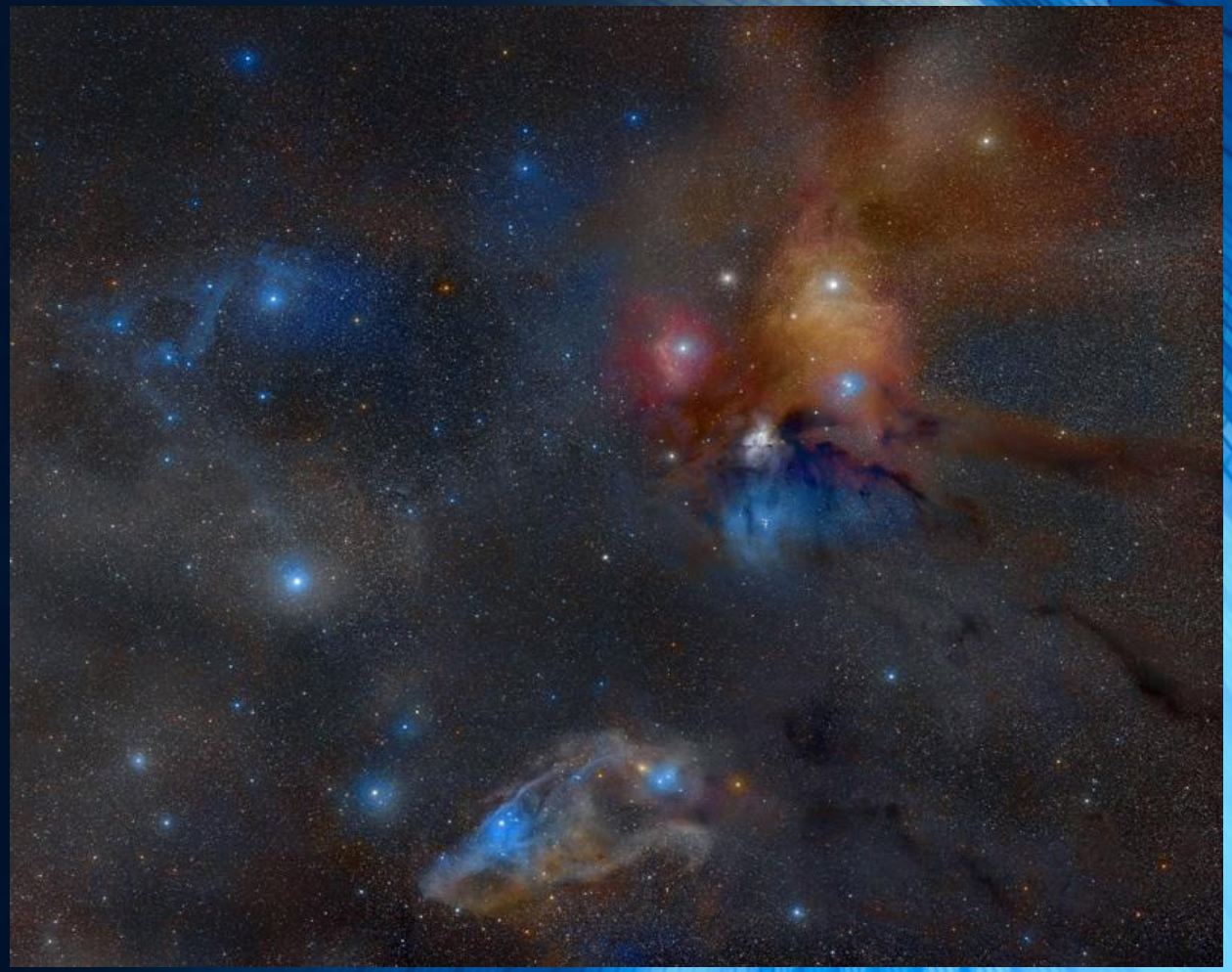
A Beginners Guide to Astrophotography Using Your DSLR



SIMON LEWIS

STARDATE SOUTH ISLAND 2019

" Astronomy? Impossible to understand and madness to investigate"

Sophocles (497- 405 BC)

Getting started in DSLR Astrophotography

- How to get started?
- What gear do I 'need'?
- 'Simple' Astrophotography Introduction
- Finding the right settings to be successful
- Taking your first shots
- Software and tools to help
- Further Reading / Resources

How to get Started

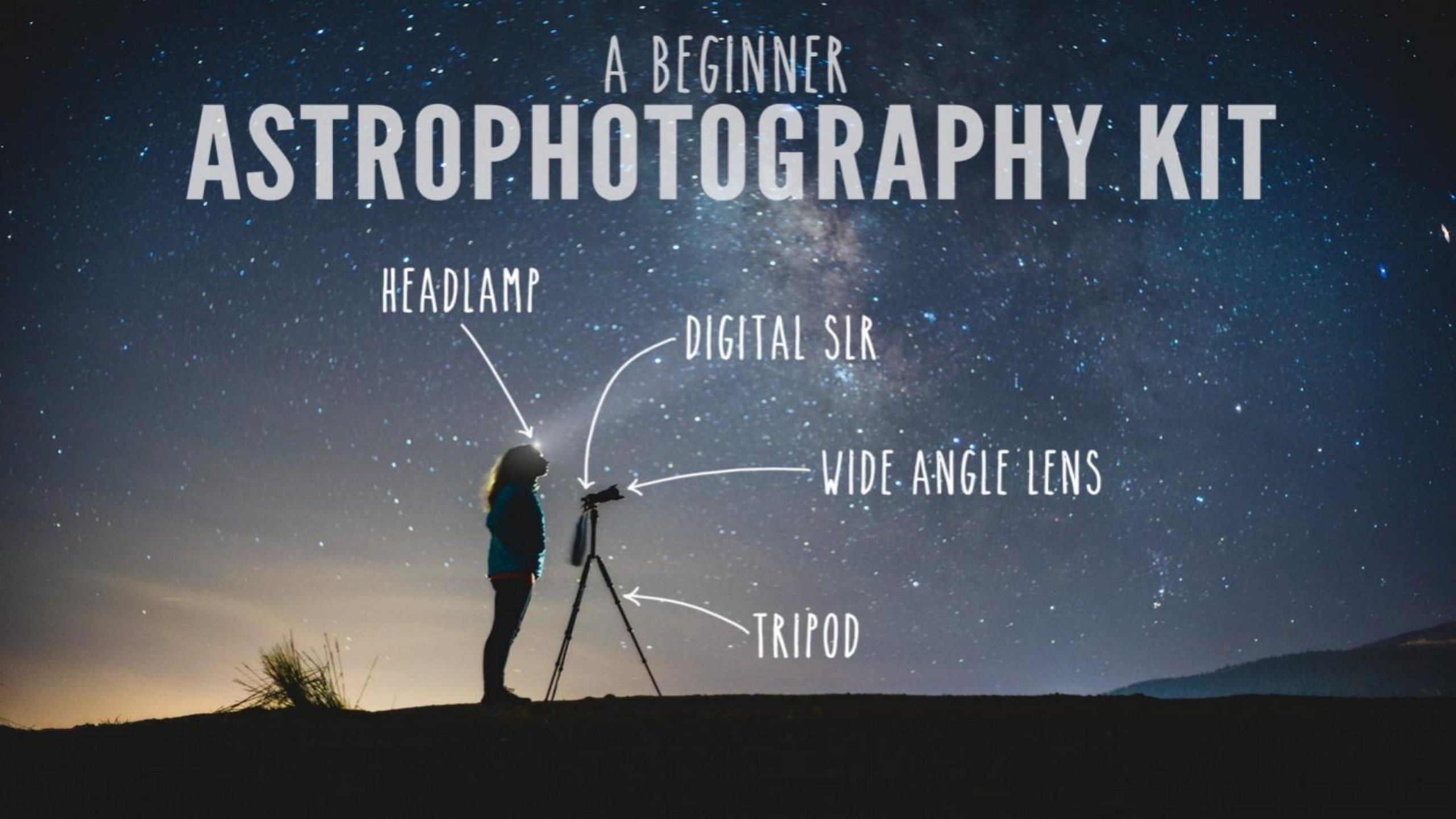
- Start with basics – walk before you can run
- Decide on an area of interest and concentrate on that
- Budget will decide a path for you ☺
- Even the family DSLR / Tripod will give you a sound start
- Be prepared for plenty of trial and error – AP takes some patience
- Build on the basics and grow as budget/skills and time allow
- Use CAS to help – we have both skills in house and equipment on hand to use

What gear do I 'Need'

- Remember the previous slide ..... Start with basics
- What do you have available?
- What is my interest? Aurora? Lunar Photography or Deep Sky? – Basic DSLR can do it all!
- What budget do I have?
- What is my existing skill level?
- How much time do I have free?
- Consider all of this and you will start forming some answers to 'need' or rather what you "don't" need!

Simple DSLR Astrophotography

- Simple AP can be as simple as a basic DSLR and tripod
- Most kit lenses are ok to start – a wide angle lens is a help
- Even a basic tripod will help in keeping the camera steady
- Most DSLR's can do 30 seconds timed interval
- Learn how to set manual mode and manual focus
- Turn off all noise reduction in camera
- Can capture images of stars, moon and aurora
- Sky around the Southern Celestial Pole a good start
- Learn how to stack and process
- A PC is guaranteed to be required!


A BEGINNER
ASTROPHOTOGRAPHY KIT
HEADLAMP
DIGITAL SLR
WIDE ANGLE LENS
TRIPOD

Setting Up Your DSLR

- Using any kind of Program Mode or preset setting isn't usually possible. You will need to choose a fully manual mode so that you can set both aperture and shutter speeds

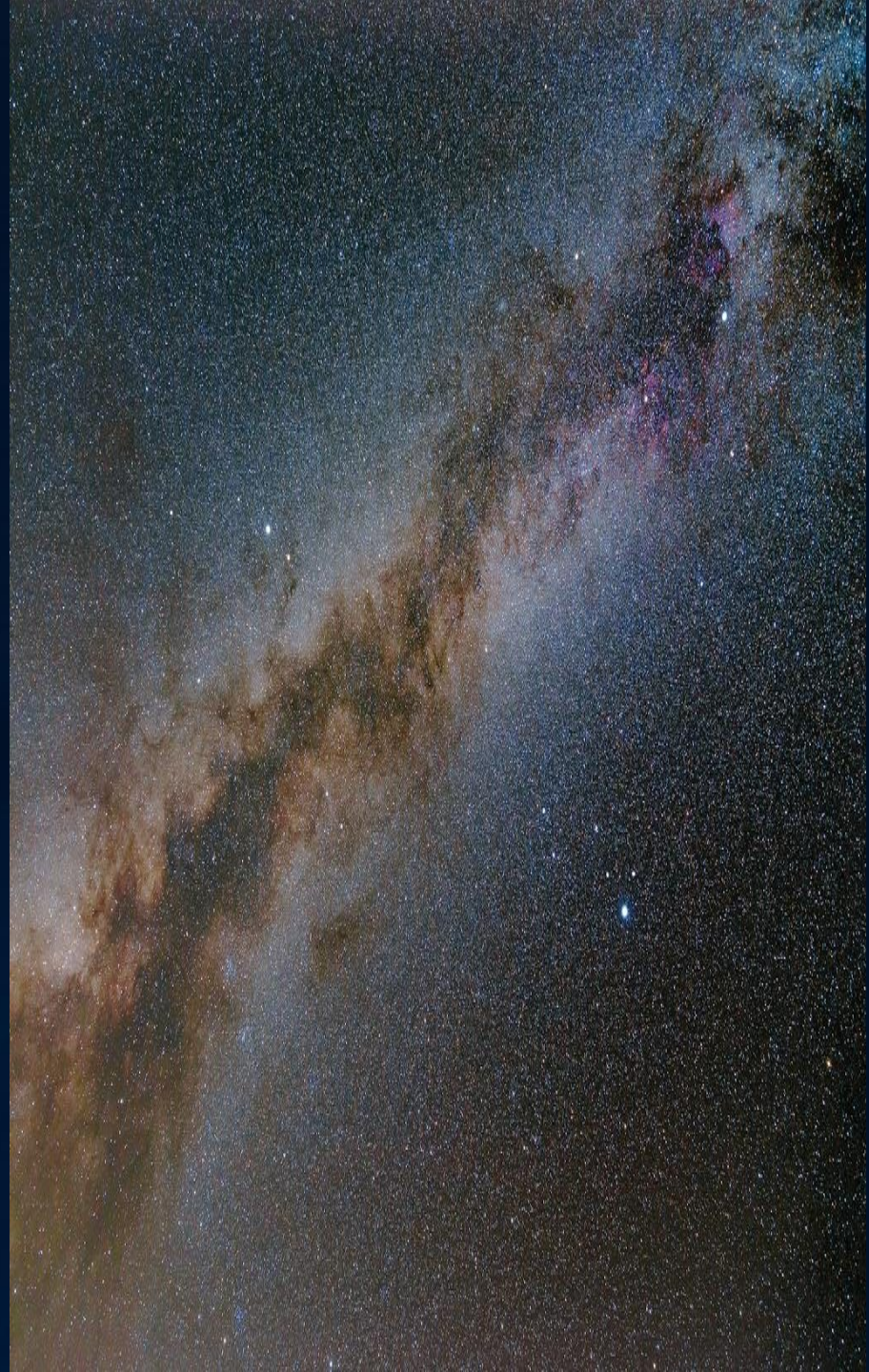
- You will need to do longer exposures than normal – 30 seconds is a good start – so find the interval timer settings on your camera

- Auto Focusing in low light won't work so you will need to ensure that your focusing menu is set for manual focus – sometimes the lens will also have a slide switch for manual focus mode

- In my D5300 I also need to disable menu settings for focus lock so that it will take a frame without being in focus – check your settings

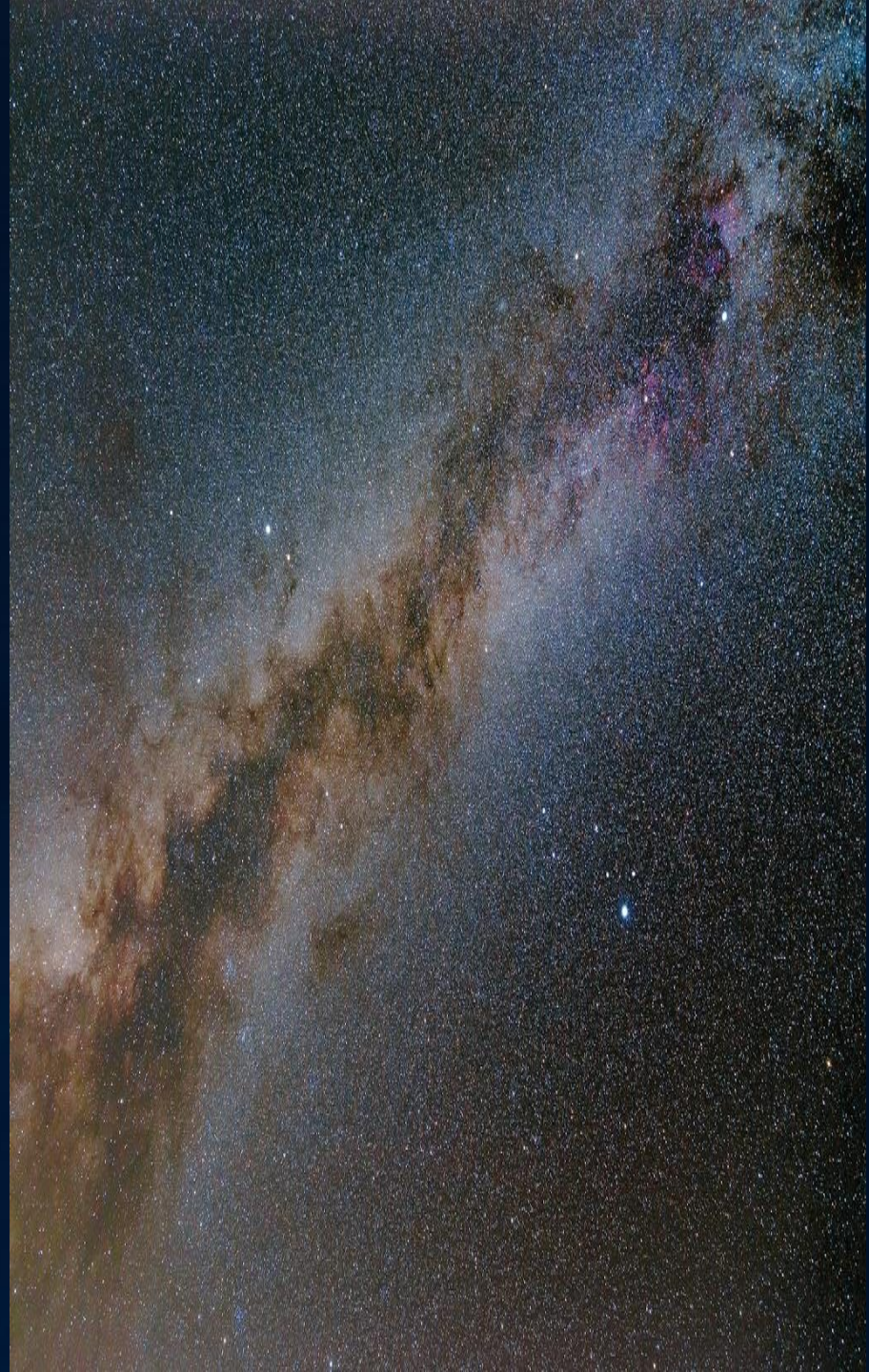
- Look for the ISO setting – you need to shoot ar around ISO 400-800 for most modern DSLR's to ensure they are fast enough but minimise noise in the image.

- You need to also select RAW format for the image in settings and ensure that all noise reduction is off and you are shooting at the highest bit value you can – usually 14 bit



Setting Up Your DSLR

- During the daylight – manually focus your camera on a distance object like the mountains – find the focus point and make a note where it lies on the focus ring - at night you will need to remember this position
- You will want to select the widest (fastest aperture) you can set – some kits lenses are as fast as f/1.8 but you may need to shoot around f/4 for best results depending on lens
- Before your first night out – make sure your memory cards in the camera and the battery(s) are fully charged – low temperatures can reduce the capacity so if out all night think of taking extra batteries or keep them in your pocket (without keys!)
- Do all this in the daylight – well before you want to take those short notice auroras are seen
- Don't be trying to do this in the dark for the first time, on the side of a hill, in the cold, surrounded by other photographers waving your white light around!
- Test things at home well before the field!



Taking Those First Shots

- Set up your tripod in a sheltered spot – mount the camera and make sure that you have set the lens to the infinity focus point you set earlier
- For first shots point towards to Southern Cross
- Using the interval timer – take a 30 second shot – remember to keep your lights off the camera during the exposure (did you remember the red head torch?)
- Check the image on the LCD – you might need to adjust the focus slightly – use the +/- magnify buttons and check how sharp the stars are – adjust and retake if necessary. Depending on focal length you may start to see stars trailing – reduce exposure time if required
- You might need to adjust settings to suit your set up – patience is the key – so take your time and be prepared to spend time finding the best settings for you
- Now go be creative – try the milky way and see what you can find!

Helpful Tools

- Use a mobile phone – compass, star charts and handy to have as a safety tool (find a night mode on the phone to avoid reducing night vision)
- Make sure your dressed for the occasion – it can get cold very quickly
- Read, read some more, test and read some more again ☺
- Use some of the resources I will list at the end of this presentation
- Join CAS !

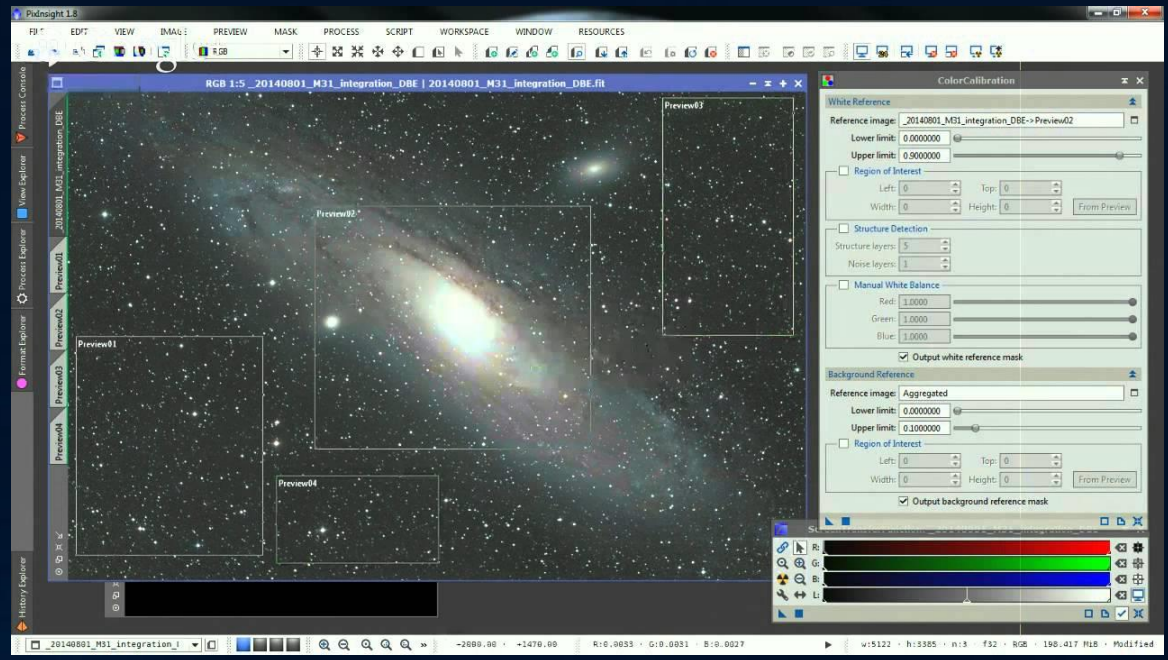
Simple AP – Next Steps

- Adding a more specialised wide angle lens – bigger wider images
- Building on a basic system – intervalometer – longer exposures (note earlier comment about star trails)
- Dew control – always a battle even in NZ summer
- Power supply for camera – longer exposures / longer runs
- Adding a Star Tracker to your tripod
- More socks!

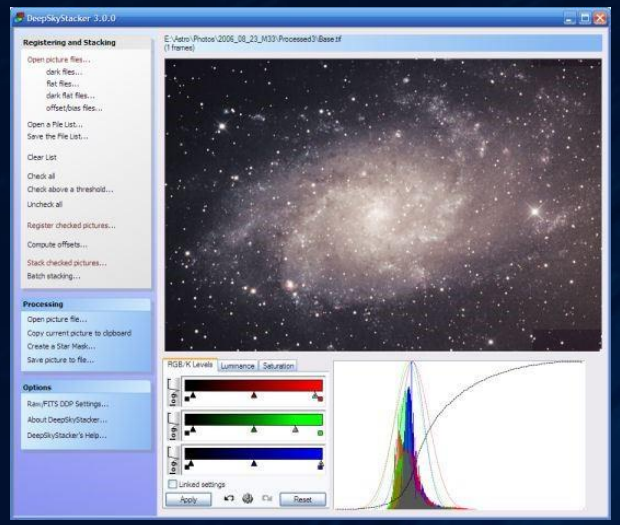
Software & Tools – Deep Sky Imaging

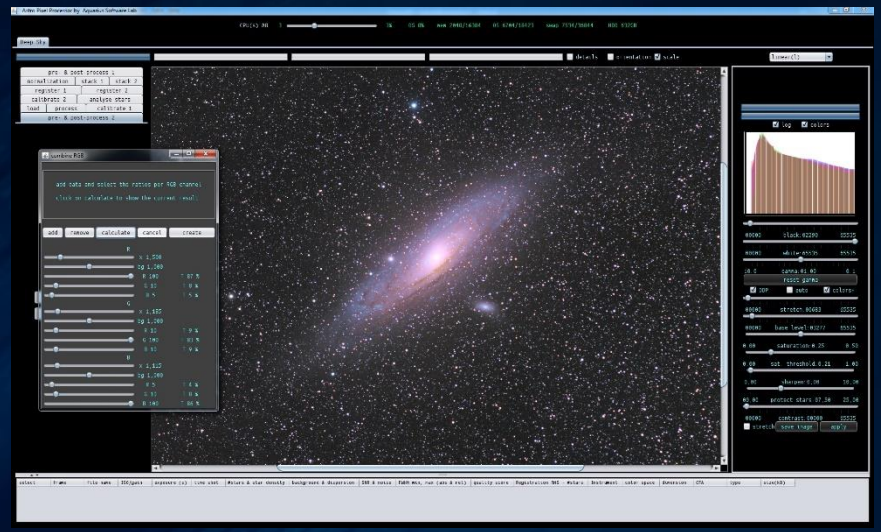
Backyard Nikon/Canon

Pixinsight

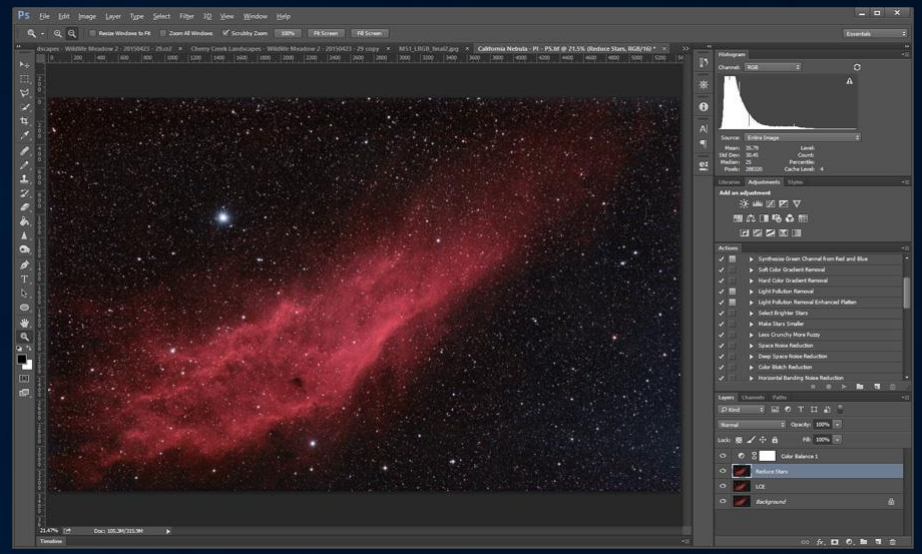


Deep Sky Stacker / Astro Pixel Processor





Photoshop & Astrophoto Tools



Further Reading / Resources

http://cas.org.nz

https://astrobackyard.com

http://cloudynights.com

http://astromart.com

Digital SLR Astrophotography (Practical Amateur Astronomy)
Mike Covington

Getting Started: Budget Astrophotography
Allan Hall

Budget Astrophotography: Imaging with Your DSLR or Webcam
Timothy Jensen

Questions?