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Professional Path

- 2022–Now Professor, Indiana University – Bloomington
- 2016–2022 Associate Professor, Indiana University – Bloomington
- 2017–2018 Visiting Scientist, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany
- 2011–2016 Assistant Professor, Indiana University – Bloomington
- 2008–2011 Postdoctoral Research Associate, University of Illinois, Urbana-Champaign
- 2006–2008 Postdoctoral Fellow, University of British Columbia

Awards and Distinctions

- 2023-2025 NASF-EAGER, \$900,000 (co-PI), with A. Gumennik (PI), P. Richerme (co-PI).
- 2019-2023 Department of Energy award, \$900,000 (co-PI), with P. Richerme (PI), G. Ortiz (co-PI).
- 2021 IU Faculty Research Support Program – External Submission \$58,426 (PI).
- 2015-2018 US-Israel Binational Science Foundation Award, \$75,000 (PI), with E. Grosfeld (PI).
- 2014-2020 **National Science Foundation CAREER Award**, \$474,024 (PI).
- 2016 IU Ostrom Outreach Grant \$5,660 (PI), with R. Tayloe (PI).
- MAR 2015 **Outstanding Junior Faculty Award**, Indiana University, Bloomington.
- APR 2014 Joseph and Sophia Konopinski Award for Outstanding Teaching, IUB.
- APR 2013 Outstanding Undergraduate Teaching Award, Department of Physics, IUB.
- MAR 2008 NSERC Postdoctoral Fellowship, \$80,000, Location of tenure: UIUC.
- MAR 2006 NSERC Industrial R&D Fellowship, \$60,000 (declined).
- JAN 2006 President's PhD Stipend, \$6,000, (Simon Fraser University).
- 2002–2004 Graduate Fellowship, \$24,000 (Simon Fraser University).
- JAN 2004 Billy Jones Memorial Graduate Scholarship, \$2,700 (Simon Fraser University).
- JAN 2003 Sulzer Pumps Inc. Graduate Scholarship, \$1,000 (Simon Fraser University).
- 1995–1998 Undergraduate Scholarship, IPM, Tehran, Iran.
- MAR 1994 First Place, Physics Subject
Second Place, General, Nation-wide University Entrance Examination, Iran.

Education

- AUG 2006 PhD in Physics Simon Fraser University, Burnaby, British Columbia, Canada
- AUG 2000 MSc in Physics Sharif University of Technology, Tehran, Iran
- JUN 1998 BSc in Physics Sharif University of Technology, Tehran, Iran

Publication profile

Publications

total = 45; 42 peer-reviewed (all available on [arXiv](#)).

17 **Letters** and **Rapid Communications** 1 **Editors' Suggestion** 3 **Open Access**

Citations

total ~ 1600, h-index = 21 (Source: [NASA ADS](#));

total ~ 2000, h-index = 23 (Source: [Google Scholar](#)).

Publications (at Indiana University; group members underlined)

28. S. Aich, **B. Seradjeh**, *Real-space multifold degeneracy in graphene irradiated by twisted light*, Under review in Physical Review Letters, preprint [arXiv:2311.04792](#).
27. R. Kumari, **B. Seradjeh**, A. Kundu, *Josephson-Current Signatures of Unpaired Floquet Majorana Bound States*, Submitted to Physical Review Letters, preprint [arXiv:2301.07707](#).
26. A. Kumar, Y. Li, **B. Seradjeh**, *Enhancement of High Harmonic Generation in Bulk Floquet Systems*, Under review in SciPost Physics, preprint [arXiv:2207.02830](#).
25. A. Kostelecky, R. Lehnert, N. McGinnis, M. Schreck, **B. Seradjeh**, *Lorentz violation in Dirac and Weyl semimetals*, *Phys. Rev. Res.* **4**, 023106 (2022); [arXiv:2112.14293](#). Open Access
24. A. Eaton, Y. Li, H. A. Fertig, **B. Seradjeh**, *Renormalized magic angles in asymmetric twisted graphene multilayers*, *Phys. Rev. B* **106**, 045117 (2022); [arXiv:2202.12502](#).
23. Y. Li, A. Eaton, H. A. Fertig, **B. Seradjeh**, *Dirac Magic and Lifshitz Transitions in AA-Stacked Twisted Multilayer Graphene*, *Phys. Rev. Lett.* **128**, 026404 (2022); [arXiv:2107.10687](#). Letter
22. A. Kumar, G. Ortiz, P. Richerme, **B. Seradjeh**, *Floquet Gauge Pumps as Sensors for Spectral Degeneracies Protected by Symmetry or Topology*, *Phys. Rev. Lett.* **126**, 206602 (2021); [arXiv:2012.09677](#). Letter
21. Y. Li, H. A. Fertig, **B. Seradjeh**, *Floquet-engineered topological flat bands in irradiated twisted bilayer graphene*, *Phys. Rev. Res.* **2**, 043275 (2020); [arXiv:1910.04711](#). Open Access
20. D. Dahan, E. Grosfeld, **B. Seradjeh**, *Dynamically induced topology and quantum monodromies in a proximity quenched gapless wire*, *Phys. Rev. B* **102**, 125142 (2020); [arXiv:1908.06111](#).
19. A. Kumar, M. Rodriguez-Vega, T. Pereg-Barnea, **B. Seradjeh**, *Linear response theory and optical conductivity of Floquet topological insulators*, *Phys. Rev. B* **101**, 174314 (2020); [arXiv:1912.12753](#).
18. M. Rodriguez-Vega, A. Kumar, **B. Seradjeh**, *Higher-order Floquet topological phases with corner and bulk bound states*, *Phys. Rev. B* **100**, 085138 (2019); [arXiv:1811.04808](#). Editors' Suggestion
17. F. N. Ünal, **B. Seradjeh**, A. Eckardt, *How to Directly Measure Floquet Topological Invariants in Optical Lattices*, *Phys. Rev. Lett.* **122**, 253601 (2019); [arXiv:1812.04636](#). Letter
16. M. Rodriguez-Vega, M. Lentz, **B. Seradjeh**, *Floquet Perturbation Theory: Formalism and Application to the Low Frequency Limit*, *New J. Phys.* **20**, 093022 (2018); [arXiv:1805.01190](#). Open Access
15. M. Rodriguez-Vega, H. A. Fertig, **B. Seradjeh**, *Quantum noise detects Floquet topological phases*, *Phys. Rev. B* **98**, 041113(R) (2018); [arXiv:1803.10646](#). Rapid Communication
14. M. Rodriguez-Vega, **B. Seradjeh**, *Universal Fluctuations of Floquet Topological Invariants at Low Frequencies*, *Phys. Rev. Lett.* **121**, 036402 (2018); [arXiv:1706.05303](#). Letter
13. **B. Seradjeh**, M. Vennettilli, *Surface spectra of Weyl semimetals through self-adjoint extensions*, *Phys. Rev. B* **97**, 075132 (2018); [arXiv:1712.04355](#).
12. A. Rahmani, **B. Seradjeh**, M. Franz, *Optimal diabatic dynamics of Majorana-based quantum gates*, *Phys. Rev. B* **96**, 075158 (2017); [arXiv:1605.03611](#).
11. D. Dahan, M. T. Ahari, G. Ortiz, **B. Seradjeh**, E. Grosfeld, *Non-Abelian fermion parity interferometry of Majorana bound states in a Fermi sea*, *Phys. Rev. B* **95**, 201114(R) (2017); [arXiv:1609.04627](#). Rapid Communication

10. A. Kundu, H.A. Fertig, **B. Seradjeh**, *Floquet-Engineered Valleytronics in Dirac Systems*, *Phys. Rev. Lett.* **116**, 016802 (2016); arXiv:1505.03818. Letter
9. M. T. Ahari, G. Ortiz, **B. Seradjeh**, *On the role of self-adjointness in the continuum formulation of topological quantum phases*, *Am. J. Phys.* **84**, 858 (2016); arXiv:1508.02682.
8. D. Ariad, **B. Seradjeh**, E. Grosfeld, *On the effective theory of vortices in two-dimensional spinless chiral p -wave superfluid*, *Phys. Rev. B* **92**, 035136 (2015); arXiv:1407.2553.
7. A. Kundu, H.A. Fertig, **B. Seradjeh**, *Effective Theory of Floquet Topological Transitions*, *Phys. Rev. Lett.* **113**, 236803 (2014); arXiv:1406.1490. Letter
6. Y. Li, A. Kundu, F. Zhong, **B. Seradjeh**, *Tunable Floquet Majorana fermions in driven coupled quantum dots*, *Phys. Rev. B* **90**, 121401(R) (2014); arXiv:1402.7353. Rapid Communication
5. W. K. Zhu, M. Wang, **B. Seradjeh**, F. Yang, S. X. Zhang, *Enhanced weak ferromagnetism and conductivity in hole-doped pyrochlore iridate $Y_2Ir_2O_7$* , *Phys. Rev. B* **90**, 054419 (2014); arXiv:1501.00615.
4. C.-K. Lu, **B. Seradjeh**, *Zero modes of the generalized fermion-vortex system in magnetic field*, *Phys. Rev. B* **89**, 245448 (2014); arXiv:1403.8092.
3. A. Kundu, **B. Seradjeh**, *Transport Signatures of Floquet Majorana Fermions in Driven Topological Superconductors*, *Phys. Rev. Lett.* **111**, 136402 (2013); arXiv:1301.4433. Letter
2. **B. Seradjeh**, *Majorana edge modes of topological exciton condensate with superconductors*, *Phys. Rev. B* **86**, 121101(R) (2012); arXiv:arXiv:1203.6628. Rapid Communication
1. **B. Seradjeh**, *Topological exciton condensate of imbalanced electrons and holes*, *Physics Review B* **85**, 235146 (2012); arXiv:1202.6240.

Publications (post-doctoral)

12. **B. Seradjeh**, E. Grosfeld, *Unpaired Majorana fermions in a layered topological superconductor*, *Phys. Rev. B* **83**, 174521 (2011); arXiv:1102.0360.
11. E. Grosfeld, **B. Seradjeh**, S. Vishveshwara, *Proposed Aharonov-Casher interference measurement of non-Abelian vortices in chiral p -wave superconductors*, *Phys. Rev. B* **83**, 104513 (2011); arXiv:1004.2295.
10. **B. Seradjeh**, J. Wu, P. Phillips, *Reply to Comment on "Signatures of Surface States in Bismuth at High Magnetic Fields,"* *Phys. Rev. Lett.* **104**, 059706 (2010); arXiv:0910.2734. Letter
9. **B. Seradjeh**, J. Wu, P. Phillips, *Signatures of Surface States in Bismuth at High Magnetic Fields*, *Phys. Rev. Lett.* **103**, 136803 (2009); arXiv:0905.0689. Letter
8. **B. Seradjeh**, J. Moore, M. Franz, *Exciton Condensation and Fractionalization in a Topological Insulator Film*, *Phys. Rev. Lett.* **103**, 066402 (2009); arXiv:0902.1147. Letter
7. G. Rosenberg, **B. Seradjeh**, C. Weeks, M. Franz, *Creation and manipulation of anyons in a layered superconductor-2DEG system*, *Phys. Rev. B* **79**, 205102 (2009); arXiv:0812.3140.
6. **B. Seradjeh**, H. Weber, M. Franz, *Vortices, Zero Modes and Fractionalization in Bilayer-Graphene Exciton Condensate*, *Phys. Rev. Lett.* **101**, 246404 (2008); arXiv:0806.0849. Letter
5. **B. Seradjeh**, M. Franz, *Fractional Statistics of Topological Defects in Graphene and Related Structures*, *Phys. Rev. Lett.* **101**, 146401 (2008); arXiv:0709.4258. Letter
4. **B. Seradjeh**, *Midgap spectrum of the fermion-vortex system*, *Nature Phys.* **805**, 182 (2008); arXiv:0807.0618.

3. **B. Seradjeh**, C. Weeks, M. Franz, *Fractionalization in a square-lattice model with time-reversal symmetry*, *Phys. Rev. B* **77**, 033104 (2008); [arXiv:0706.1559](#).
2. C. Weeks, G. Rosenberg, **B. Seradjeh**, M. Franz, *Anyons in a weakly interacting system*, *Nature Phys.* **3**, 796 (2007); [arXiv:cond-mat/0703001](#).
1. **B. Seradjeh**, I. Herbut, *Excitons in QED₃ and spin response in a phase-fluctuating d-wave superconductor*, *Phys. Rev. B* **76**, 024503 (2007); [arXiv:cond-mat/0701724](#).

Publications (pre-doctoral)

5. M. Case, **B. Seradjeh**, I. Herbut, *Self-consistent theory of compact QED₃ with relativistic fermions*, *Nature Phys.* **676**, 672-686 (2004); [arXiv:cond-mat/0308260](#).
4. I. Herbut, **B. Seradjeh**, S. Sachdev, G. Murthy, *Absence of U(1) spin liquids in two dimensions*, *Phys. Rev. B* **68**, 195110 (2003); [arXiv:cond-mat/0306537](#).
3. I. Herbut, **B. Seradjeh**, *Permanent Confinement in Compact QED₃ with Fermionic Matter*, *Phys. Rev. Lett.* **91**, 171601 (2003); [arXiv:cond-mat/0305296](#). **Letter**
2. **B. Seradjeh**, I. Herbut, *Fine structure of chiral symmetry breaking in the QED₃ theory of underdoped high-T_c superconductors*, *Phys. Rev. B* **66**, 184507 (2002); [arXiv:cond-mat/0207221](#).
1. V. Karimipour, **B. Seradjeh**, *A new class of models for surface relaxation with exact mean-field solution*, *Europhys. Lett.* **57**, 658-664 (2002); [arXiv:cond-mat/0104196](#).

Selected Invited Talks

Tuning topology by twists and light in flatland

OCT 2022 ICMT Seminar, University of Illinois, Urbana-Champaign, IL.

Lorentz violation in Dirac and Weyl semimetals

MAY 2022 IUCSS 9th meeting on CPT and Lorentz Symmetry, Bloomington, IN (virtual).

Quantum playdough: Nonequilibrium dynamics and topology in synthetic quantum matter

SEP 2021 Colloquium, Indiana University, Bloomington, IN.

SME and CMP: Perspective and recent Results

MAY 2021 IUCSS SME 2021 Summer School, Bloomington, IN (virtual)

Engineering topological phases of synthetic quantum matter

JUL 2021 IASBS 26th Physics School, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran (virtual).

Floquet-engineered topological phases and probes of quantum matter

APR 2021 Seminar, Ben-Gurion University, Beer Sheva, Israel (virtual).

APR 2021 QuSpin Seminar, Norwegian University of Science and Technology, Trondheim, Norway (virtual).

OCT 2020 Colloquium, Lehigh University, Lehigh, PA (virtual).

Lorentz violation and Weyl semimetals

NOV 2020 IUCSS SME 2020, Bloomington, IN (virtual).

Higher-order Floquet topological phases with corner and bulk bound states

JUL 2019 Aspen Center for Physics.

JUN 2019 MPI-PKS Workshop on Engineering Nonequilibrium Dynamics of Open Quantum System.

FEB 2019 SBQMI Workshop on Synthetic Topological Matter, University of British Columbia, BC.

Floquet topology: fast, slow, and across

SEP 2018 CMP Seminar, Michigan State University, Lansing, MI.

Topology and adiabatic limit in slowly driven quantum systems

MAR 2018 IoP Topical Research Meeting on Topological States in Strongly Interacting Light-Matter Systems.

Universal Fluctuations of Floquet topological invariants at low frequencies

FEB 2018 CMT Seminar, Weizmann Institute, Rehovot, Israel.

JAN 2018 CMT Seminar, INSPIRE, Johannes Gutenberg University, Mainz, Germany.
 JAN 2018 LCN Seminar, University College London, UK.
 JUL 2017 Aspen Center for Physics.

Teaching and Other Experience

2011–Now **Assistant and Associate Professor**, Indiana University – Bloomington
 P615 Condensed Matter Physics I, Spring 2017
 P557 Introduction to Solid State Physics, Fall 2011
 P556 Statistical Physics, Spring 2019, Spring 2020, Spring 2021
 P454 Modern Physics (Quantum Mechanics II), Fall 2022
 P453 Introduction to Quantum Mechanics, Spring 2016, Spring 2015, Spring 2022, Spring 2023
 P442 Analytical Mechanics II, Spring 2014, Spring 2013
 P441 Analytical Mechanics I, Fall 2013, Fall 2012
 P222 Physics II, Fall 2016, Fall 2015, Fall 2014, Fall 2021
 P120 Energy & Technology, Fall 2018, Fall 2019, Fall 2020

2000–2006 **Teaching Assistant**, Simon Fraser University
 2001–2003 **Physics Subject Editor**, Continuing Studies, Simon Fraser University
 1999–2000 **Physics Teacher**, National Organization for Development of Exceptional Talents, Tehran, Iran
 1999–2003 **Subject Editor**, Encyclopedia for Young People, Children’s Book Council, Tehran, Iran
 1998–2000 **Teaching Assistant**, Sharif University of Technology

Advisory Experience

Postdoctoral fellows:

Yantao Li (2019–2022), now Postdoctoral fellow at Kent State University;
 Daniel Ariad (2019–2020), now Postdoctoral Fellow at Johns Hopkins University;
 Martin Rodriguez-Vega (2016–2018), now Associate Editor at Physical Review Letters;
 Chi-Ken Lu (2012–2014), now Research Associate at Rutgers University;
 Arijit Kundu (2012–2015), now Associate Professor at IIT-Kanpur.

Graduate Students:

Nicolas Lam (PhD, 2021–Now);
 Suman Aich (PhD, 2020–Now);
 Abhishek Kumar (PhD, 2016–2022), now Postdoctoral Fellow at Virginia Tech;
 Mostafa Tanhayi Ahari (PhD, 2013–2015), now Postdoctoral Fellow at UIUC;
 Yantao Li (PhD visiting student from Sun-Yat Sen University, 2013–2015).

Undergraduate Students:

Zachary Anderson (REU 2022),
 Brian Gould (REU 2021),
 Willow Beemsterboer (Center of Excellence for Women & Technology REU 2020–2021),
 Colleen Klein (Center of Excellence for Women & Technology REU 2019–2020),
 Caitlin Patterson (REU 2019),
 Meghan Lentz (REU 2017),
 Michael Vennettilli (REU 2015),
 Marvin Jones (STEM Summer Scholar 2013 and 2014),
 Orsola C. Searle (REU 2014).
 Jordan Venderley (REU 2013).

Service

Professional:

Editorial College Fellow, [SciPost Physics](#) (2021–Now).
Organizer, [VSF Floquet Summer School](#) 2022.
Founding Member, [Virtual Science Forum](#) (2019–Now).
Organizer, VSF Long Range Colloquium series (2020 and 2021).
Organizer, [Observing Anyons 2020](#) mini-conference.
Editorial Board Member, [Journal of Physics: Condensed Matter](#) (2016–2022).

Referee: Science; Nature; Physical Review Letters; Physical Review B; Physical Review E; Nuclear Physics B; Journal of Physics: Condensed Matter; and European Physical Journal.

Reviewer, National Science Foundation; Fonds de Recherche du Québec.

Chair, Gordon Research Seminar for Gordon Research Conference – Correlated Electron Systems, 2012.

Departmental (Indiana University, Bloomington):

Chair, Colloquium Committee (2020-2023).

Member, Executive Committee (2020-2023).

Member, various committees, notably Graduate Admissions, Outreach, and Diversity (2011-Now)

Faculty Member, IU Physics APS Bridge Program.

Faculty Advisor, IU Physics Club (2012-2018).

Founder and Faculty Advisor, IU Physics Undergraduate Seminar and Journal Club (2012-2018).

Campus-wide (Indiana University, Bloomington):

Member, College of Arts and Sciences Tenure Committee (2022-Now).

Faculty Member, College of Arts and Sciences Academic Fairness Committee (2020-2021).

Member, Outstanding Junior Faculty Award Selection Committee, OVPR and VPFAA (2019).

Expert Panelist, NSF CAREER Award workshop, OVPR (2018).

Languages

English (fluent), Persian (native), French (intermediate), German (intermediate), Italian (beginner), Spanish (beginner), Arabic (working understanding).