Espectroscopía astronómica

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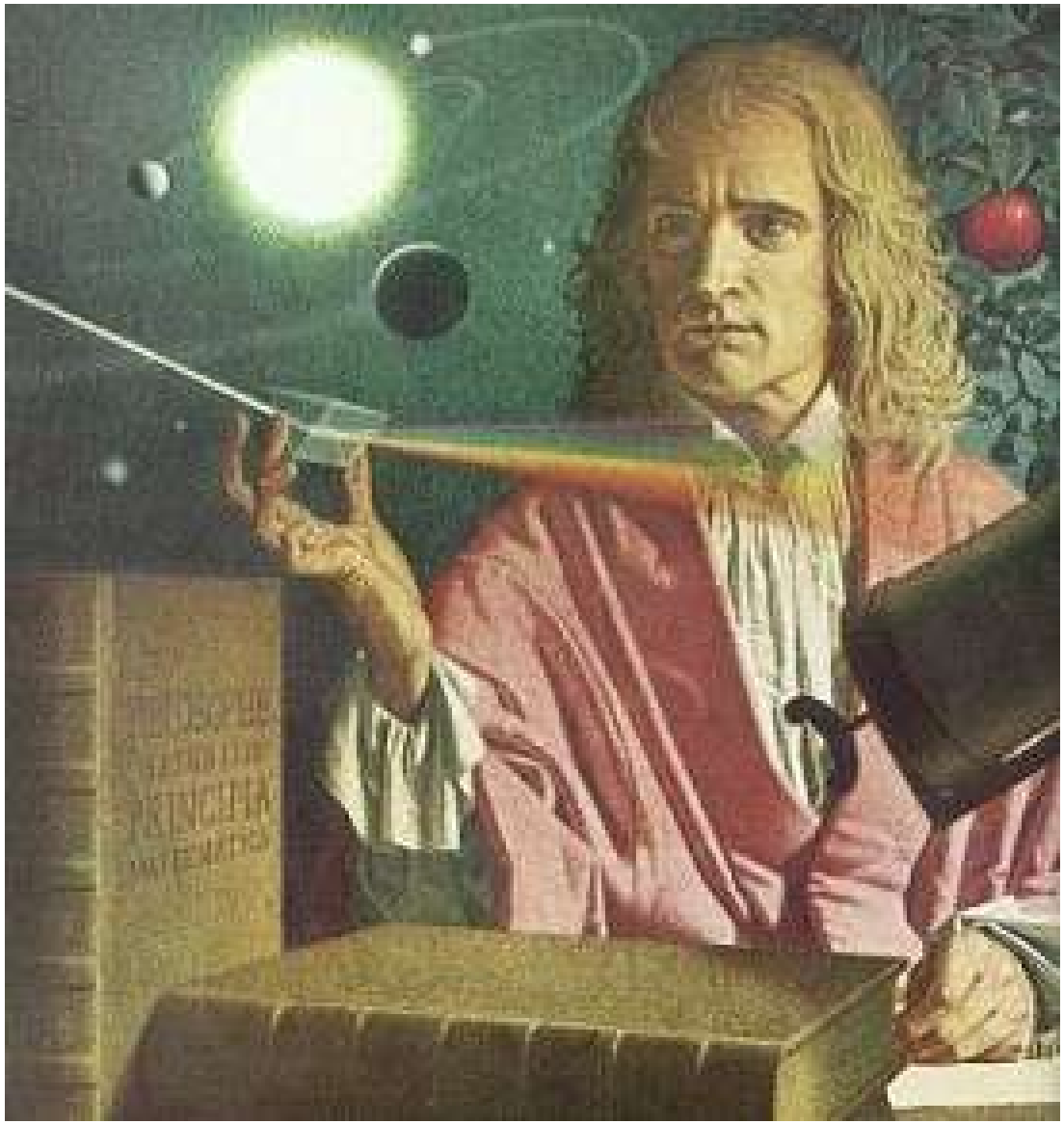
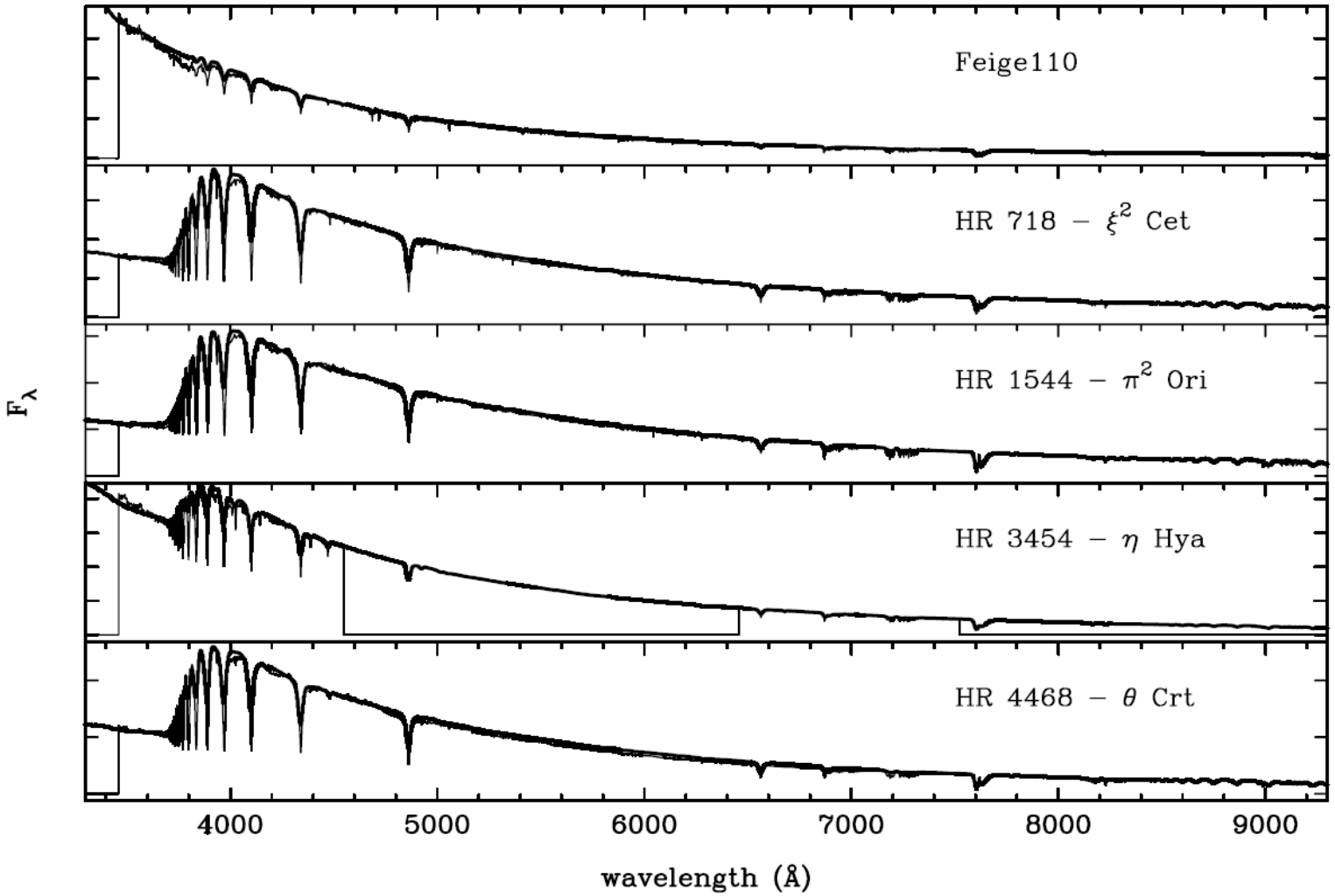
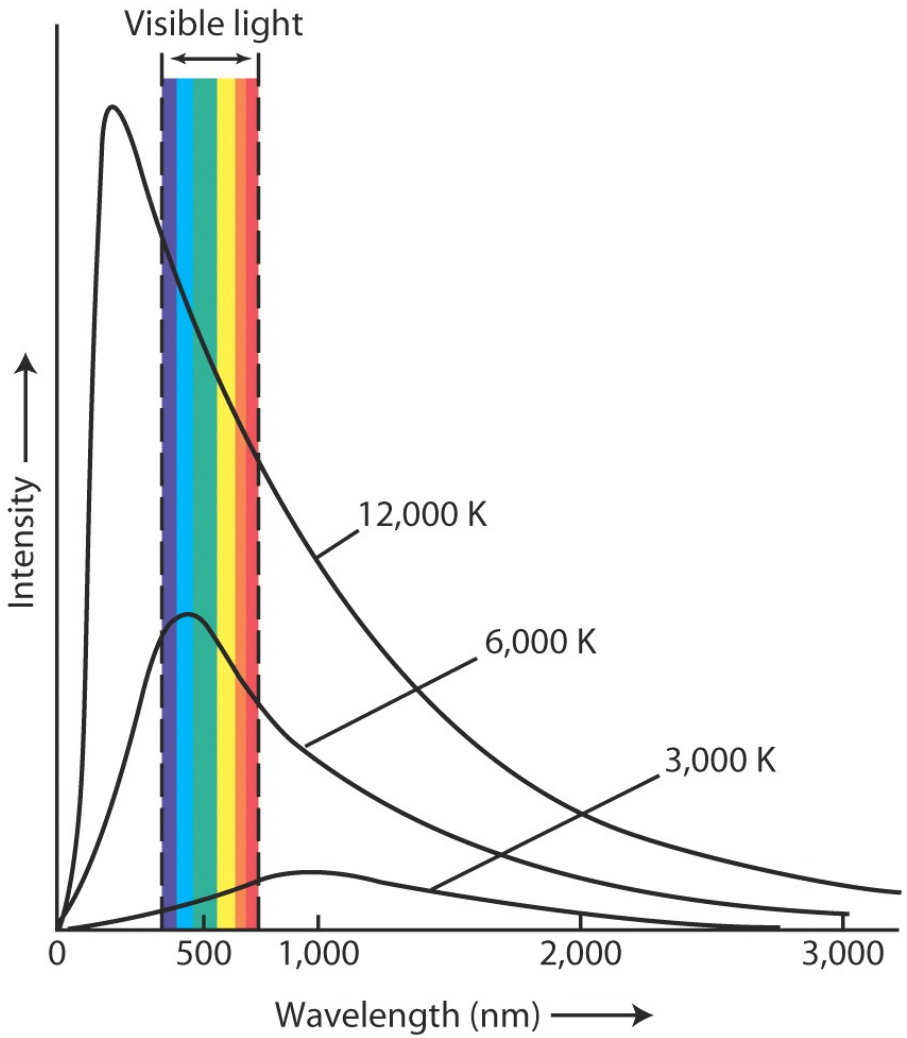
GEOS meeting 2014, Ca' del Monte



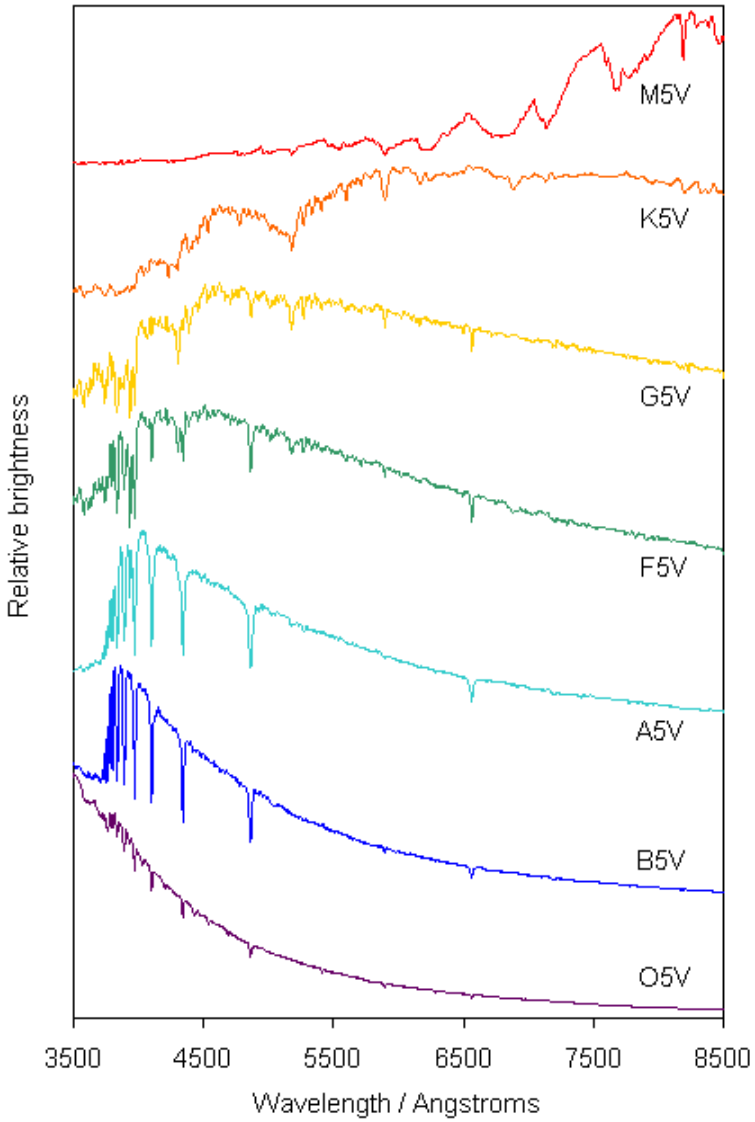
Espectros estelares



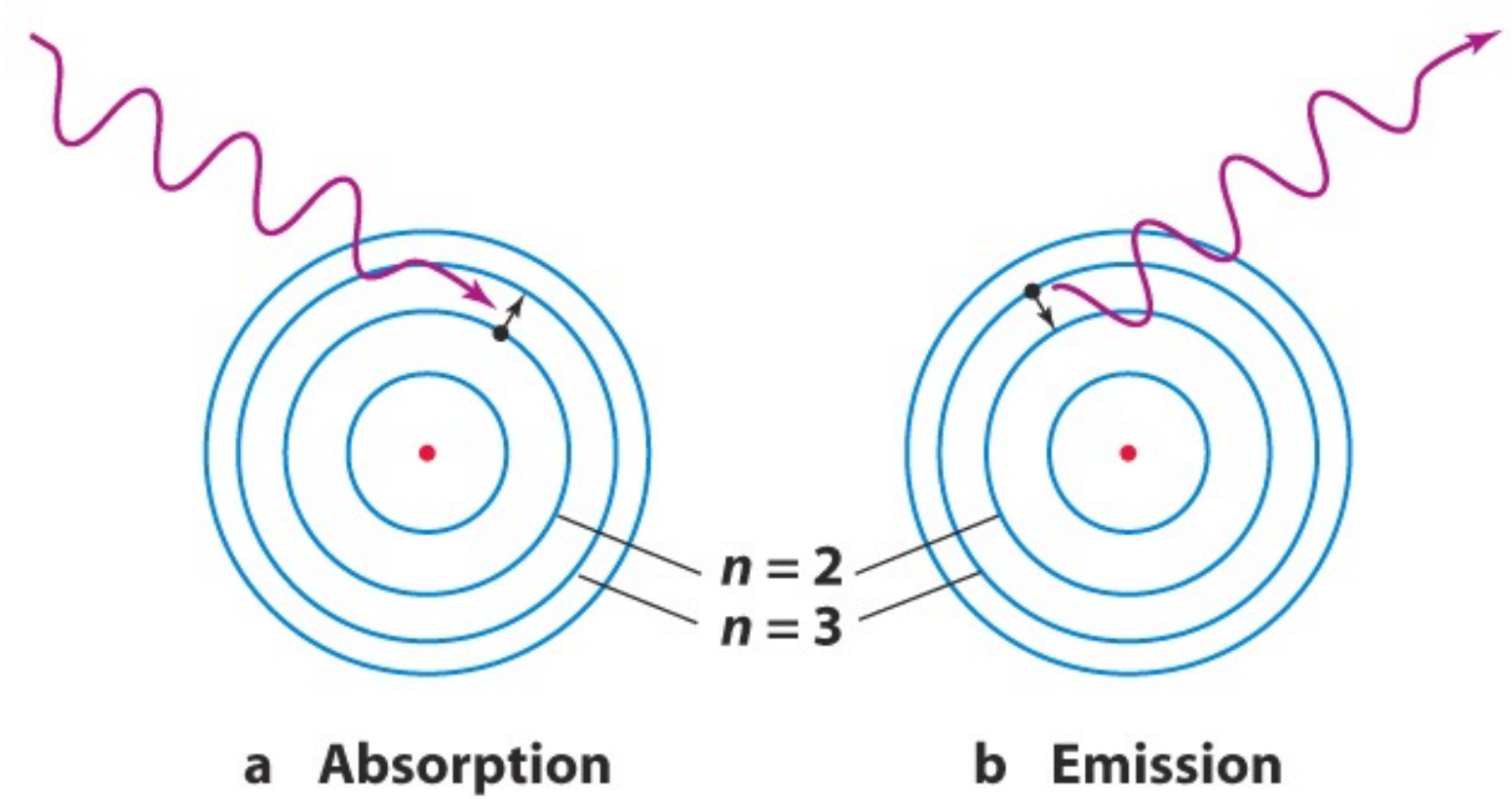
Formación del espectro: contínuo espectral



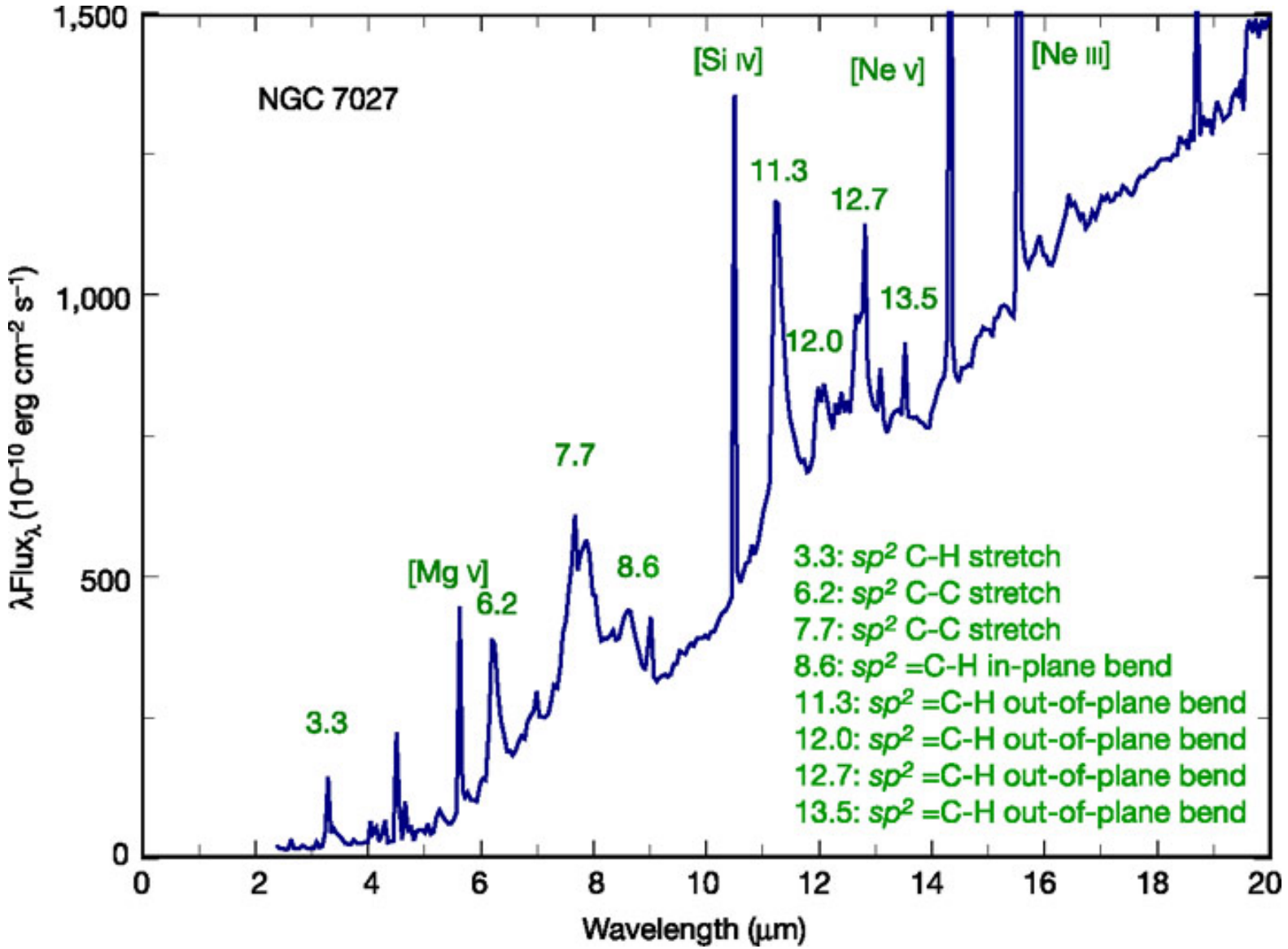
Análisis espectral: el espectro contínuo

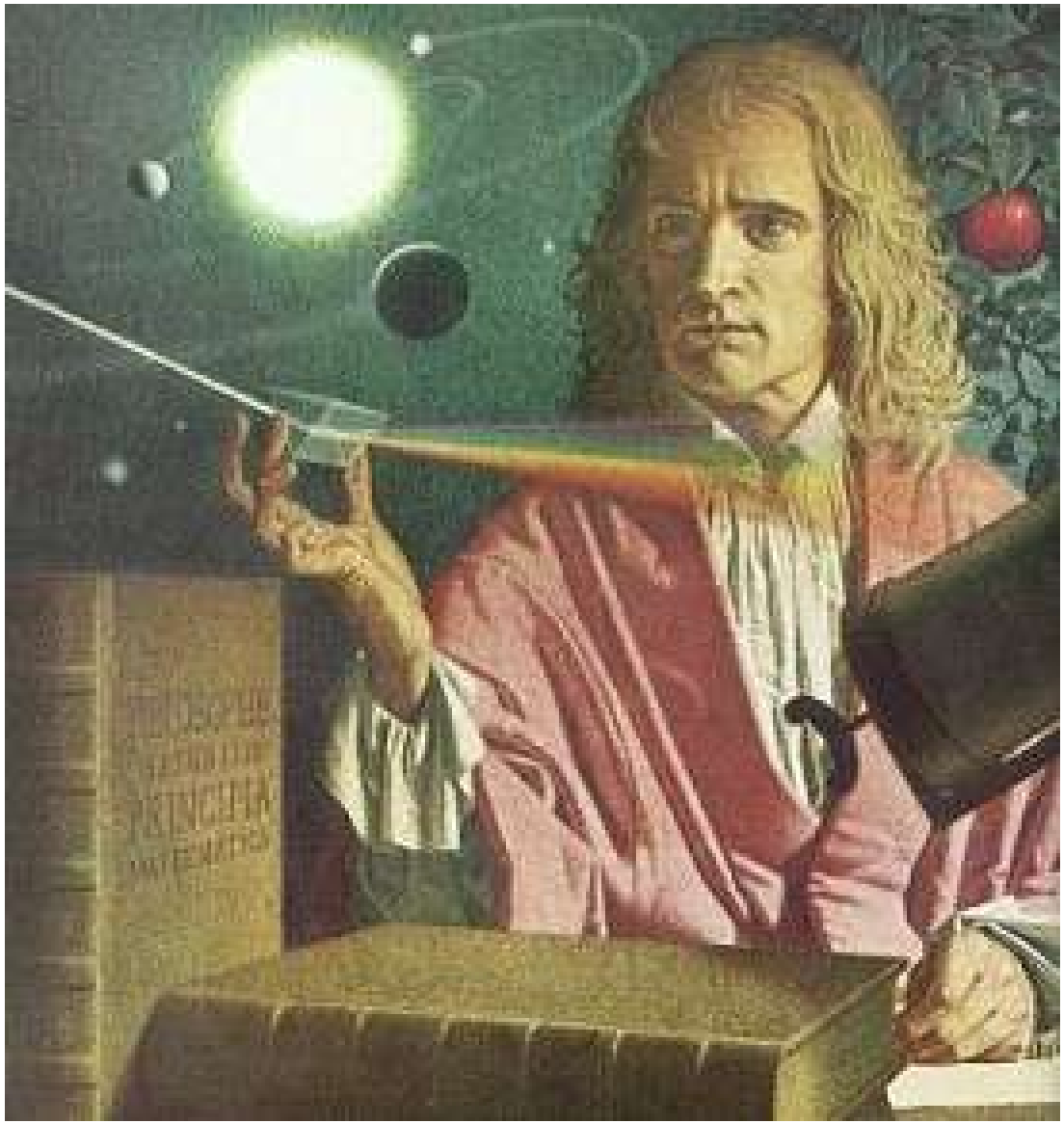


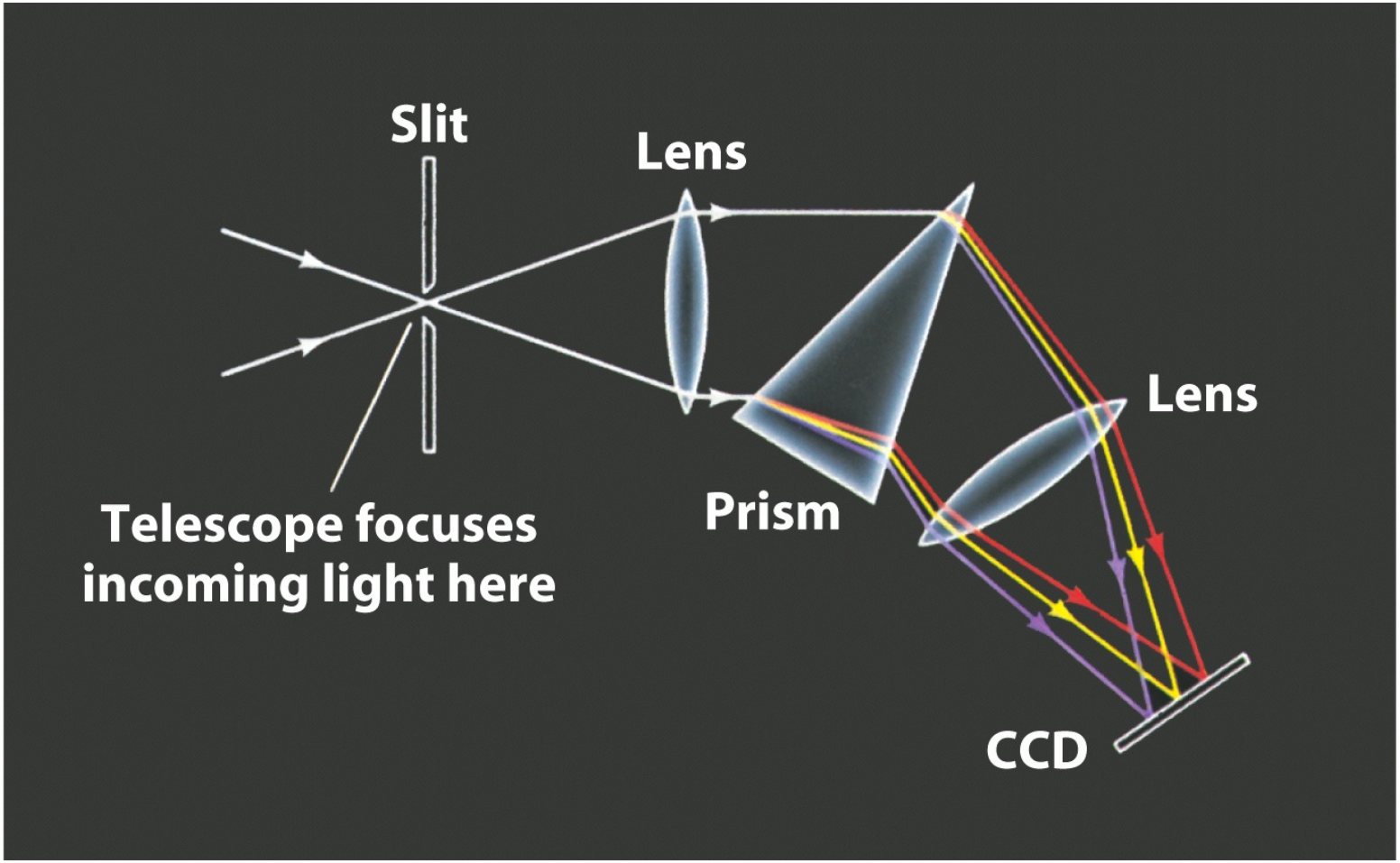
Formación del espectro: líneas

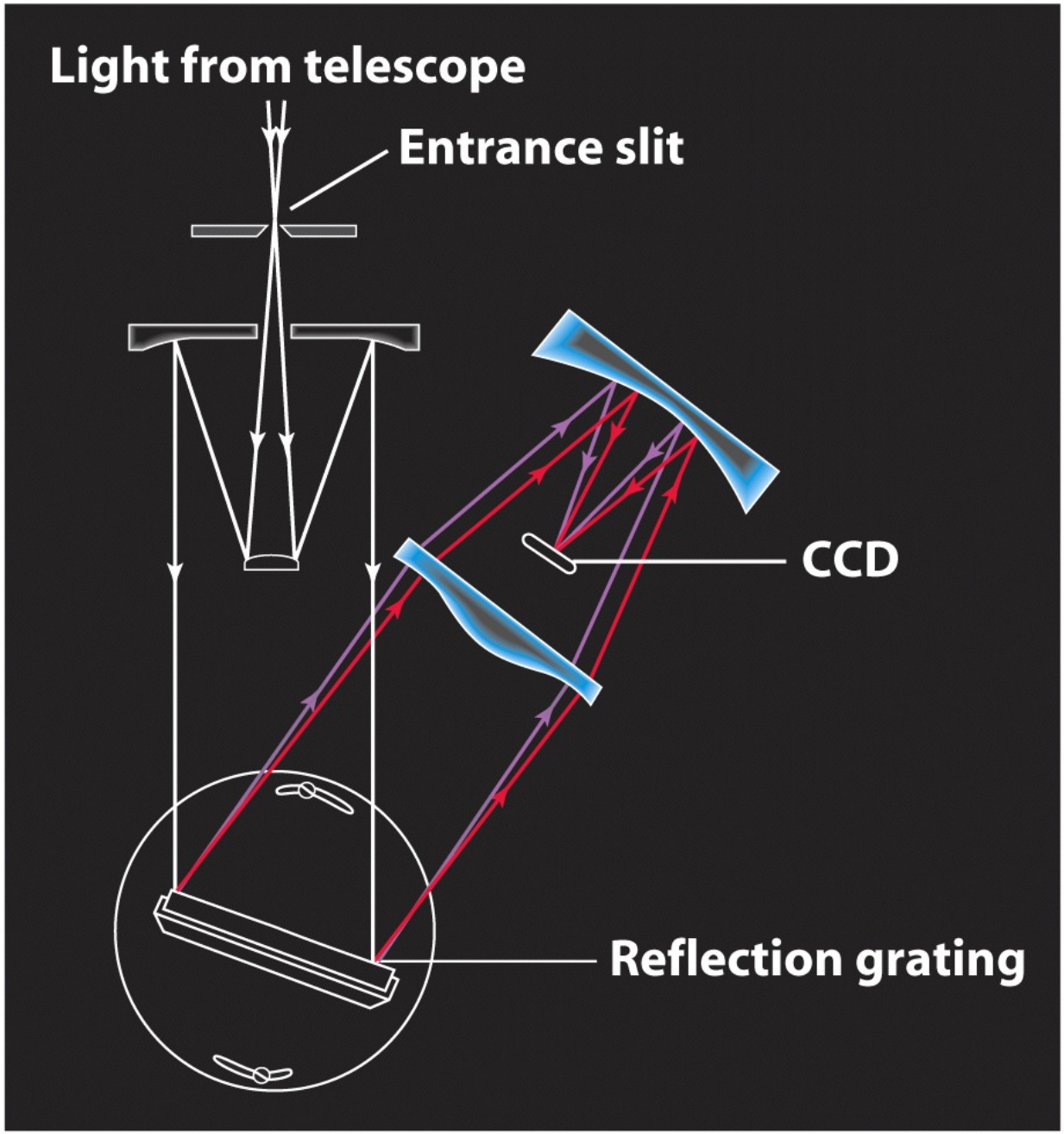


Líneas de emisión






Slit
Lens
Lens
Prism
Telescope focuses
incoming light here
CCD


Light from telescope
Entrance slit
CCD
Reflection grating

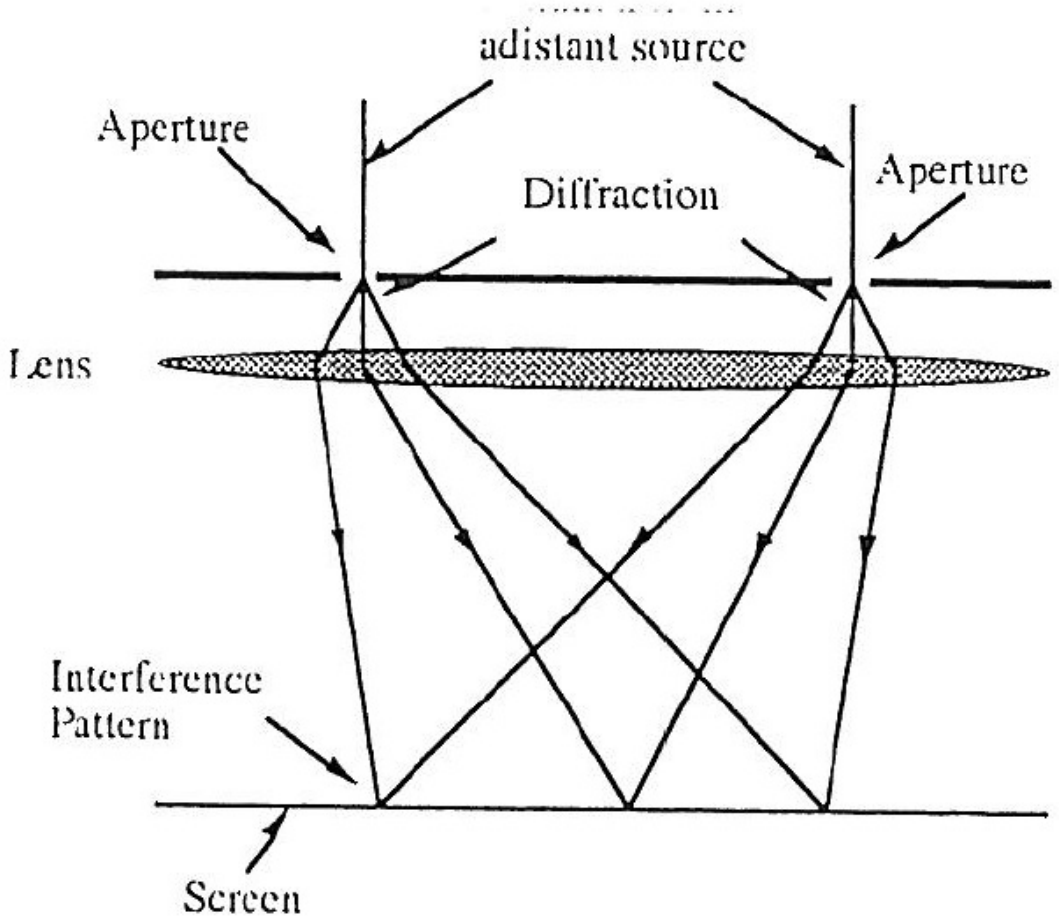


Figure 8.1 Fraunhofer interference from a pair of apertures.

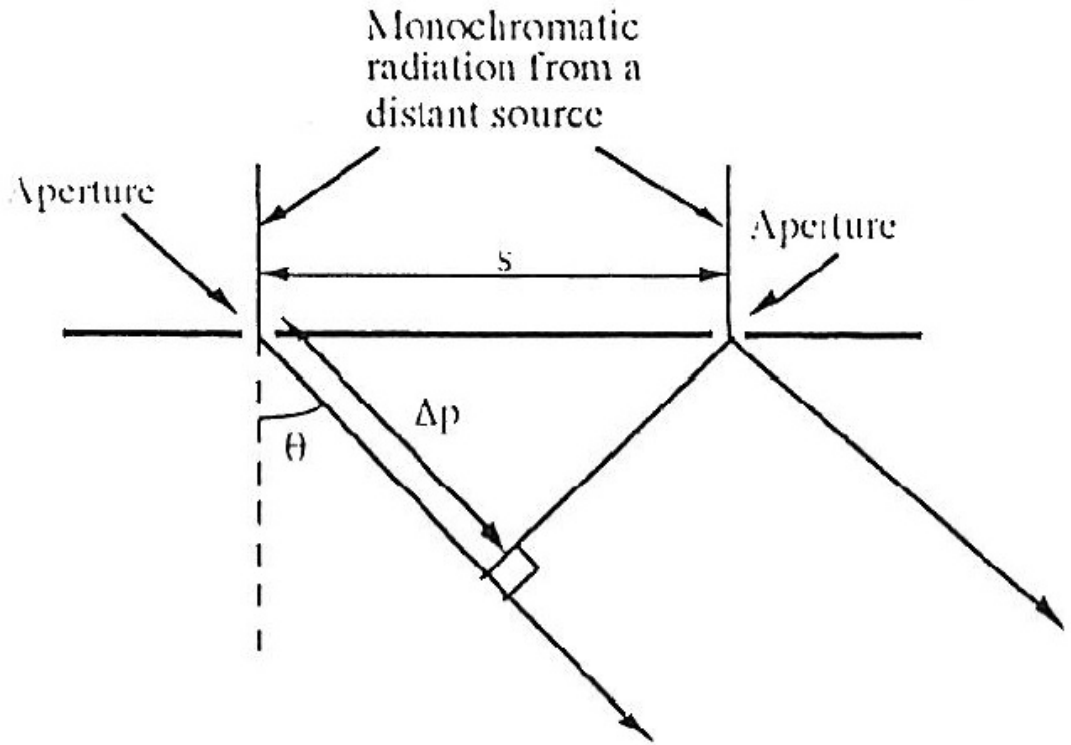


Figure 8.2 Path difference in Fraunhofer interference at two apertures.

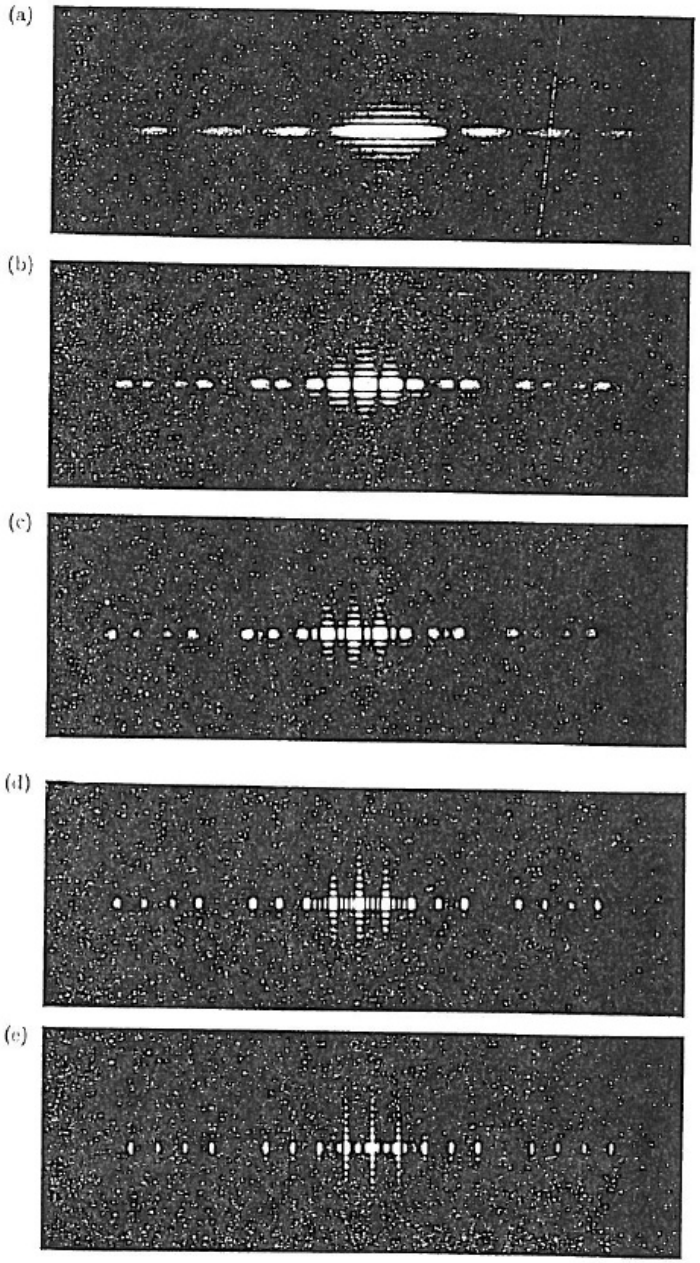


Figure 8.3 Fraunhofer interference patterns: (a) from a single aperture, (b) from two apertures, (c) from three equally spaced apertures, (d) from five equally spaced apertures,

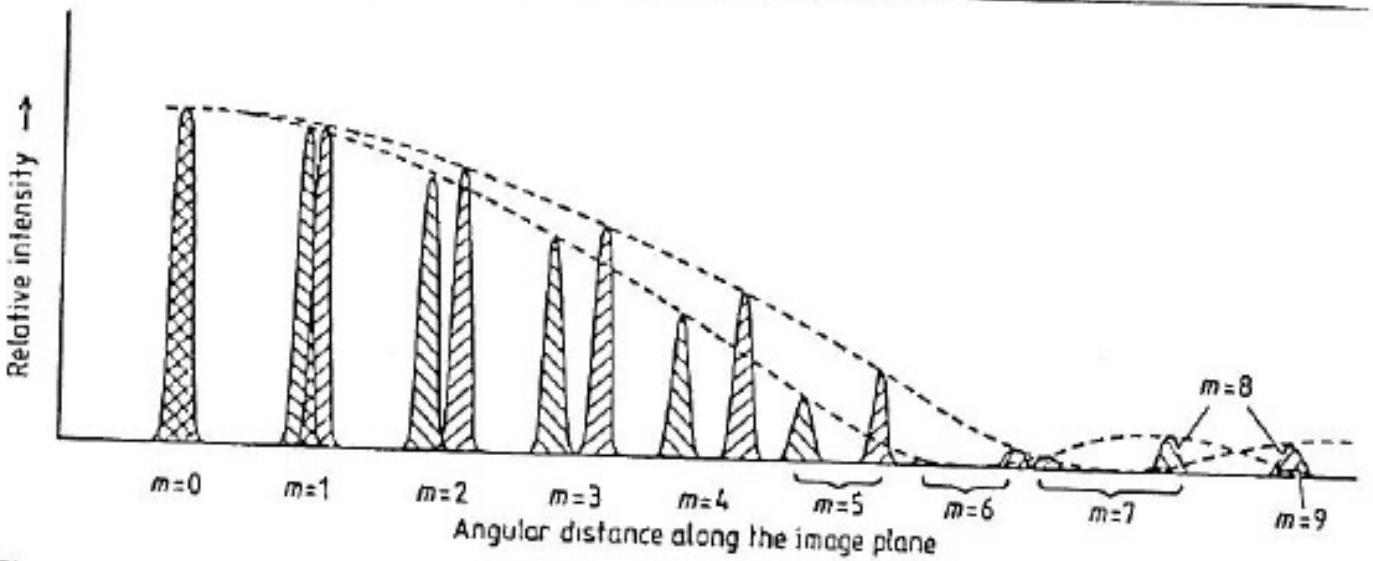


Figure 4.1.10 A portion of the image structure for a single bichromatic point source viewed through several apertures.

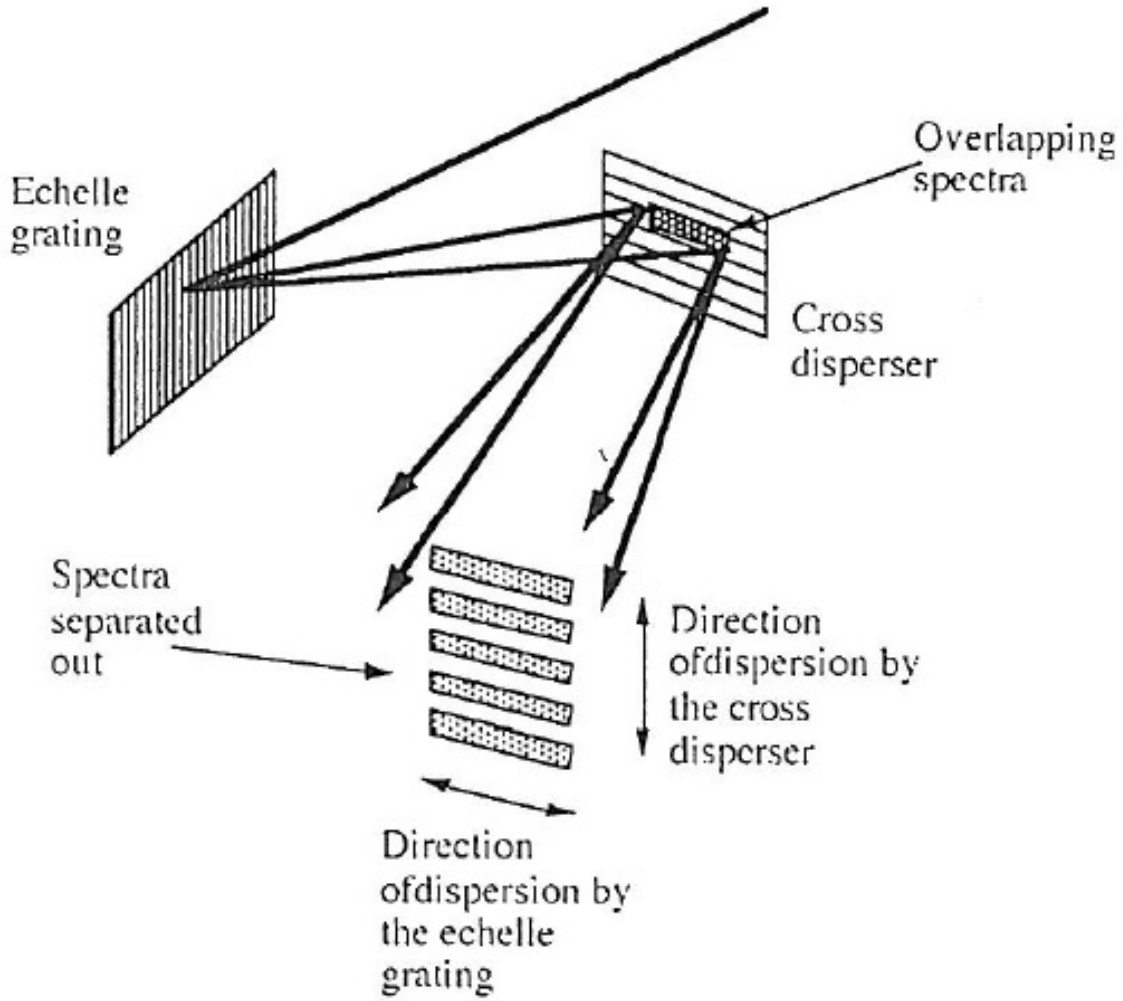
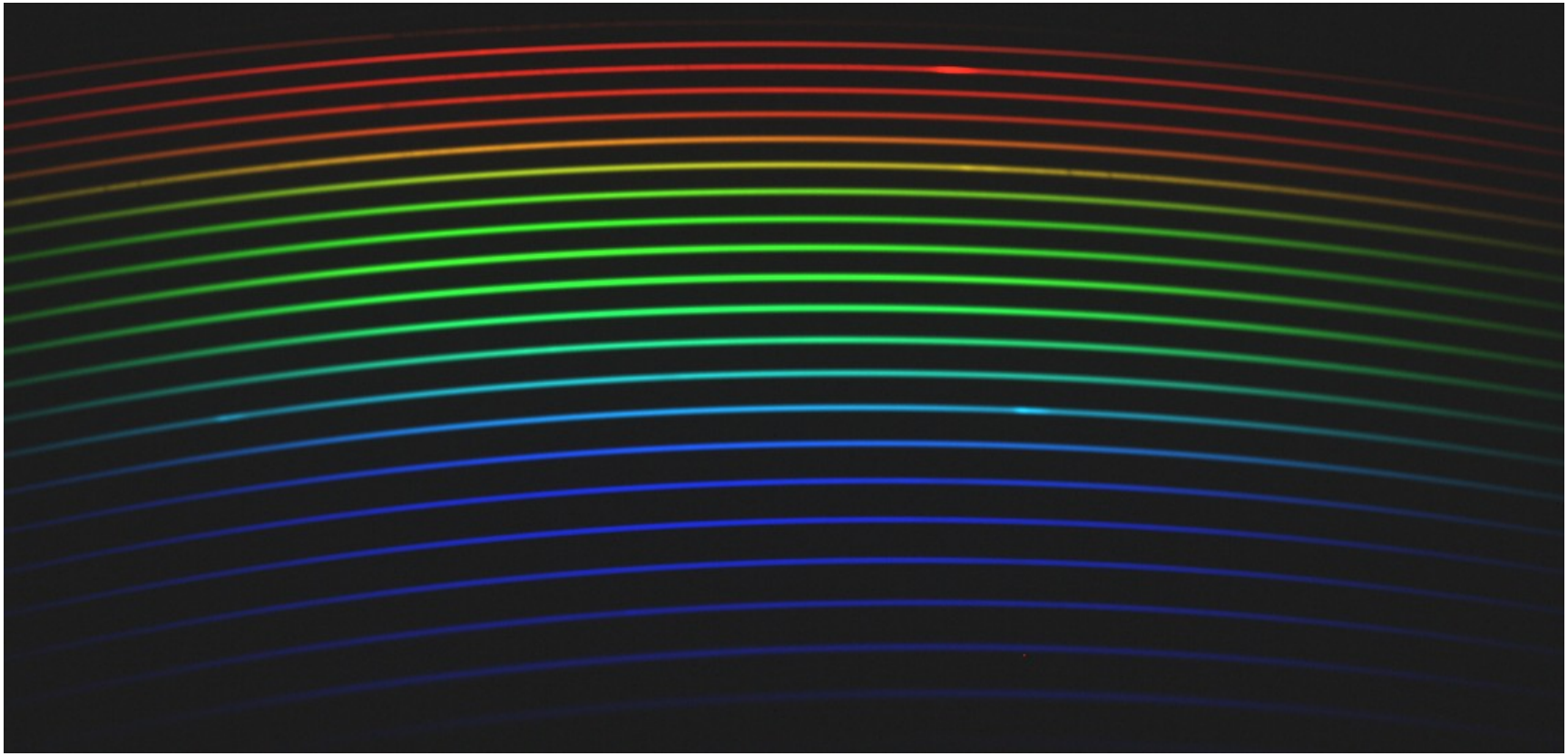
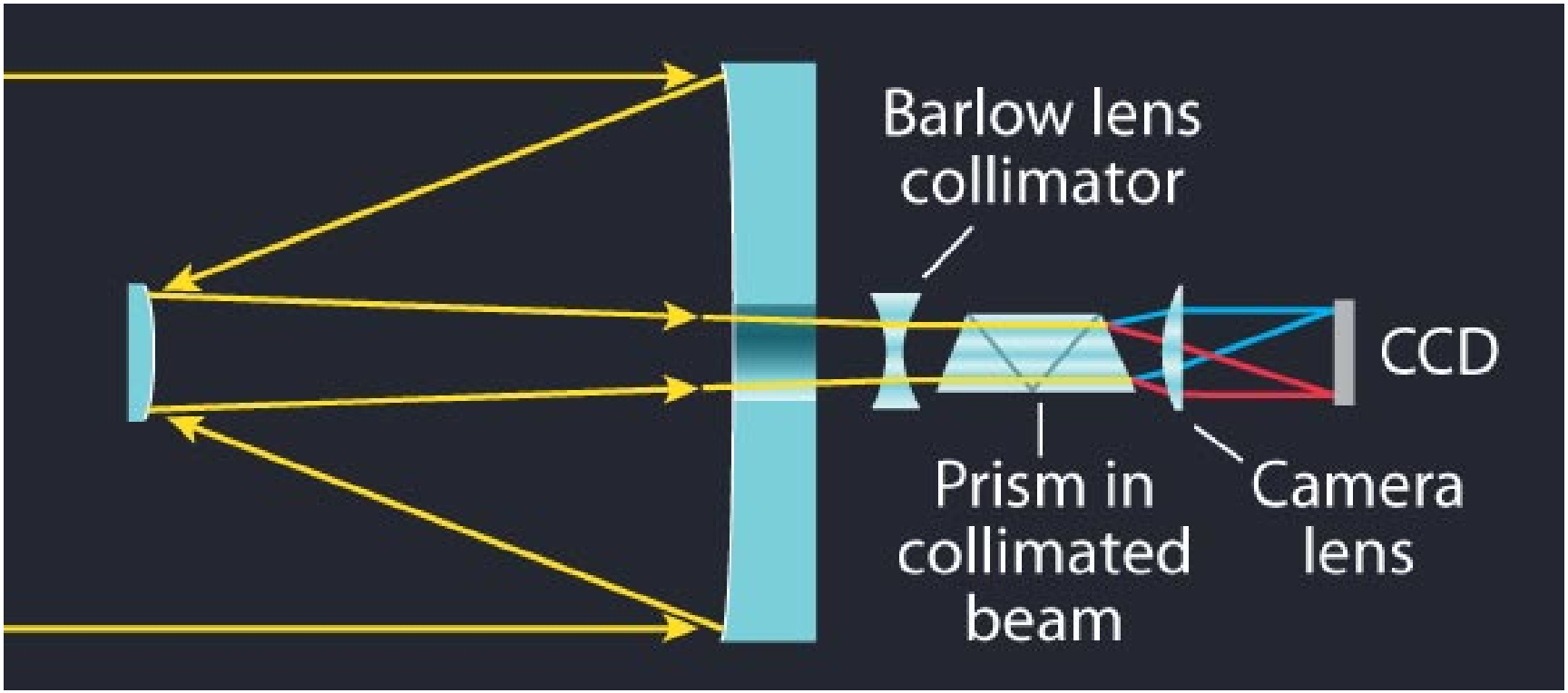
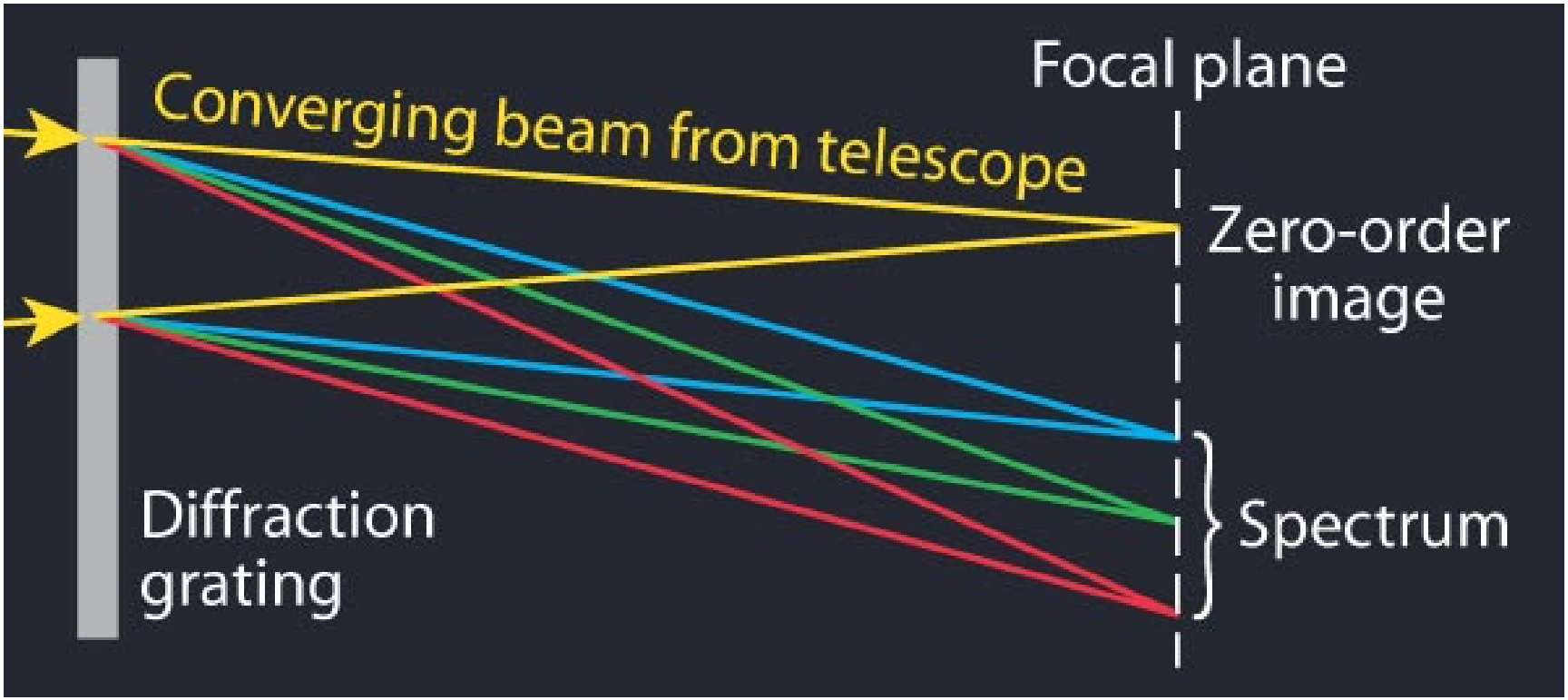
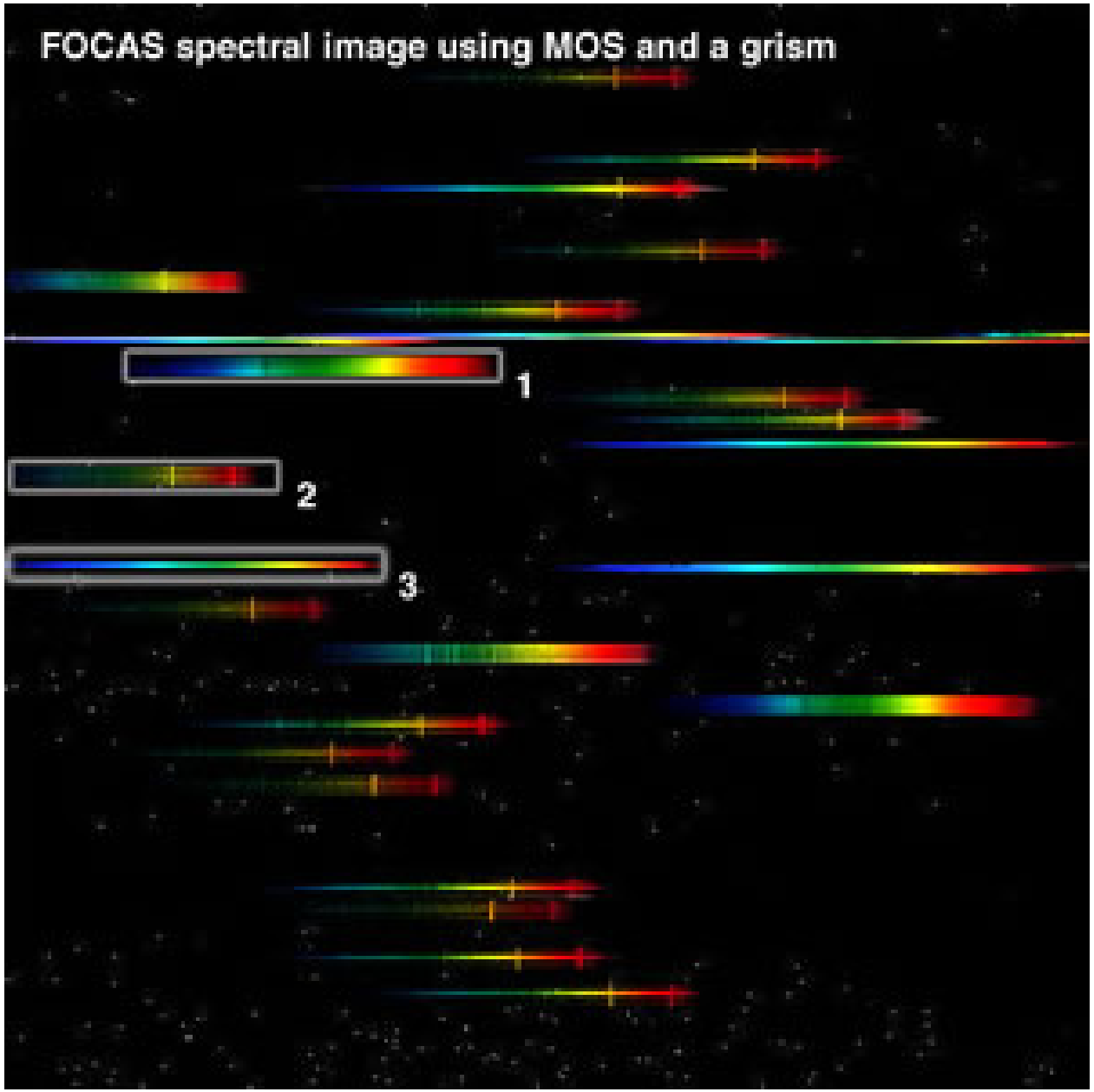


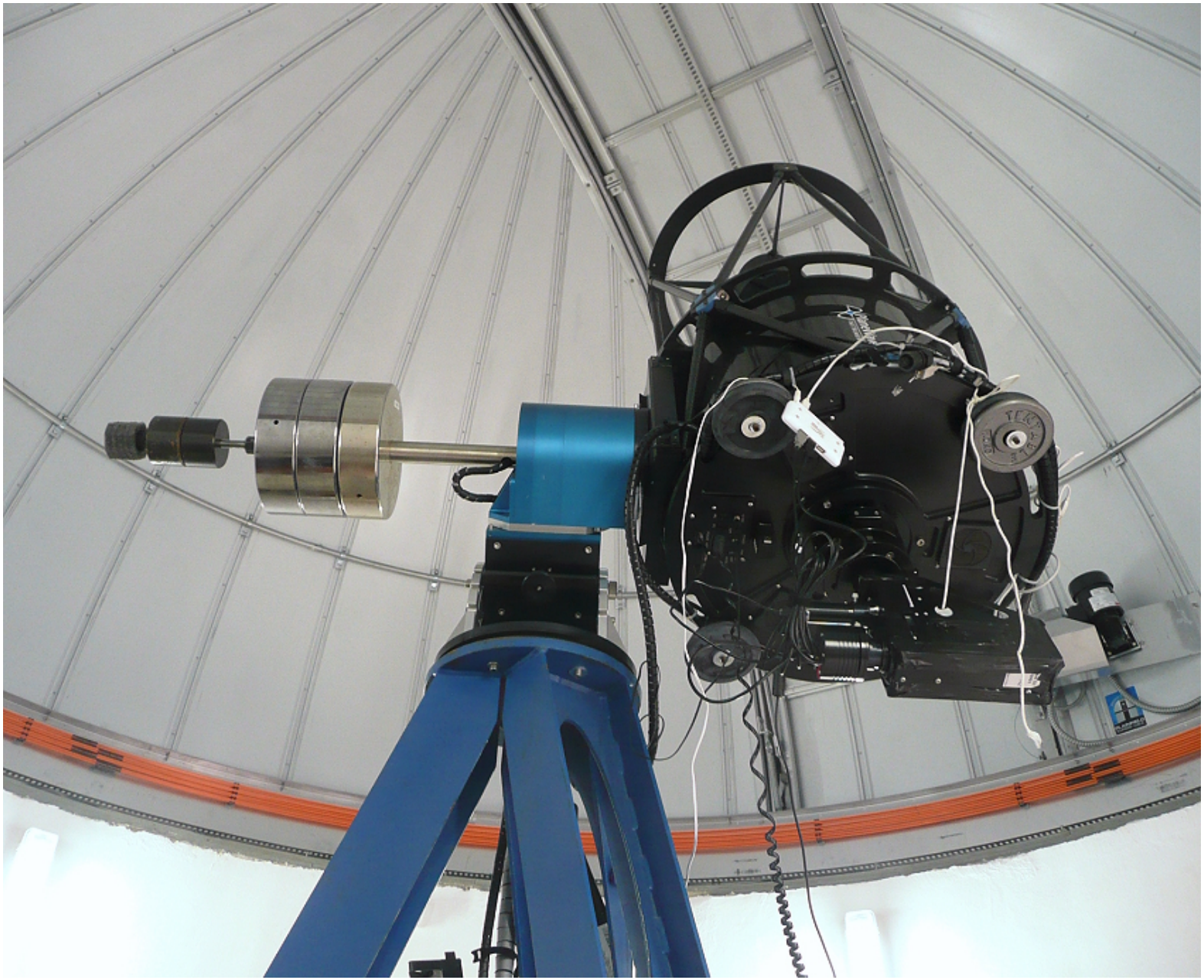
Figure 8.9 Schematic view of an echelle grating and a cross disperser.



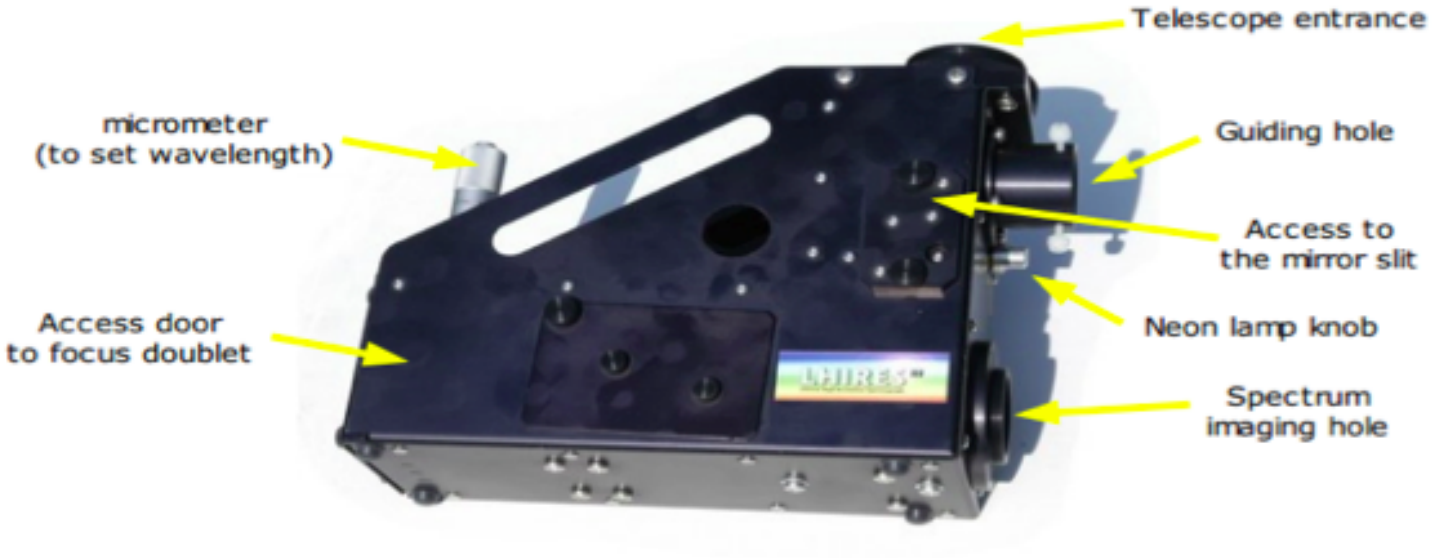

Barlow lens
collimator
CCD
Prism in
collimated
beam
Camera
lens


Focal plane
Converging beam from telescope
Zero-order image
Diffraction grating
Spectrum


FOCAS spectral image using MOS and a grism
1
2
3



LHIRES III

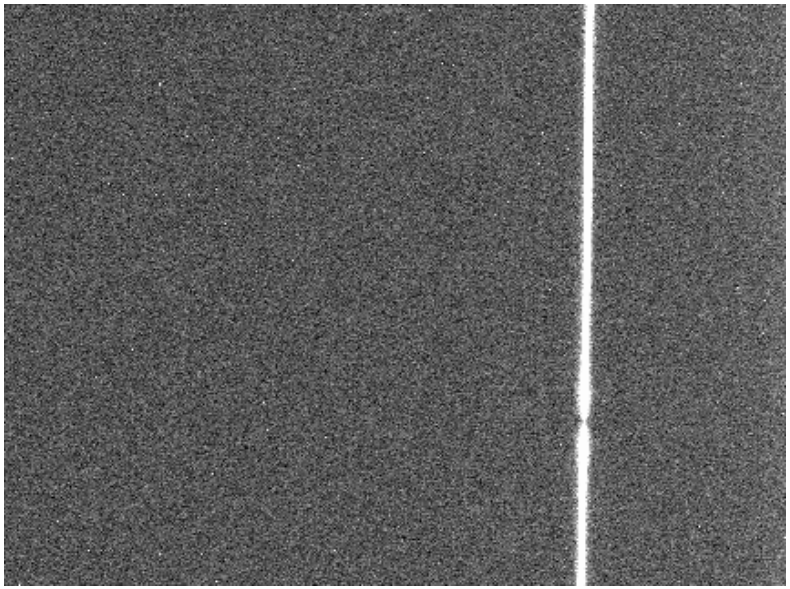


Lhires III spectrograph

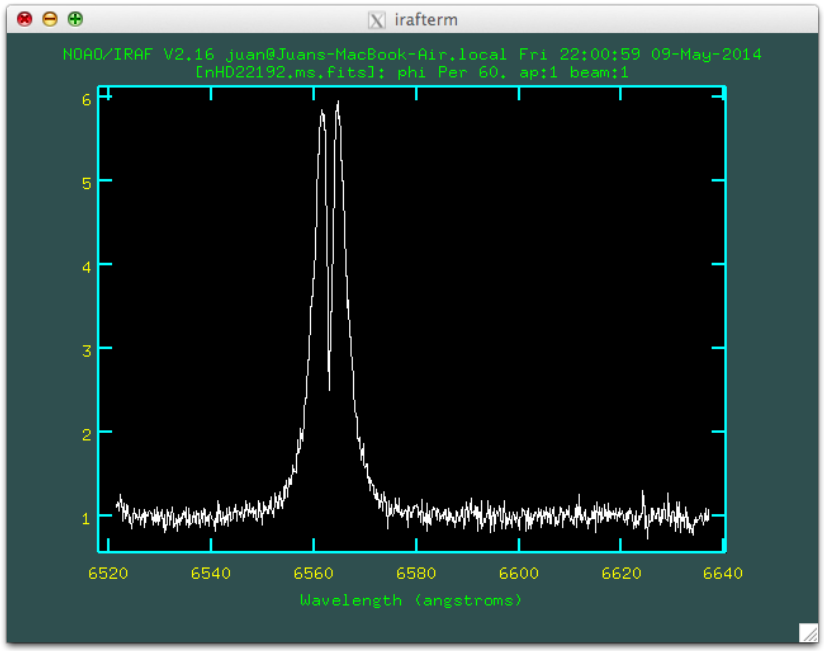
- *Poder de resolución máximo, R ~ 17 000 en el rojo*
- *Capaz de resolver 0.4 A en las cercanías de H*
- *Lámpara de Ne integrada*
- *Redes de difracción: N = 150, 300, 600, 1200, 1400 l/mm.*

Data reduction

What we get



What we want



Data reduction

- Amateur software (on Windows)
  - Christian Buil's IRIS
  - Valérie Desnoux's Visual Spec
  - Others...
- IRAF
  - More powerful and flexible
  - Complex and not documented

Data reduction

- Bias and dark subtraction
- Flat fielding
- Spectra extraction
- Wavelength calibration
- Flux calibration
- Continuum rectification