

FET open: radically new ideas for paradigm-changing future technology

## Experience of a successful Principal Investigator & key recommendations for putting together a proposal

From Prof. Christopher Marrows, Principal Investigator on 'MAGicSky'



The MAGicSky Team at Leeds (from left to right): Assoc. Prof. Gavin Burnell, Dr. Katharina Zeissler and Prof. Christopher Marrows.

**Christopher Marrows**, Professor of Condensed Matter Physics at the University of Leeds, worked as a **Principal Investigator (PI)** on '[MAGicSky](#)', a **FET open** project led by CNRS between 2014 and 2018. Prof. Marrows shared with us his experience of the project.

Owing to his unique expertise in spintronic and nanoscale magnetic materials, Prof. Marrows was invited by CNRS to join a world-class interdisciplinary consortium of seven European universities and research institutions interested in skyrmion-based devices and spintronic. This was a **great collaboration opportunity** for the **Condensed Matter Physics group** at Leeds: all the PIs involved in the consortium were considered as 'world-leaders' in their particular specialisms, including one Nobel Prize winner. Whilst Christopher helped the consortium **sketch out the vision** and **develop the Work Packages**, **being a Partner** meant that the **bulk of work at proposal stage was carried out by the Coordinator**.

MAGicSky explored new materials and techniques, with the aim to manipulate skyrmions individually in devices at room-temperature. This '**high-risk/high impact**' research was a **first proof of concept towards a science-to-technology breakthrough**, which could potentially lead to **major impact** on the information technology of the future and **more specifically on data storage and use**.

Indeed, the development of storage devices based on skyrmions could in **future significantly improve storage capacity**, the **speed of processing** as well as the **efficiency of the writing and reading of information** whilst reducing **energy consumption**.

It was Leeds's first collaboration with *Unité Mixte de Physique CNRS/Thales* but the research groups knew each other from working in related fields and having met at workshops and conferences. Christopher noted that it is important to **make sure that 'you are known by the people in your field'** and that **they have a clear understanding of 'what you can do in your lab'**. According to Christopher, **working collaboratively was one of the most rewarding aspects** of MAGicSky:

*'You get to do some science that you want to do. And you get to do it with the consortium, with the other top groups.'*

*'We wouldn't be able to do it nearly as well if we would be by ourselves because we wouldn't have these other people who we can ask to look at our material in different ways or model it. So yes, it's getting access to that network of collaborators that's valuable' [...]*

*'With EU, you get to be part of something much bigger, particularly collaborating with really great groups in other countries.'*

Christopher's **top three recommendations for putting together a successful FET proposal** are:

**1. Don't shoehorn your project into the call.** Christopher emphasised:

*'The overall sort of **scope of the project has to fit the call**'. [...] You need to have an idea you believe in and can see you can package it as a fundable proposition that really fits the call'.*

**FET Proposals** should be based on a **radically new idea** aiming to **accelerate the development** of a **paradigm-changing future technology**.

**2. Put together a strong consortium involving the leaders in your field:**

*'You have got to have the right consortium [...]. So you might have to be really ruthless*

*[...]. Fortunately it just worked out nicely in this case. [...] One of the things that came back from the evaluation report was the strength of the consortium, there were no weak links in the consortium membership. Everyone was really world-leading'.*

**3. Involve experts from relevant industries that are able to take-up or build the technology in future.**

As the MAGicSky consortium was composed of academic scientists and *'FET is about technologies [...]* we created an industrial advisory board that would guide us through the project.