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## **【101】 Coupled magnetism and ferroelectricity in magnetic high entropy oxide**

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Using low energy Muons spin rotation spectroscopy, measurement of dc/ac magnetic susceptibility and measurement of capacitance, we show that epitaxially grown Nd-based perovskite high entropy oxides exhibit significant ferromagnetism, spin-glass behaviour, high dielectric constant at RT and a temperature-dependent ferroelectric hysteresis that are intricately coupled to each other. X-ray absorption spectroscopy at 3d transition metal edges indicates a mixed valence state - possibly originating from the off-centring of the B-sites- that helps to explain these properties. These materials could be useful for exploiting magnetostriction and other related properties leading to next-generation sensors.

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