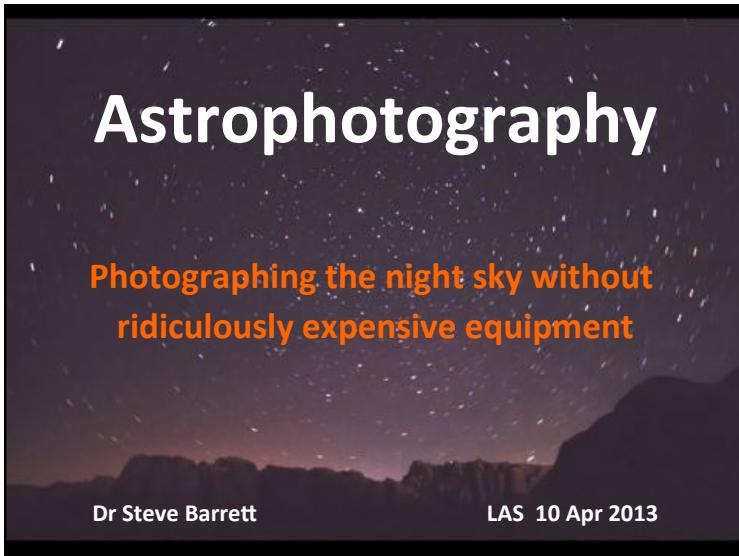


Astrophotography



A dark night sky filled with stars. In the center, the words "Astrophotography" are written in large white letters. Below them, in orange text, is the subtitle "Photographing the night sky without ridiculously expensive equipment". At the bottom left is the name "Dr Steve Barrett" and at the bottom right is the date "LAS 10 Apr 2013".

Astrophotography

What can be done with a camera and ...

- ... nothing else?
- ... a DIY star tracker?
- ... an amateur telescope?

Astrophotography / Introduction

2



Astrophotography

Aurora Borealis



Astrophotography / Fixed / Aurora Borealis

5

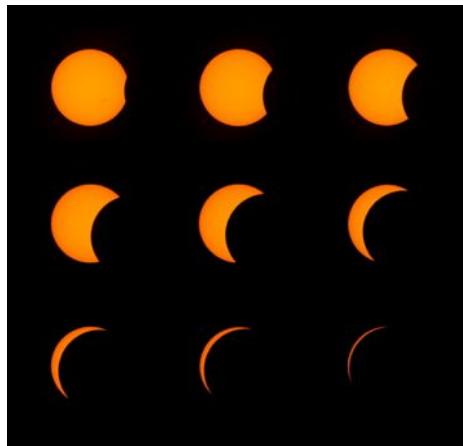
Aurora Borealis



Astrophotography / Fixed / Aurora Borealis

6

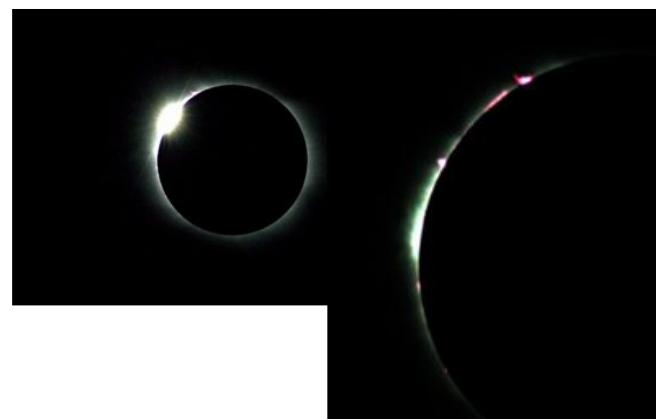
Solar Eclipse



Astrophotography / Fixed / Solar Eclipse

7

Solar Eclipse



Astrophotography / Fixed / Solar Eclipse

8

Astrophotography



Star Trails



Astrophotography / Fixed / Star Trails

10

Tracking the Stars

How can the sky be photographed without the stars trailing?
Build a device to compensate for the Earth's rotation — a star tracker.

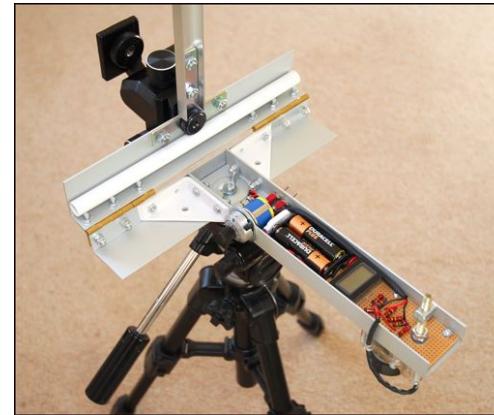
Ideally... For K2 this means...

Compact	Footprint no larger than A4
Light	Less than 1 kg
Strong	Able to support a digital SLR
Accurate	Exposures of up to 15 minutes
Battery operated	AA batteries
Low power	Run for ~ 6 hours
Cheap	Cost < £50 for all components
Easy to construct	Manual tools (no workshop)

Astrophotography / Star Tracker

11

K2 Star Tracker

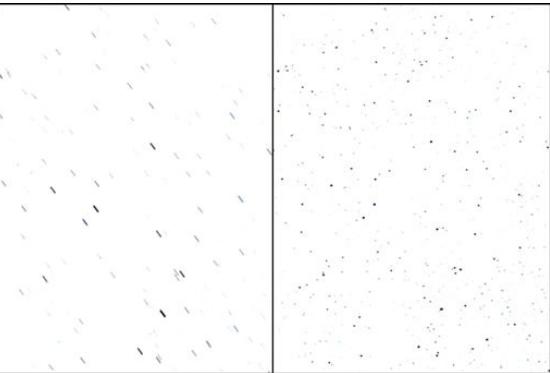


Astrophotography / Star Tracker

12

Astrophotography

K2 Star Tracker



K2 off K2 on

Astrophotography/ Star Tracker 13



Telescopes



Astrophotography/ Telescopes 15



Astrophotography

Saturn Video



Astrophotography / Telescopes / Saturn

17

Orion Nebula



Astrophotography / Telescopes / M42 Orion Nebula

18

Pleiades Cluster



Astrophotography / Telescopes / Piggy-Backing / M45 Pleiades

19

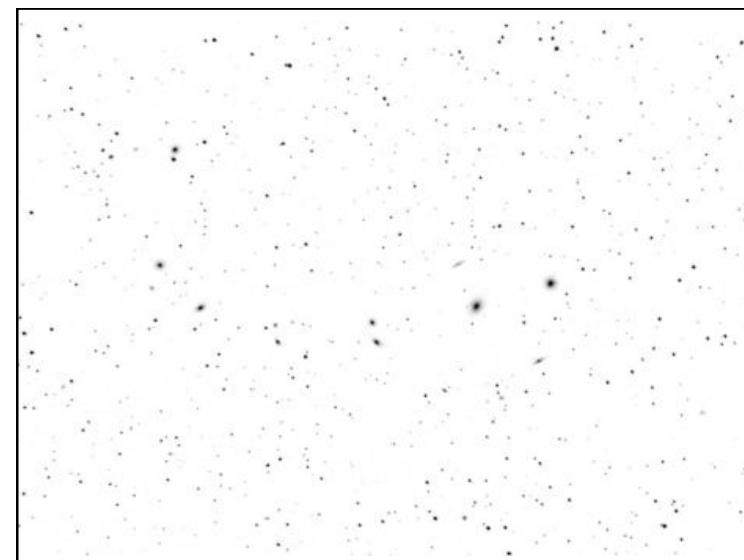
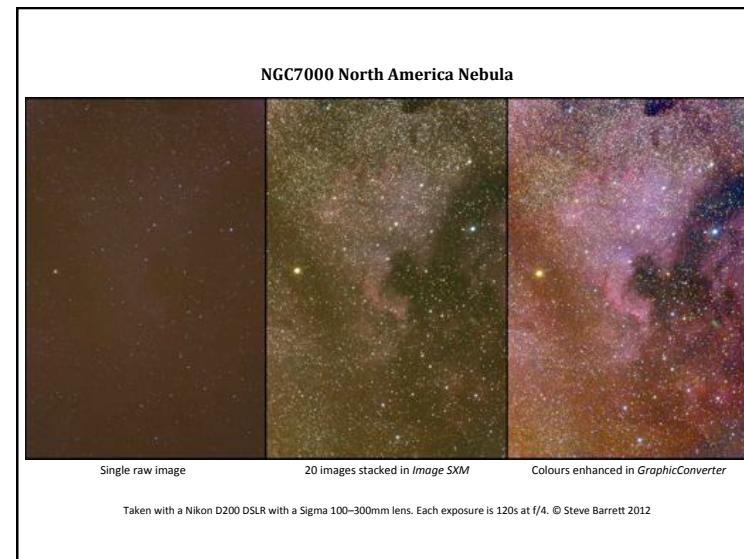
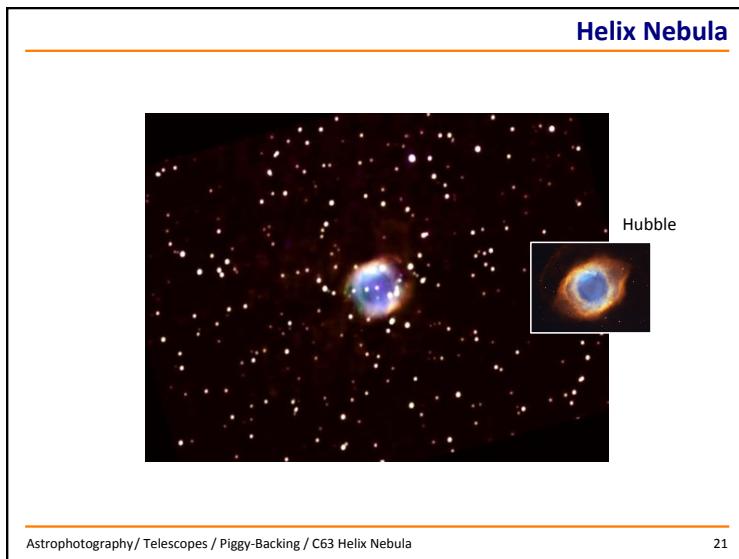
Andromeda Galaxy



Astrophotography / Telescopes / Piggy-Backing / M31 Andromeda Galaxy

20

Astrophotography



Astrophotography

Image Processing

Dark
Flat
Raw

Astrophotography / Image Processing / Markarian's Chain

25

Image Processing

Astrophotography / Image Processing / Andromeda Galaxy

26

Deep Sky Photography

Astrophotography / Image Processing / Rosette Nebula

27

Astrophotography

Photographing the night sky without
ridiculously expensive equipment

<http://www.liv.ac.uk/~sdb/Talks>