

BASIC INFORMATION

Mailing address

ICFO –The Institute of Photonic Sciences
Mediterranean Technology Park
Av. Carl Friedrich Gauss, 3
08860 Castelldefels (Barcelona), Spain

Phone: +34 935542254**Email:** leticia.tarruell@icfo.eu**Website:** <https://qge.icfo.eu>**Citizenship:** Spain and France

One daughter, born in 2024

CV SUMMARY

I am an experimental physicist with an international research career at the interface between atomic and condensed matter physics. My research activities are centered on the experimental simulation of quantum many-body physics with ultracold atoms. Recently, my key research topics have included ultradilute quantum liquid droplets, artificial gauge fields, supersolidity, gauge theories, and the SU(N) Fermi-Hubbard model. Previous topics I have worked on include as well the SU(2) Fermi-Hubbard model, quantum magnetism, artificial graphene, and superfluid Fermi gases. After a PhD thesis at Ecole Normale Supérieure in Paris, a postdoctoral stay at ETH Zurich, and a CNRS research scientist position at Institut d'Optique in Bordeaux, I joined ICFO as Group Leader in 2013 and became ICREA professor in 2022. At ICFO, I have established the first experimental research group working on quantum simulation with ultracold quantum gases in Spain, producing in 2015 the first Spanish Bose-Einstein condensate. Since then, I have developed three distinct research lines. First, I have pioneered the field of continuum quantum mixtures with competing interactions, a research line that is well recognized internationally and for which I received in 2025 the Junior BEC Award. My work on this topic has led to several high-impact publications (2 Science, 1 Nature, 2 Phys. Rev. Lett.), invited talks in the major conferences (BEC, ICOLS, ICAP, APS March Meeting, DAMOP), and is currently supported by an ERC Consolidator Grant. Second, I have developed a strontium quantum-gas microscope, which allows us to investigate Bose- and Fermi-Hubbard models in a single-atom and single-site resolved manner, and where I have very recently demonstrated spin-resolved microscopy of SU(N) Fermi-Hubbard systems for the first time. This more recent project has led to a high-impact publication (PRX Quantum) and is supported by the European Quantum Technologies Flagship program in quantum simulation through the project PASQuan², where I am member of the coordination team. Finally, I have recently started the development of a new research line that aims at investigating gauge theories with programmable arrays of Rydberg atoms. My work is carried out in collaboration with leading theory groups in Catalonia and worldwide. My experimental group currently consists of 3 postdocs, 6 PhD students, 1 visiting PhD student, 2 Master students, and 2 bachelor students. In parallel to my experimental research activities, I co-supervise 3 theory PhD students, teach in Master programs and in international graduate schools, and regularly give talks and labtours for general audiences.

CURRENT POSITION

ICREA Professor

01/2022 - present

ICFO – The Institute of Photonic Sciences, Castelldefels (Barcelona), Spain
Head of the Ultracold Quantum Gases group

PREVIOUS POSITIONS

Group Leader

06/2013 - 12/2021

ICFO – The Institute of Photonic Sciences, Castelldefels (Barcelona), Spain
Head of the Ultracold Quantum Gases group

CNRS scientist (CR2), Laboratoire Photonique, Numérique, Nanosciences

01/2012 - 05/2013

Institut d'Optique d'Aquitaine, Talence (Bordeaux), France (currently on leave)
Cold Atoms group – Group Leader: Philippe Bouyer
Academic guest, Institute for Quantum Electronics 01/2012 - 09/2012
ETH Zurich, Switzerland
Quantum Optics group – Group Leader: Tilman Esslinger
Postdoctoral researcher, Institute for Quantum Electronics 07/2008 - 12/2011
ETH Zurich, Switzerland
Quantum Optics group – Group Leader: Tilman Esslinger

EDUCATION

Ph.D. in Physics, Université Pierre et Marie Curie (Paris 6), France 10/2004 - 06/2008
Laboratoire Kastler Brossel, Ecole Normale Supérieure Paris
Advisor: Christophe Salomon
Thesis: *Superfluidity in an Ultracold Fermi Gas*
Master in Quantum Physics, Ecole Normale Supérieure Paris, France 09/2003 - 06/2004
Exchange student, Université Denis Diderot (Paris 7), France 09/2002 - 07/2003
Bachelor studies in Physics, Universidad Complutense de Madrid, Spain 09/1999 - 07/2002

AWARDS

Junior BEC Award 2025
ERC Consolidator Grant, European Research Council 2020
Outstanding Reviewer, New Journal of Physics 2018
Ramón y Cajal Fellowship, Spanish Ministry of Research 2016
Young Physicist Award (experimental physics), Spanish Royal Physics Society 2015
L'Oréal - UNESCO Spanish prize For Women in Science 2014
NEST Fellowship, Fundació Privada CELLEX Barcelona 2013
EPL poster prize, International Conference on Atomic Physics (ICAP) 2012
PhD Fellowship, French Ministry of Research 2004 - 2007
Spanish Extraordinary Prize for outstanding high school students 1999
(Premio Extraordinario de Bachillerato)

PUBLICATION SUMMARY

- As of January 2026, 32 refereed publications, including 2 Nature, 3 Science, 9 Phys. Rev. Lett., 1 PRX Quantum, 5 publications in conference proceedings or chapters in books, 1 invited publication, 1 outreach article
- H-index=24 (28), 5317 (7479) citations, Web of Science (Google Scholar), January 2026
- 2 journal covers (Nature, Eur. Phys. J. Special Topics)
6 publications selected for feature articles or as Editors' Suggestion (Nature *News and Views*, Science *Perspective*, Nature Physics *News and Views*, Nature Physics *Research Highlight*, Physics Today, Physical Review Research *Editors' Suggestion*)
1 invited feature article (Science *Perspective*)

SELECTED PUBLICATIONS

1. C. S. Chisholm, S. Hirthe, V. B. Makhlov, R. Ramos. R. Vatr , J. Cabedo, A. Celi, and L. Tarruell. *Probing supersolidity through excitations in a spin-orbit-coupled Bose-Einstein condensate*. Science **391**, 480-484 (2026).

2. S. Buob, J. Hörschle, V. Makhalov, A. Rubio-Abadal, and L. Tarruell. *A strontium quantum-gas microscope*. PRX Quantum **5**, 020316 (2024).
3. A. Frölian, C. S. Chisholm, E. Neri, C. R. Cabrera, R. Ramos, A. Celi, and L. Tarruell. *Realizing a 1D topological gauge theory in an optically dressed BEC*. Nature **608**, 293 (2022).
4. J. Sanz, A. Frölian, C. S. Chisholm, C. R. Cabrera, and L. Tarruell. *Interaction control and bright solitons in coherently-coupled Bose-Einstein condensates*. Phys. Rev. Lett. **128**, 013201 (2022).
5. C. R. Cabrera, L. Tanzi, J. Sanz, B. Naylor, P. Thomas, P. Cheiney, and L. Tarruell. *Quantum liquid droplets in a mixture of Bose-Einstein condensates*. Science **359**, 301 (2018). **Selected for a Science Perspective, a Nature Physics News and Views, and a highlight and an article in Physics Today.**
6. P. Cheiney, C. R. Cabrera, J. Sanz, B. Naylor, L. Tanzi, and L. Tarruell. *Bright Soliton to Quantum Droplet Transition in a Mixture of Bose-Einstein Condensates*. Phys. Rev. Lett. **120**, 135301 (2018). **Selected for a Nature Physics News and Views and an article in Physics Today.**
7. D. Greif, T. Uehlinger, G. Jotzu, L. Tarruell, and T. Esslinger. *Short-range quantum magnetism of ultracold fermions in an optical lattice*. Science **340**, 1307 (2013). **Selected for a Science Perspective.**
8. L. Tarruell, D. Greif, T. Uehlinger, G. Jotzu, and T. Esslinger. *Creating, moving and merging Dirac points with a Fermi gas in a tunable honeycomb lattice*. Nature **483**, 302 (2012). **Selected for a Nature News and Views and as Nature cover.**
9. R. Jördens, L. Tarruell, D. Greif, T. Uehlinger, N. Strohmaier, H. Moritz, T. Esslinger, L. De Leo, C. Kollath, A. Georges, V. Scarola, L. Pollet, E. Burovski, E. Kozik, and M. Troyer. *Quantitative Determination of Temperature in the Approach to Magnetic Order of Ultracold Fermions in an Optical Lattice*. Phys. Rev. Lett. **104**, 180401 (2010).
10. N. Strohmaier, D. Greif, R. Jördens, L. Tarruell, H. Moritz, T. Esslinger, R. Sensarma, D. Pekker, E. Altman, and E. Demler. *Observation of elastic doublon decay in the Fermi-Hubbard model*. Phys. Rev. Lett. **104**, 080401 (2010).

SELECTED INVITED TALKS

BEC Sant Feliu de Guixols (2025, 2023, 2017), APS March Meeting (2023), Gordon Research Conference (2023), ICAP (2022), DAMOP (2026, 2022, 2018), DPG Spring Meeting (2026), MIT-Harvard CUA seminar (2022, 2018), Collège de France seminar (2025, 2022), Munich MCQST colloquium (2024), PTB/University of Hannover colloquium (2022), KITP (2021, 2016, 2012), BEC Center Trento (2019), ICOLS (2019), LKB seminar (2019), CLEO (2019, 2013), ECAMP (2025), EGAS (2024, 2018), Heidelberg CQD colloquium (2018), Quantum Optics IX (2017), MPQ colloquium (2017), MPI PKS (2016, 2012), ICTP (2012), Aspen (2012, 2009).

COMPETITIVE FUNDING

European funding

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|--|----------|
| 1. Quantum Technologies Flagship <i>PASQUANS 2.1</i> (2023 – 2027)
PI and member of the coordination team | 1.050 k€ |
| 2. QuantERA <i>DYNAMITE</i> (2022 – 2025), co-PI | 87 k€ |
| 3. ERC Consolidator Grant <i>SuperComp</i> (2021– 2026), sole PI | 2.000 k€ |
| 4. EC Horizon 2020 FET-Open <i>DAALI</i> (2020 – 2024), PI | 400 k€ |
| 5. EC FP7 FET-Proactive <i>QUIC</i> (2015 – 2019), co-PI | 177 k€ |
| 6. EC FP7 Marie Curie Career Integration Grant <i>MAGQuPT</i> (2014 – 2018), sole PI | 100 k€ |

Spanish national funding

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| 7. NextGenerationEU <i>QuantumSpain</i> (2023 – 2026), co-PI | 76 k€ |
| 8. NextGenerationEU <i>Quantum Communications</i> (2022 – 2025), co-PI | 550 k€ |

9. Plan Nacional de I+D+i 2023 <i>MAPS</i> (2024 – 2027), PI	362.5 k€
10. Plan Nacional de I+D+i 2020 <i>LIGAS</i> (2021 – 2024), PI and coordinator	254 k€
11. Plan Nacional de I+D+i 2017 <i>QuDROP</i> (2018 – 2021), sole PI	151 k€
12. Plan Nacional de I+D+i 2014 <i>StrongQSIM</i> (2015 – 2017), sole PI	97 k€
13. Equipamientos científico-técnicos 2019 (2019 – 2021), PI	190 k€
14. Equipamientos científico-técnicos 2019 (2019 – 2020), PI	167 k€
15. Equipamientos científico-técnicos 2018 (2018-2020), PI	107 k€

Foreign national funding

16. German DFG Research Unit <i>FOR2414</i> (2016 – 2022), PI	264 k€
17. US Army ARO Conference Grant <i>BEC 2023 conference</i> (2023), PI	18 k€

Catalan funding

18. AGAUR SGR consolidated group <i>QENOP</i> (2022 – 2025), PI and coordinator	60 k€
19. RIS3CAT <i>QuantumCAT</i> (2018 - 2021), PI	371 k€
20. AGAUR SGR emergent group <i>QGE</i> (2017 – 2021), sole PI	10 k€

Private foundations

21. Fundación Ramón Areces <i>CODEC</i> (2019 – 2021), PI and coordinator	130 k€
22. Fundación BBVA <i>GAS3D</i> (2015), sole PI	40 k€
23. L'Oréal-UNESCO Prize For Women in Science <i>MAAF</i> (2015), sole PI	15 k€

External fellowships for group members

1. FI-STEP PhD fellowship, Leonardo Bezzo (2025 – 2028)	87 k€
2. LaCaixa Junior Leader fellowship, Antonio Rubio-Abadal (2024 – 2027)	163 k€
3. Marie Curie individual fellowship, Sarah Hirthe (2024 – 2026)	163 k€
4. Marie Curie individual fellowship, Ramón Ramos (2021 – 2023)	157 k€
5. Marie Curie individual fellowship, Elettra Neri (2021 – 2022)	55 k€
6. Marie Curie individual fellowship, Pierrick Cheiney (2015 – 2017)	158 k€
7. Ramón y Cajal fellowship, Leticia Tarruell (2017 – 2021)	209 k€
8. Juan de la Cierva Formación fellowship, Antonio Rubio-Abadal (2022 – 2024)	59 k€
9. FPI PhD fellowship, Carlos Gas Ferrer (2025 – 2028)	108 k€
10. FPI PhD fellowship, Claudio Iacovelli (2016 – 2019)	99 k€
11. FPI Severo Ochoa PhD fellowship, Sandra Buob (2016 – 2019)	79 k€
12. Beatriu de Pinós postdoctoral fellowship, Vasilii Makhalov (2021 – 2024)	144 k€
13. LaCaixa INPhINIT PhD fellowship, Anika Frölian (2018 – 2021)	115 k€
14. FPI PhD fellowship, Julio Sanz Sánchez (2016 – 2019)	93 k€
15. Mexico CONACYT PhD fellowship, Cesar R. Cabrera Córdova (2014 – 2018)	42 k€

GROUP STRUCTURE

- Three experimental laboratories (potassium mixtures, strontium quantum-gas microscope gases, strontium Rydberg atom arrays)
- Current experimental group size: 3 postdocs, 6 PhD students, 2 Master students, 2 Bachelor students
- Current co-supervision of theoretical researchers: 3 PhD students
- Supervision at ICFO of 15 experimental postdoctoral researchers (3 ongoing, 4 of them previous PhD students staying for a postdoc) and co-supervision of 2 visiting theory postdocs.

3 former postdocs have obtained tenure-track or permanent positions in academia (L. Tanzi: CNR researcher at LENS, R. Vatr  , ma  tre de conference at Universit   Sorbonne Paris-Nord, A. Rubio-Abadal, tenure-track profesor lector at Universitat de Barcelona).

1 former postdoc has established a cold atom group in industry (R. Ramos: IDEADED)

Thesis advisor for 12 experimental PhD students (6 ongoing, 6 have graduated) and co-supervisor of 3 theory PhD students.

2 experimental PhD students received the **ICFO PhD thesis prize**.

1 former PhD student has obtained a permanent position in academia (C. Cabrera, permanent Oportunius researcher at IGFAE after obtaining an ERC Starting Grant)

Thesis advisor for 15 Master students (1 ongoing) and 4 Bachelor students (2 ongoing)

Supervision of 10 internship students at Master level (1 received the **Prix du Stage from Ecole Polytechnique**), and 14 internship students at bachelor level.

Students continued with PhD theses at University of Heidelberg, MPQ, Vrije Universiteit Amsterdam, University of Hannover, Institut d'Optique, Université Sorbonne Paris Nord, Technical University of Denmark, Université Paul Sabatier- Toulouse, Collège de France, ETH

PROFESSIONAL SERVICE

Organization of conferences, workshops, and schools

- Chair, International Conference on Bose-Einstein Condensation 2027
Sant Feliu de Guíxols, Spain
- Co-organizer, CQA Winter School on *Ultracold Quantum Many-Body Systems* 2026
Benasque, Spain
- Vice-chair, International Conference on Bose-Einstein Condensation 2025
Sant Feliu de Guíxols, Spain
- Co-organizer, Conference *Taming Light and Matter for Novel Quantum Systems* 2025
ETH Zurich, Switzerland
- Co-organizer, EMMI workshop on *Synthetic topological matter* 2025
Benasque, Spain
- Co-organizer, CAPS and CQA Winter School on *Ultracold Quantum Many-Body Systems*, Benasque, Spain 2025
- Local organizing committee , International Conference on Bose-Einstein Condensation, Sant Feliu de Guíxols, Spain 2023, 2021
- Co-organizer, CAPS School on *Ultracold Atoms*, Barcelona, Spain 2022
- Co-organizer, European AMO online colloquium series [Quantum Science Seminar](#), 2020 - 2022
to palliate the lack of conferences during the COVID-19 pandemic
- Co-organizer, Workshop *Dynamics and interactions in quantum gases* 2019
Menorca, Spain
- Local organizing committee, International Conference on Atomic Physics (ICAP) 2018
Barcelona, Spain
- Program committee, QUTE-Europe Summer School, Chalmers, Sweden 2015
- Co-organizer, Workshop *Modelling materials with cold gases through simulations* 2011
ETH Zurich, Switzerland

Editorial and referee work

- Editorial board of Physical Review X Quantum 2023 - 2025
- Co-editor for Europhysics Letters 2018 - 2022
- Referee for Science, Nature, Nature Physics, Physical Review X, Physical Review Letters, Physical Review A, Physical Review B, New Journal of Physics (IoP Outstanding Reviewer 2018), Reports on Progress in Physics, and others.

Evaluation and management of grants

- Member of the coordination team for the European Quantum Flagship project since 2023
PASQuaS² (27 partners, 7 countries, 16.6M€)
- Panel member for ERC Consolidator Grants 2024
- Panel member for Spanish AEI grants (Plan Nacional, Consolidación Investigadora) 2023, 2019
- Referee for ERC (AdG, CoG, StG), Spanish AEI and Fundación BBVA, French ANR, DIM (Nano-K, Sirteq), German DFG, Italian "Quantum Science and Technology in Trento", New Zealand Marsden Foundation, British Leverhulme Trust, Israel Science Foundation, etc.
- PhD thesis evaluations for University of Cambridge, ETH Zurich, University of Innsbruck, Institut d'Optique, Ecole Normale Supérieure, Sorbonne Université, Université Paris Sciences et Lettres, Université Paul Sabatier-Toulouse, Université de Nice, Niels Bohr Institute, University of Aarhus, University of Florence, University of Trento, Universidad Complutense de Madrid, ICFO.
- Habilitation thesis evaluations for Technical University of Vienna, CNRS.

TEACHING AND OUTREACH ACTIVITIES

Graduate summer schools: Varenna (Quantum Computers and Simulators with Atoms 2024), Les Houches (Quantum information 2022, Statistical Physics 2015, Cold atoms 2015, Computational Physics 2014), ICFO-UNAM-UniAndes (2021), University of Frankfurt (2020), University of Strathclyde (2015), Benasque Physics Center (2014).

Master and postgraduate courses: University of Barcelona Master in Quantum Science and Technology (since 2023), UPC Master in Photonics (since 2017), UPC Postgraduate in Quantum Technologies (since 2021), ETH Zurich Master in Physics (2010-2011).
Coordination team for the Master in Quantum Science and Technology, University of Barcelona (since 2021).

Undergraduate courses: ETH Zurich Advanced Physics Laboratory (2008 – 2012) - *Prize of the ETH physics department for the Advanced Physics Laboratory 2012*. Exercise classes at ETH Zurich (2009-2010), Ecole Normale Supérieure Paris (2006-2008), Université Pierre et Marie Curie (Paris 6) (2004-2006).

Outreach

Speaker in outreach events: UAB(2025), Barcelona Public Libraries (2025), Quantum Technologies Flagship *QuantumBits* (2022), RSEF *Universo GEFES* (2022), Fotónica en 5 minutos (2021), Societat Catalana de Física *Física Oberta* (2020), Barcelona *Pint of Science* (2017)

Mentoring of summer research projects: Catalunya Caixa – ICFO Summer Fellows program for undergraduate students (2025, 2024, 2023, 2022, 2021, 2018, 2017, 2016, 2014)

Quantum mechanics demonstration experiments: development and demonstration of double slit experiments with single photons, ETH Zurich (2010)

Speaker in career sessions: CARLA Camp – careers in photonics (2024, 2022, 2021), EGAS career talk (2021)

COMPLETE LIST OF PUBLICATIONS

Journal articles

1. C. S. Chisholm, S. Hirthe, V. B. Makhalov, R. Ramos, R. Vatr  , J. Cabedo, A. Celi, and L. Tarruell.
Probing supersolidity through excitations in a spin-orbit-coupled Bose-Einstein condensate.
Science **391**, 480-484 (2026)
2. J. Arg  ello-Luengo, U. Bhattacharya, A. Celi, R. W. Chhajlany, T. Grass, M. P  odzie  , D. Rakshit,
T. Salamon, P. Stornati, L. Tarruell, and M. Lewenstein
Synthetic dimensions for topological and quantum phases: Perspective
Communications Physics **7**, 143 (2024)
3. S. Buob, J. H  schele, V. Makhalov, A. Rubio-Abadal, and L. Tarruell
A strontium quantum-gas microscope
PRX Quantum **5**, 020316 (2024)
4. L. Barbiero, J. Cabedo, M. Lewenstein, L. Tarruell, and A. Celi
Frustrated magnets without geometrical frustration in bosonic flux ladders
Phys. Rev. Research **5**, L042008 (2023)
5. J. H  schele, S. Buob, A. Rubio-Abadal, V. Makhalov, and L. Tarruell
Atom-number enhancement by shielding atoms from losses in strontium magneto-optical traps
Phys. Rev. Applied **19**, 064011 (2023)
6. C. S. Chisholm, A. Fr  lian, E. Neri, R. Ramos, L. Tarruell, and A. Celi
Encoding a one-dimensional topological gauge theory in a Raman-coupled Bose-Einstein condensate
Phys. Rev. Research **4**, 043088 (2022)
Selected as Editors' suggestion
7. A. Fr  lian, C. S. Chisholm, E. Neri, C. R. Cabrera, R. Ramos, A. Celi, and L. Tarruell
Realizing a 1D topological gauge theory in an optically dressed BEC
Nature **608**, 293 (2022)
8. J. Sanz, A. Fr  lian, C. S. Chisholm, C. R. Cabrera, and L. Tarruell
Interaction control and bright solitons in coherently-coupled Bose-Einstein condensates
Phys. Rev. Lett. **128**, 013201 (2022)
9. M. Buser, C. Hubig, U. Schollw  ck, L. Tarruell, and F. Heidrich-Meisner
Interacting bosonic flux ladders with a synthetic dimension: Ground-state phases and quantum quench dynamics
Phys. Rev. A **102**, 053314 (2020)
10. T. Salamon, A. Celi, R. W. Chhajlany, I. Fr  rot, M. Lewenstein, L. Tarruell, and D. Rakshit
Simulating twistrionics without a twist
Phys. Rev. Lett. **125**, 030504 (2020)
11. L. Tanzi, C. R. Cabrera, J. Sanz, P. Cheiney, M. Tomza, and L. Tarruell
Feshbach resonances in potassium Bose-Bose mixtures
Phys. Rev. A **98**, 062712 (2018)
12. L. Tarruell and L. Sanchez-Palencia
Quantum simulation of the Hubbard model with ultracold fermions in optical lattices
Comptes Rendus Physique **19**, 365 (2018)
13. Y. V. Kartashov, B. A. Malomed, L. Tarruell, and L. Torner
Three-dimensional droplets of swirling superfluids
Phys. Rev. A **98**, 013612 (2018)
14. P. Cheiney, C. R. Cabrera, J. Sanz, B. Naylor, L. Tanzi, and L. Tarruell
Bright Soliton to Quantum Droplet Transition in a Mixture of Bose-Einstein Condensates

- Phys. Rev. Lett. **120**, 135301 (2018)
 Selected for a *Nature Physics News and Views* and an article in *Physics Today*.
15. Y. Ashida, R. Schmidt, L. Tarruell, and E. Demler
Many-body interferometry of magnetic polaron dynamics
 Phys. Rev. B **97**, 060302(R) (2018)
 Selected for a *Research Highlight in Nature Physics*.
 16. C. R. Cabrera, L. Tanzi, J. Sanz, B. Naylor, P. Thomas, P. Cheiney, and L. Tarruell
Quantum liquid droplets in a mixture of Bose-Einstein condensates
 Science **359**, 301-304 (2018)
 Selected for a *Science Perspective*, a *Nature Physics News and Views*, and a highlight and an article in *Physics Today*.
 17. S. Muel, A. Dauphin, P. Massignan, L. Tarruell, M. Lewenstein, C. Lobo, and A. Celi
Measuring Chern numbers in Hofstadter strips
 SciPost Phys. **3**, 012 (2017)
 18. T. Grass, R. W. Chhajlany, L. Tarruell, V. Pellegrini, and M. Lewenstein
Proximity effects in cold atom artificial graphene
 2D Mater. **4**, 015039 (2017)
 19. J. Rodríguez-Laguna, L. Tarruell, M. Lewenstein, and A. Celi
Synthetic Unruh effect in cold atoms
 Phys. Rev. A **95**, 013627 (2017)
 20. J. Imriska, M. Iazzi, L. Wang, E. Gull, D. Greif, T. Uehlinger, G. Jotzu, L. Tarruell, T. Esslinger, and M. Troyer
Thermodynamics and magnetic properties of the anisotropic 3D Hubbard model
 Phys. Rev. Lett. **112**, 115301 (2014)
 21. D. Greif, T. Uehlinger, G. Jotzu, L. Tarruell, and T. Esslinger
Short-range quantum magnetism of ultracold fermions in an optical lattice
 Science **340**, 1307 (2013)
 Selected for a *Science Perspective*.
 22. T. Uehlinger, D. Greif, G. Jotzu, L. Tarruell, T. Esslinger, L. Wang, and M. Troyer
Double transfer through Dirac points in a tunable honeycomb optical lattice
 Eur. Phys. J. Special Topics **217**, 121 (2013)
 Selected as cover of the issue.
 23. L. Tarruell, D. Greif, T. Uehlinger, G. Jotzu, and T. Esslinger
Creating, moving and merging Dirac points with a Fermi gas in a tunable honeycomb lattice
 Nature **483**, 302 (2012)
 Selected as cover of the issue, and for a *Nature News and Views*.
 24. D. Greif, L. Tarruell, T. Uehlinger, R. Jördens, and T. Esslinger
Probing nearest-neighbor correlations of ultracold fermions in an optical lattice
 Phys. Rev. Lett. **106**, 145302 (2011)
 25. R. Sensarma, D. Pekker, E. Altman, E. Demler, N. Strohmaier, D. Greif, R. Jördens, L. Tarruell, H. Moritz, and T. Esslinger
Lifetime of double occupancies in the Fermi-Hubbard model
 Phys. Rev. B **82**, 224302 (2010)
 26. R. Jördens, L. Tarruell, D. Greif, T. Uehlinger, N. Strohmaier, H. Moritz, T. Esslinger, L. De Leo, C. Kollath, A. Georges, V. Scarola, L. Pollet, E. Burovski, E. Kozik, and M. Troyer
Quantitative Determination of Temperature in the Approach to Magnetic Order of Ultracold Fermions in an Optical Lattice
 Phys. Rev. Lett. **104**, 180401 (2010)
 27. N. Strohmaier, D. Greif, R. Jördens, L. Tarruell, H. Moritz, T. Esslinger, R. Sensarma, D. Pekker, E. Altman, and E. Demler
Observation of elastic doublon decay in the Fermi-Hubbard model

- Phys. Rev. Lett. **104**, 080401 (2010)
28. S. Nascimbène, N. Navon, K. Jiang, L. Tarruell, M. Teichmann, J. McKeever, F. Chevy, and C. Salomon
Collective Oscillations of an Imbalanced Fermi Gas: Axial Compression Modes and Polaron Effective Mass
Phys. Rev. Lett. **103**, 170402 (2009)
 29. F. Werner, L. Tarruell, and Y. Castin
Number of closed-channel molecules in the BEC-BCS crossover
Eur. Phys. J. B **68**, 401 (2009)
 30. F. Chevy, E. G. M. van Kempen, T. Bourdel, J. Zhang, L. Khaykovich, M. Teichmann, L. Tarruell, S. J. J. M. F. Kokkelmans, and C. Salomon
Resonant scattering properties close to a p-wave Feshbach resonance
Phys. Rev. A **71**, 062710 (2005)
 31. J. Zhang, E. G. M. van Kempen, T. Bourdel, L. Khaykovich, J. Cubizolles, F. Chevy, M. Teichmann, L. Tarruell, S. J. J. M. F. Kokkelmans, and C. Salomon
P-wave Feshbach resonances of ultra-cold ^6Li
Phys. Rev. A **70**, 030702(R) (2004)
 32. T. Bourdel, L. Khaykovich, J. Cubizolles, J. Zhang, F. Chevy, M. Teichmann, L. Tarruell, S. J. J. M. F. Kokkelmans, and C. Salomon
Experimental Study of the BEC-BCS Crossover Region in Lithium 6
Phys. Rev. Lett. **93**, 050401 (2004)

Preprints

33. C. Iacovelli, J. Cabedo, L. Tarruell, and A. Celi
Encoding a topological gauge theory on a ring-shaped Raman-coupled Bose gas
arXiv:2412.13861

Conference proceedings and chapters in books

34. L. Tarruell
Spectroscopic Tools for Experiments with Ultracold Fermions in Optical Lattices
Chapter 11 in Quantum Gas Experiments - Exploring Many-Body States,
Eds. P. Törmä and K. Sengstock, Imperial College Press, London (2014)
35. T. Uehlinger, D. Greif, G. Jotzu, L. Tarruell, and T. Esslinger
Bloch-Zener oscillations in a tunable optical honeycomb lattice
The Physics of Semiconductors: Proceedings of the 31st International Conference on the Physics of Semiconductors (ICPS) 2012 **1566**, 534-535 (2013)
36. C. Guerlin, K. Baumann, F. Brennecke, D. Greif, R. Jördens, S. Leinss, N. Strohmaier, L. Tarruell, T. Uehlinger, H. Moritz, and T. Esslinger
Synthetic Quantum Many-Body Systems
LASER SPECTROSCOPY: Proceedings of the XIX International Conference on Laser Spectroscopy ICOLS 2009. World Scientific, pp. 212-221 (2010)
37. L. Tarruell, M. Teichmann, J. McKeever, T. Bourdel, J. Cubizolles, L. Khaykovich, J. Zhang, N. Navon, F. Chevy, and C. Salomon
Expansion of an ultra-cold lithium gas in the BEC-BCS crossover
Proceedings of the International School on Physics Enrico Fermi 2006, Ultracold Fermi Gases (eds. Inguscio, M., Ketterle, W. and Salomon, C.), pp. 845-855. IOS Press, Amsterdam (2007)
38. J. Zhang, E.G.M. Van Kempen, T. Bourdel, L. Khaykovich, J. Cubizolles, F. Chevy, M. Teichmann, L. Tarruell, S. J. J. M. F. Kokkelmans, and C. Salomon
Expansion of a lithium gas in the BEC-BCS crossover
ATOMIC PHYSICS **19**: XIX International Conference on Atomic Physics ICAP 2004. AIP Conference Proceedings **770**, pp. 228-237 (2005)

Invited publications

39. A. Celi and L. Tarruell
Probing the edge with cold atoms (Perspective)
Science **349**, 1450 (2015)

Outreach

40. L. Tarruell
Los gases cuánticos de fermiones ultrafríos como sistemas modelo de física de la materia condensada
Revista Española de Física **31**, 35 (2017)

COMPLETE LIST OF INVITED TALKS

2025

1. INQA Conference "Quantum Simulation and Quantum Computation in Continuous Time", Barcelona (Spain)
Spin-resolved microscopy of an SU(10) Fermi-Hubbard system, 03/11/2025
2. Workshop "Entangle This VI: 100 years of quantum", Madrid (Spain)
Spin-resolved microscopy of an SU(10) Fermi-Hubbard system, 19/09/2025
3. BEC 2025 Conference, Sant Feliu de Guíxols (Spain)
Probing supersolidity through excitations in a spin-orbit-coupled Bose-Einstein condensate, 10/09/2025
4. Conference "Taming Light and Matter for Novel Quantum Systems", ETH Zurich (Switzerland)
Microscopy of strontium Bose- and Fermi-Hubbard systems, 2025/08/28
5. ECAMP 15 Conference, Innsbruck (Austria)
Microscopy of strontium Bose- and Fermi-Hubbard systems, 2025/07/03
6. Workshop "Trends in Quantum Simulation of Gauge Fields and Topological Matter", Padova (Italy)
Probing supersolidity through excitations in a spin-orbit-coupled Bose-Einstein condensate, 18/06/2025
7. Conference "Quantum Thermalization in closed systems: from theory to experiments", Garching (Germany)
Microscopy of strontium Bose- and Fermi-Hubbard systems, 2025/05/15
8. Workshop on "Topological Quantum Matter with Atoms and Photons", Collège de France, Paris (France)
Probing supersolidity through excitations in a spin-orbit-coupled Bose-Einstein condensate, 2025/04/11

2024

9. International School of Physics "Enrico Fermi", Course 214, Quantum Computers and Simulators with Atoms, Varenna (Italy)
Quantum simulation with continuum systems, 10-12/07/2024
10. MCQST Colloquium, Garching (Germany)
Exploring supersolidity with spin-orbit coupled Bose-Einstein condensates, 09/04/2024
11. EGAS 55 Conference, University of Granada (Spain)
Exploring supersolidity with spin-orbit coupled Bose-Einstein condensates, 20/06/2024

2023

12. CUBIT Seminar, JILA, NIST and University of Colorado, Boulder (USA)
Engineering exotic superfluids with spin-orbit coupled Bose-Einstein condensates, 11/12/2023

13. International conference on Quantum Simulation (ICQSIM2023), Ecole Polytechnique, Palaiseau (France)
Engineering exotic superfluids in spin-orbit coupled Bose-Einstein condensates, 13/11/2023
14. Workshop Anyons in one dimension, Technische Universität Berlin (Germany)
Realizing the chiral BF model in an optically dressed Bose-Einstein condensate, 09/11/2023
15. Physics Colloquium, University of the Basque Country, Bilbao (Spain)
Simulating exotic superfluids with optically-dressed Bose-Einstein condensates, 04/10/2023
16. International conference Bose-Einstein condensation 2023, Sant Feliu de Guíxols (Spain)
Engineering exotic superfluids with spin-orbit coupled Bose-Einstein condensates, 13/09/2023
17. Long-range interactions workshop, San Sebastián (Spain)
Supersolid-stripe phase in a spin-orbit coupled Bose-Einstein condensate, 08/09/2023
18. Gordon Research Conference in Atomic Physics, Salve Regina University, Rhode Island (USA)
Engineering exotic superfluids in optically-dressed Bose-Einstein condensates, 15/06/2023
19. Seminar, Atominstitut, Technical University of Vienna (Austria)
Engineering exotic superfluids in optically-dressed Bose-Einstein condensates, 05/05/2023
20. ICFO-IMPRS workshop, Castelldefels (Spain)
Engineering exotic superfluids in optically-dressed Bose-Einstein condensates, 20/04/2023
21. 2023 MIAPbP Program “Quantum Computing Methods” for lattice gauge theories, Garching (Germany)
Engineering a topological field theory with an optically dressed Bose-Einstein condensate, 18/04/2023
22. APS March Meeting 2023, Las Vegas (USA)
Engineering a topological gauge theory in an optically coupled Bose-Einstein condensate, 08/03/2023
23. Seminar, University of Cambridge (United Kingdom)
Engineering a topological gauge theory in an optically dressed Bose-Einstein condensate, 28/02/2023

2022

24. 777. WE-Heraeus Seminar Ultracold Quantum Matter, Bad Honnef (Germany)
Engineering a topological gauge theory in an optically dressed Bose-Einstein condensate, 14/12/2022
25. Colloquium, University of Hannover and PTB Braunschweig
Engineering gauge theories with Bose-Einstein condensates, 17/11/2022
26. Workshop Quantum Methods for Lattice Gauge Theories, Mainz Institute for Theoretical Physics, Mainz (Germany)
Engineering a topological gauge theory in an optically dressed Bose-Einstein condensate, 08/11/2022
27. Solvay Workshop in Quantum Simulation, Brussels (Belgium)
Engineering a topological gauge theory in an optically dressed Bose-Einstein condensate, 30/08/2022
28. International Conference in Atomic Physics (ICAP) 2022, Toronto (Canada)
Engineering a topological gauge theory in an optically dressed Bose-Einstein condensate, 21/07/2022
29. DAMOP Conference 2022, Orlando (USA)
Realizing a topological gauge theory in an optically dressed Bose-Einstein condensate, 02/06/2022
30. OSCAR Conference, Bad Honnef (Germany)

Engineering a topological gauge theory in an optically dressed Bose-Einstein condensate, 15/06/2022

31. ETH Condensed Matter Seminar, Zurich (Szwitzerland)
Simulating a topological field theory in an optically dressed Bose-Einstein condensate, 20/05/2022
32. Seminar, Cours 2022 du Prof. Jean Dalibard, Collège de France, Paris (France)
Realizing a topological gauge theory in an optically dressed Bose-Einstein condensate, 15/04/2022
33. MIT-Harvard Center for Ultracold Atoms (CUA) Seminar, Cambridge (USA)
Realizing a topological gauge theory in an optically dressed Bose-Einstein condensate, 29/03/2022

2021

34. Seminar, Department of Physics, University of Vilnius (Lithuania), online
Realizing a topological gauge theory in an optically-coupled Bose-Einstein condensate, 01/12/2021
35. NNV AMO Meeting, Lunteren (The Netherlands), online
Realizing a topological gauge theory in an optically-coupled Bose-Einstein condensate, 12/10/2021
36. Interdisciplinary Workshop on Supersolidity, Trento (Italy)
Spin-orbit coupled BECs with tunable interactions: from stripe phases to topological gauge theories, 22/09/2021
37. Munich Center for Quantum Science and Technology conference 2021, Munich (Germany), online
Realizing a 1D topological gauge theory in an optically dressed BEC, 20/07/2021
38. KITP Santa Barbara program “Interacting Topological Matter”, Santa Barbara (USA), online
Realizing a 1D topological gauge theory in an optically dressed BEC, 17/06/2021
39. Conference SuperFluctuations 2021 - Fluctuations and Highly Non-Linear Phenomena in Superfluids and Superconductors, University of Camerino (Italy) and University of Columbia (USA), online
Realizing a topological gauge theory in an optically-coupled Bose-Einstein condensate, 14/06/2021
40. Young Atom Opticians (YAO) conference, University of Aarhus (Denmark), online
Realizing a 1D topological gauge theory in an optically dressed BEC, 28/05/2021
41. Seminar, Department of Physics, University of Göttingen (Germany), online
Realizing a 1D topological gauge theory in an optically dressed BEC, 27/04/2021
42. Seminar, BEC Center, Trento (Italy), online
Realizing a 1D topological gauge theory in an optically dressed BEC
43. Clustering and Global Challenges Conference 2021, online
Realizing a chiral gauge theory in an optically dressed Bose-Einstein condensate, 07/04/2021
44. ICFO-IMPRS Joint Workshop, online
Realizing a chiral gauge theory in an optically dressed Bose-Einstein condensate, 25/03/2021
45. Workshop on Entanglement in Strongly Correlated Systems, Benasque (Spain), online
Realizing a chiral gauge theory in an optically dressed Bose-Einstein condensate, 18/02/2021

2020

46. Minisymposium, Collaborative research center SFB/TR 185, Universities of Bonn and Kaiserslautern (Germany)
Engineering interactions and density-dependent gauge fields in coherently-coupled Bose-Einstein condensates, 23/11/2020
47. Quantum Technology International Conference – QTech 2020, Barcelona (Spain)
Bose-Einstein condensates with chiral interactions, 02/11/2020
48. Seminar, Department of Atomic and Laser Physics, University of Oxford (UK)
Chiral interactions in optically coupled Bose-Einstein condensates, 12/10/2020

49. Virtual AMO Seminar - [VAMOS](#) (USA)
Chiral interactions in optically coupled Bose-Einstein condensates, 18/09/2020

2019

50. Seminar, Laboratoire de Physique Théorique et Modèles Statistiques (LPTMS), Orsay (France)
Solitons and droplets in two-component Bose-Einstein condensates, 17/12/2019
51. Quantum Mixtures Workshop (for the 70th birthday of S. Stringari), Trento (Italy)
Solitons and droplets in two-component Bose-Einstein condensates, 15/07/2019
52. International Conference on Laser Spectroscopy (ICOLS), Queenstown (New Zealand)
Solitons and droplets in two-component Bose-Einstein condensates, 08/07/2019
53. Workshop on Dynamical gauge fields and lattice gauge theories in quantum gases, ETH Zurich
Density-dependent gauge fields in Raman-coupled Bose-Einstein condensates, 28/06/2019
54. CLEO, Munich (Germany)
Solitons and droplets in two-component Bose-Einstein condensates, 25/06/2019
55. Seminar of Laboratoire Kastler Brossel, Collège de France, Paris (France)
Making Quantum Liquids from Quantum Gases, 19/06/2019
56. ICE (Información cuántica en España) meeting
Solitons, droplets and artificial gauge fields in two-component BECs, 30/05/2019
57. European Conference on Quantum Technologies, Grenoble (France)
Simulating quantum liquids with quantum gases, 18-22/02/2019

2018

58. Quo Vadis BEC: Research Frontiers in Ultracold Quantum Gases, Bad Honnef (Germany)
Solitons and droplets in two-component Bose-Einstein condensates, 17-21/12/2018
59. Symposium on Quantum Technologies, Fundación Ramón Areces, Madrid (Spain)
Solitons and droplets in two-component Bose-Einstein condensates, 21-22/11/2018
60. RSEF Foro de Física de Átomos Fríos, Bilbao (Spain)
Solitons and droplets in two-component Bose-Einstein condensates, 16-17/11/2018
61. IFIMAC Seminar, Universidad Autónoma de Madrid (Spain)
Making Quantum Liquids from Quantum Gases, 19/10/2018
62. EGAS (European Group on Atomic Systems) conference, Krakow (Poland)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 11/07/2018
63. YAO (Young Atom Opticians) conference, Glasgow
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 25/06/2018
64. APS DAMOP, Fort Lauderdale (USA)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 01/06/2018
65. QSIT (Quantum Science and Technology) Workshop, Monte Verità (Switzerland)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 28/05/2018
66. Seminar, Service de Physique de l'Etat condensé, CEA Saclay (France)
Making Quantum Liquids from Quantum Gases, 02/05/2018
67. Quantum Gases and Quantum Coherence Conference, Bad Honnef (Germany)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 17/04/2018
68. Seminar of Center for Ultracold Atoms, Harvard University, Boston (USA)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 13/03/2018
69. Made@ICFO colloquium, ICFO, Castelldefels (Spain)
Making Quantum Liquids from Quantum Gases, 21/03/2018
70. Quantum Simulation and Computation Workshop, Bilbao (Spain)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 13/02/2018
71. Theoretical Physics Seminar, LMU Munich (Germany)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 26/01/2018
72. Colloquium, Center for Quantum Dynamics, University of Heidelberg (Germany)

Quantum liquid droplets in a mixture of Bose-Einstein condensates, 24/01/2018

2017

- 73. MPQ Colloquium, Garching (Germany)
Making quantum liquids from quantum gases, 19/12/2017
- 74. Young researchers meeting 2017, Instituto Nicolás Cabrera, UAM, Miraflores de la Sierra (Spain)
Making quantum liquids out of quantum gases, 15/12/2017
- 75. Croucher conference on Frontiers in Cold Atom Physics, Hong Kong
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 06/12/2017
- 76. Workshop Designing out-of-equilibrium many-body quantum systems, Glasgow (UK)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 27/10/2017
- 77. Quantum Optics IX conference, Gdansk (Poland)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 20/09/2017
- 78. Conference Bose-Einstein condensation 2017, Sant Feliu de Guixols (Spain)
Quantum liquid droplets in a mixture of Bose-Einstein condensates, 02-08/09/2017
- 79. SFB Colloquium, University of Stuttgart (Germany)
From solitons to droplets in attractive Bose-Bose mixtures, 02/06/2017
- 80. Conference Quantum science approaches to strongly correlated systems : from ultracold atoms to high-energy and condensed matter physics, GGI, Florence (Italy)
From solitons to droplets in attractive Bose-Bose mixtures, 29/05-02/06/2017

2016

- 81. Conference Designer Quantum Systems Out of Equilibrium, KITP, Santa Barbara (USA)
Soliton-to-droplet crossover in attractive Bose-Bose mixtures, 14-17/11/2016

2015

- 82. Workshop Synthetic Quantum Magnetism, Max Planck Institute for the Physics of Complex Systems, Dresden (Germany)
Short-range quantum magnetism of ultracold fermions in optical lattices, 31/08-04/09/2015
- 83. Conference “Quantum Technologies VI”, Warsaw (Poland)
Short-range quantum magnetism of ultracold fermions in optical lattices, 21-27/06/2015
- 84. Seminar, Departamento de Física de la Materia Condensada, Universidad de Zaragoza (Spain)
Simulando materiales artificiales con átomos ultra-fríos en redes ópticas, 08/05/2015
- 85. Seminar, Institute for Laser Physics, University of Hamburg (Germany)
Short-range quantum magnetism of ultracold fermions in optical lattices, 09/02/2015
- 86. FOM Physics meeting, Veldhoven (Netherlands)
Short-range quantum magnetism of ultracold fermions in optical lattices, 21-22/01/2015

2014

- 87. Workshop Dirac and Topological Matter, Université de Bordeaux (France)
Simulating graphene with ultracold fermions in optical lattices, 12-14/11/2014
- 88. Conference Cold atoms and beyond, AIAS Aarhus (Denmark)
Short-range quantum magnetism of ultracold fermions in an optical lattice, 25-27/06/2014
- 89. 6th Madrid meeting on ultracold atoms, Instituto de Física Teórica, UAM, Madrid (Spain)
Ultracold fermions in tunable-geometry optical lattices, 31/01/2014

2013

- 90. Seminar, Universitat Politècnica de Catalunya (Spain)
Engineering synthetic quantum materials with ultracold fermions in a tunable-geometry optical lattice, 11/11/2013
- 91. Seminar, Universidad Complutense de Madrid (Spain)

Engineering synthetic quantum materials with ultracold fermions in a tunable-geometry optical lattice, 26/09/2013

92. Seminar, Institute of Theoretical Physics, University of Goettingen (Germany)
Engineering artificial materials with ultracold fermions in a tunable-geometry optical lattice, 02/07/2013
93. CLEO Conference, QELS-Fundamental Science Symposium "Quantum Simulators", San José (USA)
Simulating graphene with ultracold fermions in a honeycomb optical lattice, 08-13/06/2013
94. Seminar, Goethe University, Frankfurt (Germany)
Engineering artificial materials with ultracold fermions in a tunable-geometry optical lattice
95. Symposium on Topological Quantum Information, Benasque (Spain)
Engineering Dirac points with ultracold fermions in a tunable honeycomb optical lattice

2012

96. Max Planck Institute for the Physics of Complex Systems, Dresden (Germany)
Engineering Dirac points with ultracold fermions in optical lattices
97. KITP program on Quantum Dynamics in Far from Equilibrium Thermally Isolated Systems, Santa Barbara (USA)
Engineering Dirac points with ultracold fermions in optical lattices
98. Session plénière, GDR Physique Mésoscopique, Aussois (France)
Engineering Dirac points with ultracold fermions in optical lattices
99. Workshop on Quantum Simulations with Ultracold Atoms, ICTP, Trieste (Italy)
Engineering Dirac points with ultracold fermions in optical lattices
100. Workshop on Theory of Quantum Gases and Quantum Coherence, ENS Lyon (France)
Engineering Dirac points with ultracold fermions in optical lattices
101. Laboratoire Photonique, Numérique et Nanosciences, Institut d'Optique, Bordeaux (France)
Engineering Dirac points with ultracold fermions in optical lattices
102. Seminar, ICTP, Trieste (Italy)
Engineering Dirac points with ultracold fermions in optical lattices
103. Winter conference on New directions in Ultracold Atoms, Aspen (USA)
Creating, moving and merging Dirac points with a Fermi gas in a tunable honeycomb lattice

2011

104. Journée de l'Institut de Physique Fondamentale, Bordeaux (France)
Observation et manipulation de points de Dirac dans un gaz de fermions ultra-froids
105. Atelier de Physique Théorique, Université de Genève (Switzerland)
Creating, moving and merging Dirac points with a Fermi gas in a tunable honeycomb lattice
106. Workshop on Ultracold atoms/molecules, National Tsing-Hua University, Hsinchu (Taiwan)
Studying the metal-Mott insulator transition with ultracold fermions in an optical lattice
107. Workshop on Ultrafast Dynamics in Strongly Correlated Systems, ETH Zurich (Switzerland)
Non-equilibrium dynamics of ultracold fermions in optical lattices
108. Seminar, Ultracold Atoms Group, University of Nottingham (UK)
Probing nearest-neighbor correlations of ultra-cold fermions in an optical lattice
109. Seminar, Institute of Atomic and Subatomic Physics, Vienna University of Technology (Austria)
Simulating strongly correlated materials with ultracold fermions in optical lattices
110. Seminar, ICFO-The Institute of Photonic Sciences, Castelldefels (Spain)
Simulating strongly correlated materials with ultracold fermions in optical lattices

2010

111. Workshop on Ultracold Quantum Gases Beyond Equilibrium, Natal (Brazil)
Equilibrium and out of equilibrium physics with ultracold fermions in optical lattices

112. Workshop on Time-dependent dynamics and non-equilibrium quantum systems, Budapest (Hungary)

Equilibrium and out of equilibrium physics with ultracold fermions in optical lattices

113. SFB Seminar, University of Kaiserslautern (Germany)

Equilibrium and out of equilibrium physics with ultra-cold fermions in optical lattices

2009

114. Workshop on Quantum Simulation with Cold Atoms and Molecules, Aspen (USA)

Exploring the Fermi-Hubbard model with atoms in optical lattices

115. Seminar, University of Stuttgart, Germany (2009)

Equilibrium and out of equilibrium physics with ultracold fermions in optical lattices

116. Seminar, Laboratoire Charles Fabry, Institut d'Optique, Palaiseau (France)

Fermions en interaction dans un réseau optique : isolant de Mott et physique hors équilibre

2008

117. Seminar, Laboratoire Agrégats-Collisions-Réactivité, Université Paul Sabatier, Toulouse (France)

Systèmes fortement corrélés avec des fermions ultra-froids : de la superfluidité à l'isolant de Mott fermionique

2007

118. Seminar, Ultracold Atoms and Quantum Gases Group, University of Innsbruck (Austria)

Superfluidity in an ultra-cold Fermi gas

119. Seminar, Ultracold Atoms Group, University of Mainz (Germany)

Superfluidity in an ultra-cold Fermi gas

120. Seminar, Quantum Optics Group, ETH Zurich (Switzerland)

Superfluidity in an ultra-cold Fermi gas

121. Seminar, Ultracold Atoms Group, University of Heidelberg (Germany)

Experimental study of fermionic lithium in the BEC-BCS crossover

122. Trimester on Quantum Gases, Institut Henri Poincaré, Paris (France)

p-wave Feshbach resonances of ultra-cold ^6Li

2006

123. International School on Ultracold Fermi Gases, Varenna (Italy)

Expansion of ^6Li in the BEC-BCS crossover

COMPLETE LIST OF GROUP MEMBERS (at ICFO)

CURRENT GROUP MEMBERS

Postdocs

Sarah Hirthe, *Marie Curie Fellowship*

Quentin Redon

Félix Faisant

Start date

16.01.2023

01.12.2024

01.11.2025

PhD students

Claudio Iacovelli, *FPI Fellowship (co-supervision with A. Celi, UAB)*

Julia Bergmann (*co-supervision with A. Celi, UAB*)

Ana Pérez Barrera

Carlos Gas Ferrer, *FPI Fellowship*

Ignacio Pérez Ramos, *ICFO FLIGHT Fellowship*

01.02.2022

01.09.2022

01.10.2022

08.01.2024

12.02.2024

Andreas Meyer, <i>ICFO FLIGHT Fellowship</i>	01.06.2024
Roxana Wedowski, <i>ICFO FLIGHT Fellowship</i>	01.06.2024
Leonardo Bezzo, <i>FI-STEP Fellowship</i>	01.05.2025

Master students

Matías Volante Abovich, <i>Master in Quantum Science and Technology</i>	10.11.2025
Mar López Iglesias, <i>Master in Quantum Science and Technology</i>	01.12.2025

Bachelor students

Pablo Gómez Montañez, <i>Universitat de Barcelona (UB)</i>	01.07.2025
Nuria Castillo Ariño, <i>Universitat Autònoma de Barcelona (UAB)</i>	15.10.2025

Visiting postdoc

Pierpaolo Fontana, <i>Universitat Autònoma de Barcelona (UAB)</i>	21.04.2023
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Visiting PhD students

Marc Miranda Ríaza, <i>FPU Fellowship (co-supervision with A. Celi, UAB)</i>	19.01.2024
Giamarco Massini, <i>LENS (L. Fallani's group)</i>	22.11.2025

FORMER GROUP MEMBERS

Postdocs	Start date	End date
Antonio Rubio Abadal, <i>LaCaixa Junior Leader and Juan de la Cierva Formación Fellowships</i> <i>Now assistant professor (profesor lector) at University of Barcelona</i>	19.04.2021	14.09.2025
Rémy Vatré <i>Now associate professor (Maître de Conférences) at Université Sorbonne Paris Nord</i>	18.09.2023	31.08.2025
Sandra Buob <i>Now Quantum Engineer at IDEADED</i>	23.11.2024	30.04.2025
Jonatan Höschele <i>Now Quantum Engineer at IDEADED</i>	01.05.2024	31.08.2024
Vasiliy Makhalov, <i>Beatriu de Pinós Fellowship</i> <i>Now Senior Quantum Engineer at IDEADED</i>	08.10.2019	31.01.2024
Craig S. Chisholm <i>Now physicist at OpenStar</i>	20.06.2023	27.10.2023
Ramón Ramos, <i>Marie Curie Fellowship</i> <i>Now Head of Quantum Simulation at IDEADED</i>	01.10.2019	23.06.2023
Elettra Neri, <i>Marie Curie Fellowship</i> <i>Now physicist at CareGlance Srl</i>	01.11.2019	31.12.2021
Cesar R. Cabrera Córdoba, <i>ICFO-MPQ CELLEX Fellow</i> <i>Continued as Marie Curie postdoctoral fellow at MPQ and LMU Munich (I. Bloch's group) and senior postdoc at University of Hamburg (H. Moritz's group). Starts his own group at IGFAE with an ERC Starting Grant</i>	11.10.2018	30.06.2020
Bruno Naylor <i>Now professeur agrégé de physique</i>	03.04.2017	31.03.2018
Luca Tanzi <i>Now permanent CNR researcher at LENS</i>	03.11.2014	31.08.2017
Pierrick Cheiney, <i>Marie Curie Fellowship</i> <i>Now Research Engineer at exail</i>	04.11.2013	31.03.2017

Visiting postdoc

Josep Cabedo Bru, <i>UAB</i>	22.05.2022	31.08.2025
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PhD students

Sandra Buob, <i>Severo Ochoa FPI Fellowship</i>	01.03.2020	22.11.2024
<u>Thesis:</u> Quantum-gas microscopy of strontium Bose- and Fermi-Hubbard systems		
<u>Grade:</u> Excellent <i>cum laude</i>		
<i>Continued in the group as postdoc</i>		
Jonatan Hörschele, <i>ICFO Stepstone Fellowship</i>	07.01.2019	30.04.2024
<u>Thesis:</u> A strontium quantum-gas microscope		
<u>Grade:</u> Excellent <i>cum laude</i>		
<i>Continued in the group as postdoc</i>		
Craig S. Chisholm, <i>ICFO Stepstone Fellowship</i>	25.06.2018	19.06.2023
<u>Thesis:</u> Raman dressed Bose-Einstein condensates with tunable interactions: Topological gauge theories and supersolids		
<u>Grade:</u> Excellent <i>cum laude</i> , ICFO PhD thesis prize		
<i>Continued in the group as postdoc</i>		
Anika Frölian, <i>LaCaixa INPhINIT Fellowship</i>	08.01.2018	07.04.2022
<u>Thesis:</u> Simulating a topological gauge theory in a Raman-dressed Bose-Einstein condensate		
<u>Grade:</u> Excellent <i>cum laude</i>		
<i>Continued as associate at McKinsey & Company, now Chief of Staff at Quantum Diamonds</i>		
Julio Sanz Sánchez, <i>FPI Fellowship</i>	02.11.2015	10.02.2020
<u>Thesis:</u> Two-component Bose gases with competing interactions		
<u>Grade:</u> Excellent <i>cum laude</i>		
<i>Now quantum systems engineer at Quside</i>		
Cesar R. Cabrera Córdoba, <i>CONACYT Fellowship</i>	07.01.2014	10.10.2018
<u>Thesis:</u> Quantum liquid droplets in a mixture of Bose-Einstein condensates		
<u>Grade:</u> Excellent <i>cum laude</i> , ICFO PhD thesis prize		
<i>Continued in the group as postdoc</i>		

Visiting PhDs

Lenny Hoenen, <i>University of Heidelberg (L. Chomaz's group)</i>	01.07.2025	30.11.2025
Luca Cavicchioli, <i>LENS (F. Minardi's group)</i>	09.01.2023	30.04.2023

Master Students

Derik Rochlitz Puig, <i>Master in Quantum Science and Technology</i>	05.12.2024	31.07.2025
<u>Thesis:</u> Atomic Properties & Red Laser System for a Sr-Based Rydberg Quantum Simulator		
<i>Continued as PhD student at University of Heidelberg (Oriol Vendrell's group)</i>		
Lucía Verdegay Fernández, <i>Master in Quantum Science and Technology</i>	26.09.2023	06.09.2024
<u>Thesis:</u> Generating arbitrary potentials for Bose-Einstein condensates with a digital micromirror device		
<i>Continued as PhD student at Vrije Universiteit Amsterdam</i>		
Judith González Sorribes, <i>Master in Photonics</i>	26.09.2023	06.09.2024
<u>Thesis:</u> A laser system for addressing the strontium clock transition		
<i>Now optical engineer at Aistech Space</i>		
Irene Prieto Rodríguez, <i>Master in Quantum Science and Technology</i>	30.10.2023	06.09.2024
<u>Thesis:</u> A laser system for cooling strontium atoms in a new Rydberg atom-array experiment		
<i>Continued as PhD student at MPQ (M. Aidelsburger's group)</i>		
José Luis Reyes Calderón, <i>Master in Quantum Science and Technology</i>	30.10.2023	06.09.2024
<u>Thesis:</u> Towards the Observation of 2D Supersolidity in a Raman-Dressed Bose-Einstein Condensate		
Co-supervision with A. Celi (UAB)		
<i>Continued as PhD student at University of Hannover (L. Santos' group)</i>		
Marc Miranda Ríaza (Master in Quantum Science and Technology)	01.03.2023	05.09.2023
<u>Thesis:</u> Engineering quantum spin liquid states with ultracold bosons in optical lattices		
<u>Grade:</u> 9.8/10. Co-supervision with A. Celi (UAB)		
<i>Continued at UAB as FPU PhD student (A. Celi's group)</i>		
Carlos Gas Ferrer (Barcelona Master in Photonics)	20.02.2023	09.09.2023

Thesis: Characterization and transverse laser cooling of a strontium atomic source

Grade: 10/10

Continued in the group as PhD student

Ana Pérez Barrera (Barcelona Master in Photonics) 01.10.2021 09.09.2022

Thesis: Beam shaping and aberration correction using a spatial light modulator in ultracold atom experiments

Grade: Matrícula de Honor

Continued in the group as PhD student

Eric Gil Portal (Barcelona Master in Photonics) 10.02.2022 06.09.2022

Thesis: A Strontium Atomic Source for Ultracold Quantum Gas Experiments

Grade: 9.8/10

Now PhD student at IDEADED

Antonio Estarellas Perales (Barcelona Master in Photonics) 16.04.2021 09.09.2021

Thesis: A 461 nm laser system for an ultracold strontium quantum gas experiment

Grade: 8.7/10

Now PhD student at Real Observatorio de la Armada

David Jacobs (University of Hamburg) 08.10.2018 26.11.2019

Thesis: Design and construction of a new experimental apparatus for the laser cooling of strontium

Continued at Greenpeace Energy

Philip Thomas (University of Hamburg) 03.10.2016 29.10.2017

Thesis: Optical dipole potentials for multicomponent Bose-Einstein condensates

Continued as PhD student at MPQ (G. Rempe's group)

Julio Sanz Sánchez (Barcelona Master in Photonics) 25.10.2014 10.09.2015

Thesis: Development of a fluorescence imaging system for a quantum gas experiment

Grade: Matrícula de Honor

Continued in the group as PhD student

Manel Bosch Aguilera (Barcelona Master in Photonics) 20.11.2013 12.09.2014

Thesis: An experimental setup for gray molasses sub-Doppler cooling of potassium gases

Grade: Matrícula de Honor

Continued as PhD student at Laboratoire Kastler Brossel (J. Dalibard's group) and postdoc at University of Basel (P. Treutlein's group)

Internship Students (Master level)

Théo Dardier (Ecole Normale Supérieure Paris-Saclay, France) 26.09.2023 19.07.2024

Project: An Optical Tweezers Setup For A New Rydberg Atom Array Experiment To Quantum Simulate Lattice Gauge Theories

Continued as PhD student at Institut d'Optique (A. Browaeys' group)

Giacomo Guarda (Master in Quantum Science and Technology) 03.10.2023 29.02.2024

Project: Electromagnetically-induced transparency in a hot rubidium vapor

Continued as PhD student at the University of Trento, Ferrari's group

David Ribes Marzá (Master in Quantum Science and Technology) 27.09.2023 31.01.2023

Project: Development of laser sources for the laser cooling and manipulation of potassium atoms

Roland Finance (École Polytechnique, France) 24.03.2022 31.09.2022

Project: Repumping Schemes for an Ultracold Strontium Experiment

Prix du Stage from Ecole Polytechnique

Continued as Master student at ICFP, Ecole Normale Supérieure Paris

Ana Pérez Barrera (UAB, Spain) 19.04.2021 30.09.2021

Project: A setup for modulation transfer spectroscopy of potassium on the 767 nm transition

Continued as Master student in the group

Roger Bahí (BIST Master of Multidisciplinary Research) 01.03.2021 31.05.2021

Project: Magnetic field control for a strontium quantum gas experiment

Manon Ballu (Ecole Normale Supérieure Paris-Saclay, France) 09.04.2018 27.07.2018

Project: Development of a Raman laser system for coherent coupling of potassium BECs

Now PhD student at Université Paris Nord (H. Perrin's group)

Vincent Brunaud (École Polytechnique, France)	21.03.2016	30.08.2016
<u>Project:</u> Construction of a potassium magnetometer based on Faraday rotation <i>Continued as PhD student at Université Paul Sabatier – Toulouse (D. Guéry-Odelin's group)</i>		
Lisa Saemisch (University of Bonn, Germany)	01.09.2014	31.03.2015
<u>Project:</u> Development of a high numerical aperture imaging system for a quantum gas experiment <i>Continued as PhD student at ICFO (N. van Hulst's group)</i>		
Vincent Lienhard (Ecole Normale Supérieure de Cachan, France)	22.04.2014	31.07.2014
<u>Project:</u> Contributions to an ultracold atom experiment <i>Continued as PhD student at Institut d'Optique Palaiseau (A. Browaeys' group)</i>		

Bachelor Students

Sara Molló Guri (UPC, Barcelona)	01.10.2024	31.01.2025
<u>Project:</u> Quantum fluid of light in a Rubidium vapor <i>Continued as visiting bachelor student at Harvard University (S. Yelin and M. Greiner's groups)</i>		
Constantin Lescow (University of Hamburg)	20.11.2023	03.03.2024
<u>Project:</u> Coil assembly for a cold atom experiment		
Daniel Allepuz Requena (UB, Barcelona)	01.03.2019	30.06.2019
<u>Thesis:</u> Holographic creation of arbitrary potentials for BECs with digital micromirror devices <u>Grade:</u> Matrícula de Honor <i>Continued as Master and PhD student at Technical University of Denmark</i>		
Jordi Sastre Pellicer (UPC-CFIS, Barcelona)	16.02.2015	27.10.2015
<u>Thesis:</u> Design and construction of optical superlattices for a quantum gas experiment <u>Grade:</u> Excellent (9.8) <i>Continued as PhD student at EMPA and ETH Zurich (A. Tiwari's group)</i>		

Summer Students

Adrià Cadenas Ber (UAB, Barcelona)	25.06.2025	31.08.2025
<u>Project:</u> Quantum fluid of light in a Rubidium vapor		
Sara Molló Guri	04.12.2024	30.09.2024
<u>Project:</u> Interlock system for a Rydberg atom array experiment/Quantum fluid of light in a Rubidium vapor <i>Continued as internship student in the group</i>		
Guillermo Gordillo Núñez (Universidad de Granada)	17.07.2023	29.09.2023
<u>Project:</u> Implementation of a 405 nm ECDL-based laser system <i>Continued as PhD student in Mathematics at University of Porto</i>		
Luis Castillo González (UAB, Barcelona)	26.06.2023	29.09.2023
<u>Project:</u> Electromagnetically induced transparency in rubidium atoms <i>Continued as Bachelor student in Physics and Mathematics at UAB</i>		
Aditya Prakash (ISER Bhubaneswar, India)	17.05.2023	31.07.2023
<u>Project:</u> Generating light potentials for ultracold atoms using a Digital Micromirror Device and a broad spectrum light source <i>Continued as Master student in Physics at ISER Bhubaneswar</i>		
Carla Caro Villanova (UB, Barcelona)	04.07.2022	30.09.2022
<u>Project:</u> Construction and lock of a 767 nm Distributed Feedback Laser using a Red Pitaya <i>Continued as Bachelor student in Physics at UB and in Philosophy at UNED</i>		
Sofie Castro Holbæk (University of Copenhagen, Denmark)	27.09.2022	27.09.2022
<u>Project:</u> Magnetic levitation and numerical calculation of the lifetime of a Raman-coupled potassium BEC <i>Continued as Master student in Physics at Niels Bohr Institute and PhD student at University of Zurich</i>		
Max Zayas Orihuela (UPV, Valencia)	01.07.2021	31.08.2021
<u>Project:</u> A laser system for cooling ^{40}K fermionic atoms <i>Continued as Bachelor student in Industrial Engineering at UPV and in Physics at UV</i>		
Daniel Allepuz Requena (UB, Barcelona)	09.07.2018	31.08.2018

Project: Characterization of a *Red Pitaya* board applied to atomic physics experiments

Continued in the group as Bachelor student

Teo Gil Moreno de Mora Sardà (UAB, Barcelona) 02.07.2018 26.09.2018

Project: Measurement and stabilization of ambient magnetic fields for a quantum gas experiment

Continued as Bachelor student in Physics and Mathematics at UAB

Alberto Muñoz de las Heras (UAM, Madrid) 20.06.2017 22.09.2017

Project: Dynamical potentials and aberration correction with a Digital Micromirror Device

Continued as PhD student at the BEC Center, Trento (with I. Carusotto) and ComFuturo postdoctoral fellow at IFF-CSIC. Now assistant professor (profesor ayudante doctor) at Universidad de Castilla La Mancha

Iñigo Urtiaga Erneta (UPC-CFIS, Barcelona) 27.06.2016 30.09.2016

Project: Generating Arbitrary Potentials with a Digital Micromirror Device

Continued as Master student in Mathematics at University of Bonn and PhD student in Mathematics at UPC

Jordi Sastre Pellicer (UPC-CFIS, Barcelona) 01.07.2014 30.09.2014

Project: Development of RF and MW sources for evaporative cooling of a potassium gas

Continued in the group as Bachelor student