

## Richard D. Graham

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CONTACT INFORMATION      Physics and Astronomy      *Phone:*      +64 3 364-2987 + 4665  
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New Zealand

ACADEMIC INTERESTS      Ring laser gyros.  
Lasers and gain media.  
Applications of laser gyros in gravitational wave detection.  
Data acquisition technologies and electronics in experimental physics.  
Software engineering in relation to experimental and computational physics.

EDUCATION      **University of Canterbury**, Christchurch, New Zealand

Doctor of Philosophy (Physics)

- Research Topic: “New Concepts for Operating Ring Laser Gyroscopes”
- Supervisors: Dr. Jon-Paul Wells, Prof. Roger Reeves

Master of Science with Honours<sup>1</sup> (Physics)

- Research Topic: “Distribution of Laser Gain in a Helium-Neon Plasma”
- Supervisors: Dr. Bob Hurst, Prof. Phil Butler

Bachelor of Science (Physics<sup>2</sup>)

- Research Topic: “Investigation and Control of the Effects of Backscatter in Large Ring Lasers”
- Supervisor: Dr. Bob Hurst

**Nelson College**, Nelson, New Zealand

University Bursary (B), 2001  
Sixth Form Certificate, 2000  
School Certificate, 1999

EMPLOYMENT      **University of Canterbury**, Christchurch, New Zealand

Lecturer:

- Instrumentation, 300 level (2009)

Senior Lab Demonstrator / Lab Supervisor:

- Advanced Experimental Physics, 300 level (2009, 2008)
- Digital Electronics, 200 level (2009, 2007)
- Analog Electronics, 200 level (2008)
- Waves, Thermodynamic and Materials, 100 level (2009)
- Physics for Biological and Earth Sciences, 100 level (2009)

Lab Demonstrator:

- Experimental Physics, 200 level (2006)
- Electrical and Quantum Physics, 100 level (2005, 2006)
- Waves, Thermodynamics and Materials, 100 level (2005)

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<sup>1</sup>2nd Class, 1st Division

<sup>2</sup>Note: Also completed the majority of credits required for a major in computer science.

PUBLICATIONS

R.D. Graham, R.B Hurst, R.J Thirkettle, C.H Rowe, P.H Butler. **Experiment to Detect Frame Dragging in a Lead Superconductor** in Physica C: Superconductivity and its applications, 468 (5): 383-387, March 2008.

A. Velikoseltsev, K.U. Schreiber, T. Klüge, S. Voigt, R. Graham. **Sagnac Interferometry for the Determination of Rotations in Geodesy and Seismology** in Proceedings of the 15th St. Petersburg International Conference on Integrated Navigation Systems, St. Petersburg, Russia, March 2008

R.B. Hurst, G.E. Stedman, K.U. Schreiber, R.J. Thirkettle, R.D. Graham, N. Rabeendran, J.-P.R. Wells. **Experiments with a 834 m<sup>2</sup> ring laser interferometer: the UG-2 project** in Journal of Applied Physics, 105: 113115, June 2009.

N. Beverini, C. Bradaschia, G. Carelli, A. DiVirgilio, R. Graham, E. Maccioni, A. Porzio, S. Solimeno, F. Sorrentino. **G-Pisa gyrolaser** in Proceedings of the 5th International Symposium on Modern Problems of Laser Physics, Novosibirsk, Russia August 2008.

R.D. Graham, R.B. Hurst, K.U. Schreiber. **Data Acquisition for Large Ring Lasers** (publication pending).

J. Holdaway, R.B. Hurst, R.D. Graham, N. Rabeendran, K.U. Schreiber, J.-P.R. Wells. **Self Locked Operation of Large Ring Laser Gyroscopes** (publication pending).

HONOURS AND AWARDS

**New Zealand Institute of Physics anual conference 2009**  
Best student research talk

**Canterbury Physics and Astronomy Department anual conference 2006**  
Best student research talk

**Summer Vacation Research Scholarship**, Macquarie University, Sydney  
Research topic: Structural and Vibrational Study of  $\text{KGd}(\text{WO}_4)_2$   
Supervisors: Dr. Helen Pask, Dr. Richard Mildren

**Australian Physics Competition 2004**  
Winning team 2004

**Nelson Science Scholarship 2002**

**IPENZ travel scholarship 2001**

COMPUTER SKILLS

**Scientific Packages**

National Instruments LabVIEW (G). SciPy and NumPy. Matlab / GNU Octave.

**Languages**

Python, Java, C, PHP, L<sup>A</sup>T<sub>E</sub>X, XQuery, RELAXNG, BASIC, AVR Assembly

**Operating Systems**

GNU/Linux (Debian and Red Hat based), Microsoft Windows, DOS.

SUNDRY

First Aid Certificate (2001)

QUALIFICATIONS

Laser safety course (Macquarie University, 2006)

Leadership training course (2001)