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# "I'll find out about that in the future" – DLR asteroid researcher Dr Alan Harris

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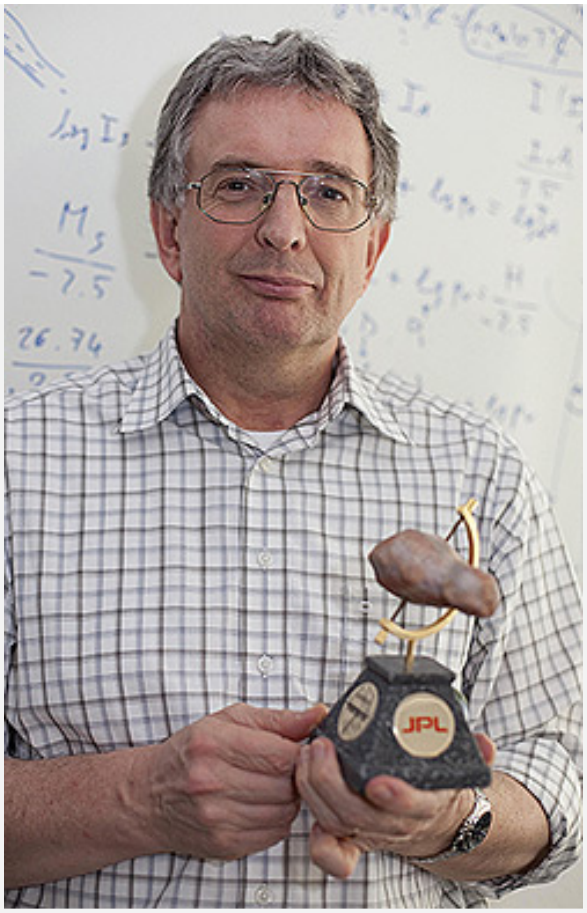


*The DLR Asteroid Researcher Dr Alan Harris*

*By Elisabeth Mittelbach*

"Surprise!" – Alan Harris loves this word. It really suits the character and profession of this 58-year old British scientist. With a Doctorate in Physics, this 'Senior Scientist' at the German Aerospace Center's (Deutsches Zentrum für Luft- und Raumfahrt; DLR) Berlin-based Institute of Planetary Research (Institut für Planetenforschung) works in the 'Asteroids and Comets' department. As a scientist, he knows that his research will always lead him to surprises and questions. "I'll find that out at a later date – right now it's still unknown to me," he says with a grin. Even after 30 years of professional experience, Dr Harris believes that the ability to remain inquisitive and to be positively motivated about things is as important to a researcher as luck and good fortune.

Born in the industrial city of Birmingham, he has had an interest in astronomy since his earliest years: "Even as a child, I took an interest in the stars, and especially in watching the night sky. I kept on asking myself the same questions: what are they, where do they come from, and what do they mean?

My mother was unable to answer these questions for me, so I derived most of my knowledge from books," says the man with the lively brown eyes.

### The origins of asteroids and comets

Finding out how our Cosmos evolved billions of years ago, the role that planets, stars and other heavenly bodies have to play in our Solar System, where asteroids and comets come from and why their impacts have such devastating consequences – these are topics that never leave the mind of this eminent DLR scientist – and that includes the question of when the Earth will be struck by an asteroid next. "This is something that could happen tomorrow, or just as easily, not for 100,000 years," says the astrophysicist. "Collisions are a natural process in our Solar System. Without it, there would be no planets, and also no life on Earth."

Alan Harris views comets and asteroids as a means of transport, also for the materials essential for life. "Without them, we cannot understand the origins and development of planets," he explains. Comets are of such great interest to astronomers because they are about 4.6 billion years old – meaning that they carry within them a portion of the 'original material' of outer space. Scientists hope to learn something about the origin of life from these lumps of rock and frozen gases. In most cases, asteroids are the debris of collisions between larger bodies or the remnants of a burnt-out comet. In the course of their development from a grain of dust to a planet, they have somehow 'got stuck in a rut'. Some have a diameter of several hundred kilometres, while others are no larger than a pebble.

### Collisions with Earth millions of years ago

Dr Alan Harris in his Berlin office

The planets in our Solar System move on steady orbits around the Sun. This means that scientists like Alan Harris can calculate their behaviour precisely. In theory, the same is also true of comets and asteroids. The difference is that they are relatively small and light, and they can also be sent off course by a range of different forces – for example, the gravitational pull exerted by other heavenly bodies. This is when things start getting dangerous.

"In the course of its history, the Earth has often been struck by asteroids and comets, but the last collisions with global effects took place millions of years ago," says Alan Harris. For example, about 15 million years ago a double asteroid struck what is now the Nördlinger Ries region of Bavaria and the Steinheimer Becken of Baden-Württemberg, leaving craters roughly 25 and 3 kilometres in diameter respectively. "This was clearly an asteroid with a diameter of roughly one kilometre, and it even had its own moon. This object struck the Earth at a staggering 15 kilometres a second," he added. An impact of this magnitude unleashes unimaginable levels of kinetic energy. "That is a great deal worse than a volcanic eruption or an earthquake, and has global implications. However, since we have no specific experience with asteroid collision impacts, all we can do is model them. In other words, use the laws of physics and mathematics to conduct research into the lasting effects of an asteroid impact on Earth.

**Coming to grips with the risk of an asteroid impact**

Asteroid 951 Gaspra

Astrophysicist Harris admits that an event of this kind, while a very real possibility, is nonetheless a very rare occurrence. He also admits that a high proportion of his daily work deals less with defence against asteroid impacts than with research into their physical properties – that is, their form, density, structure and surface properties – as well as their history. "These are insights which further the cause of basic research into the Solar System, but which are also important in terms of potential protective measures and which enable us to get a handle on the risk of a collision's impact," summarises our DLR researcher. The focus of his attention are 'near-Earth' asteroids. "We are familiar with about 90 percent of the larger ones in this category, but there are also a great many smaller ones, some of them concealed, meaning that we cannot observe them."

So what was it that brought 'asteroid hunter' Alan Harris to DLR? After obtaining his high school leaving certificate, he was off to the University of Leeds to study physics and then went on to study for a Doctorate in Astronomy. "Back then, we built a telescope capable of receiving infrared radiation from a very high-altitude balloon gondola," he reminisces. In 1977, Harris obtained his doctorate in infrared astronomy and moved to the Max-Planck Institute for Astronomy in Heidelberg for postdoctoral research. A spell at the Astronomy Centre of the European Space Agency (now ESAC) in Madrid followed, after which he returned to the UK in 1986 and worked as an astrophysicist at the Rutherford-Appleton Laboratory, not far from Oxford. In 1989, he moved to the Max-Planck Institute for Extra-terrestrial Physics in Garching, where he came into contact with DLR's planetary researchers, who were still based in the town of Oberpfaffenhofen, near Munich, at that time.

**Deeply committed to the exchange of ideas with young scientists**

Doctoral supervisor Alan Harris and his PhD student Michael Mommert

With the reunification of Germany, the Institute was relocated to Berlin and Harris moved there too, with his wife and daughter. Since July 1993, his desk has stood in Office 321 of the DLR premises in Berlin-Adlershof. This is where the scientific papers and books pile up, the PC is always running, and where photos and posters record highlights of the last 30 years of astrophysics and planetary research.

Harris is also deeply committed to sharing his knowledge with new talent in his field. He regularly assists doctoral students, and often has lunch with them to discuss their work. His calendar has a number of permanent fixtures and, alongside numerous international events and conferences, he makes it a point to attend the Asteroids, Comets, Meteors (ACM) conference convened every three years by the International Astronomical Union. At the 1999 ACM in Ithaca, in the US state of New York, the astrophysicist was awarded the industry's equivalent of a knighthood: Asteroid '(7737) Sirrah' – 'Harris' spelled backwards – was named after him. The name 'Harris' was already taken because Alan Harris, the DLR scientist has – and what a surprise this is – a colleague with the same name in the USA, also an astrophysicist with his name given to an asteroid. Then again, this DLR researcher has no problem coping with combinations of that kind. After all, he is accustomed to reaching for the stars.

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