

Julien Rioux

Curriculum vitæ

Julien Rioux

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Personal Data

Born May 2, 1983 in St-Hyacinthe, Québec, Canada Nationality Canadian
Status Married, one child

Education

- 2006–2011 **Ph.D. Physics**, *University of Toronto*.
Thesis: Full-band structure calculations of optical injection in semiconductors: Investigations of one-color, two-color, and pump-probe scenarios
- 2005–2006 **M.Sc. Physics**, *University of Toronto*.
Thesis: Fourteen-band and thirty-band $\mathbf{k} \cdot \mathbf{p}$ method
- 2002–2005 **B.Sc. Honours Physics**, *McGill University*, Montréal.

Experience

- since 2011 **Postdoctoral Fellow**, *University of Konstanz*.
Spintronics research and teaching position in Prof. Burkard's Group
- 2005–2011 **Graduate Student**, *University of Toronto*.
Semiconductor optics research and teaching assistant in Prof. Sipe's Group
- 2005 **Summer Student**, *University of Toronto*.
Paleoclimate modelling of the snowball Earth in Prof. Peltier's Group
- 2004–2005 **Research Student**, *McGill University*, Montréal.
Search for rare $B^0 \rightarrow \mu^+ \mu^-$ decay events at BaBar in Prof. Robertson's Group
- 2004 **Lab Assistant**, *McGill University*, Montréal.
Preparation of the equipment and documentation for the undergraduate physics labs.

Miscellaneous

- 2003 **Logistics Coordinator**, *Canadian Undergraduate Physics Conference*, Montréal.
In charge of the program, registrations, hotel and conference rooms booking.

Teaching

- since 2011 **Supervisor & Tutor**, *Department of Physics, University of Konstanz*.
In charge of student seminars, tutor for various courses, including: advanced quantum mechanics, quantum mechanics, electromagnetism.
- 2005–2008 **Tutor for various courses**, *Department of Physics, University of Toronto*.
Including: interpretations of quantum mechanics, second- and third-year quantum mechanics, physics for non-scientists, first-year physics labs.

Honours and Awards

- 2006–2010 FQRNT B1 & B2 Postgraduate Scholarships
2005–2006 University of Toronto & E. F. Burton Fellowships
2005 NSERC Undergraduate Student Research Award
2003–2005 First Class Honours in Physics, E. P. Aikman & E. R. Pounder Prizes

Skills

- Languages** French (mother tongue), English (fluent), German (B1)
Computer Proficient in the following areas:
 Systems Unix, Linux, Windows
Languages Fortran 90, Python, HTML, PHP, L^AT_EX/BibT_EX
Software ABINIT, Emacs, Make, Maple, Office applications, OpenDX, Spreadsheet

Interests

- Sports** Hockey, cycling, hiking, canoeing
Hobbies Music listening, open source development

References

- Prof. Guido Burkard**, *current employer*.
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Prof. John Sipe, *Ph.D. thesis supervisor*.
✉ sipe@physics.utoronto.ca ☎ +1 (416) 978-4517
Prof. Steven Robertson, *B.Sc. thesis supervisor*.
✉ steven@physics.mcgill.ca ☎ +1 (514) 398-1543

Publications

- Articles** *Optical injection processes in semiconductors*, J. Rioux and J. E. Sipe, *Physica E* **45**, 1 (2012)
- Evidence for interlayer electronic coupling in multilayer epitaxial graphene from polarization-dependent coherently controlled photocurrent generation*, D. Sun, J. Rioux, J. E. Sipe, Y. Zou, M. Mihnev, C. Berger, W. A. de Heer, P. N. First, and Th. B. Norris, *Phys. Rev. B* **85**, 165427 (2012)
- Theory of optical spin orientation in silicon*, J. L. Cheng, J. Rioux, J. Fabian, and J. E. Sipe, *Phys. Rev. B* **83**, 165211 (2011)
- Full band structure calculation of two-photon indirect absorption in bulk silicon*, J. L. Cheng, J. Rioux, and J. E. Sipe, *Appl. Phys. Lett.* **98**, 131101 (2011)
- Two-photon indirect optical injection and two-color coherent control in bulk silicon*, J. L. Cheng, J. Rioux, and J. E. Sipe, *Phys. Rev. B* **84**, 235204 (2011)

Articles *Hole spin relaxation and intervalley electron scattering in germanium*, E. J. Loren, J. Rioux, C. Lange, J. E. Sipe, H. M. van Driel, and A. L. Smirl, Phys. Rev. B **84**, 214307 (2011)

Current injection by coherent one- and two-photon excitation in graphene and its bilayer, J. Rioux, G. Burkard, and J. E. Sipe, Phys. Rev. B **83**, 195406 (2011)

Optical injection and control in germanium: Thirty-band $\mathbf{k} \cdot \mathbf{p}$ theory, J. Rioux and J. E. Sipe, Phys. Rev. B **81**, 155215 (2010)

Coherent control of ballistic photocurrents in multilayer epitaxial graphene using quantum interference, D. Sun, C. Divin, J. Rioux, J. E. Sipe, C. Berger, W. A. de Heer, P. N. First, and Th. B. Norris, Nano Lett. **10**, 1293 (2010)

Full band structure LDA and $\mathbf{k} \cdot \mathbf{p}$ calculations of optical spin injection, F. Nastos, J. Rioux, M. Strimas-Mackey, B. S. Mendoza, and J. E. Sipe, Phys. Rev. B **76**, 205113 (2007)

Talks *Optical pure spin current injection in graphene*, J. Rioux and G. Burkard, American Physical Society March Meeting, Baltimore, 2013

Spin-dependent carrier dynamics in germanium, J. Rioux, A. L. Smirl, and J. E. Sipe, Canadian Association of Physicists Annual Congress, Toronto, 2010

Ultrafast optical measurement of hole and electron spin dynamics in germanium, A. L. Smirl, E. J. Loren, J. Rioux, J. E. Sipe, and H. M. van Driel, Conference on Lasers and Electro-Optics, San Jose, 2010

Optical spin injection and two-color interference effects in Ge, J. Rioux and J. E. Sipe, Tagung der Deutschen Physikalischen Gesellschaft, Dresden, 2009

Full band structure calculations of optical spin injection in Si and CdSe, J. Rioux, F. Nastos, and J. E. Sipe, American Physical Society March Meeting, New Orleans, 2008

Phonon-assisted coherent control of injected carriers in indirect bandgap semiconductors, J. Rioux, F. Nastos, and J. E. Sipe, American Physical Society March Meeting, Denver, 2007

Optical injection and coherent control of charge carriers in Si, J. Rioux and J. E. Sipe, Canada-America-Mexico Physics Graduate Conference, Montréal, 2007

Posters *Optical pure spin current injection in graphene*, J. Rioux and G. Burkard, Graphene Nanophotonics, Benasque, 2013

Optical spin current injection in graphene, J. Rioux, J. E. Sipe, and G. Burkard, Graphene 2012, Brussels, 2012, and Graphene Week, Delft, 2012

Calculations of optical injection and coherent control in graphene, J. Rioux and J. E. Sipe, American Physical Society March Meeting, New Orleans, 2008

Indirect optical transitions in the parabolic band approximation, J. Rioux and J. E. Sipe, Fundamental Optical Processes in Semiconductors, Montana, 2007