Fractional Quantum Hall Effect Based On Field Theoretical Approach

#Fractional Quantum Hall Effect #Field Theoretical Approach #Topological Quantum States #Condensed Matter Theory #Anyonic Excitations

Delve into the intricate world of the Fractional Quantum Hall Effect, explored through the powerful lens of a field theoretical approach. This framework provides deep insights into the emergence of exotic topological phases, non-abelian anyonic excitations, and the robust quantization observed in these fascinating condensed matter systems, offering a fundamental understanding beyond conventional perturbation methods.

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FRACTIONAL QUANTUM HALL STATES - THEORETICAL CONSIDERATIONS AND THE LAUGHLIN WAVE FUNCTION - FRACTIONAL QUANTUM HALL STATES - THEORETICAL CONSIDERATIONS AND THE LAUGHLIN WAVE FUNCTION by Topological quantum matter - Weizmann online 893 views 1 year ago 27 minutes - So today we would like to look at **theoretical approaches**, to understand the **fractional quantum hall effect**, this problem is simple to ...
Integer and fractional quantum Hall effects: An Introduction - Integer and fractional quantum Hall effects: An Introduction by TAUVOD 72,036 views 9 years ago 53 minutes - Speaker: Matthew A. Grayson (EECS, NU) "The workshop on Semiconductors, Electronic Materials, Thin Films and Photonic ...
The Straightest Line EVER Measured?! | Quantum Hall Effect Explained - The Straightest Line EVER Measured?! | Quantum Hall Effect Explained by Parth G 36,096 views 4 years ago 19 minutes - Can you find a line that's straighter than this one? Hey guys, I'm back with another video! This one's a long one, and in this video I ...
Named after Edwin Hall The HALL
QUANTUM MECHANICS!!!
QUANTUM- The HALL
INTRODUCTION TO THE QUANTUM HALL EFFECT - INTRODUCTION TO THE QUANTUM HALL EFFECT by Topological quantum matter - Weizmann online 7,231 views 2 years ago 19 minutes - I'm going to introduce you to the **quantum hall effect**, before doing that i'd like to make a personal comment to me the **quantum hall**, ...
Quantum Hall Effect - Landau levels - Quantum Hall Effect - Landau levels by Artem Mishchenko

7,707 views 3 years ago 13 minutes, 46 seconds - To observe **quantum hall effect**, we would need two ingredients you would need to have a two-dimensional electron gas and you ...
FRACTIONAL QUANTUM HALL STATES - FLUX ATTACHMENT AND COMPOSITE FERMION THEORY - FRACTIONAL QUANTUM HALL STATES - FLUX ATTACHMENT AND COMPOSITE FERMION THEORY by Topological quantum matter - Weizmann online 656 views 2 years ago 34 minutes - ... composite fermion **theory**, within the mean **field**, approximation allows us to calculate quantities of **fractional quantum hall**, states ...
(Fractional) Quantum Hall Effect - (Fractional) Quantum Hall Effect by Seth Musser 739 views 3 years ago 1 hour, 22 minutes - Find more info about this talk here: https://swmusser.com/jc101/qhe/
Introduction to integer quantum Hall effect by Ganpathy Murthy - Introduction to integer quantum Hall effect by Ganpathy Murthy by International Centre for Theoretical Sciences 24,975 views 4 years ago 1 hour - DISCUSSION MEETING : EDGE DYNAMICS IN TOPOLOGICAL PHASES ORGANIZERS : Subhro Bhattacharjee, Yuval Gefen, ...
Quantum Field Theory visualized - Quantum Field Theory visualized by ScienceClic English 1,901,859 views 3 years ago 15 minutes - How to reconcile relativity with **quantum**, mechanics ? What is spin ? Where does the electric charge come from ? All these ...
Introduction
Field and spin
Conserved quantities
Quantum field
Standard model
Interactions
Conclusion
Hall Effect - Hall Effect by Physics by Alexander FufaeV 46,851 views 2 years ago 5 minutes, 17 seconds - https://www.youtube.com/watch?v=1OZCWetFCps&list=PLTjLwQcqQzNKzSAxJxKpmO-tAriFS5wWy4 00:00 **Hall effect**,: ...
Hall effect: Explanation
Derivation of the Hall voltage / coefficient
The Quantum Experiment that Broke Reality | Space Time | PBS Digital Studios - The Quantum Experiment that Broke Reality | Space Time | PBS Digital Studios by PBS Space Time 6,816,406 views 7 years ago 13 minutes, 32 seconds - The double slit experiment radically changed the way we understand reality. Find out what the ramifications of this experiment ...
Introduction
Interference
Photons
Interference Pattern
Double Slit
Copenhagen Interpretation
Sponsor
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20.08 Quantum Field Theory - a quantum field permeates all of space and time. - 20.08 Quantum Field Theory - a quantum field permeates all of space and time. by Steven Elias 9,006 views 2 weeks ago 2 minutes, 45 seconds - In the words of the Gita, an ancient Hindu text, all actions take place in time by the interweaving of the forces of nature. A **quantum**, ...
20.4b Hall Effect and Hall Voltage | A2 Magnetic Fields | CAIE A Level 9702 Physics - 20.4b Hall Effect and Hall Voltage | A2 Magnetic Fields | CAIE A Level 9702 Physics by ETphysics 17,722 views 3 years ago 29 minutes - What is the **Hall effect**, and how can we use it in a probe to measure B? 00:00 Types of semiconductors 02:20 Setup 10:26 ...
Types of semiconductors
Setup
Explanation of Hall Effect
Deriving Hall Voltage Equation
Steven Girvin - Quantum Hall Effect - Steven Girvin - Quantum Hall Effect by Institute for Quantum Computing 130,250 views 11 years ago 7 minutes, 24 seconds - Find out more about IQC! Website - https://uwaterloo.ca/institute-for-**quantum**,-computing/ Facebook ...
The Classical Hall Effect
The Lorentz Force
The Quantum Hall Effect
Quantized Hall Resistance

Topological Quantum Computer
Topological Quantum Computation: A Possible Road To Reality - Topological Quantum Computation: A Possible Road To Reality by Quantum Information Society 7,190 views 3 years ago 1 hour, 20 minutes - Speaker: Prof. Jason Alicea, Caltech **Quantum**, Information Society, University of Oxford Facebook: ...
Basic Problem in Condensed Matter
Exchange statistics
Particle classes
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Penrose Tiling
square grid
triangular grid
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Introduction
Hall effect
Hall effect situation
Hall effect in speedometers
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Anomalous Hall Effect
Quantum Mechanics
QUANTUM HALL EFFECT - THE EDGE - QUANTUM HALL EFFECT - THE EDGE by Topological quantum matter - Weizmann online 1,419 views 2 years ago 25 minutes - So today we are going to look at the physics of a **quantum hall**, edge whether integer or **fractional**, we already know that whenever ...
FRACTIONAL QUANTUM HALL STATES - COUPLED WIRE CONSTRUCTIONS - FRACTIONAL QUANTUM HALL STATES - COUPLED WIRE CONSTRUCTIONS by Topological quantum matter - Weizmann online 416 views 2 years ago 17 minutes - So today we are continuing our journey through different **approaches**, for **theoretically**, analyzing the fraction **quantum hall effect**, we ...
Dam T. Son: Fractional quantum Hall effect, field-theoretic dualities, and a new state of matter - Dam T. Son: Fractional quantum Hall effect, field-theoretic dualities, and a new state of matter by Brown University Department of Physics 2,345 views 5 years ago 1 hour, 1 minute - Dam T. Son, University of Chicago April 30, 2018 Brown Physics Colloquium.
1879: Classical Hall effect Edwin Hall
1980: Integer Quantum Hall effect
Explanation of IQHE
Fractional QHE
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Energy scales
A nonperturbative problem
Nevertheless, some systematics
The mystery of a missing symmetry
Particle-hole symmetry
PH symmetry of a Fermi liquid?
PH asymmetry in the CF theory CF representation of PH conjugate pairs of FQH states
Graphene: example of Dirac fermion in condensed matter
Berry phase
IQHE in graphene
Particle-hole conjugation
Fermionic particle-vortex duality
Predictions of Dirac CF theory
PH-Pfaffian state
What is the nu=5/2 state

Thermal Hall conductivity
Conclusions
Seed duality
Fractional quantum Hall effect intro (by Sankar Das Sarma) - Fractional quantum Hall effect intro (by Sankar Das Sarma) by Course on topology in condensed matter 7,791 views 8 years ago 6 minutes, 4 seconds - Full lecture contents available at ...
Introduction
What does fractional quantization mean
What did we expect
What happened
Fractional excitations
Ken K. W. Ma | The Fractional Quantum Hall Effect at ½=5/2: Past, Recent, and Future - Ken K. W. Ma | The Fractional Quantum Hall Effect at ½=5/2: Past, Recent, and Future by Harvard CMSA 423 views 3 months ago 1 hour, 40 minutes - Topological **Quantum**, Matter Seminar 12/4/2023 Speaker: Ken K. W. Ma (Northeastern University) Title: The **Fractional Quantum**, ...
Juven Wang-Effective Field Theory of Fractional Quantum Hall near ½= 5/2 @Harvard&Weizmann 7/08/2020 - Juven Wang-Effective Field Theory of Fractional Quantum Hall near ½= 5/2 @Harvard&Weizmann 7/08/2020 by Juven Wang 332 views 3 years ago 1 hour, 41 minutes - 7/8/2020@ Harvard University and Weizmann Institute of Science Juven Wang (Harvard CMSA) "Parent" Effective **Field Theory**, for ...
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Second Order Phase Transition
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Intermediate Plateau
Global Symmetry for Eft
Phase Diagram by Deformations
Meaning of Spontaneous Symmetry Breaking
Portion Phase Diagram
Tension Calculation
Three-dimensional Massive Gravity and the Fractional Quantum Hall Effect - Three-dimensional Massive Gravity and the Fractional Quantum Hall Effect by Dublin Institute for Advanced Studies DIAS 60 views 3 weeks ago 1 hour, 12 minutes - ... observed in the **Fractional Quantum Hall effect**, with the Fierz-Pauli description of massive spin-2 modes in quantum **field theory**,.
TMS19 Steve Simon: Intro to integer and fractional QHE (I) - TMS19 Steve Simon: Intro to integer and fractional QHE (I) by Topological Matter School 7,913 views 4 years ago 1 hour, 2 minutes - First lecture given by Steve Simon at TMS19.
Introduction
Lorentz Force
Twodimensional electron systems
Twodimensional electrons
Exercise
Bond cleansing constant
H E squared
Plateau width
Electronic magnetic field
Harmonic oscillator
Simplified QHE
Thermal QHE
Number of excitations
Partition of integers
Buyers Yang Theorem
Fractional Quantum Hall Effect - Fractional Quantum Hall Effect by Journal Club 101 100 views 3 years ago 1 hour, 22 minutes - Uh be uh this is my outline so um i'll be talking about uh some basic stuffs of rational **quantum hall**, and an effective **field theory**, ...
Dam Tan Son: Effective field theory of the fractional quantum Hall effect - Dam Tan Son: Effective field theory of the fractional quantum Hall effect by Galileo Galilei Institute (GGI) 245 views 2 years ago 1 hour, 57 minutes - Plan **Fractional Quantum Hall effect**, • Lowest Landau Level limet • Volume preserving doff Effective **field theory**, Noncommutative ...
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Quantum Phases of Matter: 29. Fractional quantum Hall effect by Subir Sachdev 703 views Streamed 3 years ago 1 hour, 3 minutes - Please see https://canvas.harvard.edu/courses/76589/pages for links to Zoom recordings of discussions and sections, and ...
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