



### UNDERSTANDING DOMAIN ORIENTATION EFFECTS IN POLYCRYSTALLINE PIEZOELECTRICS

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**Monday 4<sup>th</sup> August 2008, 4:00 p.m. – 5:00 p.m.**  
**Engineering Lecture Theatre E7**

We have explored how domains are aligned in grains of all orientations and how the domain alignments may change with temperatures up to and above the original poling temperature in textured and untextured piezoelectrics. This research is complementary to research analyzing stable domain configurations, research on the motion and characteristics of ferroelectric or 180° domain walls, and the very small number of in situ investigations of mechanical or electrical effects on domain alignment. Our domain texture studies have advanced understanding of ferroelastic domains by considering residual stresses induced via surface grinding and prior poling effects on polarization and strain hystereses in soft and hard piezoelectrics. In this presentation contexts for further investigation of microstructure, temperature and stress effects will be described as well as proposed considerations for advancing the performance of the new classes of lead free piezoelectrics.

Keith Bowman is a Professor and Head of Materials Engineering with a courtesy appointment in the Department of Engineering Education at Purdue University. He joined the faculty as Assistant Professor at Purdue University in 1988 after receiving degrees in Metallurgy and Materials Science from Case Western Reserve University (B.S. 1981, M.S. 1983), and Materials Science and Engineering from the University of Michigan (Ph.D. 1987). He was promoted to Professor in 1996. Professor Bowman has over 120 publications in print and is the author of a textbook "An Introduction to Mechanical Behavior of Materials" (Wiley, 2004).

Visitors are most welcome: Please note the parking arrangements. There is a designated Visitors Car Park (N1) clearly ground-marked by white paint and tickets, at a cost of \$3/day, are available from a dispensing machine. ('Blue' permit designated areas are for Monash members only.). It is also possible to park at other designated Visitors Car Parks (E1, S1 and S2) on the Clayton Campus, but tickets are \$1.4/hour.

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