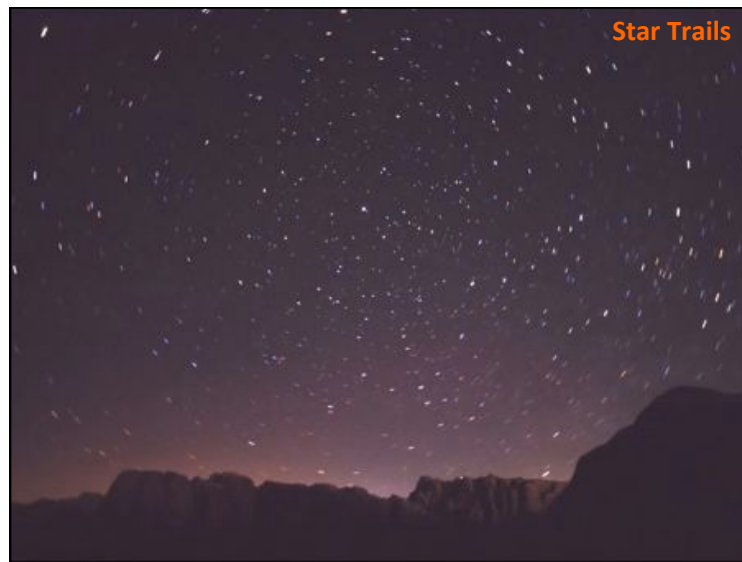
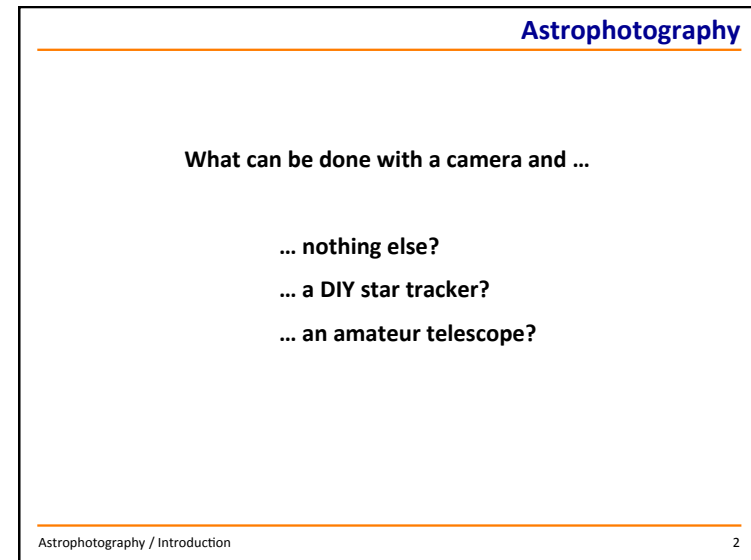
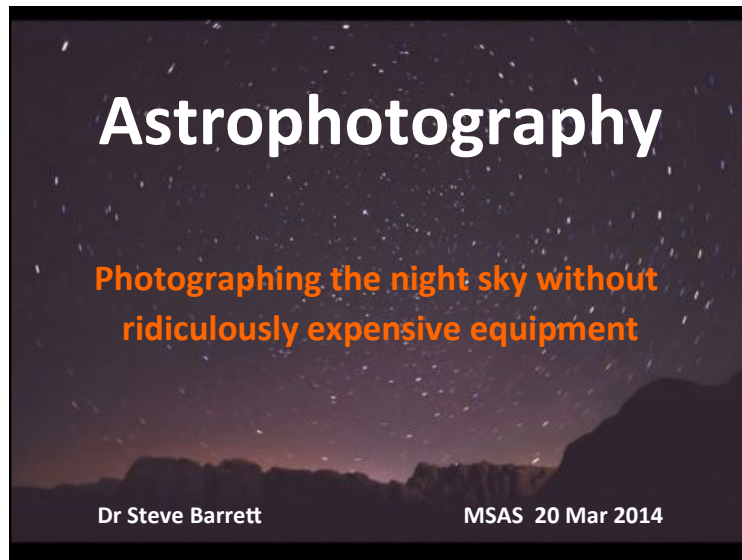


Astrophotography



Astrophotography

Aurora Borealis



Astrophotography / Fixed / Aurora Borealis

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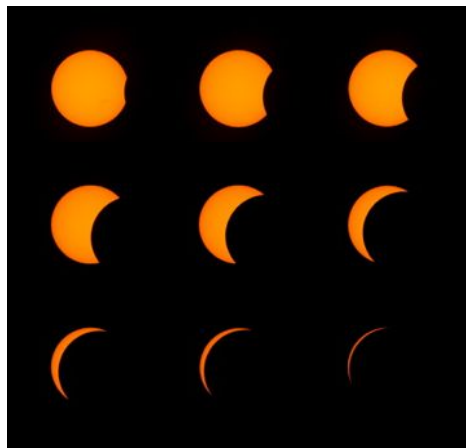
Aurora Borealis



Astrophotography / Fixed / Aurora Borealis

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Solar Eclipse



Astrophotography / Fixed / Solar Eclipse

7



Astrophotography

Star Trails



Astrophotography / Fixed / Star Trails

9

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.

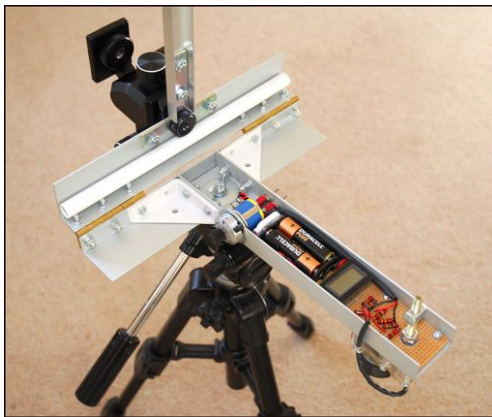
Ideally... For K2 this means...

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

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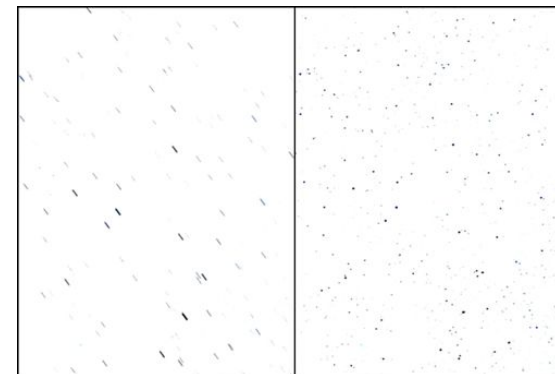
K2 Star Tracker



Astrophotography / Star Tracker

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K2 Star Tracker



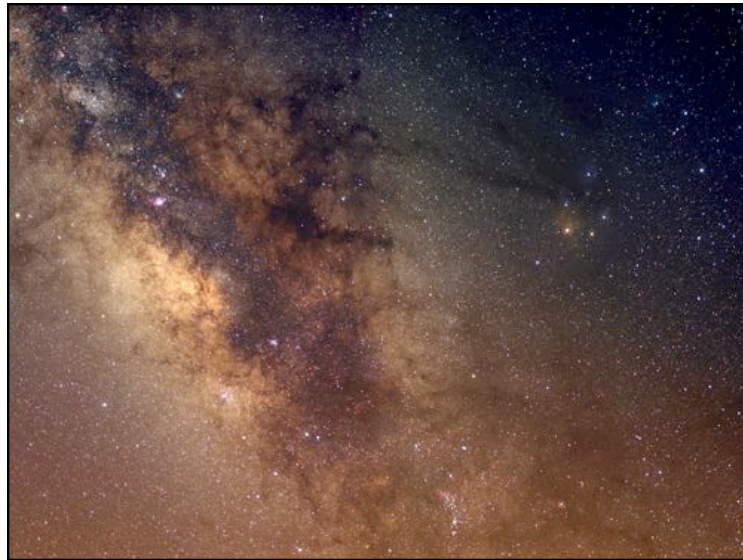
K2 off

K2 on

Astrophotography / Star Tracker

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Astrophotography



Tracking the Stars



Astrophotography / Star Tracker / Antares

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Star Trackers



Astrophotography / Star Trackers

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Telescopes



Astrophotography / Telescopes

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Astrophotography



Saturn Video



Astrophotography / Telescopes / Saturn

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Orion Nebula



Astrophotography / Telescopes / M42 Orion Nebula

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Pleiades Cluster



Astrophotography / Telescopes / Piggy-Backing / M45 Pleiades

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Astrophotography

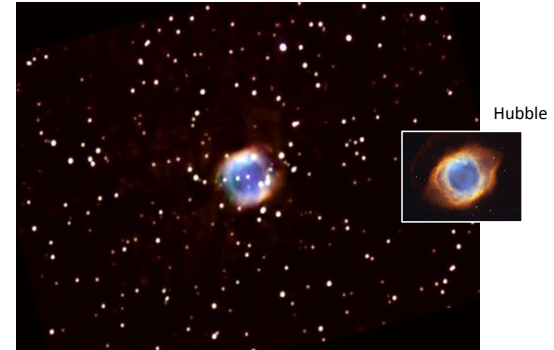
Andromeda Galaxy



Astrophotography / Telescopes / Piggy-Backing / M31 Andromeda Galaxy

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Helix Nebula



Astrophotography / Telescopes / Piggy-Backing / C63 Helix Nebula

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NGC7000 North America Nebula



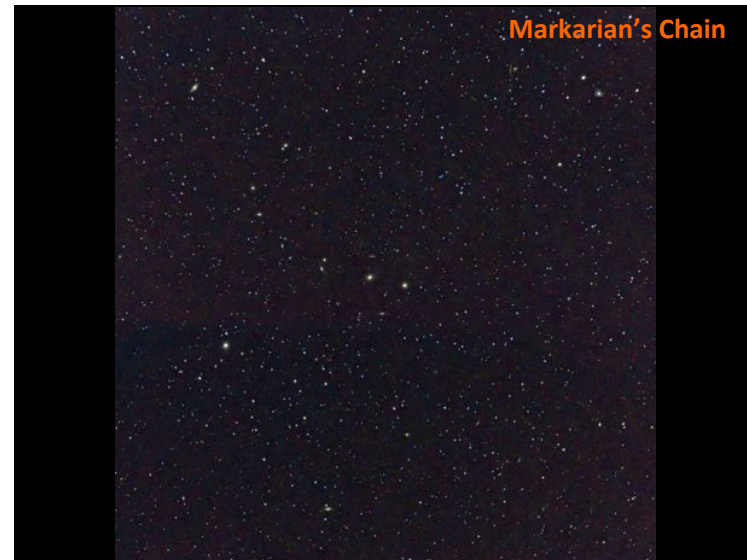
Single raw image

20 images stacked in *Image SXM*

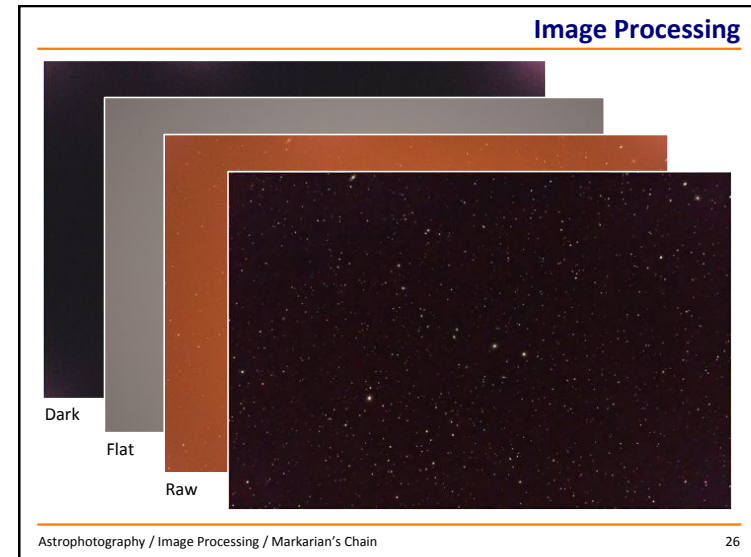
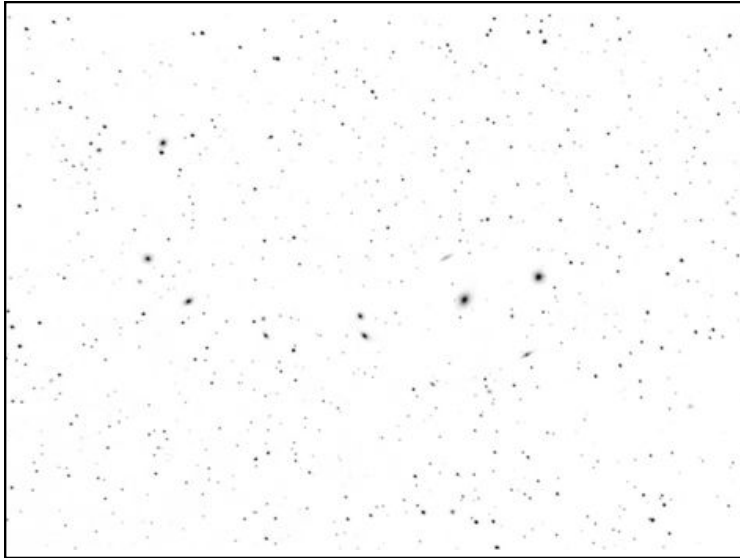
Colours enhanced in *GraphicConverter*

Taken with a Nikon D200 DSLR with a Sigma 100–300mm lens. Each exposure is 120s at f/4. © Steve Barrett 2012

Markarian's Chain



Astrophotography



Astrophotography

What can be done with a camera and ...

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

The answer is... quite a lot!

Astrophotography / Summary 27



Astrophotography

**Photographing the night sky without
ridiculously expensive equipment**

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