

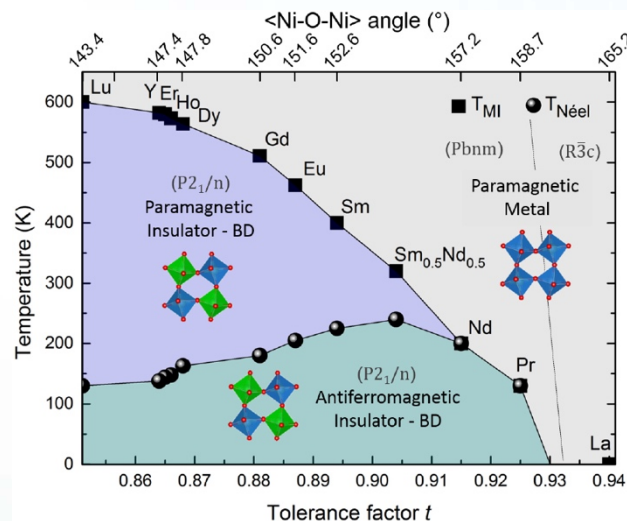
Floating Zone Crystal Growth at Record Oxygen Pressure to Create a PrNiO₃ Single Crystal

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The electronic and magnetic properties of rare-earth nickelates ($R\text{NiO}_3$) are complex and change dramatically with the rare-earth atom (R) and temperature.

PrNiO₃ is particularly interesting because its electronic and magnetic changes occur simultaneously and suddenly at the same temperature, making it a great candidate to understand the underlying processes in detail. Such understanding comes from studying single crystals. Prior researchers have only been able to produce extremely small crystals of this material despite using over 40,000 atm pressure.

Using PARADIM's high-pressure floating zone furnace, a PARADIM user grew mm-size PrNiO₃ crystals at $p\text{O}_2 = 295$ atm. These crystals are the largest and most perfect of this material produced to date. Analysis of the crystal structure hints that it is different than previously thought.



S. Catalano *et al.*, *Rep. Prog. Phys.* **81** (2018) 046501.

