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3D Magnetic Topological Structures for Information Storage

Tech ID: 28850 / UC Case 2016-975-0

ABSTRACT

Researchers at the University of California, Davis, have developed a new way to directly create 3-dimensional topological magnetic structures that allows for efficient information storage with potentially low energy dissipation.

FULL DESCRIPTION

Current exploration of spin textures with topological characters is largely limited to 2-dimensional nanostructures and bulk materials. Topological spin texture research has yet to take advantage of the topological character of 3-dimensional patterns, particularly at the micro- and nanoscale.

UC Davis researchers have discovered a new way to create 3-dimensional topological magnetic structures that can be used for information storage. Topological structures such as Möbius bands may be utilized for their unique spin configurations, which display interesting topological properties, like magnetic vortices and skyrmions. The method offers a procedure to set the magnetic state into the topological state, allowing 3D arrays of such topological structures to form a magnetic information storage device with low energy dissipation and high stability.

APPLICATIONS

- ▶ Efficient information storage
- ▶ Micro/nano-electronics

FEATURES/BENEFITS

- ▶ Low energy cost
- ▶ Extremely stable information storage device
- ▶ Magnetic topological structures may be created through a variety of methods, such as 3D printing

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,744,162	08/29/2023	2016-975
United States Of America	Issued Patent	11,145,805	10/12/2021	2016-975

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INVENTORS

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OTHER INFORMATION

KEYWORDS

topological structures, 3D manufacturing, spin configurations, magnetics, microstructures, nanostructures, information storage, electronics

CATEGORIZED AS

- ▶ **Communications**
 - ▶ Other
- ▶ **Energy**
 - ▶ Storage/Battery
- ▶ **Materials & Chemicals**
 - ▶ Nanomaterials
 - ▶ Storage
- ▶ **Nanotechnology**
 - ▶ Electronics
 - ▶ Materials

RELATED CASES

2016-975-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Synthesis Technique to Achieve High-Anisotropy FeNi](#)

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