



Quasiparticle interference of chiral correlated charge density phase of Pb/Si(111)
Physical Review Letters (2018)

CURRICULUM VITAE of Prof. Gianni Profeta



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1 Personal Informations

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1.1 Education and employments

- **July 1998:** degree in Physics, "laurea" cum laude, Department of Physics, University of L'Aquila.
- **October 1998:** enrolls in the PhD program in Physics at the University of L'Aquila, Physics Department.
- **October 2001:** defended the PhD thesis: "*Superconductivity and Density Functional Theory*"
- **January 2002:** INFN (Sez. D) Post-Doc position at the University of L'Aquila, Physics Department (Italy).
- **December 2003:** Post-Doc position at the University of L'Aquila, Physics Department (Italy).
- **January 2006:** Post-Doc position at the University of Cagliari, Physics Department (Italy).
- **December 2006:** Researcher at Consorzio Nazionale Interuniversitario per le Scienze Fisiche della Materia (CNISM) (Italy).
- **January 2010:** Post-Doc position at the INFN-CNR in L'Aquila (Italy).
- **June 2011:** Post-Doc position at Max-Planck-Institute for Microstructure Physics Halle (Germany).
- **October 1, 2011:** Assistant Professor (Researcher) at the University of L'Aquila, Department of Physical and Chemical Sciences.

- **May 2015:** Associate Professor at the University of L'Aquila, Department of Physical and Chemical Sciences.
- **April 2021:** Full Professor at the University of L'Aquila, Department of Physical and Chemical Sciences.

2 Professional Experiences

2.1 Scientific Experiences

- Jun. 1999 - Aug. 1999: Visiting researcher in the group of Prof. A.J. Freeman at Northwestern University, Evanston IL (USA).
- Oct.-Dec. 2004: Visiting professor at SISSA (Trieste) in the group of Prof. ██████████
- Sept.-Dec. 2005: Visiting professor at SISSA (Trieste) in the group of Prof. ██████████
- 2005: Hiring as Professor in Physics at *l'Istituto Istruzione Superiore A. Zoli (Atri, Teramo)* (classe di concorso 38/A, FISICA) (leave for research activities).
- September-October 2007: Invited professor at the Laboratoire de Mineralogie-Cristallographie Paris, in the group of Prof. ██████████
- June-September 2010: Invited professor at the Laboratoire de Mineralogie-Cristallographie Paris, in the group of Prof. ██████████
- October 2010: Permanent Researcher Position at the Physics Department at the University of L'Aquila. The formal hiring was programmed for October 2011.
- May 2015: Associate Professor at the University of L'Aquila, Department of Physical and Chemical Sciences.
(settore disciplinare FIS/03, settore concorsuale 02/B2 - Fisica Teorica della Materia)
- April 2021: Full Professor at the University of L'Aquila, Department of Physical and Chemical Sciences.
(settore disciplinare FIS/03, settore concorsuale 02/B2 - Fisica Teorica della Materia)

2.2 Qualifications

- September 2000: Qualification (public selection) as Physics Professor in the High-school (classe di concorso 38/A, FISICA).

- November 2012: Qualification (Abilitazione Scientifica Nazionale, ASN) as Associate Professor in Physics (settore disciplinare FIS/03, settore concorsuale 02/B2-Fisica Teorica della Materia).
- November 2012: Qualification (ASN) as Full Professor in Physics (settore disciplinare FIS/03, settore concorsuale 02/B2 - Fisica Teorica della Materia).
- March 2018: Qualification (ASN) as Full Professor in Physics (settore disciplinare FIS/03, settore concorsuale 02/B1 - Fisica Sperimentale della Materia) (valid until 26/07/2024).
- August 2018: Qualification (ASN) as Full Professor in Physics (settore disciplinare FIS/03, settore concorsuale 02/B2 - Fisica Teorica della Materia) (valid until 08/08/2024).

3 Professional Services

3.1 Affiliations

- **Permanent** affiliation at the CNR-SPIN (SuPerconducting and other INnovative materials and devices institute).
- Affiliation at the INFN *Gruppo Collegato Gran Sasso ai Laboratori Nazionali Gran Sasso (LNGS) presso il GSSI (Gran Sasso Science Institute)*.

3.2 Academic Appointments and Institutional assignments

- **Member of Institute Council** of SPIN-CNR Institute (since February 2020), <https://www.spin.cnr.it/about-us/organization>.
- **Deputy Director of the SPIN-CNR unit of L'Aquila as *Responsabile Unita' Organizzativa Supporto (RUOS)*** (from 1/2/2015 to 1/5/2019)
- Member of the PhD board of the Department of Physical and Chemical Sciences (DSFC), at the University of L'Aquila (since 2016).
- Deputy for the Orientation and Dissemination activities of Department of Physical and Chemical Sciences of the University of L'Aquila (DSFC), (since 2012 –).
- Member of the Orientation and Dissemination committee of the University of L'Aquila (since 2012 –).
- Member of the organization committee of the Open-Days of the University of L'Aquila (since 2012 –).
- Member of the Student Monitoring committee of DSFC (2012).
- Member of the technical committee for the event *50 Anni della Fisica all'Aquila*, L'Aquila (2016).
- Manager of the Laboratory of Calculus of the DSFC (since 2018 –).
- Member of the constituency for Representation of Students at the University of L'Aquila, (D.R. n. 178-2019 del 08.03.2019).

- Member of the Evaluation Committee of the University of L'Aquila for the *Programma Erasmus+ studio a.a. 2021/2022*.

3.3 Editorial board of Journals and International conferences

- Member of Scientific Council of **SuperFOx**: *Conference on Superconductivity and Functional Oxides*
<http://www.superfox2020.eu/index.php/casa/committee> (dal 2015 –).
- Guest Editor of *Novel Superconducting and Magnetic Materials*, memorial issue in honour of Professor S. Massidda **Journal of Physics: Condensed Matter**,
<http://iopscience.iop.org/journal/0953-8984/page/novel-sc-mag-materials>
- Guest Editor del Roadmap article *Designing Room Temperature Superconductors* Journal of Physics: Condensed Matter (2020).
- Member of the organizing committee of the workshop *Challenges in designing Room Temperature Superconductors* July 27 2020 - July 30 2020, at the Gran Sasso Science Institute (GSSI) L'Aquila, Italy. The Workshop has selected as part of the 2020 CECAM flagship program.
<https://www.gssi.it/seminars/seminars-and-events-2020/item/7572-challenges-in-de>
- Member of the organizer committee of the Symposium *Computational Materials, Design and Applications* of the Conference of Young Researches on Advanced Materials October 2014, China.
- Review Editorial Board of *Frontiers in Condensed Matter Physics*,
<https://www.frontiersin.org/>
- Member of the Editorial Advisory Board of *Novel Superconducting Materials*,
<https://www.degruyter.com/view/j/nsm>

3.4 Publications

https://scholar.google.com/citations?hl=it&user=TfonzkYAAAAJ&view_op=list_works&sortby=pubdate

3.5 Scientific evaluation activities

- 2021: Remote Evaluator of the HORIZON-EIC-2021-PATHFINDEROPEN projects of the European Commission.
- H2020 *FET OPEN RIA* Call 2016-1 Remote Evaluator.
- H2020 *ERC Starting-Grant* Reviewer.
- Evaluator of the Czech Academy of Sciences.
- Reviewer of ANR projects of France government.
- Reviewer of *National Science Center*, Poland.
- Reviewer for the United States Department of Energy, Office of Basic Energy Sciences.
- Reviewer - Call *Credits and Projects 2016 of the Fund for Scientific Research - FNRS*.
- Reviewer of computational projects for Cineca (Italy).
- Evaluator for the Agenzia Nazionale di Valutazione del Sistema Universitario e della Ricerca Valutazione della Qualità della Ricerca (2016).
- Member of *Reprise* register of independent scientific experts for the evaluation of Italian scientific research by Miur.
- G. P. is referee for various scientific journals (among the others):
 - Nature Physics
 - Nature Communication
 - Physical Review Letters, Physical Review B
 - Surface Science
 - Journal of Superconducting Material
 - Solid State Communication
 - Chemical Physics Letters

- Journal of Physics and Chemistry of Solids
- Europhysics Letters
- The European Physical Journal B
- Scientific Reports
- Carbon
- Journal of Magnetism and Magnetic Materials

4 Supervision of thesis degrees, PhD students and Post-docs

G. P. was supervisor of PhD, bachelor and master thesis students and post-docs.

4.1 Present Research Group

- Post-doc (two-years) on *Two-dimensional superconductors* (Dr. ██████████)
- PhD student in Physical and Chemical Sciences, at the University of L'Aquila (Dr. ██████████)
- Master thesis student in Nuclear Engineering at the Politecnico of Milan (student: ██████████)

4.2 Past Post-Doc researchers

- Two-years Post-doc position at the Department of Physical and Chemical Sciences, University of L'Aquila and at SPIN-CNR (2012-13) (Dr. ██████████)

4.3 PhD students

In the following we list the PhD students and PhD thesis's titles G. P. supervised:

- (co-supervisor) *Superconducting properties of Hydrogen Under Pressure*
Student: ██████████ (2002 – 2005)
- *New low dimensional superconductors*
Student: ██████████ (2014 – 2017)
- *Contrasting Agents for nuclear magnetic resonance*
Student: ██████████ (2015 – 2018)
- *Electronic properties of novel two-dimensional materials*
Student: ██████████ (2017–2020)

4.4 Master Thesis (Magistrale)

G. P. supervised the following master thesis (where not specified, it is in the Physics degree).

- (co-supervisor) *Ottimizzazione globale di cluster metallici*
Student: ██████████ (2004).
- (co-supervisor) *Studio a principi primi delle proprietà elettroniche e strutturali di adsorbati metallici su Si(111)*
Student: ██████████ (2004).
- (co-supervisor) *Superconduttori a base di Fe-As: studio a principi primi di BaFe₂As₂*
Student: ██████████ (2010).
- *Ruolo della bassa dimensionalità nei superconduttori a base di ferro*
Student: ██████████ (2014).
- *Studio a principi primi di nuovi materiali superconduttori*
Student: ██████████ (2014).
- *Superconduttori molecolari ad alta pressione*
Student: ██████████ (2015) (Chemistry degree).
- *Superconduttività sotto pressione dell'SnSe*
Student: ██████████ (2017).
- (co-supervisor) *An ARPES investigation via ¹³C-¹²C isotopic substitution*
Student: ██████████ (2019).
- (co-supervisor) with Prof. ██████████ Politecnico di Milano,
Idruri superconduttivi
Student: ██████████ (2020) (degree in Nuclear Engineering, Politecnico di Milano)
- *First-principles study of HgTe quantum wells*
Studente ██████████ (2021).

4.5 Bachelor Thesis (Triennale)

G. P. supervised the following bachelor thesis in Physics.

- (co-supervisor) *Calcolo della corrente di scanning tunnelling microscopy per materiali di interesse tecnologico*
Student: [REDACTED] (2003) .
- *Struttura elettronica del fosforene*
Student: [REDACTED] (2018).
- *Simmetrie nei cristalli in due dimensioni*
Student: [REDACTED] (2018).
- *Effetto Hall Quantistico*
Student: [REDACTED] (2019).
- *Propagazione elettronica dei super-reticoli*
Student: [REDACTED] (2019).
- 2020: *Proprietà dinamiche di rivelatori di Dark Matter allo ioduro di sodio*
Student: [REDACTED]
- 2021: *Proprietà dinamiche del grafene disordinato*
Studente: [REDACTED]
- 2021: *Evoluzione adiabatica e diabatico dell'idrogeno in un campo magnetico*
Studente: [REDACTED]

5 Evaluation committees

5.1 Faculty positions

- Member of the evaluation committee for associate Professor position in Physics (SSD FIS/03, 02/B2) art. 24, comma 5, della Legge 30.12.2010 n. 240 S.C. 02/B2, S.S.D. FIS/03 – FISICA DELLA MATERIA at the University of L'Aquila (2020).

5.2 PhD programs

- Member of the evaluation committee for the PhD defence exam in Physics, University of Salerno (2012).
- Member of the evaluation committee for the PhD defence exam in Physics at University of Technology of Graz (2014).
- Committee member for the Erasmus Mundus Program (2016).
- Member of the committee for the Physical and Chemical Sciences PhD selection at the Università dell'Aquila (2017).
- External evaluator of the PhD thesis in Physics at the University "La Sapienza", in Rome (2017, candidate ██████████)
- Member of the of the evaluation committee for the PhD defence exam in Physics, Politecnico di Torino (2017, candidate ██████████)
- Member (supplente) admission committee for the PhD program in *Ricerca in Modelli Matematici per l'Ingegneria, elettromagnetismo e nanoscienze*, 36° ciclo, La Sapienza University of Rome (2020).

5.3 Post-doc positions

- 2020: Member of evaluation committee for post-doc positions at the Department of Physical and Chemical Sciences, University of L'Aquila.
- 2020: Member of the evaluation committee for post-doc position at SPIN-CNR (SPIN AR 002/2020), University of L'Aquila on *Interazioni elettromagnetiche su*

scale molto al di sotto della lunghezza d'onda per il controllo della radiazione in dispositivi ultra compatti.

- 2019: Member of evaluation committee for a post-doc position on *Two dimensional contrast agents in MRI* at the Dipartimento di Medicina Clinica, sanità pubblica, scienze della vita e dell'ambiente (MESVA) of University of L'Aquila.
- 2018: Member of the evaluation committee for a post-doc research position on *Materiali bidimensionali innovativi* at the Dipartimento di Scienze Fisiche e Chimiche of University of L'Aquila.
- 2018: Member of evaluation committee for a researcher position RTDA, at Department of Physics at "La Sapienza", University of Rome.
- 2017: Member of evaluation committee for a post-doc position on *Using controlled disorder to investigate the mechanisms of iron based superconductors*, at the Dipartimento di Scienze Fisiche e Chimiche of University of L'Aquila.
- 2017: Member of evaluation committee for a post-doc position CNR-SPIN on *Meta-materiali per applicazioni innovative nel campo della risonanza magnetica* at the Dipartimento di Scienze Fisiche e Chimiche of University of L'Aquila.
- 2017: Member of evaluation committee for a researcher position on *Modellizzazione di materiali a bassa dimensionalità e studio delle eccitazioni di spin, carica ed orbitali mediante tecniche spettroscopiche avanzate* at CNR-SPIN, Salerno.
- 2012: Member of evaluation committee for a post-doc position on *Studio a principi primi di superconduttori a base di ferro* at the Dipartimento di Scienze Fisiche e Chimiche .

6 Conferences, Seminars and Prizes

6.1 Invited talks at international conferences

1. March 2002: XXI Convegno di Fisica Teorica e Struttura della Materia
Fai della Paganella (Italy).
Superconducting properties of diborides
2. June 2005: INFMeeting (2005)
Genova (Italy).
Superconductivity from first principles
3. September 2006: XXIV Convegno di Fisica Teorica
Levico Terme (Italy).
Nuovi materiali e nuovi metodi per un vecchio problema: la Superconduttività
4. January 2009: Total Energy and Force Methods Conference
Trieste (Italy).
Hydrogen Superconductivity and other superconductors
5. June 2009: Young Research Meeting
Berlin (Germany).
Electron-phonon coupling superconductivity and related phenomena
6. September 2010: SATT15
Alghero (Italy).
Phonon and Electron-phonon in MgB_2 by Wannier functions
7. November 2010: Electron-phonon interaction in metals, superconductors and semi-conducting nanostructures
Paris (France).
Phonon and Electron-phonon interaction by Wannier functions
8. September 2011: SYLCA 2011: Superconductivity 100 years later: A computational Approach
Alghero (Italy).
How to make graphene superconducting

9. September 2011: SIF (Italian Physical Society) Congress
L'Aquila (Italy).
How to make graphene superconducting
10. April 2012: MRS Spring Meeting
San Francisco, CA (USA).
Theoretical Predictions and Experimental Evidences in Iron-based Superconductors
11. June 2013: 7th ISSP International Workshop/Symposium- Emergent Quantum Phases in Condensed Matter : from topological to first-principles description
Kashiwa Chiba (Japan).
Phonons, electron-phonon interaction and superconductivity from first-principles
12. September 2013: SIF (Italian Physical Society) Congress
Trieste (Italy).
Superconduttori a base di ferro: tra dubbi e certezze
13. June 2014: (Towards) Room Temperature Superconductivity
Leiden (Netherlands).
How to make FeTe superconductor
14. September 2015: PsiK-2015 Conference
San Sebastian (Spain).
Electron-Phonon superconductivity: some examples
15. September 2015: Graphita 2015
Bologna (Italy)
Detaching graphene from a substrate
16. April 2016: Novel Quantum Phenomena in ultra thin superconductors
Camerino (Italy).
Novel 2D superconductors: first-principles predictions
17. May 2016: International Workshop Superhydrides. Towards Room Temperature Superconductivity: Hydrides and more
Rome (Italy).
Superconductivity in metastable phases of phosphorus/hydride compounds under high pressure

18. October 2016: Computational methods towards engineering novel correlated materials
Lausanne (Switzerland).
Iron chalcogenides superconductors: insights from electronic structure calculations
19. September 2017: European Conference of Applied Superconductivity (EUCAS)
Ginevra (Switzerland).
New superconductors: waiting for room temperature (?)
20. October 2017: FisMat, Italian National Conference of Condensed Matter
Trieste (Italy).
New iron-based superconductors
21. November 2017: Superconductivity in atomically thin materials and heterostructures
Lugano (Switzerland).
Chiral spin texture in the charge-density-wave phase of the correlated metallic Pb/Si(111) monolayer
22. May 2018: MultiSuper Conference
Trieste (Italy).
Chiral spin texture in the charge-density-wave phase of the correlated metallic Pb/Si(111) monolayer
23. May 2018: International Workshop on Electronic Structure of Superconductors and Novel Materials (Romesc2018)
Rome (Italy).
Chiral spin texture in the charge-density-wave phase of the correlated metallic Pb/Si(111) monolayer
24. September 2019: Italian national conference on the physics of matter
Catania (Italy).
Towards Room temperature Superconductivity
25. June 2021: CIMTEC 2021 - 15th International Conference on Modern Materials and Technologies
Montecatini Terme (Italia).
Room-temperature superconductivity in hydrides

