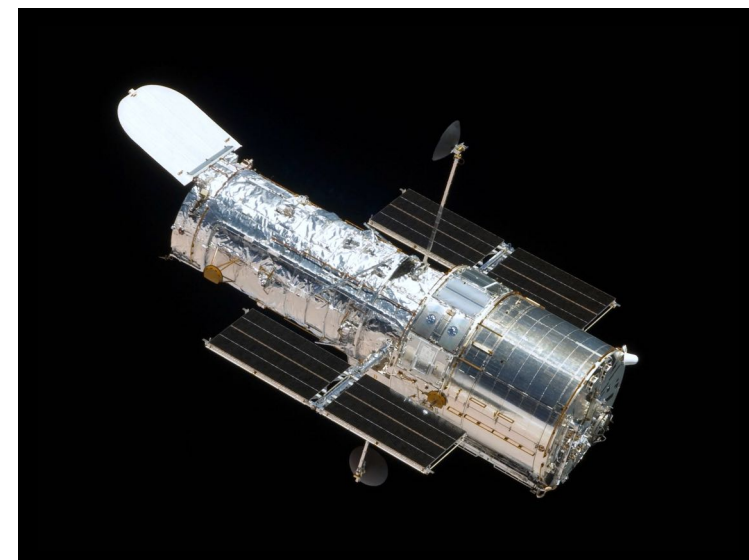
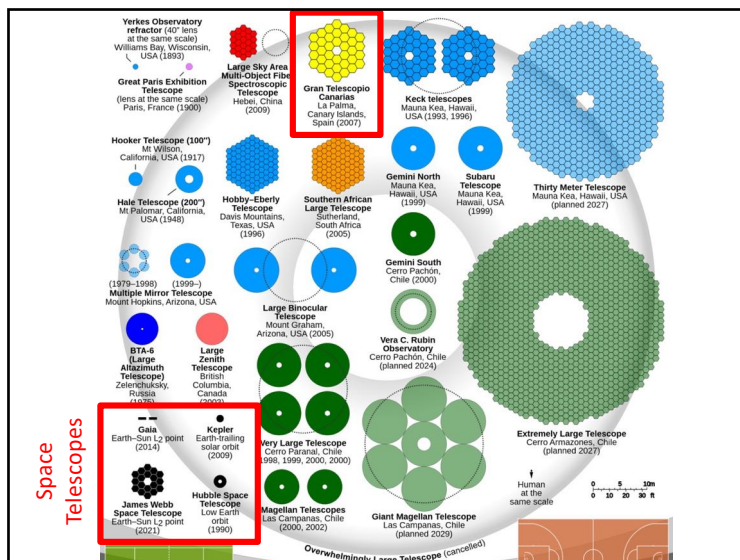
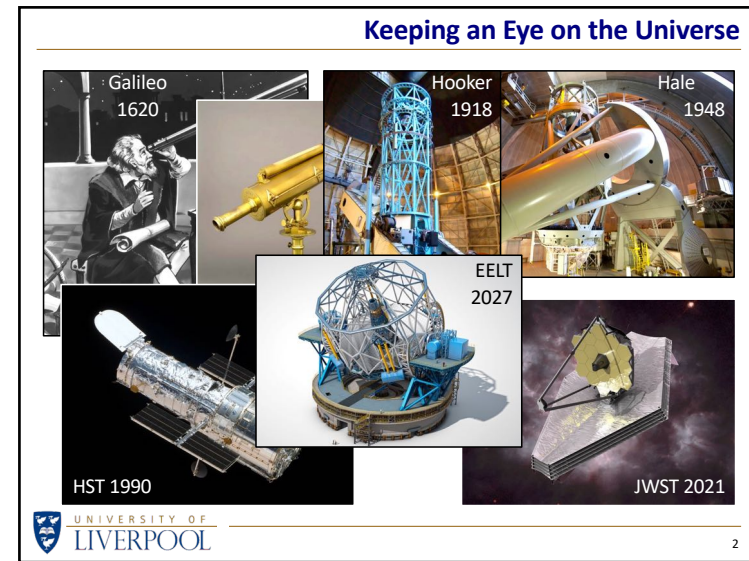
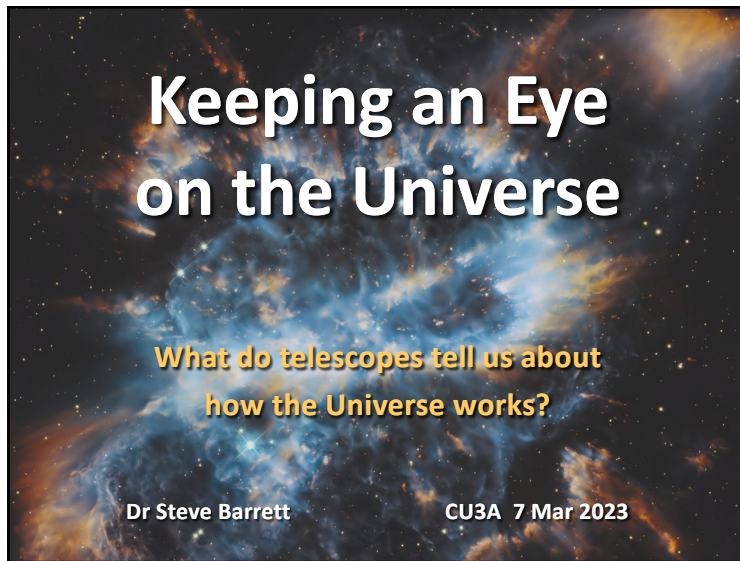
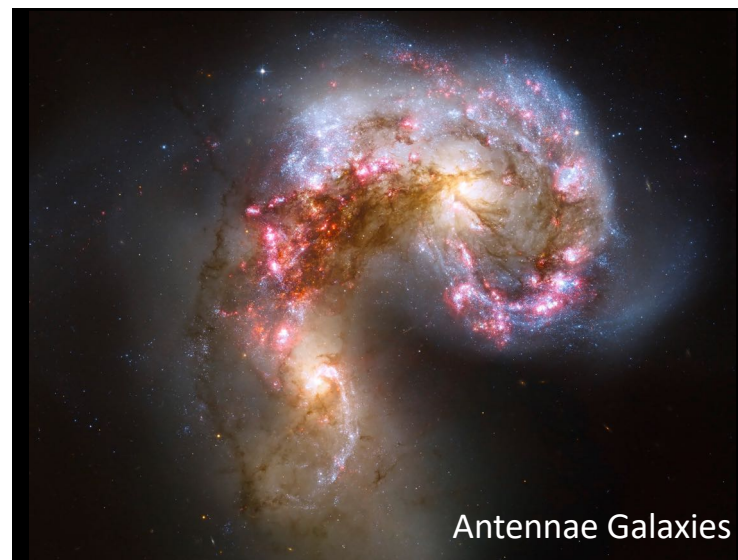
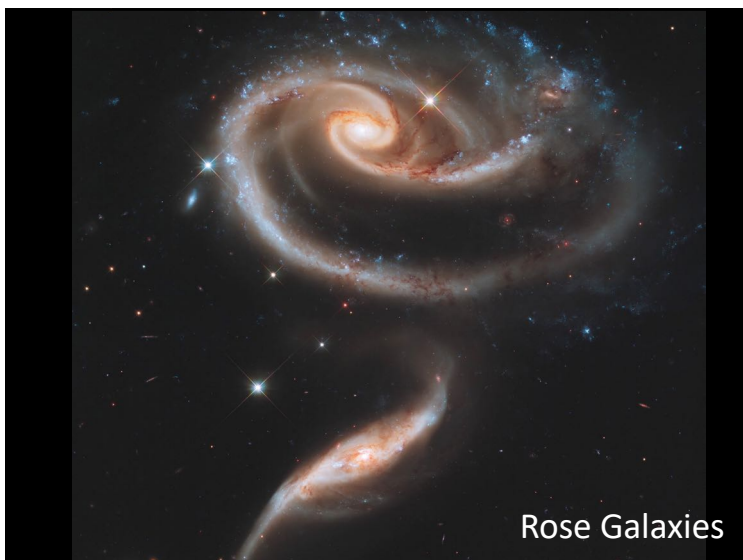
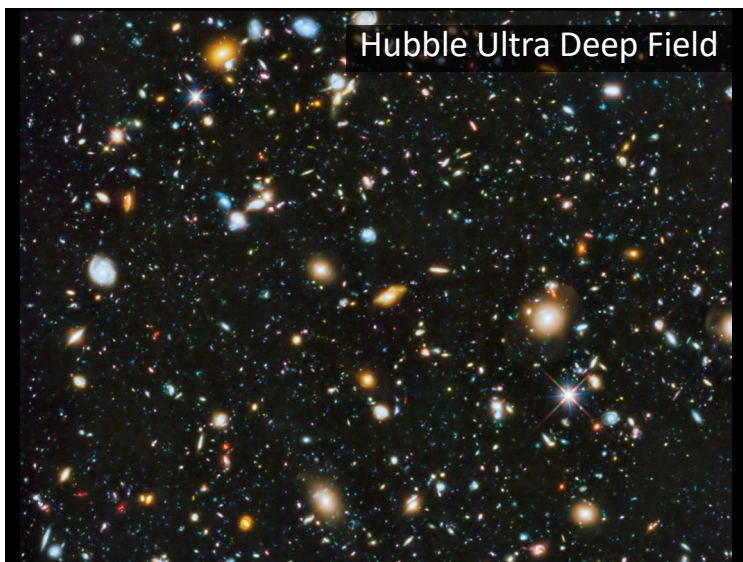


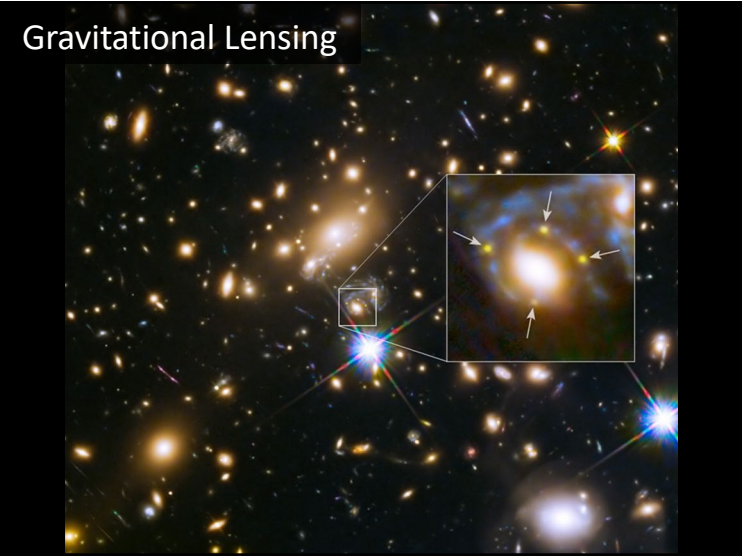
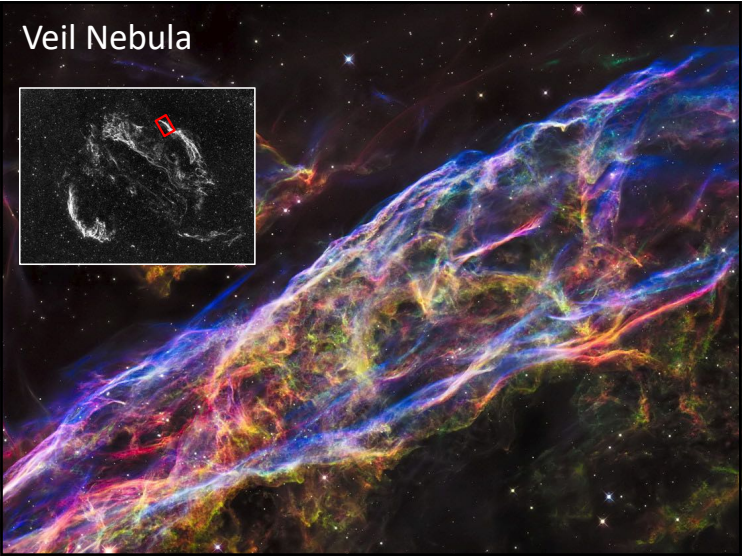
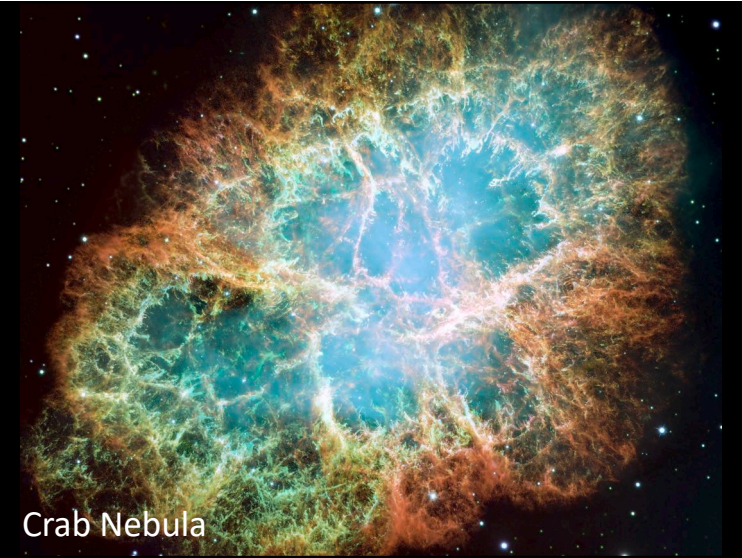
Keeping an Eye on the Universe



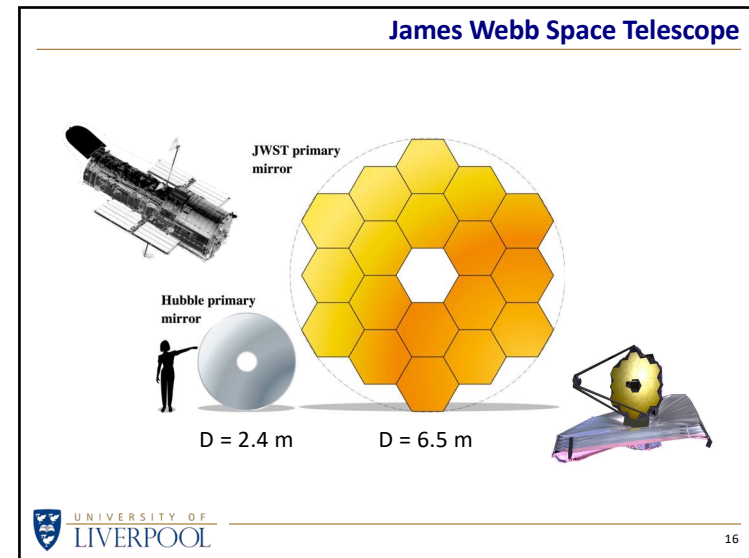
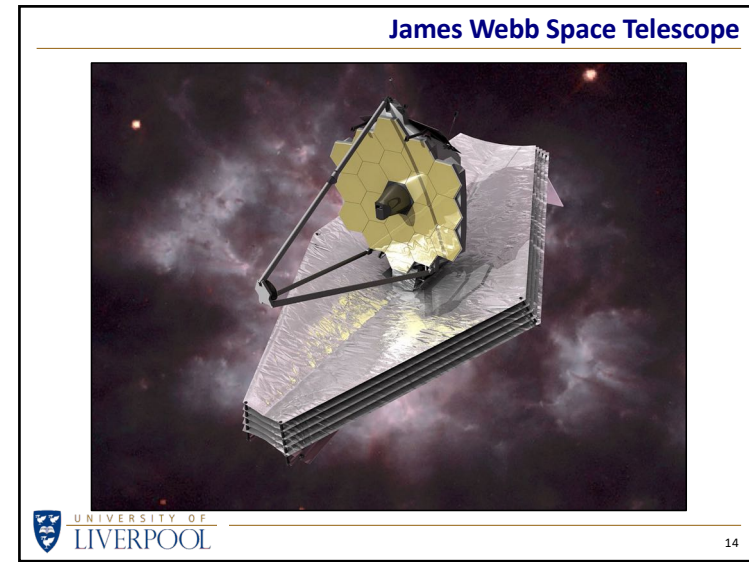
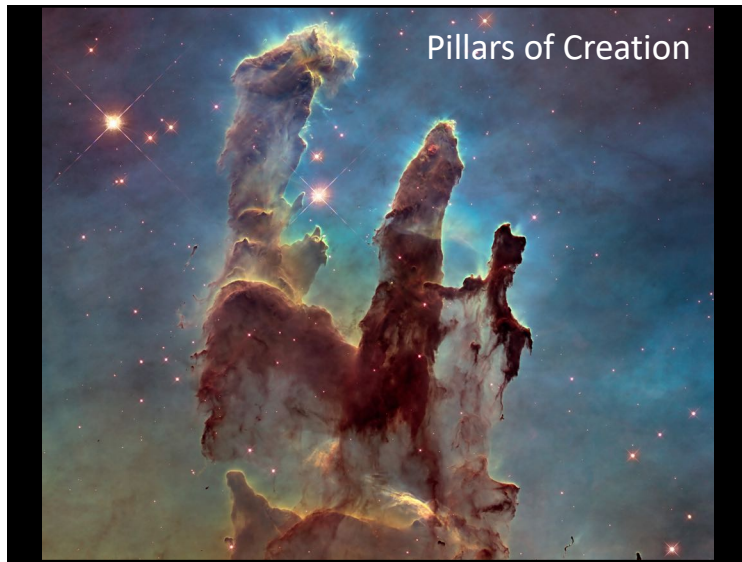
Keeping an Eye on the Universe



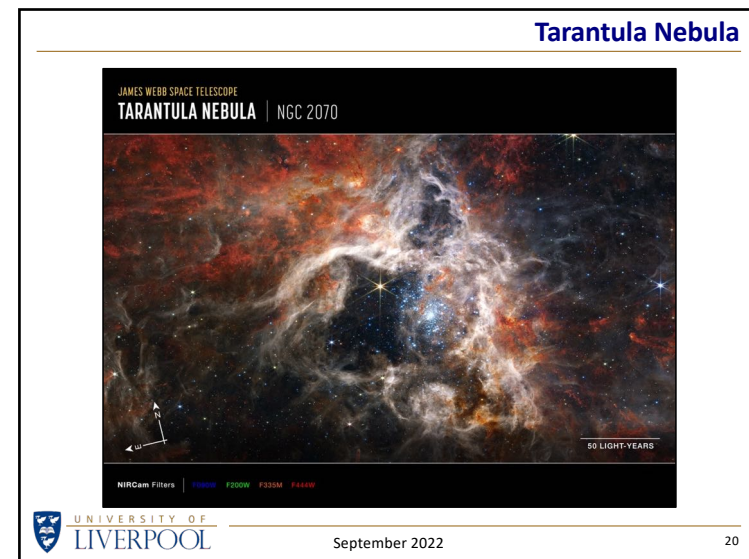
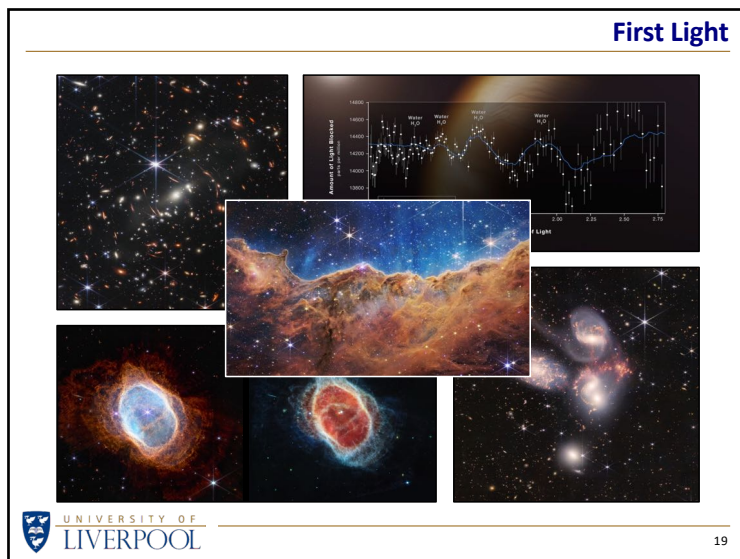
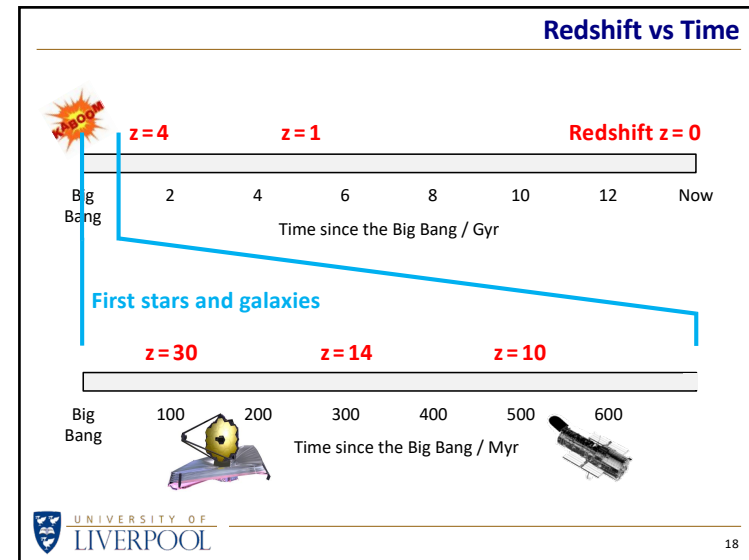
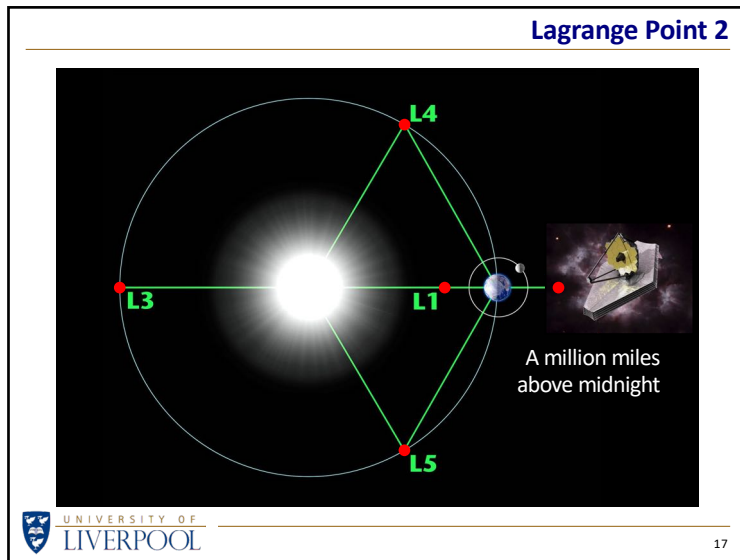
Keeping an Eye on the Universe



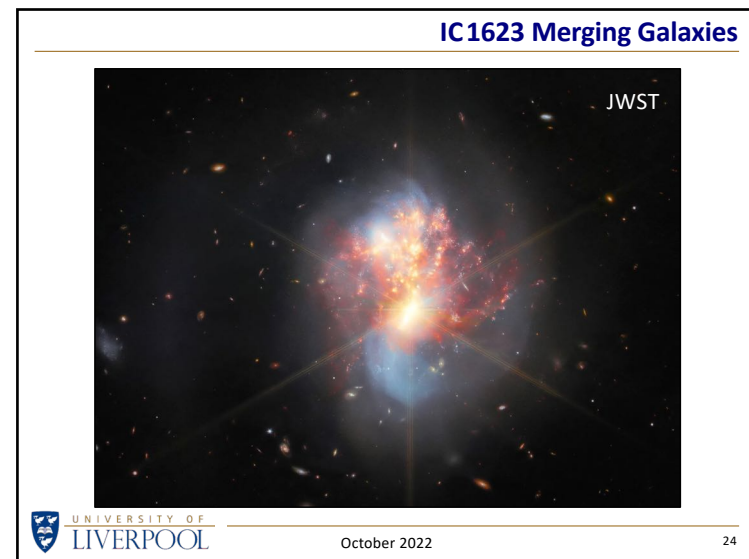
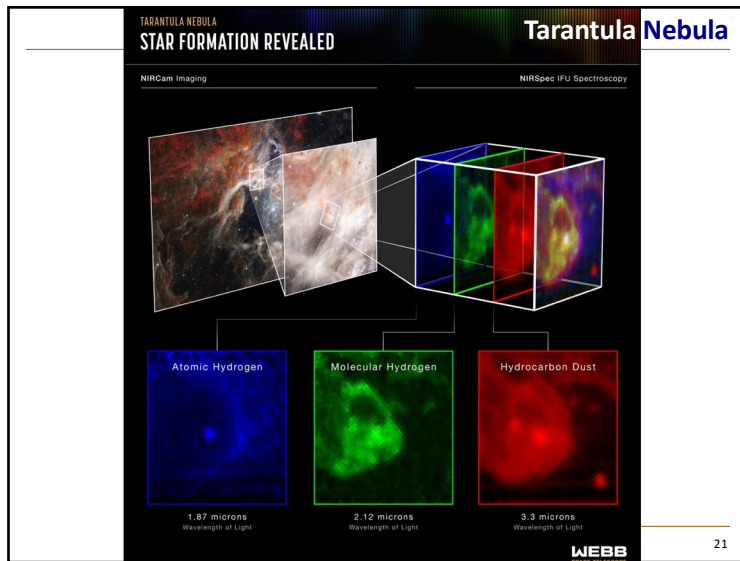
Keeping an Eye on the Universe



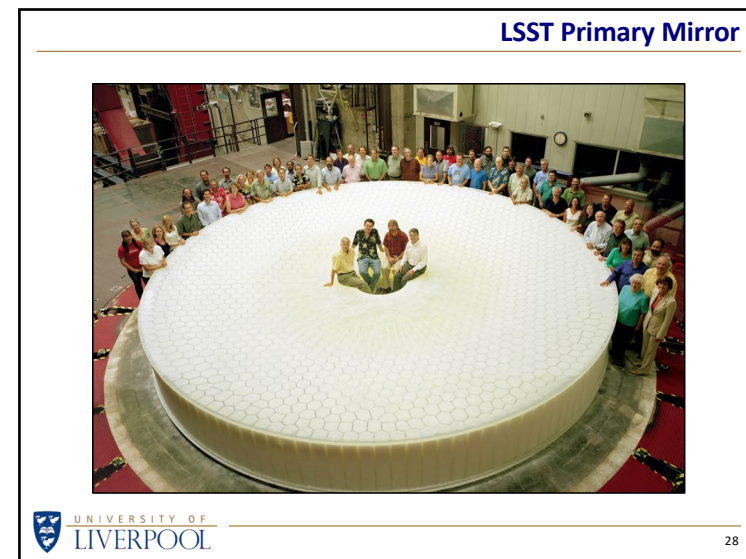
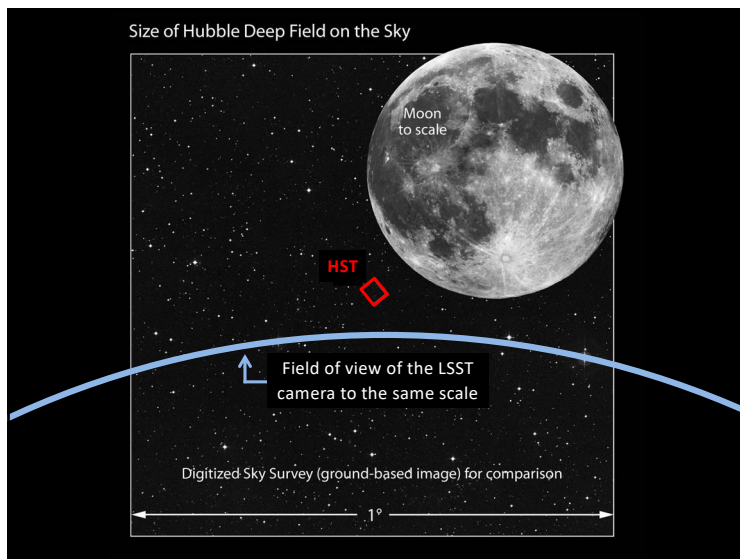
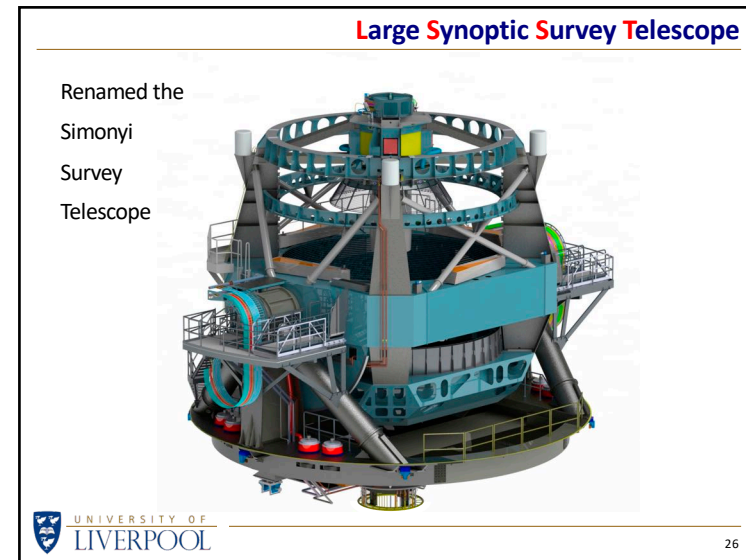
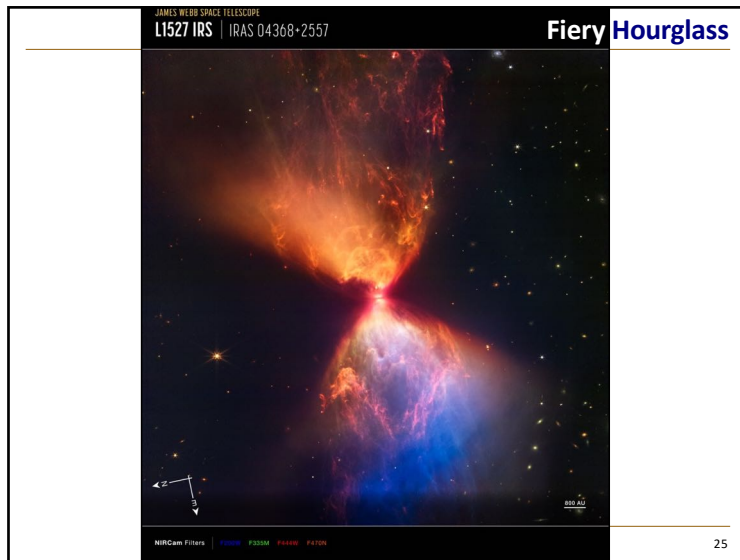
Keeping an Eye on the Universe



Keeping an Eye on the Universe




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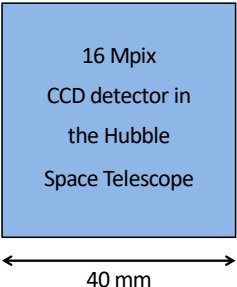
Keeping an Eye on the Universe

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

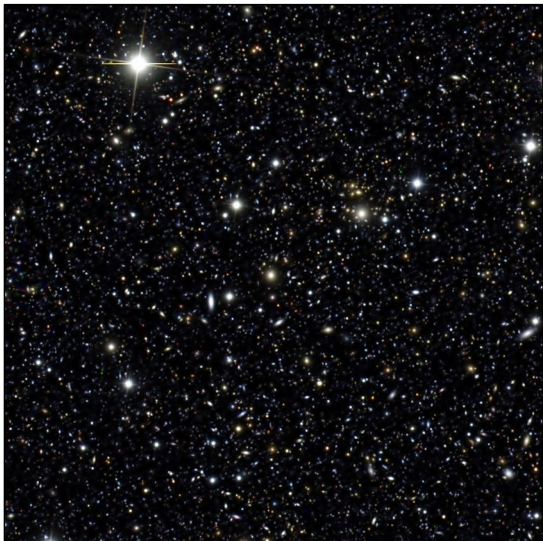
Array is 0.6x0.6 m

Image is 3 Gpixels


Readout in 2 sec

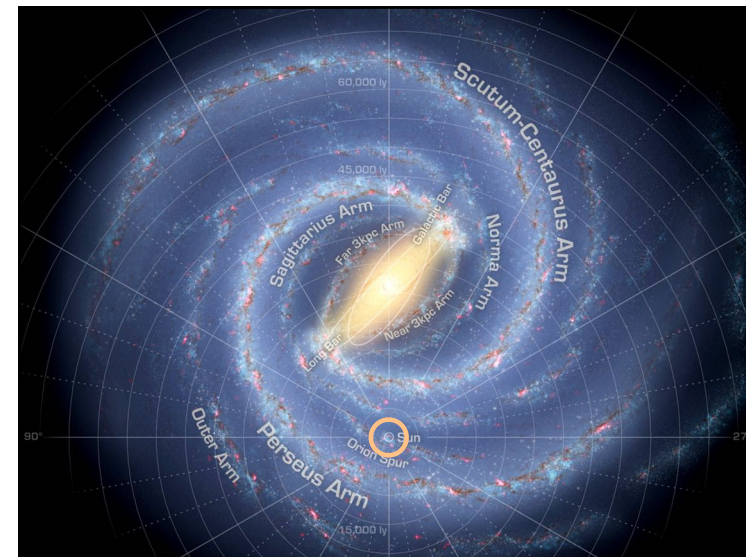
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LSST Camera



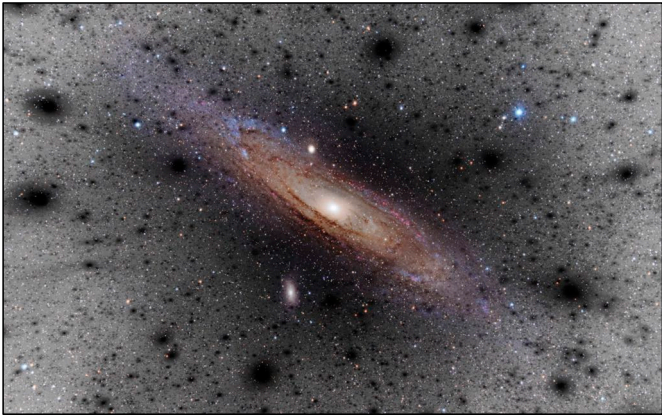
This simulated image is about a Mpixel, or 0.03% of the full-sized image captured by the camera, and gives an idea of what can be expected to be seen in a single 15 sec exposure.

 31



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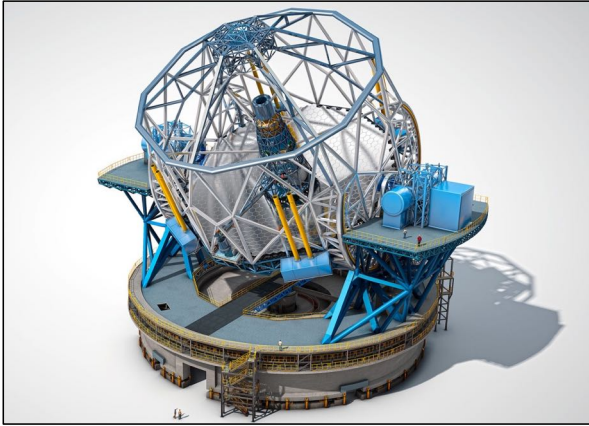
LSST Science – Dark Matter



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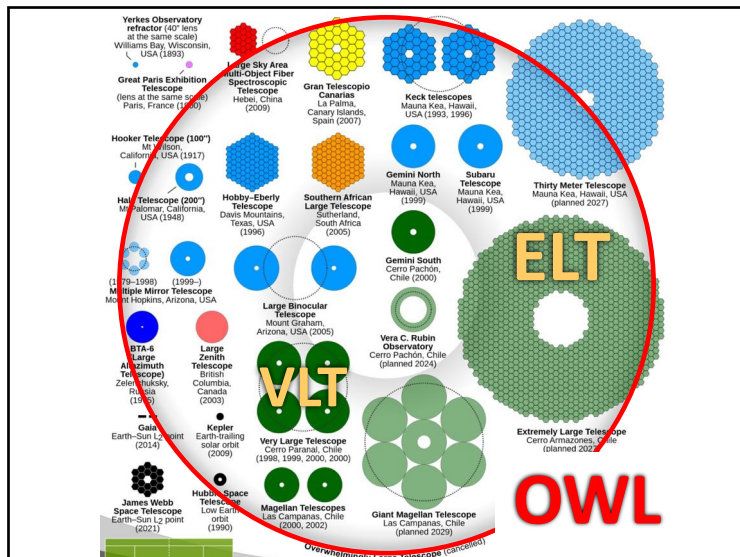
33

European Extremely Large Telescope



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34



Keeping an Eye on the Universe

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

Dr Steve Barrett

CU3A 7 Mar 2023