

# A Ramble Through the Night Sky



## A Ramble Through the Night Sky

- |                               |  |
|-------------------------------|--|
| What's up there?              | planets and comets<br>stars and galaxies |
| How can I find my way around? | maps<br>apps                             |
| What if I want to see more?   | binoculars<br>telescopes                 |
| How can I take photos?        | star trails<br>tracking the sky          |

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## A Ramble Through the Night Sky

### Disclaimer 1

I'm not an astrophysicist ...

I'm an amateur astronomer (who happens to be a physicist)

### Disclaimer 2

I'm not attempting to describe everything 'up there'

This is a random walk through the Universe

Along the way, I will show photographs that I have taken

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## What's up there?

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# A Ramble Through the Night Sky

## Aurora Borealis



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Even our closest  
neighbour can  
be fascinating...  
...watching the  
shadows of the  
craters and  
mountains  
change from  
night to night



## Comet Hale-Bopp 1997



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## Comet Holmes 2007

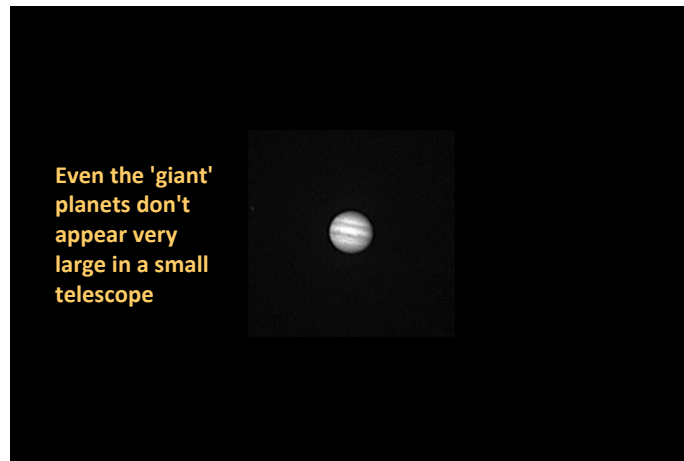


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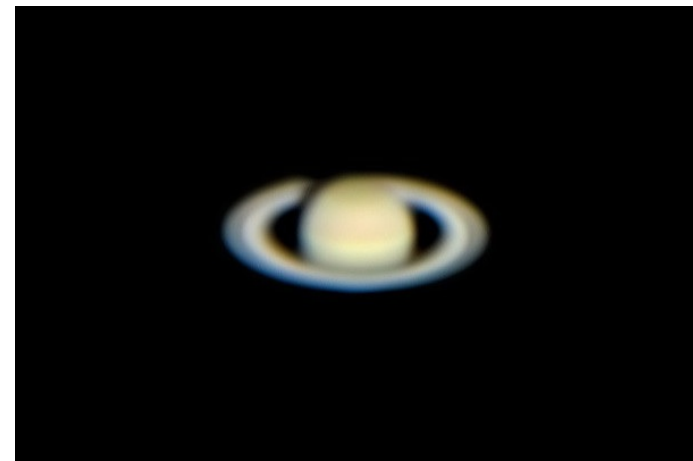
Jupiter



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Saturn



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Stars and Stuff



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Pleiades Star Cluster



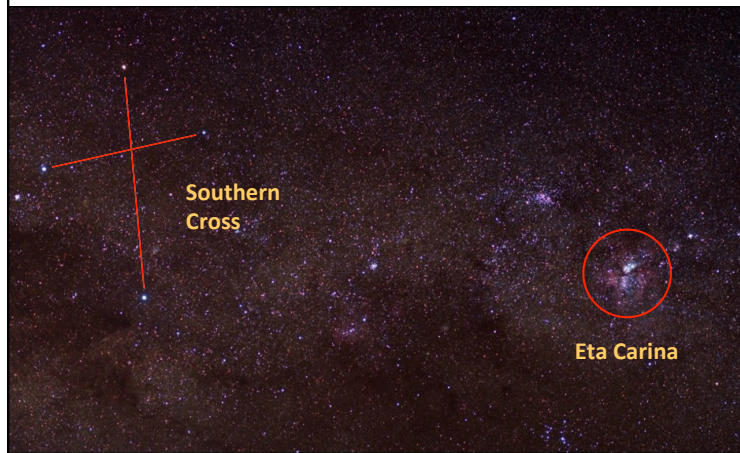
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# A Ramble Through the Night Sky

**Centaurus – Crux – Carina**



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**Helix Nebula**



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**Andromeda Galaxy**



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**Markarian's Chain of Galaxies**



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# A Ramble Through the Night Sky

How can I find  
my way around?

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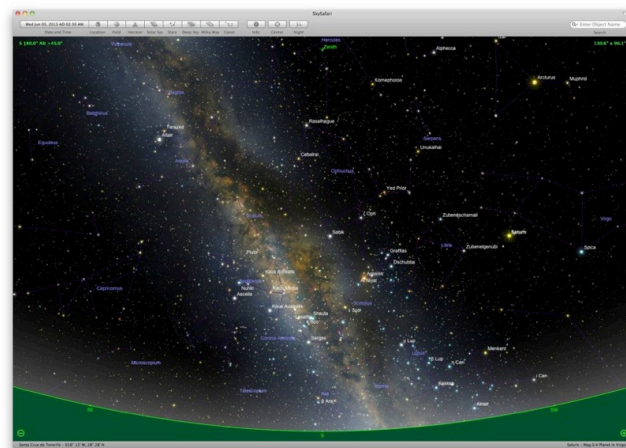
## Maps and Apps



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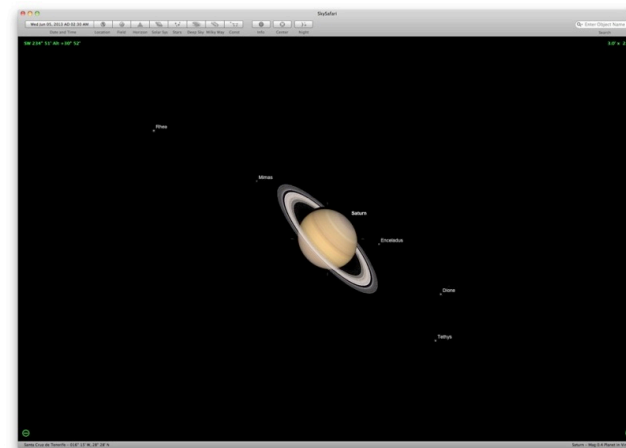
## Maps and Apps



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## Maps and Apps



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# A Ramble Through the Night Sky

What if I want  
to see more?

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## Astronomy Hardware

**Binoculars, small telescope or big telescope?**

How should you decide what is worth buying?

**Is the image...**

Bright? Clear? Steady? Big?

**Making a choice**

You would hope that a large, expensive telescope would give brighter, clearer images.

Even small telescopes need a solid, stable mount to ensure that the image is steady.

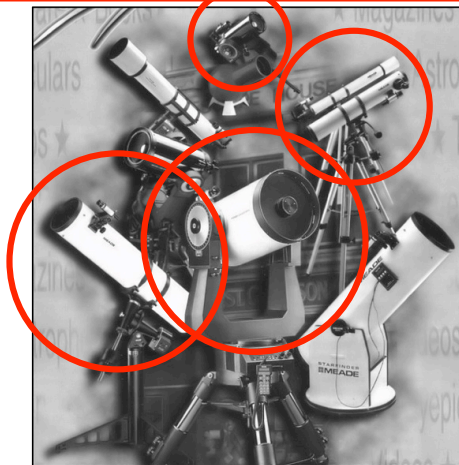
Image magnification is the least important factor.

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## Astronomy Hardware

There are many  
types of telescope  
available, making a  
choice somewhat  
confusing



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## Astronomy Hardware

**Refractors**

use lenses to focus the light



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# A Ramble Through the Night Sky

## Astronomy Hardware



Refractors

use lenses to focus the light

**Reflectors**

use mirrors to focus the light

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## Astronomy Hardware



Refractors

use lenses to focus the light

Reflectors

use mirrors to focus the light

**Schmidt-Cassegrains**

use both lenses and mirrors

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## Astronomy Hardware



Refractors

use lenses to focus the light

Reflectors

use mirrors to focus the light

Schmidt-Cassegrains

use both lenses and mirrors

**Compact 'Go To' telescopes**

user-friendly controllers to  
point the telescope

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## Observatories



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## Teide Observatory

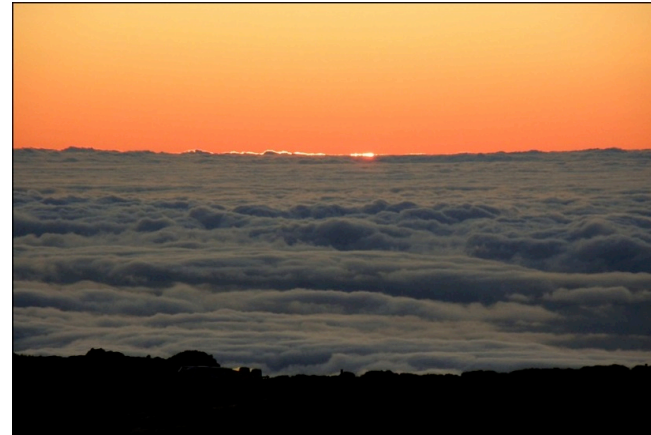
Astrophysics students get to visit...



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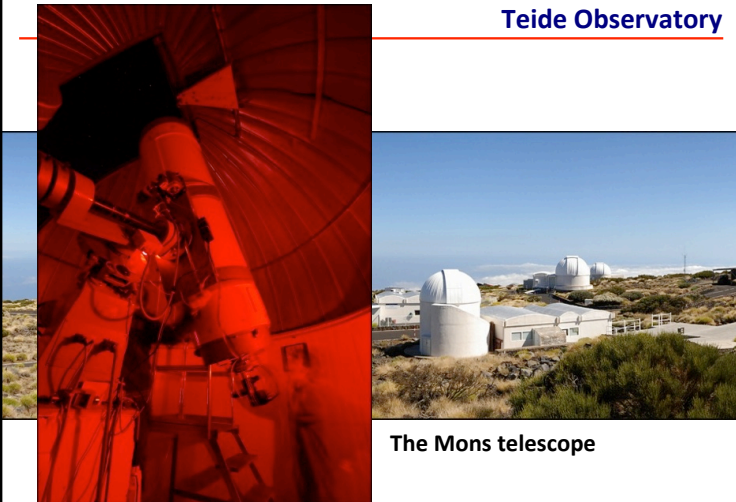
## Teide Observatory



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## Teide Observatory



The Mons telescope

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## Teide Observatory



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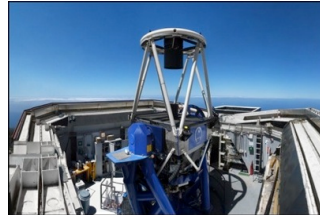
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## La Palma Observatory

On the neighbouring island of La Palma is the fully-robotic Liverpool Telescope



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The Eagle Nebula imaged with the Liverpool Telescope



## How can I take photos?

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## Star Trails



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## Star Trails



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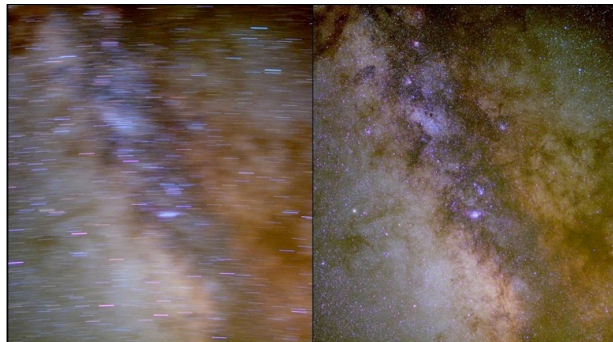
## Avoiding Star Trails



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## Avoiding Star Trails



Star tracker off

Star tracker on

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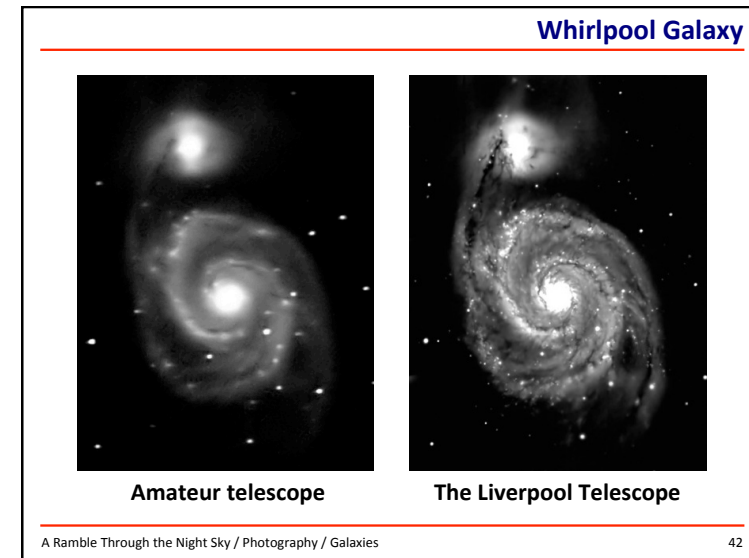
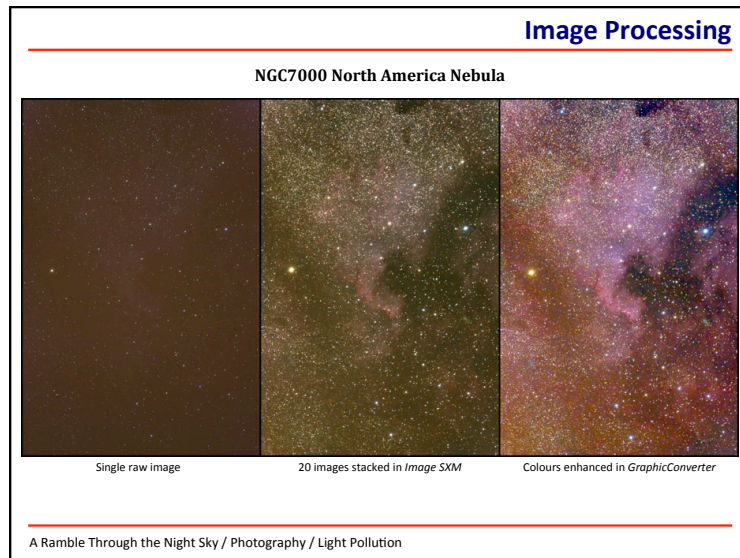
## Photography with a Star Tracker

A mosaic of four images of part of the Milky Way

The Milky Way is not just a smudge of light across the sky – a surprising amount of detail can be seen



# A Ramble Through the Night Sky




**A Ramble Through the Night Sky**

What's up there?

How can I find my way around?

What if I want to see more?

How can I take photos?



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[www.liverpool.ac.uk/~sdb/Talks](http://www.liverpool.ac.uk/~sdb/Talks)

Dr Steve Barrett

Wirral Ramblers 26 Feb 2015