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 2DEG — 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; QMC for

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; matl

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