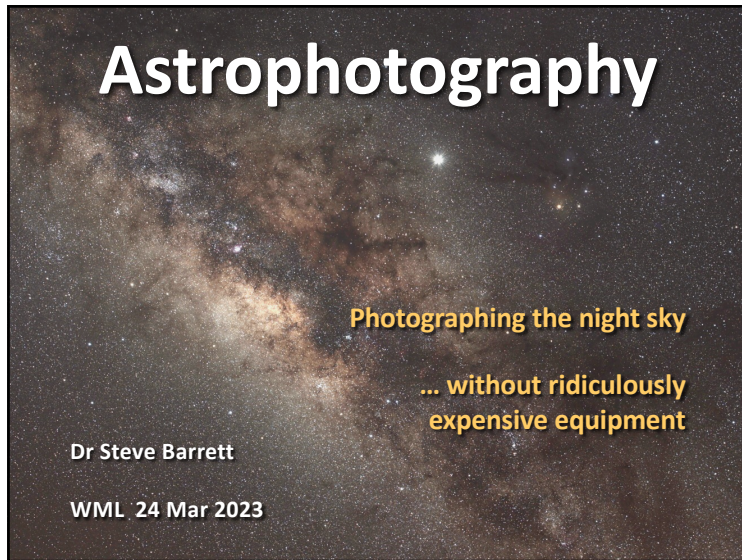



Astrophotography





What Do You Need?

Start Simple	Just a camera and tripod
Equipment	Telescopes and mounts
Equipment	Cameras and star trackers
Photo Gallery	Some of my images
Astro Africa	Under the darkest skies


 2


Star Trails



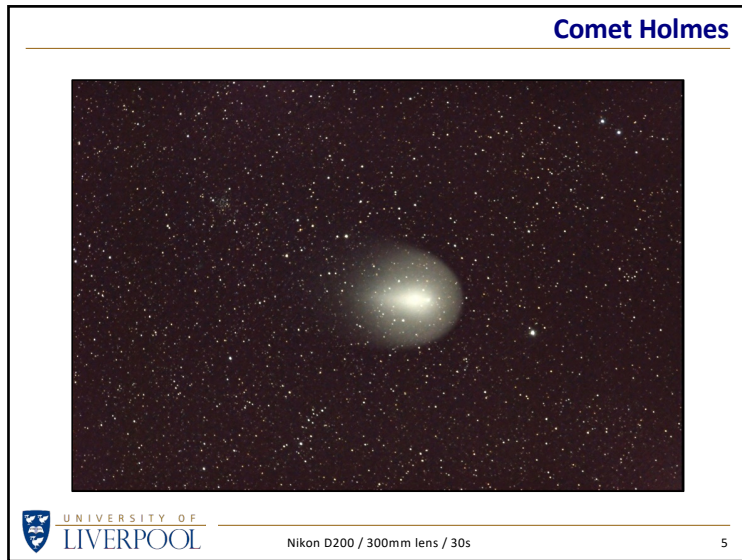
 Nikon FM2 / Fujichrome slide film / 24mm lens / 300s 3

Star Trails



 Nikon D7100 / 10mm lens / 6 hours (= 360 x 60s) 4

Astrophotography



Astrophotography

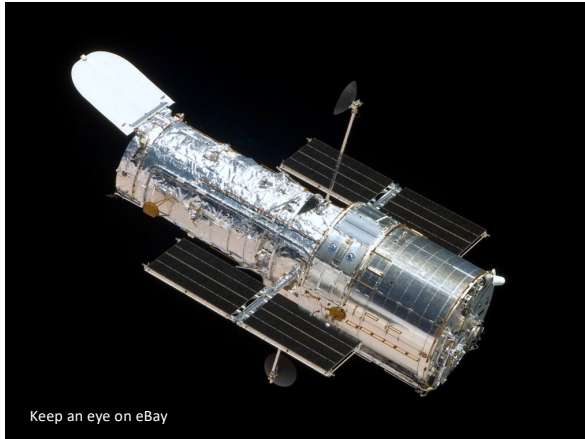
What Do You Need?

- Start Simple** Just a camera and tripod
- Equipment** Telescopes and mounts
- Equipment** Cameras and star trackers
- Photo Gallery** Some of my images
- Astro Africa** Under the darkest skies

UNIVERSITY OF LIVERPOOL

9

What Do You Need?



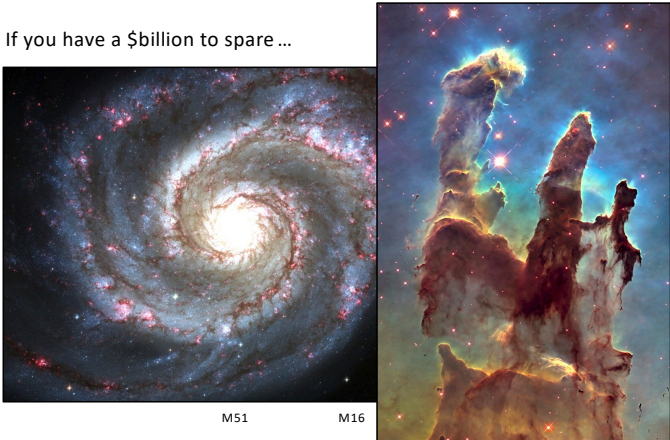
Keep an eye on eBay

UNIVERSITY OF LIVERPOOL

10

What Do You Need?

If you have a \$billion to spare ...




M51 M16

UNIVERSITY OF LIVERPOOL

11

What Do You Need?

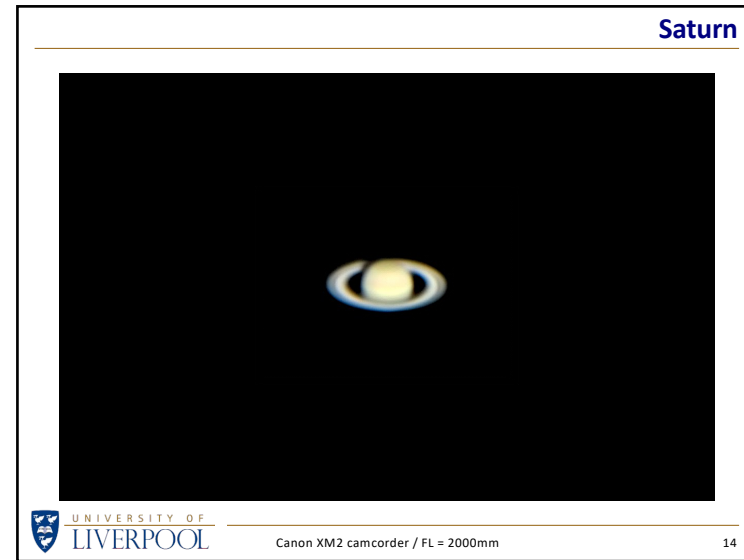


Refractors **Reflectors**

UNIVERSITY OF LIVERPOOL

12

Astrophotography



Astrophotography

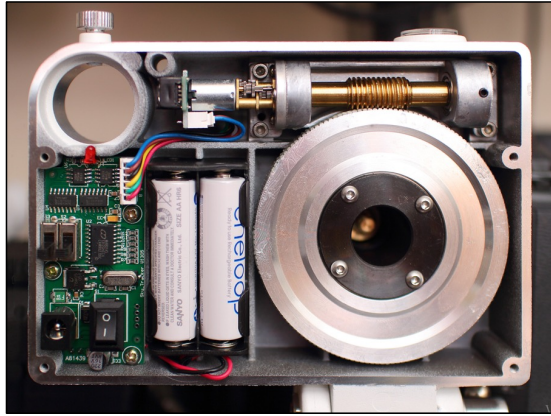
Star Trackers



UNIVERSITY OF LIVERPOOL

17

Inside a Star Tracker



UNIVERSITY OF LIVERPOOL

18

What Do You Need?


Start Simple	Just a camera and tripod
Equipment	Telescopes and mounts
Equipment	Cameras and star trackers
Photo Gallery	Some of my images
Astro Africa	Under the darkest skies

UNIVERSITY OF LIVERPOOL

19

Some Of My Images

I like to take astrophotographs without using a telescope, just using a camera on a star tracker:



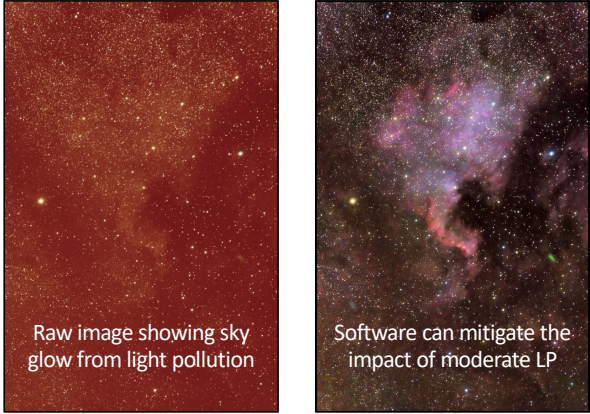
Astrophotography using a telescope can be very rewarding, but to get the most out of it will take quite a bit of time, effort and cash.

UNIVERSITY OF LIVERPOOL

20

Astrophotography

Image Processing



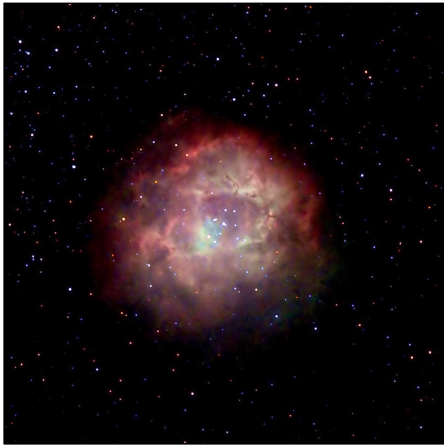
Raw image showing sky glow from light pollution

Software can mitigate the impact of moderate LP

UNIVERSITY OF LIVERPOOL

21

Rosette Nebula

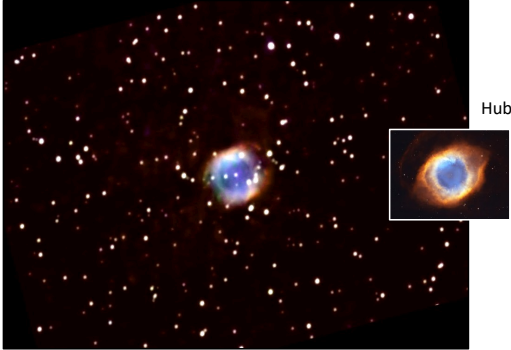


UNIVERSITY OF LIVERPOOL

Nikon D7500 / 300mm lens / 110 x 30s

22

Helix Nebula



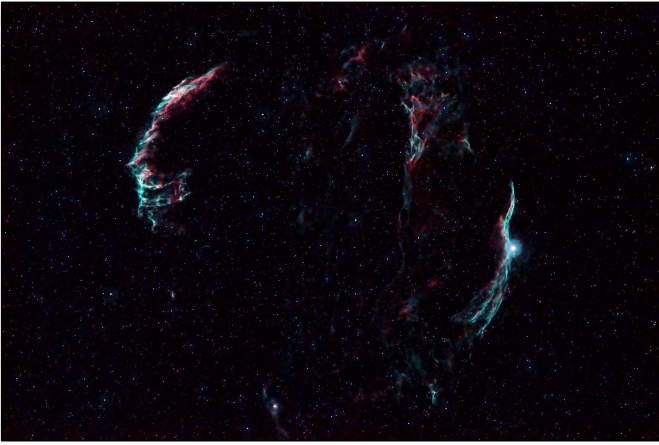
Hubble

UNIVERSITY OF LIVERPOOL

Nikon D70 / 300mm lens / 20 x 120s

23

Veil Nebula




UNIVERSITY OF LIVERPOOL

Nikon D7500 / 300mm lens / 60 x 60s / Tri-band

24

Astrophotography

Andromeda Galaxy

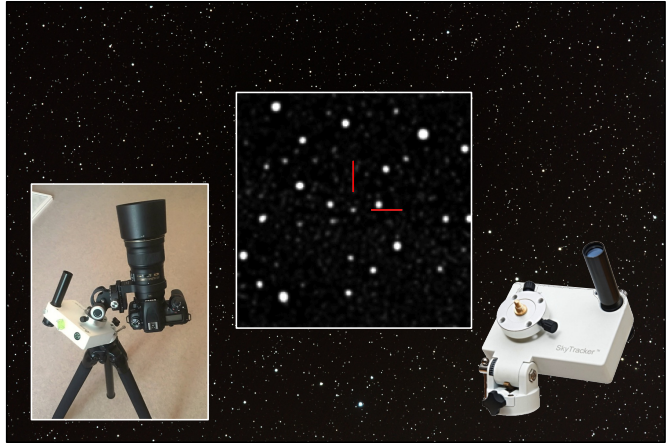


UNIVERSITY OF LIVERPOOL

Nikon D7500 / 300mm lens / 30 x 60s

25

Lockdown Challenge

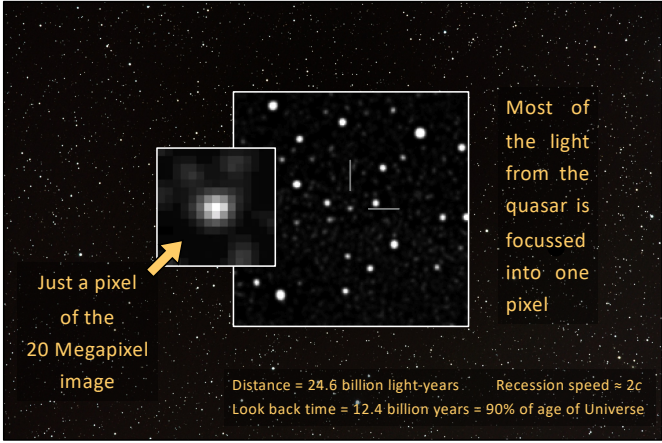


UNIVERSITY OF LIVERPOOL

Nikon D7500 / 300mm lens / 256 x 30s

26

Lockdown Challenge



Just a pixel of the 20 Megapixel image

Most of the light from the quasar is focussed into one pixel!

Distance = 24.6 billion light-years Recession speed = $2c$
Look back time = 12.4 billion years = 90% of age of Universe

UNIVERSITY OF LIVERPOOL

Nikon D7500 / 300mm lens / 256 x 30s

27

What Do You Need?

Start Simple	Just a camera and tripod
Equipment	Telescopes and mounts
Equipment	Cameras and star trackers
Photo Gallery	Some of my images
Astro Africa	Under the darkest skies

UNIVERSITY OF LIVERPOOL

28

Astrophotography

Wild Astronomy

Animals by day ...

... stars by night

Wildlife

Astronomy

Photography

Safari!

(Sleep when you get home)

UNIVERSITY OF LIVERPOOL

29

Milky Way

Saturn

Jupiter

UNIVERSITY OF LIVERPOOL

Nikon D7500 / 35mm lens / 10 x 120s

30

Milky Way

Sky Tracker™

UNIVERSITY OF LIVERPOOL

Nikon D7500 / 35mm lens / 10 x 120s

31

Astrophotography

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

Photographing the night sky

... without ridiculously expensive equipment

Dr Steve Barrett

WML 24 Mar 2023