

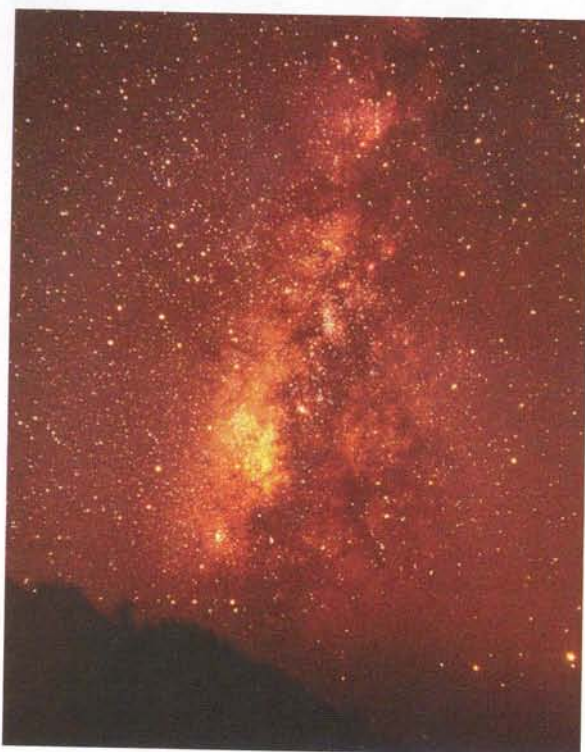
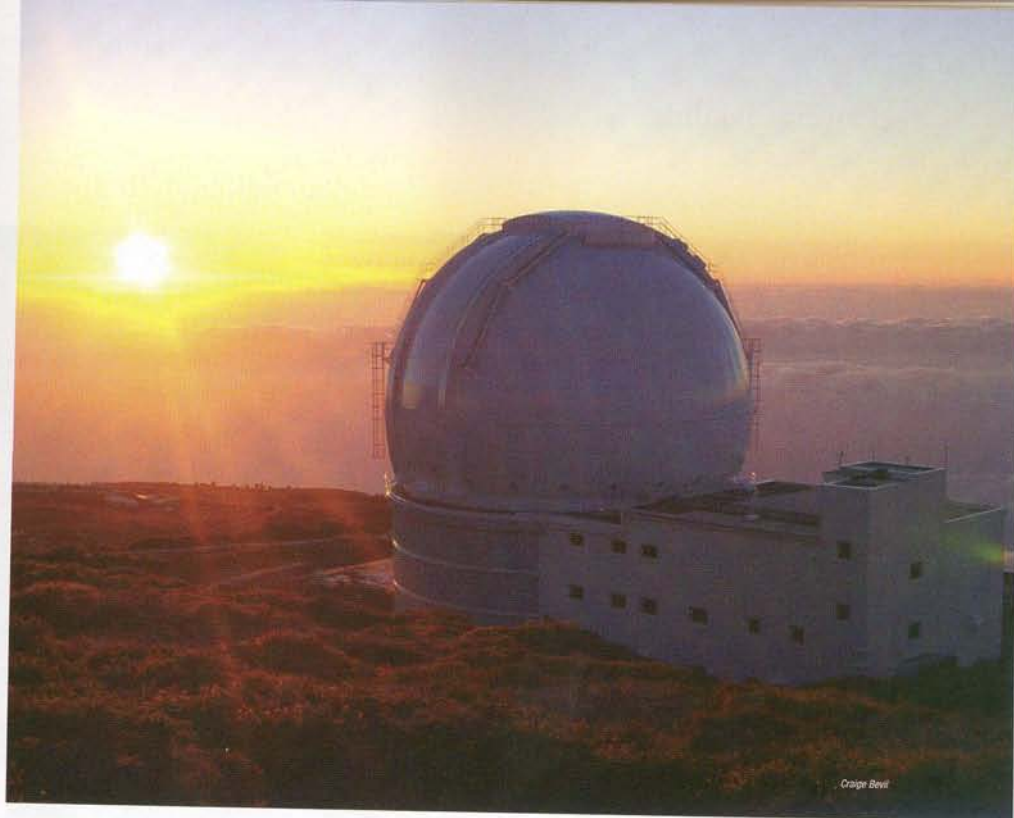
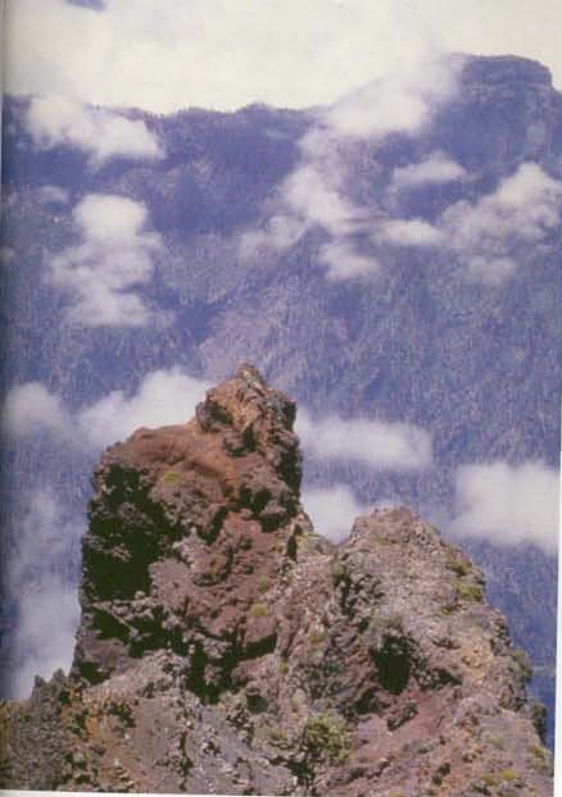
everything islands

# In the sky with diamonds

Words by Ron Toft, pictures by Ron Toft, Particle Physics and Astronomy Research Council and the Isaac Newton Group

La Palma is the most unspoilt of the Canary Islands. Despite its warm seas and beautiful beaches, it doesn't attract as many *Baywatch* babes as nearby Tenerife and Gran Canaria. Instead, with the cleanest skies in Europe, it attracts sky-gazers...





#### Heavenly bodies

Main: walkers enjoying the skyscape from the Caldera de Taburiente, La Palma's most extraordinary feature and one of the largest volcanic craters in the world. This page, clockwise: clouds drift above the island's highest point; The William Herschel Telescope at Observatorio del Roque de los Muchachos at sunset; the Milky Way viewed at night from La Palma; La Palma's craggy coast; a splash of brilliant floral yellow

Gazing up into the ink-black sky above La Palma, one of the tiniest of the seven Canary Islands that sit off the coast of Africa, you can't help but be drawn into stars. The clarity of the sky here is so dazzling it excites astronomers the world over. Known as one of the best locations in the world for astronomical observation, it is about to become home to the biggest one-eyed monster on the planet - the world's largest telescope.

Unlike the livelier islands in the archipelago like Gran Canaria and Tenerife, La Palma doesn't 'factory' tourists, nor does it depend on tourism for its survival. There are no bustling seafront promenades dotted with high rise hotels, no Ibiza-style nightclubs

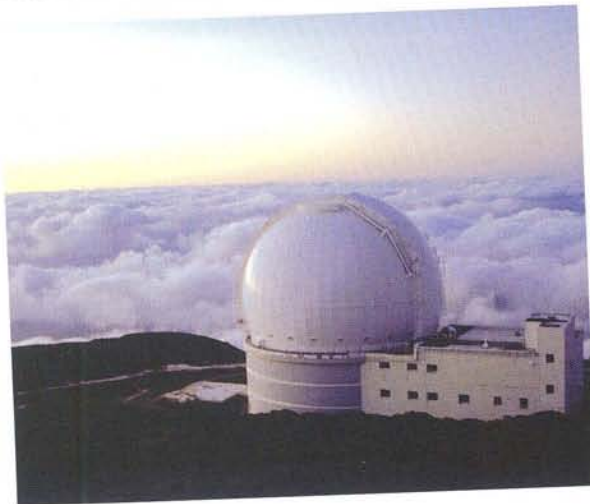
to attract the attention of the British tabloids. In fact there's little to do here at all except enjoy the peace and natural beauty of the place with its fascinating landscape of volcanic mountains, rugged cliffs, black beaches and lush tropical vegetation.

Not many of the thousands of holidaymakers who visit each year know that La Palma has some of the most spotless skies in the world and that, as a result, it is an internationally renowned centre for studying the heavens. Take a trip up to the highest points of this island though and you might think you had already been beamed up and onto another far-away planet. Vast white astro-globes sit on the loftiest points and dotted all over the craggy, boulder-strewn basalt slopes of the world's largest volcanic crater,



**To infinity and beyond...**

This page, clockwise: reflecting the skies; volcanic black sand is a feature of La Palma's clean unspoilt beaches; the island's clean unpolluted environment means it is home to rare botanical species; the observatory at its lofty peaks above cloud cover



Caldera de Taburiente, high above the clouds at an altitude of 2,400 metres, are state-of-the-art astronomical telescopes. Here, at the island's summits, they are used by astronomers to study everything from the sun to distant galaxies at the edge of the observable universe.

Positioned at the edge of a massive broken wall of volcanic rock, this little part of our planet is considered unique for its natural conditions. Three out of four of the nights are totally clear and the clarity of the air means that no pollution interferes with astrophysical observation. La Palma is the astronomical equivalent of a nature reserve because light coming from the island's towns is controlled by laws restricting the type of street lights that can be used. The law forbids air traffic, radio waves and large buildings near the observatory and people living on the island do their bit for research, forcing a complete black-out when they turn out the island's lights once a year to allow the astronomers their ultimate luxury - out-and-out gloom.

The Roque de los Muchachos Observatory here is run by the Tenerife-based Instituto de Astrofísica de Canarias but the telescopes and other star-gazing

equipment belong to scientific institutions from all over the world. Belgium, Finland, Germany, Holland, Italy, Russia, Spain, Sweden and the UK, among others, are all represented.

But the country with the biggest astronomical presence on the mountain is the UK, which has been observing from La Palma since the mid-1980s. Astronomy students from Sheffield University get to spend part of their course here and to use some of the four huge telescopes, all but one of which is wholly or partly owned and operated by the Particle Physics & Astronomy Research Council.

The biggest monster of them all the Anglo-Dutch William Herschel Telescope, whose main mirror is a vast 4.2 metres in diameter. Its baby brother is the 2.5-metre Isaac Newton Telescope which was relocated from the often-cloudy skies of south-east England.

But the most high-tech of them has a mind of its own: it is the recently completed two-metre-long Liverpool Telescope, owned and operated by Liverpool John Moores University's Astrophysics Research Institute and is the world's biggest robotic astronomical telescope. When fully operational later this year, it will work automatically. The clam-shell roof will open and

# Home thoughts from... La Palma



**Chris Benn is a British astronomer with stars in his eyes. He lives and works on La Palma and is married with an eight-year-old son, Paul**

research on quasars – and it's an easy commute to the office in Santa Cruz or an hour to the observatory itself. Eating out is cheap too.

### Where do you live?

I currently live with my wife and son in a flat in Santa Cruz, which is rented through the Observatory. However, we're now looking to buy our own place, preferably a villa in a more rural area.

### What is the property market like on La Palma?

Property is expensive, not unlike the south of England. This is mainly because there is a limited amount of land that is suitable for building on so the market is restricted. Many homes are built on steep slopes and most plots are different from the next one.

### How are you finding dealing with the estate agents?

Fine. Bear in mind, there are virtually no British property agents here, simply because Brits don't come here to live. There's a contingent of Germans

who come to La Palma and consequently there are German agents – who invariably speak English; and then of course there are plenty of local agents. We're finding the actual buying process straightforward.

### What about schooling for your son?

He goes to the local Spanish school, where he is the only blond child! There are no British schools on the island.

### Do you see yourself staying here permanently?

That's difficult to say – it depends partly on how rewarding the job continues to be!

### What brought you to La Palma and how long have you been here?

My job as an astronomer brought me here in 1989. I have a post here at the Isaac Newton Group (ING) of telescopes, which is run by a British-Dutch team. Before that I was working for the Royal Observatory in East Sussex.

### So what exactly do you do?

I'm a support astronomer. My job is to help develop new kinds of cameras for the William Herschel Telescope – the largest at the ING. I also help visiting astronomers with their night-time observing.

### What do you enjoy about La Palma?

The weather and scenery are fantastic, the environment is relaxed and it's safe for kids. I enjoy my job too – 25 per cent of my time is spent on



close by itself and the telescope will lock on to and observe space objects as directed by researchers thousands of miles away in Britain and beyond.

They will direct the Liverpool Telescope to focus its beady eye on newly discovered or rapidly changing objects, such as exploding stars and near-earth asteroids. Current research ranges from the study of the expansion of the universe through to star bursts and gamma rays, eruptions of extragalactic supernovae and understanding the Big Bang.

But it's not just the space scientists who get to travel at the speed of light here. Five per cent of the observing time has been allocated to schoolchildren and students registered with the National Schools' Observatory. This is an innovative, web-based facility aimed at giving young people a chance to experience the wonder of the star-spangled heavens while at the same time improving their scientific, mathematical, computer and other skills.

Since its inauguration in 1987, the William Herschel Telescope has been the biggest instrument by far on the mountain. But even this giant reflector is about to be dwarfed by a mainly Spanish instrument, construction of which is at an advanced stage.

Due to receive its first light from the stars in 2005, the Great Canarian Telescope (Gran Telescopio Canarias) will be truly enormous and help push back the frontiers of astronomical knowledge in a variety of fields.

The main mirror of this colossus is being made not from one heavy piece of glass, as in most other large reflecting telescopes, but from 36 hexagonal sections, each one measuring 1.9 metres diagonally and weighing 450 kilogrammes yet only eight centimetres thick. When linked together, these sections – polished to within one three-thousandth of the width of a human hair – will form a light-gathering surface equivalent to that of a single mirror 10.4 metres across.

This mammoth optical beast is a triumph of modern engineering – the already-completed metal dome incorporates some 16,000 screws (4,000kg) and 43,000 nuts (1,500kg), as well as around 450kg of washers! When finished, the entire structure will tip the scales at an enormous 850 tonnes.

It will be used to probe both nearby and distant wonders of the universe, including the atmospheres of solar system planets, other planetary systems being formed in our own Milky Way, stars, black holes and incredibly remote galaxies.

The observatory operates around the clock; astronomers, technicians and other people constantly coming and going. Astronomers stay at the 60-room residencia, about half of which is occupied most of the time. "We get all sorts of people staying here," says site manager and former solar astronomer Dr Juan Carlos Perez Arencibia, "including VIPs, such as Spanish and European ministers and other politicians."

Most astronomers work by night and sleep by day, so they tend to have breakfast before going to bed and dinner before starting a night's work. Around 150 people on La Palma work at the observatory all year round.

Only two languages are officially spoken at the observatory – Spanish and English. "You may have Germans, Italians and Swedes all dining at the same table, but invariably they talk to one another in English – the international language of science," says Dr Arencibia.

Roque's busiest months are May, June, July and August when astronomers descend on the observatory in droves. "Although there are fewer observing hours during the shorter, summer nights, the weather is better. In January and February, when the nights are longer, we sometimes get extremely violent winds and ice storms," adds Dr Arencibia.

Every summer there are at least three public open days at Roque. "It's a special occasion for the local

community", Dr Arencibia says. "We provide food and music for around 400 people and show them around the site."

The open days are for islanders and holiday-makers generally. "Because of the growing interest in what we are doing here, generated in part by the new telescope, we are talking to a private company with a view to opening a space-themed visitor centre."

With one of the world's biggest and most advanced telescopes due to be completed within the next year and a visitor centre planned nearby, clearly Roque de los Muchachos is set to have a much higher public profile and 'astrotourism' is likely to become an increasingly important part of La Palma's economy. ●

### At-a-glance



### Getting there

There are no direct flights to La Palma but local airline Binter Canarias links all the Canary Islands so the simplest route is to fly direct to Tenerife (British Airways, easyJet, Monarch Scheduled, plus others) and then fly to Santa Cruz de la Palma airport. Otherwise fly to Tenerife and take an overnight ferry with Trasmediterranea  
[www.easyjet.com](http://www.easyjet.com)  
[www.ba.com](http://www.ba.com)  
[www.flymonarch.com](http://www.flymonarch.com)  
[www.bintercanarias.es/ingles](http://www.bintercanarias.es/ingles)  
[www.trasmediterranea.es](http://www.trasmediterranea.es)

### Seeing there

#### El Roque de Los Muchachos

Here, where the observatory is located, is the optimum place to stare heavenwards but mountainous La Palma has many miradores (viewing spots) for superb views.

For more information about the observatory contact the Instituto de Astrofísica de Canarias at [www.iac.es](http://www.iac.es). For details of open days, email [adminorm@orm.iac.es](mailto:adminorm@orm.iac.es). Visit La Palma's tourism website at [www.lapalmaturismo.com](http://www.lapalmaturismo.com)

#### Santa Cruz de la Palma

The island's capital boasts an enchanting old town centre with fine examples of Canarian architecture grouped around charming plazas.

### Surreal sight

The observatory and cluster of domes and telescopic equipment perched on the edge of the volcanic crater (right); banana plantations on the volcanic terraced slopes of La Palma – the island is the greenest of the Canary Islands (below)

