亮点报道：聚焦低维钙钛矿：引领新一代存储技术

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忆阻器将存储与计算功能集成于单一单元，有望实现低功耗和高速存储，并能同时执行存储与逻辑运算。在神经形态计算领域中，忆阻器展现出其独特的吸引力。

德国慕尼黑工业大学 Peter Müller-Buschbaum 教授团队对低维钙钛矿忆阻器这一前沿领域的最新进展进行了系统性综述。将该领域的先进材料与新型存储器件紧密结合。钙钛矿以其独特的材料化学性质、优异的光电性能及低成本制造优势著称，在各类光电器件中展现出巨大应用潜力。基于在太阳能电池、发光二极管等领域对钙钛矿物理化学性质的深入认知，研究人员正将其拓展至存储技术领域。尤其是低维钙钛矿为在分子层面设计具有新颖特性与功能的材料提供了广阔平台，使其在忆阻器应用中前景广阔。

该综述为该研究领域提供了全面、前沿的概览，为研究人员提供了宝贵资源。文章深入阐释了低维钙钛矿材料的结构多样性、忆阻器的器件构型及其工作机制，并重点探讨了优化存储器件电学性能的工程策略。通过揭示低维钙钛矿存储器件领域的进展与挑战，该综述提供了关键见解，将对学术界产生积极影响，并为设计下一代智能、高效、自适应的电子系统提供重要支撑。

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Highlights: Emerging low-dimensional perovskite resistive switching memristors: from fundamentals to devices

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Memristors have distinct advantages of small size, fast processing speed, low energy consumption, by combining memory and computation within the same units. These features make them attractive for future electronics.

The research group of Prof. Dr. Peter Müller-Buschbaum at the Technical University of Munich reviews recent progress on low-dimensional perovskite memristors, a cutting-edge field that combines advanced materials with novel memory devices. Perovskite semiconductors are well known for their unique materials chemistry, remarkable electrical and optical properties, and low-cost manufacturing, showing intriguing application potential for various optoelectronic devices. Driven by the understanding of physical and chemical properties of perovskites in solar cells and light-emitting diodes, these materials are now being investigated in memory technologies.

By providing a comprehensive and up-to-date overview of the advances in this research field, the review serves as a valuable resource for both researchers and engineers. It explains the structural diversity of low-dimensional perovskite materials, the device geometry of memristors and the corresponding working mechanisms, highlighting engineering strategies that can improve the electrical parameters of memory devices.

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