Matthew E. Reid
Curriculum Vitae

Assistant Professor of Physics
Department of Physics
University of Northern British Columbia
Prince George, B.C., Canada, V2N 4Z9
ph: (250) 960-6622
fax: (250) 960-5544
e-mail: mreid@unbc.ca

Home Address
177 Van Somer
Prince George
B.C., V2M 6C9
ph: (250) 612-3810

Education

- 2001 - 2005, University of Alberta
  Ph.D. in the Department of Electrical and Computer Engineering
  Title: Terahertz radiation from InAs, GaAs and InP emitters at high excitation fluences and applications

- 1999 - 2001, University of Alberta
  M. Sc. program in the Department of Electrical and Computer Engineering
  Transferred to Ph. D. program (Sept. 2001)
  Title: Generation and detection of pulsed terahertz radiation

- 1994 - 1999, University of Northern British Columbia
  B. Sc. with majors in Physics and Mathematics
  4^{th} year project titles: Quantum tunneling phenomena: exact vs. approximate solutions (Physics); An introduction to stochastic modeling (Mathematics)

Academic Awards and Honours

- George Walker Award
  Best PhD thesis in the Department of Electrical and Computer Engineering
  2005 (U of A)

- Dissertation Fellowship (University of Alberta)
  2004-2005 (U of A), valued at $22,000 / yr + tuition

- iCORE Graduate Student Award (Province of Alberta)
  2004-2005 (U of A), valued at $15,000 / yr

- Province of Alberta Graduate Scholarship (Province of Alberta)
  2003-2004 (U of A), valued at $10,500 / yr

- MPBT Inc., Graduate Student Award (Corporate)
  1999-2004 (U of A), valued at $5,000 / yr

- NSERC Post-Graduate Scholarship B (Government of Canada)
  2001-2003 (U of A), valued at $19,100 / yr
- iCORE Graduate Student Award (Province of Alberta)
  2001-2003 (U of A), valued at $15,000 / yr
- Sir Walter John's Scholarship (University of Alberta)
  1999-2003 (U of A), valued at $3,750 / yr
- NSERC Post-Graduate Scholarship A (Government of Canada)
  1999-2001 (U of A), valued at $17,300 / yr
- iCORE Graduate Student Award (Province of Alberta)
  1999-2001 (U of A), valued at $12,000 / yr
- Department of Electrical and Computer Engineering Graduate Student Award (University of Alberta)
  1999 (U of A), valued at $3,000
- Wilson King Annual Scholarship (Corporate), valued at $1500
  1998-1999 (UNBC).
- NSERC Undergraduate Student Award (Government of Canada)
  Summer of 1999 (UNBC), valued at approximately $5000.
- Novak Bros. Contracting Ltd. Annual Scholarship (Corporate)
  1997-1998 (UNBC), valued at $1000.
- NSERC Undergraduate Student Award (Government of Canada)
  Summer of 1998 (UNBC), valued at approximately $5000.

Professional Experience

- National Research Council contract position:
  - Constructed, tested and calibrated a 3-axis frequency-resolved magnetic field sensor down to 10 μG (@ 60Hz) from 0.1 - 3000 Hz.
  - Measured magnetic field levels over the proposed building site for the National Institute for Nano-Technology (NINT), leading to a more effective building layout design.
- Vitatech Engineering contract work:
  - Studied magnetic field perturbations caused by moving magnetic objects including elevators, doors and vehicles.
  - Studied magnetic field coupling through steel re-bar used in reinforcing concrete buildings.

- Contract position under Phil Haswell, Director of Facilities, University of Alberta:
  - Investigated magnetic field levels over the building site for the new University of Alberta Physics building.

Publications

- **Articles published or accepted in refereed journals**

1. **M. Reid**, I. V. Cravetchi and R. Fedosejevs. (2005) Terahertz radiation and second-harmonic generation from InAs: Bulk vs surface electric field induced contributions. *Physical Review B.* 72: 0352011-032059 (Ph.D. work).
   - Article selected for the August issue of the *Virtual Journal of Ultrafast Science.*
   - Contribution: I provided the theoretical framework, designed and performed the experiments and analysis, and wrote the paper.
2. **M. Reid**, I. V. Cravetchi, R. Fedosejevs, I. M. Tiginyanu, L. Sirbu and Robert W. Boyd. (2005) Enhanced nonlinear optical response of InP (100) membranes. *Physical Review B.* 71: 0813061-0813064 (Ph.D. work).
   - Article selected for the March issue of the *Virtual Journal of Ultrafast Science.*
   - Contribution: I designed and performed the experiments, analyzed the data and wrote the paper.
3. **M. Reid** and R. Fedosejevs. (2005) Quantitative comparison of THz emission from (100) InAs surfaces and GaAs large-aperture photoconductive switch at high fluence. *Applied Optics.* 44: 149-153 (Ph.D. work).
   - Contribution: I designed and performed the experiments, analyzed the data and wrote the paper.
4. **M. Reid**, I. V. Cravetchi, R. Fedosejevs, I. M. Tiginyanu and L. Sirbu. (2005) Enhanced terahertz emission from porous InP (111) membranes. *Applied Physics Letters.* 86: 0219041-0219043 (Ph.D. work).
   - Article selected for the February issue of the *Virtual Journal of Ultrafast Science.*
   - Contribution: I designed and performed the experiments, analyzed the data and wrote the paper.
5. **M. Reid** and R. Fedosejevs. (2005) Terahertz emission from (100) InAs surfaces at high excitation fluences. *Applied Physics Letters.* 86: 0119041-0119043 (Ph.D. work).
   - Contribution: I designed and performed the experiments, analyzed the data and wrote the paper.

6. M. R. A. Shegelski, G. L. Goodvin, R. Booth, P. Begnall and **M. Reid**. (2004) Exact normal forces and trajectories for a rotating tripod sliding on a smooth surface. *Canadian Journal of Physics*. 82: 875-890 (General interest).
   - Contribution: I designed and performed one set of experiments, and wrote one section of the paper.
7. M.R.A. Shegelski, **M. Reid**, and R. Holenstein. (2001) Exact vs. quasi-classical tunneling times for idealized potentials. *Canadian Journal of Physics*. 79: 1105-1116 (Undergraduate work).
   - Contribution: I wrote the computer code, performed some of the analysis and wrote one section of the paper.
8. M.R.A. Shegelski, **M. Reid**, and L. Pow. (2000) Multiple scattering in low-energy electron holography. *Ultramicroscopy*. 84: p.159-170 (Undergraduate work).
   - Contribution: I generated the algorithms, wrote the computer code, performed the simulations and analysis and wrote one section of the paper.
9. M.R.A. Shegelski, **M. Reid**, and R. Niebergall. (1999) The motion of rotating cylinders sliding on pebbled ice. *Canadian Journal of Physics*. 77: 847-862 (Undergraduate work).
   - Contribution: I performed the numerical analysis, constructed the experimental device, collected data and performed the analysis.
10. M.R.A. Shegelski, **M. Reid**. (1999) The motion of a curling rock: Inertial vs. noninertial reference frames. *Canadian Journal of Physics*. 77: 903-922 (Undergraduate work).
    - Contribution: I performed some of the calculations and did the analysis.
11. M.R.A. Shegelski, T. Clark, **M. Reid**, and S. Faltus. (1999) Improvements in the reconstruction of in-line holograms by energy sampling and tomography: II. *Ultramicroscopy*. 77: 135-140 (Undergraduate work).
    - Contribution: I generated some of the numerical results and performed some of the analysis.

- **Articles submitted to refereed journals**

1. **M. Reid** and R. Fedosejevs. Terahertz birefringence and attenuation properties of wood and paper. *Applied Optics*. Submitted May 31, 2005. document id: 62348 (PhD work).
   - Contribution: I designed and performed the experiments, performed the analysis and wrote the paper.

- **Other refereed contributions**

  1. **M. Reid**, I. V. Cravetchi, R. Fedosejevs, I. M. Tiginyanu, L. Sirbu and Robert W. Boyd. (2005) Enhanced terahertz emission from porous InP. In *Optical Terahertz Science and Technology Topical Meeting on CD-ROM* (The Optical Society of America, Washington, DC, 2005). WA41-WA43 (Ph.D. work).
     - Contribution: I designed and performed the experiments, analyzed the data and wrote the proceedings.
  2. **M. Reid** and R. Fedosejevs. (2004) Terahertz emission from surface optical rectification in n-InAs. Proceedings of The International Society for Optical Engineering (SPIE). 5577: 659-669 (Ph.D. work).
     - Contribution: I designed and performed the experiments, analyzed the data and wrote the proceedings.

- **Non-refereed contributions**

  1. **M. Reid**, I. V. Cravetchi, R. Fedosejevs, I. M. Tiginyanu, L. Sirbu and Robert W. Boyd. (2005) Enhanced terahertz emission from porous InP. Presented orally at the Optical Terahertz Science and Technology Topical Meeting of the Optical Society of America. Orlando FL, USA (Ph.D. work).
     - Contribution: I designed and performed the experiments, analyzed the data and generated and gave the presentation.
  2. **M. Reid** and R. Fedosejevs. (2004) Terahertz emission from surface optical rectification in n-InAs. Presented at Photonics North. Ottawa ON, Canada (Ph.D. work).
     - Contribution: I generated the theoretical framework, designed and performed the experiments, analyzed the data, and generated and gave the presentation.
  3. **M. Reid** and R. Fedosejevs. (2003) THz emission scaling from InAs versus GaAs sources. Poster presented at the 11th IEEE International Conference on Terahertz Electronics. Sendai, Japan (Ph.D. work).
     - Contribution: I designed and performed the experiments, analyzed the data and generated and presented the poster.
  4. **M. Reid** and R. Fedosejevs. (2003) Terahertz emission from InAs in a magnetic field at high excitation fluences. Poster presented at the Annual Meeting for the Canadian Institute for Photonics Innovations. Edmonton, Alberta, Canada (Ph.D. work).
     - Contribution: I designed and performed the experiments, analyzed the data and generated and presented the poster.

5. **M. Reid** and R. Fedosejevs. (2002-2003) Investigation of magnetic fields over the proposed NINT building site. Contracted by the National Research Council under the National Institute for Nano Technology project manager Bill Cowley (Contract work).
   - Contribution: I designed, calibrated and tested field equipment for the frequency-resolved low-level magnetic fields, performed the site survey, wrote the technical report.
6. W. Cheung, **M. Reid** and R. Fedosejevs. (2003) EMI Report: Perturbations of magnetic fields due to moving objects and coupling of magnetic field sources in steel structures. Contracted by Vitatech Engineering by Lou Vitale (Contract work).
   - Contribution: I helped with setting up the equipment and helped with the analysis.

- **Contributions to industrially relevant R & D activities**

1. R. Fedosejevs, I. M. Tiginyanu, I. V. Cravetchi, **M. Reid** and L. Sirbu. (2004) Efficient THz Source Employing a Nanostructured Semiconductor. Report of invention submitted to the Research Services Office (Ph.D. work).
   - Contribution: I designed and performed the experiments, analyzed the data and wrote the report of invention.
2. **M. Reid** and R. Fedosejevs. (2003) Birefringent elements for the Terahertz Frequency Band. Report of invention submitted to the Research Services Office (Ph.D. work).
   - Contribution: I designed and performed the experiments, analyzed the data and wrote the report of invention.
3. **M. Reid** and R. Fedosejevs. (2003) A Method to Determine the Internal Orientation of Fibers in Wood Products. Report of invention submitted to the Research Services (Ph.D. work).

Other relevant information

- A significant delay in publication from 1999 to 2003 was observed. This delay was a result of mulitiple factors. First, having to set up a THz system from the ground up. In addition, the new Electrical and Computer Engineering building was ready to move into in the fall of 2001, and moving to a new building again delayed progress. A substantial delay in reporting results was also incurred as a result of filing multiple reports of invention, with the intention of patenting, and therefore withholding of publications. Finally, I was fortunate to be blessed with two children (2001 and 2003), however, it also slowed progress in 2001 and 2003.