



Above: Prof. Carlos Frenk, cosmologist studying dark matter and dark energy.

I've made my career mostly as a photographer in reportage, but I've had the idea for the portraits of astronomers in mind for a few years. "Explorers of the Universe" is really two shows in one and I did hesitate about doing both; most photographers specialise in one or the other. But as my background is in reportage photography and I had the ideas for the themed portraits, I was encouraged by the Science and Technology Facilities Council and the Royal Astronomical Society to do both. It's rare and difficult to do on this scale but I'm glad I have – I'm delighted with the way it has turned out.

I've been interested in astronomy since I was a child in New Zealand. It was the classic things that started me off – seeing the Apollo moonwalks, space exploration, and Carl Sagan's *Cosmos* brought it all together for me. I always read about astronomy in the press and in science and astronomy magazines. But I started to take it a bit more seriously after a job at the Ice Hotel in northern Sweden. I knew it was solar maximum and I had always wanted to see the Northern Lights. I got lucky one night with a truly mesmerising show. It was the first time I'd come across people actually gasping with wonder at something in nature. Back in the UK, I wanted

Profile: Max Alexander

The exhibition 'Explorers of the Universe' shows portraits of astronomers and images of astronomy in IYA2009. Max Alexander, photographer, and Ian Howarth, astronomer, spoke together about the ideas behind the project and the challenges of realizing them, as well as the steps that led to the pictures.

to find out more about the science behind what I had seen. I ended up having a long chat with Steve Fossey at University College London and he mentioned that there was an evening diploma course at UCL that I might be interested in. At the time I wasn't that keen, but later that year I thought 'why not?' and from 2000 to 2002 I was back in the classroom. Every third week we went to the University of London Observatory at Mill Hill, which is where I met Ian Howarth. It's also where I started to become an amateur

astronomer rather than just reading about it.

While I was doing the diploma course I decided that I wanted to work in the industry, somehow – not as an astro-photographer, but somewhere in the astronomy and space science field. I had an idea for a series of portraits, but the concept wasn't yet clear in my mind, and I was travelling a lot for work, so 2001 wasn't the right time.

In July 2007 I was covering an event for the STFC press office and heard Mike Edmunds give a talk about the International Year of Astron-

Above: Nik Szymanek, astrophotographer extraordinaire and London Underground driver.
Below: Dr Giovanna Tinetti, who works on astrobiology and exoplanets.

omy. Straight away the whole thing crystallizes for me and I knew “this is the moment”. I contacted Mike, who put me on to Ian Robson in Edinburgh (the point of contact for the UK IYA2009) and from there all roads led to the Science and Society awards from the STFC.

Without the support of the STFC I would never have achieved this. I had a fairly clear idea of how it would be and the STFC provided the resources to achieve what I set out to do. They were really encouraging and it was important to me as well as to them that I showed the diversity in astronomy in the UK in 2009. I wanted to include not just leading figures, but also to have a cross-section of people working in the field, including amateur observers, women, young people, people from varied cultures and from a wide geographical spread across the country.

But first I had to apply for the grant. The academic system was a whole other world for me, a professional photographer. I was used to a completely different approach, working with publishers, art directors and designers, where you develop a brief and then just get on with it. The process of writing applications for grants and making PowerPoint presentations to the STFC panel was a steep learning curve for me, and very time-consuming. I groaned when I found out I would have to have an ‘STFC researcher’ on board, and be reviewed by some academic panel, but having Ian involved has been a revelation. Having Ian as my mentor really worked, especially with his experience of how the system operates. He’s very keen on photography and having an astronomer who is visually aware has been a huge asset. In short, Ian got it.

The portraits are primarily ideas-driven. I wanted some straight character portraits; if they were all interpretive, we would lose the audience. But I wanted most of them to say more. I used ideas I had absorbed from reading biographies, especially, and found that astronomy served as a catalyst to draw out new ideas. I was influenced by a biography of Beatrice Tinsley, an astronomer from my home town of New Plymouth, New Zealand. She was an amazing person who died young – only forty – but she was writing papers right to the end of her life.

I wanted some of the portraits to have layers of meaning, and to do so using everyday things – such as the TV that Hiranya Peiris is holding in her portrait, with its link to the cosmic microwave background. I think it’s really important to remember that our ordinary world is interconnected with the universe, not separate from it; right here on Earth we are part of the Milky Way. So I photographed Peter Birtwhistle, who discovers asteroids, against a background of



Ian Howarth on collaboration in a new field

I got involved because it sounded an interesting project; I like photography and thought it would be a change from the straightforward scientific aspects of my job. I was interested in investigating the artistic impact of imagery and the technical expertise needed to achieve it. I felt that I could learn from Max and I could add something to the project. It turned out to be a most interesting and stimulating project, but I got sucked into it more than I expected!

It has been fascinating to see a professional at work, in a field I know something about. But as a scientist, you're after entirely different images. You want the information, and you don't always think about the aesthetics. When Max sends me a new shot I almost always just go "Wow!". The images always exceed my expectations, both technically and in the image and the thought behind it. Max's work epitomizes the idea of technical expertise in a creative image. I was fascinated to see a professional photographer

at work, and got a lot of technical insights. It's a shame people don't see the amount of work that goes into the prints.

I was also surprised that so many of these portraits were taken in one exposure. Part of Max's skill is to do things "in the camera", in other words to do it all in the shot, not with computer trickery afterwards. Even Carlos Frenk's image, with the careful proportions of light and dark, and the writing with the torches in Boulby Mine in the image of Sean Paling, were taken in one go. And Brad Gibson really is flying in his picture, using a theatrical harness.

The imagery is central. When people see the exhibition they are going to see a collection of interesting people; the science is secondary, but it is there, just as science is there in everyday life. Max's primary concern was for good images – he's a photographer, after all. But there are background ideas in a lot of these images. They're subtle, but people who know something about the subject will

see more. Then again, some of them are straightforward portraits – Donald Lynden Bell has a great face.

I had some input at an early stage in the project. Max came up with the idea of covering the diversity of science, including invisible astronomy, cosmology, the origin of life, and with the idea of covering the diversity of people involved in astronomy and their diversity of approach, the amateurs and the professionals and their geographical diversity. I also found the science images to go with the portraits – that was good fun, just what we all enjoy, really – and wrote a little about each one. Actually, I started out writing lengthy essays, but Max quite rightly steered me into producing two short paragraphs for each image at the most. And he did allow me one graph!

I'm very impressed with what Max has achieved. I think it's an imaginative survey of the subject in IYA, and I'm very pleased to have been involved with the project.

ocean and clouds, because most of the water on Earth came from space, in all probability. Some people might see the portrait of Carlos Frenk as him looking out into the universe, or looking like a crescent Moon, but there's more to it – the illuminated part of his face fills 4% of the frame, roughly the same as the fraction of visible matter in the universe. The parts of his head in darkness fill 23% of the frame, the same as the 23% of the universe that is dark matter, and the rest of the frame, 73%, represents the proportion of dark energy in the universe.

These subtleties can be a bit esoteric, but I wanted some to be challenging. Not everyone gets it, but of course you don't need to get it to respond to the portraits. But if the idea does jump out at you, that's a reward.

I worked closely with Ian, on many levels. He was my astronomy guru, art director, writer, web designer, all-round fixer and even held things for me on a couple of shoots. It has been very much a collaborative effort which I've enjoyed immensely, and the project is undoubtedly better for Ian's committed involvement. We collaborated on ideas and who to put those concepts alongside (with STFC approval). I guess I had about twenty themes written down a piece of paper, with all these astronomical analogies and metaphors that I picked up over the years.

We sat down together at Burlington House for brainstorming sessions. Some of my ideas were pretty left field. Ian would let me run with some of them, and we'd refine them along the way; on others he would reel me in, because the ideas either didn't stack up, or they were just plain naff. He had a very diplomatic way of laying

these concepts to rest, without making me feel crushed. And he came up with ideas out of the blue, using the analogy of ripples spreading on a pond for gravity waves, which I used.

I also worked closely with the astronomers I photographed, suggesting ideas and they would say either "yes, I like that" and maybe offer some fine-tuning, or "no" and suggest something different altogether. They were very creative in their problem-solving, in how to make the photographs work, often after some initial scepticism. Although it was sometimes hard going working with people who were not used to having their pictures taken, I found out just how creative scientists are – and need to be.

There's a narrative running through the subjects, from the visionaries through the solar system, stars, galaxies, the origin of life, invisible astronomy and onto theoretical ideas, cosmology and the future. I set out to include the whole profession, the up-and-coming as well as the leaders, amateurs such as Damien Peach and Tom Boles – and even a keen nine-year-old observer I bumped into about four times at public astronomy events and who had such infectious optimism. There are few professions where outsiders can make such valuable contributions and amateurs do a real part of the work.

In the reportage I started with some history, and then a sort of homage to the past 50 years of British astronomy and solar system science, but I also wanted to include the public involvement, the whole stargazing and sidewalk astronomy side of the subject. I got a series of pictures from the spring Moonwatch week, which I think catch the wonder that is such a part of

Exhibition details

Explorers of the Universe: Royal Albert Hall 24 September – 2 November

Wine & Talk evening with Prof. John Zarnecki: Sunday 4 October 5–7pm, tickets required

<http://www.royalalberthall.com/tickets/production.aspx?id=6884>

The exhibition is open to view on:

Saturday 3 October (10am – 2pm)

Saturday 10 October (10am – 2pm)

Wednesday 14 October (6–9pm)

Saturday 24 October (10am – 2pm)

observing. STFC wanted to draw children into astronomy and STEM subjects (science, technology, engineering and medicine) generally, so I set out to make images that engaged the public. Getting kids interested and inspired was a real imperative, to show them something different from science at school.

When I think about the people I've met and photographed for this project, I see inspiring people at the cutting edge of what they do, which is unravelling the secrets of the universe. I was surprised by their creativity and the sense of community – they certainly weren't boffins at all! Although there's nothing here of the celebrity culture of pop stars and reality shows, I wanted to show something of the glamour of science through these inspirational people. ●

Further information

<http://www.maxalexander.com/astronomy>