

数学与系统科学研究院学术报告

报告题目: Hamiltonian & Reservoir Engineering for quantum systems

报告人: Sonia G Schirmer, University of Cambridge

时间地点: 2010年7月26日上午10:00—11:00, 思源楼309

报告人简介:

CURRICULUM VITAE FOR SONIA G SCHIRMER

- Office:** Dept of Applied Maths and Theoretical Physics, University of Cambridge
CMS, Wilberforce Road, Cambridge, CB3 0WA, United Kingdom
- E-mail:** sgs29@cam.ac.uk; <http://cam.qubit.org/users/sonia>
- Education:** **Ph.D., University of Oregon (March 2000)**
DISSERTATION: “Theory of Control of Quantum Systems”
ADVISERS: J. V. Leahy (Mathematics) and M. D. Girardeau (Physics)
Mathematics M.A., University of Oregon (Spring 1996)
- Academic Positions:** **EPSRC Advanced Research Fellow, CQC Cambridge (10/2006–)**
Dept of Applied Maths and Theoretical Physics, University of Cambridge
Marie Curie (Senior Research) Fellow (04/2008–07/2008)
Dept of Mathematics and Statistics, Univ. of Kuopio, Kuopio, Finland
CMI/Fujitsu Research Fellow, CQC Cambridge (10/2002–09/2006)
Dept of Applied Maths and Theoretical Physics, University of Cambridge
Research Fellow, Quantum Processes Group (04/2000–09/2002)
Dept of Applied Maths & Computing, The Open University, Milton Keynes
Graduate Teaching Fellow (1995–2000, part-time)
Department of Mathematics, University of Oregon, Eugene, Oregon
Teaching Assistant (Fall 1998/Spring 1999, part-time)
Department of Chemistry, University of Oregon, Eugene, Oregon
- Research Interests:** *Quantum systems, nano-science* at the quantum edge, quantum engineering and *technology*, especially all aspects of *modelling* and *control* of quantum systems, which are crucial for the realization of quantum devices and applications in quantum *information processing*, quantum *metrology*, chemistry, materials science, *biomedical* applications of quantum particles, *photonic* devices.
Other general interests include *mathematical biology* and *chemistry*, especially *computational neurobiology*, genetics and chemical pattern formation, for example, and *scientific computing* in general.
- Research Outputs:** Author of *over 50 papers* published in various *international journals* ranging from Physical Review, Journal of Physics, New Journal of Physics, Nature Physics, Journal of Optics, and Philosophical Transactions of the Royal Society to IEEE publications, and contributed and invited (refereed) papers in *proceedings* of many *major international conferences* in *physics, chemistry* and *engineering*, including US, UK and Australian Institute of Physics Conferences, Quantum Communication, Measurement & Computing, PhysCon, SIAM Mathematical Theory of Networks and Systems, IEEE Decision and Control, Hamiltonian and Lagrangian methods in Nonlinear Control, IEEE Symposium on Communications Technology and Signal Processing, etc.
★ See *publication list* for details.
- Research Funding:** EPSRC Advanced Fellowship and Research Grant (EP/D07195X/1, £455,296)
CMI grant (CMI 3316/P-PPP, £121,063, co-investigator)
Hitachi CASE Studentship & other non-departmental studentships
Several minor grants for travel (Royal Society), public outreach (BA) etc.

- Teaching Experience:**
- *Course Development:* Graduate course on Control of Quantum Systems (Part III Maths, U. Cambridge)
 - *Lecture courses taught:* Control of Quantum Systems; Undergraduate mathematics courses including Differential and Integral Calculus, Business Calculus, Calculus and Dynamical Systems for Life Scientists, College Algebra, etc. (U. Oregon)
 - *Research Supervision:* PhD students (Ivan Pullen, Peter Pemberton-Ross, Xiaoting Wang, Pierre de Fouquieres), visiting PhD students (Jared Cole, Simon Devitt, Gajendran Kandasamy, K. Chatzisavvas) Undergrad research students (Avinash Kolli, Damien Murat, Akshay Mishra, James Unwin, Bidan Huang, Tessa Peteete, R. Nigmatullin, ...)
 - *Personal tutoring* of undergraduate science students as a teaching assistant
 - Graduate of several *Teaching Effectiveness* programs (U. Oregon), and experience using innovative teaching techniques, interactive teaching materials, web-based teaching to enhance student's learning experience
- Scientific Activities:**
- *International Collaborations with Industry & Academia* including Hitachi, NII (Japan), Centre for Quantum Computer Technology, (Australia), MIT, Princeton, U.Oregon, etc; Participant in UK & EU research networks (incl. QIP IRC)
 - *Co-organization of Scientific Meetings* including Symposium on Quantum Technologies (2006, 2008), Towards Quantum Standards (2006), Industry in the Quantum Age (2006), Summer School on Quantum Theory & Technology (2005), Institute of Physics Workshop on Control of Quantum Systems (2002), ...
 - *25+ presentations* (including 11 invited talks) at major *international conferences* and many *invited seminar talks* in the USA, UK, Australia, Russia, Japan, Europe ★ selected presentations available from my website
 - *Member of EPSRC Peer Review College* and referee for many journals (Phys. Rev. A/B/Lett., J. Phys. A/B, J. Math. Phys, J. Chem. Phys., IEEE Transactions on Automatic Control, IEEE CDC, Int'l J. Quantum Information, etc.)
 - *Public outreach:* Organization and presentation of *science day activities* (e.g. BA Science Week Event on Quantum Engineering, Cardiff 2008), *public lectures* (Fujitsu lecture by A. Zeilinger, 2004) and interviews.
- Computer Skills:**
- UNIX (Linux) operating system, programming (Matlab, C, C++, Modula 2, Pascal, ...), computer algebra systems, L^AT_EX and office applications.
- References:**
1. *Prof Peter Haynes*, Dept of Applied Maths & Theoretical Phys., Cambridge University, Cambridge, CB2 0WA; P.H.Haynes@damtp.cam.ac.uk
 2. *Prof Lloyd Hollenberg*, Dept of Physics, University of Melbourne, Melbourne, Victoria, Australia, L.Hollenberg@physics.unimelb.edu.au
 3. *Dr David Williams*, Hitachi Cambridge Laboratories, Cavendish Laboratory, Cambridge, UK williams@phy.cam.ac.uk
 4. *Prof John Leahy*, Dept of Mathematics, Univ. of Oregon, Eugene, OR 97403, USA; leahy@math.uoregon.edu