

# Francesco Pederiva

*Professor, Nuclear and Subnuclear Physics, University of Trento, Italy*

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## Education

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| 10/27/1994 | <b>S.I.S.S.A., Trieste, Italy</b><br><i>Doctor Philosophiae in Condensed Matter Theory: "Quantum Theory of non-Homogeneous Phases of Helium"</i><br>Advisors: prof. ██████████ (SISSA), prof. ██████████ (Milano) |
| 11/02/1992 | <b>S.I.S.S.A., Trieste, Italy</b><br><i>Magister Philosophiae in Condensed Matter Theory: "Parametrization of Shadow Wave Functions for non-Homogeneous Systems"</i><br>Advisor: prof. ██████████ (SISSA)         |
| 03/12/1991 | <b>University of Trento, Trento, Italy</b><br><i>Laurea in Physics: "A Density Functional Approach to the Volume and Surface Plasmon"</i><br>Advisor: prof. ██████████ (Trento)                                   |

## Work Experience

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| Feb 2020 – Ongoing  | <b>University of Trento, Trento, Italy</b><br><i>Professor, 02/A2-FIS/04 (Nuclear and Subnuclear Physics).</i>                                |
| Dec 2010 – Jan 2020 | <b>University of Trento, Trento, Italy</b><br><i>Associate Professor, 02/A2-FIS/04 (Nuclear and Subnuclear Physics)</i>                       |
| Mar 2004 – Nov 2010 | <b>University of Trento, Trento, Italy</b><br><i>Assistant Professor FIS/03 (Condensed matter Physics)</i>                                    |
| Jan 2019 – Dec 2000 | <b>University of Trento, Trento, Italy</b><br><i>Post-doctoral Research Assistant (Assegnista di Ricerca)</i>                                 |
| Jan 1997 – Dec 1998 | <b>Cornell University, Ithaca, NY, USA</b><br><i>Post-doctoral associate researcher, Computational Science and Engineering Research Group</i> |
| Jan 1995 – Dec 1996 | <b>University of Trento, Trento, Italy</b><br><i>Member of the technical staff (scientific software development)</i>                          |

## Affiliations

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- *INFN – Italian National Institute of Nuclear Physics*  
Associate member (Incarico di Ricerca)
- *Lawrence Livermore National Laboratory, Livermore, CA, USA*  
Visiting Scientist, Physical and Life Science Division – Quantum Coherent Device Physics Group (2018 – Ongoing)  
Visiting Scientist, Physical and Life Science Division – Quantum Simulations Group (2008 – 2018)  
Participating Guest, Defense and Nuclear Technology (AX) division (1998 – 2008)
- *ECT\* - European Center for Theoretical Studies in Nuclear Physics and Related Areas, Trento, Italy*  
Associate

## Past Affiliations

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- *CNR-DEMOCRITOS National Simulation Center*
- *CNISM - Italian Inter University Consortium for Condensed Matter Physics*
- *INFN - Italian National Institute of Condensed Matter Physics*

## Leadership Experience

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Jan 2015 – Ongoing	<b>INFN-TIFPA, Trento, Italy</b> <i>Theory Group Coordinator and Local Representative in the INFN National Theoretical Physics Committee</i>
Oct 2016 – Ongoing	<b>University of Trento, Trento, Italy</b> <i>Dean of the Ph.D. School in Physics</i>
2013 – Ongoing	<b>University of Trento, Trento, Italy</b> <i>Member of the Restricted Board (Giunta) of the Physics Department</i>
2010 – 2015	<b>University of Trento and FBK, Trento, Italy</b> <i>Founder and co-Director of LISC, Interdisciplinary Laboratory of Computational Science, a joint venture between the University of Trento and the Bruno Kessler Foundation aimed to coordinate and promote the computational science activities in the Trento area, and home of the AURORA project</i>

## Financed Projects

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- PRIN 2007 "Theoretical Modelling and simulation of polymer-based nanostructured biomatrices" National P.I.: Antonio Deriu. P.I. of the Trento Unit.
- AURORA project (Joint Venture between the Provincia Autonoma di Trento and INFN): Project manager for the Faculty of Science of the University of Trento (2009) (EUR 150k)
- Q@Tn grant "Acceleration of Nuclear Physics Calculations by Quantum Simulators" (ANuPC-QS) (2018) (EUR 70k)
- Q@Tn grant "Machine Learning techniques FOR Quantum Gate Engineering" (ML Q-FORGE) (2019) (EUR 70k)
- Subcontractor of the LDRD-DR LLNL project "Nuclear Reactor on a Quantum Chip" (FY 2019-2021) (EUR 120k)
- P.I. of the INFN Theoretical National Specific Initiative "MANYBODY", with units in Trento, Pavia, Torino, Bologna, Lecce, Rome "La Sapienza" (2016-2020)
- P.I. of the INFN Theoretical National Specific Initiative "MONSTRE", with units in Trento, Milano, Padova, Bologna, Napoli, Lecce, Catania, and Laboratori Nazionali del Sud (2021-2023)
- Co P.I. of the project "Near Term Quantum Simulations for Nuclear Physics", financed by the US-DoE (EUR 80k)

## Ph.D. students

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2007	██████████ "Study of the properties of pure and defective hydrogen crystals with Quantum Monte Carlo Methods" (now high school teacher)
2008	██████████ "The Auxiliary Field Diffusion Monte Carlo Method for Nuclear Physics and Nuclear Astrophysics" (now staff researcher at LANL)
2009	██████████ "Quantum Monte Carlo Methods applied to Strongly Correlated and Highly Inhomogeneous many-Fermion Systems" (now employed in a private company)
2010	██████████ "Quantum Monte Carlo study of spin orbit effects in confined electrons systems" (now RTDB (tenure track) at University of Padova)
2011	██████████ "Progress on development of EFT-based NN and accurate NY interaction by Monte Carlo Methods" (now employed in a private company)
2011	██████████ "Development of free energy calculation methods forth: study of monosaccharides conformation in computer simulations." (now employed in a private company)
2013	██████████ "From Hypernuclei to Hypermatter: a Quantum Monte Carlo Study of Strangeness in Nuclear Structure and Nuclear Astrophysics" (now FRIB Research Professor - MSU/LANL)
2014	██████████ "Ground State and Dynamical Properties of Many-Body Systems by non-Conventional Quantum Monte Carlo Algorithms" (now RTDB (tenure track) at University of Trento)
2017	██████████ "Pionless Effective Field Theory: Building the Bridge between lattice Quantum Chromodynamics and Nuclear Physics" (now post-doc at IPNO-Orsay)
2019	██████████ "A Quantum Monte Carlo approach to dark matter-nuclei interaction" (now post-doc at WUSTL, USA)
2020	██████████ "Spin polarization effects in neutron stars" (now high school teacher)

- Current

1. ██████████  
Nuclear Structure and Nuclear Dynamics on Quantum Computers
2. ██████████  
Machine Learning Applied to Optimal Control Techniques in Quantum Computing with Superconducting Qubits
3. ██████████  
Mathematical Aspects of Circuit Optimization in Quantum Computation

## Organization

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- Organizer of the workshop "Quantum Monte Carlo; Recent Advances and Common Problems in Condensed Matter and Field Theory", ECT\*, Trento 3-6/07/2001.
- Co-organizer of the symposium QFS2004 (Trento, July 2004) as Publications Chairman (Journal of Low Temp. Phys., issues Jan-Feb 2005)
- Organizer with ██████████ of the collaboration meeting ECT\* on "Investigating Protein Dynamics with Theoretical Physics Methods" (May 2005).
- Organizer of the National Workshop "QMCI: Quantum Monte Carlo in Italia" December 2006, with ██████████ and ██████████, November 2008, with ██████████
- Organizer of the "First Aurora School", September, 20th - October, 1st 2010, ECT\*, Trento, Italy
- Organizer of the course "High-performance computing and computational tools for nuclear physics", in the "TALENT- Training the next generation of nuclear physicists" series, June 25th, July 13th 2012, ECT\*, Trento
- Lead organizer of the INT Program "Advances in Quantum Monte Carlo Techniques for Non-Relativistic Many-Body Systems (INT-13-2a)", June 24th - August 2nd, 2013 at the Institute of Nuclear Theory, Washington University, Seattle, WA (USA).
- Organizer of the Workshop "Equations of state in quantum many-body systems", ECT\*, Trento, 05/30-06/01/2016
- Lead organizer of the INT Program "Advances in Quantum Monte Carlo Techniques for Many-Body Quantum Systems (INT-18-2b)", July 30th to September 7th, 2018 at the Institute of Nuclear Theory, Washington University, Seattle, WA (USA).
- Lead organizer with ██████████ (INT, Seattle, USA) of the online program "Quantum Simulations for Nuclear Physics" (QS4NP) (2020-2021)

## Miscellanea

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- Member of the Editorial Board of the Journal "Symmetry" (MDPI) (2020-2021)
- Referee for Physical Review, Physical Review Letters, EPJ, AJP, Nature, and others.
- Referee for the NSF, PRACE, NCN, and others.
- Member of the NuPECC Working Group on Computational Nuclear Physics (1999-2000)
- Coordinator of the "Percorso di Approfondimento in Fisica" (Honors Program) for the bachelor in Physics (2014-2016)
- Coordinator of the S.I.S.S.A. - UNITN Joint Master Degree in Physics. (2010-2013)
- Coordinator for the International programs for the Physics Department of the University of Trento (2012-2016)

## Scientific Interests

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Development of Quantum Algorithms, in particular on Circuit-QED based devices, with a special focus on application to nuclear physics problems and optimal control techniques.

Many-body theories of inhomogeneous and disordered fermionic and bosonic systems, and in particular: Development of algorithms for Quantum Monte Carlo calculations in nuclear and neutron matter; Quantum Monte Carlo methods in momentum space for non-local Hamiltonians; Many-body theories of electron gas in reduced dimensionality, (quantum wires and quantum dots); General techniques for the solution of the "sign problem" in Monte Carlo methods for many fermions systems; Methods and application of parallel computing in condensed matter and nuclear theory.

General methods for non equilibrium statistical mechanics: path-minimization based methods for the sampling of rare events and diffusion processes, with particular focus to models of epidemiological interest.

## Bibliometrics (09/01/2021)

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- 125 publications
- 2665 citations (2404 without self-citations)
- h index = 28

## Publications

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1. De-Leon, H. & **Pederiva, F.** Statistical mechanics study of the introduction of a vaccine against COVID-19 disease. English. *PHYSICAL REVIEW E* **104** (JUL 26 2021).
2. Marino, F., Barbieri, C., Carbone, A., Colo, G., Lovato, A., **Pederiva, F.**, Roca-Maza, X. & Vigezzi, E. Nuclear energy density functionals grounded in ab initio calculations. English. *PHYSICAL REVIEW C* **104** (AUG 9 2021).
3. Endrizzi, A., Perego, A., Fabbri, F. M., Branca, L., Radice, D., Bernuzzi, S., Giacomazzo, B., **Pederiva, F.** & Lovato, A. Thermodynamics conditions of matter in the neutrino decoupling region during neutron star mergers. *THE EUROPEAN PHYSICAL JOURNAL. A, HADRONS AND NUCLEI* **56** (2020).
4. Holland, E. T., Wendt, K. A., Kravvaris, K., Wu, X., Ormand, W. E., Dubois, J. L., Quaglioni, S. & **Pederiva, F.** Optimal control for the quantum simulation of nuclear dynamics. *PHYSICAL REVIEW A* **101**, 062307 (2020).
5. De-Leon, H. & **Pederiva, F.** Particle modeling of the spreading of coronavirus disease (COVID-19). *PHYSICS OF FLUIDS* **32**, 087113 (2020).
6. Massella, P., Barranco, F., Lonardoni, D., Lovato, A., **Pederiva, F.** & Vigezzi, E. Exact restoration of Galilei invariance in density functional calculations with quantum Monte Carlo. *JOURNAL OF PHYSICS. G, NUCLEAR AND PARTICLE PHYSICS* **47**, 035105 (2020).
7. Riz, L., Gandolfi, S. & **Pederiva, F.** Spin response and neutrino mean free path in neutron matter. *JOURNAL OF PHYSICS. G, NUCLEAR AND PARTICLE PHYSICS* **2020**, 47 (2020).
8. Riz, L., **Pederiva, F.**, Lonardoni, D. & Gandolfi, S. Spin Susceptibility in Neutron Matter from Quantum Monte Carlo Calculations. *PARTICLES* **3**, 706–718 (2020).
9. Andreoli, L., Cirigliano, V., Gandolfi, S. & **Pederiva, F.** Quantum Monte Carlo calculations of dark matter scattering off light nuclei. *PHYSICAL REVIEW C* **99**, 025501 (2019).
10. Madeira, L., Lovato, A., **Pederiva, F.** & Schmidt, K. E. Quantum Monte Carlo formalism for dynamical pions and nucleons. *PHYSICAL REVIEW C* **98**, 034005 (2018).
11. Roggero, A. & **Pederiva, F.** Extension of the Configuration Interaction Monte Carlo Method to Atoms and Molecules. *ADVANCES IN QUANTUM CHEMISTRY* **76**, 241–253 (2018).
12. Contessi, L., Lovato, A., **Pederiva, F.**, Roggero, A., Kirscher, J. & van Kolck, U. Ground-state properties of  $4\text{He}$  and  $16\text{O}$  extrapolated from lattice QCD with pionless EFT. *PHYSICS LETTERS. SECTION B* **772**, 839–848 (2017).
13. Ferrari Ruffino, F., Lonardoni, D., Barnea, N., Deflorian, S., Leidemann, W., Orlandini, G. & **Pederiva, F.** Benchmark Results for Few-Body Hypernuclei. *FEW-BODY SYSTEMS* **58** (2017).
14. **Pederiva, F.**, Roggero, A. & Schmidt, K. E. in *Lecture Notes in Physics* (ed U., H.-J. M. M. K.) 401–476 (Springer Verlag, HEIDELBERG - DEU, 2017).
15. Lipparini, E. & **Pederiva, F.** Transverse isospin response function of asymmetric nuclear matter from a local isospin density functional. *PHYSICAL REVIEW C* **94**, 024323 (2016).
16. Lonardoni, D., Lovato, A., Gandolfi, S. & **Pederiva, F.** *Strangeness in nuclei and neutron stars: a challenging puzzle in 21ST INTERNATIONAL CONFERENCE ON FEW-BODY PROBLEMS IN PHYSICS Book Series: EPJ Web of Conferences* **113** (E D P SCIENCES, COUTABOEUF - FRA, May 2016).
17. Melton, C. A., Zhu, M., Guo, S., Ambrosetti, A., **Pederiva, F.** & Mitas, L. Spin-orbit interactions in electronic structure quantum Monte Carlo methods. *PHYSICAL REVIEW A* **93**, 042502 (2016).
18. Roggero, A., Mori, P., Mukherjee, A. & **Pederiva, F.** Configuration Interaction Monte Carlo with Coupled Clusters Wave Functions. *ADVANCES IN QUANTUM CHEMISTRY* **73**, 315–332 (2016).
19. Ambrosetti, A., Silvestrelli, P. L., **Pederiva, F.**, Mitas, L. & Toigo, F. Repulsive atomic Fermi gas with Rashba spin-orbit coupling: A quantum Monte Carlo study. *PHYSICAL REVIEW A* **91** (2015).
20. Barnea, N., Contessi, L., Gazit, D., **Pederiva, F.** & Van Kolck, U. Effective field theory for lattice nuclei. *PHYSICAL REVIEW LETTERS* **114**, 052501 (2015).

21. Carlson, J. C., Gandolfi, S., **Pederiva, F.**, Pieper, S. C., Schiavilla, R., Schmidt, K. E. & Wiringa, R. B. Quantum Monte Carlo methods for nuclear physics. *REVIEWS OF MODERN PHYSICS* **87**, 1067–1118 (2015).
22. Kirscher, J., Barnea, N., Gazit, D., **Pederiva, F.** & van Kolck, U. Spectra and scattering of light lattice nuclei from effective field theory. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **92** (2015).
23. Lonardoni, D., Lovato, A., Gandolfi, S. & **Pederiva, F.** Hyperon puzzle: Hints from Quantum Monte Carlo calculations. *PHYSICAL REVIEW LETTERS* **114**, 092301 (2015).
24. Roggero, A., Mukherjee, A. & **Pederiva, F.** Constraining the Skyrme energy density functional with quantum Monte Carlo calculations. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **92** (2015).
25. Calcevachia, F., **Pederiva, F.**, Kalos, M. H. & Kühne, T. D. Sign problem of the fermionic shadow wave function. *PHYSICAL REVIEW E, STATISTICAL, NONLINEAR, AND SOFT MATTER PHYSICS* **90**, 053304 (2014).
26. Lonardoni, D., **Pederiva, F.** & Gandolfi, S. Accurate determination of the interaction between  $\Lambda$  hyperons and nucleons from auxiliary field diffusion Monte Carlo calculations. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **89** (2014).
27. Lonardoni, D., **Pederiva, F.** & Gandolfi, S. *From hypernuclei to the inner core of neutron stars: A quantum Monte Carlo study in 17TH INTERNATIONAL CONFERENCE ON RECENT PROGRESS IN MANY-BODY THEORIES (MBT17)* **529** (Institute of Physics Publishing, BRISTOL - GBR, 2013 2014), 012012.
28. **Pederiva, F.**, Roggero, A. & Orlandini, G. Use of the Sumudu transform to extract response functions from Quantum Monte Carlo calculations. *JOURNAL OF PHYSICS. CONFERENCE SERIES* **527**, 012011 (2014).
29. Roggero, A., Mukherjee, A. & **Pederiva, F.** *Quantum Monte Carlo with non-local chiral interactions in XIV CONFERENCE ON THEORETICAL NUCLEAR PHYSICS IN ITALY* **527** (Institute of Physics Publishing, BRISTOL - GBR, 2013 2014), 012003.
30. Roggero, A., Mukherjee, A. & **Pederiva, F.** Quantum Monte Carlo calculations of neutron matter with nonlocal chiral interactions. *PHYSICAL REVIEW LETTERS* **112**, 221103 (2014).
31. Lipparini, E. & **Pederiva, F.** Asymmetric nuclear matter studied by time-dependent local isospin density approximation. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **88** (2013).
32. Lonardoni, D., Gandolfi, S. & **Pederiva, F.** Effects of the two-body and three-body hyperon-nucleon interactions in  $\Lambda$  hypernuclei. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **87** (2013).
33. Lonardoni, D., **Pederiva, F.** & Gandolfi, S. Auxiliary Field Diffusion Monte Carlo study of the hyperon–nucleon interaction in  $\Lambda$ -hypernuclei. *NUCLEAR PHYSICS. A* **914**, 243–247 (2013).
34. Roggero, A., Mukherjee, A. & F., P. Quantum Monte Carlo with coupled-cluster wave functions. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **88** (2013).
35. Roggero, A., **Pederiva, F.** & Orlandini, G. Dynamical structure functions from quantum Monte Carlo calculations of a proper integral transform. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **88**, 094302-1-094302–7 (2013).
36. Ambrosetti, A., **Pederiva, F.**, Lipparini, E. & Mitas, L. *Quantum Monte Carlo in Presence of Spin-Orbit Interaction in ADVANCES IN QUANTUM MONTE CARLO* (eds Tanaka, S., Rothstein, S. M. & Lester, W. A.) **1094** (American Chemical Society, Washington, D.C., Washington, D.C., USA - USA, Dec. 2012), 119–130.
37. Ambrosetti, A., Silvestrelli, P., Toigo, F., Mitas, L. & **Pederiva, F.** Variational Monte Carlo for spin-orbit interacting systems. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **85**, 045115 (2012).
38. Faccioli, P. & **Pederiva, F.** Microscopically computing free-energy profiles and transition path time of rare macromolecular transitions. *PHYSICAL REVIEW E, STATISTICAL, NONLINEAR, AND SOFT MATTER PHYSICS* **86** (2012).
39. Illarionov, A. Y., Fantoni, S., **Pederiva, F.**, Gandolfi, S. & Schmidt, K. Determination of the finite temperature equation of state of dense matter. *PHYSICS OF ATOMIC NUCLEI* **75**, 866–869 (2012).

40. A Beccara, S., Faccioli, P., Sega, M., **Pederiva, F.**, Garberoglio, G. & Orland, H. Dominant folding pathways of a peptide chain from ab initio quantum-mechanical simulations. *THE JOURNAL OF CHEMICAL PHYSICS* **134**, 024501 (2011).
41. Ambrosetti, A., Escartin, J. M., Lipparini, E. & **Pederiva, F.** Spin-orbit excitations of quantum wells. *EUROPHYSICS LETTERS* **94**, 27004 (2011).
42. Ambrosetti, A., **Pederiva, F.** & Lipparini, E. Quantum Monte Carlo study of circular quantum dots in presence of Rashba interaction. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **83**, 155301 (2011).
43. Arias de Saavedra, F., Kalos, M. & **Pederiva, F.** Cancellation time for correlated random walkers. *MOLECULAR PHYSICS* **109**, 2797–2806 (2011).
44. Armani, P., Illarionov, A. Y., Lonardonì, D., **Pederiva, F.**, Gandolfi, S., Schmidt, K. E. & Fantoni, S. *Recent progress on the accurate determination of the equation of state of neutron and nuclear matter in 13th Conference on Theoretical Nuclear Physics in Italy* (eds Bombaci, I., Covello, A., Marcucci, L. E. & Rosati, S.) **336** (IOP Publishing, BRISTOL - GBR, June 2011), 012014.
45. Lohne, M. P., Hagen, G., Hjort Jensen, M., Kvaal, S. & **Pederiva, F.** Ab initio computation of the energies of circular quantum dots. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **84**, 115302 (2011).
46. Sega, M., Autieri, E. & **Pederiva, F.** Pickett angles and Cremer–Pople coordinates as collective variables for the enhanced sampling of six-membered ring conformations. *MOLECULAR PHYSICS* **109**, 141–148 (2011).
47. A Beccara, S., Garberoglio, G., Faccioli, P. & **Pederiva, F.** Communications: Ab initio dynamics of rare thermally activated reactions. *THE JOURNAL OF CHEMICAL PHYSICS* **132**, 111102 (2010).
48. Autieri, E., Sega, M., **Pederiva, F.** & Guella, G. Puckering free energy of pyranoses: A NMR and metadynamics-umbrella sampling investigation. *THE JOURNAL OF CHEMICAL PHYSICS* **133**, 095104-1-095104-14 (2010).
49. Gandolfi, S., Illarionov, A. Y., Fantoni, S., Miller, J. C., **Pederiva, F.** & Schmidt, K. E. Microscopic calculation of the equation of state of nuclear matter and neutron star structure. *MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY* **404**, L35–L39 (2010).
50. Ambrosetti, A., **Pederiva, F.**, Lipparini, E. & Gandolfi, S. Quantum Monte Carlo study of the two-dimensional electron gas in presence of Rashba interaction. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **80**, 125306-1-125306-12 (2009).
51. Autieri, E., Faccioli, P., Sega, M., **Pederiva, F.** & Orland, H. Dominant reaction pathways in high-dimensional systems. *THE JOURNAL OF CHEMICAL PHYSICS*, 064106-1-064106-14 (2009).
52. Colletti, L., Malet, F., Pi, M. & **Pederiva, F.** Quantum Monte Carlo study of few-electron concentric double quantum rings. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **79**, 125315-1-125315-8 (2009).
53. Dandrea, L., **Pederiva, F.**, Gandolfi, S. & Kalos, M. H. Fermionic Shadow Wave Function Variational Calculations of the Vacancy Formation Energy in He-3. *PHYSICAL REVIEW LETTERS* **102**, 255302-1-255302-4 (2009).
54. Dandrea, L., **Pederiva, F.** & Lipparini, E. Ground state properties of a laterally confined two-dimensional electron gas. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **79**, 155321-1-155321-5 (2009).
55. Faccioli, P., Sega, M., **Pederiva, F.** & Orland, H. Stochastic dynamics and dominant protein folding pathways. *PHILOSOPHICAL MAGAZINE* **88**, 4093–4099 (2009).
56. Gandolfi, S., Illarionov, A. Y., **Pederiva, F.**, Schmidt, K. E. & Fantoni, S. Equation of state of low-density neutron matter, and the S-1(0) pairing gap. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **80**, 045802-1-045802-11 (2009).
57. Gandolfi, S., Illarionov, A. Y., Schmidt, K. E., **Pederiva, F.** & Fantoni, S. Quantum Monte Carlo calculation of the equation of state of neutron matter. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **79**, 054005-1-054005-13 (2009).
58. Gandolfi, S., **Pederiva, F.** & a Beccara, S. Quantum Monte Carlo calculation for the neutron-rich Ca isotopes. *THE EUROPEAN PHYSICAL JOURNAL. A, HADRONS AND NUCLEI* **35**, 207–211 (2009).
59. Sega, M., Autieri, E. & **Pederiva, F.** On the calculation of puckering free energy surfaces. *THE JOURNAL OF CHEMICAL PHYSICS* **130**, 225102-1-225102-6 (2009).

60. Gandolfi, S., Illarionov, A. Y., Fantoni, S., **Pederiva, F.** & Schmidt, K. E. Equation of state of superfluid neutron matter and the calculation of the  $1S_0$  pairing gap. *PHYSICAL REVIEW LETTERS* **101**, 132501-1-132501-4 (2008).
61. Colletti, L., **Pederiva, F.**, Lipparini, E. & Umrigar, C. J. Spin- and charge-density excitations in quantum dots via quantum Monte Carlo simulation. *PHYSICA STATUS SOLIDI. B, BASIC RESEARCH* **244**, 2317-2321 (2007).
62. Gandolfi, S., **Pederiva, F.**, Fantoni, S. & Schmidt, K. E. Auxiliary field diffusion Monte Carlo calculation of nuclei with  $A \leq 40$  with tensor interactions. *PHYSICAL REVIEW LETTERS* **99**, 022507-1-022507-4 (2007).
63. Gandolfi, S., **Pederiva, F.**, Fantoni, S. & Schmidt, K. E. Quantum Monte Carlo calculations of symmetric nuclear matter. *PHYSICAL REVIEW LETTERS* **98**, 102503-1-102503-4 (2007).
64. Operetto, F. & **Pederiva, F.** Diffusion Monte Carlo study of the equation of state of solid ortho-D-2. *THE JOURNAL OF CHEMICAL PHYSICS* **126**, 074704-1-074704-5 (2007).
65. Operetto, F. & **Pederiva, F.** Distortion effects and clustering of isotopic impurities in solid molecular para-hydrogen from variational Monte Carlo simulations with shadow wave functions. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **76**, 174517-1-174517-5 (2007).
66. Operetto, F. & **Pederiva, F.** Effect of vacancies on the structure of solid molecular parahydrogen studied with variational Monte Carlo simulations. *PHYSICAL REVIEW. B, CONDENSED MATTER AND MATERIALS PHYSICS* **75**, 064201-1-064201-8 (2007).
67. Sega, M., Faccioli, P., **Pederiva, F.**, Garberoglio, G. & Orland, H. Quantitative Protein Dynamics from Dominant Folding Pathways. *PHYSICAL REVIEW LETTERS* **99**, 118102-1-118102-4 (2007).
68. Faccioli, P., Sega, M., **Pederiva, F.** & Orland, H. Dominant pathways in protein folding. *PHYSICAL REVIEW LETTERS* **97**, 108101-1-108101-4 (2006).
69. Gandolfi, S., **Pederiva, F.**, Fantoni, S. & Schmidt, K. E. Auxiliary field diffusion Monte Carlo calculation of properties of oxygen isotopes. *PHYSICAL REVIEW. C, NUCLEAR PHYSICS* **73**, 044304-1-044304-6 (2006).
70. Hui, L., Ying, L., Liu, Y. C., Dong, S. L. & **Pederiva, F.** Shadow wave function variational calculation of bond orientational order and disclination in liquid and solid He-4. *EUROPHYSICS LETTERS* **73**, 76-82 (2006).
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