GAEL REINAUDI
Authorized to work in the U.S. on a permanent basis
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Education

Sep 2004-Aug 2008 • **Ph.D. in physics, *École Normale Supérieure de Paris***
Atom Optics Group led by Claude Cohen-Tannoudji (Nobel Laureate)
Ph.D. thesis published as a book

Sep 2001-Aug 2005 • ***École Normale Supérieure de Paris*** (Admission through competitive exams)

Skills

Quantitative:

- Numerical methods, probability theory, basic knowledge of financial mathematics
- Complex, rigorous analysis as well as back-of-the-envelope calculation

Programming:

- C++, data structures, class hierarchy design, design patterns, optimization, algorithms
- Tools/IDE: Profiler, version control, Visual Studio, Eclipse
- Frameworks: Qt, Boost, Wt (C++ web development)
- Knowledge of Maple, Octave, R, Python
- Competitor in the TopCoder and Google CodeJam algorithm competitions

Optimization and Machine Learning:

- Numerical libraries: NLopt, AlgLib, GaLib & Evolving Objects (genetic optimization)
- Completed course by Andrew Ng (machine learning) and by G. Hinton (neural networks)
- Keen interests: Evolutionary Optimization, disruptive design for neural networks

Professional Experience

Research:

Mar 2011-present • **Columbia University (New York):** Associate Research Scientist in atomic physics
Precision metrology in atomic and molecular physics

Sep 2008-Mar 2011 • **Columbia University (New York):** Postdoc in atomic physics
Building of an experiment for the production of ultra-cold molecules

Sep 2004-Aug 2008 • **École Normale Supérieure de Paris:** Ph.D. in the Laboratoire Kastler-Brossel
Evaporative cooling of atomic clouds for the production of a continuous matter-wave in the degenerate regime

Framework for controlling laboratory experiments:

- Project single-handedly designed and coded
  Used in Columbia University atom-optics experiments
- Main characteristics and features:
  - C++, Fully object-oriented, multi-threaded, 30k+ lines
  - Very graphical and interactive user experience
  - Plugin enabled: API for integration of user defined components
  - 29 existing plugins, coded by users through the provided API
  - *plugin wizard* for streamlining the coding of new modules
  - High degree of modularity and runtime inter-connectivity between components
  - Interfaces for numerical optimizations (gradient, non-gradient based and genetic)
  - Interface for image processing and shape fitting
  - Can be seen on vimeo.com/32183792 and vimeo.com/31039111

Teaching:

Sep 2006-Jun 2008 • Scientific expert demonstrator at the *Palais de la Découverte* (scientific museum) in Paris

Sep 2004-Sep 2005 • Examiner in preparatory classes for the Grandes Écoles

• Scientific guide in the *Atom Optics Group, École Normale Supérieure*

Additional information

Languages • Fluent in French and English, knowledge of German

Hobbies • Avid rock climber (7.12d), making and flying model airplanes and helicopters, guitar, motorcycling

Publications

2012
- G. Reinaudi, C. B. Osborn, M. McDonald, S. Kotochigova & T. Zelevinsky
  Optical Production of Stable Ultracold Sr88 Molecules
  Phys. Rev. Lett., **109**, 115303 (2012)
- G. L. Gattobigio, A. Couvert, G. Reinaudi, B. Georgeot & D. Guéry-Odelin
  Optically guided beam splitter for propagating matter waves
  Phys. Rev. Lett., **109**, 030403 (2012)
  Selected for the *American Physical Society* ***"Spotlighting exceptional research"***

2011
- G. Reinaudi, C. B. Osborn, K. Bega, & T. Zelevinsky
  Dynamically configurable and optimizable Zeeman slower using permanent magnets and servomotors
  J. Opt. Soc. Am. B, 160242 (2011)

2010
- G. Reinaudi, book publication of the Ph.D. Thesis
  Manipulation d'atomes ultra-froids: vers un laser à atomes continu (Manipulation of ultra cold atoms: towards a continuous atom laser)
  Editions Universitaires Europeennes, ISBN 978-613-1-50940-7 (2010)

2008
- A. Couvert, M. Jeppesen, T. Kawalec, G. Reinaudi, R. Mathevet, & D. Guéry-Odelin
  Quasi-monomode guided atom laser
  Eur. Phys. News **39-*Highlights***, 6-14 (2008)
- A. Couvert, M. Jeppesen, T. Kawalec, G. Reinaudi, R. Mathevet, & D. Guéry-Odelin
  A quasi-monomode guided atom-laser from an all-optical Bose-Einstein condensate
  Europhys. Lett. **83**, 50001 (2008)
  Selected for the ***"Highlights"*** section in Eur. Phys. News **39**
- G. Reinaudi & D. Guéry-Odelin
  A Maxwell's demon in the generation of an intense and slow guided beam
  Phys. Rev. A **78**, 015401 (2008)
- A. Couvert, T. Kawalec, G. Reinaudi & D. Guéry-Odelin
  Optimal transport of ultracold atoms in the non-adiabatic regime
  Europhys. Lett. **83**, 13001 (2008)

2007
- G. Reinaudi, T. Lahaye, Z. Wang & D. Guéry-Odelin
  Strong saturation absorption imaging of dense clouds of ultracold atoms
  Opt. Lett. **32**, 3143 (2007)
- G. Reinaudi, A. Sinatra, A. Dantan & M. Pinard
  Squeezing and entangling nuclear spins in ^3He
  J. Mod. Opt. **54**, 675-695 (2007)
- G. Reinaudi, Z. Wang, A. Couvert, T. Lahaye & D. Guéry-Odelin
  A mirror to generate a beam
  Eur. Phys. News **38-*Highlights***, 3-17 (2007)

2006
- G. Reinaudi & D. Guéry-Odelin
  The atom lasers
  DGA Edition, Bulletin bibliographique *Prospective Oriented Group on Lasers and Optronics (POLOQ)* n°2006-1, p. 165-172
- G. Reinaudi, Z. Wang, A. Couvert, T. Lahaye & D. Guéry-Odelin
  A moving magnetic mirror to slow down a bunch of atoms
  Eur. Phys. J. D **40**, 405-410 (2006)
  Selected for the ***"Highlights"*** section in Eur. Phys. News **38**
- T. Lahaye, G. Reinaudi, Z. Wang, A. Couvert & D. Guéry-Odelin
  Transport of Atom Packets in a Train of Ioffe-Pritchard Traps
  Phys. Rev. A **74**, 033622 (2006)
- G. Reinaudi , T. Lahaye , A. Couvert, Z. Wang & D. Guéry-Odelin
  Evaporation of an atomic beam on a material surface
  Phys. Rev. A **73**, 035402 (2006)

2005
- T. Lahaye, Z. Wang, G. Reinaudi, S.P. Rath, J. Dalibard & D. Guéry-Odelin
  Evaporative cooling of a guided rubidium atomic beam
  Phys. Rev. A **72**, 033411 (2005)
- T. Aichele, V. Zwiller, M. Scholz, G. Reinaudi, J. Persson & O. Benson
  Multiplexed quantum cryptography with single InP quantum dots
  Proceedings of SPIE **5722**, 30-44 (2005)
- A. Dantan, G. Reinaudi, A. Sinatra, F. Laloë, E. Giacobino & M. Pinard
  Long lived quantum memory with nuclear atomic spins
  Phys. Rev. Lett. **95**, 123002(2005)

2004
- T. Aichele, G. Reinaudi & O. Benson
  Separating cascaded photons from a single quantum dot: Demonstration of multiplexed quantum cryptography
  Phys. Rev. B **70**, 235329 (2004)