

# Imaging the heavens

**Nik Szymanek is one of Britain's top astrophotographers. He tells Pete Seiden about his imaging techniques and what it's like to go observing at La Palma**



**Nik Szymanek in his Essex-based back-garden observatory. The telescope is a 10-inch Meade LX200. Mounted on top is a Vixen 60 mm refractor used for autoguiding with an SBIG ST-4. Image: Nik Szymanek.**

**A**stronomy is often quoted as the only science where amateurs can usefully assist the professionals, a statement borne out by the increasing number of collaborations and discoveries linking the two groups in recent years. When these joint ventures take place, however, they are never taken lightly, and the professionals demand the very highest levels of work and dedication from the amateurs involved.

One amateur who has consistently demonstrated his ability to assist the professionals is Essex-based Nik Szymanek.

Already a well-known figure in the ama-

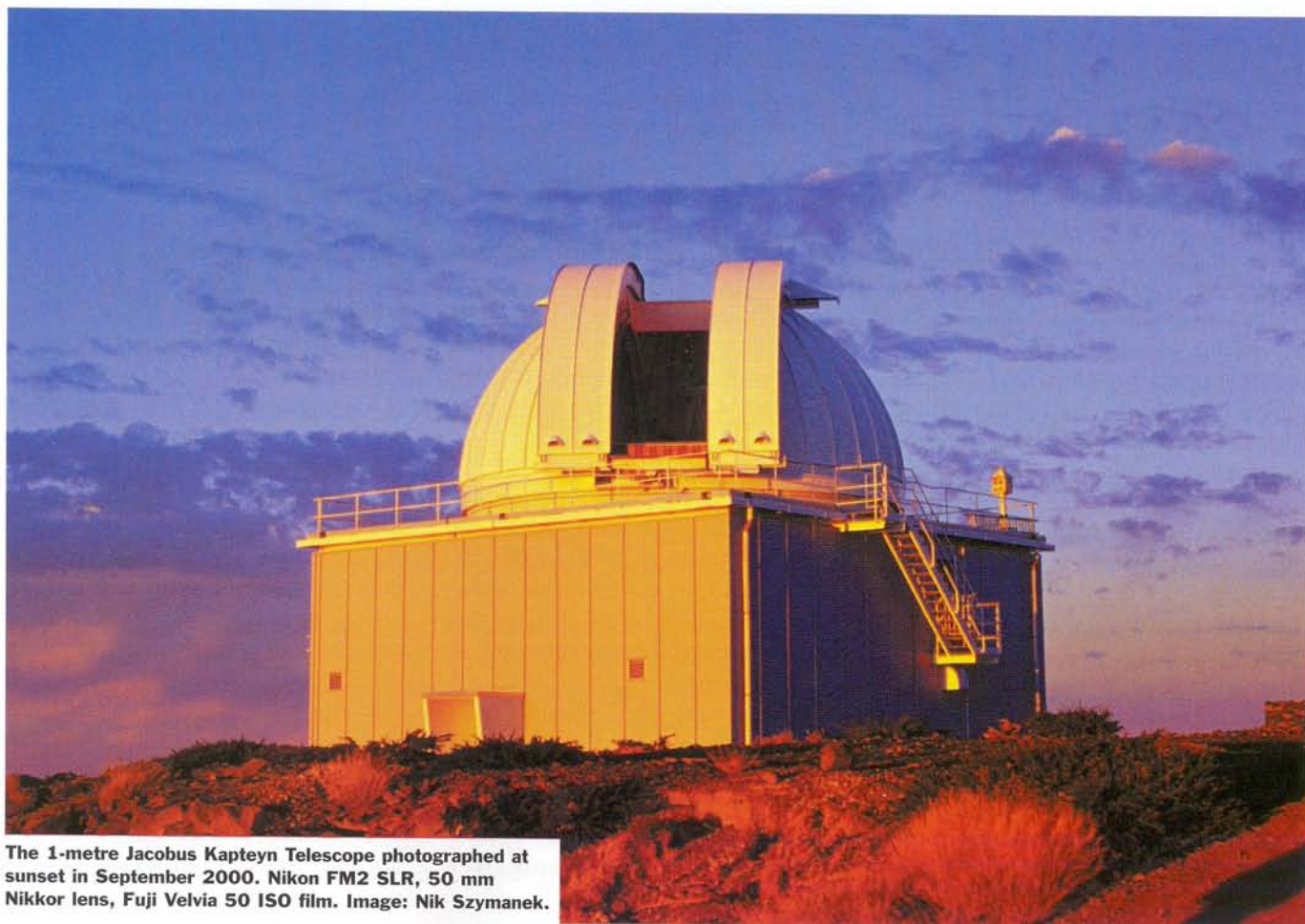
teur scene in this country, he is increasingly being acknowledged in the professional world for his expertise in producing outstanding photographs from the raw scientific images obtained by astronomers at the La Palma observatories in the Canary Islands.

Although Nik does not get involved in the research work carried out at the observatories, he is the man the professionals seek out to process their images for use by the press and other media outlets to publicise the work carried out at the site.

He has had a lifetime interest in the

night sky, but only started taking an active interest in astronomy in 1980. "I spent about ten years as a 'dreaded' arm-chair astronomer, devouring book after book on the subject," he says. "But I did a little practical observing, using mainly binoculars and small telescopes to learn my way around the sky.

Finally, Nik made the decision in 1990 to fully commit himself to observing and purchased a 10-inch Meade LX3 Schmidt-Cassegrain telescope – the forerunner of



**The 1-metre Jacobus Kapteyn Telescope photographed at sunset in September 2000. Nikon FM2 SLR, 50 mm Nikkor lens, Fuji Velvia 50 ISO film. Image: Nik Szymanek.**





The Trifid Nebula imaged using a Meade 10-inch LX200 SCT @ f/10 and an SBIG ST-8 CCD camera from La Palma. This is an LRGB exposure consisting of 4 × 5-minute exposures for the luminance component and colour information, obtained using an SBIG CFW-8 filter wheel. Image: Robert Dalby and Nik Szymanek.

the popular LX200. Extensive visual use of this instrument soon tempted him into the world of astrophotography, something that he had always wanted to pursue, although the results he obtained were limited by the poor skies above his Essex home.

Following the example set by the UK professionals, who had left these shores for the clear skies of La Palma in the Canary Islands, Nik decided to take his telescope to the island and see if the conditions there would allow him to produce better images.

"I'd been kindly invited to visit La Palma with Konrad Malin-Smith and didn't really know what to expect when we got there," he recalls. "We certainly weren't expecting to gain access to the observatory site itself, as we were aware that there is a definite dividing line between professional and amateur observers, but we had two strokes of luck. John Mills, who works at the observatory, arranged access for us and introduced us to a number of working astronomers at the site. Then, Dafydd Wyn Evans, of the Institute of Astronomy, at Cambridge, and Leif Helmer, who are both involved in the

Carlsberg Meridian Telescope at La Palma, arranged for us to use an apartment in the astronomers' complex, which was very fortunate. It has transformed the volume and scope of work we can do when we visit the observatory."

Nik tries to fit in two seven-day trips each year with either Ted Rodway, a

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retired graphics company director, or Ian King, an IT support technician – both fellow amateurs. He has recently returned from his eleventh trip.

#### **Trade secrets**

Nik produces his images using a variety of telescopes and cameras. He tends to do high-resolution work with the 10-inch Meade and CCD cameras, while taking other images with smaller scopes and ordinary telephoto lenses mounted on electronic drives.

Contrary to popular thinking, Nik still prefers to use conventional emulsion film rather than imaging electronically with a CCD camera. "I like Kodak Elite slide film," he says, "which at 200 ISO is quite slow by astronomical standards, but I

think it out-performs every other high-speed film I've tried. It's got excellent reciprocity-failure characteristics, great red sensitivity, very fine grain and it can be pushed one or two stops quite successfully. Another good thing though, is that it's quite cheap!"

Considering he normally exposes around 20 rolls of film per trip, the low cost of the film is a definite bonus. His choice of camera is just as uncompromising. Four Nikon FM2s go with him every trip, while his CCD camera sometimes remains at home.

Nik's normal observing routine at the site is to set up one camera exposing on a Vixen GP driven mount – either on a small telescope or with a telephoto lens. This mount can be easily polar-aligned in about 5 minutes and is good enough to provide excellent constellation pictures using lenses from 28–50 mm and even up to 135 mm on occasions for larger deep-sky objects.

At the same time he has a static, undriven camera, which he uses for imaging star trails. "Star trail shots will probably seem mundane to astronomers in this country," he says. "But the skies are so clear at La Palma that it can be





The beautiful spiral galaxy NGC 7331 in Pegasus imaged by the 1-metre Jacobus Kapteyn Telescope on La Palma. Image processing by Nik Szymanek. Image courtesy Daniel Bramich (ING) and Nik Szymanek.



Nik Szymanek during an observing trip to the island of La Palma. Image: Nik Szymanek and Ian King.

quite difficult to pick out the constellations at times, as they are swamped by the sheer number of background stars not normally visible in the light-polluted areas of England. Also, the sheer beauty of the observatory site means that it's easy to take picturesque compositions using the domes as subject matter themselves. By scanning these pictures into digital format, I can combine them on the computer to produce very nice images." For these shots he exposes each frame for between 8 and 15 minutes.

With such an ideal dark-sky location, the photographic results Nik was able to produce improved dramatically – so much so, that they came to the attention of Javier Mendez Alvarez – the public relations officer of the Isaac Newton Group of Telescopes on La Palma. This group consists of three instruments, the 1-metre Jacobus Kapteyn, the 2.5-metre

Isaac Newton and the 4.2-metre William Herschel telescopes.

As part of his PR role in promoting the work of the observatory, Javier needed a regular supply of high-quality images for publicity purposes. These differed from the raw scientific images produced by the astronomers for their research work and Nik's images looked like they would meet that requirement.

### Of late, Nik has been expanding his horizons by experimenting with a broadcast-quality video camera

"I was approached by Javier and given a CD of raw images taken by the professional astronomers and asked to 'clean them up' for PR purposes on my home computer," he recalls. "They really liked the results and from that day on, I've had a regular supply of images to work on."

As the word of his work spread through the site, Nik was offered the

chance to work with images taken by researchers at times that he refers to as 'targets of opportunity'.

"These occur whenever the professionals are trying out new equipment or accessories such as commissioning a new camera, or on 'engineering' nights, which is when the PR work can come to the fore," he explains. "On these occasions I've been able to suggest suitable objects for them to photograph that I know will produce visually impressive results."

#### Positive feedback

Nik was particularly pleased when he received an email recently from an American magazine picture editor, who had used his processed image of M92 – the globular cluster in Hercules.

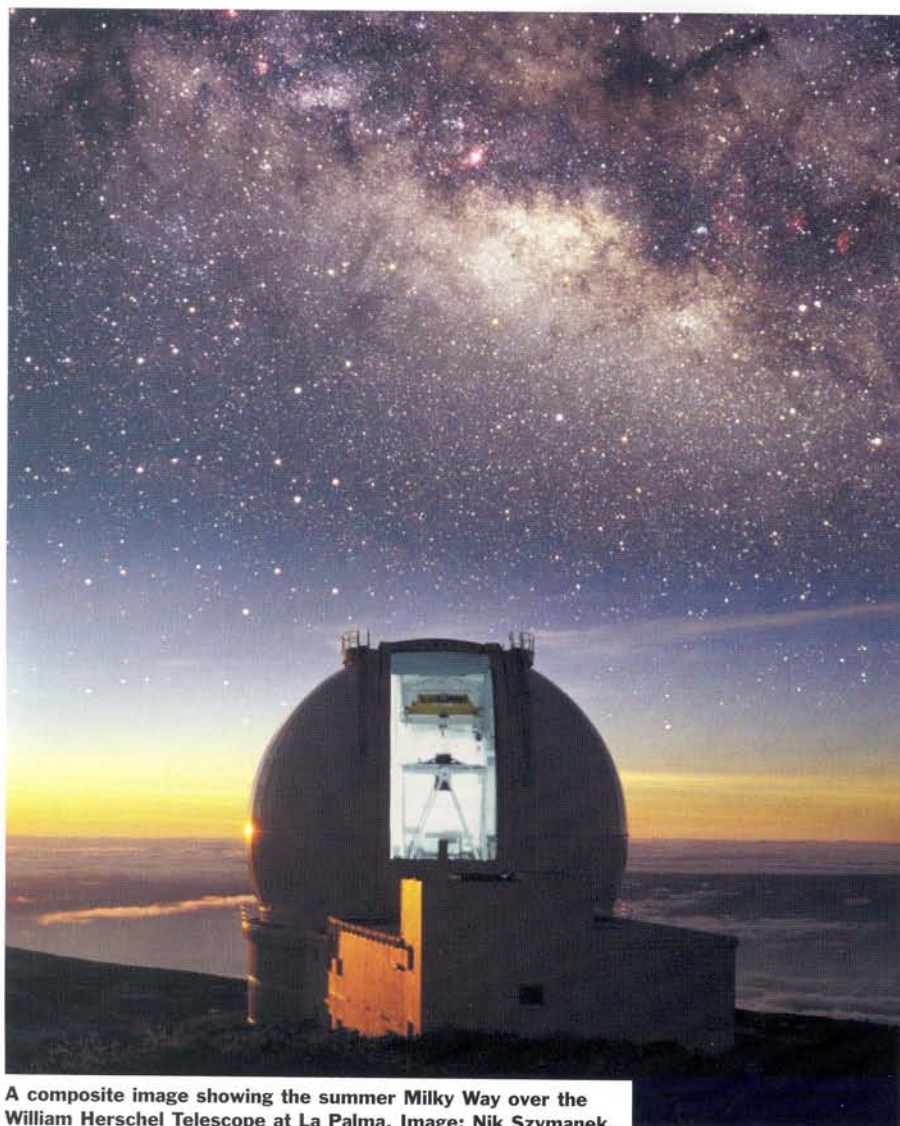
"He wrote that it was one of the best images he had ever seen of that globular, apart from the ones taken by the Hubble telescope, and he thought it even approached that for image quality," he says. "What was really pleasing about that image, was that it came about as the result of a request from the observatory. They had some unexpected free time on the 1-metre Jacobus Kapteyn Telescope, due to some engineering work being carried out, and they asked me for suggestions of objects to photograph. I checked my planetarium software and told them that M92 would be a good one to do and

would be an ideal size for the field of view of the CCD camera. About a week later the CD arrived with the

image, which took me just 15 minutes to process. That was a very pleasing result but was sad also, knowing that this telescope – which was capable of producing such a great result – will be closed later this year."

The images are taken in FITS format – one that all professional observatories use – and copied onto CD for Nik to





A composite image showing the summer Milky Way over the William Herschel Telescope at La Palma. Image: Nik Szymanek.

spruce up. He processes the raw images using Maxim DL and Photoshop software, which are both able to cope with the wide dynamic range in astronomical images. He then sends back low-resolution proofs to the observatory by email for their approval, prior to sending the finished high-resolution images on CD.

Nik has a flexible agreement with the professionals regarding the images he processes. He is free to use each image as long as it is jointly credited to the principal astronomer who made the observations, the ING and himself.

Of late, Nik has also been expanding his horizons by experimenting with a broadcast-quality video camera – taking footage of the various instruments and observatories in action. “I work the video footage in much the same way as my stills,” Nik explains. “I take the raw digital sequences of the domes and telescopes in action and then process the pieces on a

modern PC to produce usable vision bites for television.”

Nik’s enthusiasm was evident as he talked about some of the more dramatic shots he has taken. “On one occasion, Javier was able to set up a two-way radio

### Nik also has a part-time job in the astronomy department at the University of Hertfordshire

link from my video camera position to the observatory and we got the astronomers inside to rotate the dome during the exposures which resulted in some really impressive shots. It’s those sort of occasions that really make the trips worthwhile – plus it’s great fun.”

The public relations department at the observatory is now confident enough with Nik’s work that they pass on many of the requests they receive for footage directly to him to deal with. “For two or three months, I was working on some

sequences for the BBC’s *Final Frontier* programme, hosted by Dr Paul Roche, and I did some for an American company who used them on an astronomy programme in the States.”

Nik describes the work as very similar to making home movies – except that he gets introduced to some of the top astronomers at the site and gets detailed explanations of the work each of them is doing and the equipment they are using. “I think that what I do is good for the observatory in another way as well,” he adds, “as each sequence provides a snapshot in time of the work being carried out there.”

Between trips to La Palma, Nik also has a part-time job in the astronomy department at the University of Hertfordshire, where he assists undergraduate students with observing projects using a variety of instruments. The university has a well-equipped observatory at Bayfordbury, including a range of telescopes with apertures between 8 and 20 inches, as well as many modern CCD cameras and a spectrograph.

### Closing time

One cloud on the horizon for both Nik and La Palma is the closure of the two smaller telescopes in the Isaac Newton Group, due to the decision to redirect resources to the European Southern Observatory, which Britain joined in July 2002.

The 1-metre Jacobus Kapteyn Telescope is closing this year and the 2.5-metre Isaac Newton Telescope in 2004. The remaining ING resources will be concentrated on the William Herschel Telescope. “As usual with these closures, the decisions seem to be based on financial rather than scientific reasons,” Nik says. “It appears that the decision for Britain to become part of the

European Southern Observatory is a very expensive one and will result in drastic cuts not only of the two telescopes, but also in the UK staff numbers at the site.”

Nevertheless, Nik will continue visiting the island, to build further his already impressive collection of stunning astronomical imagery.

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A former magazine editor for the BAA, the FAS and SAGAS, Pete Seiden now devotes his time to documenting and photographing the work of active amateur astronomers and societies.