PERSONAL INFORMATION

Andrea Ferretti

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https://www.nano.cnr.it/researcher-profile/andrea-ferretti/

Sex M | *Date of birth* 27/09/1977 | *Nationality* Italian

Enterprise	University	EPR
☐ Management Level	☐ Full professor	X Research Director and 1st level Technologist / First Researcher and 2nd level Technologist
☐ Mid-Management Level	☐ Associate Professor	☐ Level III Researcher and Technologist
☐ Employee / worker level	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator	☐ Researcher and Technologist of IV, V, VI and VII level / Technical collaborator

WORK EXPERIENCE

Mar 2020 – present

Senior Reseacher

CNR-NANO, https://www.nano.cnr.it

- Research in the field of materials science
- Development of scientific software
- Supervision of undergraduate and graduate students
- Scientific management of funded projects
- Organization of workshop and schools

Business or sector: **Research**

Mar 2011 – Feb 2020

Researcher

CNR-NANO, https://www.nano.cnr.it

- Research in the field of materials science
- Development of scientific software
- Supervision of undergraduate and graduate students
- Scientific management of funded projects
- Organization of workshop and schools

Business or sector: **Research**

Mar 2010 – Feb 2011

Research Fellow

Materials Modelling Laboratory (MML), Oxford University, https://mml.web.ox.ac.uk/home

- Research in the field of materials science
- Development of scientific software
- Supervision of undergraduate and graduate students

Business or sector: **Research**

Mar 2009 – Feb 2010

Research Fellow

Dept. of Materials Science and Engineering, MIT, Cambridge MA, USA, https://dmse.mit.edu

- Research in the field of materials science
- Development of scientific software

Business or sector: **Research**

Mar 2005 – Feb 2009

Postdoc

Physics Dept, University of Modena & Reggio Emilia, https://www.unimore.it

- Research in the field of materials science
- Development of scientific software
- Supervision of undergraduate and graduate students

Business or sector: **Research**

EDUCATION AND TRAINING

Jan 2002 – Feb 2005

PhD in Condensed Matter Physics

University of Modena & Reggio Emilia, Modena, Italy

- Condensed Matter, Computational Physics, High Performance Computing

Oct 1994 – Sep 1999

Laurea in Materials Engineering

University of Modena & Reggio Emilia, Modena, Italy

- Condensed Matter, Computational Physics, Materials Science

PERSONAL SKILLS

Mother tongue(s): Italian

Other language(s): English (fluent)

Job-related skills: Ab-initio total energy calculations: electronic structure methods, quantum transport, Wannier functions, Koopmans-compliant functionals. Many-body perturbation theory methods: GW approximation, Bethe-Salpeter equation, 3 body scattering method. Theoretical spectroscopy, comparison with experimental spectroscopic data including direct/inverse photoemission, STS, optical absorption, EELS. Developer and maintainer of scientific software including WanT (http://www.wannier-transport.org), Quantum ESPRESSO (www.quantum-espresso.org), Yambo (http://www.yambo-code.org).

Digital skills: Fortran (77/90/95/03/08), C, Python; MPI, OpenMP, CUDA for high performance computing; Linux network and cluster administration

ADDITIONAL INFORMATION

Selected publications

1. D.A. Leon, C. Cardoso, T. Chiarotti, D. Varsano, E. Molinari, **A. Ferretti**, *Frequency dependence in GW made simple using a multipole approximation*, Phys. Rev. B **104**, 115157 (2021). doi: 10.1103/Phys- RevB.104.115157
2. N. Marzari, **A. Ferretti**, and C. Wolverton, *Electronic-structure methods for materials' design*, Nature Materials (2021). doi: 10.1038/s41563-021-01013-3
3. P. Giannozzi, O. Baseggio, P. Bonfa´, D. Brunato, R. Car, I. Carnimeo, C. Cavazzoni, S. de Gironcoli, P. Delugas, F. Ferrari Ruffino, **A. Ferretti**, N. Marzari, I. Timrov, A. Urru, S. Baroni, *Quantum ESPRESSO at the exascale*, J. Chem. Phys. **152**, 154105 (2020). doi: 10.1063/5.0005082
4. T. Rangel, M. Del Ben, D. Varsano, G. Antonius, F. Bruneval, F.H. da Jornada, M. van Setten, O.K. Orhan, D. D. O'Regan, A. Canning, **A. Ferretti**, A. Marini, S.G. Louie, G.-M. Rignanese, J. Deslippe, J.B. Neaton, *Validating G0W0 codes for solids*, Comput. Phys. Commun. **255**, 107242 (2020). doi: 10.1016/j.cpc.2020.107242
5. D. Sangalli, …, **A. Ferretti**,… , *Many-Body perturbation theory calculations using the yambo code*, J. Phys.:Condens. Matter **31**, 325902 (2019). doi: 10.1088/1361-648X/ab15d0
6. N.-L. Nguyen, N. Colonna, **A. Ferretti**, N. Marzari, *Koopmans-compliant functionals for extended sys- tem: band gaps of semiconductors and insulators*, Phys. Rev. X **8**, 021051 (2018). doi: 10.1103/Phys- RevX.8.021051
7. G. Avvisati, P. Mondelli, P. Gargiani, C. Cardoso, D. Varsano, **A. Ferretti**, M.G. Betti, *Orbital symmetry driven ferromagnetic and antiferromagnetic coupling of molecular systems*, Nano Lett. **18**, 2268–2273 (2018). doi: 10.1021/acs.nanolett.7b04836
8. M. C. Chong, N. Afshar-Imani, F. Scheurer, C. Cardoso, **A. Ferretti**, D. Prezzi, G. Schull, *Bright electroluminescence from single graphene nanoribbon junctions*, Nano Lett. **18**, 175–181 (2018). doi: 10.1021/acs.nanolett.7b03797
9. R. Denk, A. Lodi-Rizzini, S. Wang, M. Hohage, P. Zeppenfeld, J. Cai, R. Fasel, P. Ruffieux, R. Berger, Z. Chen, A. Narita, X. Feng, K. Mu¨llen, R. Biagi, V. De Renzi, D. Prezzi, A. Ruini, and **A. Ferretti**, *Probing optical excitations in chevron-like armchair graphene nanoribbons*, Nanoscale **9**, 18326 (2017). doi: 10.1039/C7NR06175G
10. P. Giannozzi, …, **A. Ferretti**, … *et al.*, *Advanced capabilities for materials modelling with Quantum-Espresso,* J. Phys.: Cond. Mat. **29**, 465901 (2017)
11. L. A. Agapito, M. Fornari, D. Ceresoli, A. Ferretti, S. Curtarolo and M. Buongiorno Nardelli, *Accurate tight-binding Hamiltonians for two-dimensional and layered materials,* Phys. Rev. B **93**, 125137 (2016)
12. N.-L. Nguyen, G. Borghi, **A. Ferretti**, I. Dabo, N. Marzari, *First-principles calculation of photoemission spectra and orbital tomography of organic molecules using Koopmans-compliant functionals*, Phys. Rev. Lett. **114**, 166405 (2015). doi: 10.1103/PhysRevLett.114.166405
13. A. Batra, D. Cvetko, G. Kladnik, O Adak, C. Cardoso, **A. Ferretti**, D. Prezzi, E. Molinari, A. Morgante, L. Venkataraman, *Probing the Mechanism for Graphene Nanoribbon Formation on Gold Surfaces through X-ray Spectroscopy*, Chem. Sci. **5**, 4419–4423 (2014).
14. R. Denk, M. Hohage, P. Zeppenfeld, J. Cai, C.A. Pignedoli, H. So¨de, R. Fasel, X. Feng, K. Mu¨llen, S. Wang, D. Prezzi, **A. Ferretti**, A. Ruini, E. Molinari, P. Ruffieux, *Exciton Dominated Optical Response of Ultra-Narrow Graphene Nanoribbons*, Nature Commun. **5**, 4253 (2014)
15. **A. Ferretti**, I. Dabo, M. Cococcioni, N. Marzari, *Bridging density-functional and many-body perturbation theory: orbital-density dependence in electronic-structure functionals*, Phys. Rev. B **89**, 195134 (2014). doi: 10.1103/PhysRevB.89.195134
16. T. Schiros, G. Kladnik, D. Prezzi, **A. Ferretti**, G. Olivieri, C. Schenck, M. Cox, K. Plunkett, D. De- longchamp, C. Nuckolls, A. Morgante, D. Cvetko, I. Kymissis, *Donor-acceptor shape matching drives performance in photovoltaics*, Adv. En. Mat. **3**, 894 (2013). doi: 10.1002/aenm.201201125
17. P. Ruffieux, J. Cai, N.C. Plumb, L. Patthey, D. Prezzi, **A. Ferretti**, E. Molinari, X. Feng, K. Mu¨llen, C.A. Pignedoli, R. Fasel, *Electronic structure of atomically precise graphene nanoribbons*, ACS Nano **6**, 6930 (2012). doi: 10.1021/nn3021376

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV