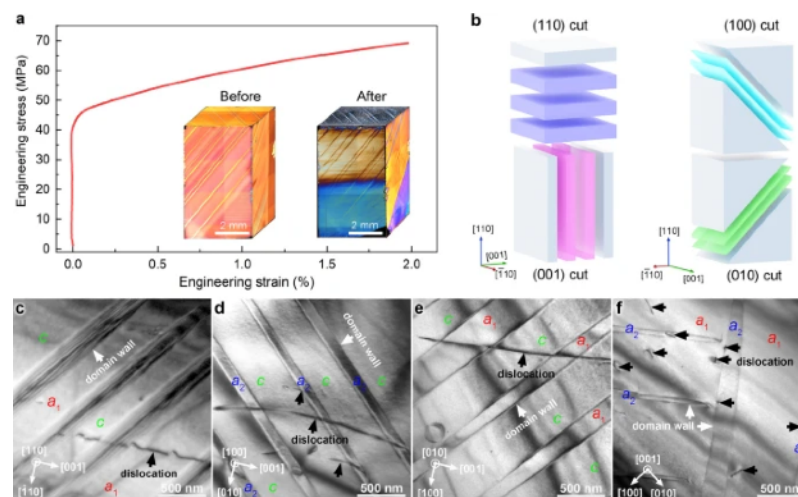


TUESDAY

9

DECEMBER



Dragan DAMJANOVIC

Professor Emeritus at Swiss Federal Institute of Technology in Lausanne – EPFL

Président de IEEE Ultrasonics, Ferroelectrics and Frequency Control Society (2024-2025).



Defects as a Control Parameter for Electromechanical Properties

11am - 12am (amphi E040 - Grandmont - Tours)

Defects are typically considered detrimental to the properties of piezoelectric materials and are usually avoided. When intentionally introduced, these are often acceptor or donor atomic dopants that control ferroelectric domain wall motion, resulting in either softening or hardening of the material's properties. Recent research shows that the range of useful defects is wider than just point defects. Perhaps the most interesting are dislocations, which can have unexpected beneficial effects on the electromechanical performance of ferroelectrics. In these cases, the effect of defects is passive, mediated through their interaction with domain walls. A much less understood phenomenon is the dynamic effect of point defects and defect clusters on electrostrain, including the strain generated by the defects themselves, which has attracted attention in recent years.

In this presentation, we will discuss this direct effect of defects on electrostrain. We will show how defects can be used to break the symmetry of a material, leading to a piezoelectric-like electromechanical effect in materials where piezoelectricity is nominally forbidden. The application potential of this defect-induced electromechanical response will also be discussed. We will also discuss the implications of defect-associated strain for the understanding of the large electrostrain reported in many recent publications on lead-free ferroelectrics.



Upcoming GREMAN Seminars:

- ◆ Thursday, December 18, 2025 (13:30PM): Ayoub FAIHE - Journal Club (A&P site)
- ◆ Tuesday, January 13, 2026 (11AM): Mads WEBER - Seminar (EMA site)
- ◆ Tuesday, January 27, 2026 (11AM): Vijaya BHASKER - Journal Club (SDM site)