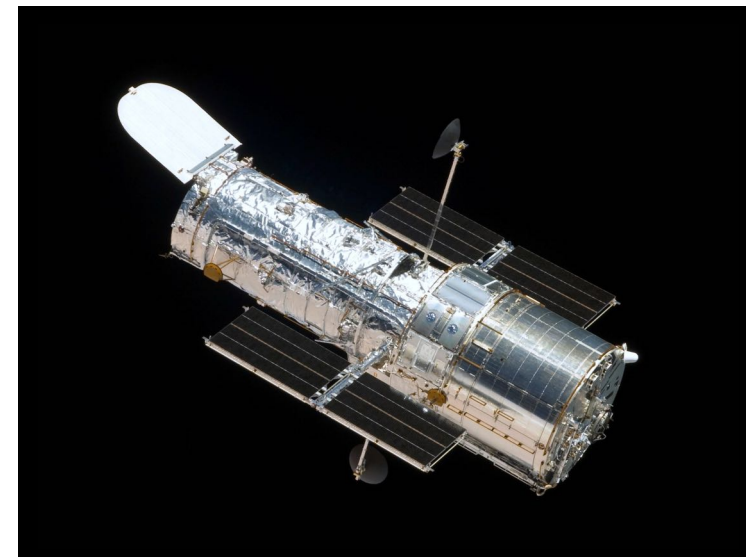
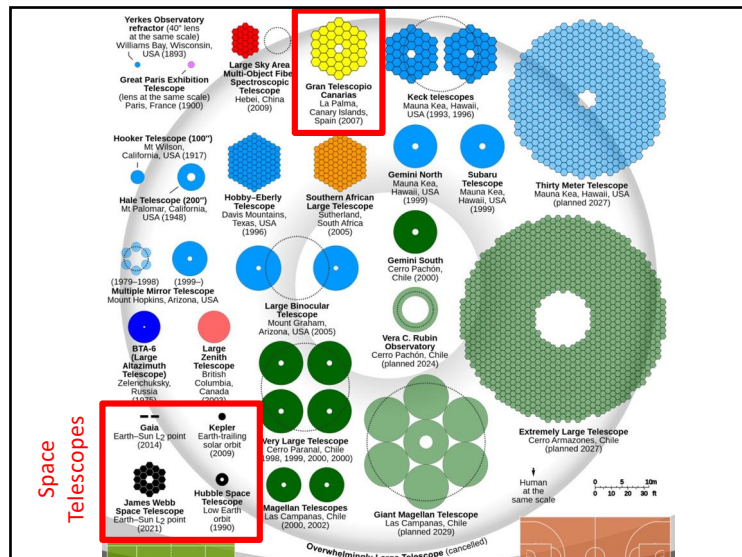
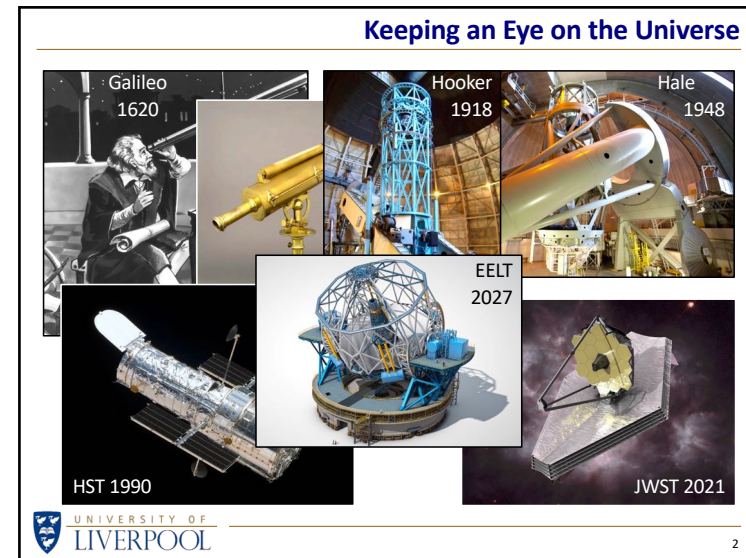
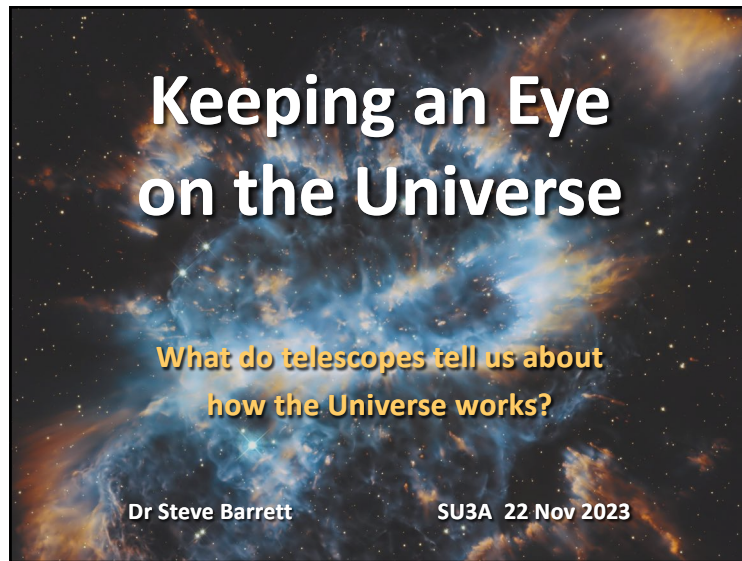
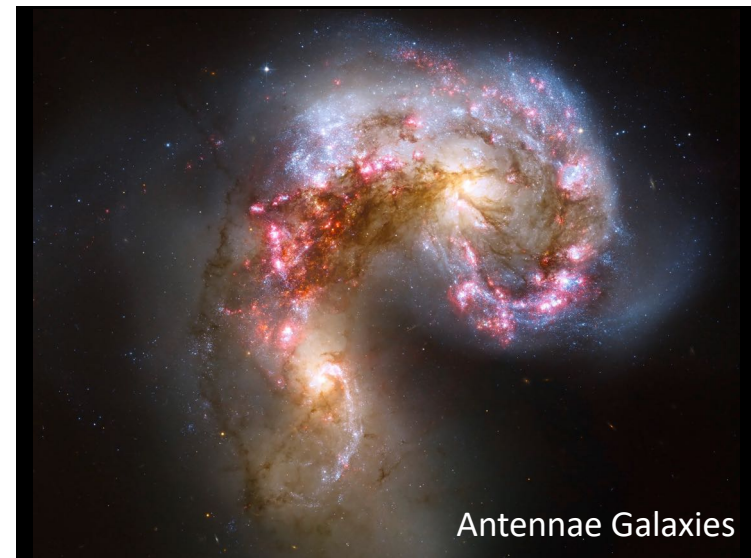
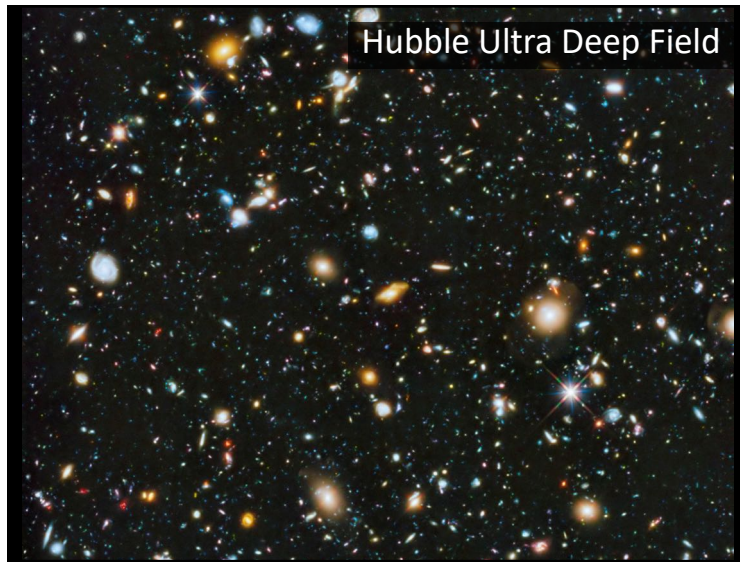


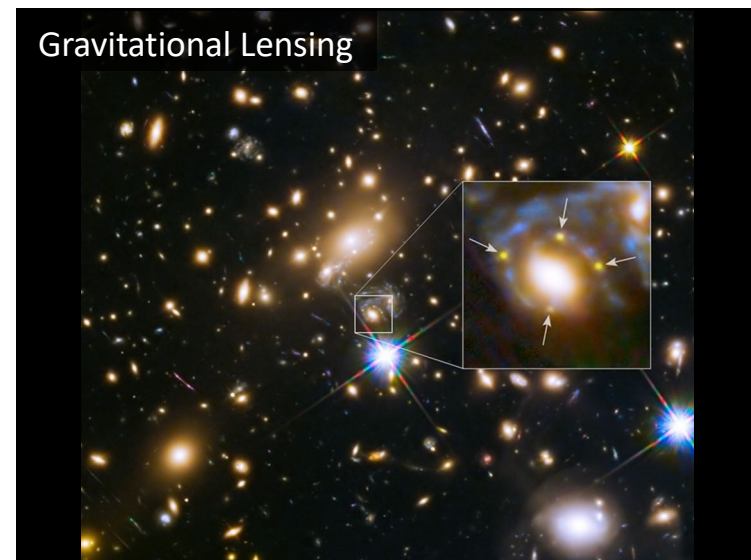
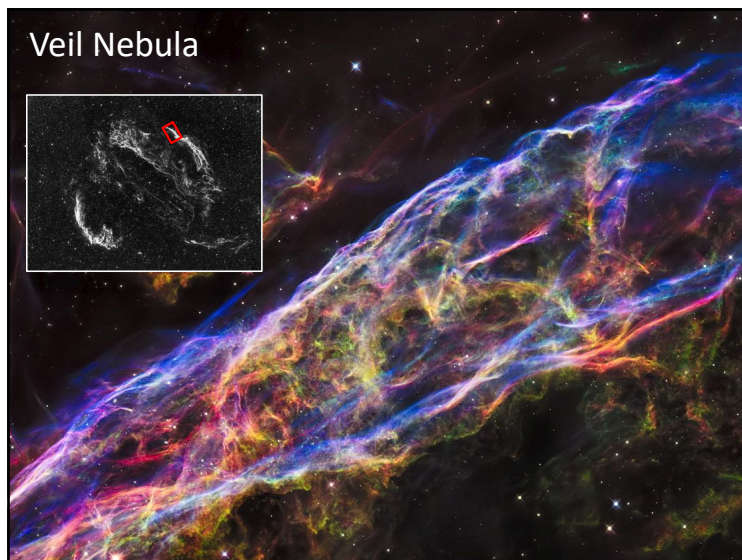
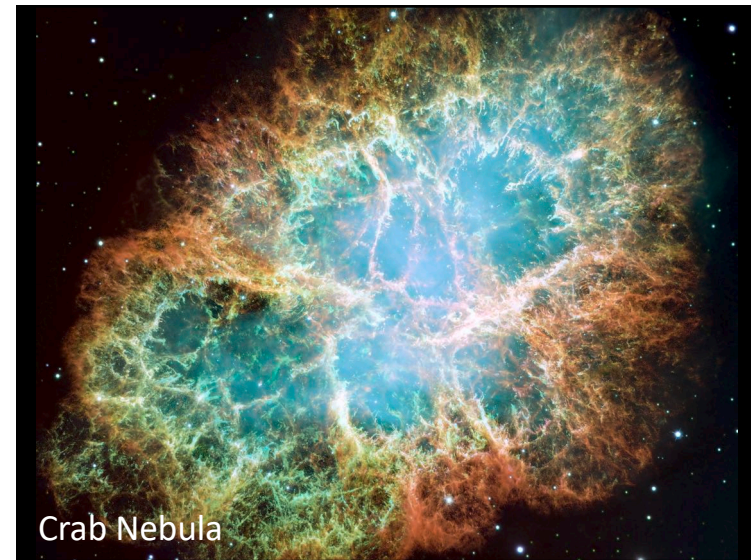
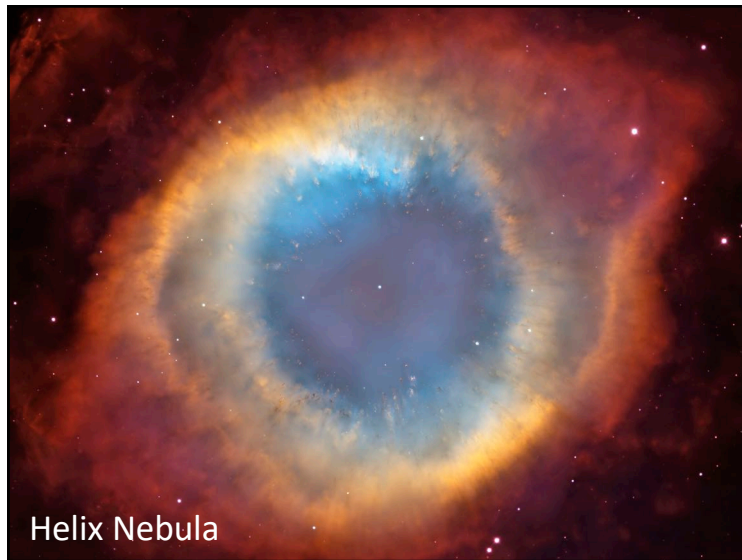
Keeping an Eye on the Universe



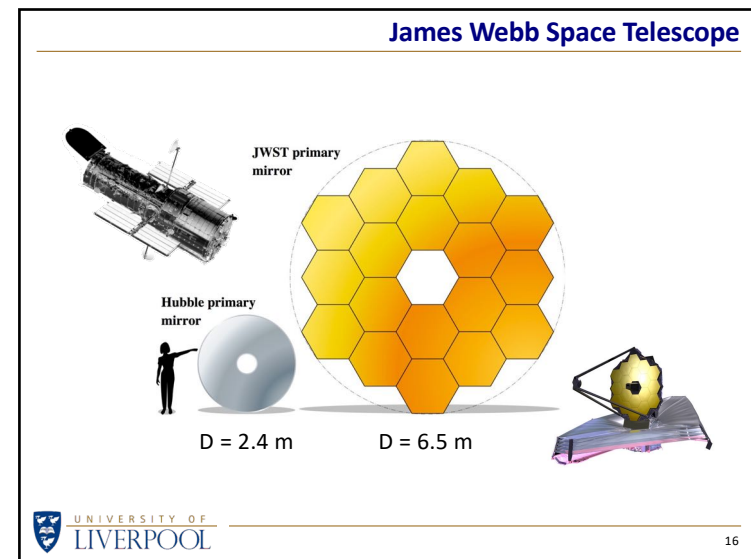
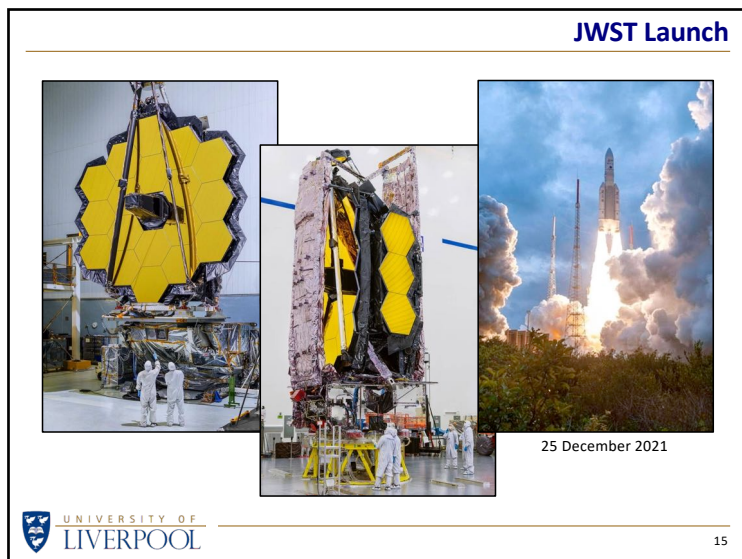
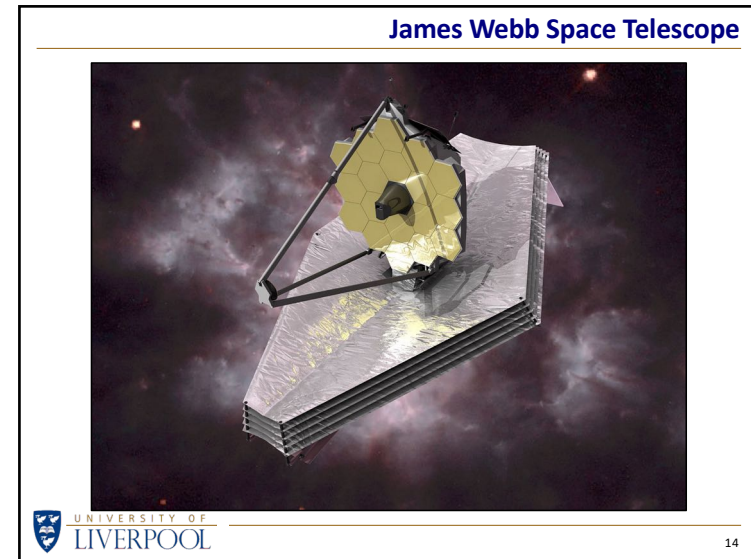
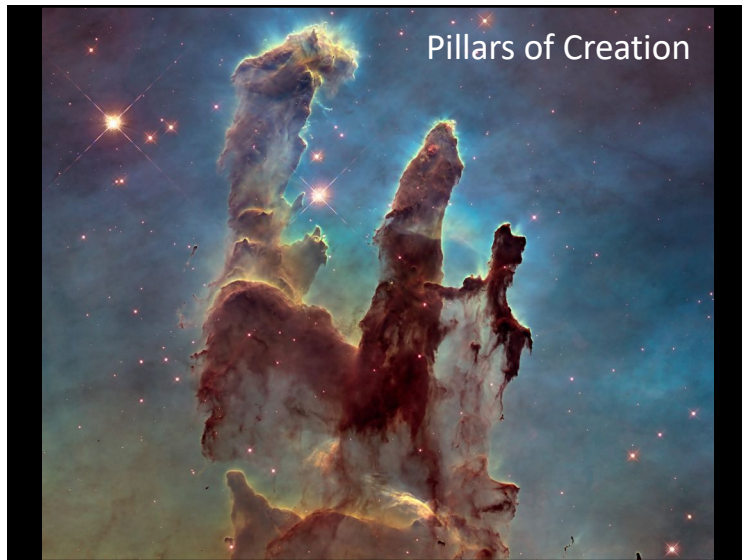
Keeping an Eye on the Universe



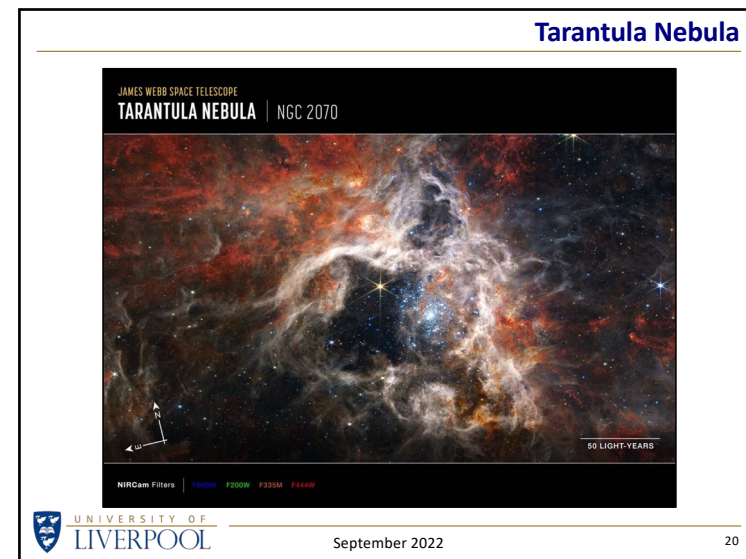
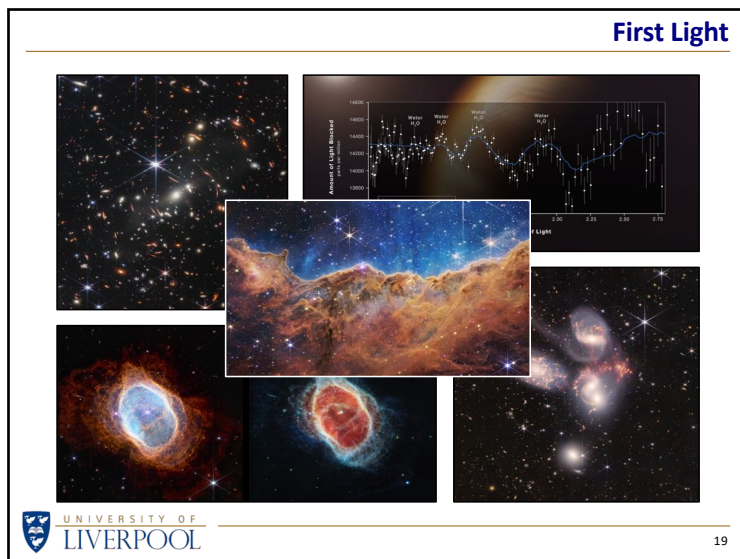
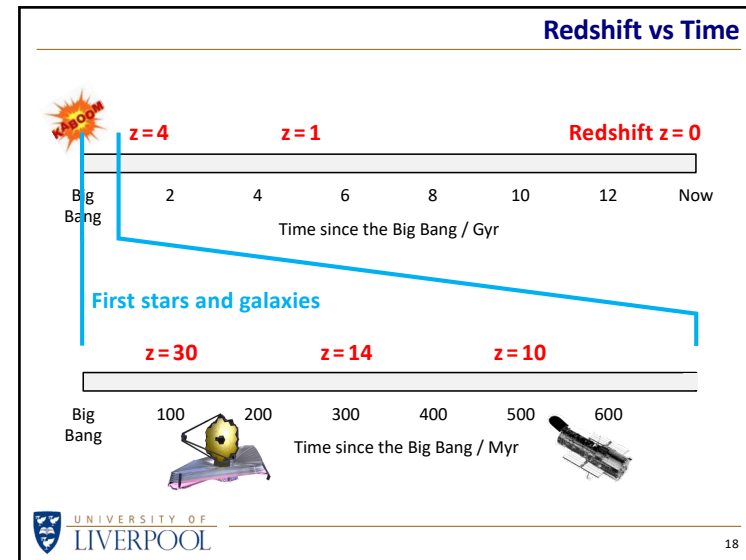
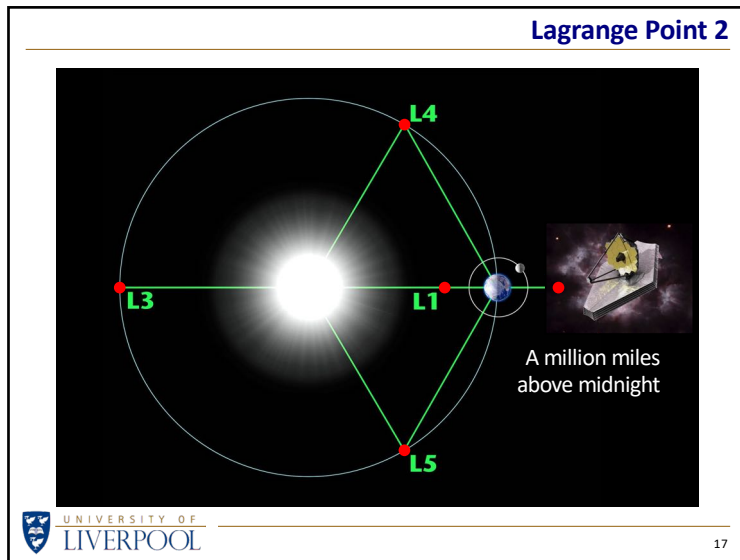
Keeping an Eye on the Universe



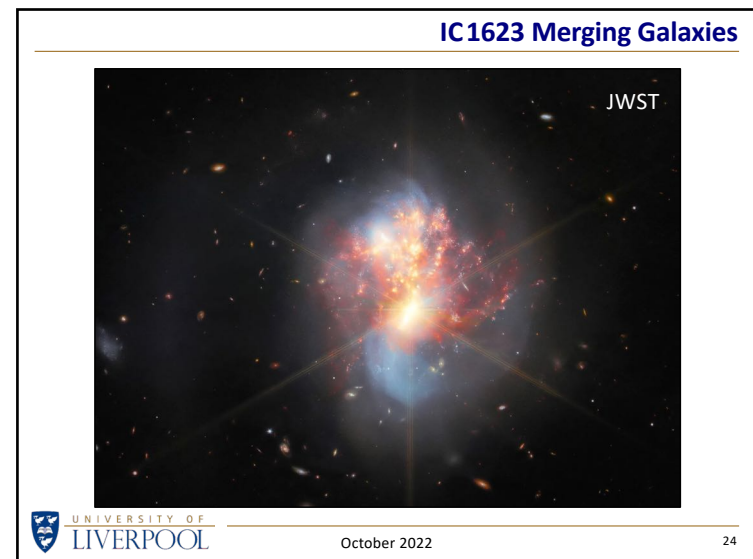
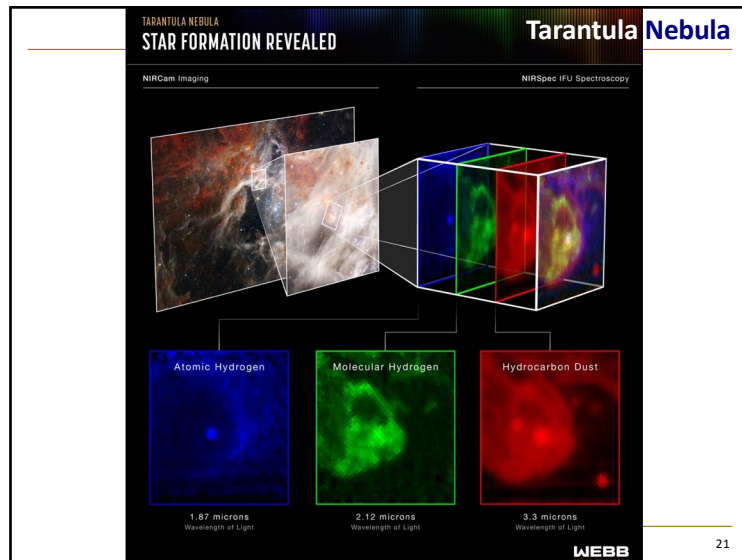
Keeping an Eye on the Universe



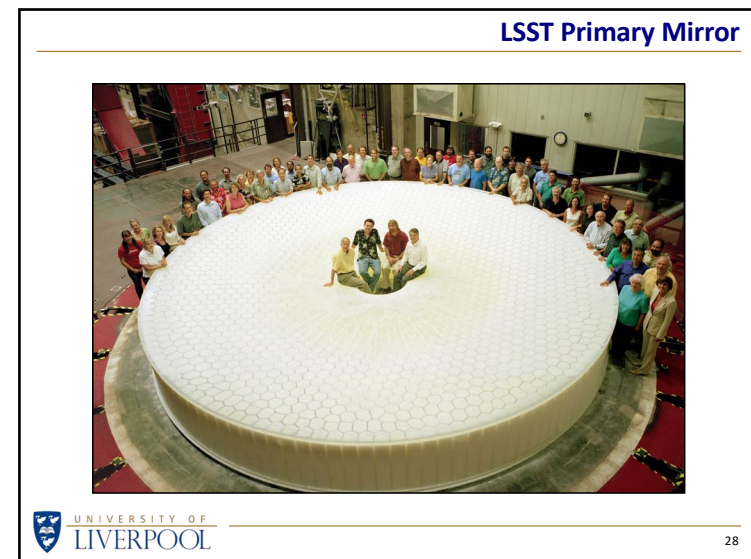
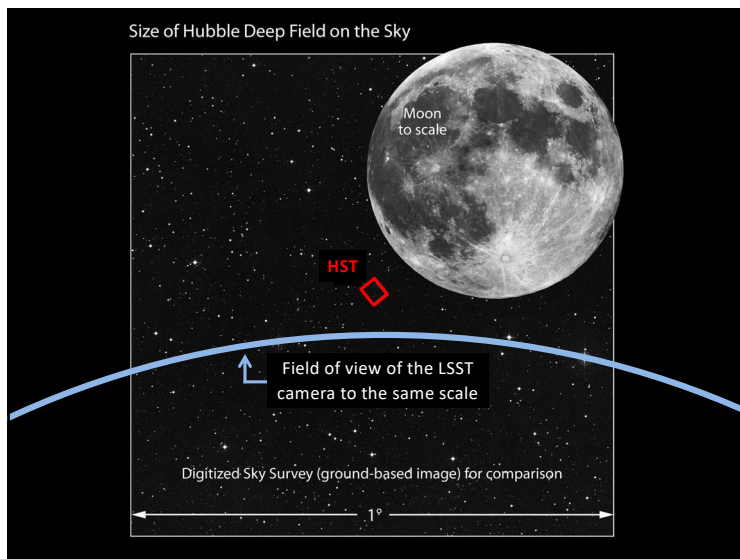
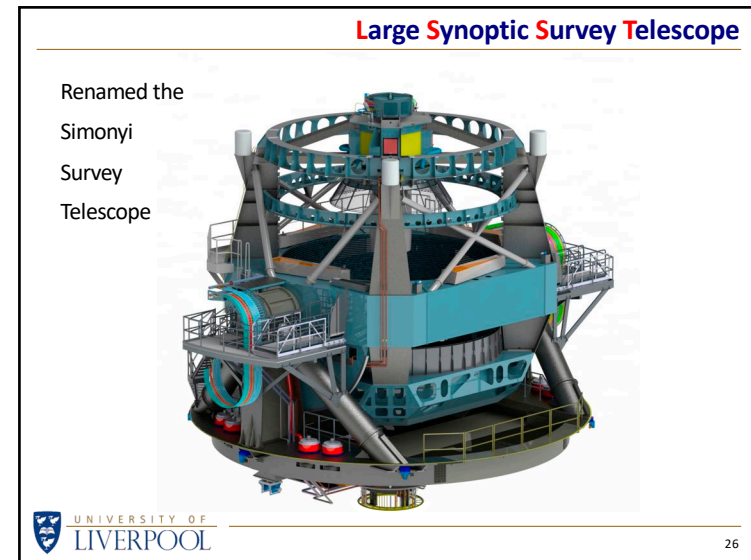
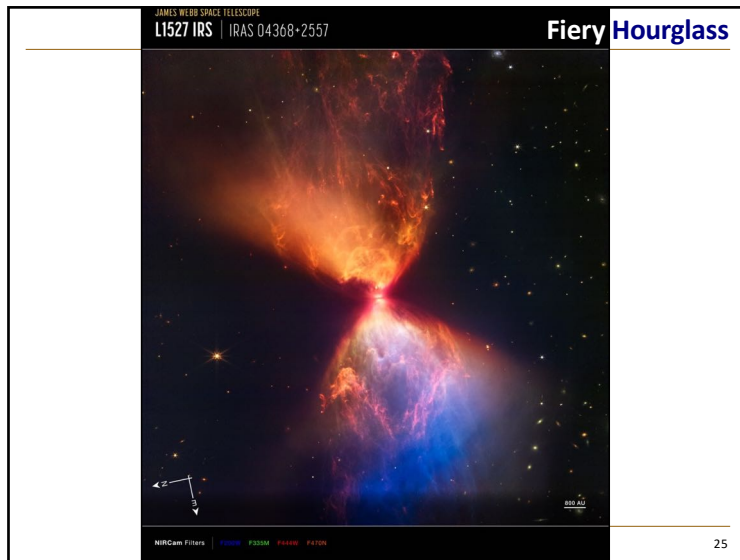
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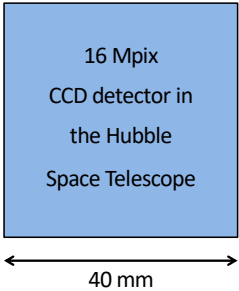
Keeping an Eye on the Universe

Camera CCD

Camera module from a mobile phone




... and at the same scale



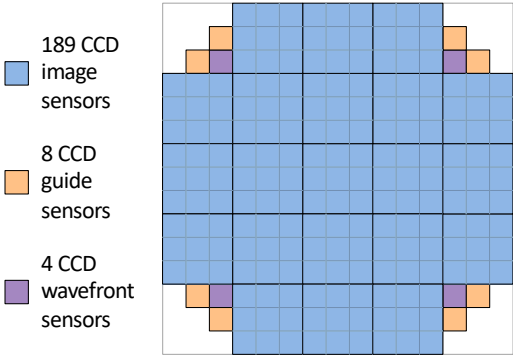
16 Mpix
CCD detector in
the Hubble
Space Telescope

40 mm

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LSST Camera CCD



189 CCD
image
sensors


8 CCD
guide
sensors

4 CCD
wavefront
sensors

Array is
0.6x0.6 m

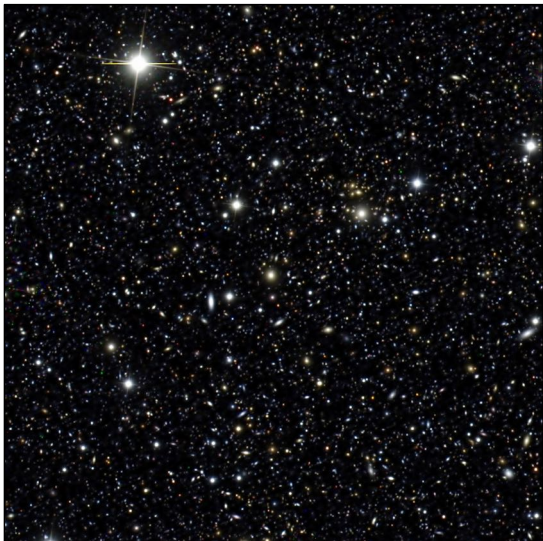
Image is
3 Gpixels

Readout
in 2 sec


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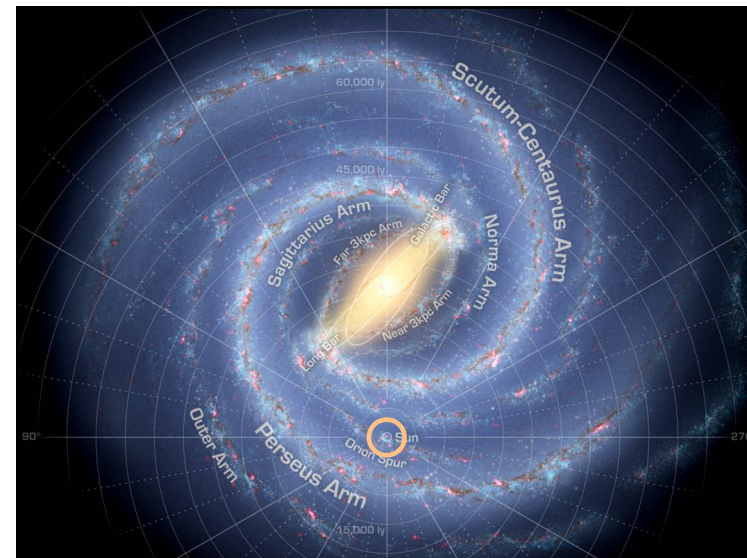
LSST Camera



This simulated image is about a Mpixel, or 0.03% of the full-sized image captured by the camera, and gives an idea of what can be expected to be seen in a single 15 sec exposure.

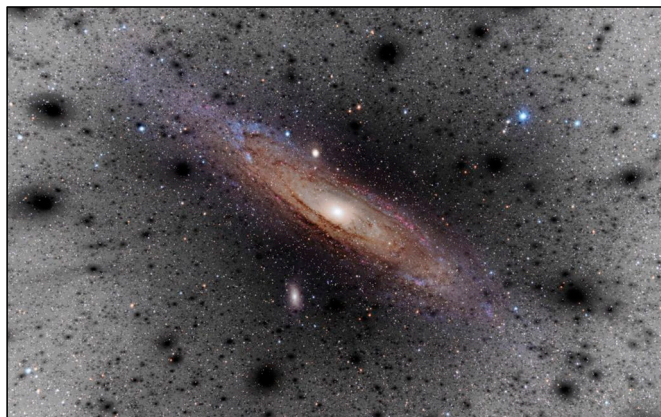
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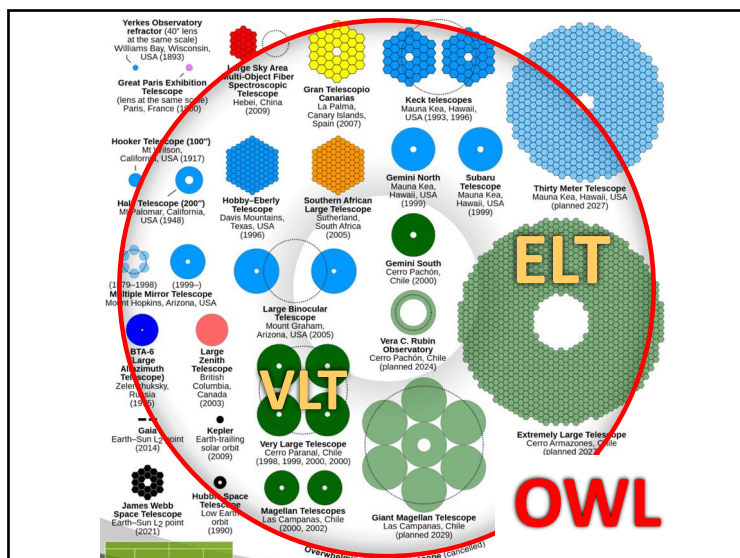
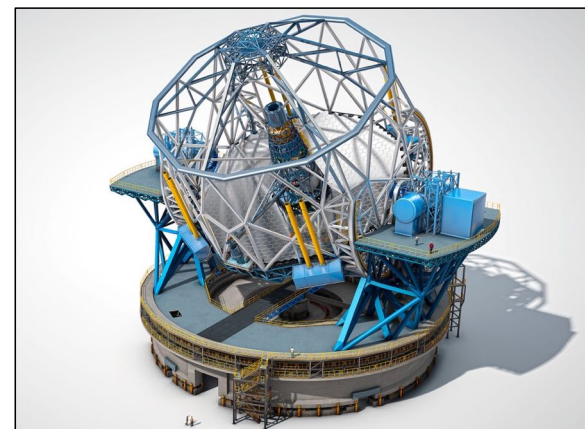


Keeping an Eye on the Universe

LSST Science – Dark Matter



European Extremely Large Telescope



Keeping an Eye on the Universe

www.liverpool.ac.uk/~sdb/Talks

Dr Steve Barrett

SU3A 22 Nov 2023