

# Quick Overview -

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## **LIGO's plans, schedule, and capabilities**

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**LIGO Project**

**Presentation at Galileo/NSF Review May 8-10, 1996**

# LIGO plan to incorporate outside users into the research effort

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- User model

- >> Facility creates Program Advisory Committee

- To be formed in 1996
    - Collaborative research proposals:
      - submitted for scientific/technical review, followed by funding agency review
      - Can be independent efforts

- >> Users Group creates “LIGO Research Community”

- Provide organized channel for interchange of information between LIGO management and those who utilize scientific opportunities afforded by LIGO.
    - Advocacy body for those who study gravitational waves

# LIGO plans (continued)

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- VIRGO

- >> Agreement with VIRGO to carry out collaborative work and to permit data exchange
- >> Interest to establish similar collaborations with others, such as Galileo, to exchange technical information and to pursue areas of common interest.

# Memoranda of Understanding

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- >> LIGO has established MoU's with broad areas of agreement. Attachments have specific details.
- >> Avenue to state specific tasks, deliverables, schedule
- >> MoU's in place with:
  - Australian National Univ.
  - LSU (Warren Johnson),
  - Syracuse (Peter Saulsen),
  - U of Wisconsin @ Milwaukee (Bruce Allen)
  - JILA (Faller)
  - Stanford U (Bob Byer)
  - Caltech (Kip Thorne)
- >> Working on additional MoU with VIRGO

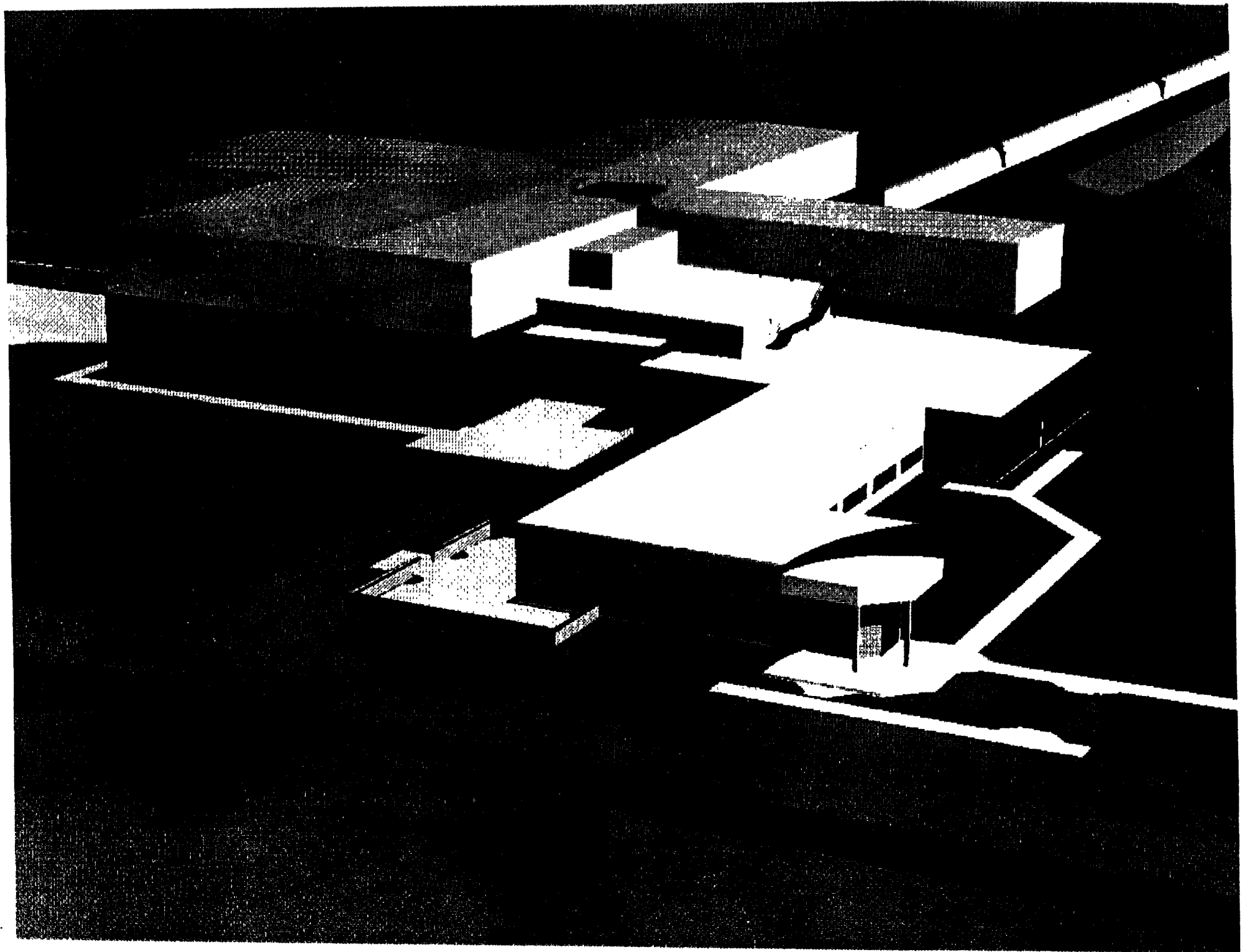
# What infrastructure can LIGO provide to outside users?

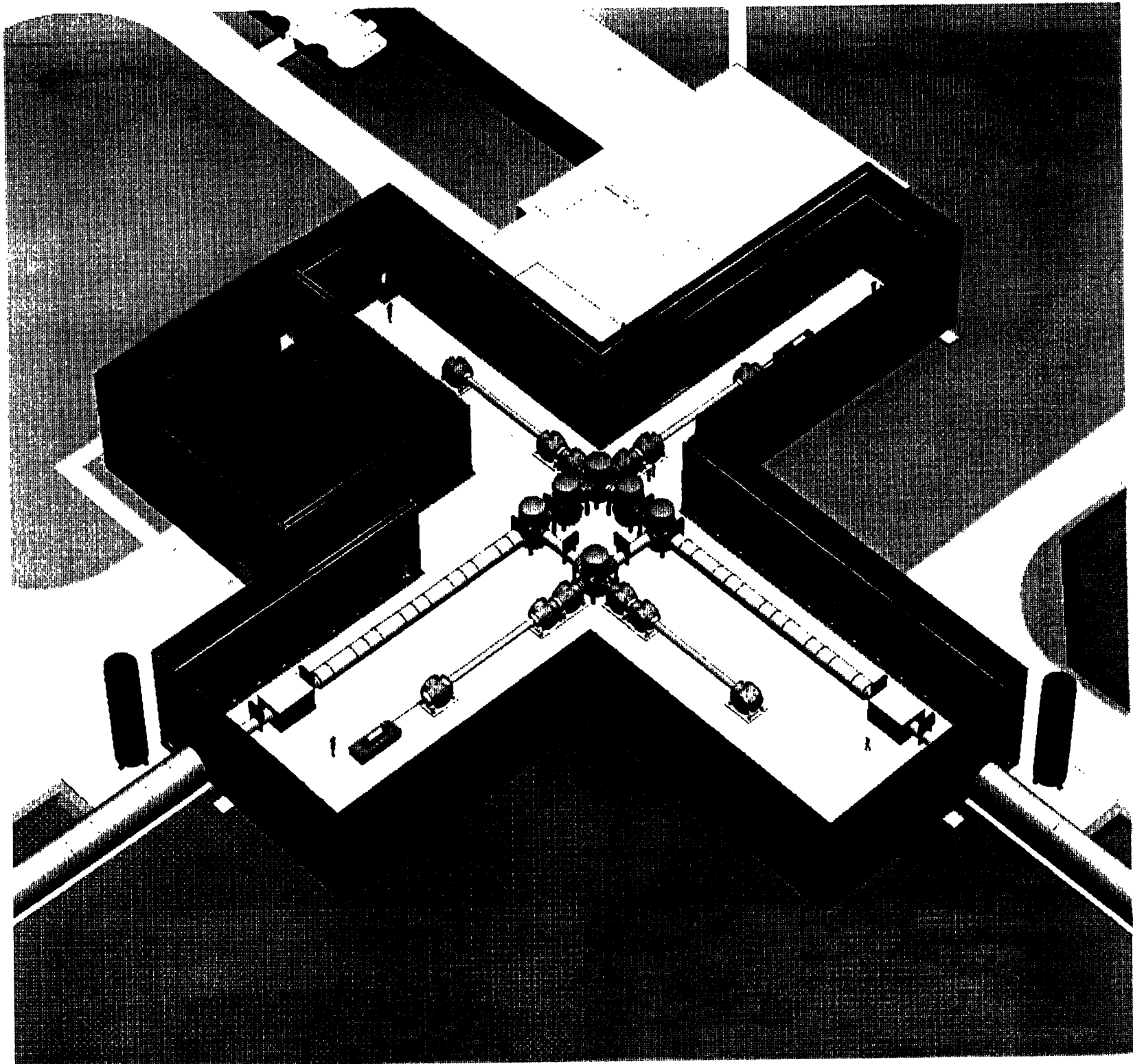
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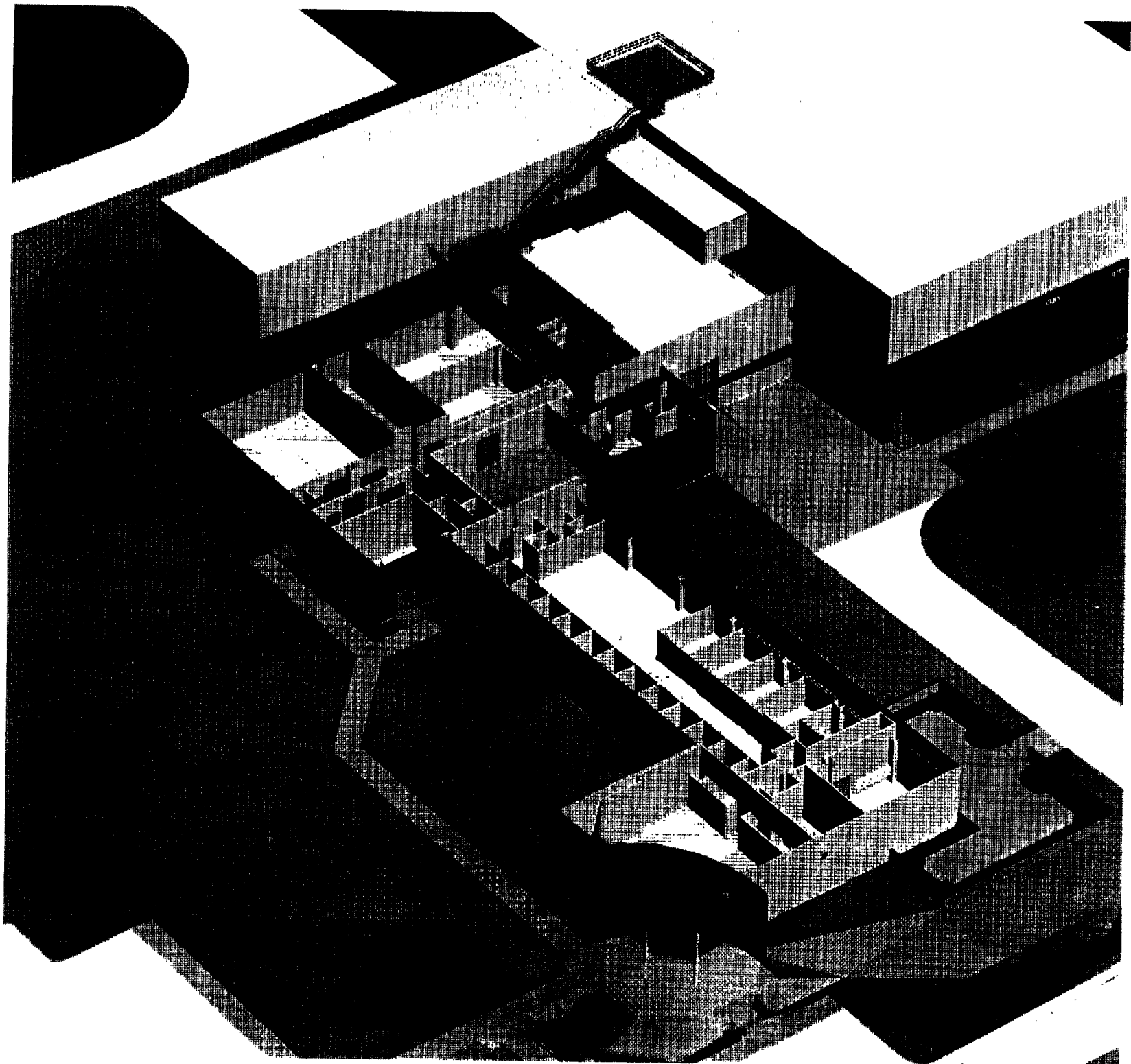
- LIGO buildings designed to house one additional interferometer at each site without requiring additional civil construction.
- Lab space for electronics and optics sized to provide operational support.
- Staffing levels provide sustaining support for initial LIGO: data collection, vacuum maintenance, electronics, etc.

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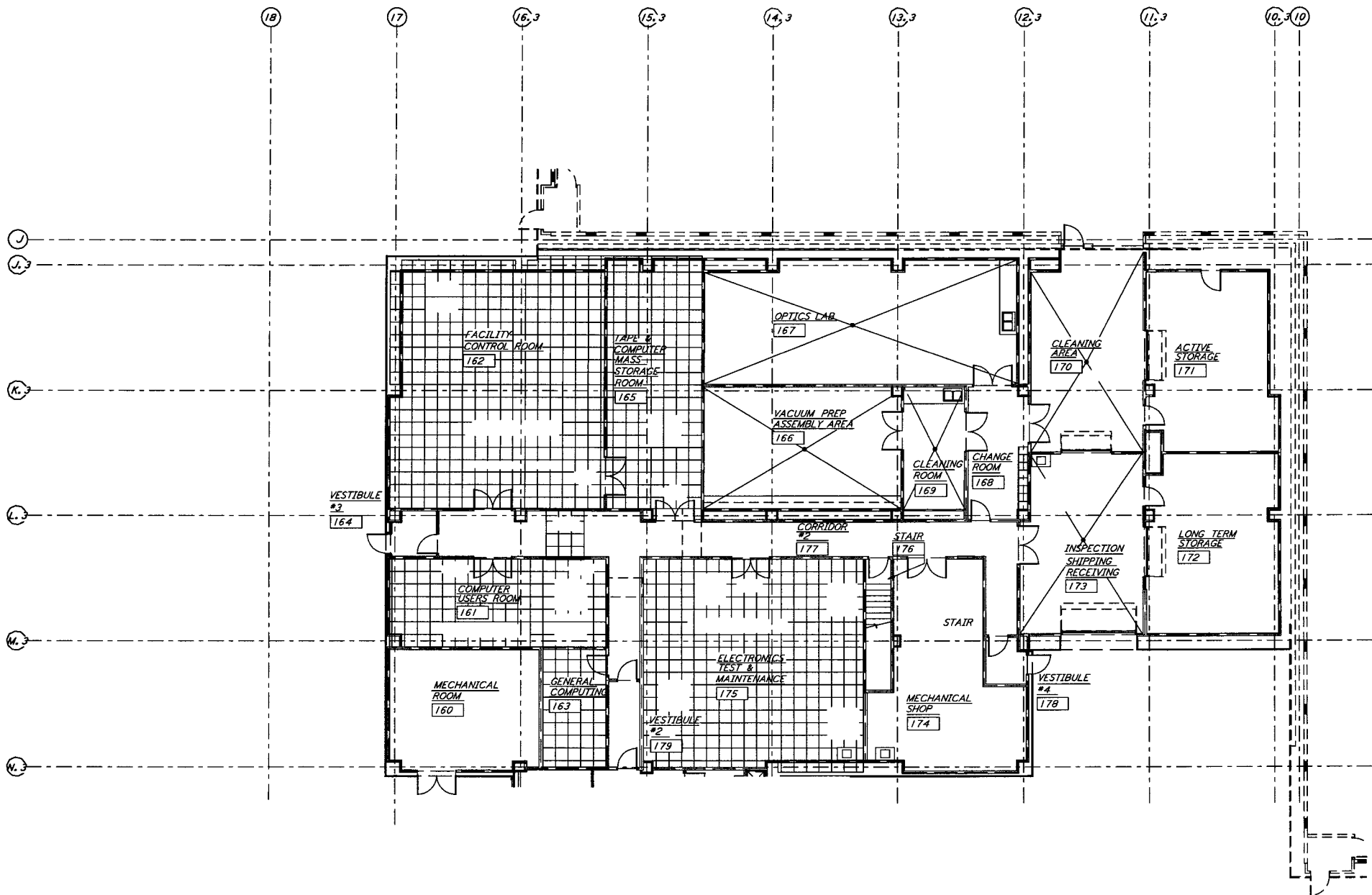
- existence of these facilities and manpower should help with addition of any new apparatus.
- possible benefit from existing Facility Monitoring System, data communications, vacuum control system

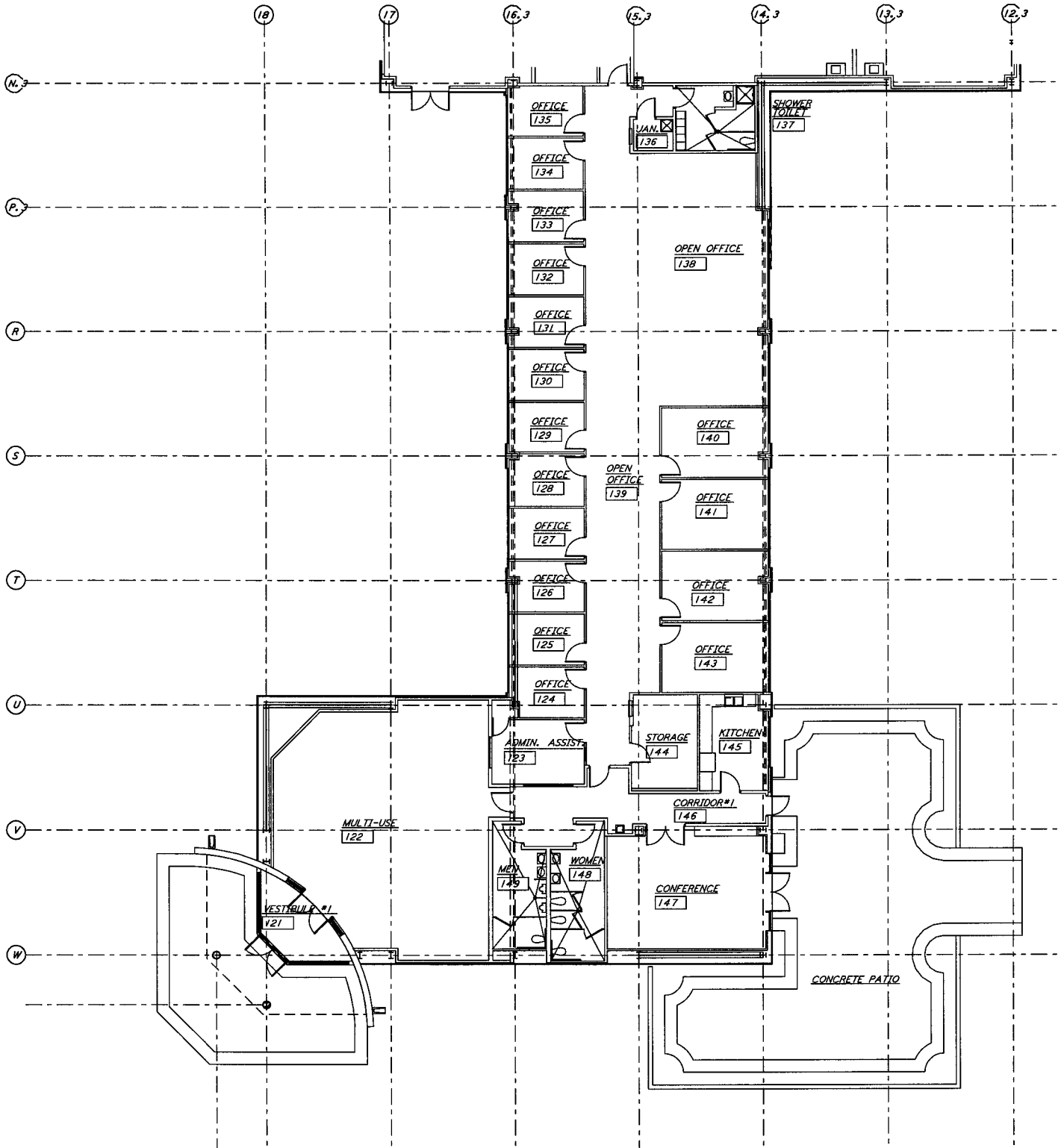












# Cost increments for new facility

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- Vacuum system ~\$3 M
  - >> 5 BSC chambers - \$250K ea.
  - >> some number of HAM chambers @ \$125K ea., (6 in LIGO design)
  - >> manifolds, < \$100K
  - >> 4 gate valves @ \$125K ea.
  - >> 4 ion pumps @ \$25K ea.
- use existing roughing and turbo pumps, fiber optic channel to end stations.

# Sequence of events for new construction

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1. Finish grading of the back side of the LVEA
2. Excavate for the wall and technical slab
3. Modify the fire ramp to make room for expansion
4. Install all underground utilities (electrical stub ups, drains, water)
5. Place concrete for the LVEA expansion and additional utility room
6. Erect the structural steel framing for the LVEA expansion and utility room
7. Finish the building shell
8. Complete the mechanical and electrical support services (ductwork, wire pulling, etc.)
9. Finish preparation of the building (cleaning, filter installation, etc.) for Vac. Eqpt. installation
10. Install Vacuum Equipment in expansion LVEA
11. Provide wall penetrations for vacuum system connection.

# When will LIGO be ready to install independent experiments?

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- LIGO baseline schedule:
  - >> operation at  $10^{-20}$  /rt(hz) in 2000
  - >> operation at  $10^{-21}$  /rt(hz) in 2001
- availability requirement
  - >> triple coincidence 75%
  - >> double coincidence LA+either WA 85%
  - >> single IFO operation 95%
- Installation should occur in way compatible with system downtime.