DSLR

ASTROPHOTOGRAPHY

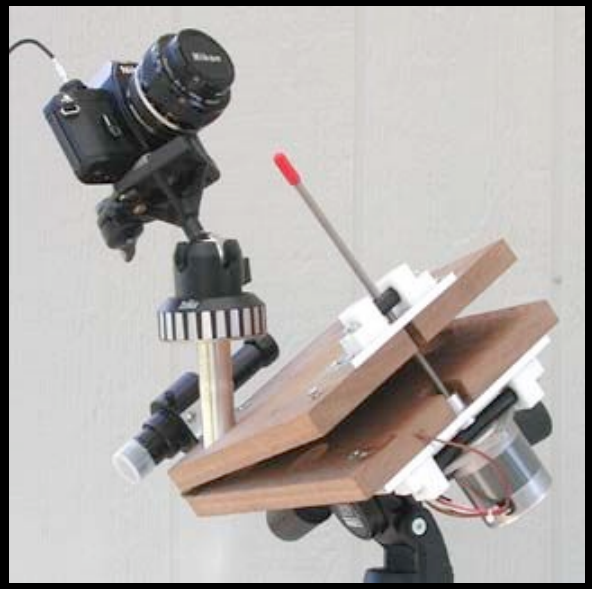
or how to make a million dollars in your spare time

First Step:

Start with three million dollars, then….

Equipment: Inexpensive Set Up

- Widefield Shots
- DSLR Camera
  - Any Digital DSLR with a bulb setting
- 200-300mm lens
- Tripod
- Barn Door Tracker



Equipment: Moderate Set Up

- Modified DSLR
  - Hutech Modified Camera
  - Canon 20da
- GEM – **German Equatorial Mounts**
  - GM-8; Orion® Atlas™ EQ-G, Vixen GPD2 Equatorial Mount with Hal110 Tripod
- Widefield Refractor: TV, Stellarview etc.
- Meade SN-8 etc.

20D camera body and standard accessories. EF-S 18-55mm F3.5-5.6 lens is included in lens kit option.

Equipment: More than Moderate

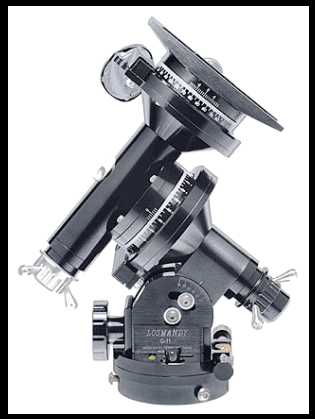
- Mount: Losmandy G11
- Guider: STV from SBIG or ST-4, Nugget
- Timer
- Field Computer, MaximDL, Cercis Astro
- Power, Line or Battery
- Telescope

Firm Foundations:

- Platform for Rig
  - Hefty Tripod
  - Concrete Mount or
  - The Full Abissi
    - Slide off observatory
    - Line Power with filter;
    - Footers and permanent power lift mount, remote control imaging, cappuccino machine, etc.

Mount

- Losmandy G11 – in my opinion, biggest bang for the buck
- CGE
- Mountain
- AP600-900-1200
- Bisque
- Takahashi



Accurate Tracking: Autoguide

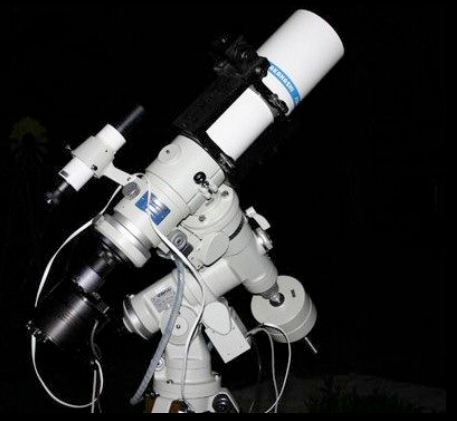
- What is Autoguiding?
- DSI and GuideDog
- STV
  - Real Fast, expensive, no computer needed, discontinued
- Nugget
  - Fast, Cheap: $500, but needs computer

Telescope

- Widefield
- Short focal length
- Refractor or Newtonian
- Astrograph?

Refractor

- Teleview: 102is
- Stellarview
- AP
- TEC
- APM
- TAK 106



Reflector

- SCT:
  - long focal length, high f stop, moving mirror – not recommended
- Newtonian
  - Fixed mirrors, low f stop, short exposures

Focuser

- BLOB PROOF: Feathertouch, Moonlight Focuser motor and FocusMax
- Fumble in the dark, disappointment at home:
  - Try focusing with a screen
  - Stiletto Focuser, Knife edge

Exposure Control

- Handheld
- Computerized..may need adaptor

Power

- Line
- Portable: Kendrick

Dew Control

- Little Heat where necessary

All set up and ready to go!

- Imaging with a DSLR
- Flats
- Bias
- Subject
- Darks
- Lights

Flats, Dark, Bias

- What is a flat
- Dark?
- Bias?

- It’s all about removing noise, dust and vignette

Lights

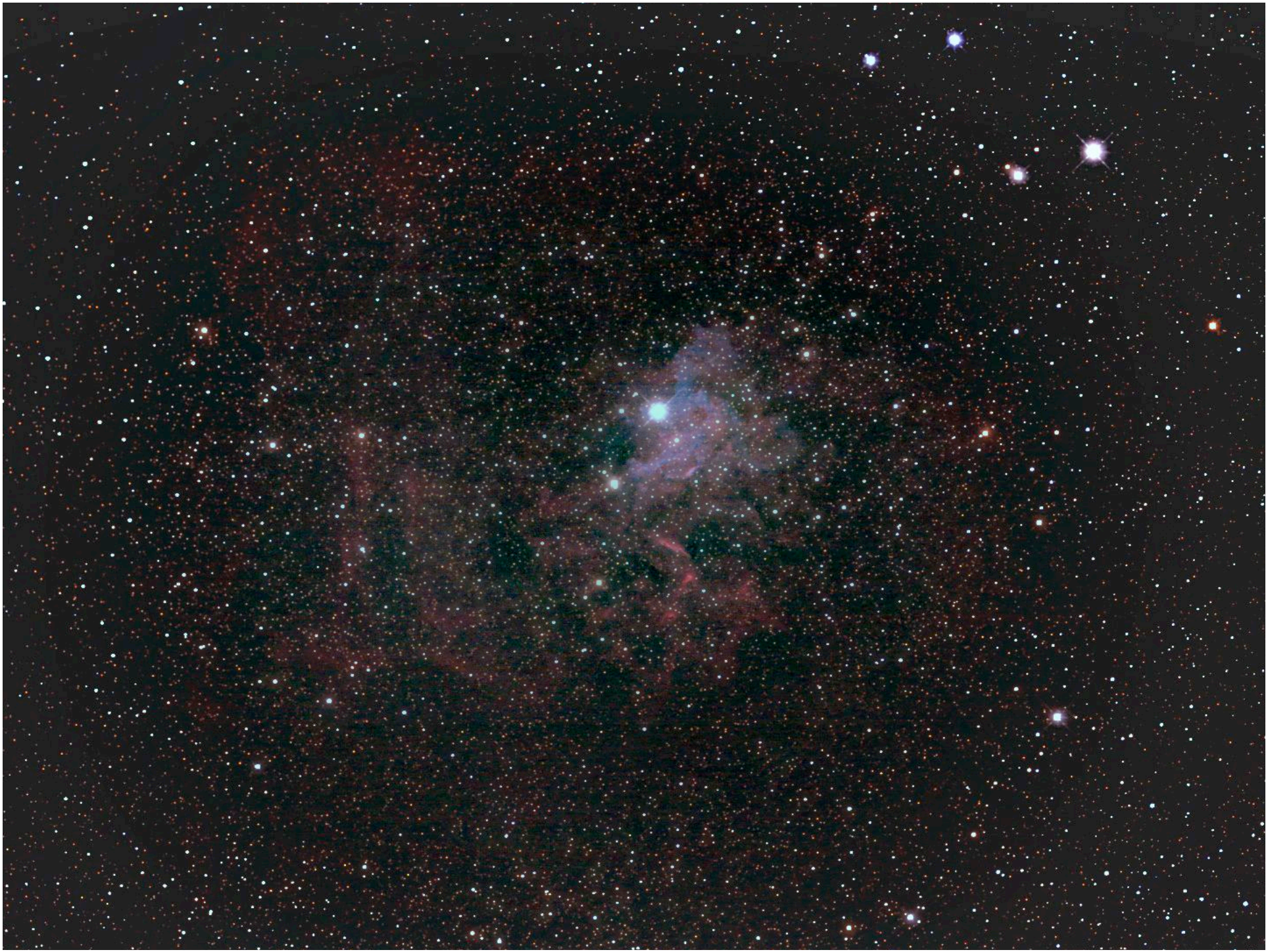
- What is a light

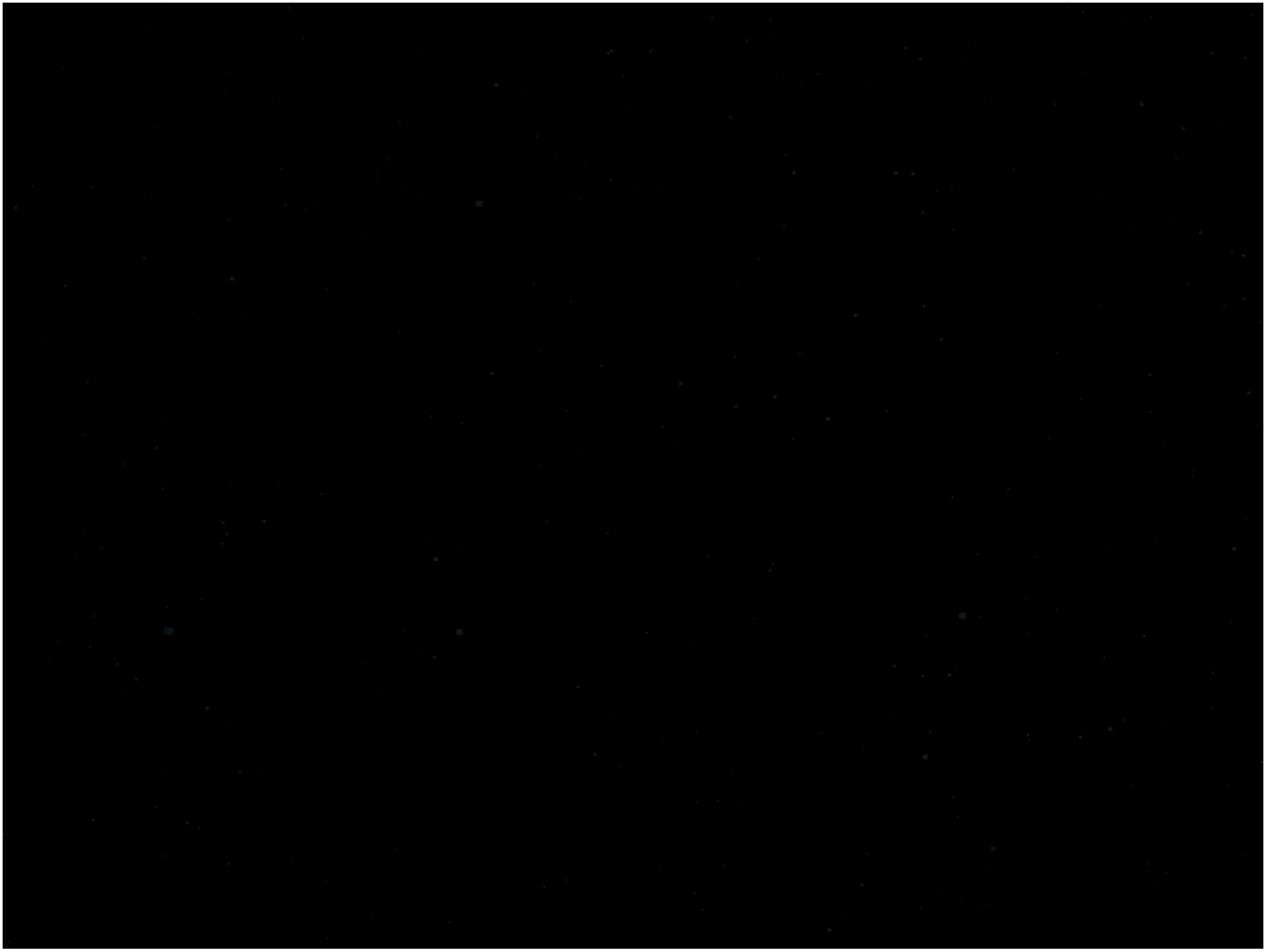
Start with open clusters

- Get the focus right
- Work on exposures
- ISO: amount of saturation

Move onto DSO

- Wide field Galaxies
- Nebulas
- Swirlly stuff
- Fuzzy stuff
- And the rest…






4302
UGC7436
4298
M99
JC781
4262
4312

Signal to Noise

- Darks, Bias frames
- You are tying to get as much signal and the least amount of noise by talking as many light frames as possible. Remember, noise is random, the signal is not

Final Words

- The learning curve is relatively steep
- A good mount is more important than a snazzy telescope
- Each night concentrate on one subject then,
  - Focus: pinpoint stars
  - Exposures and ISO
  - Subjects
  - Darks and Flats