Memorandum of Understanding (LIGO-M050266-00-M) between the Michigan Gravitational Wave Group (MGWG) and the Laser Interferometer Gravitational Wave Observatory (LIGO)

August 15, 2005

The purpose of this Memorandum of Understanding (MOU) is to establish and define a collaborative relationship between the Michigan Gravitational Wave Group (MGWG) and the Laser Interferometer Gravitational-Wave Observatory (LIGO). Both parties to this agreement share the broad goals of developing the instruments and techniques for detecting and studying gravitational waves, and subsequently using them as an astrophysical probe. Under this MOU, the MGWG Group will become a member group of the LIGO Scientific Collaboration.

1. The Michigan Gravitational Wave Group (MGWG) consists of Professor Keith Riles, who will serve as Principal Investigator for research in LIGO, Research Scientist Dick Gustafson, and a small group of graduate and undergraduate students. The focus of the work done by the MGWG under this agreement will be searching for radiation from gravitational wave pulsars, LIGO detector characterization, and commissioning of the LIGO Hanford interferometers.

2. LIGO comprises two parts: the LIGO Laboratory and the LIGO Scientific Collaboration. These two entities report to the LIGO Directorate, consisting of the LIGO Director, the LIGO Scientific Collaboration Spokesperson, and the LIGO Laboratory Deputy Director. The design and construction of the LIGO Observatories were carried out by California Institute of Technology (Caltech) and the Massachusetts Institute of Technology (MIT) under a Cooperative Agreement between the National Science Foundation (NSF) and Caltech. The LIGO Oversight Committee supervises the realization of LIGO.

    A. The LIGO Laboratory is responsible for the operation of the LIGO Observatories, the development and implementation of future detector systems, and participates in all aspects of the research with the LIGO detectors. LIGO is a system of three interferometric Fabry-Perot antennas, two of them 4 kilometers long and the third one 2 kilometers long, aimed at the simultaneous detection of gravitational waves in the frequency range 40-6000 Hz. LIGO Observatories are located in Hanford, Washington and in Livingston Parish, Louisiana (USA) and began observations in the year 2002. The LIGO Laboratory is funded through a Cooperative Agreement between the National Science Foundation and Caltech, with the portion of

the LIGO Laboratory at MIT funded through a subcontract.

B. The LIGO Scientific Collaboration (LSC) is organized as a separate organization from the LIGO Laboratory. It includes scientists from the LIGO Laboratory, and those from collaborating institutions, and has its own leadership and governance. The Collaboration ensures equal scientific opportunity for individual participants and institutions. It organizes the research, publications, and all other scientific activities. The Collaboration reports to the LIGO Directorate for final approval of its research program, technical work, observational physics publications, and talks announcing new observations and physics results. This will be done through regular reports to the Directorate and its Program Advisory Committee. The organization of the LSC and its governance are defined in its Charter.

3. As a member group of the LSC, the MGWG Group will participate in the governance of the LSC and in setting its policies and procedures, as defined in the LSC charter. Similarly, it agrees to abide by the policies and procedures adopted by the LSC and posted on its website (http://www.ligo.org/policies.html), concerning publication, data access, software standards, and so on.

4. Participation in the LSC brings with it responsibility for service functions to support the overall effort in achieving high detector sensitivity and high data quality. In particular, each LSC group is expected to assist in the staffing of scientific monitoring shifts during organized data runs. The staffing of these shifts is notable for both its importance and the travel burden it places on scientists.

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 institution.

6. Attachments to this MOU will be prepared annually to define the specific activities and responsibilities of the MGWG Group and to define any resources to be provided by the LIGO Laboratory to the MGWG Group in support of those activities.

7. MGWG Group will provide a status report on its activities in support of LIGO annually. The report will consist of a summary status on research by topic as indicated in the Attachments for that period including progress against the milestones if any, significant accomplishments such as new insights/discoveries or publications, issues of concern if any, and an indication of invested time by each member of the group. The report will be due one month before the close of the period of performance under the Attachments in question.

8. The LSC will review the progress report against the Attachments from the previous year and assess the Attachments for the up-coming year annually, under its established procedure, and recommend acceptance or rejection of the Attachment by

the LIGO Director and the LSC Spokesperson.

9. The membership list of the MGWG group will be updated at least every six months. MGWG Group members and appropriate contact information will be provided in electronic form as Attachment Z to this Memorandum of Understanding. In cases where individuals who leave the group have had access to LIGO data and this access should be terminated, the MGWG Group Principal Investigator is responsible for timely notification to the Directorate and to the computing committee so access may be revoked.

10. The LIGO Laboratory is responsible for obtaining NSF approval of collaborative Memoranda of Understanding where required. All Memoranda of Understanding will be provided to NSF for their information.

11. The rights to intellectual property developed under this Attachment using LIGO Laboratory resources will be subject to the National Science Foundation Grant Policy as indicated in Section 730, Intellectual Property.

    A. In the event a patentable invention is conceived or first actually reduced to practice during the work of a member of the ABC Group using LIGO Laboratory resources, he/she will:
        i) make prompt disclosure of the invention to the Director of the LIGO Laboratory; and
        ii) cooperate with LIGO Laboratory and supply all information and execute all papers including invention reports, records of invention, patent applications and powers of attorney, necessary and proper to fulfill the obligations of the LIGO Laboratory to the U.S. Government sponsor.
    B. The ownership of inventions conceived solely by members of the MGWG Group or first actually reduced to practice at LIGO facilities solely by member of the ABC Group shall be owned by the University of Michigan, although the LIGO Laboratory shall be granted a license to use such invention for noncommercial research purposes at LIGO facilities. Inventions that are conceived or first actually reduced to practice by both members of the ABC Group and LIGO Laboratory staff shall be jointly owned by the University of Michigan and Caltech/MIT in proportion to the number of joint inventors from each institution.

    In all other regards, the rights to intellectual property developed by members of the MGWG Group under this Attachment will be in accordance with the policies of University of Michigan.

12. This MOU supersedes the previous MOU between the LIGO Laboratory and the MGWG group (LIGO- M950073-00-M) and its amendments and attachments. This MOU will remain in force until the parties mutually agree to terminate it, or until it is terminated in accordance with LSC procedures.

Approved:

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Barry Barish LIGO Director	Keith Riles Principal Investigator University of Michigan

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Peter Saulson
LSC Spokesperson