To produce the real-colour images, the image sets, originally in FITS format, are read into an image processing package called Maxim DL. This programme allows manipulation of ING images as well as powerful image co-addition, calibration and colour combination/balancing routines. Images are saved in a variety of formats including FITS, TIFF and JPEG. It is our intent to produce a finished result that extracts detail from the core region of galaxies as well as any other features, such as rings, gravitational tails, interacting arms, etc. A variety of processing routines will do this successfully, such as logarithmic scaling, but in our opinion the best routine is that of "Digital Development" a software algorithm created by the Japanese amateur astronomer Dr. Kunihiko Okano. Digital Development applies a hyperbolic transfer function that sits neatly between the standard gamma curve and a logarithmic curve. The Digital Development curve is successful for a number of reasons. The steeply rising curve withholds the brightness value of the sky background and as the curve levels out the effect is to enhance the middle-grey tones, typically information which is contained in the overexposed ("burnt-out") core of the galaxy. As the curve finally levels out and flattens this has the effect of compressing the dynamic range of the image. A sharpening routine known as "unsharp masking" is also applied to enhance detail. There are several user-definable parameters within Maxim DL, as well as a preview screen which displays how the image will appear once Digital Development is applied.

Each of the galaxy image components will be processed using the above method. Best (or certainly most spectacular) images are achieved using standard B, R and V images. Additional wavelength data, such as H-alpha components, can be overlaid at any point. Maxim DL allows the colour addition and registration of the individual files but, in our opinion, the best results are obtained using powerful image-manipulation software such as Adobe Photoshop. The FITS files are converted to 8-bit TIFF files after careful scaling, and combined in registration. Further processing such as colour balancing and the removal of unsightly artifacts such as cosmic ray hits, dust-"donuts" and general CCD defects are easily applied in Photoshop.

It is important to realise that the above processing routines are applied to produce aesthetically pleasing images and perhaps not images that are intended for purely scientific research. To be fair, the Digital Development routine extracts more detail than most other applications and performs spectacularly with the nuclei of galaxies and globular clusters. The ING Archive contains many high-quality images taken with the JKT, INT and WHT and these images can be used to demonstrate the quality of ING equipment and, indeed, the quality of the sky at La Palma (see *Sky & Telescope*, June 2001, pp. 44–45).

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ING Stick to the Task – Work for the NSST

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ING recently demonstrated the range of services they can offer to other telescopes by completing a contract for the Royal Academy of Sciences, Sweden for mirror handling, pad gluing and aluminising a pair of 1.4 metre diameter mirrors to be installed in the New Swedish Solar Telescope (NSST) on La Palma.

Mirror handling involved the need to invert the mirrors after unpacking, then placing them face down so that a set of eighteen Invar axial pads could be glued to the rear of each one. This involved rehearsing the procedure with the dummy mirror supplied which matched the size and weight of the actual mirrors (1400 mm diameter, 150 mm thick and 600 Kg). Rehearsal of these operations is vital to avoid unforeseen occurrences that could damage optical components; the more so when they are this size and weight. ING's policy for all of this type of work is that we look after the mirrors as if they were our own.

Once the mirrors were in position the template that defined the position of the axial pads on the back of each mirror was aligned. The mirror surface was prepared by carefully cleaning then grinding the Zerodur in the area of each pad before applying a special primer. The surfaces of the axial pads were roughened. The pads were then positioned and aligned using the jigs supplied, before being attached by the specified two-pack flexible epoxy adhesive. The jigs controlled the thickness of the epoxy under each axial pad to 75 microns. One mirror was completed before the template and jigs were transferred to the second mirror.

The work was carried out in the WHT aluminising area. To cure the adhesive, they had to be kept at an elevated temperature of at least 24 degrees C for seven days. To achieve this a 'tent' was created for each mirror using polythene sheeting and scaffolding, which was then warmed with space heaters to reach the required temperature while minimising the transfer of additional heat to the dome.

While the axial pads were being glued to the mirrors a total of three 'test pieces' (one for each day of gluing) were made using some of the actual epoxy mixes used. The test pieces were axial pads glued to steel plates, which