**GAEL REINAUDI**
Permanent resident
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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, basic knowledge of financial mathematics
- Highly logical and curious, rigorous analysis as well as back-of-the-envelope calculation

### *Programming:*

- C++, data structures, class hierarchy design, design patterns, algorithms, optimization
- Tools/IDE: Python, git, Fabric, Django, LogStash, Visual Studio, Eclipse, Linux
- Competitor in the TopCoder and Google CodeJam algorithm competitions

### *Computer Driven Optimization:*

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

## Professional Experience

### *Trading:*

**Apr 2014-present** • **Global Trading System (New York):** Lead Trading Model Developer
Optimization and signal discovery through simulation and trading data analysis

**Apr 2013-Apr 2014** • **Global Trading System (New York):** Trading Model Developer
High frequency market-making client on CME and BrokerTec
  - ◇ Redesigning & developing, minimizing latency (low level optim, branches,...)
  - ◇ Obtained the first successful derivatives strategy at GTS
  - ◇ Responsible for the trading logic implementation of two successful strategies

### *Framework for controlling laboratory experiments:*

- Project single-handedly designed and coded
  Used in Columbia University atom-optics experiments
- Main characteristics and features:
  - ◇ C++, object-oriented, Qt-based gui, multi-threaded, 30k+ lines
  - ◇ 29 existing plugins, coded by users through the exposed API & plugin wizard
  - ◇ 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

### *Scientific Research:*

**Mar 2011-Apr 2013** • **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*

### *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), Electronics, 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)