Felipe Taha Sant'Ana

ftahas.github.io
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Personal information

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Current Position

Assistant Professor, Institute of Physics PAS, NCN Polonez Bis 1 Fellow
Theoretical physics with focus on interacting quantum systems

Principal investigator of the project "Correlation aspects of interacting quantum systems in reduced dimensionality", with research (investigation, analytical and numerical calculations, grants proposals and manuscripts writing) and administrative duties, such as budget management and hiring of postdoctoral personnel.

Education

- Ph.D. in Physics, 2020, São Carlos Institute of Physics - University of São Paulo.
  Fields: Bose-Einstein condensate, optical lattices,
  quantum phase transitions, one-dimensional interacting Bose gas.
  Thesis: A study on quantum gases: bosons in optical lattices
  and the one-dimensional interacting Bose gas.
  arXiv:2006.13100; teses.usp
- M.Sc. in Electrical Engineering, 2015, São Carlos School of Engineering - University of São Paulo. Fields: Autonomous robots, dynamical environments, collision probability estimation. Dissertation: Estimação de probabilidade de colisão com obstáculos móveis para navegação autônoma. teses.usp,
- B.Sc., Physics, 2012, São Carlos Institute of Physics - University of São Paulo.

Languages and skills

Portuguese (native), English (advanced), Spanish (basic).
Fortran, Python, Latex, Mathematica, Linux.

Experiences

2022-2024, Assistant Professor, Institute of Physics PAS, NCN Polonez Bis 1 Fellow
2020-2022, Assistant Professor, Faculty of Physics, University of Warsaw
2018-2019, Ph.D. Researcher, Institute de Physique de Nice.
2016-2020, Ph.D. Researcher, Sao Carlos Institute of Physics.
2015, Financial Model Analyst, Luz Financial Solutions, Sao Carlos.

2013-2015, M.Sc. Researcher, University of Sao Paulo.
2012-2013, Artificial Intelligence Developer, Warthog Robotics.

Teaching

Quantum Field Theory, 2023-2024, Institute of Physics, Polish Academy of Sciences.
Statistical Physics, 2021-2022, University of Warsaw.
Quantum Mechanics, 2021-2022, University of Warsaw.
Computational Physics, 2017, University of São Paulo.

Grants

- November 2022 - October 2024: Correlation aspects of interacting quantum systems in reduced dimensionality. Project co-funded by the National Science Centre and the European Union Framework Programme for Research and Innovation Horizon 2020 under the Marie Skłodowska-Curie grant agreement.

Publications

- Oleksandr Gamayun, Miłosz Panfil, Felipe Taha Sant'Ana, Kubo-Martin-Schwinger relation for an interacting mobile impurity, Phys. Rev. Research 5, 043265, 2023. arXiv:2308.06482
- Oleksandr Gamayun, Miłosz Panfil, Felipe Taha Sant'Ana, Mobile impurity in a one-dimensional gas at finite temperatures, Phys. Rev. A 106, 023305, 2022. arXiv:2202.07657
- Miłosz Panfil, Felipe Taha Sant'Ana, The relevant excitations for the one-body function in the Lieb-Liniger model, J. Stat. Mech. (2021) 073103. arXiv:2104.10491
- F. T. Sant'Ana, F. Hébert, V. Rousseau, M. Albert, P. Vignolo, Scaling properties of Tan's contact: Embedding pairs and correlation effect in the Tonks-Girardeau limit, *Phys. Rev. A* **100**, 063608 (2019). arXiv:1908.08714
- Felipe Taha Sant'Ana, Axel Pelster, and Francisco Ednilson Alves dos Santos, Finite-temperature degenerate pergutbation theory for bosons in optical lattices, *Phys. Rev. A* **100**, 043609 (2019). arXiv:1906.09661
- M. Kübler, F. T. Sant'Ana, F. E. A. dos Santos, and A. Pelster, Improving mean-field theory for bosons in optical lattices via degenerate perturbation theory, *Phys. Rev. A* **99**, 063603 (2019).arXiv:1804.08689
- Felipe Taha Sant'Ana *et al.*, Warthog Robotics Team Description Paper 2012, *Latin American Robotics Competition Symposium* (2012).

Talks and posters

- "Correlation aspects of interacting quantum systems in one dimension", International Conference on Statistical Physics - SIGMAPHI 2023, Chania, Greece, 10-14 July 2023;
- "Correlation aspects of interacting quantum systems in reduced dimensionality", BEC seminar, CFT PAN, Warsaw, Poland, 2 December 2022;
- Recent Advances in Quantum Integrable Systems Lyon, August 29th – September 2nd, 2022;
- São Paulo School of Advanced Science on Quantum Fluids and Applications, February 20 to March 4, 2022, at the São Carlos Institute of Physics, University of São Paulo, "The relevant excitations for the one-body function in the Lieb-Liniger model";

- Condensed matter physics seminar, University of Warsaw 2021, "Correlation features of interacting bosons";
- Student workshop on integrability, 2021, "Understanding the important excitations in the Lieb-Liniger model";
- Condensed matter physics seminar, University of Warsaw 2020, "A study on quantum gases: bosons in optical lattices and the interacting Bose gas";
- School on Interaction of Light with Cold Atoms, January 30 - February 10, 2017, São Paulo, Brazil, "Bosons in optical lattices".