GRAVITATIONAL-WAVE INTERNATIONAL COMMITTEE

GWIC

29 March 2010

President
Dr. Junichi Hamada
The University of Tokyo
7-3-1, Hongo, Bunkyo, Tokyo 113-8654
Japan

Dear Dr Hamada,

The Large-scale Cryogenic Gravitational-wave Telescope (LCGT)

On behalf of GWIC, the Gravitational Wave International Committee, I am writing to express our strongest support for the funding of the Large-scale Gravitational-wave Telescope LCG proposed to be constructed in the Kamioka mine.

We understand that research groups at Tokyo University and the Institute for Cosmic Ray Research are currently seeking budgetary approval for this project.

The detection of gravitational waves from violent astrophysical systems in our Universe is one of the most challenging problems in experimental astro-physics and is of the highest potential return. It promises the opening up of a new field of astronomy – looking at the interactions of black holes and neutron stars in a way not possible with conventional optical, radio or other electromagnetic observations.

The development of gravitational wave detectors has been in progress for the past forty years but it is only with the recent building of long baseline laser interferometers in Japan, the USA and Europe that limiting noise sources have been reduced to a level – equivalent to the detection of movements close to one millionth of the diameter of an atomic nucleus of masses several km apart - where detection is a real possibility.

In reality however, to have a high probability of detecting signals and thus to bring about the opening of gravitational wave astronomy – where gravitational wave signals can be fully characterized in terms of polarisation, direction and source distance - requires more sensitive instruments and a network of such instruments to be strategically placed about the globe.

Advanced versions of LIGO (USA), Virgo (Europe) and GEO 600 (Europe) are now fully funded for operation on the post 2014 timeframe, and the addition of a detector in Japan of equivalent or better sensitivity would significantly enhance the potential for a discovery and place Japan at the forefront of the field. The directional sensitivity of this array of gravitational wave detectors would provide a true global observatory.

The Japanese gravitational wave groups have made major fundamental and fruitful contributions to global interferometer research with the development and operation of the TAMA 300 detector and are leading the research field with the studies of the underground cryogenic interferometer prototype, CLIO. Members interact fully with the other relevant research institutes around the world and the Japanese groups have hosted many international meetings.

Thus, our Committee strongly supports the funding of LCGT to be operational by 2016 or shortly thereafter, and will be happy to provide further background information at any time, if appropriate.

Yours sincerely

Prof. James Hough FRS, FRSE, FAPS, FInstP
Chair, Gravitational Wave International Committee,
Kelvin Professor of Natural Philosophy
Associate Director of the Institute for Gravitational Research, University of Glasgow, Glasgow G12 8QQ, UK

cc Prof Takaaki Kajita
Dr Yoichiro Matsumoto

The Gravitational Wave International Committee (GWIC: http://gwic.gravity.psu.edu) was formed in 1997 by the directors of the large gravitational wave detector facilities to facilitate international collaboration and cooperation in the development of experimental gravitational wave science. It is affiliated with the International Union of Pure and Applied Physics as a sub-committee of IUPAP's Particle and Nuclear Astrophysics and Gravitational International Committee (PaNAGIC).

Current member projects and representatives on GWIC include:

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- Jesper Munch, University of Adelaide

ALLEGRO

- William O. Hamilton, Louisiana State University

AURIGA

- Massimo Cerdonio, University of Padua and INFN

EINSTEIN TELESCOPE

- Michele Punturo, INFN-Perugia

EXPLORER/NAUTILUS

- Eugenio Coccia, University of Rome "Tor Vergata"

EUROPEAN PULSAR TIMING ARRAY (EPTA)

- Michael Kramer, Jodrell Bank Centre for Astrophysics (University of Manchester)

GEO 600

- Karsten Danzmann, Albert-Einstein-Institut fur Gravitationsphysik and University of Hannover
- Sheila Rowan, University of Glasgow
- James Hough, University of Glasgow (Chair)

LIGO, including the LSC

- Jay Marx, California Institute of Technology
- David Reitze, University of Florida

LISA

- Thomas Prince, California Institute of Technology
- Bernard Schutz, Albert-Einstein-Institut fur Gravitationphysik
- Robin Stebbins, Goddard Space Flight Center
- Stefano Vitale, University of Trento

MiniGRAIL and other Spherical Acoustic Detectors

- Giorgio Frossati, Leiden University

NANOGrav

- Andrea Lommen, Franklin and Marshall College

PARKES PULSAR TIMING ARRAY (PPTA)

- Dick Manchester, Australia Telescope National Facility (ATNF)

TAMA/CLIO/LCGT

- Seiji Kawamura, National Astronomical Observatory (Japan)
- Kazuaki Kuroda, Institute for Cosmic Ray Research, University of Tokyo

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