

Issue no. 1

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1. Welcome

This is the first newsletter of the IOP Mathematical and Theoretical Physics Group in 2008. Its main purpose is to inform about recent and future meetings sponsored by the group, Isaac Newton Institute Programmes of interest to group members, and to announce opportunities for research students in Mathematical and Theoretical Physics (such the IOP Research Student Conference Fund or PhD studentships).

2. Announcement of meetings organised by the group

The second **Fundamental Physics UK Meeting** will take place at King's College London in autumn 2008. This event receives funding from the Mathematical and the Relativity IOP Groups. The meeting is expected to last two days, and will provide an opportunity for researchers throughout the UK to meet and discuss the latest developments in String Theory, Quantum Field Theory and Gravity. The seminars will be in a pedagogical style and there will be ample time scheduled for informal discussions.

The group is also sponsoring the conference **QG² 2008 - Quantum Geometry and Quantum Gravity Conference** to be held in Nottingham from June 30th to July 4th 2008. For more details see:

<http://www.maths.nottingham.ac.uk/conferences/qgsquared-2008/>

If there is a topic that you think is suitable for a half- or one-day meeting that you either would like the group to organise, or that you would like to organise yourself under the aegis of the group, please get in touch with the Honorary Secretary at your earliest convenience (see also items 6 and 8).

3. Events organised or supported by the group in 2007

- **11th Annual UK meeting on Integrable Models, Conformal Field Theory and Related Topics**, King's College London, 11-12 May 2007, also supported by the LMS.
(See <http://www.mth.kcl.ac.uk/events/icft07/>)
- **6th International Workshop on Pseudo Hermitian Hamiltonians in Quantum Physics**, City University, 16-18 July 2007, also supported by the LMS.
(See <http://www.staff.city.ac.uk/~fring/PT/>)
- **Low-Energy Quantum Gravity Workshop**, University of York, 19-20 July 2007, jointly organised with the Gravitational Physics group. (See <http://winstanley.staff.shef.ac.uk/LEQG.html>)
- **Island 3**, Islay, 2-7 July 2007, also supported by the EPSRC, the LMS, the EMS, the GMJ Trust, the Daiwa foundation, the Sasakawa foundation and the ESF.
(See <http://www.maths.gla.ac.uk/island/island3/index.htm>)
- **Workshop on Mathematical Virology**, ICMS Edinburgh, 6-10 August 2007, also sponsored by the ICMS, the COB (Company of Biologists) and various industrial sponsors (Beckman, BIAcore, Dionex and Horiba Jovin). The contribution of the IOP was used to sponsor the invited talks of prominent Mathematical Physicists who discussed applications of group theory in the context of Mathematical Virology.
(See <http://www.icms.org.uk/workshops/mathvir>)
- **Integrability and the Gauge String Theory Correspondence**, Isaac Newton Institute, Cambridge, 10-14th Dec 2007.
(See <http://www.newton.cam.ac.uk/programmes/SIS/sisw03.html>)

Details on some of the workshops

The meeting **ICFT08 - 12th Annual UK Meeting on Integrable Models, Conformal Field Theory and Related Topics** took place at the India Street home of the International Centre for Mathematical Sciences in Edinburgh on 11th-12th April 2008. The meeting was well-attended with around forty participants from across the UK and Europe. The eight speakers were a deliberate mix of established UK and international authorities and UK-based post-docs and graduate students. All the talks were of a consistently high quality. There was a spread between 'core' topics, such as those covered by H. Boos and I. Runkel, and 'related' topics making use of integrable/CFT results. Examples of the latter would be the talks of P. Fendley and C. Young. The increasingly important and dominant subject of the role of integrability in the ADS/CFT correspondence was also covered in a very clear and accessible talk by N. Beisert. Further information and slides of all presentations may be found at <http://www.icms.org.uk/workshops/icft08>.

The **Low-Energy Quantum Gravity** at the University of York (19-20th July 2007) was an informal two-day discussion meeting organised by Bernard Kay, Ian Moss and Elizabeth Winstanley. The meeting included pedagogical talks on a variety of topics in Low-Energy Quantum Gravity, and sessions were attended by just under 40 people. The majority of participants were PhD students or young researchers, mainly from the UK, but there were also a few European visitors. The meeting was the second joint venture between the Gravitational Physics and the Mathematical and Theoretical Physics Groups of the IOP. Speakers included David Toms (Newcastle), Calvin Smith (University College Dublin), Jorma Louko (Nottingham), Jean Alexandre (King's College London), Karl-Henning Rehren (Goettingen), Remo Garattini (Bergamo), Veronika Hubeny (Durham) and Atsushi Higuchi (York). Some talks are available online at: <http://winstanley.staff.shef.ac.uk/LEQG.html>

The **Island III Workshop on Algebraic Aspects of Integrability** on Islay in Scotland (3-7th July 2007) was organised by Chris Athorne, Misha Feigin, Claire Gilson, Christian Korff, Jonathan Nimmo and Ian Strachan from the ISMP Group at the Department of Mathematics of the University of Glasgow. This meeting was the third in a series of workshops on integrable systems organised by the department. The ISLAND workshop, focussed on "Integrable Systems: Linear and Nonlinear Dynamics" was focussed on topics in integrable systems, and had 60 participants. Keynote speakers included Date, Dubrovin, Noumi, Ruijsenaars, Varchenko and Veselov. A highlight of the workshop was a talk by McKay (Concordia University) who pointed out the integrable systems structures appearing in the theory of modular functions. Details of the presentations are provided on the conference website <http://www.maths.gla.ac.uk/island/island3> and in a refereed special issue of the Glasgow Mathematical Journal.

The **Mathematical Virology II Workshop** at the ICMS in Edinburgh (6th – 10th August 2007), organised by Peter Stockley (Leeds) and Reidun Twarock (York), has brought together about 50 participants from the disciplines Mathematics, Mathematical Physics, Biophysics and Biology, to discuss experimental and theoretical challenges at the forefront of virology. A collaboration of these disciplines is key for our understanding of the mechanisms underlying viral diseases, and this workshop focused on important aspects of virus research such as the structure and physical properties of viruses, their formation, the structure and injection of the viral genomic material, and viral evolution. Techniques such as knot theory, group theory and topology, were featured prominently at the workshop and proved very relevant to the study of viruses. For example, knot theory is important for understanding the structural organisation of the viral genome within a virus, group theory is important for predicting virus structure and modelling vibrational modes, and topology plays a crucial role for the study of the RNA cage structure that have been observed in some virus families. One of the highlights of the workshop were a number of talks by Mathematical Physicists, sponsored by the IOP, that focussed on the application of symmetry methods in virology, by Kerner (Paris), Janner (Radboud University) and Taormina (Durham). Details on the meeting can be found on the website <http://www.icms.org.uk/workshops/mathvir> and in a refereed special issue of the journal Computational and Mathematical Methods in Medicine.

4. News from the Isaac Newton Institute, Cambridge

The Isaac Newton Institute (INI) is inviting proposals for programmes of 4-week, 4-month or 6-month durations to run in 2010 or later. Proposals are considered twice yearly, with deadlines for submission on January 31st and July 31st. The INI has put on many meetings in areas of interest to group members, and organisers get to spend 6 months in Cambridge away from their usual duties.

Perhaps new to group members is the fact that anyone can attend the INI for up to two days without an invitation - although it may be helpful to let them know you are coming. Also very useful is the "junior fellow" scheme which can pay all the costs of young researchers attending programmes.

A recent event of interest was the workshop on "Statistical-Mechanics and Quantum-Field Theory Methods in Combinatorial Enumeration" (21st to 25th April 2008). Running in the second half of this year is the interesting programme "Mathematics and Physics of Anderson localization: 50 Years After" with the following four associated events:

- 14 - 25 July 2008
Anderson Localization Transition: Introductory Training Course
<http://www.newton.cam.ac.uk/programmes/MPA/mpaw01.html>
- 18 - 22 August 2008
Anderson Localization and Related Phenomena
<http://www.newton.cam.ac.uk/programmes/MPA/mpaw02.html>
- 2 - 6 November 2008
Delocalization Transitions and Multifractality (A Satellite Meeting at Gregynog Hall, University of Wales)
<http://www.newton.cam.ac.uk/programmes/MPA/mpaw03.html>
- 15 - 19 December 2008
Classical and Quantum Dynamics in the Presence of Disorder

5. IOP Research Students Conference Funds

We encourage research students to apply for funding via the Research Student Conference Fund, see advert below. The first three student bursaries have been awarded recently.



Supporting research students

Research Student Conference Fund

Providing financial support to research student members, to attend international conferences and major national meetings.

Apply for up to £250 during the course of your PhD.

Applications are considered on a quarterly basis and should reach the Institute by: 1 March, 1 June, 1 September or 1 December

For further information see www.iop.org or contact supportandgrants@iop.org

IOP Institute of Physics

6. Calls for proposals

The Mathematical and Theoretical Physics Group organises scientific meetings and occasionally other activities of interest to its members. The committee always welcomes suggestions of topics for meetings; people interested in organising a meeting or who would like to suggest a topic suitable for a meeting are invited to contact the Honorary Secretary (see item 8). The group supports around six meetings a year on average.

7. Current committee membership

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We would like to thank Gerard Watts for taking on the role as Acting Chair while Uwe Grimm was on research leave, and Almut Beige for her time on the committee.

This newsletter is also available on the web and in larger print sizes

The contents of this newsletter do not necessarily represent the views or policies of the Institute of Physics, except where explicitly stated.

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