

In conversation with... Professor Brad Gibson

I had heard a great deal about Brad's work with the primary school where a member of the Editorial Board teaches. She was extremely enthusiastic about his support for primary education and his inspiring approach for young learners. Since this conversation, and the many subsequent ones that Brad and I have now had, I can see why she was so positive about him and his work. This interview pulls together why thinking about the nature of science is fundamental in terms of developing future scientists.

(Leigh Hoath)



Leigh Hoath talks to Professor Brad Gibson, Director of the E. A. Milne Centre for Astrophysics at the University of Hull, about his thoughts on the nature of science

Tell us a little about what you do and how you got here

Born and raised in Canada, I am now an Australian–Canadian 'transplant' who has made the UK his home for the past 15-plus years. I am the Head of Physics and Maths at the University of Hull, and Director of the E. A. Milne Centre for Astrophysics. I spend a lot of time looking up at the sky, both with

my eyes and telescopes, and making use of supercomputers, all in the name of trying to understand the origins of stars, planets, galaxies and, indeed, the universe itself.

The stunning visual nature of astronomy and astrophysics makes it one of the singularly most important STEM enablers available to teachers and parents/carers alike. It brings together

space and dinosaurs – both of which resonate with the broader community in ways that other areas can only envy! Beyond my research in understanding our place in the universe, it is the use of these space sciences that fuels my passion for engagement with schools, colleges and the public-at-large. My particular passion lies in widening participation and supporting the so-called 'levelling up' agenda, that is, providing opportunities for under-represented groups. These range from addressing the socio-economic attainment gap, to focusing outreach into areas of monetary deprivation, to running a 'Changing Face of Physics' campaign, which has been named Best Practice in the Country by the UK's Equality Challenge Unit.

Key words: ■ Nature of science ■ Public engagement

This issue focuses on the nature of science – what does this term mean to you?

For me, and it might sound a hackneyed response, the ‘nature of science’ is a fundamental educational responsibility for all humanity. Science permeates every aspect of every day of our lives, from the technology of WiFi to vaccines that are critical to emerging from a pandemic. The proliferation of pseudoscience has never been more unrestrained or more dangerous; unfiltered social media means children and adults alike are exposed to non-scientific fearmongering, masquerading as ‘science’. The nature of science, in its purest sense, does not allow for pseudoscience. All of us, as educators, must continue to fight the tide of pseudoscience, using the positive and engaging aspects of science. Showing the beauty underpinning the nature of science is a fundamental responsibility of all educators, one that we all embrace wholeheartedly – and one that must be shared across all corners of society.

How has your perspective on the nature of science changed during your career?

My view of the ‘nature of science’ today, as outlined above, is night-and-day

different from how I viewed said ‘nature’ in my early career. As an early-career researcher, my focus was significantly more selfish: my priorities were in furthering my career, pushing boundaries and publishing papers in an attempt to ‘get ahead’, and thinking about future employment. Outreach and engagement with schools and the public were the furthest thing from my mind. The responsibility that comes with being a publicly funded scientist required an evolution of my mind-set, which could only come with time.

Working in a disparate array of countries allowed me to slowly come to realise that science should not be a ‘competition’, but rather should be embraced as an intrinsic aspect of everyone’s life. While I have never lost sight of the sheer enjoyment of pushing the envelope of scientific knowledge, that ‘nature of scientific’ discovery must be shared with the community-at-large. This is admittedly sometimes at odds with the pressures from employers and funding agencies, but taking science to the next generation and to those funding us through their taxes and donations is now a singularly primary passion for me.

What do you think makes the nature of science tricky to understand? Why is it important

that the nature of science is understood as well as the ‘facts’?

I suppose it is human nature to often accept the ease of anecdotal evidence ahead of scientific evidence. This has never been so obvious or concerning, as when assessing the public’s response to the ongoing COVID-19 pandemic. A basic understanding of ‘statistical significance’ is critical going forward; we must educate our students, the public and ourselves. Such ‘significance’ underpins the related medical arguments, but also arguments about issues ranging from climate science to the likelihood that we might be alone in the universe. While it is not ‘tricky’, it is admittedly easier to believe anecdotal falsehoods: we must embed the nature of science learning into our education system, from primary through to higher education.

What can we learn from the pandemic around the nature of science for the wider public community?

The rampant proliferation of pseudoscience was already a problem before the pandemic, ranging from the absurd (ghosts, flat Earth, etc.) to the more insidious (deepfakes, etc.). Anti-vax sentiments have always existed in our culture at some level, but the rapid spread of scientific disinformation, fuelled by ready access to multiple pseudoscience voices on social media, has demonstrated that science education has never been more critical. It is a responsibility for all of us in education to fight the good fight for science!

.....

Dr Leigh Hoath is a Senior Professional Practice Fellow at Leeds Trinity University.
Email: l.hoath@leedstrinity.ac.uk

.....



Brad enthals pupils with science as part of his outreach work