

Memorandum of Understanding
between the
Center for Gravitational Physics and Geometry(CGPG) of the
Pennsylvania State University
and the
Laser Interferometer Gravitational Wave Observatory (LIGO) Project
August 1, 1995

The purpose of this Memorandum of Understanding is to establish and define a collaborative relationship between the Center for Gravitational Physics and Geometry(CGPG) of the Pennsylvania State University and the Laser Interferometer Gravitational Wave Observatory (LIGO) Project. Both parties to this agreement share the joint goals of observing gravitational radiation and of using gravitational radiation as an astrophysical probe. This agreement is intended to further these joint goals.

1. The primary goal of the Center for Gravitational Physics and Geometry(CGPG) is to enhance research in quantum gravity and general relativity, and in the related areas of geometry, mathematical physics, computational relativity, cosmology, and relativistic astrophysics. Located in the Physics Department of the Pennsylvania State University, the Center interacts strongly with theorists in high-energy physics, and its members include faculty in the Mathematics and Astronomy Departments as well. The core faculty of the Center are Abhay Ashtekar, Lee Smolin, Jorge Pullin, and Curt Cutler, and Prof. Roger Penrose visits the Center for approximately one month each semester. In addition, the Center generally has eight to ten postdoctorals and a comparable number of graduate students.
2. The Laser Interferometer Gravitational-Wave Observatory (LIGO) Project is aimed at opening the field of gravitational-wave astrophysics through the direct detection of gravitational waves. LIGO detectors will use laser interferometry to measure the distortions of the space between free masses induced by passing gravitational waves. The design, construction, and operation of LIGO is being carried out by scientists, engineers, and staff at the California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT). Caltech has prime responsibility for the project under the terms of a Cooperative Agreement¹ with the National Science Foundation (NSF). LIGO is a national facility for gravitational-wave research, providing opportunities for the broader scientific community to participate in detector development, observations and data analysis. LIGO welcomes the participation of outside scientists at any of these levels. LIGO is being constructed in a phased approach

1. Cooperative Agreement No. PHY-9210038 between the National Science Foundation, Washington, D.C. 20550 and the California Institute of Technology, Pasadena, CA 91125, dated May 1992.

beginning with one three-interferometer detector system and evolving to a nine-interferometer configuration to enable simultaneous use by several gravitational-wave observation systems.

3. In entering into this Memorandum of Understanding, the LIGO Project will carry out its responsibilities following the requirements of the Cooperative Agreement¹.
4. The LIGO Project is responsible for obtaining NSF approval of all collaborative Memoranda of Understanding with international partners, or of those involving NSF costs exceeding \$100,000. All Memoranda of Understanding will be provided to NSF for their information.
5. Each party to this agreement continues to be responsible for all support of its staff including travel costs associated with the activities under this agreement. Exceptional support of travel by the other institution may be allowed for travel requested by that party.
6. This Memorandum of Understanding will remain in force until the parties mutually agree to terminate it. An annual Attachment will define specific activities if any, beyond those spelled out in this document , to be carried out during the following year.

Approved:

Barry Barish
 Barry Barish
 LIGO Principal Investigator

 Curt Cutler
 Pennsylvania State University
 Principal Investigator

Aug 3, 1995
 Date

 Date

 Raymond Nargi
 Associate Treasurer

 Date