Pathak Shubham Parashar

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Research Themes

- Hydrodynamics & Turbulence — DNS of 2+1D advection; RG scaling laws.
- Correlated Electrons & Transport — Marginal FL in 2D; symplectic Sp(2N) Hertz–Millis; non-associative operators.
- Non-Hermitian & Lattice Theory — Extensions of Nielsen–Ninomiya constraints.
- Topological Phases — Quantum double models in 3+1D.
- Gravitation & HEP — Black-hole inspirals (D>5); CPV in SUSY Pati–Salam / SO(10).

Publications — in preparation

- Hydrodynamic and diffusive magneto-transport near a density perturbation in a two-dimensional electron gas — Parashar, Fogler (2025).
- Imaging diffusive-to-ballistic crossover of magnetotransport in graphene — Krebs et al., incl. Parashar (2025).
- Thermodynamics of the spin-splitting transition in quantum Hall effect — Parashar, Arovas, Fogler (2025).
- Symplectic ferromagnetism and phase transitions in multi-component fermionic systems — Cai, Parashar, Wu (2025).

Education & Appointments

- Ph.D., Physics — UC San Diego (2022–2025), Advisor: Michael M. Fogler
- Researcher — UC San Diego (2017–2022), Advisors: Benjamin Grinstein, Congjun Wu
- M.S., Physics — IISc Bangalore (2016–2017), Advisor: Rahul Pandit
- B.S., Physics — IISc Bangalore (2012–2016), Advisor: Rahul Pandit

Experience

- Research Intern — JAIST, Ishikawa, Japan (2015–2016); Supervisor: Ryo Maezono; MEXT Research Fellowship; Quantum Monte Carlo for correlated electrons.

Selected Graduate Coursework

- PHYS 230 (A+), PHYS 211B (A), PHYS 239 (Phases, A), PHYS 239 (Optics, A)
- PHYS 215A/215B (QFT I & II, A/A+), PHYS 217 (Field Theory/RG, A)
- PHYS 220 (Group Theory, A), PHYS 201 (Mathematical Physics, A+)

Teaching & Instruction

- PHYS 500 — Introduction to Physics Teaching (UC San Diego), Grade: S (Fall 2017).
- Subject areas: condensed matter & transport; quantum mechanics; quantum field theory; field theory/RG; group theory; mathematical physics.

Awards & Grants

- MEXT Research Fellowship (Japan) — 2015–2016

- Bhadra Fellowship — 2025
- NSF Grant — 2018–2020
- UCSD Scholar's grant — 2017

Talks

- Spin-split collapse in higher Landau levels — UC San Diego, 2023
- Vorticity patterns — Columbia University (NY), 2022
- Magneto-transport across local inhomogeneities — APS March Meeting, 2020
- Non-associative operators inspired from string theory — APS March Meeting, 2019
- Quantum double models in icosahedral structures — UC Irvine, 2018