

A day in the life of a Nanotechnology Researcher

8.45am – a rushed start this morning with a 9.00am lecture followed by a teaching lab session at Dublin City University.

My job description is a university physics lecturer. However, I am involved in an active research group in studying nanostructured semiconductors. Certainly that is a mouthful, and not a good thing to try to rhyme off the cuff on Monday morning! Nanostructures are materials systems, which have structured features on the scale of 100nm or less (less than 1000 times the width of a human hair!).

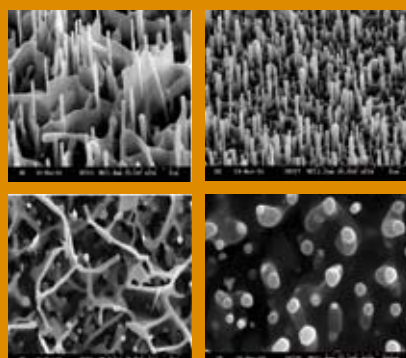
After lunch I meet with my research group (one postgraduate student and one postdoctoral fellow). At present we are trying to understand how we can tailor the structure of zinc oxide nanorods so that we get nanorods growing on top of a network of nanowalls, as shown in the left hand panel of the figure below, rather than simply growing as separate little pillars (shown in right hand panel). The width of these little pillars is less than 100nm. The problem is; none of us know how to do it so that it works every time. We discuss the possible options, what might be going on and how we can control it. Actually this is the key to our research, trying to develop control of the growth processes so that we are confident in our methods. We need to understand the physics, some chemistry and some engineering to do this: we are at the interface of a number of disciplines.

Zinc oxide (yes, the stuff in skin creams) has great potential for use in next generation UV and white light sources for data storage, energy efficient lighting and displays. Nanostructures based on zinc oxide may produce exceptionally efficient device structures. Hence the large mouthful used earlier in describing my research work.

By 4.00pm I'm ready to have a cup of coffee and a chat with my friend and colleague, Paul van Kampen, whose research is concerned with the best ways to teach physics. We talk about everything, physics, research grants, families and football and everything in between. Paul often has useful insights about my work, and occasionally I can repay the favour.

At the end of the day, when things have quietened down I will do the usual things, answering emails, clearing forms on my desk, trying to finish off writing a research paper for a journal on some previous results from our lab, and prepare for the next day's challenges!

Enda McGlynn



Tilted (top) and perpendicular (bottom) views of ZnO nanostructures on sapphire, with nanorods & nanowalls (left hand side) and just nanorods (right).

'We need to understand the physics, some chemistry and some engineering to do this'



Second level teacher and visitor to the group, Ms. Claire Kelly (front right), R.T. Kumar (back) and Enda McGlynn in the nanostructure growth laboratory. Enda graduated from Dublin City University with a BSc in Applied Physics followed by a PhD in Solid State Physics.