# Article information:

Low-threshold topological nanolasers based on the second-order corner state | Light: Science & Applications
<https://www.nature.com/articles/s41377-020-00352-1>

# Article summary:

1. This article discusses the development of a topological nanolaser based on a second-order corner state in a two-dimensional photonic crystal.

2. The corner state is induced by edge dipole polarization quantized by the 2D Zak phase, and its quality factor and mode volume are optimized by tuning the gap distance between the trivial and nontrivial parts of the photonic crystal slab.

3. The topological nanolaser exhibits robustness with respect to defects in the bulk of the photonic crystal, as well as low threshold and high energy efficiency at 4.2 K with InGaAs quantum dots serving as active material.

# 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:

This article provides an overview of recent research into topological nanolasers based on second-order corner states in two-dimensional photonic crystals. The authors discuss how these nanolasers can combine the advantages of both topological robustness and nanolasers, such as small footprints, low thresholds, and high energy efficiency. They also present their own experimental results demonstrating lasing behaviour from a topological nanocavity with high performance, including a low threshold and a high spontaneous emission coupling factor (β).

The article is generally reliable in terms of its scientific content; however, there are some potential biases that should be noted. For example, while the authors do mention possible applications for their proposed topological nanolaser, they do not explore any potential risks or drawbacks associated with its use. Additionally, they do not provide any counterarguments or alternative perspectives on their findings; instead, they focus solely on presenting their own results without considering other points of view or evidence that may contradict them. Furthermore, while they do discuss fabrication imperfections that can affect the quality factor and resonance wavelength of their proposed nanolaser, they do not provide any evidence to support this claim or explore any potential solutions to this issue.

In conclusion, this article provides an interesting overview of recent research into topological nanolasers based on second-order corner states in two-dimensional photonic crystals. While it is generally reliable in terms of its scientific content, there are some potential biases that should be noted; namely, it does not explore any potential risks or drawbacks associated with its use nor does it provide any counterarguments or alternative perspectives on its findings. Additionally, it does not provide any evidence to support claims about fabrication imperfections or explore any potential solutions to this issue.

# Topics for further research:

* Potential risks of topological nanolasers
* Alternative perspectives on topological nanolasers
* Fabrication imperfections of topological nanolasers
* Solutions to fabrication imperfections of topological nanolasers
* Performance metrics of topological nanolasers
* Applications of topological nanolasers

# Report location:

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