NAOMI — Common-User Adaptive Optics at the WHT

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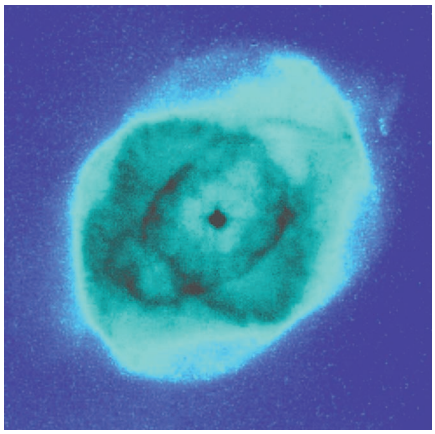
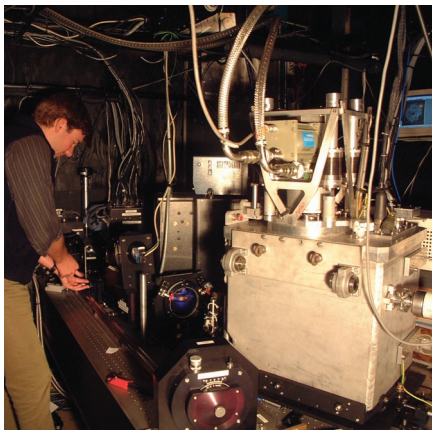
NAOMI, the WHT's adaptive-optics system, is now being used routinely with INGRID, the IR camera, to obtain near-diffraction-limited images at wavelengths 1–2.2 micron (*J*, *H*, *K*, and narrow-band filters). Time allocations are queue-scheduled to take advantage of the best seeing, but visiting observers are also welcome. The images reproduced here and on the front page are from the May 2002 commissioning run. With bright guide stars (V<11), NAOMI improves image FWHM from 0.7 to 0.2 arcsec in *J*, *H* and *K* bands. For V~12, the correction is typically from 0.7 to 0.3 arcsec, and useful correction has been obtained for guide stars down to V~13.5. An uncorrected seeing of 0.7 arcsec in *H* band corresponds to 0.9 arcsec in *V*, well above the median for the site (0.7 arcsec). A summary of measured performance (FWHM, FWHE, Strehl) can be found on the NAOMI web page: `http://www.ing.iac.es/Astronomy/instruments/naomi/`.





Left: Figure 1. N6543 planetary nebula in Paschen beta, 600-sec integration, using central star (V=11) as a wavefront reference. Adaptive-optics correction from 0.7 to 0.3 arcsec. The finest structures visible in the nebula are ~0.3 arcsec across. Image is 30 arcsec top to bottom. Right: Figure 2. NAOMI in GHRIL. INGRID is in the foreground.

Near Earth Asteroid 2002 NY40 was observed with NAOMI on the night 17 August 2002, just before its closest approach to earth. This is the first time an NEA has been imaged with an adaptive-optics system. The asteroid was only ~750000 km away during observation, and moving across the sky at about 5 arcsec per second. Despite the technical difficulties this introduced, H-band images were obtained with a resolution of 0.11 arcsec, close to the diffraction limit of the WHT. This sets an upper limit of 400 m on the projected size of the asteroid at the time of observation.

NAOMI's emissivity in *K*-band is still high (~100%), so programmes which can be observed in either *H* or *K* are probably best done in *H* until the emissivity has been reduced.

NAOMI's coronograph, OSCA, was successfully commissioned in May 2002, by Peter Doel and his team from UCL. OSCA offers 6 focal-plane stops with diameter ranging 0.2–2.0 arcsec. OSCA is offered to observers on a shared-risks basis in 2003A. For further information, see the OSCA web page: `http://www.ing.iac.es/Astronomy/instruments/osca/`.

At the end of 2002, NAOMI will move to a new purpose-built enclosure, GRACE, on the opposite Nasmyth platform (the platform formerly occupied by UES). NAOMI will stay in GRACE permanently, and will be joined by a second science instrument, OASIS, mid-2003. OASIS is the optical integral-field spectrograph formerly at CFHT. NAOMI will deliver significant adaptive-optics correction at optical wavelengths, permitting OASIS spectroscopy of galaxies (and other targets) at high spatial resolution.

The GHRIL enclosure will revert to its original function of hosting visiting instruments and experiments, including further tests by Durham University of wavefront correction using a Rayleigh laser beacon.

In support of future adaptive-optics observations, and in particular in preparation for extensive queue observing, a robotically-operated seeing monitor, RoboDIMM, has recently been brought into use. RoboDIMM (Augusteijn, T., 2001, *ING Newsl.*, **4**, 27), delivers a measurement of the seeing every few minutes, from a small telescope outside the WHT building. ¤

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Figure 3. RoboDIMM tower, dome and telescope.