



JOINT MARCH MEETING AND APRIL MEETING

Global Physics Summit

March 16–21, 2025, Anaheim, CA and virtual

March

Fractional Quantum Hall Effect I

11:30 am – 2:30 pm, Thursday March 20 // Session MAR-S21 //

Anaheim Convention Center, 254A (Level 2)



Chair: Ramon Guerrero-Suarez, Purdue University

Topics: [Condensed Matter](#); [Fractional Quantum Hall Effect](#); [Topological Materials](#); [Quantum Hall Effect](#); [Networks](#); [Measurements](#); [Composites](#); [Localization](#); [Insulators](#); [Instabilities](#); [Excitonics](#); [Liquids](#)

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1:30 pm – 1:42 pm

Identifying the topological order of quantized half-filled Landau levels through their daughter states

Presenter: Evgenii Zheltonozhskii (Technion - Israel Institute of Technology)

Authors: Evgenii Zheltonozhskii (Technion - Israel Institute of Technology), Ady Stern (Weizmann Institute of Science), Netanel Lindner (Technion - Israel Institute of Technology)

Fractional quantum Hall states at a half-filled Landau level are believed to carry an integer number C of chiral Majorana edge modes, reflected in their thermal Hall conductivity. We show that this number determines the primary series of Abelian fractional quantum Hall states that emerge above and below the half-filling point. On a particular side of half-filling, each series may originate from two consecutive

values of C , but the combination of the series above and below half-filling uniquely identifies C . We analyze these states both by a hierarchy approach and by a composite fermion approach. In the latter, we map electrons near a half-filled Landau level to composite fermions at a weak magnetic field and show that a bosonic integer quantum Hall state is formed by pairs of composite fermions and plays a crucial role in the state's Hall conductivity.

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11:30 am – 11:42 am

Quaternion representation of FQHE wave functions: Search for instability near half-filling

Mytraya Gattu, Jainendra Jain

11:42 am – 11:54 am

Neural Network-Based Variational Wavefunctions for the Fractional Quantum Hall Effect

nezhat pournaghavi, Bishoy Kousa, Allan MacDonald

11:54 am – 12:06 pm

Capacitive measurements of chemical potential in the fractional quantum Hall regime

Matthew Mann, Kinga Lasek, Geoffrey Gardner, Joshua Folk, Michael Manfra

12:06 pm – 12:18 pm

Topological Protection at $\nu=9/11$: A hallmark of flux-six composite fermions

Waseem Hussain, Haoyun Huang, Sean Myers, Loren Pfeiffer, Kenneth West, Kirk Baldwin, Gabor Csathy

12:18 pm – 12:30 pm

Edge states of fractonic systems

Bhandaru Parasar, Yuval Gefen, Vijay Shenoy

12:30 pm – 12:42 pm

Exploring the daughter states of the $1/2$ fractional quantum Hall state in GaAs two-dimensional hole systems

Chia-Tse Tai, Siddharth Kumar Singh, Chengyu Wang, Casey Calhoun, Pranav Thekke Madathil, Adbhut Gupta, Kirk Baldwin, Loren Pfeiffer, Mansour Shayegan

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