



**UNSW**  
SYDNEY



## High-Strain Piezoelectric Ceramics for Sonar Applications

**Electric-field-induced phase-change ceramics offer large strain actuation in sonar applications, allowing for the design of more efficient, accurate and compact sonar systems.**

### Competitive advantage

- Conventional piezoelectric ceramics for sonar applications operate by microstructural mechanisms, limiting their strain magnitudes
- Structural knowledge of phase change processes in an electric field opens the possibility of achieving larger strains
- Performance metrics of these materials can be superior for specific sonar applications
- Fabrication costs are in-line with conventional functional ceramic processing

### Impact

- More efficient, accurate and compact sonar systems

### Capabilities and facilities

- Ceramic fabrication facilities for small batch testing. Aqueous and nonaqueous processing
- Range of milling equipment from regular ball milling to high-energy planetary milling
- Furnace facilities for sintering under various atmospheres
- Electro-mechanical characterisation equipment for measurement of local and bulk properties
- In situ structural characterisation capabilities for observing grain-scale response of electro-ceramics during actuation

### More Information

Associate Professor John Daniels

School of Materials Science and Engineering

T: +61 (0) 2 9385 5607

E: [j.daniels@unsw.edu.au](mailto:j.daniels@unsw.edu.au)

UNSW Knowledge Exchange

[knowledge.exchange@unsw.edu.au](mailto:knowledge.exchange@unsw.edu.au)

[www.capabilities.unsw.edu.au](http://www.capabilities.unsw.edu.au)

+61 (2) 9385 5008