# Article information:

Negative‐Pressure‐Induced Large Polarization in Nanosized PbTiO3 - Sun - 2020 - Advanced Materials - Wiley Online Library  
<https://onlinelibrary.wiley.com/doi/full/10.1002/adma.202002968>

# Article summary:

1. Nano-ferroelectrics have received intensive attention in current researches as the technological base for integration and miniaturization of electron devices, but maintaining high ferroelectric performance in nano-ferroelectrics is a big challenge.

2. Two feasible approaches have been performed to enhance ferroelectricity in nanostructures: negative pressure design and strain engineering. Negative pressure produced from phase transition can be achieved in PX-phase PbTiO3 with 1D nanowire morphology, while strain engineering is often used in 2D functional thin films via substrate strain which targets on few unit cells.

3. The article reports a case to realize the enhancement of spontaneous polarization in 0D freestanding PbTiO3 nanoparticles through surface modification, providing a good example of tunable ferroelectricity. The ferroelectric performance depends on spontaneous polarization of the lattice, and comprehensive methods have been performed to investigate the spontaneous polarization from an atomic level.

# 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:

作为一篇科学论文，该文章在描述研究结果和方法方面是比较准确和详细的。然而，在讨论中存在一些潜在的偏见和不足之处。

首先，文章没有充分探讨负压力对纳米 PbTiO3 的影响机制。作者只是简单地提到了负压力可以增强铁电性能，但并没有深入探讨其原因。此外，文章也没有考虑其他可能的因素对铁电性能的影响，如晶体缺陷、表面形貌等。

其次，文章未能全面评估纳米 PbTiO3 的应用前景和潜在风险。虽然作者提到了纳米 PbTiO3 作为电子器件集成和微型化的技术基础受到广泛关注，但并未探讨其实际应用中可能出现的问题或潜在风险。例如，纳米 PbTiO3 可能会引起环境污染或生物毒性等问题。

此外，在讨论中还存在一些片面报道和无根据的主张。例如，作者声称通过表面修饰可以调节铁电性能，但并未提供足够的证据来支持这一主张。同样地，在介绍其他研究方法时也存在类似问题。

最后，文章未能平等地呈现双方观点，并且存在一定程度上的偏袒。例如，在介绍其他研究方法时只提到了自己团队开发的方法，并未涉及其他团队或学者所做出的贡献。

总之，尽管该文章在描述研究结果和方法方面比较准确和详细，但仍存在一些潜在偏见及其来源、片面报道、无根据的主张、缺失考虑点、所提出主张缺失证据、未探索反驳、宣传内容以及是否注意到可能风险等问题。

# Topics for further research:

* Mechanism of negative pressure effect on PbTiO3
* Other factors affecting ferroelectric properties
* Comprehensive evaluation of application prospects and potential risks
* Evidence supporting claims of surface modification on ferroelectric properties
* Balanced presentation of different research methods and contributions
* Consideration of potential environmental and biological risks

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