

# **Dynamic local symmetry breaking: the key for understanding devices from energy conversion to superconductivity?**

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I will present evidence that local, fluctuating broken symmetry states are widespread in functional materials, presenting three examples with implications for photovoltaics, thermoelectrics and superconductivity. These have been studied using local probes such as atomic pair distribution function analysis (PDF) that allow us to study disordered and short-range ordered states of matter. These are now being combined with measurements of the atom dynamics in materials to give new insights into how functional materials function.