# Remote Astronomy

## www.global-rent-a-scope.com

Control of Telescopes from Anywhere

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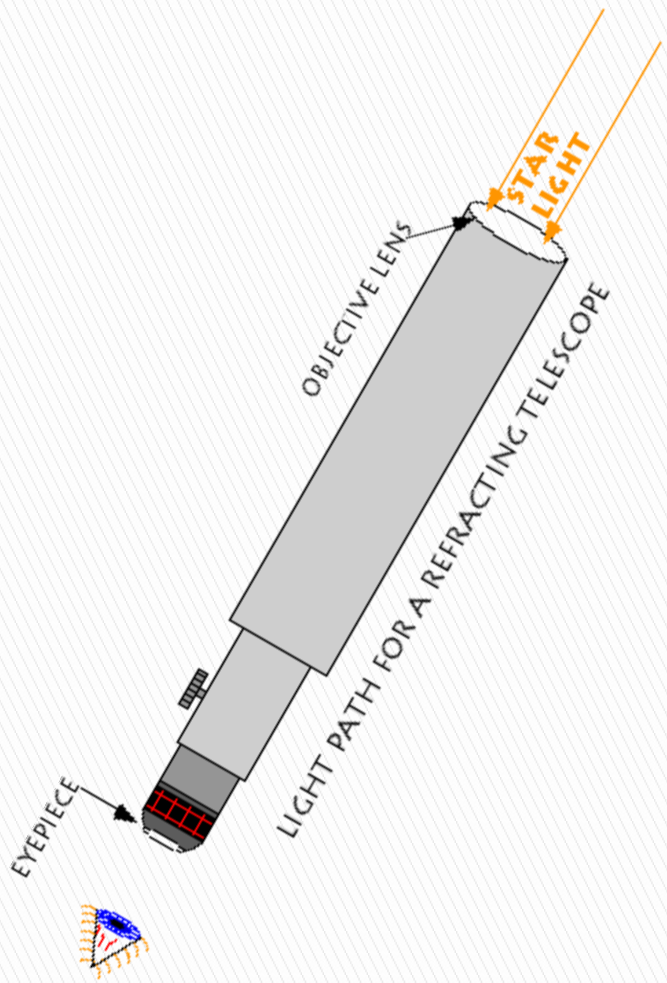
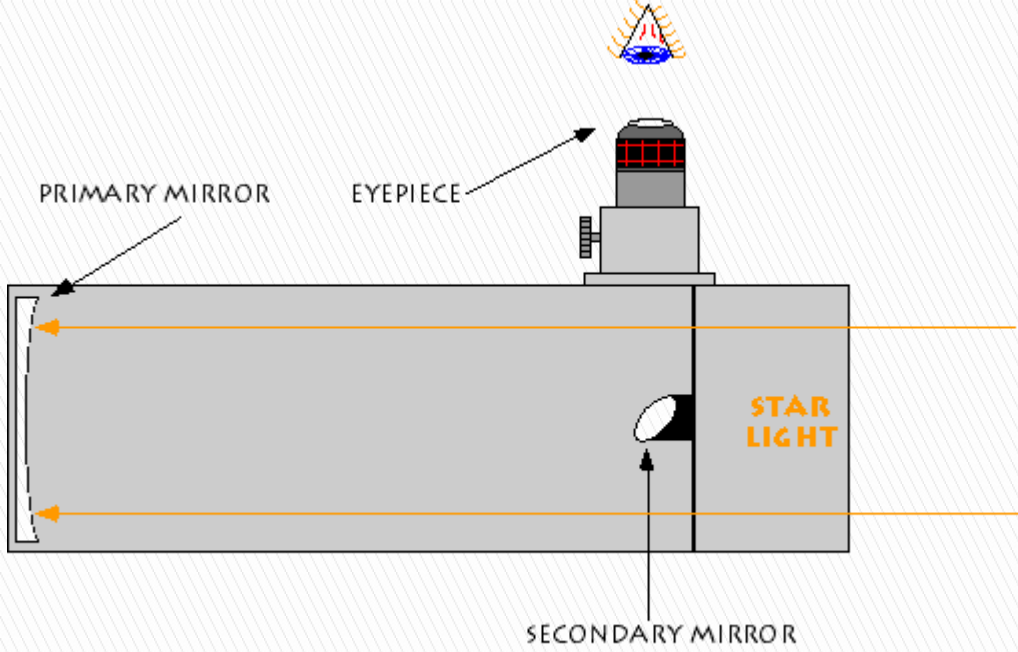
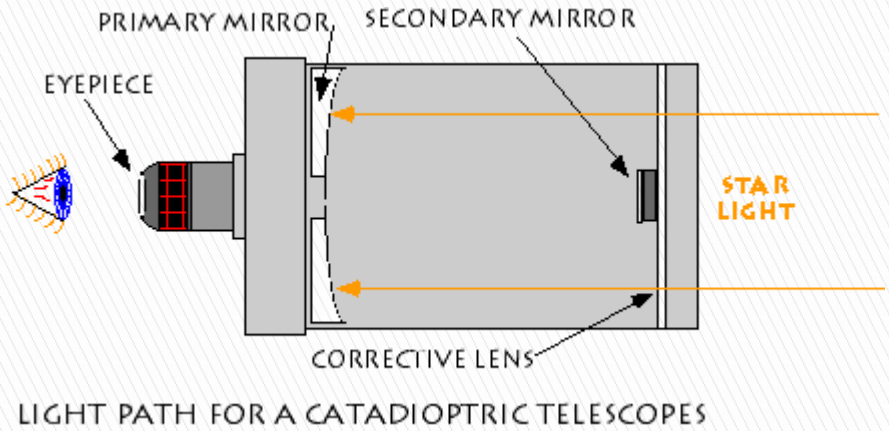
IEEE PES Las Vegas September 28th 2010

# Overview

- Background on telescopes
- Equipment
- Remote telescopes –Global Rent-a-Scope
- Applications- Imaging and Research
- Go live to Spain ☺



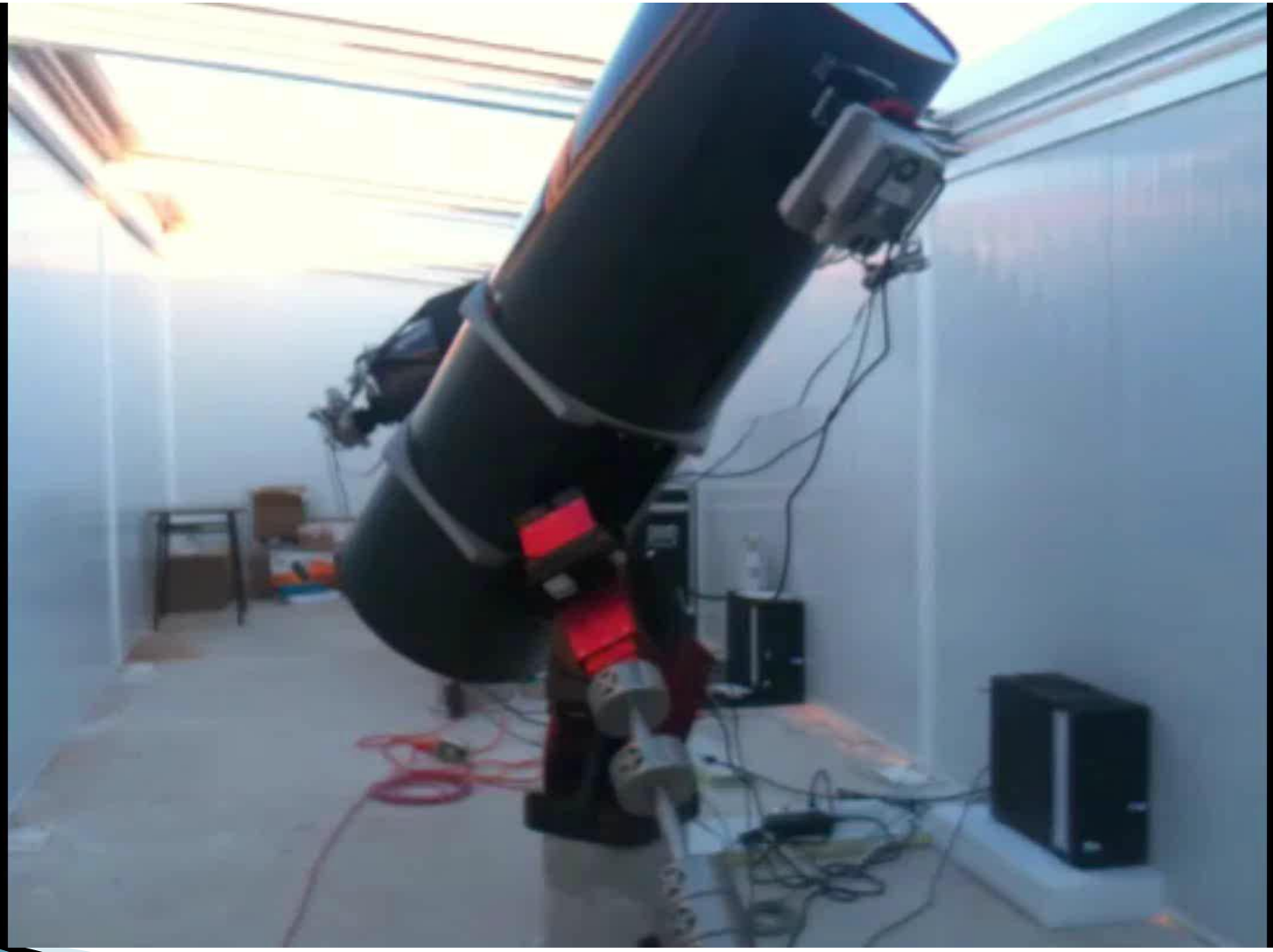




## Refractor

## Reflector

# Equipment

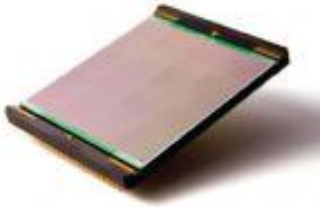

TAKAHASHI

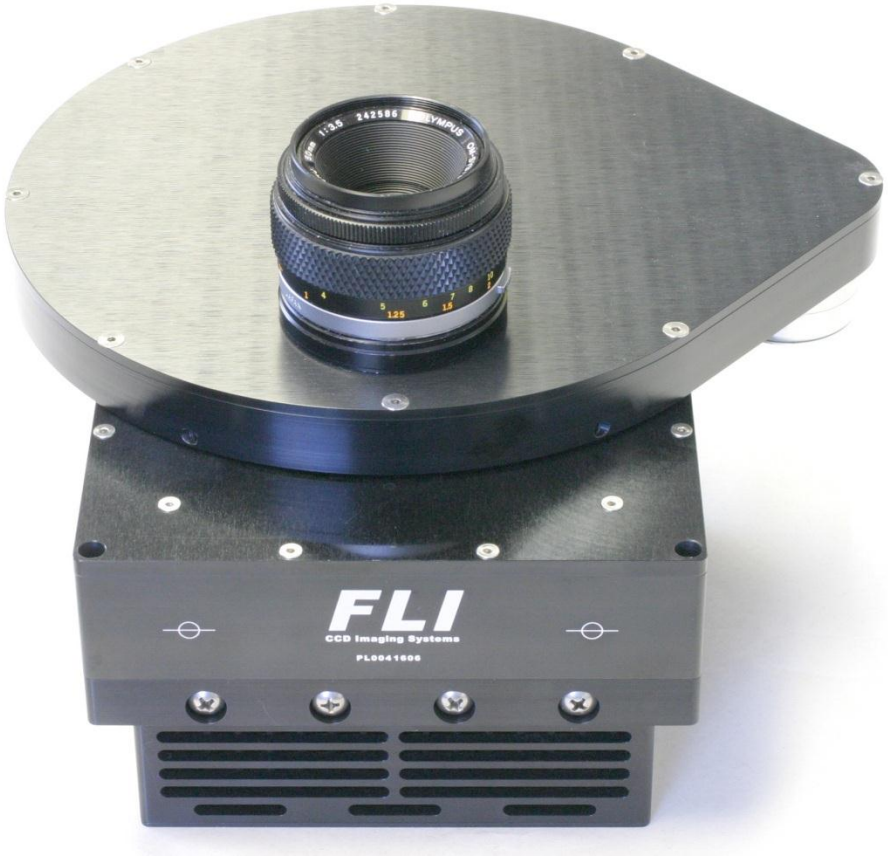


# Flexure Issue…

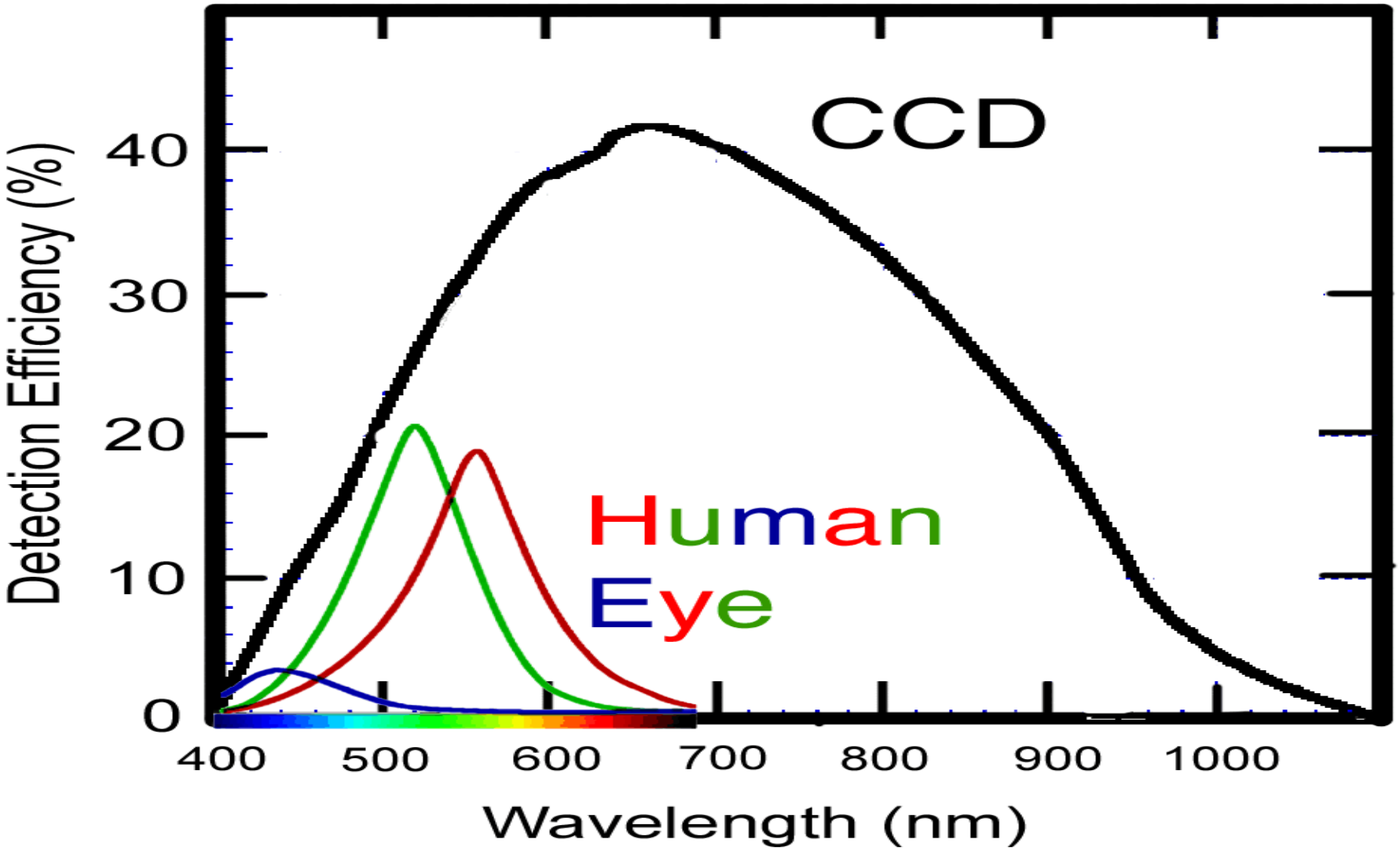

PlaneWave

# Digital camera –cooled chip (CCD)

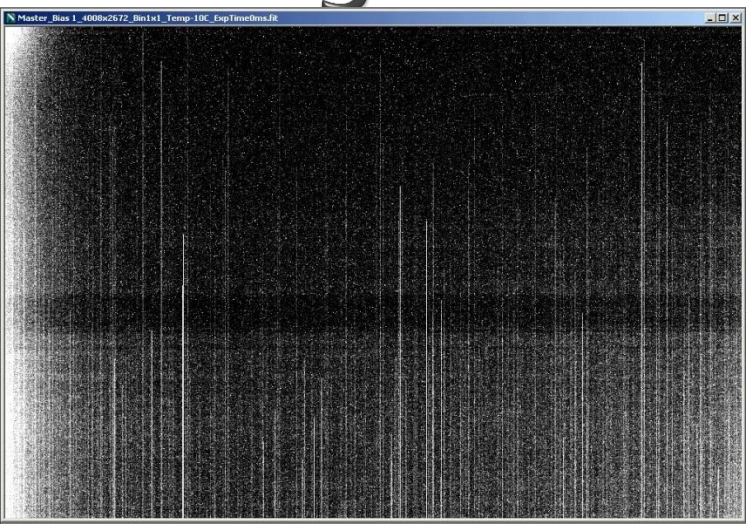





# Sensitivity of Eye vs. CCD



# Image calibration

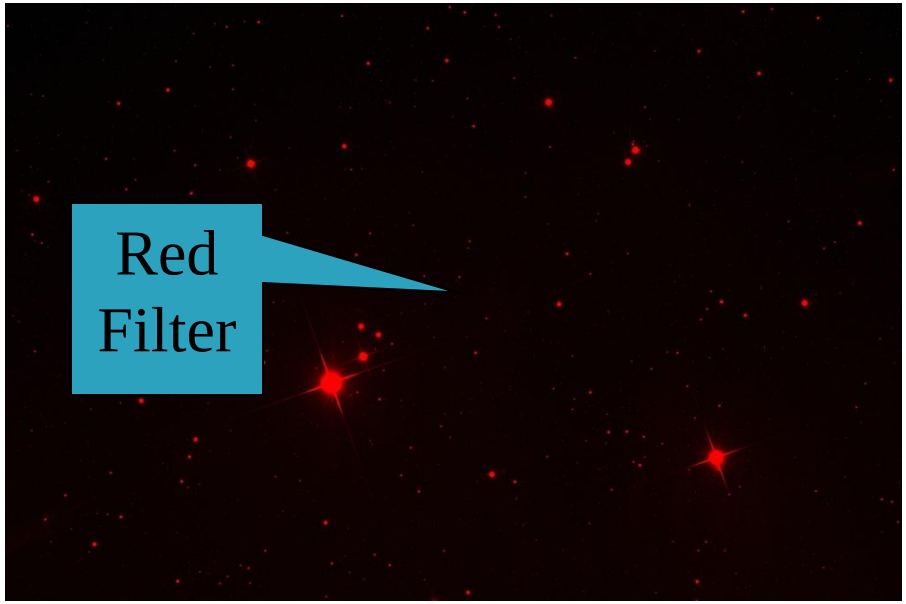


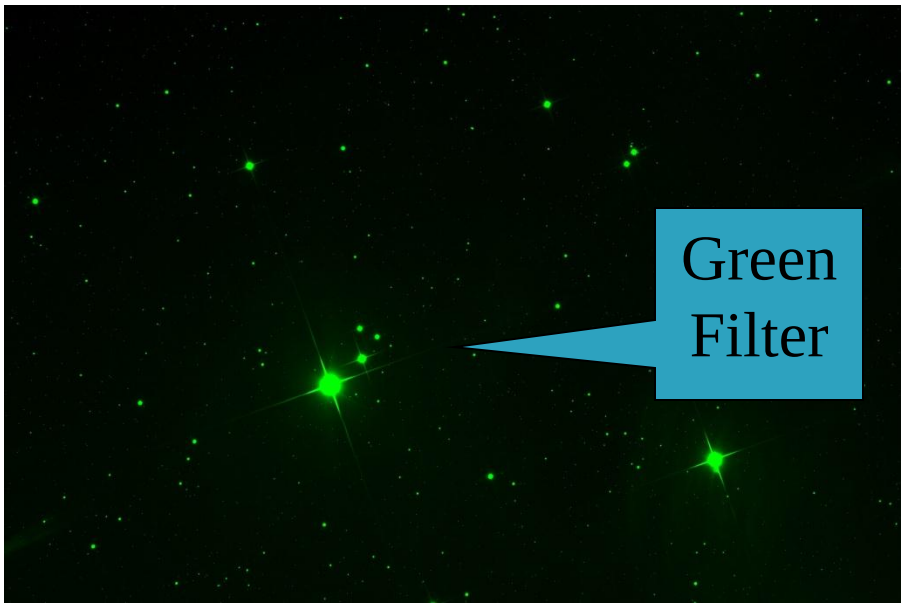

Bias – electronic noise


Dark – thermal noise

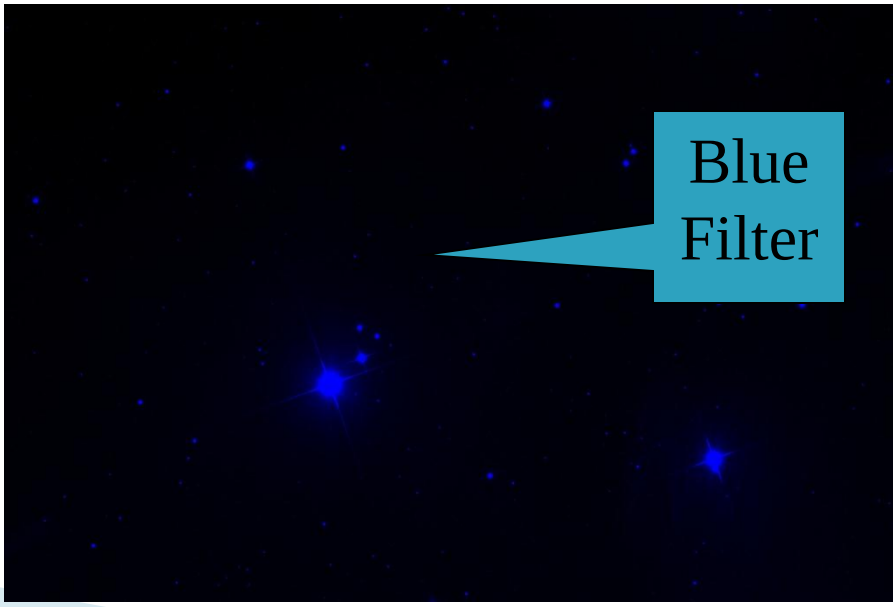

Flat – optical and dust

# Creating Color Images – 4x5min

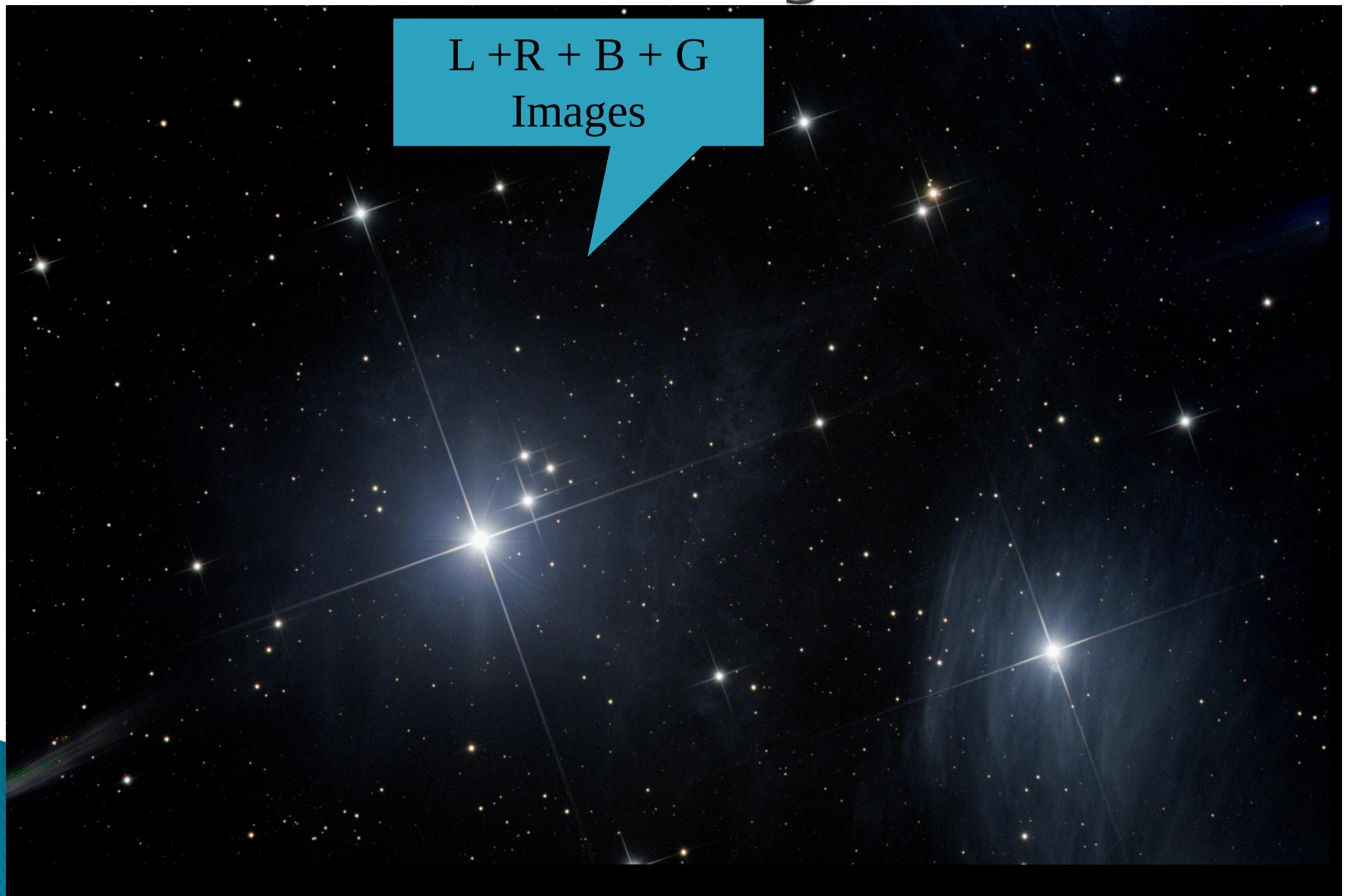






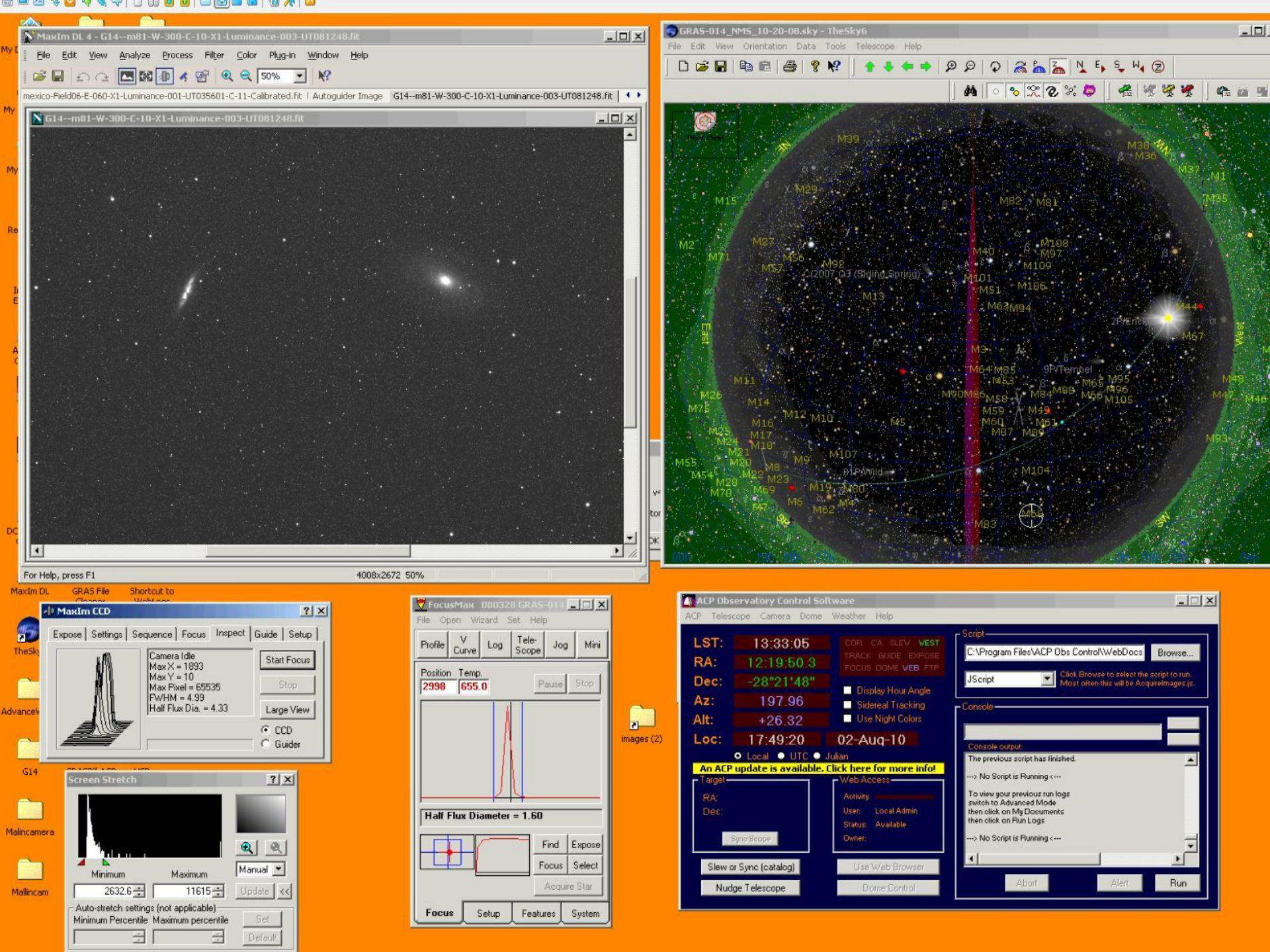
# Combined Color Image –Stretched



# Processed Color Image -Photoshop

# Global-Rent-a-Scope (GRAS)

- Started in 2003
- Run by Arnie Rosner and Brad Moore
- Affiliates also own telescopes
- Telescopes in New Mexico, Southern Australia and Southern Spain
- There are over 4,100 registered users
- Users can login from anywhere
- The sun never rises at GRAS

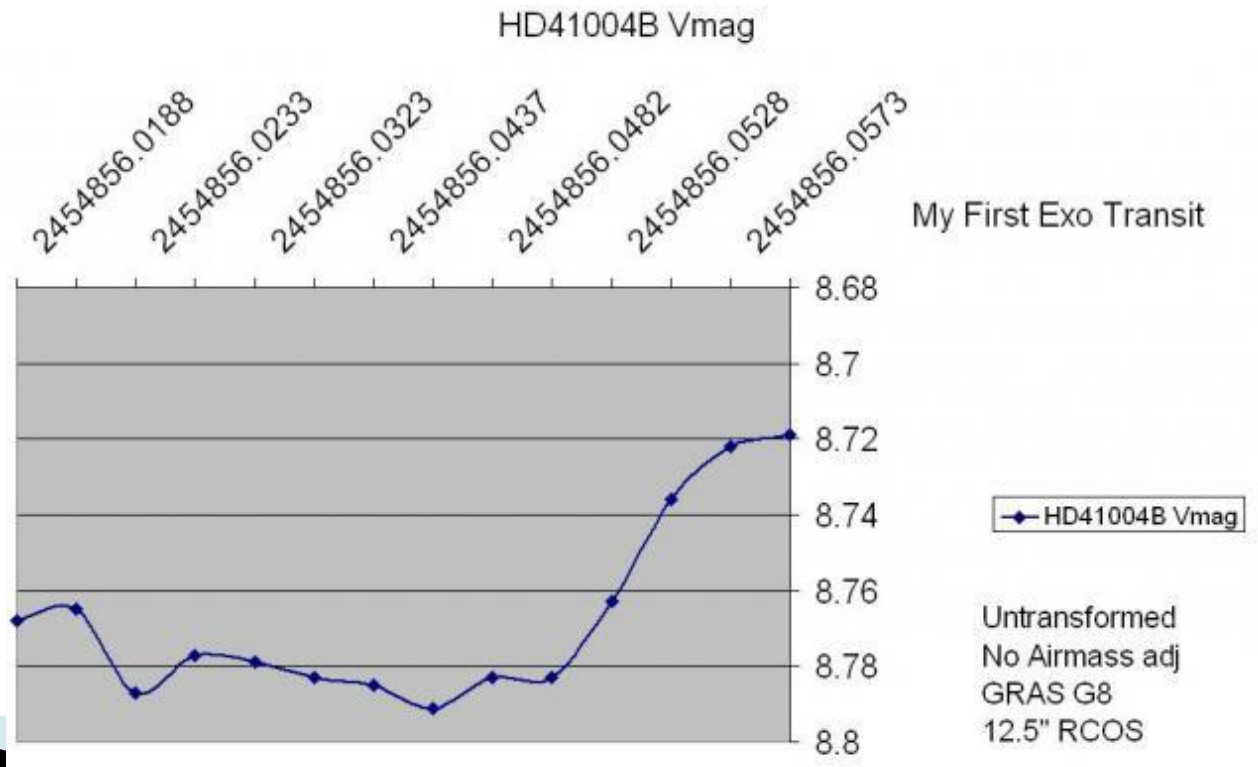

MaxIm DL 4 - G14--m81-W-300-C-10-X1-Luminance-003-UT081248.fit
File Edit View Analyze Process Filter Color Plug-in Window Help
G14--m81-W-300-C-10-X1-Luminance-003-UT081248.fit
For Help, press F1
4008x2672 50%
GRAS-014_NMS_10-20-08.sky - TheSky6
File Edit View Orientation Data Tools Telescope Help
MaxIm CCD
Expose Settings Sequence Focus Inspect Guide Setup
Camera Idle
Max X = 1893
Max Y = 10
Max Pixel = 65535
FWHM = 4.99
Half Flux Dia. = 4.33
Start Focus
Stop
Large View
CCD
Guider
FocusMax 080328 GRAS-014
File Open Wizard Set Help
Profile V Curve Log Tele-Scope Jog Mini
Position Temp.
2998 655.0
Pause Stop
Half Flux Diameter = 1.60
Find Expose
Focus Select
Acquire Star
Focus Setup Features System
ACP Observatory Control Software
ACP Telescope Camera Dome Weather Help
LST: 13:33:05
RA: 12:19:50.3
Dec: -28°21'48"
Az: 197.96
Alt: +26.32
Loc: 17:49:20 02-Aug-10
Local UTC Julian
An ACP update is available. Click here for more info!
Display Hour Angle
Sidereal Tracking
Use Night Colors
Target
RA:
Dec:
Sync Scope
Web Access
Activity
User: Local Admin
Status: Available
Owner:
Slew or Sync (catalog)
Use Web Browser
Nudge Telescope
Dome Control
Script
C:\Program Files\ACP Obs Control\WebDocs
Browse...
JScript
Click Browse to select the script to run.
Most often this will be AcquireImages.js.
Console
Console output:
The previous script has finished.
---> No Script is Running <---
To view your previous run logs
switch to Advanced Mode
then click on My Documents
then click on Run Logs
---> No Script is Running <---
Abort Alert Run
Screen Stretch
Minimum Maximum
2632.6 11615
Manual
Update
Auto-stretch settings (not applicable)
Minimum Percentile Maximum percentile
Set
Default
images (2)
Malincamera
Mallincam
G14


9/28/2010 2:51:37 PM UTC
9/29/2010 12:21:37 AM LOCAL

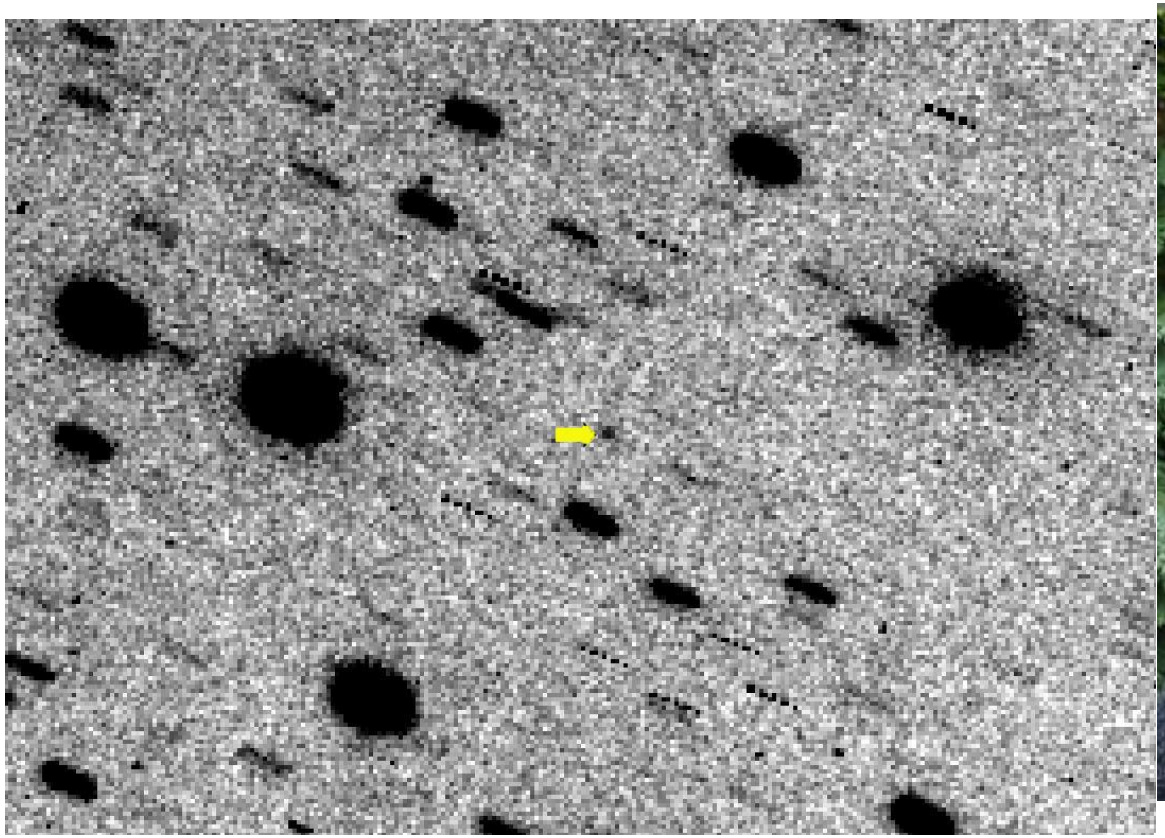

Diving into
the Orion
Nebula

# Research at GRAS

- Photometry
- Variable Stars
- Asteroids and Comets
- Double Stars
- Exoplanets

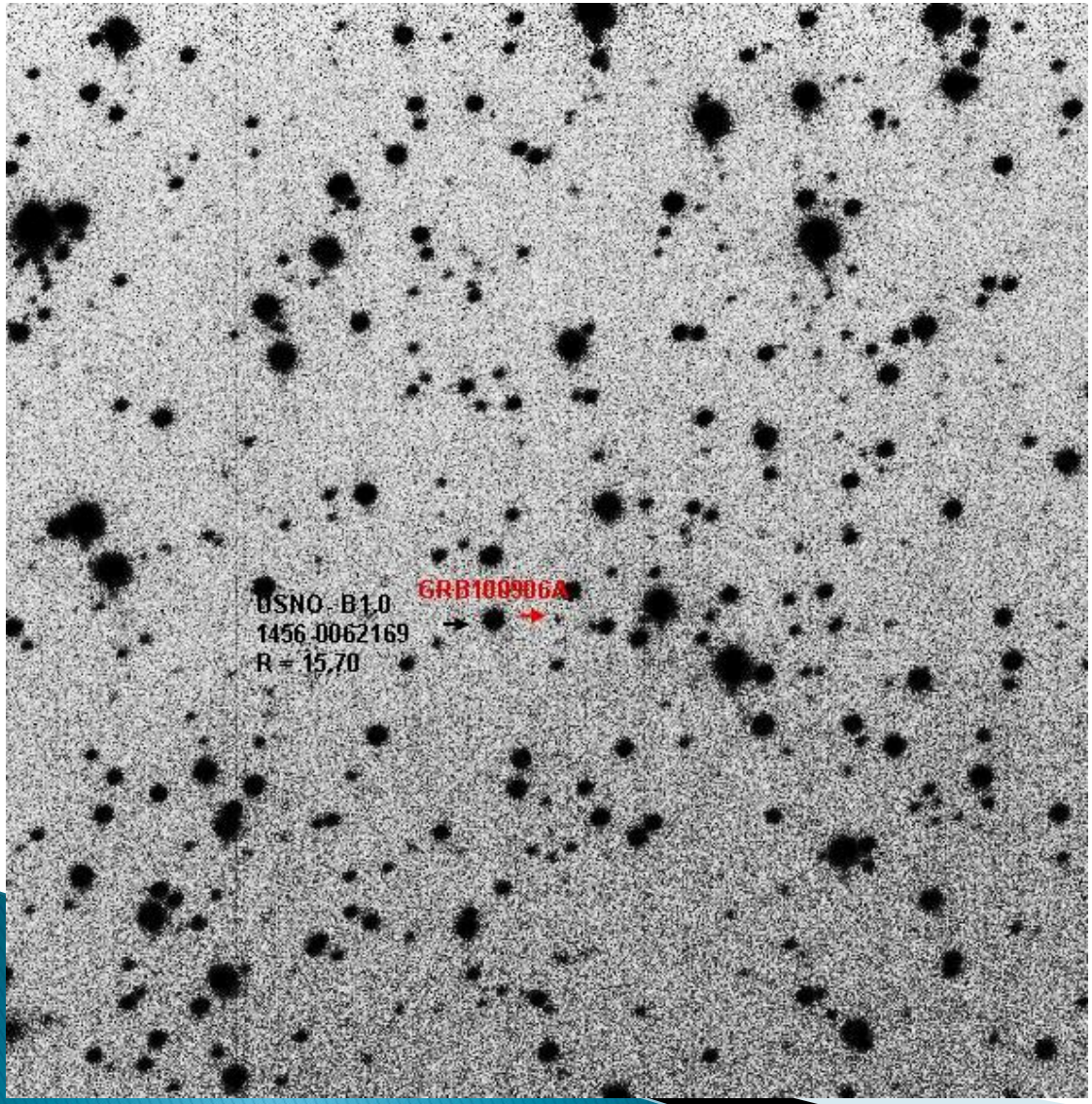


# Hunting Asteroids



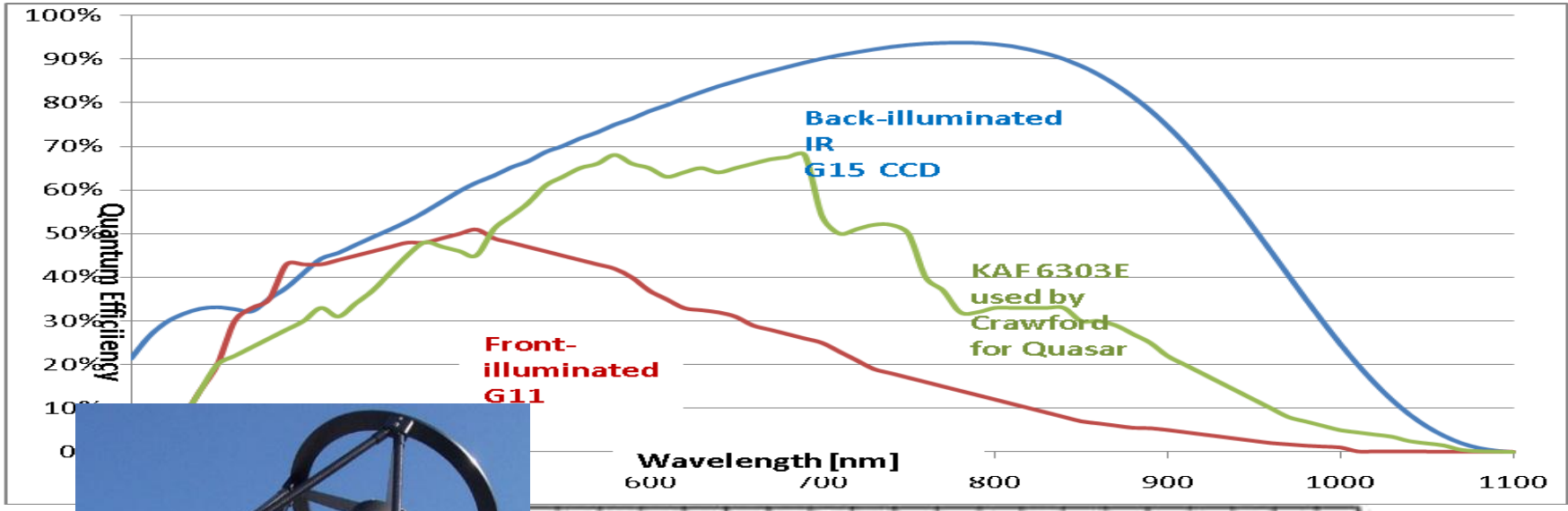
# Comet hunting

# Gamma Burst Sept 2010





# How far can you go – Quasars




- Free Trial account
- http://www.global-rent-a-scope.com/


Thank you!