Can quantum anomalous Hall effect reduce energy loss?The quantum anomalous Hall effect (QAHE) demonstrates the potential for achieving quantized Hall resistance without the need for an external magnetic field, making it highly promising for reducing energy loss in electronic devices. What is quantum anomalous Hall effect?The quantum anomalous Hall effect is defined as a quantized Hall effect realized in a system without external magnetic field. Quantum anomalous Hall effect is a novel manifestation of topological structure in many-electron systems, and may have potential applications in future electronic devices. Does quantum Hall effect require an external magnetic field?The traditional quantum Hall effect (QHE) relies on the application of an external magnetic field, characterized by the quantization of Landau levels. 1 In contrast, the quantum anomalous Hall effect (QAHE) does not require an external magnetic field. Is there a quantum anomalous Hall effect in a magnetic topological insulator?Chang, C.-Z. et al. Experimental observation of the quantum anomalous Hall effect in a magnetic topological insulator. Science 340, 167-170 () Correspondence to Yoshinori Tokura. The author declares no competing interests. Tokura, Y. 10 years of the quantum anomalous Hall effect. What is the anomalous Hall effect?Hall later reported an unusual and stronger response in ferromagnets with qualitatively different field dependence. 15 It hence came to be known as the anomalous Hall (AH) effect, correlated with the spontaneous magnetization M. Can a material without external magnetic field have quantized Hall conductance?By making use of spin-orbit coupling and magnetism, a material without external magnetic field can have quantized Hall conductance, as a consequence of the Berry's phase gauge field in momen-tum space. This effect has been predicted and experimentally verified in magnetically doped topological insulators. Quantum anomalous Hall effect Theory | NISTQuantum anomalous Hall materials exhibit a well-quantized Hall resistance at low temperatures. To increase the operating temperature for these materials, it's necessary to Prediction of High Chern Number Quantum Anomalous Hall 2 ???&#; The design of quantum anomalous Hall (QAH) materials with high working temperature and high Chern numbers has garnered significant attention due to their potential in spintronics Colloquium: Quantum anomalous Hall effect | Rev this Colloquium, the physical mechanisms responsible for each class of QAH insulator are reviewed, with both differences and commonalities highlighted, and potential applications of the QAH effect are The quantum anomalous Hall effect in two The quantum anomalous Hall effect (QAHE) demonstrates the potential for achieving quantized Hall resistance without the need for an external magnetic field, making it highly promising for reducing energy loss in electronic devices. Brief discussion on quantum anomaly Hall effect: From theory to This work endeavors to conduct a comprehensive examination and evaluation of the theory and practical implementation of the quantum Anomaly Hall effect by the analysis The quantum anomalous Hall effectIn recent years, quantum anomalous Hall effect has been proposed theoretically and realized experimentally. In this review article, we provide a systematic overview of the theoretical and Progress and prospects in the quantum anomalous The quantum anomalous Hall effect is of topological nature and well suited for field-free resistance metrology and low-

power information processing utilizing dissipationless chiral edge transport. 10 years of the quantum anomalous Hall effect This marked the start of a race in experimental research to confirm the QAHE in magnetic topological insulators. Initial results showed a large anomalous Hall effect, but quantization was Visualizing the breakdown of the quantum anomalous Hall effectIn this work, we use magnetic imaging combined with global electrical transport measurements to visualize the current-induced breakdown of the quantum anomalous Hall Tunable Quantum Anomalous Hall Effect via Crystal The quantum anomalous Hall (QAH) effect provides dissipationless channels for spin transport, which is highly expected for low-power quantum computation. Spin-splitting bands are vital for the QAH effect in Twisted Graphene/CrI Heterostructures Exhibit Tunable They then developed a low-energy model accurately describing the behaviour of electrons in this combined structure, confirming its classification as a Chern insulator exhibiting quantized Experimental Observation of the Quantum Anomalous The quantized version of the anomalous Hall effect has been predicted to occur in magnetic topological insulators, but the experimental realization has been challenging. Here, we report the observation of the Colloquium: Quantum anomalous Hall effect | Rev.The quantum Hall effect, discovered by von Klitzing more than 40 years ago, requires strong magnetic fields for its realization. More recently it was found that the effect can also be realized in zero magnetic field as a result Progress and prospects in magnetic topological materialsHere we review the theoretical and experimental progress achieved in the field of magnetic topological materials, beginning with the theoretical prediction of the quantum Quantum anomalous Hall states in Li/Na-doped kagome VThe quantum anomalous Hall (QAH) insulators have great potential in low-energy electronic devices due to their dissipationless conducting channels. By Visualizing the breakdown of the quantum anomalous Hall effectThe creation of topologically non-trivial matter across electronic, mechanical, cold-atom, and photonic platforms is advancing rapidly, yet understanding the breakdown of Towards the quantized anomalous Hall effect in The Motivation Behind This Research The quantum anomalous Hall (QAH) effect has been a significant research frontier in condensed matter physics over the past decade, with profound scientific implications for exploring Giant enhancement of perpendicular magnetic anisotropy and induced At the same time, we find that the $ {\mathrm {NiI}}_ {2}$ substrate induces strong magnetic proximity effects on graphene and the quantum anomalous Hall effect (QAHE) New laser technique reveals nearly 20 previously hidden states of 2 ???&#; New laser technique reveals nearly 20 previously hidden states of matter Researchers have uncovered nearly 20 hidden quantum states in twisted molybdenum ditelluride, revealing CryoCiM: Cryogenic Compute-in-Memory based on the Quantum Anomalous Therefore, CiM provides extreme energy efficiency that can enable lower cooling cost at cryogenic temperature. In this work, we demonstrate CryoCiM, a cryogenic Prediction of High Chern Number Quantum Anomalous Hall Effect 2 ???&#; The design of quantum anomalous Hall (QAH) materials with high working temperature and high Chern numbers has garnered significant attention due to their potential in spintronics First-principles prediction of quantum anomalous

Hall effect in two The quantum anomalous Hall effect (QAHE) has special quantum properties that are ideal for possible future spintronic devices. However, the experimental realization is rather New laser technique reveals nearly 20 previously hidden states of 2 ???&#; New laser technique reveals nearly 20 previously hidden states of matter Researchers have uncovered nearly 20 hidden quantum states in twisted molybdenum ditelluride, revealing First-principles prediction of quantum anomalous Hall effect in two The quantum anomalous Hall effect (QAHE) has special quantum properties that are ideal for possible future spintronic devices. However, the experimental realization is rather Tailoring Robust Quantum Anomalous Hall Effect via Entropy The development of quantum materials and the tailoring of their functional properties is of fundamental interest in materials science. Here, a new design concept is Antiferromagnetic quantum anomalous Hall effect under spinA new device based on 7-septuple-layer MnBi2Te4 covered with an AlOx capping layer enables the investigation of antiferromagnetic quantum anomalous Hall effect An Introduction to the Quantum Hall EffectIn this paper, the Hall Efect, Integer Quantum Hall (IQH) Efect, and Fractional Quantum Hall (FQH) Efect are discussed. The Hall Efect is explained in terms of the Drude Model of metals Non-linear Hall effects: Mechanisms and materialsThe quantum anomalous Hall effect, on the other hand, involves the generation of a quantized Hall conductance without the need for an external magnetic field [9]. The Anomalous Quantum Hall Effect The Quantum Anomalous Hall E ect has been de nitively observed in thin lms of Cr-doped topological insulators, with broken time reversal symmetry. Local ferromagnetic order replaces The quantum anomalous Hall effect in two The quantum anomalous Hall effect (QAHE) demonstrates the potential for achieving quantized Hall resistance without the need for an external magnetic field, making it highly promising for reducing energy loss in electronic devices. Visualizing the breakdown of the quantum anomalous Hall effectThe quantum anomalous Hall (QAH) effect refers to QH effects that occur in the absence of external magnetic fields due to spontaneously broken time-reversal symmetry. Progress and prospects in the quantum anomalous Hall effectThe quantum anomalous Hall effect refers to the quantization of the Hall effect in the absence of an applied magnetic field. The quantum anomalous Hall effect is of topological Quantum Anomalous Hall Effect | SpringerLinkMoreover, his theoretical insights played a crucial role in the discovery of quantum anomalous Hall effect (QAHE) by the joint team led by Professor Qikun Xue in the The quantum anomalous Hall effect in two The quantum anomalous Hall effect (QAHE) demonstrates the potential for achieving quantized Hall resistance without the need for an external magnetic field, making it highly promising for reducing energy loss in electronic devices. Visualizing the breakdown of the quantum anomalous The quantum anomalous Hall (QAH) effect refers to QH effects that occur in the absence of external magnetic fields due to spontaneously broken time-reversal symmetry. Progress and prospects in the quantum anomalous The quantum anomalous Hall effect refers to the quantization of the Hall effect in the absence of an applied magnetic field. The quantum anomalous Hall effect is of topological nature and well suited for field-free

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