Daniel Sheinbaum Frank

Personal Information

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Research Interests

Finding mathematically rigorous and physically natural connections between, on the one hand, cohomological and homotopical methods, and on the other functional analysis to classify properties of condensed matter systems, quantum mechanics or any falsifiable theory of physics.

Education

12/2019 | PhD - University of British Columbia (UBC)
Thesis: *Applications and Connections between Twisted Equivariant K-theory, Quantum Mechanics and Condensed Matter*
Supervisor: Alejandro Adem

06/2013 | MSc Physics - University of British Columbia
Thesis: *Momentum-space classification of topologically stable Fermi surfaces*
Supervisor: Gordon W. Semenoff

04/2013 | BSc Mathematics - Universidad Nacional Autónoma de México (UNAM)
Thesis: *Simulations of boson-fermion stars in 3+1 numerical relativity*
Supervisor: Miguel Alcubierre

Awards

2013–2020 | **Scholarship for graduate studies**
Consejo Nacional de Ciencia y Tecnología (CONACYT)

Publications

A. Adem, O. Antolín Camarena, G. W. Semenoff and **D. Sheinbaum**(2016) Topology of Fermi surfaces and anomaly inflows, *J. High Energ. Phys.*, 83, DOI: 10.1007/JHEP11(2016)083 (Corresponding Author)

C. Okay and **D. Sheinbaum** (2019) Classifying space for quantum contextuality , Under review in Annales Henri Poincaré. See preprint arXiv:1905.07723

D. Sheinbaum, O. Antolín Camarena (2020) Interacting crystallographic topological phases and equivariant cohomology: To assume or not to assume. Under review in Physical Review B, Rapid communication. See preprint arXiv:2007.06595

Conferences and Invited Talks

December 2018 | Quasi-adiabatic stability of Fermi surfaces and K-theory, Canadian Mathematical Society 2018 Winter Meeting, Vancouver, Canada.

July 2018 | Quasi-adiabatic stability of Fermi surfaces and K-theory, ICMP Young Researcher Symposium, Montreal, Canada.

May 2018 | Quasi-adiabatic stability of Fermi surfaces and K-theory, Algebraic structures in quantum computation, UBC.

February 2016 | Topology of Fermi surfaces and Anomalies, Topology seminar of the Pacific Institute for the Mathematical Sciences, UBC.

Workshops and Summer Schools

2017 **NSF-CBMS Conference: Topological and Geometric Methods in Quantum Field Theory**, Boseman, Montana, USA.

2017 **Instructional Skills Workshop**, Centre for Teaching, Learning and Technology, UBC, Vancouver.

Teaching Experience

University of British Columbia

Recitation Instructor

2018 Math 180: Differential Calculus with Physical Applications

Teaching assistant appointments

2013-2019 Math 110: Differential Calculus
Math 180: Differential Calculus with Physical Applications
Math 184: Differential Calculus with Applications to Social Science
Physics 101: Energy and Waves
Math Learning Centre Tutor

Universidad Nacional Autónoma de México

Teaching Assistant

2012-2013 Integral Calculus
Ordinary Differential Equations I
General Relativity

Skills

- Programming: Shell, Fortran
- Languages: Spanish (native), English (fluent)