities and resolving interferences among different activities

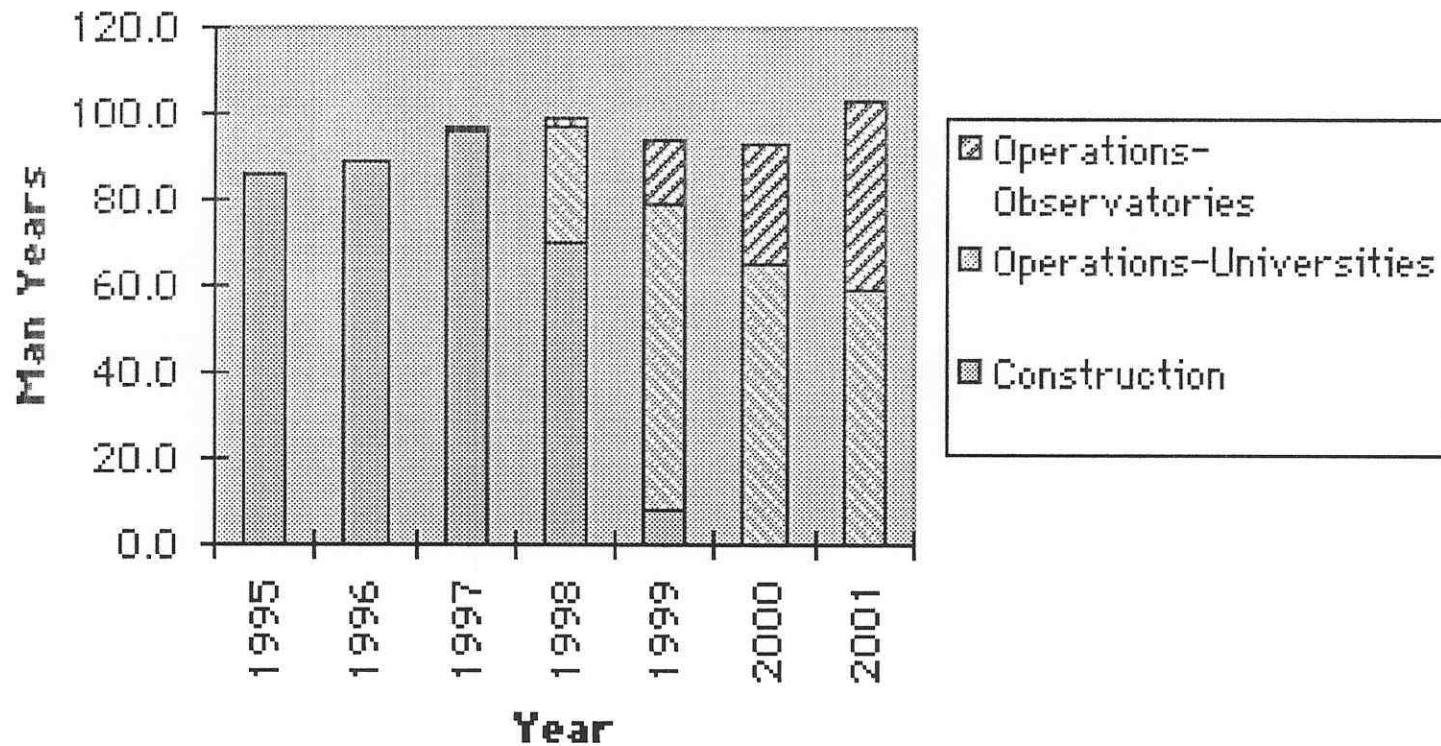
Activities at Universities During Normal Operations

- program management
 - ›› director's office
 - ›› budget/contracts office
- R&D into more advanced detector technologies and development of upgrades to initial detector
 - ›› development of improved laser sources,
 - ›› development of optics and special interferometer configurations which promise better shot-noise performance,
 - ›› development of better test masses and suspensions to improve seismic isolation and lower thermal noise,
 - ›› development of better seismic isolation techniques.
- data analysis, archiving and distribution
- student supervision/training
- coordination with national community

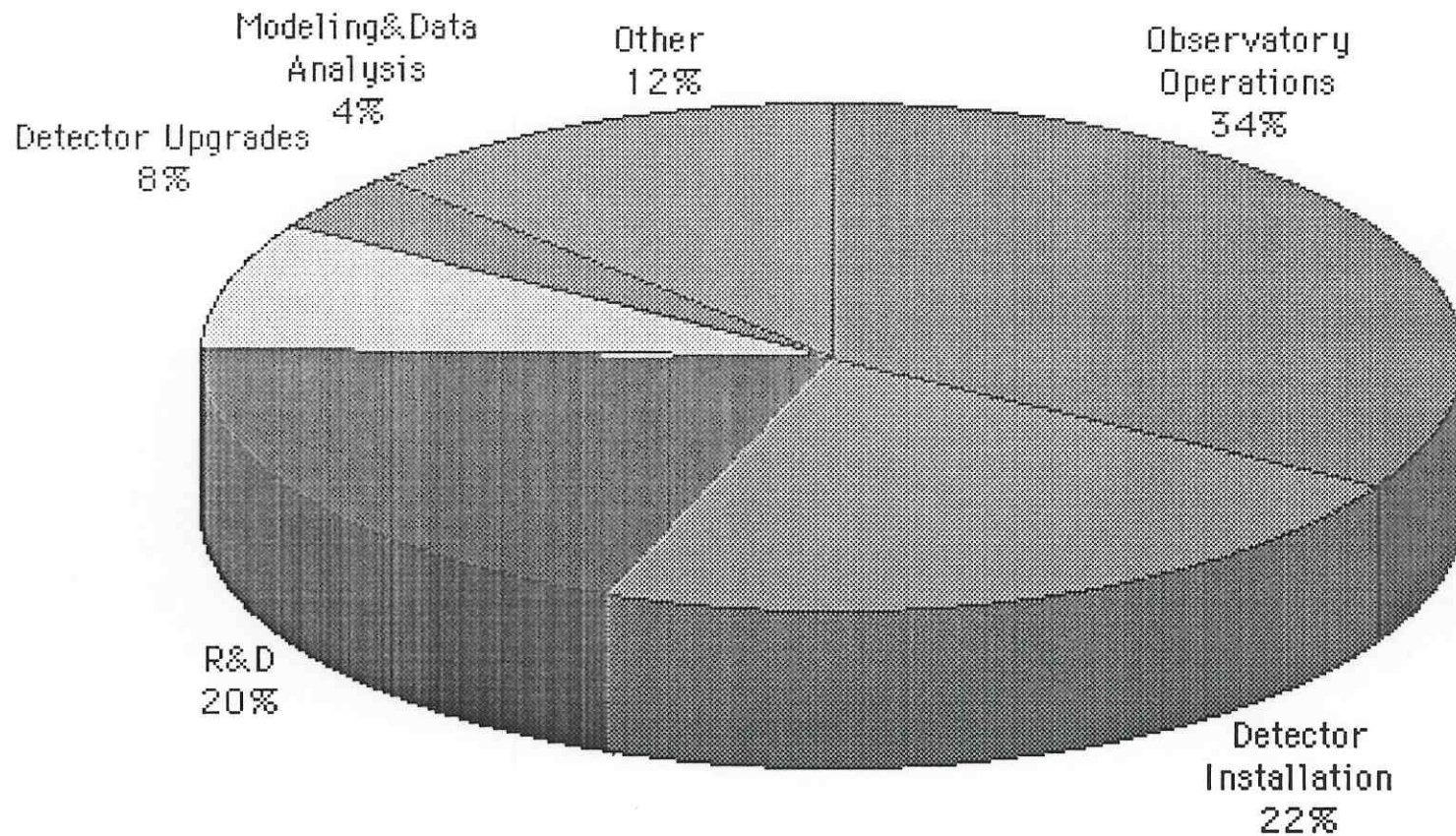
Proposed LIGO Funding Profile 1997-2001



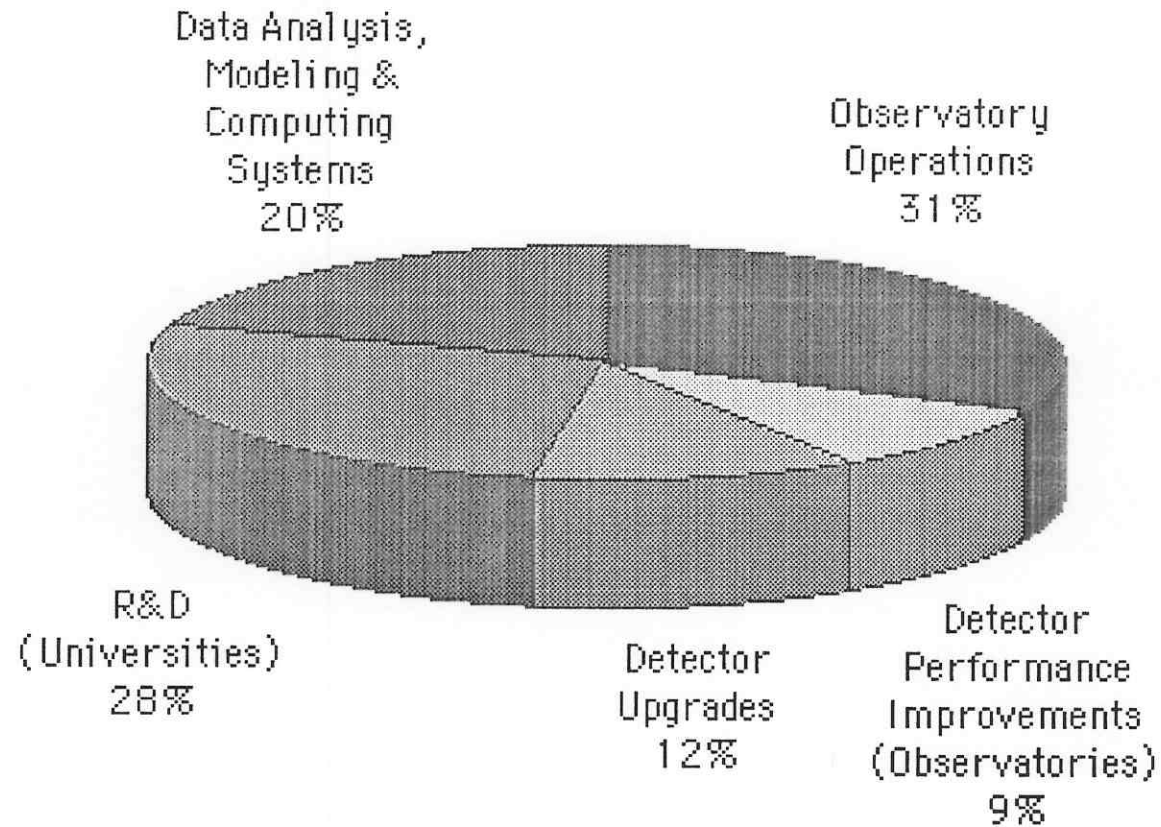
LIGO Manpower Profile 1995-2001



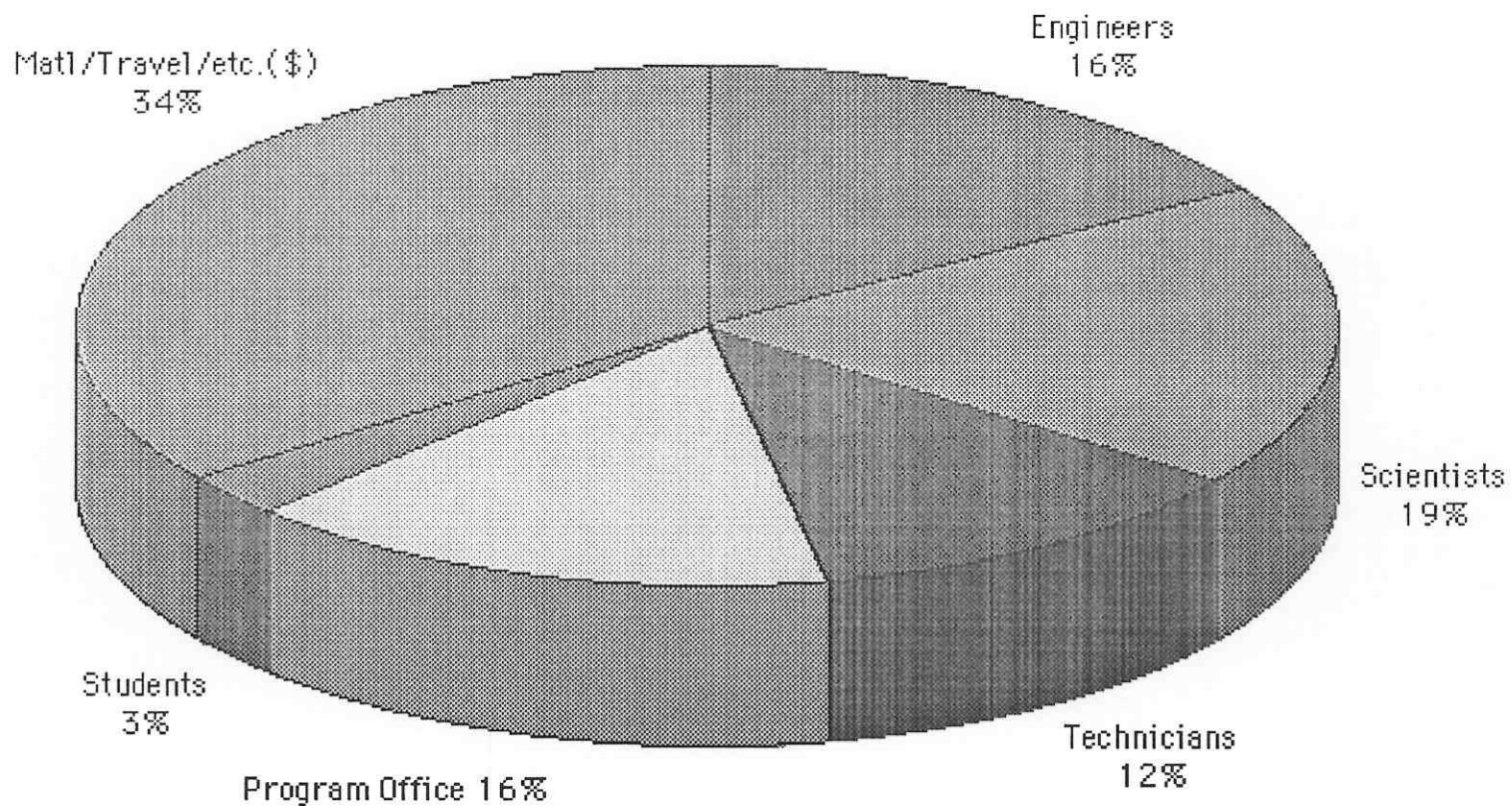
Integrated Expenditures By Activity For LIGO Operations



LIGO Technical Staff By Activity - 2001

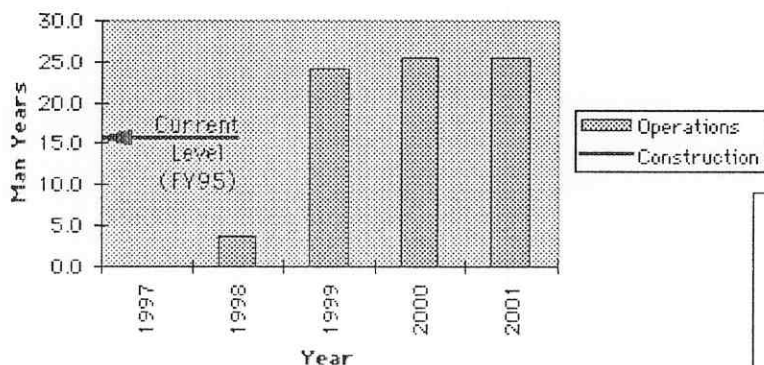


Integrated Expenditures By Resource For LIGO Operations

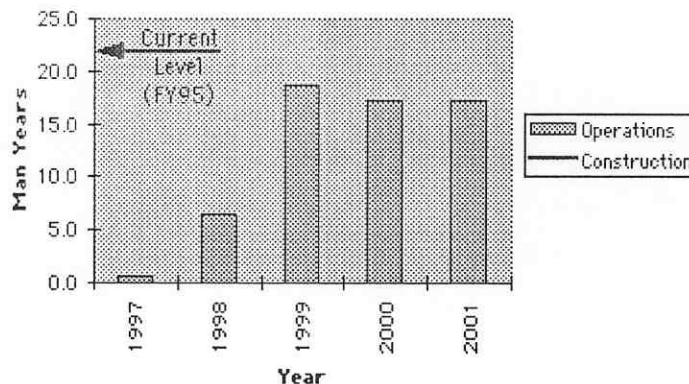


Labor Profile by Discipline for LIGO Operations

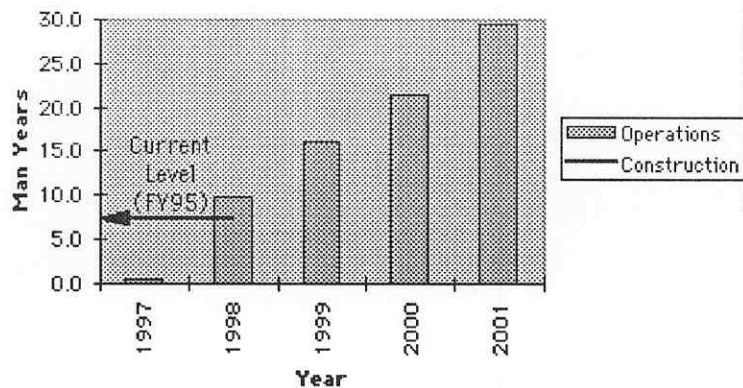
LIGO Staffing - Scientists



LIGO Staffing - Engineers



LIGO Staffing - Technicians



LIGO Personnel By Site - 2001

