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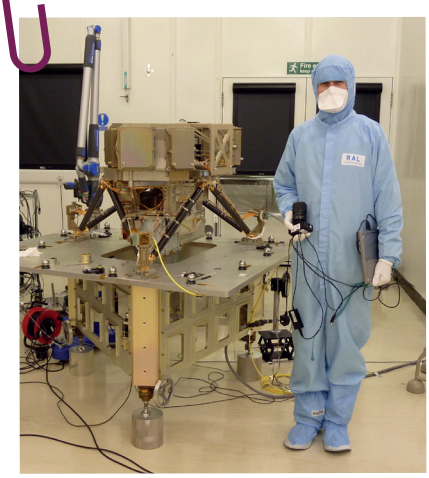
Phizzi professionals



Martyn Wells: Optical engineer

School

From a young age I was interested in how things work and then in secondary school I found that physics was all about the how and the why and how to measure, which matched this curiosity. I took physics, chemistry and maths at A-level while also developing an interest in astronomy by reading as many popular science books as I could get my hands on.

What next?

I did a physics undergraduate degree and most enjoyed the experimental, practical aspects. My PhD was in astronomy at Imperial College and that was nearly all instrumental, based on building a high-resolution spectrometer to study interstellar clouds. I now work at the UK Astronomy Technology Centre in Edinburgh as an optical engineer.

Why physics?

I have spent most of my career on the physics of light measurement and how we make best use of the tiny amount of light that arrives at our telescopes from comets, planets, stars and galaxies. Physics in astronomy involves the principles of how the universe works (theory), what to measure to confirm them (observations) and the means to make the measurements (instruments) – all equally important.

And now?

My job involves close interaction with astronomers and other engineering disciplines from the UK and many international partners. I am the optical lead for The Mid-Infrared Instrument (MIRI) on the James Webb Space Telescope. As we checked on the alignment of MIRI, I was able to stand next to the telescope as it was being assembled at the NASA Goddard Space Flight Center. A real highlight!

Physics in practice

Although my job title is optical engineer, physics is at the heart of what I do – from understanding the objects the astronomers are studying and the observations they want to make, through to the properties of the optical components in the instruments we build – lenses, mirrors and diffraction gratings and how well they can be made.

Advice for young scientists

Be curious about how everyday things work… electric motors, a loudspeaker, baking a loaf of bread or glasses that correct eyesight. When it comes to building precision instruments there are lots of programs to help you, but a thorough understanding of the underlying principles they are based on, and limitations of materials and manufacturing capabilities, are essential.

Published September 2021