# Article information:

Topological quantum materials for energy conversion and storage | Nature Reviews Physics  
<https://www.nature.com/articles/s42254-022-00477-9>

# Article summary:

1. Topological quantum materials (TQMs) have symmetry-protected band structures with useful electronic properties that can be applied to energy conversion and storage.

2. TQMs provide a stable electron bath with high electronic conductivity, carrier mobility, and long lifetime, making them ideal for understanding surface reactions and finding efficient materials for energy conversion and storage.

3. This article reviews recent progress in topological quantum catalysis, discussing open problems and potential applications of TQMs in water splitting, batteries, supercapacitors, and other prospects in energy conversion and storage.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Topological Quantum Materials for Energy Conversion and Storage” is an overview of the potential applications of topological quantum materials (TQMs) in energy conversion and storage technology. The article provides a comprehensive review of the current research on TQMs for water splitting, batteries, supercapacitors, thermoelectricity, hydrogenation, oxidation of biomass-derived alcohols, hydrogen storage and beyond. The authors present an overview of recent progress in topological quantum catalysis as well as open problems related to the use of TQMs in energy conversion and storage technology.

The article is generally reliable; it provides a comprehensive overview of the current research on TQMs for energy conversion and storage technology without any bias or promotional content. The authors provide detailed information about the various applications of TQMs as well as their advantages over traditional methods such as defect engineering or nanotechnology. Furthermore, they discuss both theoretical research as well as experimental progress related to these topics.

However, there are some points that could be improved upon in this article. For example, while the authors discuss various potential applications of TQMs in detail, they do not provide any information about possible risks associated with these technologies or how they might be mitigated. Additionally, while the authors discuss various theoretical research studies related to these topics, they do not provide any evidence to support their claims or explore counterarguments that may exist regarding these topics. Finally, while the authors discuss various potential applications of TQMs in detail they do not present both sides equally; instead they focus mainly on the advantages associated with using these technologies rather than exploring any potential drawbacks or limitations associated with them.

# Topics for further research:

* Risks associated with topological quantum materials
* Limitations of topological quantum materials
* Counterarguments to topological quantum materials
* Experimental evidence for topological quantum materials
* Safety considerations for topological quantum materials
* Impact of topological quantum materials on energy storage and conversion

# Report location:

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