

MICHELLE

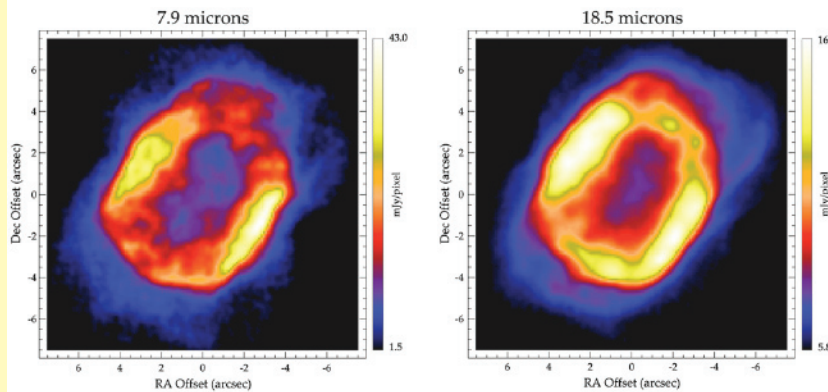
Mid-IR Imager and Spectrograph



Michelle mounted on the up-looking port of Gemini North.

*Offered at **Gemini North***

Michelle Imaging of NGC 7027



Planetary nebula NGC 7027 as seen through the 7.9- and 18.5- μ m narrowband (10%) filters of MICHELLE. North is up and East is left in both panels. For each filter, the on-source exposure time was approximately 30 seconds. The data were obtained using the standard chop/nod technique with a chop throw of 15" at a PA=90. The data were calibrated using observations of Vega. The color table is scaled the same in the sense that the lowest color (dark blue) represents the same percentage level of the peak brightness in both images.

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Queries for Gemini-specific issues should be directed to the Gemini HelpDesk at:

<http://www.gemini.edu/sciops/helpdesk/helpdeskIndex.html>

Images courtesy of the Gemini Observatory and the Michelle commissioning team.



December 2007





Michelle is a mid-infrared (7-26 μm) imager and spectrometer formerly in use at UKIRT and now in use at Gemini North.

Michelle is based upon a Si:As IBC array with a format of 320x240 pixels. When configured as a spectrometer, a plate scale of 0.198"/pixel is used together with one of five gratings, providing spectral resolutions of 100-30,000. In the lowest resolution mode, the entire 8-13 or 16-25 μm window can be recorded in a single exposure, while at higher resolutions the profiles of dust absorption and emission features and velocity profiles of broad lines can be obtained. In echelle mode, Michelle supports velocity-resolved observations of narrow emission lines. When configured as an imager, Michelle uses a 0.099"/pixel plate scale to critically sample the diffraction-limited mid-IR Gemini PSF. Michelle provides background-limited performance in almost all of these modes.

Michelle Characteristics and Capabilities

Science Modes

Broad- and narrow-band imaging at N and Q
 Imaging Polarimetry
 Long-slit spectroscopy: R=100 – 3000
 Echelle spectroscopy: R~20,000

Wavelength Coverage

7-26 μm (dependent on atmospheric transmission)

Detector

Raytheon 320x240 pixel Si:As IBC array
 Switchable-capacitance; deep-well mode for broad-band
 Imaging, medium-well mode for spectroscopy.

Imaging

Image quality approaching the diffraction limit (0.31" at 10 μm , 0.63" at 20 μm)

Pixel size = 0.10"

Field of view = 32"x24"

Six narrow-band filters for use at 7.5-13.1 μm , plus semi-broad N- and Q-band filters

Imaging Polarimetry

Linear polarization only

Self-contained polarizer and analyzer

Spectroscopy

Slit length = 43.2"

Slit widths range from 0.20-1.6"

Pixel size = 0.20"

Adjustable central wavelength

Low resolution chopped, medium-high resolution in stare mode

Wavefront Sensing

No on-board infrared sensors, uses telescope peripheral wavefront sensors.

Grating	Resolving Power	wavelength coverage $\Delta\lambda$ μm
Low N (7-14 μm)	200	7.7
Low Q (16-26 μm)	110	9.9
Medium (7-26 μm)	~1000	1.5
High (7-26 μm)	~3000	0.5
Echelle (7-22 μm^*)	~10,000-30,000	1500 km s^{-1} at blaze wavelength

*some gaps

Information herein adapted from Gemini Web pages.
 For complete information, please see: <http://www.gemini.edu/sciops/instruments/michelle/MichIndex.html>