

Curriculum Vitae

Francesca Maria Marchetti

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Personal

Citizenship: Italian
Place of Birth: Rome, Italy
Date of Birth: 4 June 1973

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Work Experience

Oct 13 – ... Associate professor (Profesor Contratado Doctor), Department of Theory of Condensed Matter, Universidad Autonoma de Madrid, Spain

Oct 08 – Sept 13 Ramon y Cajal fellow (Ministerio de Ciencia e Innovación), Department of Theory of Condensed Matter, Universidad Autonoma de Madrid, Spain

Oct 07 – Sept 08 EPSRC (Engineering and Physical Sciences Research Council) Advanced Research Fellow (Grant No. EP/E054382/1 “Quantum Coherence Phenomena in Solid State and Atomic Condensates”), Rudolf Peierls Centre for Theoretical Physics, Department of Physics, Oxford, UK

Oct 06 – Sept 07 Research Associate (EPSRC Grant No. EP/D050952/1), Rudolf Peierls Centre for Theoretical Physics, Department of Physics, Oxford, UK

Oct 05 – Sept 06 Research Associate (EPSRC Grant No. GR/S61263/01), Theory of Condensed Matter (TCM) Group, Department of Physics, Cavendish Laboratory, Cambridge, UK

Oct 02 – Sept 05 EPSRC Postdoctoral Fellow (Grant No. GR/R95951 “Phase Coherence Phenomena and Interaction Effects in Mesoscopic Structures”), TCM Group, Cambridge, UK (Research Quality Final Assessment: *Internationally leading*).

May 02 – Sept 02 Research Associate in TCM Group, Cambridge, UK

I have been on maternity leave twice for around 6 months each time (period October 2006 - April 2007 and period November 2014 - May 2015). Aside from this, I have had no major career disruptions.

My role in research, teaching, and administration

Current role, 2013-present: Associate Professor at the Universidad Autónoma de Madrid (UAM), Spain (50% research, 40% teaching, 10% administration)

Since the completion of my PhD in 2002 at the Scuola Normale Superiore, Pisa, Italy, I have been continuously employed full-time. During the period 2002-2008 I was on research-only positions, the majority of which has been on two prestigious UK independent fellowships (the EPSRC Postdoctoral fellowship which I held at the University of Cambridge and the EPSRC Advanced Research Fellowship which I held at the University of Oxford). In 2008 I took up a Spanish 5-year tenure-track prestigious independent fellowship (Ramon y Cajal fellowship) to work at the Theory of Condensed Matter Department of UAM, at the end of which I was promoted to an Associate Professor position in the same Department. Furthermore, I recently joined the newly founded Excellence Research Unit IFIMAC-Condensed Matter Physics Center.

Education

10 May 02 PhD in Physics, Scuola Normale Superiore, Pisa, Italy. Thesis: *Phase Coherence Phenomena in Normal and Superconducting Disordered Systems*. Internal supervisors: Prof. G. Jona-Lasinio and Prof. S. Caracciolo. Collaborative research: Prof. B. D. Simons. Graduated with 70/70 cum laude (First-class honours).

17 Jul 98 Degree (MSc) in Theoretical Physics, Department of Physics, University of Rome “La Sapienza”, Italy. Diploma thesis, *Magnetic Field Induced Symmetry Breaking in the 2 + 1-dimensional Dirac Field*

Theory: Analysis of the Vacuum Structure. Supervisor: Prof. G. Jona-Lasinio. Graduated with 110/110 cum laude (First-class honours).

Awards

Fellowships and grants: 5 year Ramon y Cajal Fellowship (Ministerio de Ciencia e Innovación), 5 year EPSRC Advanced Research Fellowship, 2 year Leverhulme Early Career Fellowship (offer declined), 3 year EPSRC Postdoctoral Fellowship

Travel grants: 6 week Exchange Grant Intelbiomat (ESF) in 2009, 9 week Exchange Grant Intelbiomat (ESF) in 2010, 10 week Exchange Grant Polatom (ESF) in 2011, 10 week Exchange Grant Intelbiomat (ESF) in 2012

Scholarships: 3 year Honor Scholarship at Scuola Normale Superiore, Pisa, Italy

Colleges: 2 year Junior Research Fellowship, Mansfield College, Oxford, UK; 3 year Junior Research Fellowship Wolfson College, Cambridge, UK

Research Support Income

Since arriving at the UAM I successfully obtained the following grants/fellowships:

2021-2024 Spanish Ministry of Economy and Competitiveness, National Research Grant “Quantum correlations and interference of interacting photons in two-dimensional coupled light-matter structures (2DEn-Light)” (Ref. to be assigned), PIs F. M. Marchetti and E. del Valle Rebol, 75,000eur.

2018-2021 Spanish Ministry of Economy and Competitiveness, National Research Grant “Quantum light-matter coupling in two-dimensional systems (QLMC-2D)” (Ref. MAT2017-83722-R), PIs L. Vina and F. M. Marchetti, 200,000eur.

2015-2017 Spanish Ministry of Economy and Competitiveness, National Research Grant “Quantum optics in semiconductor nanostructures (QOINS)” (Ref. MAT2014-53119-C2-1-R), PI L. Vina, 411,000eur.

2011-2015 Spanish Ministry of Economy and Competitiveness, National Research Grant “Nanostructures for Quantum Optics (NANOQUO)” (Ref. MAT2011-22997), PI C. Tejedor, 564,000eur

2010-2013 Madrid Autonomous Community, I+D Research Grant “Efficient nanodevices for classical and quantum light (Q&CLIGHT)” (Ref. S2009/ESP-1503), PI L. Vina, 840,000eur.

2008-2011 Spanish Ministry of Education and Science, National Research Grant “Quantum Optical Information Technology (QOIT)” (Ref. CSD2006-00019), PI J. Eschner (ICFO) and C. Tejedor (UAM), 400,000eur.

2009-2012 European Science Foundation (ESF) Exchange grants: I spent every summer (1-2 month visit each time) from 2009 to 2012 at the Theory of Condensed Matter Group, Cavendish Laboratory, University of Cambridge UK, around 4,000eur grant each summer.

Publications

Metric summary:

51 publications

3251 total cites (WoS)

H-index: 17 (WoS)

Most cited publications:

[12] [24] [14] [17] [9] [16] [33] [25] [36] [43] [11] [30] [21] [40] [6] [28] [39]

Web of Science Researcher ID: F-7695-2012

Orcid: 0000-0003-1394-7394

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- [2] F. M. Marchetti and B. D. Simons, “Optimal fluctuations and tail states of non-Hermitian operators”, *J. Phys. A: Math. Gen.* **34**, 10805 (2001).
- [3] F. M. Marchetti and B. D. Simons, “Tail states in disordered superconductors with magnetic impurities: the unitarity limit”, *J. Phys. A: Math. Gen.* **35**, 4201 (2002).

- [4] I. E. Smolyarenko, F. M. Marchetti and B. D. Simons, “Parametric spectral correlations in disordered and chaotic structures”, *Phys. Rev. Lett.* **88**, 256808 (2002).
- [5] F. M. Marchetti, I. E. Smolyarenko and B. D. Simons, “Universality of parametric spectral correlations: local *versus* extended perturbing potentials”, *Phys. Rev. E* **68**, 036217 (2003).
- [6] F. M. Marchetti, B. D. Simons, and P. B. Littlewood “Condensation of cavity polaritons in a disordered environment”, *Phys. Rev. B* **70**, 155327 (2004). **Cited 25 (WoS)**.
- [7] F. M. Marchetti, M. H. Szymańska, P. R. Eastham, B. D. Simons, and P. B. Littlewood “Condensation and lasing of microcavity polaritons: comparison between two models”, *Solid State Communications* **134**, 111 (2005).
- [8] A. Lamacraft, F. M. Marchetti, J. S. Meyer, R. S. Moir, and B. D. Simons “Critical states in disordered superconducting films”, *J. Phys. A: Math. Gen.* **37** L447 (Letter to the Editor) (2004).
- [9] P. B. Littlewood, P. R. Eastham, J. Keeling, F. M. Marchetti, B. D. Simons, and M. H. Szymańska, “Models of coherent exciton condensation”, *J. Phys.: Condens. Matter* **16** S3597 (2004). **Cited 79 (WoS)**.
- [10] M. V. Mostovoy, F. M. Marchetti, B. D. Simons, and P. B. Littlewood, “Effects of disorder on coexistence and competition between superconducting and insulating states”, *Phys. Rev. B* **71**, 224502 (2005).
- [11] F. M. Marchetti, J. Keeling, M. H. Szymańska, and P. B. Littlewood, “Thermodynamics and excitations of condensed polaritons in disordered microcavities”, *Phys. Rev. Lett.* **96**, 066405 (2006). **Cited 37 (WoS)**.
- [12] J. Kasprzak, M. Richard, S. Kundermann, A. Baas, P. Jeambrun, J. Keeling, F. M. Marchetti, M. H. Szymańska, R. André, J. L. Staehli, V. Savona, P. B. Littlewood, B. Deveaud, Le Si Dang, “Bose-Einstein condensation of exciton polaritons”, *Nature* **443**, 409 (2006). **Cited 1858 (WoS)**.
- [13] S. Tsonis, G. Varelogiannis, F. M. Marchetti, B. Simons and P.B. Littlewood, “Mixing of order parameters by particle-hole asymmetry, magnetic fields and impurities in fermionic systems: An interesting example”, *Physica B: Condensed Matter* **378-380**, 428 (2006).
- [14] M. M. Parish, F. M. Marchetti, A. Lamacraft, and B. D. Simons, “Finite temperature phase diagram of a polarised Fermi condensate”, *Nature Physics* **3**, 124 (2007). **Cited 159 (WoS)**.
- [15] F. M. Marchetti, J. Keeling, M. H. Szymańska, and P. B. Littlewood, “Absorption, photoluminescence and resonant Rayleigh scattering probes of condensed microcavity polaritons”, *Phys. Rev. B* **76**, 115326 (2007).
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- [17] J. Keeling, F. M. Marchetti, M. H. Szymańska, and P. B. Littlewood, “Collective coherence in planar semiconductor microcavities”, *Semicond. Sci. Technol.* **22**, R1 (2007). **Cited 108 (WoS)**.
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- [21] F. M. Marchetti, C. Mathy, M. M. Parish, and D. A. Huse, “Phase separation and collapse in Bose-Fermi mixtures with a Feshbach resonance”, *Phys. Rev. B* **78**, 134517 (2008). **Cited 29 (WoS)**.

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- [24] D. Sanvitto, F.M. Marchetti, M.H. Szymanska, G. Tosi, M. Baudisch, F.P. Laussy, D.N. Krizhanovskii, M.S. Skolnick, L. Marrucci, A. Lemaitre, J. Bloch, C. Tejedor, and L. Viña, “Persistent currents and quantised vortices in a polariton superfluid”, *Nature Physics* **6**, 527 (2010). **Cited 198 (WoS)**.
- [25] F.M. Marchetti, M.H. Szymanska, C. Tejedor, and D.M. Whittaker, “Spontaneous and triggered vortices in polariton OPO superfluids”, *Phys. Rev. Lett.* **105**, 063902 (2010). **Cited 45 (WoS)**.
- [26] M.H. Szymanska, F.M. Marchetti, and D. Sanvitto “Propagating wave-packets and quantised currents in coherently driven polariton superfluids”, *Phys. Rev. Lett.* **105**, 236402 (2010).
- [27] M. M. Parish, F.M. Marchetti, and P. B. Littlewood, “Supersolidity in electron-hole bilayers with a large density imbalance”, *Europhys. Lett.* **95**, 27007 (2011).
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- [29] E. Cancellieri, F.M. Marchetti, M. H. Szymanska, and C. Tejedor, “Multistability of a two component exciton-polariton fluid”, *Phys. Rev. B* **83**, 214507 (2011).
- [30] G. Tosi, F. M. Marchetti, D. Sanvitto, C. Anton, M. H. Szymanska, A. Berceanu, C. Tejedor, L. Marrucci, A. Lemaitre, J. Bloch, L. Vina, “Onset and dynamics of vortex-antivortex pairs in polariton OPO superfluids”, *Phys. Rev. Lett.* **107**, 036401 (2011). **Cited 34 (WoS)**.
- [31] F. M. Marchetti, M. H. Szymanska, “Vortices in polariton OPO superfluids”, chapter in *Exciton Polaritons in Microcavities: New Frontiers* (Eds. Daniele Sanvitto and Vadislav Timofeev), Springer Series in Solid-State Sciences, Springer-Verlag, ISBN: 978-3-642-24185-7 (2012), arXiv:1107.4487.
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- [33] M. M. Parish and F. M. Marchetti, “Density instabilities in a two-dimensional dipolar Fermi gas”, *Phys. Rev. Lett.* **108**, 145304 (2012). **Cited 51 (WoS)**.
- [34] A. Berceanu, E. Cancellieri, and F. M. Marchetti, “Drag in a resonantly driven polariton fluid”, *J. Phys.: Condens. Matter* **24**, 235802 (2012).
- [35] F. M. Marchetti and M. M. Parish, “Density-wave phases of dipolar fermions in a bilayer ”, *Phys. Rev. B* **87**, 045110 (2013).
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- [42] M. Van Regemortel, M. Wouters, and F. M. Marchetti, “Probing the collective excitations of a spinor polariton fluid”, *Phys. Rev. B* **91**, 075308 (2015)
- [43] G. Dagvadorj, J. M. Fellows, S. Matyjaskiewicz, F. M. Marchetti, I. Carusotto, M. H. Szymanska, “Non-equilibrium Berezinskii-Kosterlitz-Thouless Transition in a Driven Open Quantum System”, *Phys. Rev. X* **5**, 041028 (2015). **Cited 41 (WoS)**.
- [44] A. C. Berceanu, L. Dominici, I. Carusotto, D. Ballarini, E. Cancellieri, G. Gigli, M. H. Szymanska, D. Sanvitto, F. M. Marchetti, “On multicomponent polariton superfluidity in the optical parametric oscillator regime”, *Phys. Rev. B* **92**, 035307 (2015).
- [45] M. Callegari, M.M. Parish, and F.M. Marchetti, “Dipolar fermions in a multilayer geometry”, *Phys. Rev. B* **95**, 085124 (2017).
- [46] J. Keeling and F. M. Marchetti, “Viewpoint: Matter-light condensates reach thermal equilibrium”, *Physics* **9** 154 (2017).
- [47] G. Diaz-Camacho, C. Tejedor, F. M. Marchetti, “Spontaneous patterns in coherently driven polariton microcavities”, *Phys. Rev. B* **97**, 245309 (2018).
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- [49] A. Munoz de las Heras, M. M. Parish, F. M. Marchetti, “Early-time dynamics of Bose gases quenched into the strongly interacting regime”, *Phys. Rev. A* **99**, 023623 (2019).
- [50] A. Tiene, J. Levinsen, M. M. Parish, A. H. MacDonald, J. Keeling, F. M. Marchetti, “Extremely imbalanced two-dimensional electron-hole-photon system”, *Phys. Rev. Research* **2**, 023089 (2020).
- [51] A. Strashko, F. M. Marchetti, A. H. MacDonald, J. Keeling, “Crescent states in charge-imbalanced polariton condensates”, *Phys. Rev. Lett.* **125**, 067405 (2020).

Invited Talks

15 Oct 20 *Cold Atom Workshop 2020*, online.

28 Jan 20 *10th International Conference on Spontaneous Coherence in Excitonic Systems (ICSCE10)*, Melbourne, Australia.

4 Sept 19 *Dynamics & interactions in quantum gases — Quantum Menorca 2019*, Maó, Menorca, Spain.

16 Nov 18 *Cold Atom Workshop — CAW-Bilbao2018*, Bilbao, Spain.

4 Sept 18 *Correlations and Entanglement with Photons in Cavities*, Chicheley Hall, UK.

1 Apr 14 *DPG Spring Meeting*, Dresden, Germany.

27 Mar 14 *ICMM Seminarios Alternativos*, Instituto de Ciencia de Materiales, CSIC, Madrid, Spain.

14 May 13 Co-chair of plenary discussion on “Atomic vs. Polariton BECs”, Lorentz Center workshop *Universal Themes of Bose-Einstein Condensation*, University of Leiden, the Netherlands.

23 May 12 2 hour lectures at the *Physics’s school POLATOM* (ESF), Toledo, Spain.

6 Aug 11 Workshop *Quantum phenomena in graphene, other low-dimensional materials, and optical lattices*, Majorana center, Erice, Italy.

27 Jan 11 Departamento de Física de Materiales, Universidad Complutense de Madrid, Spain.

12 Apr 10 *Physics of Light-Matter Coupling in Nanostructures (PLMCN10)*, Cuernavaca, Mexico

5 Feb 10 *VI Reunión del Grupo Especializado en Física del Estado Sólido (GEFES10)*, Zaragoza, Spain
15 Jan 09 CSIC, Instituto de Ciencia de Materiales de Madrid, Spain.
30 Jan 08 *2008 Latsis Symposium*, EPFL, Lausanne, Switzerland.
29 Sept 07 *Workshop on solving the Bogoliubov-de Gennes and Gross-Pitaevskii equations for superconductors, superfluids and BEC*, Britannia Hotel, Manchester, UK
23 May 07 KITP Programme on *Strongly Correlated Phases in Condensed Matter and Degenerate Atomic Systems*, UCSB, Santa Barbara, CA, USA
18 May 07 Condensed Matter Physics Seminar, California Institute of Technology, Pasadena, CA, USA
16 Feb 07 Laboratoire de physique théorique et modèles statistiques (LPTMS) Paris-sud, Orsay, France
19 Dec 06 Sissa (International School for Advanced Studies), Trieste, Italy
23 Nov 06 Scuola Normale Superiore, Pisa, Italy
20 Nov 06 *Seminario di Struttura della Materia*, Università di Firenze, Florence, Italy
13 Nov 06 EPFL (Ecole Polytechnique Fédérale de Lausanne), Lausanne, Switzerland
18 Sept 06 *24° Convegno di Fisica Teorica e Struttura della Materia*, Levico Terme, Italy
4 Jul 06 *Quantum Complexities in Condensed Matter* conference, Cavendish Laboratory, Cambridge, UK
19 Oct 05 CMT group, Theoretical Physics, Oxford University, UK
12 Oct 05 School of Physics and Astronomy, Cardiff University, UK
22 Sept 05 Departamento de Física Aplicada, Universidad de Alicante, Spain
11 Apr 05 Laboratoire de de Spectrométrie Physique, Grenoble, France
30 Mar 05 Condensed Matter Theory Group, Harvard University, Cambridge, MA, USA
21 May 04 Department of Physics, Princeton University, USA
11 Dec 03 Materials Science Centre, University of Groningen, The Netherlands
30 Oct 01 Università di Roma “La Sapienza”, Rome, Italy

Contributed Talks

13 Sept 13 *International Conference on Optics of Excitons in Confined Systems (OECS13)*, Rome, Italy
13 Sept 11 *International Conference on Optics of Excitons in Confined Systems (OECS12)*, Paris, France
8 Feb 11 *5th International Conference on Spontaneous Coherence in Excitonic Systems (ICSCE5)*, Lausanne, Switzerland
9 Sept 09 *International Conference on Optics of Excitons in Confined Systems (OECS11)*, Madrid, Spain
5 March 07 APS March Meeting 2007, Denver, CO, USA
25 June 06 Network conference *6th Photon Mediated Phenomena in Semiconductor Nanostructures*, Cambridge, UK
25 March 06 Network conference *5th Photon Mediated Phenomena in Semiconductor Nanostructures*, Lund, Sweden
9 Sept 05 *2nd International Conference on Spontaneous Coherence in Excitonic Systems (ICSCE2)*, University of Southampton, UK
7 July 05 *Quantum Condensates Meeting (IoP)*, Cambridge, UK
11 June 05 Network conference *4th Photon Mediated Phenomena in Semiconductor Nanostructures*, Autrans, France
23 Mar 05 APS March Meeting 2005, Los Angeles, CA, USA
5 Oct 04 Network conference *3rd Photon Mediated Phenomena in Semiconductor Nanostructures*, University of Paderborn, Germany

Teaching

Jan 21-Mar 21 Classes of “Condensed Matter Physics” for undergraduate fourth year students in Physics (approx. 32 students for 26 hours)
Sept 20-Jan 21 Classes of “Classical Mechanics” (“Mecanica y Ondas I”) for undergraduate second year students in Physics (approx. 68 students for 45 hours)
March 20-May 20 Classes of “Condensed Matter Physics” for undergraduate fourth year students in Physics (approx. 18 students for 26 hours)
Sept 19-Jan 20 Classes of “Classical Mechanics” (“Mecanica y Ondas I”) for undergraduate second year

students in Physics (approx. 60 students for 45 hours)

March 19-May 19 Classes of “Condensed Matter Physics” for undergraduate fourth year students in Physics (approx. 20 students for 25 hours)

Sept 18-Jan 19 Classes of “Classical Mechanics” (“Mecanica y Ondas I”) for undergraduate second year students in Physics (approx. 60 students for 42 hours)

Sept 17-Jan 18 Classes of “Classical Mechanics” (“Mecanica y Ondas I”) for undergraduate second year students in Physics (approx. 73 students for 42 hours)

Oct 17-Jan 18 Classes of “Computational Methods in Biophysics” for master students in Biophysics (approx. 6 students for 24 hours)

Sept 16-Jan 17 Classes of “Classical Mechanics” (“Mecanica y Ondas I”) for undergraduate second year students in Physics (approx. 65 students for 42 hours)

Oct 16-Jan 17 Classes of “Computational Methods in Biophysics” for master students in Biophysics (approx. 8 students for 24 hours)

Feb 15-Apr 15 Physics laboratory for undergraduate first year students in Chemistry, UAM, Madrid, Spain (20 students for 35 hours)

Oct 15-Dec 15 Classes of “Computational Methods in Biophysics” for master students in Biophysics (approx. 10 students for 24 hours)

Sept 15-Dec 15 Classes of “Computation I” for undergraduate first year students in Physics (approx. 20 students for 42 hours)

Feb 15-Apr 15 Physics laboratory for undergraduate first year students in Chemical Engineering, UAM, Madrid, Spain (20 students for 35 hours)

Oct 14-Dec 14 Classes of “Computational Methods in Biophysics” for master students in Biophysics (approx. 10 students for 12 hours)

Sept 14-Dec 14 Classes of “Computation I” for undergraduate first year students in Physics (approx. 20 students for 42 hours: 6 credits)

Feb 14-Apr 14 Physics laboratory for undergraduate first year students in Chemistry and Chemical Engineering, UAM, Madrid, Spain (20 students for 35 hours: 4 credits)

Sept 13-Jan 14 Classes of “Computation I” for undergraduate first year students in Physics (approx. 27 students for 42 hours: 6 credits)

Jan-May 13 Classes of “Advances Statistical Mechanics: an introduction to superconductivity and superfluidity” for undergraduate fifth year students in Physics (approx. 14 students for 40 hours: 6 credits)

Apr-May 12 Classes of “Advances Statistical Mechanics: an introduction to superconductivity and superfluidity” for undergraduate fifth year students in Physics (approx. 12 students for 20 hours: 3 credits)

Oct 11-Jan 12 Classes of “Computation I” for undergraduate first year students in Physics (approx. 20 students for 20 hours: 2 credits)

Apr-May 11 Classes of “Advances Statistical Mechanics: an introduction to superconductivity and superfluidity” for undergraduate fifth year students in Physics (approx. 19 students for 20 hours: 3 credits)

Sept-Oct 10 Classes of “Computation I” for undergraduate first year students in Physics (approx. 20 students for 20 hours: 2 credits)

Apr-May 10 Classes of “Advances Statistical Mechanics: an introduction to superconductivity and superfluidity” for undergraduate fifth year students in Physics (approx. 9 students for 20 hours: 3 credits)

Nov 09-Jan 10 Classes of “Computation I” for undergraduate first year students in Physics (approx. 30 students for 20 hours: 2 credits)

Mar-Jun 09 Tutorial classes of “Mechanics and Waves II” for undergraduate second year students in Physics (approx. 30 students for 10 hours: 1 credit)

Feb-Mar 09 Laboratory for undergraduate first year students in Physics (“Técnicas Experimentales I”), UAM, Madrid, Spain (6 students for 30 hours: 3 credit)

11, 12, 13 Sept 07 3 lecture course on *Ultracold atoms*, “Superfluidity in Ultracold Fermi Gases”, for 1st year graduate students, *Physics by the Lake* summer school (EPSRC), University College of St Martin, Ambleside, UK (approx. 60 students)

8 Dec 05 1 lecture to undergraduate Part II and Part III students (TCM) on “Macroscopic Phase Coherence and Condensation Phenomena in Fermionic Systems”, TCM Winter School, TCM Group, Cambridge,

UK (approx. 10 students for 1 hours)

11-12 Jul 05 2 lectures to undergraduate (summer project) students on “Macroscopic Phase Coherence and Condensation Phenomena”, TCM Group, Cambridge, UK (approx. 7 students for 2 hours)

Oct 04 – Dec 04 5 Graduate lectures on “Cold Fermions, Feshbach Resonances and the BEC-BCS Crossover”, within the course *Quantum Condensed Matter Physics*, TCM Group, Cambridge, UK (approx. 15 students for 5 hours/Michaelmas term)

Oct 03 – Dec 03 Tutorial classes in undergraduate Part III major option course, *Concepts in Theoretical physics*, Cavendish Laboratory, Cambridge, UK (44 students for 4 hours/Michaelmas term)

Oct 02 – Dec 02 Tutorial classes in undergraduate Part III course major option, *Concepts in Theoretical physics*, Cavendish Laboratory, Cambridge, UK (40 students for 4 hours/Michaelmas term)

Oct 01 – Jun 02 Tutorial classes in undergraduate Part IA mathematics, Pembroke College, Cambridge, UK (3 students for 8 hours/Michaelmas term, 8 hours/Lent term, and 6 hours/Easter term)

Summer Schools and Long Term Workshops

28 Apr – 28 May 07 KITP Programme on *Strongly Correlated Phases in Condensed Matter and Degenerate Atomic Systems*, Kavli Institute for Theoretical Physics (KITP), UCSB, Santa Barbara CA, USA

5 – 30 Jul 04 Boulder School for Condensed Matter and Material Physics *Coherence and Interactions in Atomic and Condensed Matter Physics*, Boulder, Colorado, USA

24 Jun – 5 Jul 02 *Mesoscopic Physics and Electron Interaction* Workshop, Abdus Salam ICTP, Miramare-Trieste, Italy

13 – 26 Aug 01 Nato ASI School *Field Theory of Strongly Correlated Fermions and Bosons in Low-Dimensional Disordered Systems*, Windsor, UK

20 – 30 Jul 99 CXLII Course *New Directions in Quantum Chaos* of the International School of Physics *Enrico Fermi* Varenna, Italy

Long Term Visits to International Institutions

Theory of Condensed Matter group, Cavendish Laboratory, Cambridge, UK

Laboratoire de physique théorique et modèles statistiques (LPTMS), Orsay, France

Kavli Institute for Theoretical Physics (KITP), UCSB, Santa Barbara CA, USA

Referee

Referee for *Nature Photonics* (Nature), *Scientific Reports* (Nature), *Physical Review X* (APS), *Physical Review Letters* (APS), *Physical Review B* (APS), *Journal of Optics B: Quantum and Semiclassical Optics* (IoP), *Journal of Physics: Condensed Matter* (IoP), *Physica Status Solidi (b)* (Wiley-VCH), *European Physics Letters* (IoP), *The European Physical Journal* (Springer). Grant referee for the *Engineering and Physical Sciences Research Council (EPSRC)*.

Organising and Editing

- Program Committee member of the *International Conference on Optics of Excitons in Confined Systems (OECS13)*, Rome, Italy (**September 2013**).
- Seminar organiser (together with Merino) at the Departamento de Física Teórica de la Materia Condensada, Universidad Autónoma de Madrid, Spain (**Oct 2013 – ...**).
- Seminar organiser (together with J. Bravo) at the Departamento de Física Teórica de la Materia Condensada, Universidad Autónoma de Madrid, Spain (**Oct 2010 – May 2012**).
- Member of the LOC (together with M. Atature, J. Keeling, M. H. Szymanska, and P. B. Littlewood) of the *International Conference on Spontaneous Coherence in Excitonic Systems (ICSCE4)*, Cambridge, UK (**September 2008**).
- Guest editor of the special section of *Journal of Physics: Condensed Matter* (IoP) “Optical coherence and collective phenomena in nanostructures”, *J. Phys.: Condens. Matter* **19** No 29 (25 July 2007), 290301.

- Co-organiser (together with S. Kos and P. B. Littlewood) of the 6th *Photon Mediated Phenomena Workshop*, Cambridge, UK (**23-25 Jun 06**). This is the concluding workshop meeting in within the Research Training Network set up under the European Commission's Fifth Framework Programme (web-page http://www.astro.cf.ac.uk/research/PMPnetwork/workshops/cambridge_workshop/index.php).

Supervision of students: PhD

- Andrei Berceanu, Universidad Autonoma de Madrid, Spain (1 Oct 2010 — 08 Jul 2016), “Scattering and topological properties of driven-dissipative quantum fluids”.
- Antonio Tienne, Universidad Autonoma de Madrid, Spain (1 Jul 2019 — ...)

Supervision of students: Master

- Erasmus: Mathias Van Regemortel, Universiteit Antwerpen (1 Sept 12 — 1 Feb 13, 6 credits), “Binary Polariton Fluids”.
- Javier Galego, Universidad Autonoma de Madrid, Spain (1 Oct 13 — 1 Jun 2014), “Control of collective pairing phases in polariton microcavities”.
- Erasmus: Michele Callegari, Università di Padova, Italia (1 Feb 13 — 1 Jun 2014), “Density instabilities in multi-layer dipolar Fermi gases”.
- Alberto Muñoz de las Heras, Universidad Autonoma de Madrid (Jan 2018 - Sept 2018), “Dynamics of correlations in strongly interacting Bose-Einstein condensates”.
- Erasmus: Antonio Tienne, Università di Padova, Italia (Mar 2018 - Oct 2018), “Strong light-matter coupling in tunable doped two-dimensional materials”.

Supervision of students: Final year project (TFG)

- Alberto Muñoz de las Heras, Universidad Autonoma de Madrid (2016-2017). “Early time quench dynamics of atomic Bose-Einstein condensates into the strongly interacting regime”.
- Carmen Jimenez Lobaton, Universidad Autonoma de Madrid (2018-2019). “Spontaneous patterns in coherently driven spinor polariton structures”.
- Miguel Francisco Martinez, Universidad Autonoma de Madrid (2018-2019). “Quench dynamics in dipolar Bose gases”.

Supervision of students: Undergraduate

- *Instituto Nicolás Cabrera* prize for Physics students: Manuel Lara, Universidad Autonoma de Madrid (Jun — Sept 2013).
- *Instituto Nicolás Cabrera* fellowship for Physics students: Miguel Francisco Martinez, Universidad Autonoma de Madrid (May 2018 — Dec 2018).
- *Instituto Nicolás Cabrera* fellowship for Physics students: Santiago Agüí Salcedo, Universidad Autonoma de Madrid (Jun 2019 — Dec 2019).

Committees

- **June 20** — ... CIVIS Participative Council (<https://civis.eu/>)

PhD Committees

- **13 Mar 09** Member of the jury, PhD thesis of Elena del Valle “Quantum electrodynamics with quantum dots in microcavities”, Universidad Autonoma de Madrid, Spain

- **14 Nov 11** Member of the jury, PhD thesis of Miguel Ibñez Berganza “Exactly solvable models in low-dimensional many-body physics”, Universidad Autonoma de Madrid, Spain
- **10 May 13** Member of the jury, PhD thesis of Eneko Malatsetxebarria Elizegi “Bosons and fermions in mixed-dimensional optical lattices: phase equilibria and quantum phase transitions”, Universidad del Pais Vasco, Spain
- **8 Sept 18** Member of the jury, PhD thesis of Javier del Pino Gutierrez “Vibrational and electronic strong light-matter coupling with molecular excitations”, Universidad Autonoma de Madrid, Spain
- **25 Sept 20** President of the jury, PhD thesis of Rocío Sáez Blázquez “Dressing the Vacuum: Strong Light-Matter Coupling for Enhancing Photon Correlations and Exciton Transport”, Universidad Autonoma de Madrid, Spain

Languages

Italian	native language	Spanish	fluent
English	fluent	French	basic

Outreach

- J. Keeling and F. M. Marchetti “Matter-Light Condensates Reach Thermal Equilibrium”, *Physics* **9**, 154 (2017)
<http://physics.aps.org/articles/v9/154>
- Divulgative article
<http://www.agenciasinc.es/Noticias/Un-escenario-ideal-para-explorar-nuevas-fases-de-la-materia>
- **7 Mar 2014, 3 Oct 2014, 10 Feb 2017** Presentation at the “A Day of Divulgation of the Department Research Activities” (“Jornada de Divulgación de la Investigación”), Department of Theory of Condensed Matter, Universidad Autonoma de Madrid, Spain