# Abstract

## Title: Robust room-temperature two-dimensional layered ferroelectric material $MoTe_2$

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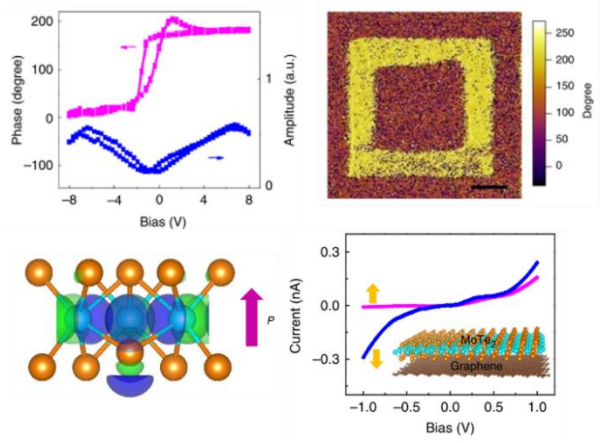
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### I. Abstract Body (up to 250 words)

Ferroelectric materials have attracted intensive interest due to their broad applications in smart sensors, capacitors, transducers, actuators, energy harvesting devices and non-volatile memories. However, maintaining ferroelectricity has been hampered by intrinsic depolarization effects. By combining first-principles calculations and experimental studies, we report experimental observation of room-temperature ferroelectricty in an unexploited distorted 1T (*d*1T) phase of $MoTe_2$. The origin of the ferroelectricity in *d*1T-$MoTe_2$ results from the spontaneous symmetry breaking due to the relative atomic displacements of Mo atoms and Te atoms. Furthermore, we construct an ultra-thin van der Waals heterostructure based ferroelectric devices. Our work demonstrates that ferroelectricity can exist in monolayer two-dimensional layered material, which facilitate the exploration of fundamental physics of ferroelectrics at the nanoscale, and opens up new possibilities for promising applications. The research is supported by the grant Research Grants Council of Hong Kong (GRF No. PolyU PolyU 153033/17P) and National Natural Science Foundation of China (NSFC No.51972279).

### II. Image:




### III. Reference:

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### IV. Biography:

Shuoguo Yuan has completed his PhD under the supervision of Prof. Jianhua Hao form The Hong Kong Polytechnic University. His research interests focus on the two-dimensional ferroelectric and piezoelectric materials. He has published more than 20 papers in reputed journals.

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