

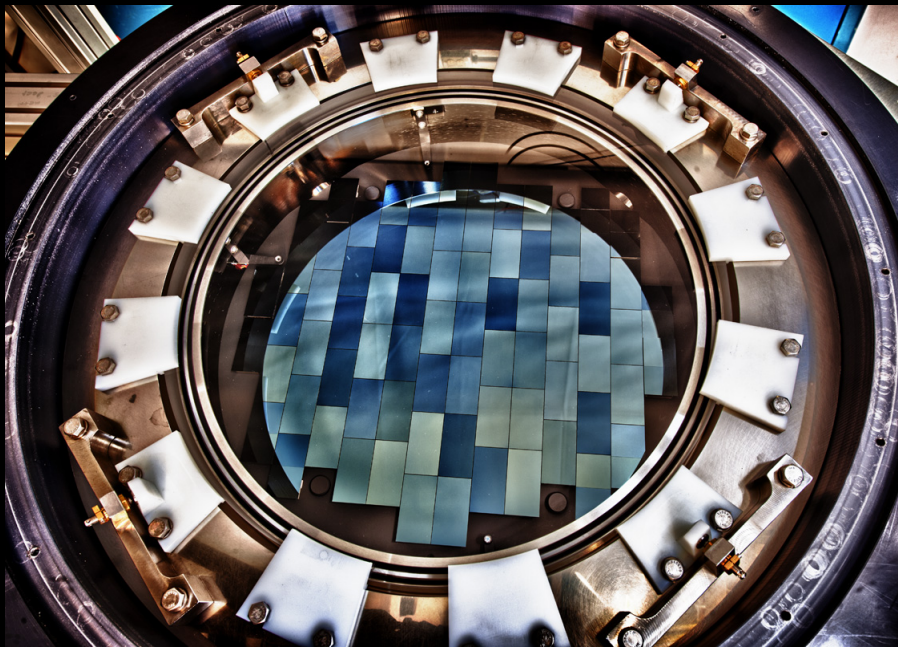
Can the World's Largest Digital Camera Answer Cosmological Questions?

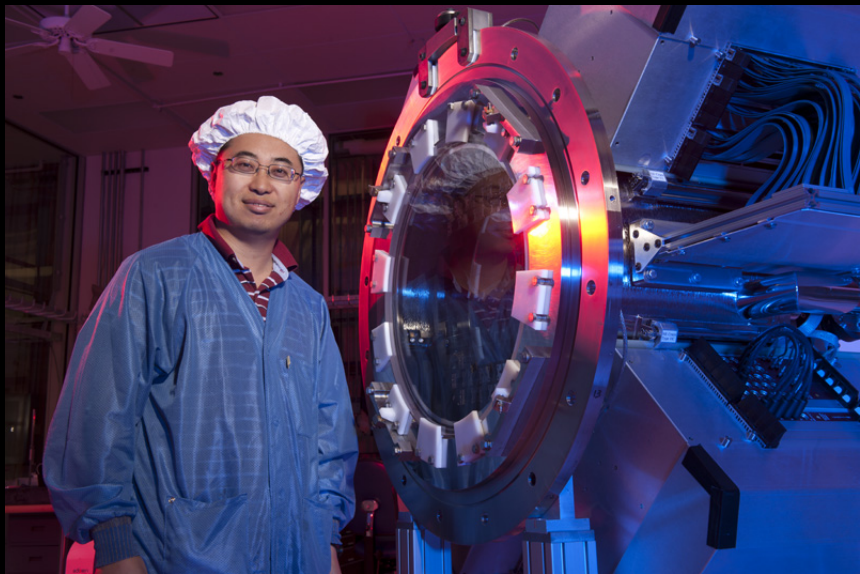
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Presentation to the Orwell Astronomical Society
21 September 2018

Find the presentation at <https://tinyurl.com/y7w542eb>

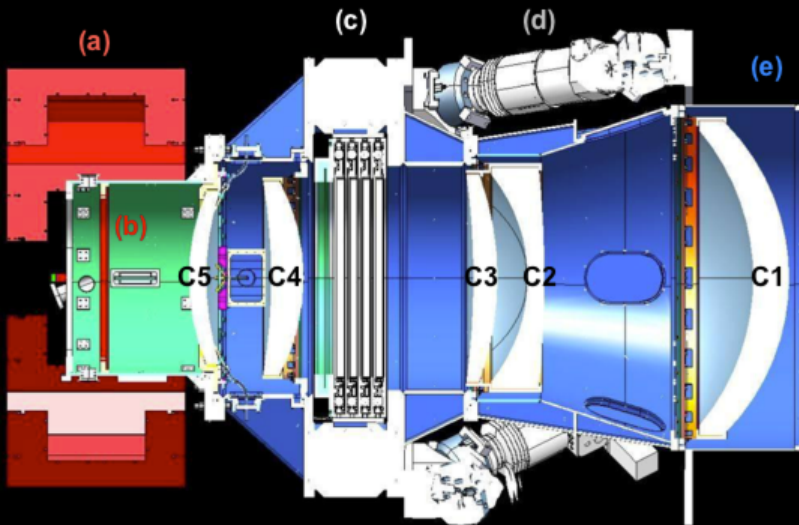




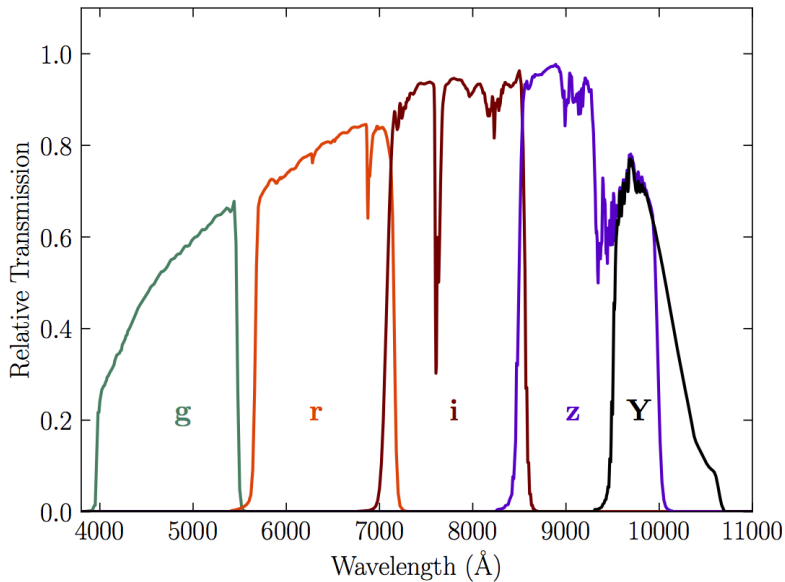
Detector

- ▶ Detector has 62 chips ('CCDs')
- ▶ Each CCD is 3 cm by 6 cm and has $2048 \times 4096 = 8$ megapixels
- ▶ Total of 500 megapixels.
- ▶ Each pixel is 15 microns square.
- ▶ The CCDs are unusually thick \implies more infrared light captured.
- ▶ Why do we want to capture infrared light?





- ▶ Detector is part of a camera called 'DECam'.
- ▶ Built in part at University College London.
- ▶ Five lenses - largest is 1m diameter.
- ▶ Careful shutter design allows precise measurement of exposure times.
- ▶ Five filters: green, red, and three infrared colours.







The Telescope

- ▶ Camera is attached to the Victor Blanco Telescope
- ▶ At the Cerro-Tololo Inter-American Observatory in Chile.
- ▶ 4m main mirror; $10m^2$ collecting area.
- ▶ First light 1976; largest Southern Hemisphere telescope until 1998.
- ▶ At 2200 m altitude.
- ▶ Ritchey-Chrétien design.

Optical system: Telescope plus camera

- ▶ Camera is at prime focus.
- ▶ f2.7
- ▶ Field of view: 2 deg diameter; $3deg^2$ area.
- ▶ Pixel scale is 0.26 arcsec/pixel (pound coin at 18 km).