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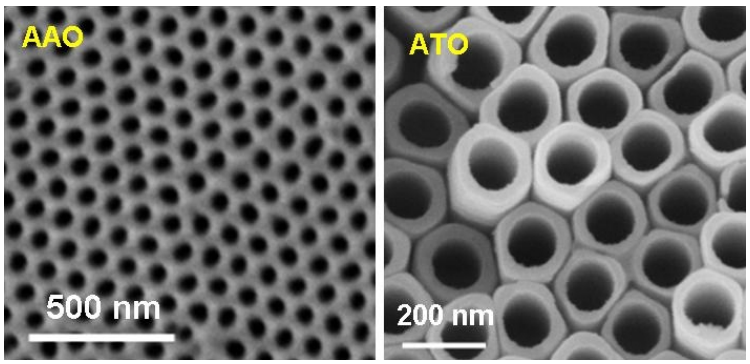
## Research Interests: Solid State Structural Chemistry, Inorganic Materials, Nanomaterials and Electron Microscopy

Our research interests cover syntheses and high resolution transmission electron microscopic (HRTEM) studies of solid state materials including mixed metal oxides, oxide ion conductors, fuel cell materials, porous materials and nanomaterials. Recent research projects include early stage crystal growth and anodic metal oxides.

Our recent research on crystal growths of zeolite analcime, zeolite A and perovskites revealed a reversed crystal growth route. In the field of anodisation, we developed a new model of formation mechanism of the ordered pores in anodic metal oxides. Using the so-called Equifield Strength Model, most experimentally observed data can be explained. For the electron beam sensitive specimens, we successfully obtained HRTEM images from zeolite beta, which show the defects for accommodate silanol groups. HRTEM images have also been obtained from extremely beam sensitive metal organic frameworks and newly discovered C60/trimethylbenzene nanowires. We also developed several new nanomaterials including $H_2Ti_3O_7$ nanotubes, which can be synthesised by a simple reaction of any type of crystalline $TiO_2$ with a highly concentrated NaOH solution. Solid state NMR and ionic conductivity studies confirmed the existence of structural protons.




## SELECTED RECENT PUBLICATIONS

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9. Direct observation of growth defects in zeolite beta, P. A. Wright, W. Zhou, J. Perez-Pariente, M. Arranz, *J. Am. Chem. Soc.* 2005, **127,** 494–495.