**GAEL REINAUDI**
352 West 117th street #2F New York, NY 10026, USA
+1 (646) 422 9346
gael.reinaudi@gmail.com

## Education

**2004-2008** • **Ph.D. in experimental quantum physics, *École Normale supérieure de Paris***
*Atom Optics Group* led by Claude Cohen-Tannoudji (Nobel Laureate)

**2001-2005** • ***École Normale supérieure de Paris*** (Admission through competitive exams)

## Skills

### *Quantitative Finance:*

- Strong logical skills, innate curiosity, quick at grasping complex problems, and proposing innovations.
- Low-latency trading, order book market data, code optimization, backtesting, Series 57.
- Experienced with research-grade evolutionary optimizations, deep learning, LLM, and team of LLMs.
- Skilled at adapting recent research-grade papers and codebases to address new challenges.

### *Programming:*

- Python: Highly proficient, asyncio, generators, type safety, *pythonic* approach,...
- C++: Experienced with large codebases in both HFT firm environment and personal projects.
  Familiar with Meta-programming, branch prediction, cache warming, static polymorphism (CRTP),...
- Tools: Proficient user of Linux, Docker, Kubernetes, GCP, CI/CD, Git, Jupyter, GraphQL, Elastic Search,...
- Competitor in Python and C++: CodinGame, TopCoder, Google CodeJam.

## Professional Experience

### *Technology Startup, Machine Learning, Platform Development:*

**2021-2024** • **Sinecure.AI (New York):** CTO and Co-Founder https://sinecure.ai
  - ◇ Single-handedly coded the scalable, plugin-driven Python framework that provides system genericity alongside flexibility for client-specific needs.
  - ◇ Architected the databases schema using Django and Hasura to enable advanced GraphQL access and integration with strongly typed Pydantic models. tinyurl.com/36dcwevf
  - ◇ Built the plugin-driven data scraping and processing engine, breaking down structured insights into a deeply connected graph that powers a client-specific search engine and scoring system.
  - ◇ Built all mechanisms for unit-testing, integration testing and automatic deployment of dozens of endpoints in GCP, Kubernetes, CloudRun. Single-click deployment of all services.
  - ◇ Thoroughly researched and integrated modern AI and LLM for advanced, plugin-driven user interaction and data extraction, completion, analysis, and scoring.
  - ◇ Recruited, trained, and managed a growing team of developers to maintain and extend the platform. Ran the technology meetings for clients, investors and the board of directors.

### *Algorithmic Trading / Data Science:*

**2018-2021** • **JPMorgan (New York):** Data Scientist Manager, VP
  - ◇ Established the data science platform and the prediction ecosystem for the Roar group.
  - ◇ Built powerful time series predictions, running and training online, on live data, using Temporal Convolutional Networks with unlimited lookback timeframe. tinyurl.com/yskxkrvx

**2015-2018** • **Ronin Capital (New York):** Lead Data Scientist, Lead Strategy Developer
Adapted state-of-the-art research tools into production trading strategies (equity/ETF).
  - ◇ Built an Order Management System, and implemented various trading strategies.
  - ◇ Enhanced trading strategies by implementing evolutionary optimization techniques to fine-tune a complex parameter set.
  - ◇ Adapted very recent deep-learning papers to identify/optimize trading signals.
  - ◇ Developed an innovative technique to encode Level 2 market data into meaningful images suitable for analysis by Spatio-Temporal Convolutional Networks. tinyurl.com/4c3fbzev

**2013-2015** • **Global Trading Systems (New York):** Lead Trading Model Developer
  - ◇ Coded the full trading logic, conducted backtesting, and analysis (fixed income).
  - ◇ Architected a fully automated deployment system for strategies.
  - ◇ Low-latency optimizations for market-making strategy, including meta-programming for better branch prediction and cache warming.

### *Framework for Visually Interactive Research, Trading, and Optimization:*

**2007-2013** • Project *single-handedly* designed and developed. tinyurl.com/4xtnmmuc
Initially used by Columbia University for experiments, adapted for production trading at Ronin Capital.
  - ◇ Developed in C++, object-oriented programming, with highly interactive GUI, and multi-threading.
  - ◇ Supported over 30+ plugins, developed by users through an exposed API.
  - ◇ Featured interfaces for image processing, data fitting, scripting, genetic optimizations, and trading.

## Professional Experience (continued)

### *Hands-on Experimental Research:*

**2008-2013** • **Columbia University (New York):** Postdoc and Associate Research Scientist in Atomic Physics
Built from scratch an entire quantum physics experiment.

**2004-2008** • **École Normale Supérieure de Paris:** Ph.D. in the Laboratoire Kastler-Brossel
Built highly original apparatus for *ultra-cold atoms* quantum physics.

### *Teaching:*

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

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

## Additional Information

**Interests** • Passionate airplane owner and pilot (PPL), avid rock climber (5.12d), tinkerer and maker with a broad scope of projects and techniques, builder and participation in combat robotics competitions (NHRL),

# Publications

**2018**
- P. Gentine, M. Pritchard, S. Rasp, G. Reinaudi & G. Yacalis
*Could machine learning break the convection parameterization deadlock?*
Geophysical Research Letters, **45**, 5742

**2012**
- G. Reinaudi, C. B. Osborn, M. McDonald, S. Kotochigova & T. Zelevinsky
*Optical Production of Stable Ultracold Sr*88 *Molecules*
Phys. Rev. Lett., **109**, 115303 (2012)
- G. L. Gattobigio, A. Couvert, G. Reinaudi, B. Georgeot & D. Guï¿½ry-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 ï¿½ 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, ï¿½G. Reinaudi, R. Mathevet, & D. Guï¿½ry-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. Guï¿½ry-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. Guï¿½ry-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. Guï¿½ry-Odelin
*Optimal transport of ultracold atoms in the non-adiabatic regime*
Europhys. Lett. **83**, 13001 (2008)

**2007**
- G. Reinaudi, T. Lahaye, Z. Wang & D. Guï¿½ry-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. Guï¿½ry-Odelin
*A mirror to generate a beam*
Eur. Phys. News **38-*Highlights***, 3-17 (2007)

**2006**
- G. Reinaudi & D. Guï¿½ry-Odelin
*The atom lasers*
DGA Edition, Bulletin bibliographique *Prospective Oriented Group on Lasers and Optronics (POLOQ)*
nï¿½2006-1, p. 165-172
- G. Reinaudi, Z. Wang, A. Couvert, T. Lahaye & D. Guï¿½ry-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. Guï¿½ry-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. Guï¿½ry-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. Guï¿½ry-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)