# Article information:

Highly efficient p-i-n perovskite solar cells that endure temperature variations | Science  
<https://www.science.org/doi/full/10.1126/science.add7331?casa_token=gUPfbnAC2dEAAAAA%3AW0UAXhnBnnGzATeg634NAZTi62ptUI0Rr3Jm2-_gsDpaDkQ5CGRO7lQ_Hd3HhppJsSx3caD6ix1Z>

# Article summary:

1. Li et al. developed a highly efficient p-i-n perovskite solar cell that can endure temperature variations.

2. The team used a fluorinated polymer to stabilize the perovskite black phase and improve solar cell performance.

3. The device achieved power conversion efficiencies of up to 24.6% and retained over 90% of its efficiency after testing conditions for 3000 hours and after repeated cycling between -60°C and 80°C.

# 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 is generally reliable, as it provides evidence for the claims made in the form of certified PCEs, lab recorded PCEs, and data from thermal cycling tests. The authors also provide detailed information on their methodology, which adds to the trustworthiness of the article. However, there are some potential biases in the article that should be noted. For example, the authors do not explore any counterarguments or alternative solutions to their proposed method for stabilizing perovskite black phase and improving solar cell performance. Additionally, they do not discuss any possible risks associated with their method or present both sides of the argument equally. Furthermore, there is no mention of any promotional content in the article, which could lead readers to believe that all claims made are unbiased and supported by evidence when this may not be true in all cases.

# Topics for further research:

* Alternative solutions for stabilizing perovskite black phase
* Risks associated with perovskite black phase stabilization
* Promotional content in solar cell research
* Counterarguments to perovskite black phase stabilization
* Benefits of thermal cycling tests for solar cells
* Balanced arguments for perovskite black phase stabilization

# Report location:

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