VATT Instrumentation and Computers

Current instruments and computing equipment available at the Vatican Advanced Technology Telescope are:

VATT CCD Imager - Vatt4k

- A replacement STA0500A back illuminated 4K CCD, ITL serial number 8301, was installed March 2017, and updated 26 January 2018. - It is similar to the September 2007 one, including its QE. - Pixels: 4096×4096, 15×15 microns - Gain:1.9 e/DN - Full well: ADC limited (65k DN) = ~120,000 electrons unbinned - Noise: ~3.9 electrons - Photon Transfer Curve - Gain Curve - FOV: 12.5 arcmin square - pixel scale: 0.188 arcsec/pixel - wavelength range: 300 - 1000 nm, peak 96% at 450 nm - Preamplifiers added October 2008 inside the dewar. These give faster readout and lower noise.

Galway Ultra Fast Imager - GUFI

- This L3CCD system, based on an Andor iXon back-illuminated CCD camera, gives a readout time of only 2ms, extremely high time resolutions of up to 400 images a second (subframed), and very low light level sensitivity.
- Field of view on VATT, 3 arcmin with current focal reducer.
- On loan from NUI Galway, currently until June 2011.
- Consult Richard Boyle for technical details, and see the NUI Galway “Brown Dwarfs and Substellar Objects” group.

VATT CCD Spectrograph - VATTSpec

- VATT4k
- This optical region spectrograph has AR coated refractive optics, with a beam size at its camera of 125 mm, giving ...
- slit length: 30 arcsec
- wavelength range: 360 - 950 nm
- spectral coverage: 100 nm at 0.1 nm resolution
- spectral resolutions: 0.1, 0.2, and 0.4 nm with 1 arcsec wide slit
- detector: back illuminated, low noise CCD STA0520A, with very nice cosmetics.

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ITL Serial Number 8228
2688x512 pixels, 15x15 microns
Detector operating temperature -110C
Gain: 1.3 e/DN with setting 10; 2.6 e/DN with setting 5
Full well, both gains: ADC limited (65k DN) = 85,000 or 170,000 electrons
Noise: 3.4 electrons (3.2 in overscan region)
QE Curve
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- efficiency: determined by Mark Wagner for telescope plus spectrograph

- further details are under the Instructions for use of the VATT Spectrograph.
- bandpass filters available: S8612 (red blocking); GG-400, GG-475, OG-550 (cut-offs to the blue in nm).

Offset and slit-viewing guide box with CCD guide camera

- provides interface to derotator for all the above instruments. - effective back focal distance, from guide box to focal surface, is 2.000“. - contains two filter wheels, each holding four 3.48” square filters. Adapters to accommodate 2“ and 3” square filters are available. - UBVRI, uvby, Vilnius, Sloan, ECAS, and Order Blocking filters are currently provided. - integrating sphere with continuum and calibration lamps.