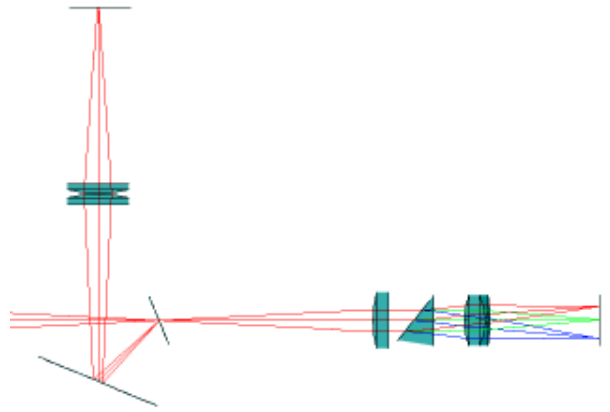
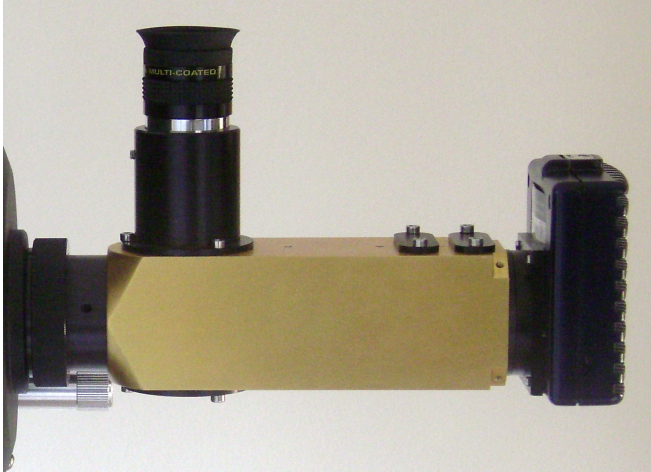


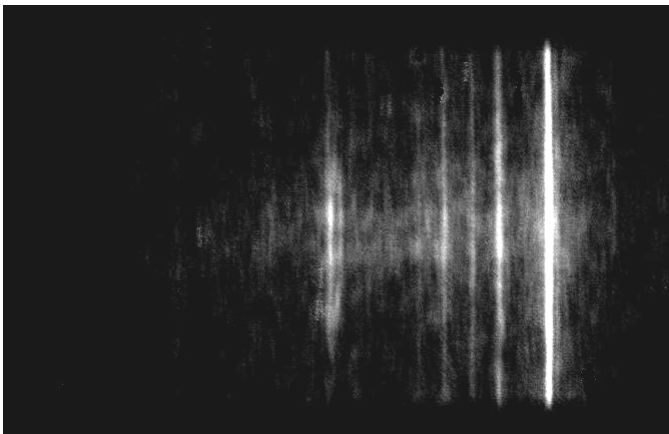
EI CCDSPEC



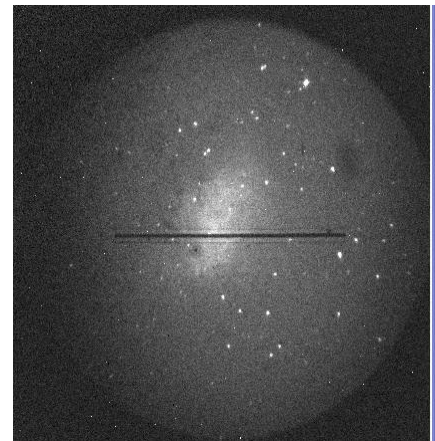
Elliott Instruments new CCDSPEC has been specially designed for amateur astronomers and small observatories, to take scientifically useful spectra of astronomical objects, from stars and nebulae to the red-shifts of galaxies and supernovae.

Features

- UK designed (Dr Ken Elliott, Anglo-Australian Observatory and Universities of Manchester and Birmingham)
- UK manufacture - CNC machined from a solid block with all components precisely aligned.
- "Plug and Play": no adjustment needed apart from fine focus.
You can have impressive spectra within minutes of taking the CCDSPEC from its box
- Operates with any CCD camera (back focus 0-18mm) so suitable for amateurs who already have a CCD camera.
- Slit viewing for acquisition and guiding by eyepiece or any CCD camera or auto-guider for long exposures.
- Compact design: only 50x50x150mm.
- Highly efficient grating / prism gives the whole of the visible spectrum with a resolution of 1.5nm.
- Optimised for f/10 telescopes or slower.
- T-mount with M42 entrance and exit fittings.
- Supplied with *PCSpectra* software for analysis and display of your data.



Spectrum of the Crab Nebula showing the split [OIII] line



The Crab Nebula on the slit of CCSPEC

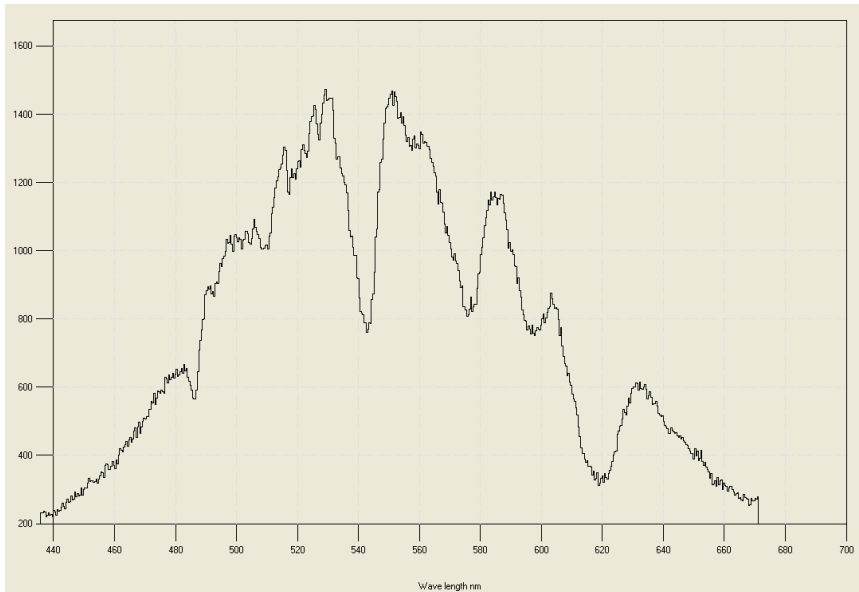
The splitting of the [OIII] 5007 Å line is caused by the Doppler shift due to the expansion of the supernova remnant at 1500km/sec
The strong lines are night sky lines, but the continuum (double horizontal band at centre) is the synchrotron radiation from the pulsar!

Description

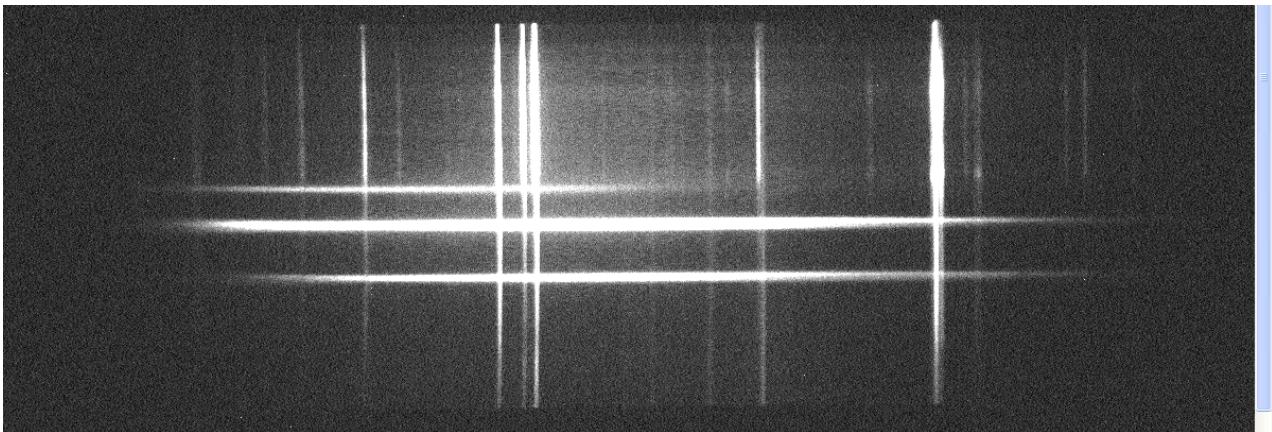
The light from the telescope is focused on to the slit, which is 4 arcsec wide so that most of the starlight will enter the spectrograph even in poor seeing. The slit is 8 arcmin in length so can be used to sample large areas of the sky, such as nebulae and galaxies, when it will give 2D spectra. The slit is normally aligned E-W so that guiding is easy on an equatorial mount, but the instrument can be rotated on the telescope so that it can for example be aligned along the axis of a galaxy or can be set to take the spectrum of more than one object at a time, e.g. Jupiter and its moons or a binary star.

Light which doesn't go into the spectrograph is reflected from the slit and is refocused into the guiding port, where it can be viewed by an eyepiece or an auto-guider. The image of the slit in the guiding port is de-magnified by 2, so is 4 times brighter and the 10mm field of view is imaged as a 5mm circle, which easily fits on most webcams or auto-guiders. The eyepiece or auto-guider simply focuses by sliding in the port and once focused is locked in place.

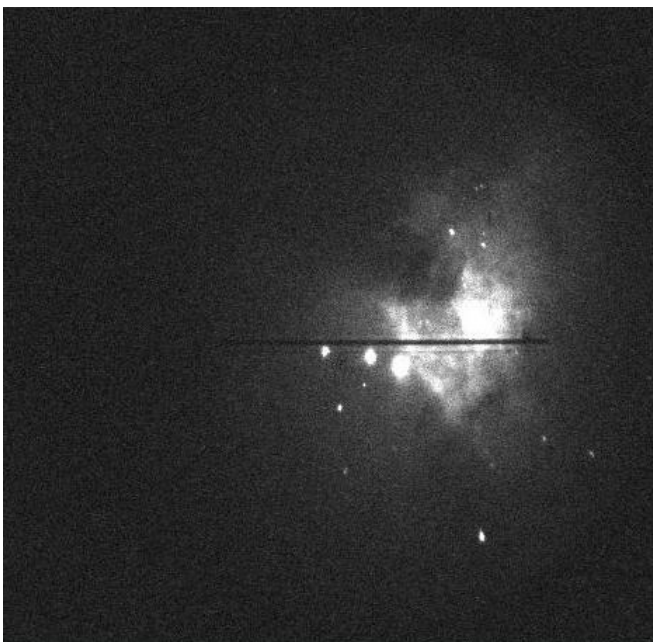
The collimator, grating, prism and camera lens produce a visible spectrum at a dispersion of 64nm/mm at the CCD. The camera lens focuses the spectrum onto the CCD, and the focus is adjusted by a vernier which is accessible through the focus hatch. The projected slit width at the CCD is ~18 microns, and it is this size that decides the resolution, as long as the CCD pixels are smaller than this. Special M42 adapters are available for most CCD cameras which have a back focus in the range 0-18mm. As the spectrograph is all refractive, there is some residual chromatic aberration outside the visible spectrum (400-700nm). This is small but it is possible to re-focus the camera for wavelengths of interest outside the visible range.



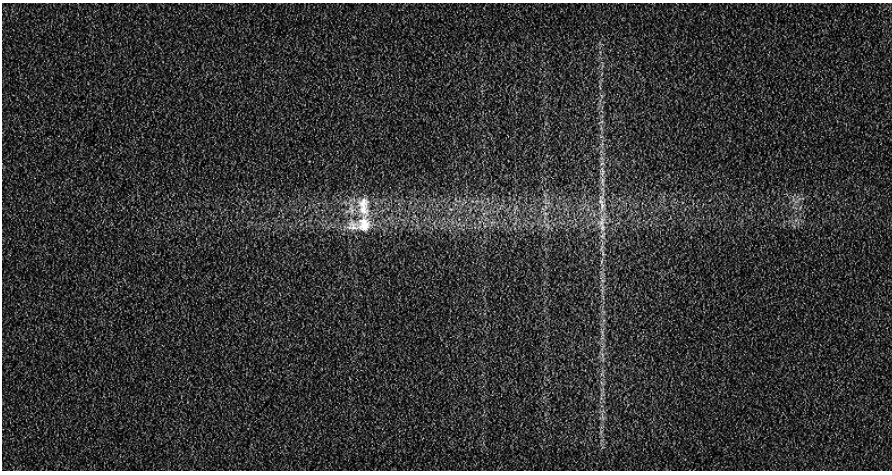
Methane absorption bands in the spectrum of Uranus



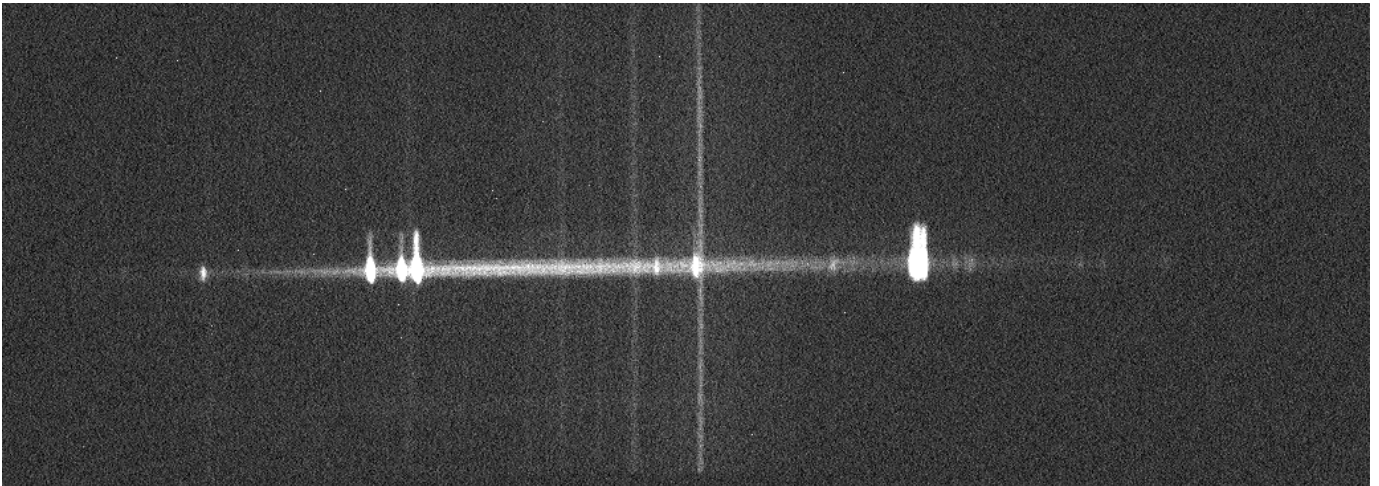
The spectrum of the Orion Nebula showing emission lines of Hydrogen, [NII], S[II] [NII] and [OIII] as well as 3 stars which appear as bright bands, showing almost no absorption lines as the stars are so hot.



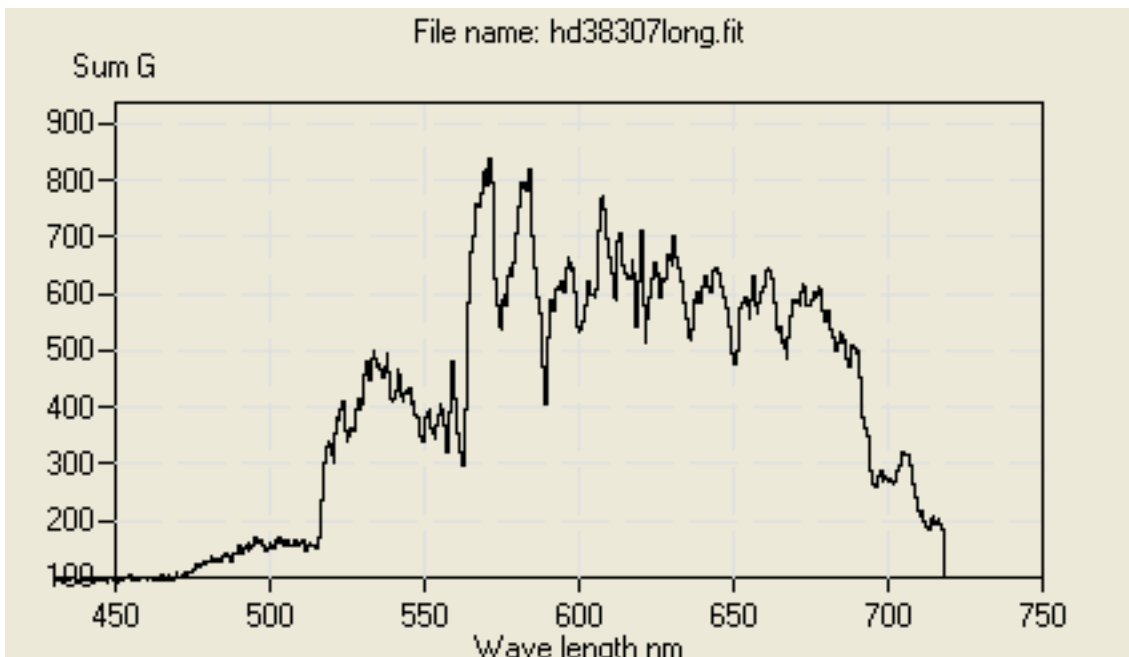
Orion Nebula on the slit of CCDSPEC



The spectrum of the Seyfert Galaxy M77 showing the [OIII] lines and the velocity broadened H alpha line



The spectrum of the Planetary Nebula IC418 showing the continuous spectrum of the central star and emission lines from the ionised gas. The long lines are all night sky emission.



The spectrum of a very cool Carbon Star, showing absorption bands of molecular carbon

Specification

Input Focal Ratio	10	on 8" f/10 SCT
Slit Viewing Field of View	10mm	16.9 arcmin
Slit Length	5mm	8.45 arcmin
Slit Width	40 microns	4.1 arcsec
Slit Viewing Magnification	0.5 (4x brighter)	
Projected slit width at CCD	18 microns	
Linear Dispersion	64.3 nm / mm	
Spectral Range (DSI II)	325nm – 725nm	
Resolution	1.5nm (400-700nm)	
Size	50 x 50 x 148 mm	
Weight	890g	



CCDSPEC mounted on an 8" Meade LX90 scope.

List price £1080 + UK VAT at 20% = £1296

CCDSPEC patent pending 1120579.6



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