Curriculum Vitae of Pina ROMANIELLO (last update October 2020)

Contact Information::

Pina Romaniello, born 27 May 1977 (Italy)
CNRS researcher since 2010
On maternity leave November 2016-February 2017 (16 weeks)
On maternity leave February 2020-June 2020 (16 weeks)
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Education::

- **2017:** *HDR* in condensed matter, Université de Toulouse, France
- **2006:** *Ph.D.* Mathematics and Natural Sciences, Rijksuniversiteit Groningen, The Netherlands
- **2001:** *Master degree* in Chemistry (cum laude), Università della Basilicata, Italy

Professional Experiences::

- **2010-:** *CNRS Researcher*, Laboratoire de Physique Théorique, Université de Toulouse, France
- **2008-2010:** *Postdoc*, Laboratoire des Solides Irradiés, École Polytechnique, France
- **2007-2008:** *Postdoc*, Solid State Physics Theory Group, Università degli Studi di Milano, Italy
- **2006-2007:** *Postdoc*, Theoretical Chemistry Group, Rijksuniversiteit Groningen, The Netherlands
- **2001-2002:** *Assistant Researcher*, Department of Chemistry at Università della Basilicata, Italy

Research Interests::

- Foundations of Density-Functional Theories and Many-Body Perturbation Theory
- Response Properties of finite and bulk systems: linear and non-linear optics using time-dependent (current)-density functional theory and/or many-body perturbation theory
- Scientific computing (developer of the AMS code (www.scm.com) since 2002)

Scientific production::

(Data retrieved on the 02/01/2020)

- 39 articles in peered-reviewed journals; h-index:18; more than 800 citations
- 3 article under revision

Scientific dissemination::

My work has been presented in 16 invited talks, 8 invited lectures/seminars, ∼17 talks, ∼15 posters.

- Invited talks
  - **2020:** "*The N-body problem in condensed matter*", GDR NBODY general meeting, Lille (France)
  - **2019:** "*Photoemission Spectra beyond GW: The Band Gap in Strongly Correlated Systems*", ETSF workshop, Jena (Germany)
  - **2019:** "*Correlation and spectroscopy in many-body theories*", workshop on Electron-Density-Based approaches, Zurich (Switzerland)
  - **2018:** "*Many-Body Effective Energy Theory: photoemission at strong correlation*", 8th workshop on TDDFT: Prospects and Applications, Benasque (Spain)
  - **2018:** "*Correlation and Spectroscopy in many-body theories*", ICQC 2018 satellite meeting on "Strong correlation in electronic structure theory", Strasbourg (France)
  - **2017:** "*Correlation and Spectroscopy in Reduced Density-Matrix Functional Theory*", CECAM Workshop "New challenges in Reduced Density Matrix Functional Theory: Symmetries, time-evolution and entanglement", Lausanne (Switzerland)

- **2017:** "*Photoemission Spectra beyond GW : the Band Gap in Strongly Correlated Systems*", CECAM Workshop "Theoretical Chemistry for Extended Systems: systematically improvable electronic structure methods", Toulouse (France)
- **2017:** "*Beyond GW: vertex corrections, multiple solutions, strong correlation*", workshop "Theory and applications of RPA-and-beyond methods in physics and chemistry", Paris (France)
- **2016:** "*Photoemission spectra beyond GW: the band gap in strongly correlated systems*", workshop "Quantum Many-Body Methods in Condensed Matter Systems", Aachen (Germany)
- **2016:** "*Photoemission spectra beyond GW: the band gap in strongly correlated systems*", mini colloquium "Green's function methods from first principles: GW, dynamical mean field theory and beyond" of the JMC15, Bordeaux (France)
- **2015:** "*Reduced Density Matrix Functional Theory: correlation and spectroscopy*", "International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods", Trieste (Italy)
- **2011:** "*DFT: insight from MBPT*", workshop "Density Functional Theory: Fundamentals and Applications in Condensed Matter Physics", Banff (Canada)
- **2010:** "*The Bethe-Salpeter equation and optical properties of many-body systems*", ETSF Young Researchers' Meeting 2010, Jyväskylä (Finland)
- **2009:** "*Nonlinear optical properties of metal-dithiolenes*", i"International Conference of Computational Methods in Sciences and Engineering 2009", Rhodes (Greece)
- **2008:** "*Double Excitations in Finite Systems*", ETSF workshop 2008, Pugnochiuso (Italy)
- **2008:** "*Double Excitations in Finite Systems*", workshop "Time-Dependent Density Functional Theory: Prospects and Applications", Benasque (Spain)

• Invited seminars

- **2010:** "*From Time-Dependent Current-Density Functional Theory to Many-Body Perturbation Theory : (non)linear response of models, molecules, and solids*", Laboratoire de Physique Théorique, Université de Toulouse, Toulouse (France)
- **2008:** "*DFT and its Progeny*", Department of Physical Chemistry, University of Geneva, Geneva (Switzerland)
- **2006:** "*Linear response of metals within TDCDFT*", Laboratories des Solides Irradiés, Ecole Polytechnique, Palaiseau (France)
- **2006:** "*Linear response of metals*", Condensed Matter Group, University of Missouri, Coulombia, MO, USA
- **2006:** "*Linear response of metals within TDCDFT*", Department of Physics, Università degli Studi di Milano, Milan (Italy)
- **2006:** "*Linear response of metals within TDCDFT*", Department of Physics, University of York, York (UK)
- **2006:** "*Relativistic effects in density functional theory*", iMaterial Science Center, University of Groningen, Groningen (The Netherlands)

Grants::

• **2020:** "Multireference Quasiparticles for strong correlation", 80—Prime fellowship; PIs: P.-F. Loos and Pina Romaniello (130 k€)

• **2019:** "Theoretical description of Resonant Inelastic X-ray Scattering", ANR 2019; PI: J.A. Berger; partner LPT: Pina Romaniello (421 k€)

• **2019:** "Multireference Quasiparticles for strong correlation ", LabEx NEXT (Nano-EXtreme measurements-Theory); PIs: Pina Romaniello and P.-F. Loos (88 k€)

• **2018:** "Photoemission Spectra from Quantum Monte Carlo and Many-Body Perturbation Theory: The best of both worlds ", ANR 2018; PI: Pina Romaniello (312 k€)

• **2016:** "Unified quantum theory of spin and charge dynamics", IDEX "Emergence 2015"; PIs: J.A. Berger and P. Romaniello (114 k€)

• **2012:** "Unified theory of spin and charge dynamics", LabEx NEXT (Nano-EXtreme measurements-Theory); PIs: J.A. Berger and Pina Romaniello (100 k€)

- **2012:** "Correlation in density matrix functional theory : new approximations from Green's function- based methods" doctoral school Sciences de la Matière of the University of Toulouse; PI: Pina Romaniello (100 k€)

Awards::

- **2019:** Prime d'encadrement doctoral et de recherche (PEDR) (14 k€)
- **2011:** Prime d'excellence scientifique (PES) (14 k€)

Supervision of scientific research::

In my scientific carrier I have (co)supervised: 5 post-doctoral affiliates, 6 PhD students, 2 stage Master 2, 1 stage M1, 1 stage License 3. More details are in the following:

- **2020-2023:** Co-supervision PhD thesis of Gabriele Riva
  Project: "Theoretical description of Resonant Inelastic X-ray Scattering"
- **2020-2023:** Co-supervision PhD thesis of Roberto Orlando
  Project: "Multireference quasiparticles for strong correlation"
- **2020-2021:** Co-supervision post-doctoral research of Stefano Di Sabatino
  Project: "Photoemission Spectra from Quantum Monte Carlo and Many-Body Perturbation Theory: The best of both worlds"
- **2019-2021:** Co-supervision post-doctoral research of Jaakko Koskelo
  Project: "Photoemission Spectra from Quantum Monte Carlo and Many-Body Perturbation Theory: The best of both worlds"
- **2019-2020:** Co-Supervision post-doctoral research of Stefano Di Sabatino
  Project: "Multireference quasiparticles for strong correlation"
- **2020:** Co-supervision stage M2 of Roberto Orlando
  Project: "Towards a better understanding of the adiabatic approximation"
- **2016-2019:** Co-supervision post-doctoral research of Rubén R. Ferradás
  Project: "Unified Quantum theory of charge and spin dynamics"
  This project resulted in 1 article published in Eur. Phys. J B (publication 7 in the Publications file)
  Current position: in quest for a post-doc position in Spain
- **2019:** Supervision stage M1 of Sarah Cavo
  Project: "Correlation and spectroscopy in many-body theories"
  This project resulted in 1 article submitted to PRB (publication 3 in the Publications file)
  Current position: student of M2 in Physics, Université de Toulouse (France)
- **2011-2013:** Co-Supervision post-doctoral research of José María Escartín
  Project: "Dissipative effects in the TDLDA dynamics"
  This project resulted in 2 articles published in JCP (publications 15 and 20 in the Publications file)
  Current position: research associate, Cavendish Laboratory, University of Cambridge (UK)
- **2012-2015:** Supervision PhD thesis of Stefano Di Sabatino
  Project: "Reduced Density-Matrix Functional Theory: Correlation and Spectroscopy"
  This project resulted in 3 articles published in JCP, PRB, and JCTC and 2 in preparation (publications 4, 11, 14 and 1, 2, respectively, of the Publications file)
  Current position: after a post-doc at the Laboratoire des Solides Irradiés (École Polytechnique), Stefano has a post-doc contract in my group
- **2012-2015:** Co-Supervision PhD thesis of Nathaniel Raimbault
  Project: "Gauge-invariant magnetic properties from the current density"
  This project resulted in 2 articles published in PRL and JCTC (publications 12 and 16 of the Publications file)
  Current position: post-doc, Fritz-Haber-Institut (Germany)
- **2014:** Supervision stage L3 of Nicolas Victorin
  Project: "Correction GW des poles de la fonction de Green Cumulante"
  Current position: PhD student, LPMMC Grenoble (France)

- **2011:** Co-supervision stage M2 of Nader Slama
  Project: ‘‘Approximations pour le calcul de la fonction de Green à une particule: une étude sur le modèle de Hubbard”
  Current position: after a PhD in my group, Nader was interested in big data field
- **2008-2011:** Co-Supervision PhD thesis of Giovanna Lani
  Project: ‘‘Towards a Novel Approach for the Calculation of Many-Body Green’s Functions”
  This project resulted in 2 articles published in NJP and PRL (publications 22 and 23 of the Publications file)
  Current position: last post-doc position at the Max Planck Institute of Microstructure Physics , Halle (Germany)
- **2007-2010:** Co-Supervision PhD thesis of Davide Sangalli
  Project: ‘‘Challenges for first-principles methods in theoretical and computational physics: multiple excitations in many-electrons systems and the Aharonov-Bohm effect in carbon nanotubes‘”
  This project resulted in 3 articles published in JCP and PRB (publications 10, 24 and 27 of the Publications file)
  Current position: permanent researcher, Istituto di Struttura della Materia, Montelibretti (Italy)

Teaching::

- **2021:** International summer School in electronic structure Theory: electron correlation in Physics and Chemistry (2 hours), Aussois
- **2017, 2019:** Doctoral course ‘‘Cours avancé de la théorie de la fonctionnelle de la densité et ses extensions”, Université de Toulouse (48 hours in total)
- **2015, 2019:** Doctoral course ‘‘Méthodes perturbatives avancées pour la physique”, Université de Toulouse (48 hours in total)
- **2012:** Invited Lecture ‘‘Approximations for the 1-body Green’s function”, Forschungszentrum Juelich (2 hours)
- **2008:** Tutorial for the course ‘‘Structure of matter”, Università degli Studi di Milano (40 hours)

Organization of scientific events::

- **2021:** 3rd International summer School in electronic structure Theory: electron correlation in Physics and Chemistry, Aussois (co-organizer, international school, ∼40 participants)
- **2020:** GDR REST min-workshop on functionals of the Green’s functions (co-organizer, online event)
- **2018:** GDR REST general meeting, Porquerolles (co-organizer, national meeting, ∼40 participants)
- **2017:** 22nd ETSF workshop, Frascati (co-organizer, international meeting, ∼60 participants)
- **2016:** Minicolloquium ‘‘Theoretical spectroscopy: extending the ab-initio landscape” of the CMD26, Groningen (co-organizer, international meeting, ∼40 participants)
- **2010-2016:** Semi-annual discussion meetings of the ETSF Collaboration Team on Correlation, Palaiseau (main organizer, international meeting, ∼30 participants)
- **2011-:** Annual international miniworkshop ‘‘Theory Days” at the Laboratoire de Physique Théorique, Toulouse (co-organizer, international meeting, ∼20 participants)
- **2013-:** CECAM workshop ‘‘Green’s function methods: the next generation” , Toulouse (2013, 2017), Lausanne (2015, 2019) (co-organizer, international meeting, ∼50 participants)
- **2015:** GDR REST Discussion meeting on correlation, Toulouse (organizer, international meeting, ∼30 participants)
- **2015:** 20th ETSF workshop, Palaiseau (co-organizer, international meeting, ∼60 participants)
- **2014:** Journées IRSAMC, Aspet (co-organizer, local meeting, ∼50 participants)

Institutional responsibilities::

- Research Team Leader (since 2010), Correlation Team coordinator (since 2010), and elected board member (2013-2015) of the ETSF (www.etsf.eu)
- Board member of the Condensed Matter Division EPS

- Board member of the GDR REST (gdr-rest.polytechnique.fr)
- Board member of the GDR NBODY (https://wiki.lct.jussieu.fr/gdrnbody)
- Elected member of the IRSAMC council (www.irsamc.ups-tlse.fr/)
- Equality referent of the lab (correspondante galit du CNRS)
- Tutor PhD students (marraine de thèse Mina Bionta (2012-2015))
- Supervision high-school students (encadrement 3 stages du 3e)

Reviewing activities::

- Member of thesis/HDR jury (G. Lani (2011, co-directrice), S. Di Sabatino (2015, directrice), N. Raimbault (2015, co-directrice), J. Zhou (2016, examinatrice), Marilena Tzavala (2017, rapporteure), Yassine Bouchafra (2019, rapporteure), Laurent Mazouin (2019, examinatrice), Hans-Christian Weissker (2018, HDR examinatrice))
- Member of recruitment committees (IPCMS Strasbourg 2014, IMPMC Paris 2019)
- CECAM referee
- NWO Vidi program referee
- Referee of Physical Review Letter, Physical Review B, Journal of Chemical Theory and Computation, Journal of Applied Physics, Journal of Physical Chemistry, Physica Status Solidi B

Membership of scientific societies::

- Member of Research Network European Theoretical Spectroscopy Facility (since 2007)

Code developments::

- Developer of the AMS code (www.scm.com) since 2002

Main current collaborations::

- Jan A. Berger, Laboratoire de Chimie et de Physique Quantiques, Université de Toulouse
  Long-standing collaboration on theoretical developments within MBPT and TDCDFT; 11 joint articles; partner in 3 scientific research projects
- Michel Caffarel, Laboratoire de Chimie et de Physique Quantiques, Université de Toulouse
  Partner in the project PhemSpec financed by the ANR call 2018.
- Pierre-François Loos, Laboratoire de Chimie et de Physique Quantiques, Université de Toulouse
  Recent collaboration on numerical aspects of MBPT in chemistry; partner of the proposal for the CNRS call 80\Prime; 2 joint articles
- Lucia Reining, Laboratoire de Solides Irradiés, Ecole Polytechnique, Palaiseau
  Long-standing collaboration on theoretical developments within MBPT; 11 joint articles;
- Claudio Verdozzi, Lund University (Suède)
  Scientific collaboration within the field of time-dependent reduced-density matrix functional theory; 1 joint article in preparation