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Chargé de recherche CNRS
Laboratoire Charles Fabry
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[Google Scholar](#)

RESEARCH INTERESTS:

Quantum physics, atomic, molecular and optical physics
Quantum many-body physics
Atom-light interactions and quantum optics
Long-range interacting systems

RESEARCH EXPERIENCE:

Atomic molecular and optical physics:

2018-present Chargé de recherche CNRS

Laboratoire Charles Fabry, Institut d'optique
Palaiseau, France
Quantum optics - atoms team

2014-2018 Post-doctoral researcher, group leader, Marie Skłodowska-Curie fellow

5. Physikalisches Institut, Stuttgart University, group of Pr. Dr. Tilman Pfau,
Stuttgart, Germany
Dipolar quantum gases team

2011-2014 Graduate student researcher

Laboratoire Kastler-Brossel, ENS Paris, France
Ultracold fermions team
Advisors: Christophe Salomon and Frédéric Chevy

TEACHING EXPERIENCE:

Advising

2018-present **Advising**: 2 graduate students, 1 postdoc, 2 Master students in collaboration with Antoine Browaeys

2014-2018 **Co-advising**: 6 graduate students, 4 master students and several bachelor students as group leader in Tilman Pfau's research group

Teaching

2018-present Institut d'Optique (IOGS):

Lectures: Ultracold gases and quantum simulators (part of 'M2 LOM')
Exercise sections: Mathematics and signal analysis

- 2014-2018 **Stuttgart University physics department:**
Weekly exercise sections: Atomic physics, linear optics and non-linear optics
Lectures: Atomic physics and quantum gases of bosons and fermions
- 2011-2014 **ENS Paris physics department:**
Experimental projects: atomic physics, quantum optics
Weekly exercise sections: Special relativity and E&M
Examiner for ENS entrance exam: experimental examination (design of the setups, student assessment)

EDUCATION:

- 2011-2014 **Graduate Studies *Ecole Normale Supérieure, physics dept., Paris, France***
Title: Mixtures of Bose and Fermi superfluids
Obtained with "Félicitations du jury à l'unanimité"
- 2010-2011 **Second year of Masters of Science in Physics at *Université Pierre et Marie Curie and Ecole Normale Supérieure, Paris, France***
Quantum Physics program
- 2009-2010 **First year of Masters of Science in Physics at the *University of California at Berkeley, Berkeley, CA***
As part of the *Education Abroad Program*, exchange with UGA
- 2005-2009 **Bachelor of science in Physics / Licence de Physique. *Université Grenoble Alpes (UGA), Grenoble, France***

AWARDS AND HONOURS:

- Young researcher grant / Financement JCJC, french national research agency (ANR), 450k€, 2020
- Marie Sklodowska-Curie individual fellowship, MSCA Actions, European Union, 2016
- Young Researcher Prize, "Prix Jeunes chercheurs"
IFRAF/GDR atomes froids, french cold atoms research network, 2015
- Doctoral School PhD grant,
Government grant, delivered by the Île de France Physics doctoral school (EDPIF), 2011

REFEREE SERVICE:

- Referee for scientific articles: *Science, Nature, Nature Physics, Physical Review Letters, Physical Review X, Physical Review A, New Journal of Physics, Optics Express, Europhysics Letters, Applied Physics B, Physics Letters A.*
- Referee for scientific proposals: *Various national science agencies.*

OUTREACH ACTIVITIES:

- 2019 Organization of the science fair "Fête de la Science" for the Institut d'Optique
- 2015-2016 Preparation of hands-on experiments for the outreach activities of the PI5 in Stuttgart through "Spiel der Kräfte"
- 2011-2014 Organization and supervision of scientific weeks for high-school students in the Paris area offered by the association "Science Ouverte"

SCIENTIFIC PUBLICATIONS:

ResearcherID: J-8759-2016

ORCID: 0000-0002-4707-0474

[Google Scholar](#)**Perspective pieces:**

- **Ultradilute quantum droplets**, Physics Today feature article
[I. Ferrier-Barbut](#)
Physics Today **72**, 4, 46 (2019)
- **Quantum liquids get thin**, perspective article about: *Science* **359**, 301 (2018)
[I. Ferrier-Barbut](#) and T. Pfau
Science **359**, 274 (2018)
- **Smashing magnets**, perspective article about: *New J. Phys.* **18**, 113004 (2016)
[I. Ferrier-Barbut](#)
New J. Phys. **18**, 111004 (2016)

Peer-reviewed:

- **Collective shift in resonant light scattering by a one-dimensional atomic chain**
A. Glicenstein, G. Ferioli, N. Sibalic, L. Brossard, [I. Ferrier-Barbut](#) and A. Browaeys.
Phy. Rev. Lett. **124**, 253602 (2020)
- **Dilute dipolar quantum droplets beyond the extended Gross-Pitaevskii equation**
F. Böttcher, M. Wenzel, J.-N. Schmidt, M. Guo, T. Langen, [I. Ferrier-Barbut](#), T. Pfau, R. Bombin, J. Sánchez-Baena, J. Boronat and F. Mazzanti.
Phy. Rev. Res. **1**, 033088 (2019)
- **A fermionic impurity in a dipolar quantum droplet**
M. Wenzel, T. Pfau and [I. Ferrier-Barbut](#)
Physica Scripta **113**, 104004 (2018)
- **Anisotropic superfluid behavior of a dipolar Bose-Einstein condensate**
M. Wenzel, F. Böttcher, J. N. Schmidt, M. Eisenmann, T. Langen, T. Pfau and [I. Ferrier-Barbut](#)
Phys. Rev. Lett. **121**, 030401 (2018)
- **Scissors mode of a dipolar quantum droplet of dysprosium atoms**
[I. Ferrier-Barbut](#), M. Wenzel, F. Böttcher, T. Langen, M. Isoard, S. Stringari and T. Pfau
Phys. Rev. Lett. **120**, 160402 (2018)
- **Onset of a modulational instability in trapped dipolar Bose-Einstein condensates**
[I. Ferrier-Barbut](#), M. Wenzel, M. Schmitt, F. Böttcher, T. Pfau
Phys. Rev. A **97**, 011604(R) (2018)
- **Striped states in a many-body system of tilted dipoles**
M. Wenzel, F. Böttcher, T. Langen, [I. Ferrier-Barbut](#) and T. Pfau
Phys. Rev. A **96**, 053630 (2017)
- **Self-bound droplets of a dilute magnetic quantum liquid**
M. Schmitt, M. Wenzel, F. Böttcher, [I. Ferrier-Barbut](#) and T. Pfau
Nature **539**, 259 (2016)
subject of a **News & Views** article by B. Laburthe-Tolra
- **Liquid quantum droplets of ultracold magnetic atoms**
[I. Ferrier-Barbut](#), M. Schmitt, M. Wenzel, H. Kadau and T. Pfau,
J. Phys. B. **49**, 214004 (2016)
- **Observation of quantum droplets in a strongly dipolar Bose gas**
[I. Ferrier-Barbut](#), H. Kadau, M. Schmitt, M. Wenzel, and T. Pfau,
Phys. Rev. Lett. **116**, 215301 (2016)
subject of a **Physics Viewpoint** by L. D. Carr & B. L. Lev

- **Observing the Rosensweig instability of a quantum ferrofluid**
H. Kadau, M. Schmitt, M. Wenzel, C. Wink, T. Maier, [I. Ferrier-Barbut](#) and T. Pfau
Nature **530**, 194 (2016)
- **Universal loss dynamics in a unitary Bose gas**
U. Eismann, L. Khaykovich, S. Laurent, [I. Ferrier-Barbut](#), B. S. Rem, A. T. Grier, M. Delehaye, F. Chevy, C. Salomon, L.-C. Ha and C. Chin
Phys. Rev. X **6**, 021025 (2016)
- **Critical velocity and dissipation of an ultracold Bose-Fermi counterflow**
M. Delehaye, S. Laurent, [I. Ferrier-Barbut](#), S. Jin, F. Chevy, and C. Salomon
Phys. Rev. Lett. **115**, 265303 (2015)
- **Broad universal Feshbach resonances in the chaotic spectrum of dysprosium atoms**
T. Maier, [I. Ferrier-Barbut](#), H. Kadau, M. Schmitt, M. Wenzel, C. Wink, T. Pfau, K. Jachymski, and P. S. Julienne
Phys. Rev. A **92**, 060702 (2015)
- **Emergence of chaotic scattering in ultracold Er and Dy**
T. Maier, H. Kadau, M. Schmitt, M. Wenzel, [I. Ferrier-Barbut](#), T. Pfau, A. Frisch, S. Baier, K. Aikawa, L. Chomaz, M. J. Mark, F. Ferlaino, C. Makrides, E. Tiesinga, A. Petrov, and S. Kotochigova
Phys. Rev. X **5**, 041029 (2015)
- **The Landau critical velocity for a particle in a Fermi superfluid**
Y. Castin, [I. Ferrier-Barbut](#), C. Salomon
Comptes Rendus Physique **16**, 241 (2015) ([link to french version](#))
- **A mixture of Bose and Fermi superfluids**
[I. Ferrier-Barbut](#), M. Delehaye, S. Laurent, A. T. Grier, M. Pierce, B. S. Rem, F. Chevy, and C. Salomon
Science **345**, 1035 (2014)
- **Λ -enhanced sub-Doppler cooling of lithium atoms in D1 gray molasses**
A. T. Grier, [I. Ferrier-Barbut](#), B. S. Rem, M. Delehaye, L. Khaykovich, F. Chevy, and C. Salomon
Phys. Rev. A **87**, 063411 (2013)
- **Lifetime of the Bose Gas with resonant interactions**
B. S. Rem, A. Grier, [I. Ferrier-Barbut](#), U. Eismann, T. Langen, N. Navon, L. Khaykovich, F. Werner, D. S. Petrov, F. Chevy, and C. Salomon
Phys. Rev. Lett. **110**, 163202 (2013)

INVITED LECTURES:

- International school on quantum gases (3x60min lectures)
Chlef, Algeria (2018)
- Granada quantum matter summer school (2x90min lectures)
Granada, Spain (2017)

INVITED TALKS IN INTERNATIONAL CONFERENCES:

- XXII conference on few-body problems in physics
Caen, France (2018)
- Workshop on long-range interactions in atomic systems
São Carlos, Brazil (2017)
- From few to many, exploring quantum systems one atom at a time
Oberurgl, Austria (2017)
- 47th colloquium on the physics of quantum electronics PQE2017
Snowbird, Utah (2017)
- Gauge field dynamics with ultracold gas systems 2016

Bad Honnef, Germany (2016)

- Long-range interactions in the ultracold workshop 2016

Ercolano, Italy (2016)

- Quantum gases and quantum coherence BEC 2016

Salerno, Italy (2016)

- Ultracold quantum gases, current trends and perspectives Quo Vadis BEC 2016

Bad Honnef, Germany (2016)

- Quantum Optics 2016

Obergurgl, Austria (2016)

- Workshop: Advanced atomic sources and extreme cooling of atoms and molecules 2016

Les Houches, France (2016)

- Synthetic Quantum Magnetism International Workshop 2015

Dresden, Germany (2015)

- 2015 International Symposium on Quantum Fluids and Solids QFS2015

Niagara Falls, NY (2015)

CONTRIBUTED TALKS:

- 7th colloquium of the CNRS research network “quantum engineering, foundations and applications” (2016)

Paris, France

- Quantum technologies conference V

Krakow, Poland (2014)

- Laser Physics international workshop LPHYS13

Prague, Czech Republic (2013)

SEMINARS:

- LPTMS, Orsay, France (2019)

- FEMTO-ST Time & Frequency Department, Besançon, France (2019)

- Syddansk University, Odense, Denmark (2018)

- Institute of Photonic Sciences, Barcelona, Spain (2017)

- Weizmann Institute of Science, Rehovot, Israel (2017)

- Institut d’Optique Graduate School, Palaiseau, France (2016)

- Leibnitz Universität Hannover, seminar series of the research training group 1991, Hannover, Germany (2016)

- Heidelberg University, Heidelberg, Germany (2016)

- Toronto University, Toronto, Canada (2015)

- Néel Institut, Grenoble, France (2014)

- Heidelberg University, Kirchhoff Institute, Heidelberg, Germany (2014)

- Cambridge University, Cavendish Laboratory, Cambridge, UK (2014)

- University of Stuttgart in the 5. Physikalisches Institut, Stuttgart, Germany (2014)

MISCELLANEOUS:

- 1st prize of Applied Physics B poster prizes at ICOLS 2017 conference Arcachon, France

- 2017 publication prize, Stuttgart Universität faculty of physics and mathematics