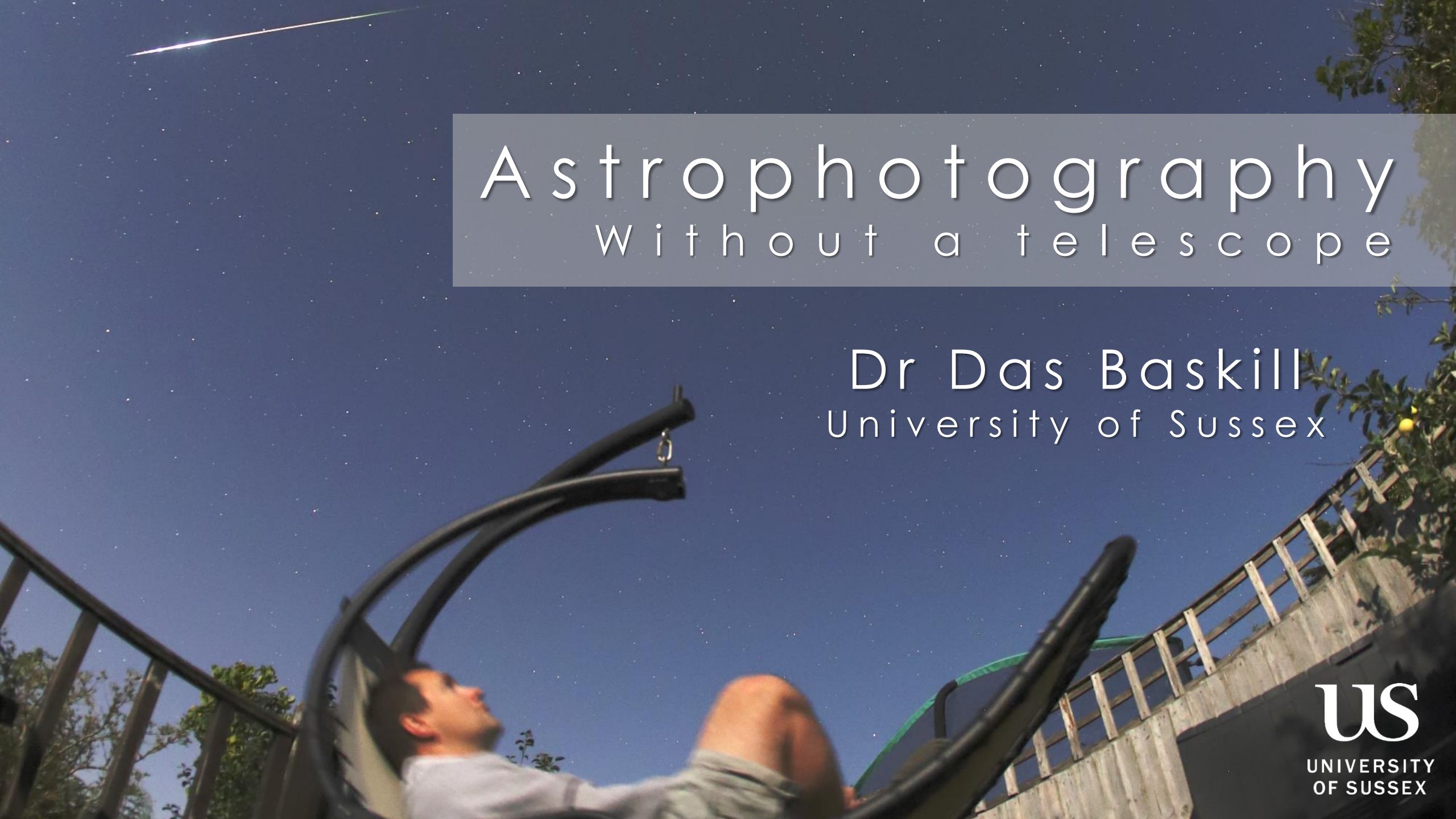


Astrophotography
Without a telescope

Dr Das Baskill
University of Sussex

UNIVERSITY OF SUSSEX

Astrophotography
Without a telescope

- Moon
- Manual camera settings
- Star-trails
- Meteors (shooting stars)
- Milky-way

The Moon

Method:

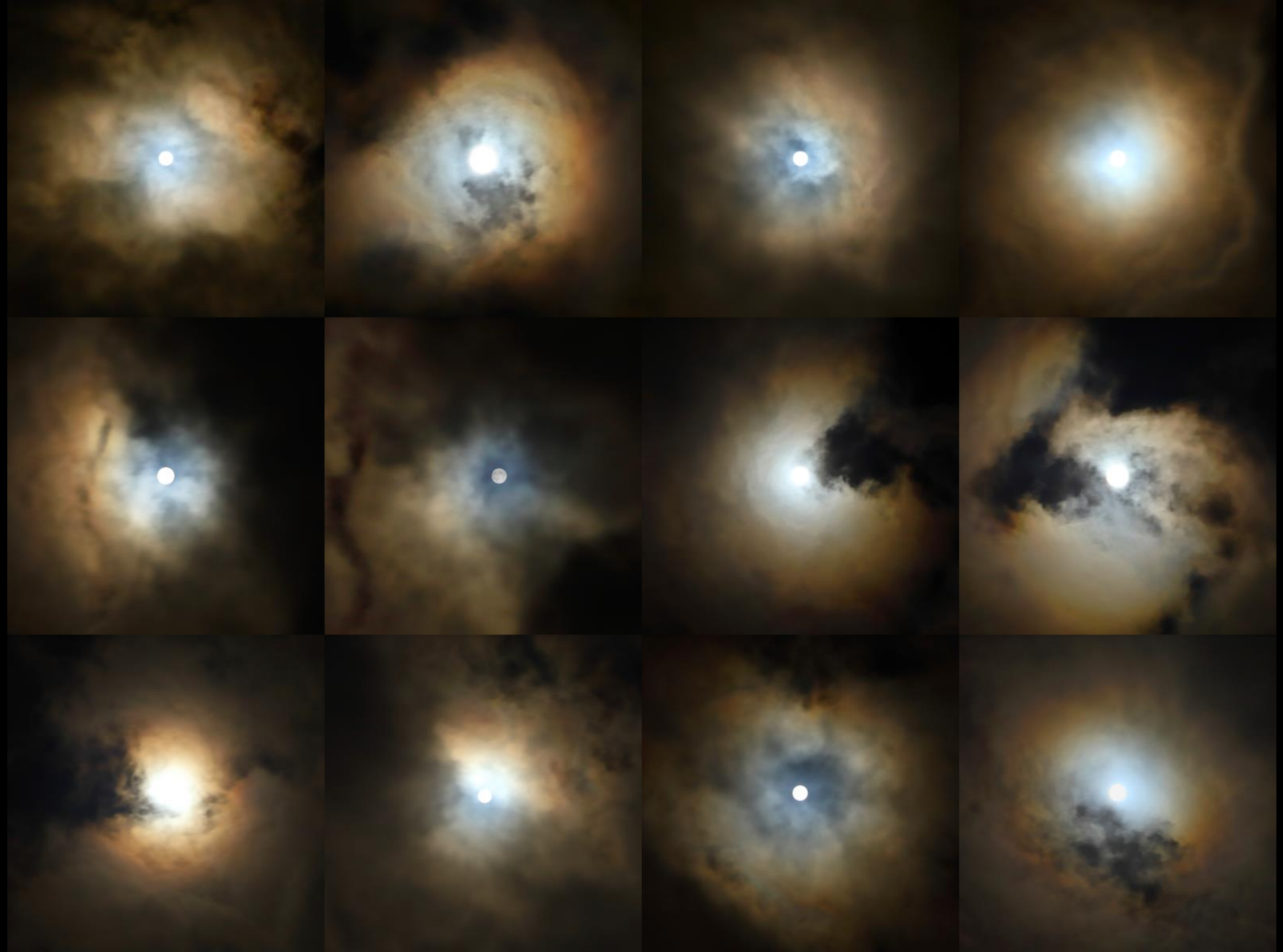
- Autofocus
- Autoexposure
- Auto f/number

The Moon

The Moon

The Moon

The Moon



Camera Settings

- Exposure time
- ISO setting
- f/number

Camera Settings

- Exposure time
  - Increase to collect more light…
  - …But objects move across the sky.
- ISO setting
- f/number

Exposure Time

Short: $^1/_8$ seconds

Exposure Time

Longer: 2s


Exposure time: 10 hours

Camera Settings

- Exposure time
- ISO setting
- f/number

Increase to make the camera more sensitive to light…

But that also makes the camera more sensitive to imperfections, too.

ISO setting

ISO 100

ISO setting

ISO 200

ISO setting

ISO setting


ISO setting
ISO 1600

ISO setting

ISO 3200

Camera Settings

- Exposure time
- ISO setting
- f/number

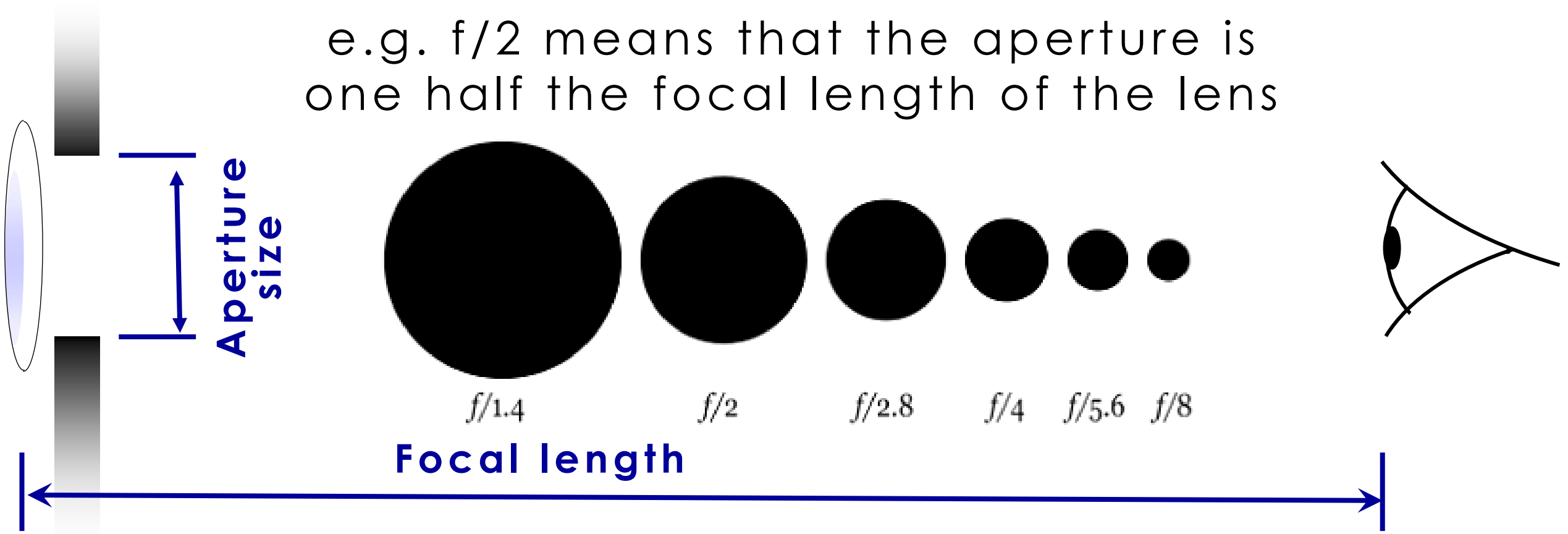
Increase to collect more light...

... Or decrease to increase the depth of field or for diffraction spikes.

Camera Settings

f/number is the aperture size (opening) of a lens, in terms of Focal length

e.g. f/2 means that the aperture is one half the focal length of the lens




f/4.5


f/13


f/32

The Moon

30 seconds
f/32
ISO 2000


f/5.6
f/11
The Moon

Camera Settings
For shooting the Moon

- Exposure time { Can take short exposures for the bright Moon: 1/50s-1/200 s
- ISO setting { No need to be too sensitive as the Moon is bright: ISO200-800
- f/number { f/4.0 to f/13+, depending on diffraction spikes

The Moon

By Laurent Laveder

http://www.pixheaven.net


Moon trails
& Movement

Moon trails

Trough a telescope

Exposures:

0.2 second
ISO 1600
1000mm telescope
D=200mm, so f/5

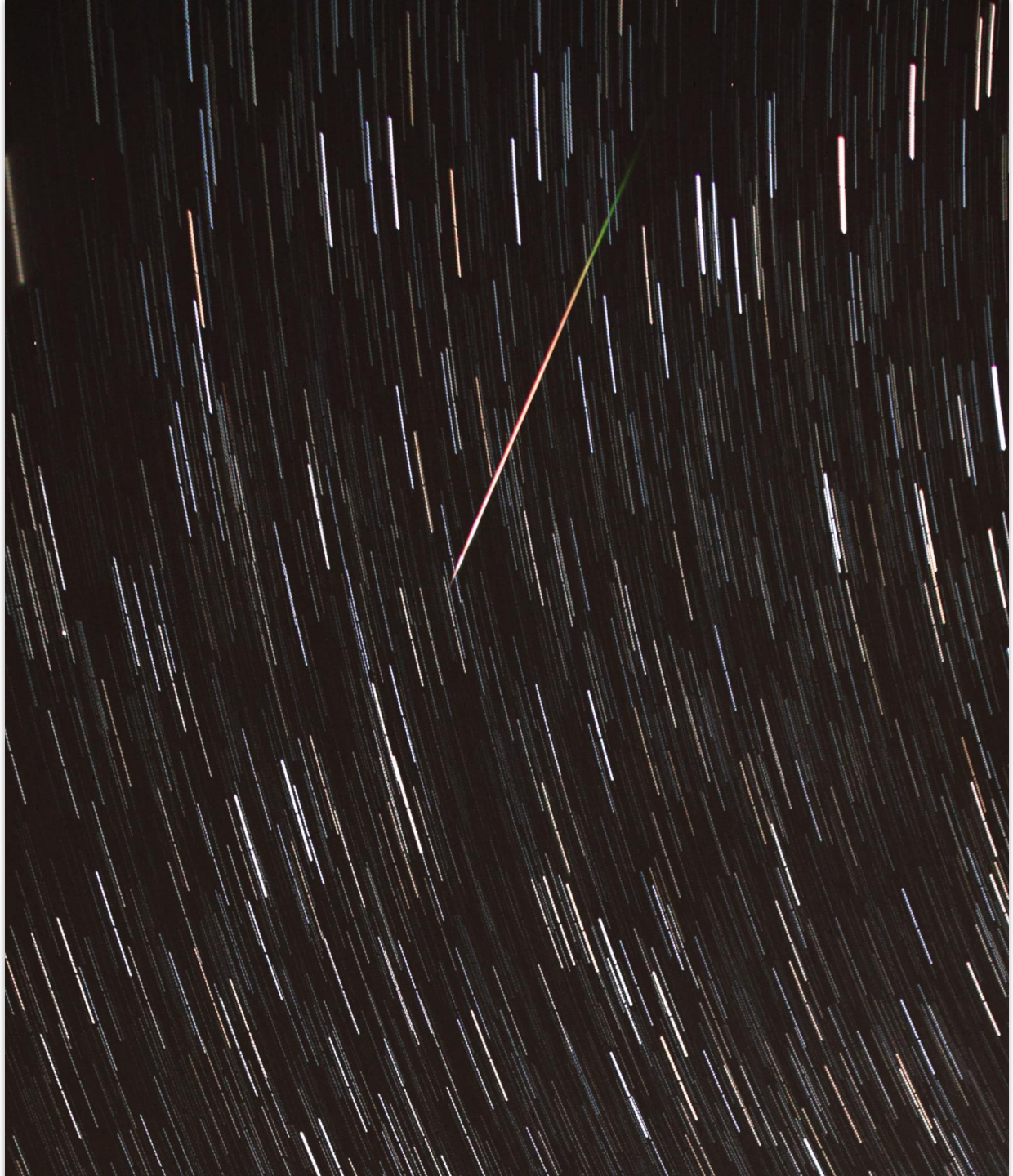
Planning with Stellarium and a map

The Moon
during a lunar eclipse

University of Sussex
Meeting House chapel

Star trails (Stacking)


Exposure
30 secon
f/9
ISO 3200
Repeate
At ~f/9,
both badger
and stars
are in focus



Meteors

Shooting stars are very difficult to photograph!

- They're very quick
- Often faint
- And can appear anywhere in the sky

Camera settings
for meteors/shooting stars

- Exposure time
  - ~10 seconds or until light pollution dominates...
- ISO setting
  - Camera needs maximum sensitivity: ISO 3200+
- f/number
  - Wide open aperture e.g. f/2.8 or f/4 to allow as much light in as possible.

Meteors

Light pollution from the inefficient lights of Brighton

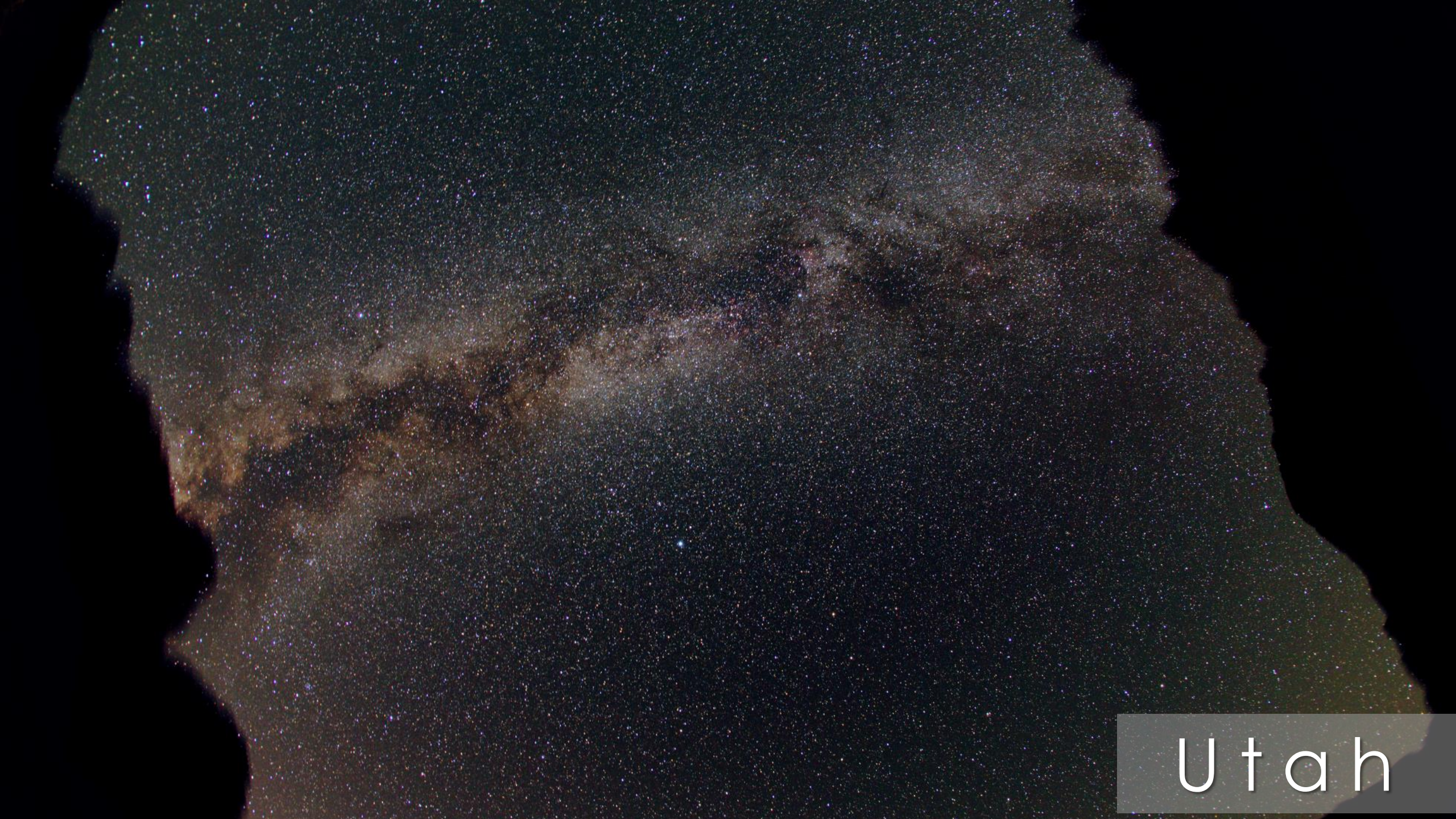
Light pollution

Typical view of the night sky
from a light polluted location

Light pollution

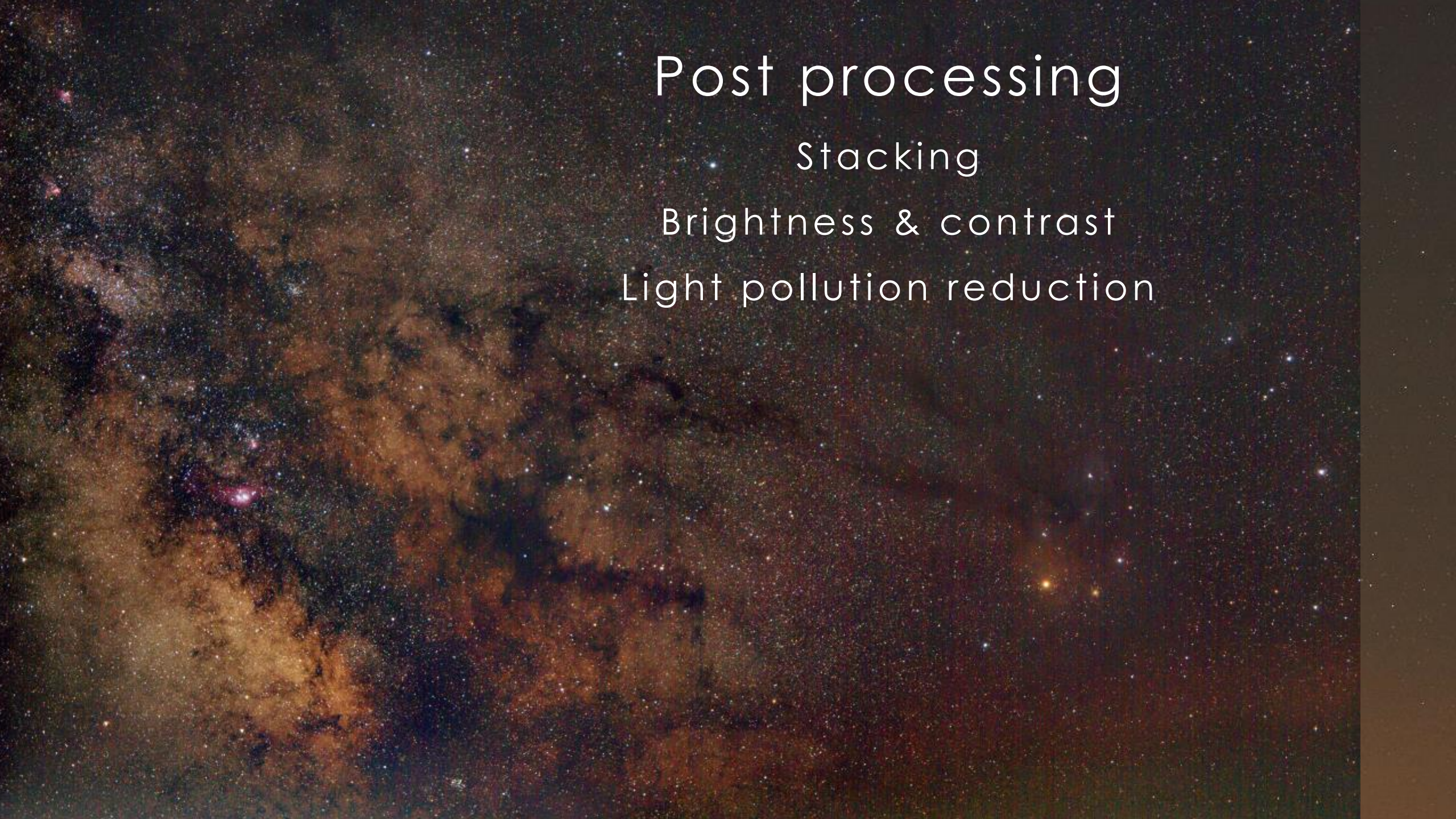
Typical view of the night sky
from a dark location


Milky way
< Andromeda galaxy
Brighton


Utah


Mauna Kea
Hawai'i


Mauna Kea
Hawai'i

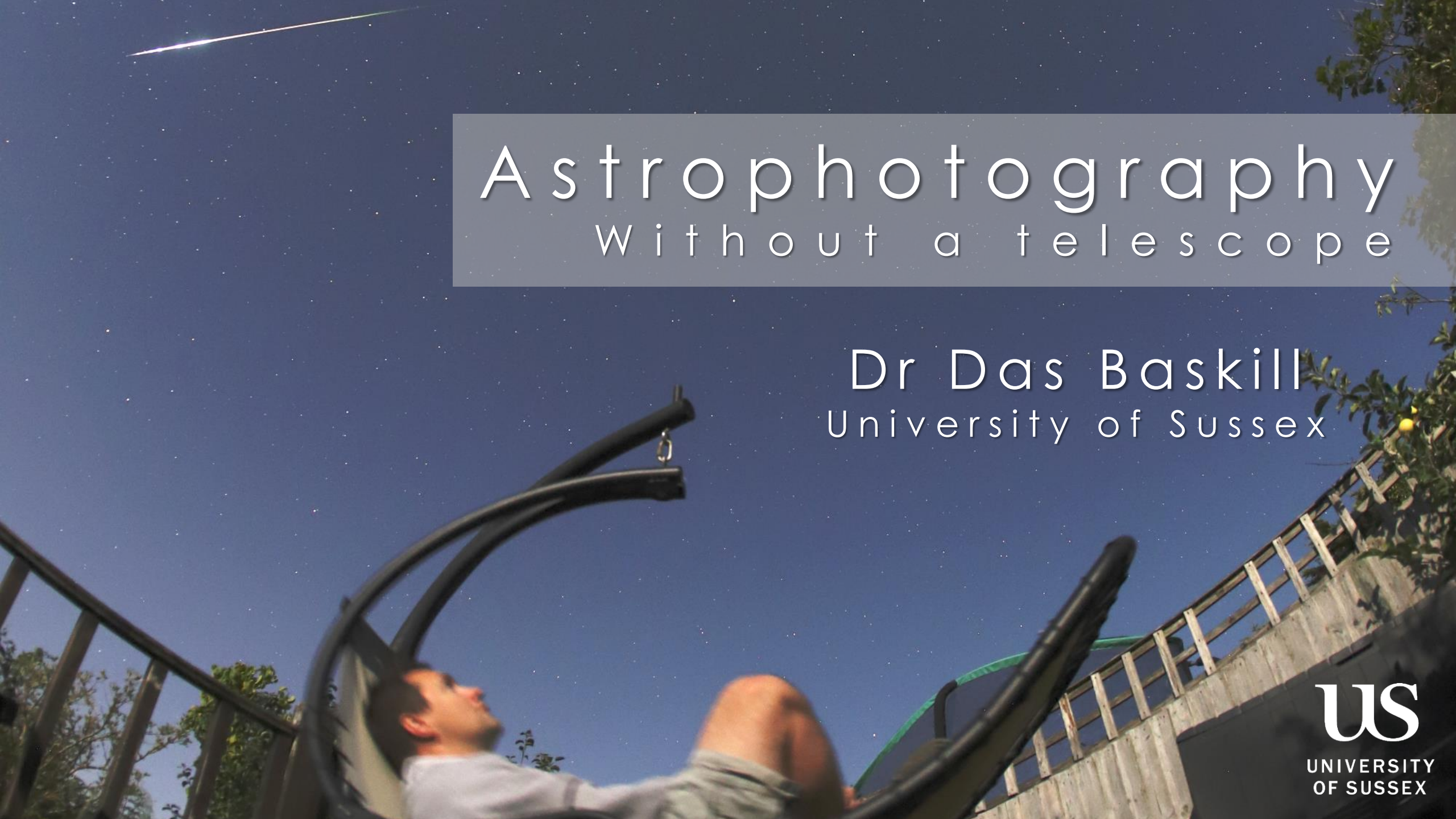


Post processing

Stacking

Brightness & contrast

Light pollution reduction



Astrophotography
Without a telescope

Dr Das Baskill
University of Sussex

UNIVERSITY OF SUSSEX