



## Ms Helen Springbett



Helen using the transmission electron microscope.

*"I enjoy research as I get to do something no one has done before. Even if it's the tiniest and most insignificant aspect of a topic (even if it's irrelevant!), you will get to see something about a sample that no one has ever seen before."*

*"If we manage to achieve safer communication in an age when cyber-security becomes ever-more critical, it would feel very satisfying to know I have contributed with my work to the success of such a key technology, even if it is only in a very small way"*

### How did you join the Cambridge Centre for Gallium Nitride?

*During the third year of my undergraduate degree we were required to produce a literature review into an area of ongoing research. While reading through the list of possible topics, I found the description of the GaN research interesting, and so I went with that. Three years later I'm still here!*

*During my fourth year research project, however, I deviated from Gallium Nitride to study the optical properties of a blue pigment, in association with the Hamilton Kerr Institute (the department within the University which undertakes the conservation of easel*

paintings). I asked Rachel Oliver if she would mind supervising the project, and she kindly agreed. This gave me a good introduction to various techniques, which I would later come to use once I started my PhD on blue single photon sources.

### **What is your role in the GaN group?**

I work on characterisation of quantum dots, focusing mainly on Electron Microscopy. Quantum dots are of interest as potential emitters of blue photons one at a time, which is necessary for future secure communication technologies based on quantum cryptography. The quantum dots I am investigating consist of inclusions of InGaN within a GaN matrix at a size on the order of a few nanometres. I use Transmission Electron Microscopes to study the structural morphology of these features, so that we can correlate different growth mechanisms with the structure, and how this affects the optical properties.

### **What do you like best about working in the group?**

I enjoy research as I get to do something no one has done before. Even if it's the tiniest and most insignificant aspect of a topic (even if it's irrelevant!), you will get to see something about a sample that no one has ever seen before. The Cambridge Centre for Gallium Nitride, in particular, is a rewarding and supportive place to study thanks to the friendly and collaborative atmosphere in the group.

### **Where do you see nitrides in the future?**

Nitrides have so many different exciting applications. As my work is mainly focussed on quantum dots, I am curious about the research development in this interesting and important field. If we manage to achieve safer communication in an age when cybersecurity becomes ever-more critical, it would feel very satisfying to know I have contributed with my work to the success of such a key technology, even if it is only in a very small way.



Helen being the light source in a demonstration to explain dual nature of light during the Cambridge Science festival.