# Article information:

Scalable Nanowire Photonic Crystals: Molding the Light Emission of InGaN - Ra - 2017 - Advanced Functional Materials - Wiley Online Library  
<https://onlinelibrary.wiley.com/doi/abs/10.1002/adfm.201702364>

# Article summary:

1. InGaN nanowire photonic crystals have been synthesized with precise control over size, spacing, and morphology.

2. These photonic crystals exhibit highly efficient and stable emission in the green and amber wavelengths, without the Varshni and quantum-confined Stark effects that contribute to efficiency droop and device instability.

3. The strong Purcell effect of these photonic crystals allows for efficient coupling of spontaneous emission to stable band-edge modes, making them ideal for high-efficiency light-emitting-diode operation.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article titled "Scalable Nanowire Photonic Crystals: Molding the Light Emission of InGaN" published in Advanced Functional Materials discusses the synthesis of InGaN nanowire photonic crystals and their efficient and stable emission properties. The authors claim that this is the first demonstration of the absence of Varshni and quantum-confined Stark effects in wurtzite InGaN light emitters, which contribute significantly to efficiency droop and device instability under high-power operation.

The article provides a detailed description of the methodology used to synthesize InGaN nanowire photonic crystals with precise control over size, spacing, and morphology. The authors also present cathodoluminescence studies that demonstrate the formation of stable and scalable band edge modes in defect-free InGaN nanowire photonic crystals. The luminescence emission remains virtually invariant in the temperature range of 5–300 K and under excitation densities of 29 W cm−2 to 17.5 kW cm−2.

While the article presents compelling evidence for the efficient and stable emission properties of InGaN nanowire photonic crystals, it does not explore potential counterarguments or risks associated with their use. Additionally, there is a lack of discussion on how these findings could be applied in practical applications or how they compare to existing technologies.

Furthermore, there is a potential bias towards promoting the use of InGaN nanowire photonic crystals as an ideal solution for uncooled, high-efficiency light-emitting-diode operation without considering other factors such as cost-effectiveness or scalability.

Overall, while the article presents interesting findings on the efficient and stable emission properties of InGaN nanowire photonic crystals, it lacks a comprehensive analysis of potential counterarguments or risks associated with their use. Additionally, there is a potential bias towards promoting their use without considering other factors such as cost-effectiveness or scalability.

# Topics for further research:

* Potential risks associated with the use of InGaN nanowire photonic crystals
* Comparison of InGaN nanowire photonic crystals to existing light-emitting-diode technologies
* Cost-effectiveness of InGaN nanowire photonic crystals in practical applications
* Scalability of InGaN nanowire photonic crystals for mass production
* Alternative solutions for uncooled
* high-efficiency light-emitting-diode operation
* Environmental impact of using InGaN nanowire photonic crystals in electronic devices

# Report location:

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