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[FRANCESCA MARIA MARCHETTI](#) Associate
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Biographical Info

- Work experience

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

Oct 08 - Sep 13 Ramon y Cajal fellow, Department of Theory of Condensed Matter, Universidad Autonoma de Madrid, Spain.

Oct 06 - Sep 08 Research associate & EPSRC (Engineering and Physical Sciences Research Council) Advanced Research Fellow, Rudolf Peierls Centre for Theoretical Physics, Department of Physics, Oxford, UK.

May 02 - Sep 06 Research associate & EPSRC Postdoctoral Fellow, Theory of Condensed Matter group, Department of Physics, Cavendish Laboratory, Cambridge, UK.

- Education

May 02 PhD in Physics at Scuola Normale Superiore, Pisa, Italy. Thesis: "Phase Coherence Phenomena in Normal and Superconducting Disordered Systems" (supervisors: S. Caracciolo, G. Jona-Lasinio, B. Simons).

Jul 98 Degree (MSc) in Theoretical Physics at the Department of Physics, University of Rome "La Sapienza", Italy (First-class honours). Diploma thesis: "Magnetic Field Induced Symmetry Breaking in the 2+1-dimensional Dirac Field Theory: Analysis of the Vacuum Structure" (supervisor: G. Jona-Lasinio).

Honors and Awards

Fellowships & grants: 5 year Ramon y Cajal Fellowship (Spanish Ministry for

Education and Science); 5 year EPSRC Advanced Research Fellowship; 2 year Leverhulme Early Career Fellowship (declined); 3 year EPSRC Postdoctoral Fellowship.

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

Research Interests

My current research develops across both fields of solid state and atomic physics with common themes such as “collective phenomena”, “strong correlations”, “macroscopic phase coherence” and “superfluidity” in systems in and out of equilibrium. Thanks also to the unprecedented sophistication reached in experiments, both areas provide a flourishing playground in which to explore quantum many-body phenomena.

Relevant/Recent Publications

F.M. Marchetti and M.M. Parish, “Density-wave phases of dipolar fermions in a bilayer”, *Phys. Rev. B* 87, 045110 (2013). [[URL](#), [archive](#)]

M. M. Parish and F.M. Marchetti, “Density instabilities in a two-dimensional dipolar Fermi gas”, *Phys. Rev. Lett.* 108, 145304 (2012). [[URL](#), [archive](#)]

G. Tosi, F. M. Marchetti, D. Sanvitto, C. Anton, M.H. Szymanska, A. Berceanu, C. Tejedor, L. Marrucci, A. Lemaître, J. Bloch, L. Vina, “Onset and dynamics of vortex-antivortex pairs in polariton OPO superfluids”, *Phys. Rev. Lett.* 107, 036401 (2011). [[URL](#), [archive](#)]

F.M. Marchetti, M.H. Szymanska, C. Tejedor, D.M. Whittaker, “Spontaneous and triggered vortices in polariton OPO superfluids”, *Phys. Rev. Lett.* 105, 063902 (2010). [[URL](#), [archive](#)]

Sanvitto, F.M. Marchetti, M.H. Szymanska, G. Tosi, M. Baudisch, F.P. Laussy, D.N. Krizhanovskii, M.S. Skolnick, L. Marrucci, A. Lemaître, J. Bloch, C. Tejedor, L. Vina, “Persistent currents and quantised vortices in a polariton superfluid”, *Nature Physics* 6, 527 (2010). [[URL](#), [archive](#)]

F. M. Marchetti, Th. Jolicoeur, and M. M. Parish, “Stability and pairing in quasi-one-dimensional Bose-Fermi mixtures”, *Phys. Rev. Lett.* 103, 105304 (2009). [[URL](#), [archive](#)]

J. Keeling, F. M. Marchetti, M. H. Szymanska, and P. B. Littlewood, “Collective coherence in planar semiconductor microcavities”, *Semicond. Sci. Technol.* 22, R1 (2007). [[URL](#), [archive](#)]

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). [[URL](#), [archive](#)]

J. Kasprzak, M. Richard, S. Kundermann, A. Baas, P. Jeambrun, J. Keeling, F. M. Marchetti, M. H. Szymanska, R. Andre', J. L. Staehli, V. Savona, P. B. Littlewood, B. Deveaud, Le Si Dang,

``Bose-Einstein condensation of exciton polaritons'', Nature 443, 409 (2006). [[URL](#)]

F. M. Marchetti, J. Keeling, M. H. Szymanska, and P. B. Littlewood, "Thermodynamics and excitations of condensed polaritons in disordered microcavities", Phys. Rev. Lett. 96, 066405 (2006). [[URL](#), [archive](#)]

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