News from the
International Society on General Relativity and Gravitation

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Near-term Goals and Plans

The International Society on GRG was formed in 1971 as the successor to the International Committee on GRG. It is Affiliated Commission 2 of the International Union of Pure and Applied Physics (IUPAP), and within IUPAP is one of the participants in its Particle, Nuclear Astrophysics and Gravitation International Committee (PANAGIC).

The Society has undergone impressive growth in membership and, more importantly, in its intellectual reach. Initially, its primary focus was on analytical general relativity. Now its research areas also include a large number of other fields: geometric analysis, numerical relativity, gravitational wave physics and associated instrumentation and data analysis, relativistic astrophysics, physical cosmology, early universe, quantum cosmology, quantum geometry, quantum gravity and string theory. It is even more impressive that significant advances continue to occur on all these diverse frontiers. In many cases, some of the central challenges that were posed by the pioneers some 20 years ago have been addressed. Here are just a few examples. LIGO has achieved the desired sensitivity along the entire range of its frequency band. Stable binary black hole simulations are now feasible and capable of providing interesting astrophysical insights as well as necessary templets for data analysis. Global existence theorems for small initial data have emerged in full non-linear general relativity. Mathematical status of quantum field theory in curved space-times has been elevated to that of quantum field theory in flat space-time. Detailed analyses have emerged indicating how non-perturbative features of quantum gravity can lead to the resolution of the big-bang singularity and of the information loss quandary. In all cases, rather than just closing doors, successes have opened new avenues to address challenges at the next level. This is why our field continues to attract so many of the best and the brightest of young researchers.

A priority for the International Society for General Relativity and Gravitation is to ensure that this dynamic growth does not come at the cost of fragmentation of our discipline. The tri-annual conferences of the Society fulfill an important need in this respect. The Society will continue to preserve their intellectual diversity by incorporating new frontiers on an ongoing basis. GR18 at Sydney, for example, was a joint conference with Amaldi7. The International Committee of the Society will strive to use this momentum to continue dialogues and cross-fertilizations of ideas between different areas of our diverse field. We hope to see a significant growth in the number of participants in GR19 which is scheduled to take place in Mexico City in July 2010.

As most of you know, the publication organ of the Society, the journal *General Relativity and Gravitation,* was recently revitalized with a new Editorial Board, representing the current intellectual richness of our field. Under the joint leadership of Professors George Ellis and Hermann Nicolai, the journal has made a significant leap in just over a year. During its meeting at Sydney, the International Committee proposed numerous

new initiatives to enhance the number of topical reviews and special issues dedicated, for example, to proceedings of focused workshops. In this endeavor, we look forward to an active involvement of the community.

Over the next three years, the International Society will strengthen its ties with the National Societies in our field. We understand that funding agencies in some of the developing countries still have considerable flexibility. The International Society will provide active help in communicating the intellectual excitement and the growing significance of our field to the appropriate agencies, world-wide, in the hope of attracting resources that our growing field richly deserves. We also hope to enhance international cooperation between National Societies, facilitating regional meetings that transcend national boundaries. Regular mailings sent out by Professor MacCallum through Society's 'hyperspace' service already keeps the international community aware of various events and opportunities in our field. This service will be soon enhanced.

While the membership of the Society has reached a new high, on standards of International Societies it is still quite low. Since a large number of researchers who actively publish in our field are yet to become members, the International Committee believes that membership can be significantly increased in the coming years. We seek your help in persuading your friends and colleagues, not only in general relativity but also geometric analysis, high energy physics, cosmology, astrophysics and *especially experimental gravitational physics*, to become members. For information on how to join, please contact Ms Randi Neshteruk ⟨rxh1@psu.edu⟩ or visit www.maths.qmul.ac.uk/grgsoc/

The current US representatives on the International committee are Professors Gary Horowitz (UC, Santa Barbara), James Isenberg (U of Oregon) and Jorge Pullin (LSU). The Chairperson of the local organizing committee for GR19 is Professor Hernando Quevedo (UNAM) and of the Scientific organizing committee is Professor Donald Marolf (UC, Santa Barbara). The Executive Committee of the Society consists of Professors Malcolm MacCallum (QMUL, London; Secretary), Clifford Will (Washington U; Deputy President) and Abhay Ashtekar (Penn State; President). Please do not hesitate to contact any of us with suggestions or questions.

International Prizes and Awards

The Society administers several international prizes and awards and plans are underway to enhance these recognitions, especially for younger researchers in our field. The following awards were given during (or soon after) the GR18/Amaldi7 conference in Sydney.

The International Xanthopoulos Prize: This prize was instituted by the FORTH Foundation of Greece to honor the memory of Basilis Xanthopoulos, a young relativist whose prolific and most promising career was brought to an abrupt end, while giving a seminar, by a deranged assassin. It is given tri-annually to researchers who are below the age of 40 or who have had no more than 12 years of research experience following their PhD, and have made outstanding (preferably theoretical) contributions to gravitational physics. It carries with it a certificate, travelling expenses to the GRG conferences and a cash award of $10,000. The seventh Basilis Xanthopoulos Prize is awarded jointly to *Martin*

Bojowald and *Thomas Thiemann* for their seminal and complementary contributions to the development of background-independent quantum gravity. The citations were as follows:

> Thomas Thiemann has made major and highly original advances in the mathematical foundations and formulation of loop quantum gravity, including the discovery of what are now being called the Thiemann Identities and the construction of coherent states, both of which have advanced the program of consistently interpreting the Hamiltonian constraint and connecting loop quantum gravity with the classical Einstein equations. This work has been a major stimulus to the study of background-independent quantum gravity.
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> Martin Bojowald has made deeply original progress on linking quantized gravity with the classical equations and concrete physical phenomena. By showing how notions of symmetry may be incorporated into loop quantum gravity, Bojowald opened a new approach to quantum cosmology. His "effective equations", which provide a semi-classical approach to loop quantum cosmology, have already led to striking results on the avoidance of a cosmological singularity and on early inflation. This work has stimulated to a great deal of new work on quantum cosmology.

The Gravitational Wave International Committee (GWIC) *Thesis Prize:* This annual prize evolved from the earlier bi-annual LIGO thesis prize. It now includes all the gravitational wave projects world-wide and is thus an international honor awarded by GWIC, the Society serving as trustees for the funds. It carries a certificate and a cash award of $1,000. The first GWIC Thesis Prize was presented to *Yoichi Aso* for his thesis "Active Vibration Isolation for a Laser Interferometric Gravitational Wave Detector using a Suspension Point Interferometer", submitted to the Department of Physics, Faculty of Science, University of Tokyo. His research was carried out under the supervision of Professor Kimio Tsubono.

The criteria for the award are: 1) originality and creativity of the research, 2) its importance to the field of gravitational waves and gravitational wave detection, broadly interpreted, and, 3) how it supports GWIC's goals to promote construction and exploitation of gravitational-wave detectors, to foster development of new or enhanced gravitational-wave detectors, and to support the development of gravitational-wave detection as an astronomical tool generally.

James B. Hartle Awards: These international awards are made to students making the best presentations at the tri-annual GRG conferences. For the GR18/Amaldi7 conference, each award carried a 3 year membership of the Society and a cash prize of $50.

Nine students won this honor: *Celine Cattoen* (Wellington; Session on Dark Energy and the Cosmological Constant); *Ertan Goklu* (Bremen; Session on Other Quantum Aspects); *Andrew Moylan* (ANU; Session on CMB, Large Scale Structure & Gravitational Lenses); *Jennifer Seiler* (AEI; Session on Numerical Relativity); *Hanns Selig* (Bremen; Session on Other Experimental & Observational Tests of Gravitational Theories); *Victor Taveras* (Penn State; Session on Quantum Aspects of Black Holes); *Robert Ward* (Caltech; Session on R&D for Advanced Ground Based GW Detectors); *Lila Warszawski* (Melbourne; Session on Relativistic Astrophysics); and, *Shuichiro Yokoyama* (Kyoto; Session on the Early Universe and Pre-Big Bang).