CURRICULUM VITAE

Johannes Klaas Slingerland

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Employment

10/2008	**Lecturer in Mathematical Physics** National University of Ireland, Maynooth, Ireland
2007-2009	**Schrödinger Fellow** Dublin Institute for Advanced Studies, Dublin, Ireland
2006-2007	**Postdoctoral Researcher** University of California, Riverside, USA **Visitor in Theoretical Physics** California Institute of Technology, Pasadena, USA
2004-2006	**Research Associate** Microsoft Research, Station Q, Santa Barbara, USA
winter 2005:	**Temporary Lecturer** University of Washington, Seattle, USA
2002-2004:	**Marie Curie fellow** Heriot-Watt University, Edinburgh, UK

Education

1998-2002:	**Ph.D. in Theoretical Physics** Institute for Theoretical Physics University of Amsterdam, Amsterdam, The Netherlands. Advisor: Prof. Dr. Ir. F. A. Bais
1992-1998:	Undergraduate study in Physics and Mathematics Utrecht University, Utrecht, The Netherlands
1998:	**M.Sc. in Theoretical Physics** Advisor: Prof. Dr. Erik Verlinde
1993:	**Propaedeutic diploma in Mathematics** (first year diploma) **Propaedeutic diploma in Physics.**
1995-1998:	Undergraduate study in Music Utrecht School of the Arts, Utrecht, The Netherlands Main instrument: Recorder.
1996:	**Propaedeutic diploma in Music**

Teaching Experience

My experience includes

- Full responsibility for lecture courses
- Seven years experience as a teaching assistant
- Both physics and mathematics courses: *linear algebra*, *real and complex analysis*, *mathematics for biologists*, *quantum mechanics*, *classical electrodynamics* and *lattice gauge theory* a.o.
- Exam preparation and marking
- Design of exercises and problem sessions
- Course website and software design and maintenance
- Setting up an internet notice board and mailing list for students to discuss their work with me and each other

Full courses lectured:

- **Linear Algebra (MATH 308)**, an intermediate level course at the university of Washington, Seattle.
- **Quantum Hall Effect, Topology and Conformal Field Theory**, part of a graduate course at the University of California, Santa Barbara.

Administration and Refereeing

- **Seminar organiser -** For two years (2002-4), I ran the Edinburgh Mathematical Physics Group's weekly seminar, inviting speakers and advertising.
- **Exam coordinator** - At the University of Amsterdam, I coordinated the invigilation of some of the physics exams.
- **Referee** for several scientific journals including *Physical Review Letters*, *Physical Review* and *Proceedings of the Royal Society.*
- Member of the international scientific committee of the International Workshop on Topological Quantum Computing in Dublin, September 2007.
- Other experience includes course evaluation and coordination with graders.

Languages

Dutch (native), English (fluent), German (good), French (good), Latin, Ancient Greek

Computer Skills

- **Programmer** for research and demonstration purposes in a variety of languages, a.o. *C/C++, Fortran, Pascal, Basic, Mathematica, SPSS, Matlab and Maple.*
- **Web designer** for courses and for science promotion.

Grants

2009-2013	**Science Foundation of Ireland Principal Investigator Grant** Funding for two Ph.D. students and a postdoctoral fellow.
2002-2004	**Marie Curie Fellowship** Self-funded postdoctoral fellowship awarded by the European Community through an independent peer review system.

Publications

1. G. Kells, J. K. Slingerland and J. Vala, A Description of Kitaev's Honeycomb model with Toric-Code Stabilizers, *Phys. Rev. B* 80, 125415, 2009, `arXiv:0903.5211`.
2. Waheb Bishara,Parsa Bonderson, Chetan Nayak, Kirill Shtengel, and J. K. Slingerland, The non-Abelian Interferometer, *Phys. Rev. B* 80, 155303 (2009), *Editors' Suggestion*, `arXiv:0903.3108`, featured in a viewpoint in *Physics* 2, 82, 2009.
3. Parsa Bonderson, Adrian Feiguin, Gunnar Möller and J. K. Slingerland, Numerical Evidence for a $p_x - ip_y$ Paired Fractional Quantum Hall State at ν=12/5 `arXiv:0901.4965`
4. F.A. Bais, J.K. Slingerland, S.M. Haaker, A theory of topological edges and domain walls, *Phys.Rev.Lett.* 102:220403,2009 `arXiv:0812.4596`.
5. L. Kampmeijer, F.A. Bais, B.J. Schroers and J.K. Slingerland, Towards a non-abelian electric-magnetic symmetry: the skeleton group, `arXiv:0812.1230`.
6. G.K. Brennen, S. Iblisdir, J.K. Pachos and J.K. Slingerland, Non-locality of non-Abelian anyons, *New J. Phys.* 11, 103023, 2009, `arXiv:0810.4319`.
7. F.A. Bais, J.K. Slingerland, Condensate induced transitions between topologically ordered phases, *Phys. Rev. B* 79, 045316, 2009, *Editor's suggestion* `arXiv:0808.0627`.
8. G. Kells, A. T. Bölükbaşı, V. Lahtinen, J.K. Slingerland, J.K. Pachos and J. Vala, Topological degeneracy and vortex dynamics in the Kitaev honeycomb model, *Phys. Rev. Lett.* 101, 240404, 2008, `arXiv:0804.2753`.
9. L. Kampmeijer, J.K. Slingerland, B.J. Schroers and F.A. Bais, Magnetic Charge Lattices, Moduli Spaces and Fusion Rules, 53pp., *Nucl. Phys. B* 806, pp. 386-435, 2009, `arXiv:0803.3376`.
10. P. Bonderson and J.K. Slingerland, Fractional Quantum Hall Hierarchy and the Second Landau Level, *Phys. Rev. B* 78, 125323, 2007, `arXiv:0711.3204`.
11. P. Bonderson, K. Shtengel and J.K. Slingerland, Interferometry of non-Abelian Anyons, *Annals of Physics* 323 (2008), pp. 2709-2755, 2007, `arXiv:0707.4206`.
12. P. Bonderson, K. Shtengel and J.K. Slingerland, Decoherence of anyonic charge in interferometry measurements, *Phys. Rev. Lett.* 98:070401, 2006, `cond-mat/0608119`.
13. P. Bonderson, K. Shtengel and J.K. Slingerland, Probing non-Abelian statistics with quasiparticle interferometry, *Phys. Rev. Lett.* 97:016401, 2006, `cond-mat/0601242`.
14. M.H. Freedman, A. Kitaev, C. Nayak , J.K. Slingerland, K. Walker and Z. Wang, Universal manifold pairings and positivity, *Geometry and Topology*, 9:2303-2317, 2005, `math.GT/0503054`
15. S.K. Hansen, J.K. Slingerland and P.R. Turner, Abelian Homotopy Dijkgraaf-Witten theory, *Adv. Theor. Math. Phys.* 9:321–353, 2005 `math.QA/0410179`
16. F.A. Bais, B.J. Schroers and J.K. Slingerland, Hopf symmetry breaking and confinement in (2+1)-dimensional gauge theory, *JHEP* 05, 068, 61pp., 2003, `hep-th/0205114`.
17. F.A. Bais, B.J. Schroers and J.K. Slingerland, Broken quantum symmetry and confinement phases in planar physics, *Phys. Rev. Lett.* 89:181601, 2002, `hep-th/0205117`

18. J.K. Slingerland, *Hopf Symmetry and its breaking; Braid Statistics and Confinement in Planar Physics*, Ph.D. thesis, 141pp., 2002,
available at `http://www.stp.dias.ie/~slingerland/`
19. J.K. Slingerland and F.A. Bais, Quantum groups and nonabelian braiding in quantum Hall systems, *Nucl. Phys. B*, 612:229–290, 2001, `cond-mat/0104035`
20. T.H. Koornwinder, B.J. Schroers, J.K. Slingerland and F.A. Bais, Fourier transform and Verlinde formula for the quantum double of a finite group,
J.Phys. A:Math. Gen., 32:8539–8549, 1999, `math.QA/9904029`.

Selected Recent Conferences and Seminars

1. Organizer, 'Maynooth Workshop on Quantum Information and Condensed Matter Physics', NUI Maynooth, September 14-18, 2009.
2. Invited speaker, '8th Symposium on Topological Quantum Computing', ETH, Zürich, August 29-31, 2009
3. Invited participant and speaker, program on 'Quantum Hall physics - Novel systems and applications', Nordita, Stockholm August 17 - September 11, 2009.
4. Invited speaker, 'Amsterdam Summer Workshop', Center for Mathematical Physics, Amsterdam, 6-11 July, 2009
5. Invited participant, 'Station Q Summer Meeting', Microsoft Station Q, University of California Santa Barbara, June 19-21, 2009
6. Invited speaker, Irish Quantum Field Theory meeting, Dublin, May 15-16, 2009.
7. Invited speaker, conference on 'Modular Categories and Applications', Indiana University, Bloomington, March 19-22, 2009.
8. *Toward fusion rules for electric-magnetic charge sectors in non-Abelian gauge theory*, Theoretical Physics Seminar, Department of Physics, Swansea University, February 13, 2009.
9. *Phase transitions and domain walls in 2+1 dimensional topological field theory*, Mathematical Physics Seminar, School of Mathematics, Cardiff University, February 12, 2009.
10. Invited participant, Microsoft Fall Meeting, Microsoft Station Q, University of California Santa Barbara, December 12-14, 2008.
11. Organizer of the 'Sixth Symposium on Topological Quantum Computation', Institute for Advanced Studies, Dublin, September 15-17, 2008.
12. *Topological Quantum Computation*, lecture series at the CoQuS Summer School, University of Vienna, Austria, September 8-12, 2008.
13. Invited speaker, Nordita conference on 'Conformal field theory approach to quantum Hall physics - non-Abelian statistics and quantum computing', Stockholm, August 13-16, 2008.
14. *Condensation induced transitions between topological phases* talk at the workshop 'Quantum Computation with Topological Phases of Matter', Banff International Research Station, Banff, Canada, July 20-25, 2008.
15. Visit to Microsoft Station Q, including participation in the Microsoft Summer Meeting, UC Santa Barbara, June 25 - July 5, 2008.
16. Visit to Nordita, including KTH/Nordita/SU seminar in theoretical physics, *Fractional quantum Hall trial wave functions*, Stockholm, May 31-June 8, 2008.
17. Invited speaker, International Workshop on the Mathematical Foundations of Quantum Control and Quantum Information Theory, QCI2008, Madrid, May 26-30, 2008.
18. *Fractional Quantum Hall hierarchy and the second Landau level*, Edinburgh Mathematical Physics Group seminar, Edinburgh, January 23, 2008.
19. Visit to Microsoft Station Q, including Q-seminar, *Fractional Quantum Hall hierarchy and the second Landau level*, University of California, Santa Barbara, December 17-20, 2007.
20. Invited speaker, Mini-Symposium on Topological Quantum Computation, Max Planck Institut für Quantenoptik, Garching, December 10-11, 2007.