Daniel Sheinbaum Frank

Personal Information

email: dshein@ciencias.unam.mx
website: https://d-shein.github.io/

Research Interests

Finding applications of algebraic topology to study condensed matter, non-linear systems and quantum mechanics.

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
Co-supervisor: Cihan Okay

06/2015 | 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

2013–2019 | **Scholarship for graduate studies**
Consejo Nacional de Ciencia y Tecnología (CONACYT)

2017 | **Travel and living expenses grant** to attend NSF-CBMS Conference: Topological and Geometric Methods in Quantum Field Theory, Boseman, Montana, USA.

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** (2020) Classifying space for quantum contextuality, **Accepted** for publication 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

D. Sheinbaum (2020) Solitons on Weakly Non-linear Topological Systems: Linearization, Equivariant Cohomology and K-theory. Under review in Physical Review Letters.

Conferences and Invited Talks

November 2019	Applications of twisted equivariant K-theory to condensed matter, Topology seminar of the Pacific Institute for the Mathematical Sciences, UBC.
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
	Math 110: Differential Calculus
2013-	Math 180: Differential Calculus with Physical Applications
2019	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-	Integral Calculus
2013	Ordinary Differential Equations I
	General Relativity

Skills

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