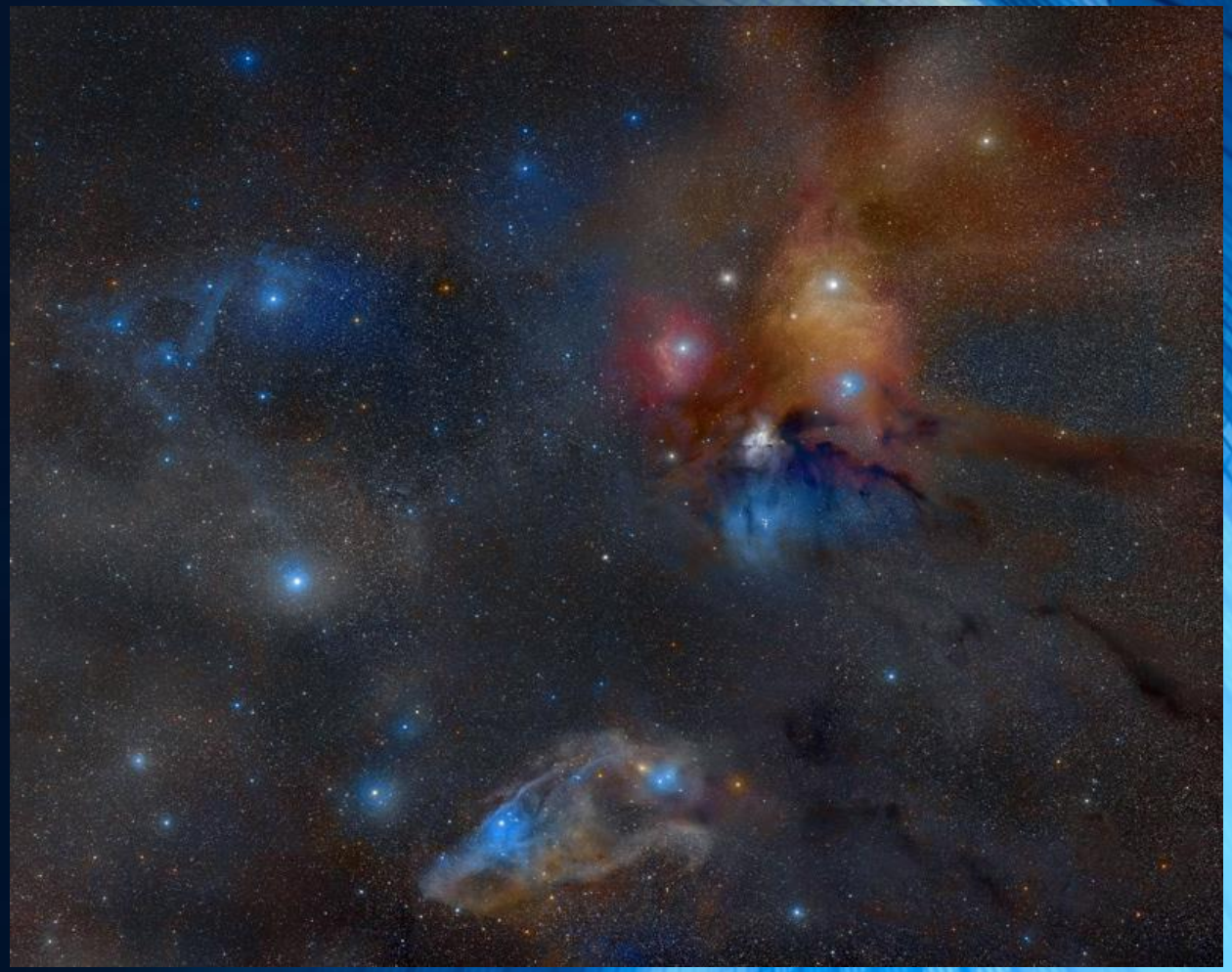
A Beginners Guide to Astrophotography



SIMON LEWIS – JULY 2018

" Astronomy? Impossible to understand and madness to investigate"

Sophocles (497- 405 BC)

The Realms of Astrophotography

- How to get started
- What gear do I 'need'?
- 'Simple' AP
- Planetary Imaging
- Deep Sky Imaging
    - Electronically Assisted Astronomy
    - DSLR based Astrophotography
- Software
    - Planetary Imaging
    - Deep Sky Imaging
- 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 a 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? Wide field? Deep Sky? Planets? All different equipment required
- 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'

Simple AP

- 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

Simple AP – Next Steps

- Adding a more specialised wide angle lens – bigger wider images
- Building on a basic system – intervalometer – longer exposures
- 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!

Planetary Imaging

- Different approach – planets are bright and easy to over expose
- Approach is to video short bursts and stack the video frames – lucky imaging
- Best option to buy a small web cam style camera
- Does not need specialised mount – can be hand tracked in azimuth or elevation
- Does need a PC
- Does need a telescope to get good images - does not have to be huge or complex however
- Lots of trial and error
- Cameras are $200-300 USD – software is free!

Resources:
ZWO Cameras

Software - Capture
Sharpcap - cap
Firecapture

Software – Stacking
Registax
Autostakeert

Deep Sky Imaging

- Entry into Deep Sky Astrophotography is popular …. And addictive!

- Usually requires a larger budget

- Like Planets and wide field imaging setups can start basic and progress to complex

- Can start simple- DSLR into a CAS telescope

- Full basic rig:

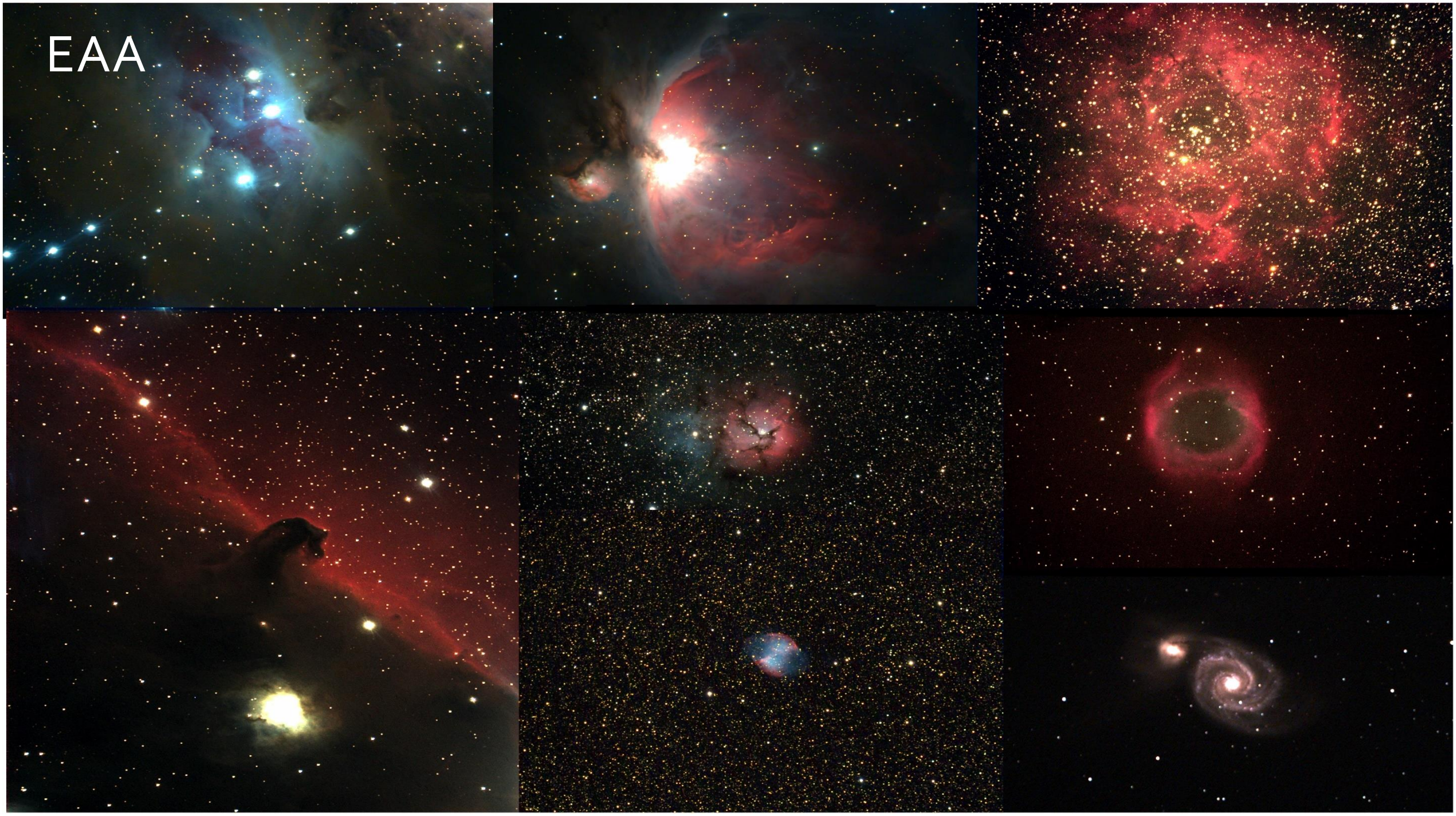
    - Equatorial mount
    - Small wide field refractor
    - DSLR

    - Guidescope/camera
    - Guiding software
    - Power supply
    - Intervalometer

CAS Member - Grant Wells Skywatcher ED120 @30 secs

Deep Sky Imaging

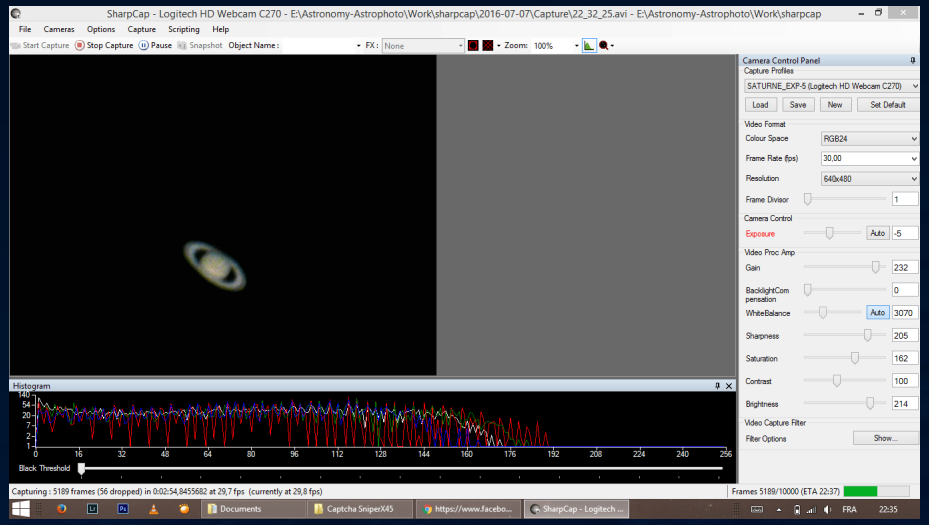
- Two main types of deep sky AP
  - Long Exposure
  - Electronically Assisted Astronomy (EAA)
- Some planetary cameras can be used for EAA – stacks short exposures to form an image
- Long exposure – 1 min to many minutes
- Pro's and Con's to each in image quality, skill level and equipment required


EAA

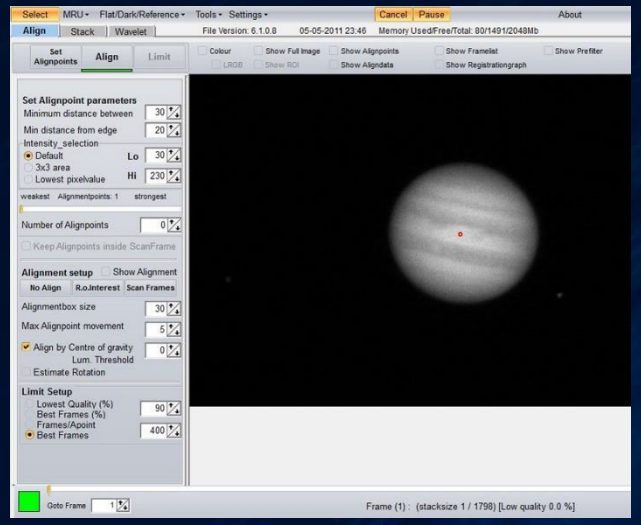
Long Exposure

Software & Tools Planetary Imaging

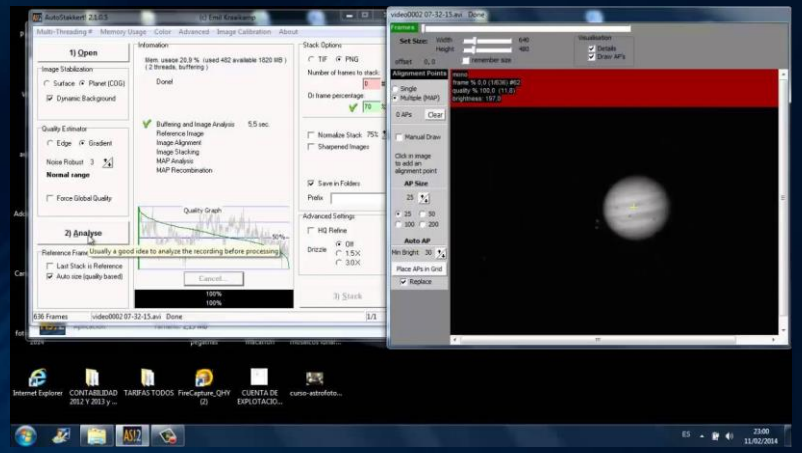
Sharpcap



Registax



Firecapture

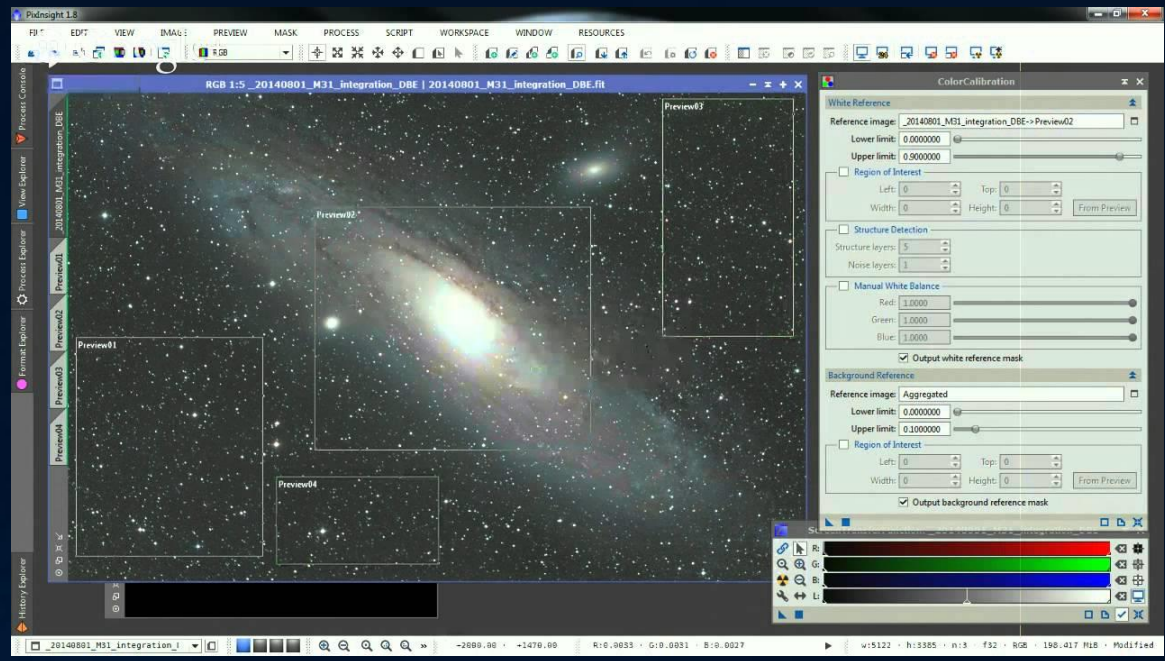


Autostakeert

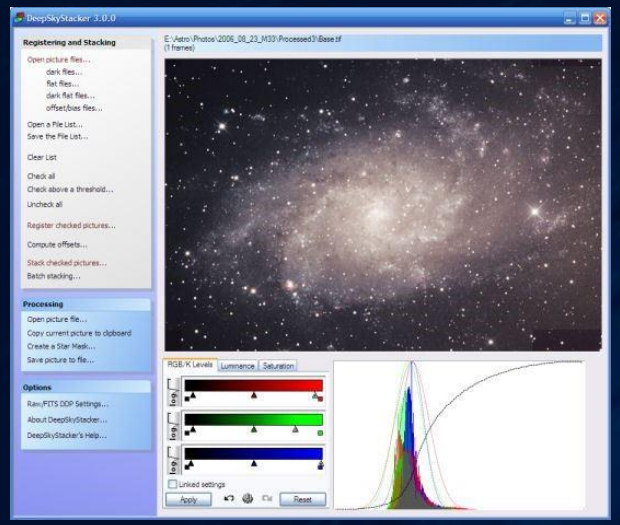
Software & Tools – Deep Sky Imaging

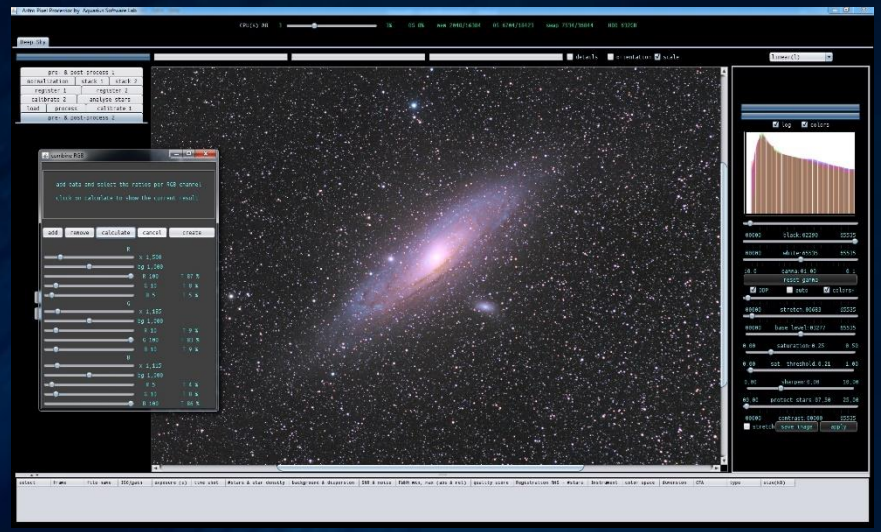
Backyard Nikon/Canon

Pixinsight

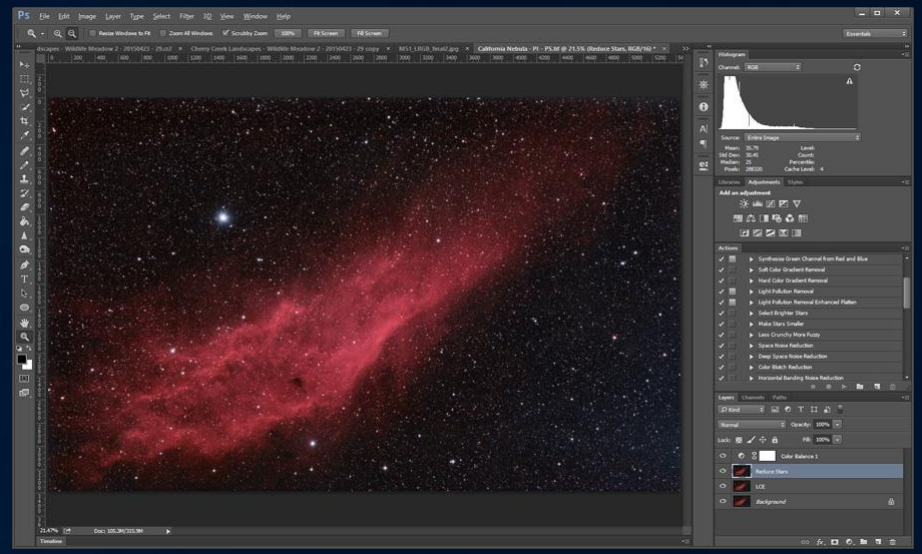


Deep Sky Stacker / Astro Pixel Processor





Photoshop & Astrophoto Tools



Further Reading / Resources

https://astrobackyard.com

http://cloudynights.com

http://astromart.com

The Astrophotography Manual: A Practical and Scientific Approach to Deep Sky Imaging
Chris Woodhouse

Getting Started: Budget Astrophotography
Allan Hall

Budget Astrophotography: Imaging with Your DSLR or Webcam
Timothy Jensen