The MidAtlantic ASTROPHOTOGRAPHY WORKSHOP

Planning for Astroimaging

Bob Traube
Trauber@aol.com – Newnebula@aol.com
www.trauber.com
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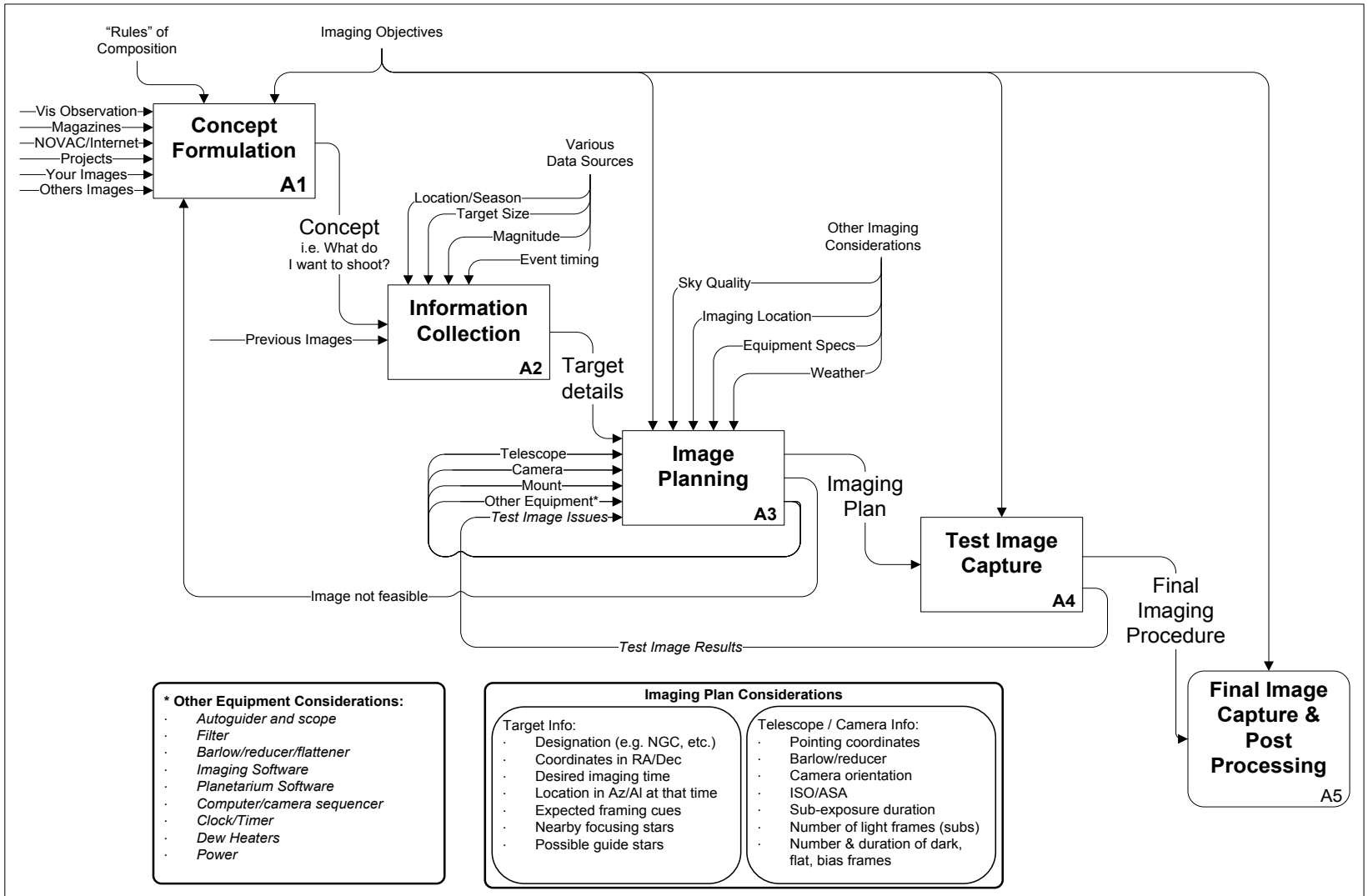
George Mason University
Fairfax, Virginia

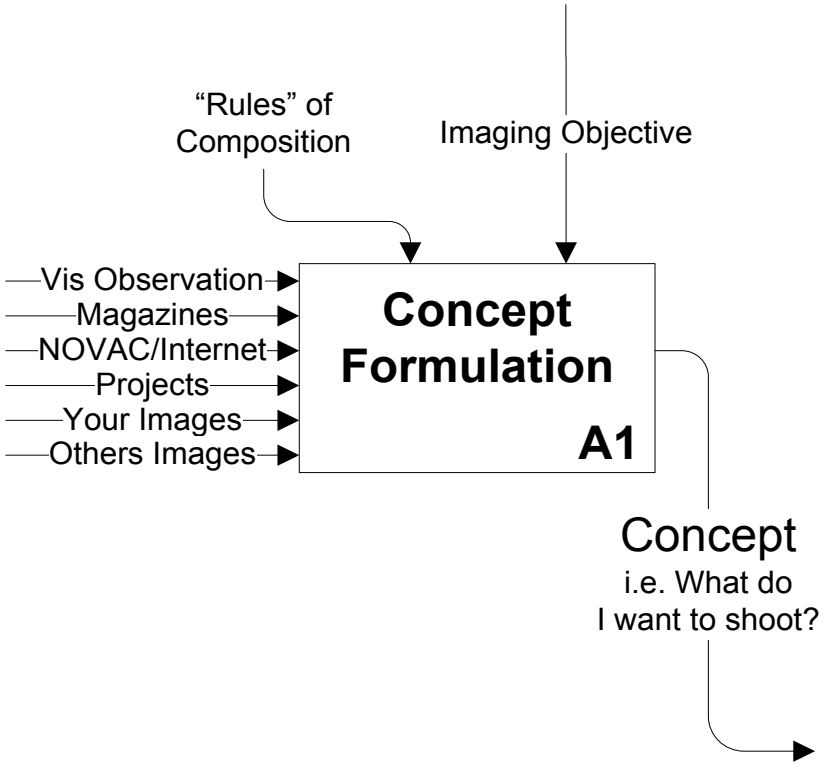
Topics

- Astro imaging process flow
  - Concept Formulation
  - Target Information Collection
  - Image Planning
  - Test Image Capture
- Thoughts on final image capture and post processing
- Questions?

Astroimaging Process Flow



Concept Formulation



Concept Formulation

What do I want to accomplish?

- Imaging Objective
  - Interesting pictures
  - Capture an event
  - Supplement a previous image
  - Scientific data
  - Other?
- *Key Considerations*
  - "Rules" of composition
  - Timing
  - Data needs
  - Accuracy
  - Your call

Concept Formulation

What do I want to shoot tonight?

- Sources of Inspiration

—Vis Observation→
———Magazines——→
—NOVAC/Internet→
———Projects——→
——Your Images——→
——Others Images→

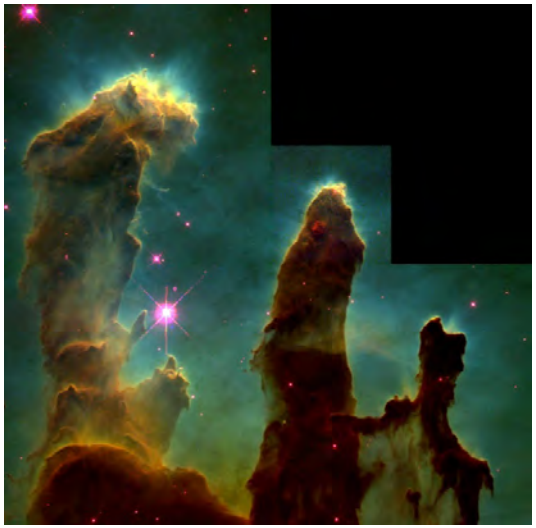
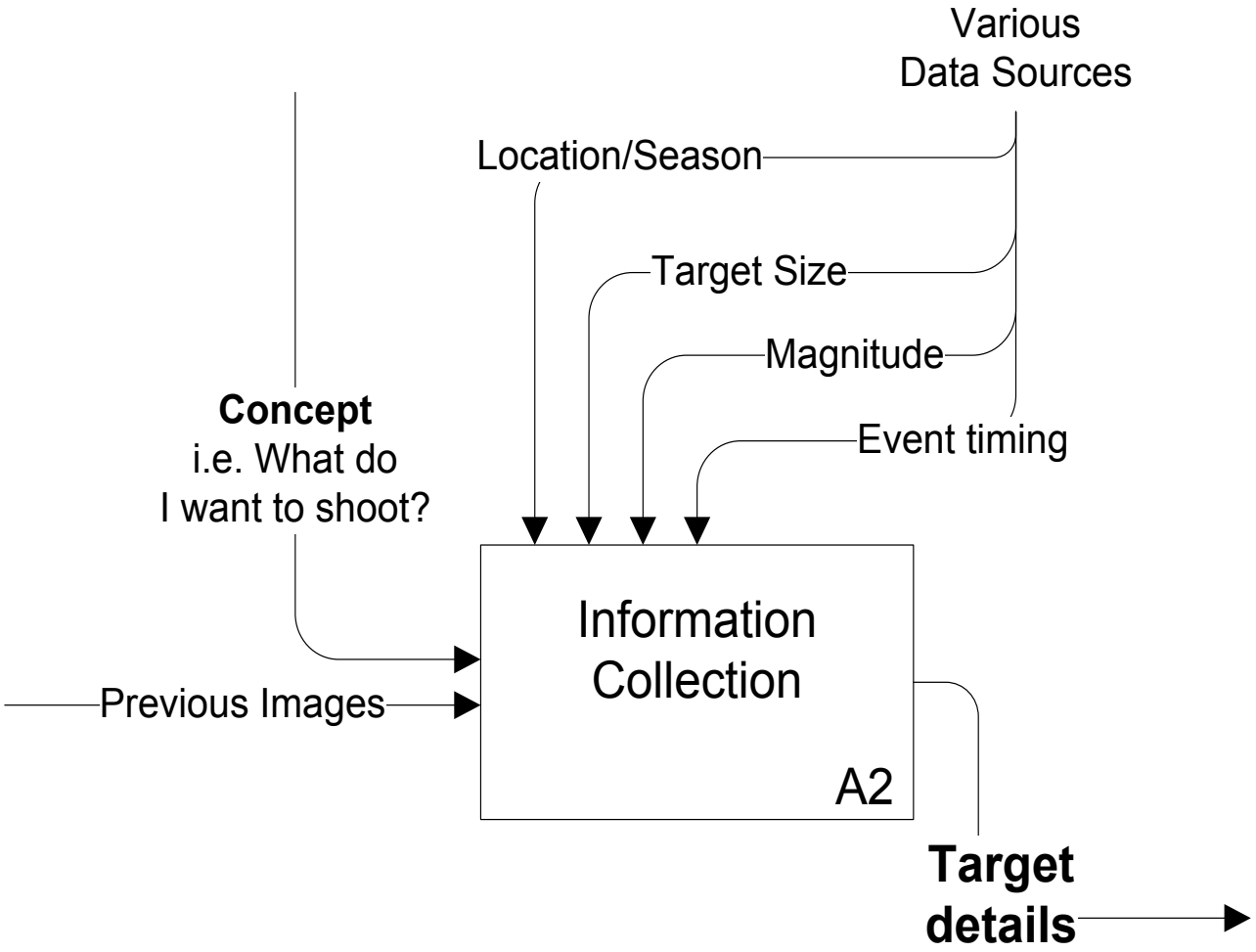


Image Concept

Information Collection



Target Information Collection

- What do I need to know…
  - What is it called? (M/ NGC/IC, etc.)
  - Where is it?
  - When is it visible?
  - How big is it?
  - How bright is it?
  - **How were other pictures of it taken?**
- Where can I find this information?
  - Various star charts & planetarium software
  - Google/Yahoo/Bing searches
  - NOVAC/SEDS/User Groups and other useful links*
  - NASA
  - Your fellow astronomers

* See MAAWS handouts

Target Information Sources

- Internet
  - http://tonightssky.com/ - from Earth and Sky
  - http://www.pa.msu.edu/abrams/SkyCalendar/Index.html
  - http://www.phy.duke.edu/~kolena/sky.html
- Imaging Related User Groups
  - SBIG/Images Plus/*Your Scope Here*
- Planetarium Software
  - The Sky
  - Starry Night
  - Cartes du Ciel

Information Collection

http://tonightssky.com/

Potential Nebula and Clusters

(Partial List of 65 objects found)

This site is Beta testing. Feel free to report any problems.

Tonight's Sky Observation Plan

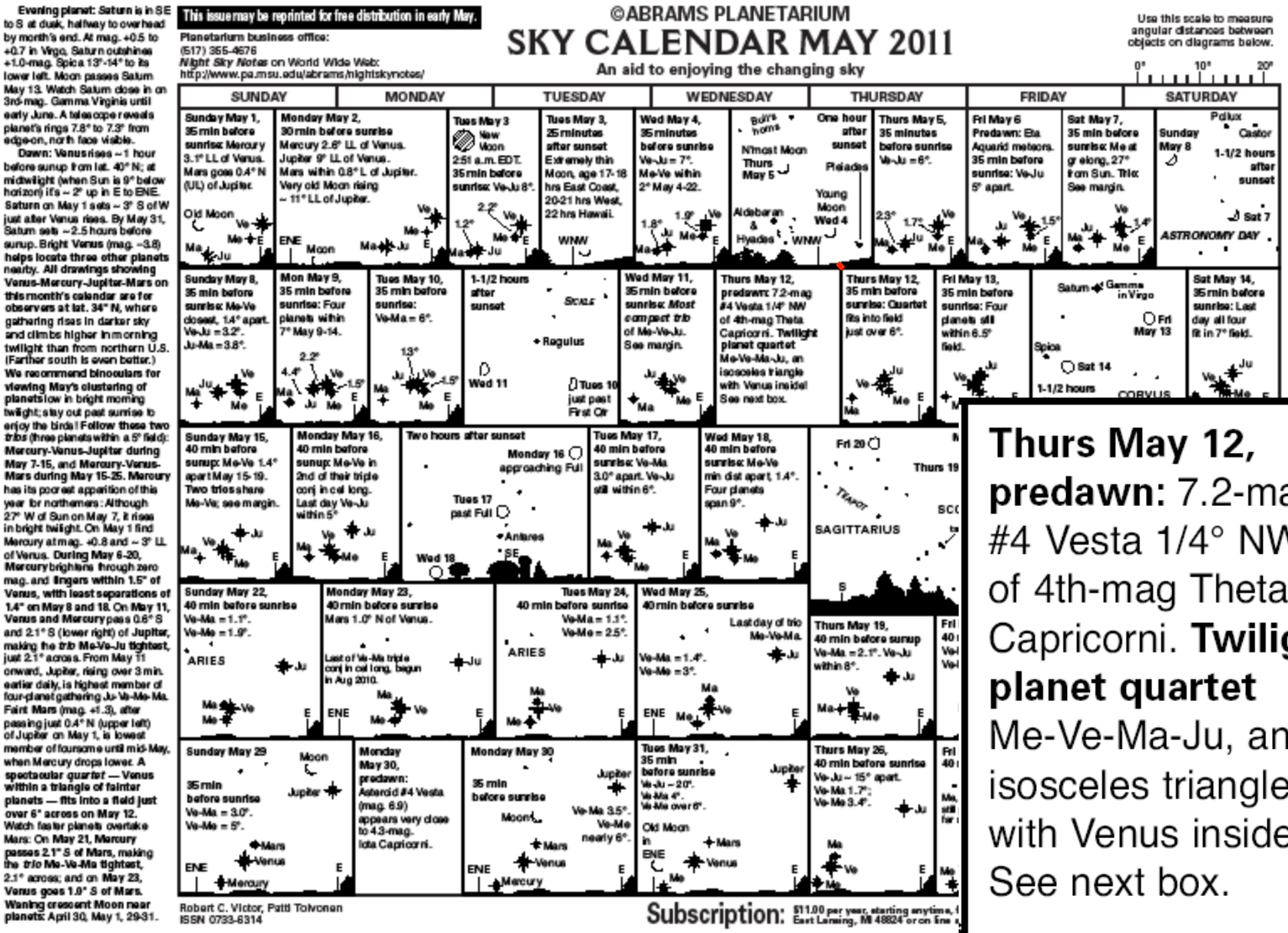
Support Tonight's Sky

Helping the amateur astronomer plan their night by showing what you can see and what it will look like.

These are the objects you selected for your observation plan. The values are based on your Latitude of 38 and Longitude of -78. These objects will be above your horizon of 20° on 3/10/2011 starting at 20:00 and for 4 hours. **This page is safe to print!**

Cat. 1	Cat. 2	Type	RA	Dec	Mag.	Size/Sep	Const	Common Name(s)
NGC957		OC	2:33	57° 34′	7.6	10.00	Per	
NGC1664		OC	4:51	43° 41′	7.6	18.00	Aur	
NGC2483		OC	7:56	-28° 06′	7.6	9.00	Pup	
NGC2506	C54	OC	8:00	-11° 14′	7.6	12.00	Mon	
NGC2533		OC	8:07	-30° 07′	7.6	6.00	Pup	
NGC1778		OC	5:08	37° 01′	7.7	8.00	Aur	
NGC1817		OC	5:12	16° 41′	7.7	20.00	Tau	
NGC2252		OC	6:35	5° 22′	7.7	20.00	Mon	
NGC2345		OC	7:08	-14° 48′	7.7	12.00	Cma	
NGC3242	C59	NB	10:25	-19° 21′	7.7	1.07	Hya	Eye Nebula, Ghost of Jupiter

http://www.pa.msu.edu/abrams/SkyCalendar/Index.html



Thurs May 12, predawn: 7.2-mag #4 Vesta 1/4° NW of 4th-mag Theta Capricorni. **Twilight planet quartet** Me-Ve-Ma-Ju, an isosceles triangle with Venus inside! See next box.

Image Planning

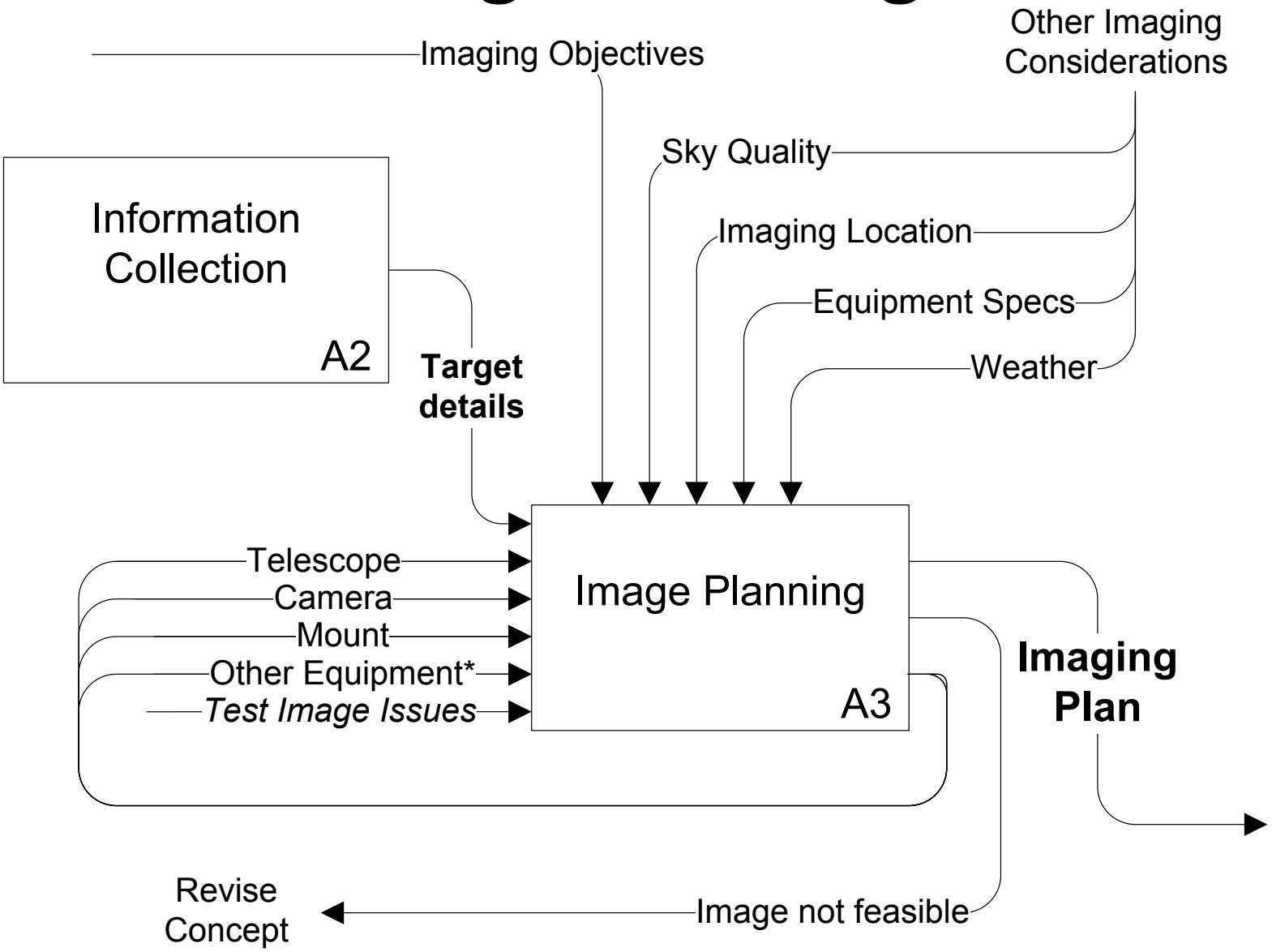


Image Planning

Imaging Plan Considerations

Target Info:

- Designation (e.g. NGC, etc.)
- Coordinates in RA/Dec
- Desired imaging time
- Location in Az/Al at that time
- Expected framing cues
- Nearby focusing stars
- Possible guide stars

Telescope / Camera Info:

- Pointing coordinates
- Barlow/reducer
- Camera orientation
- ISO/ASA
- Sub-exposure duration
- Number of light frames (subs)
- Number & duration of dark, flat, bias frames

*** Other Equipment Considerations:**

- *Autoguider and scope*
- *Filter*
- *Barlow/reducer/flattener*
- *Imaging Software*
- *Planetarium Software*
- *Computer/camera sequencer*
- *Clock/Timer*
- *Dew Heaters*
- *Power*

Image Planning

Starry Night Pro screen capture

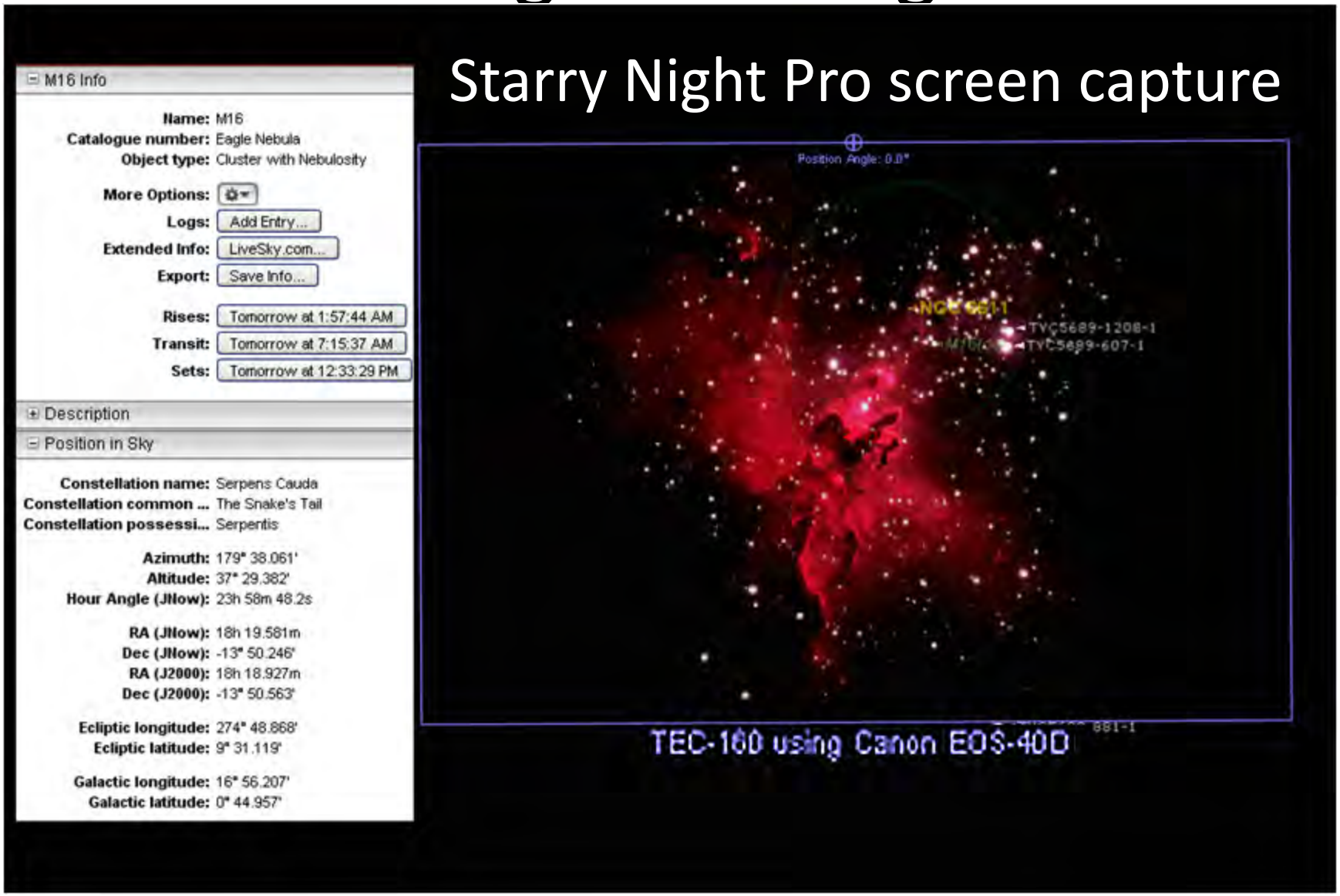
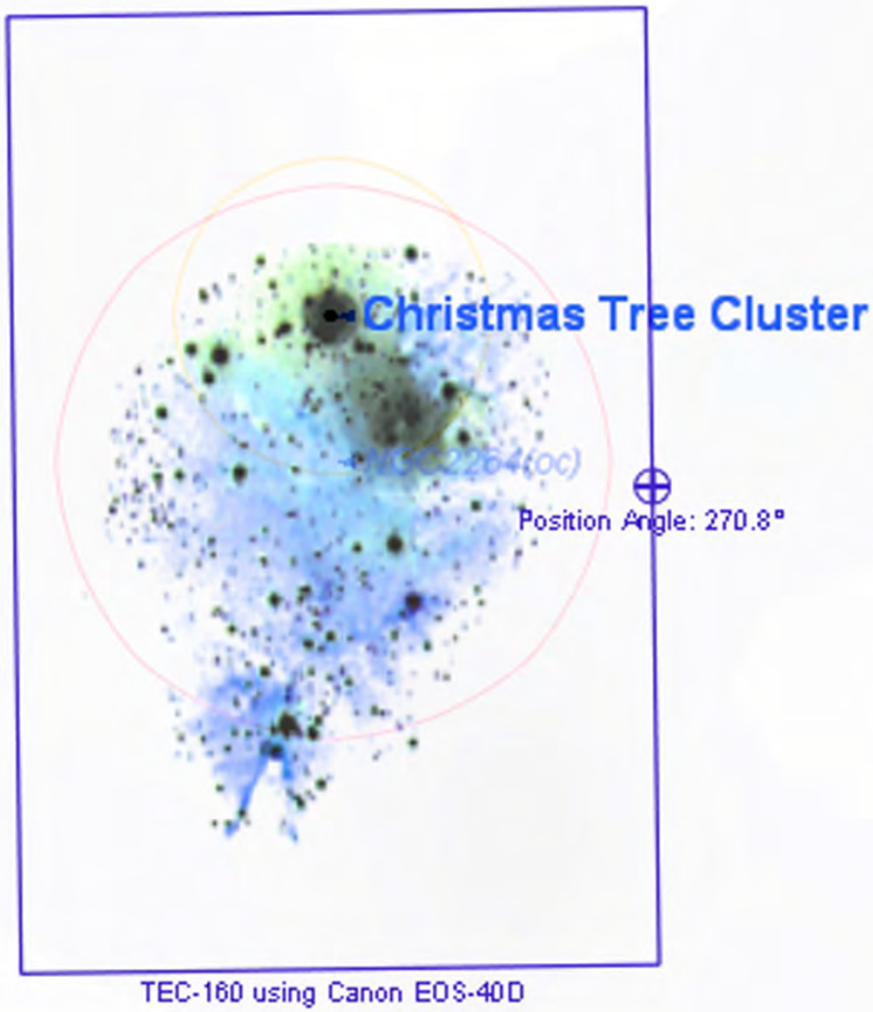


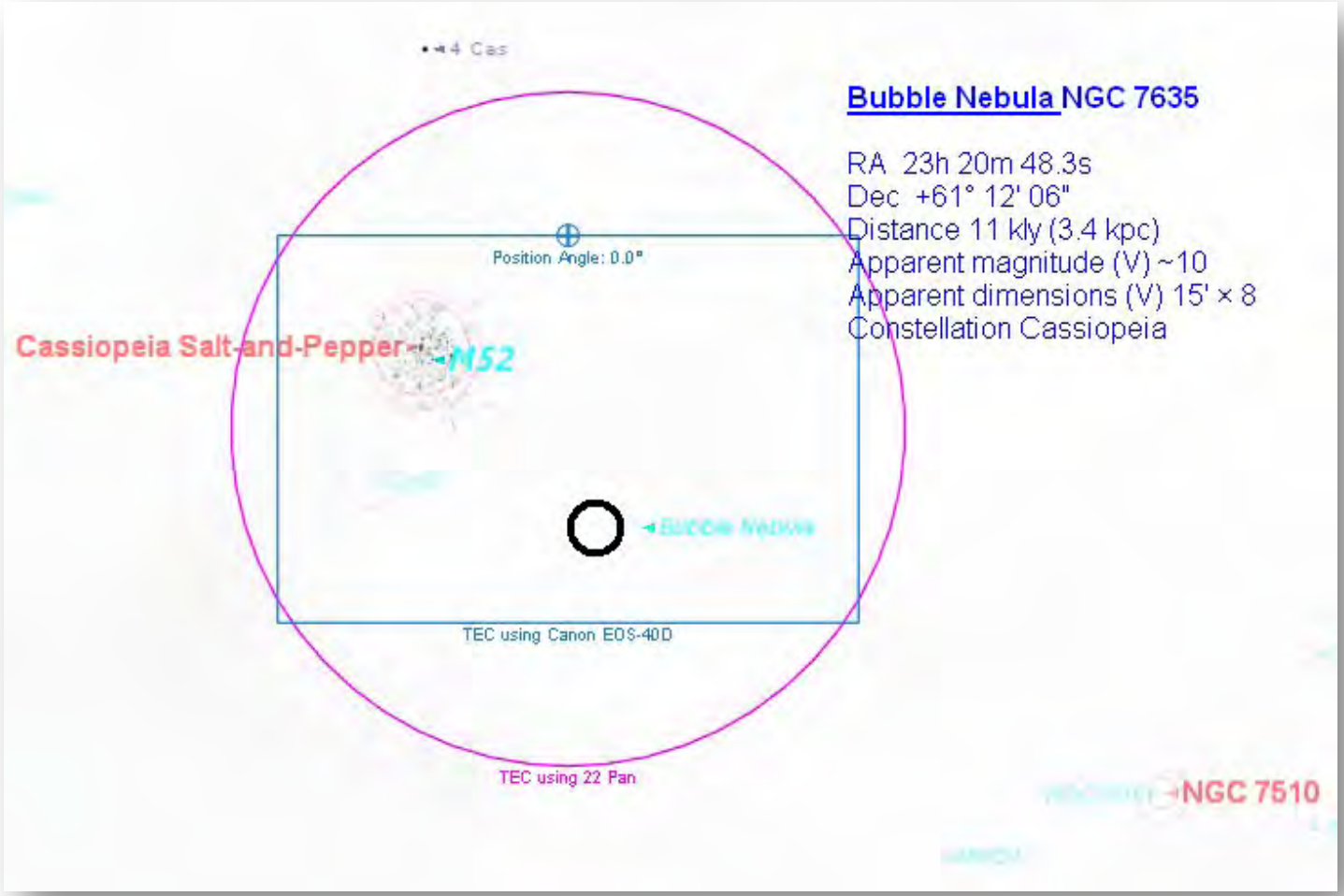
Image Planning Card

RA (JNow): 6h 41.595m
Dec (JNow): 9° 53.051'
RA (J2000): 6h 40.970m
Dec (J2000): 9° 53.733'



Resulting Photo

Image Planning Card



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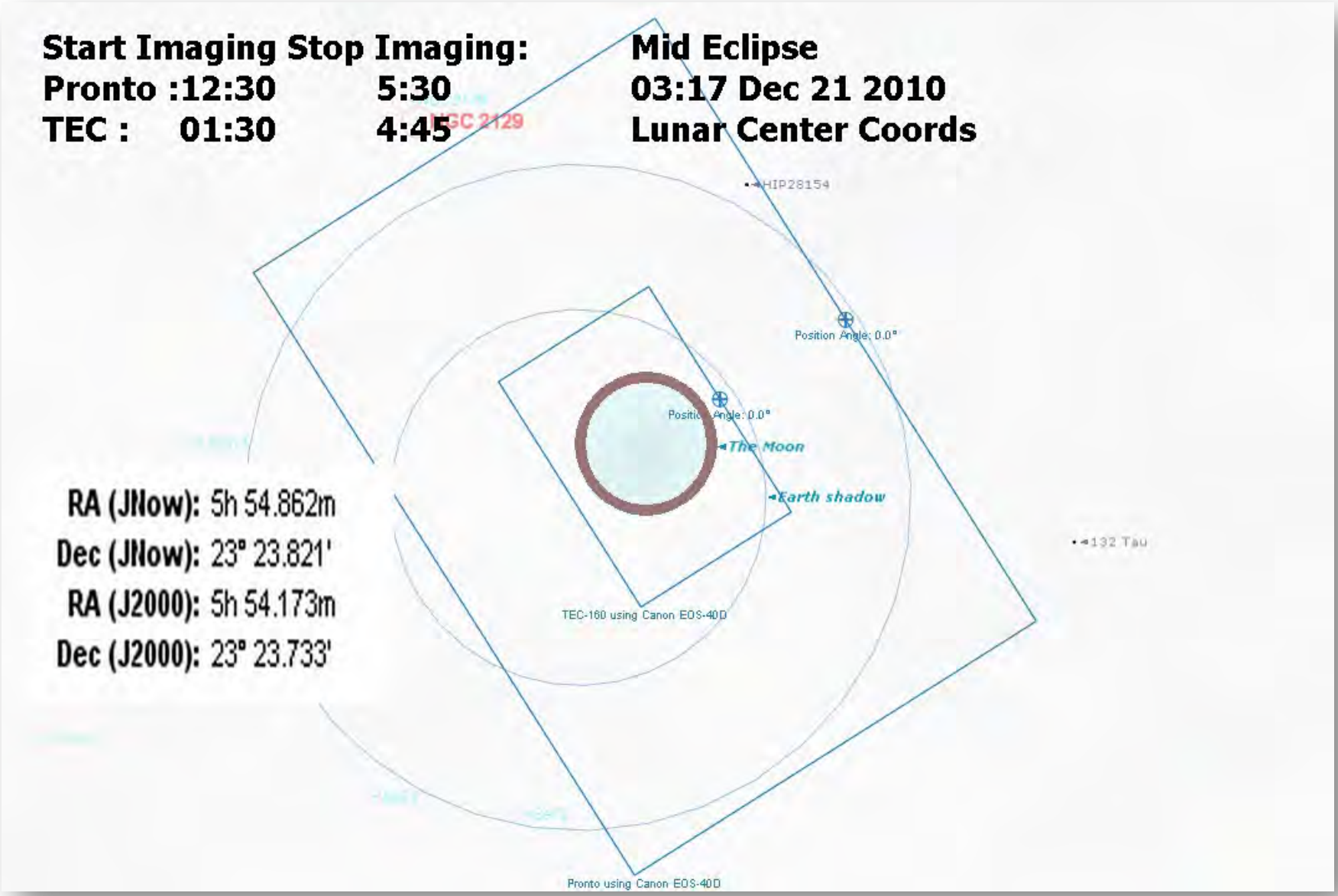

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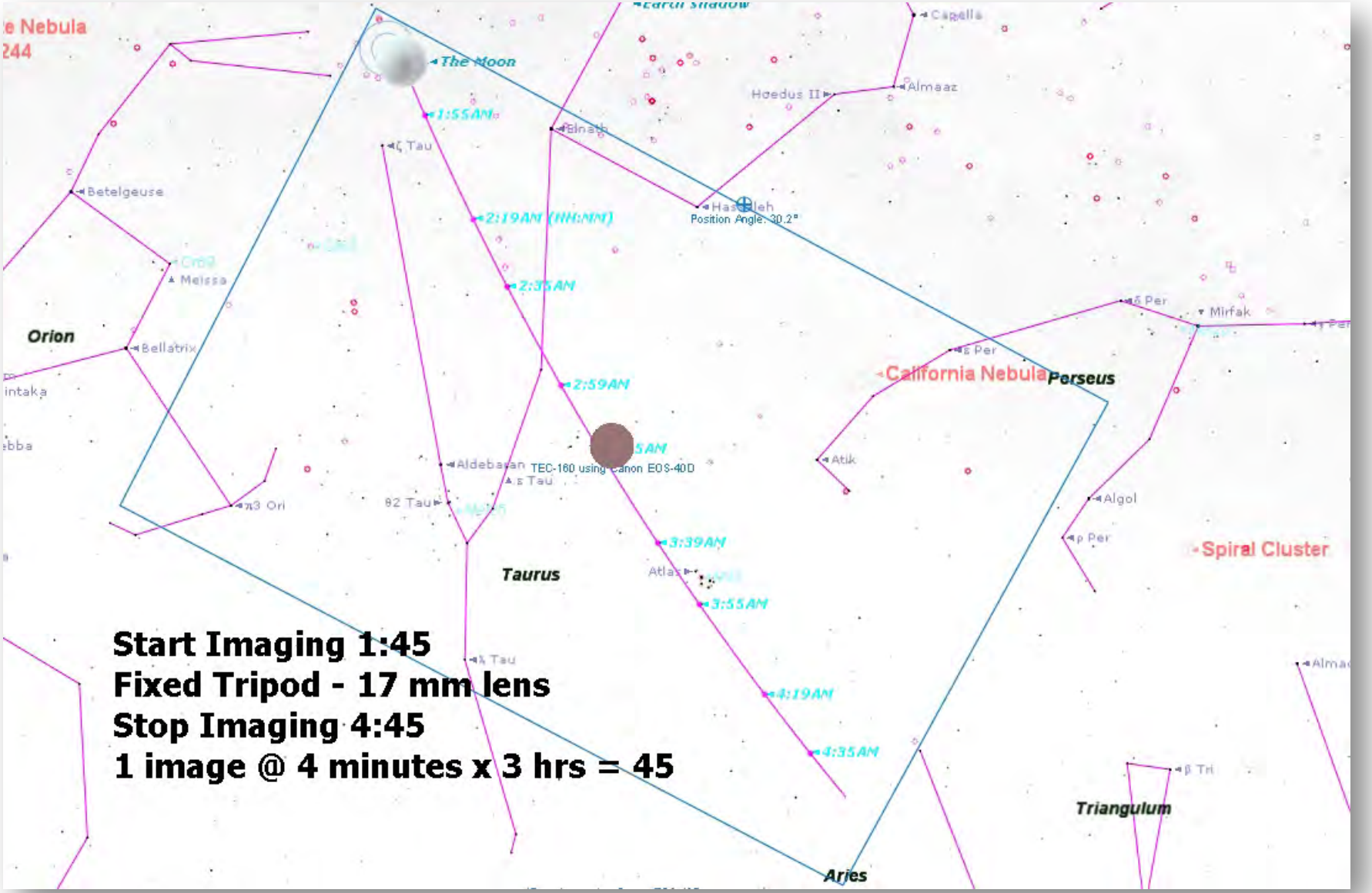

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Desired Imaging time and Az-El

- An object near the horizon is best imaged while it crosses the meridian

👍 Reduce atmospheric distortion

👍 Allows for better color capture

👎 But it limits the image duration

NGC 6334 – Cats Paw Nebula

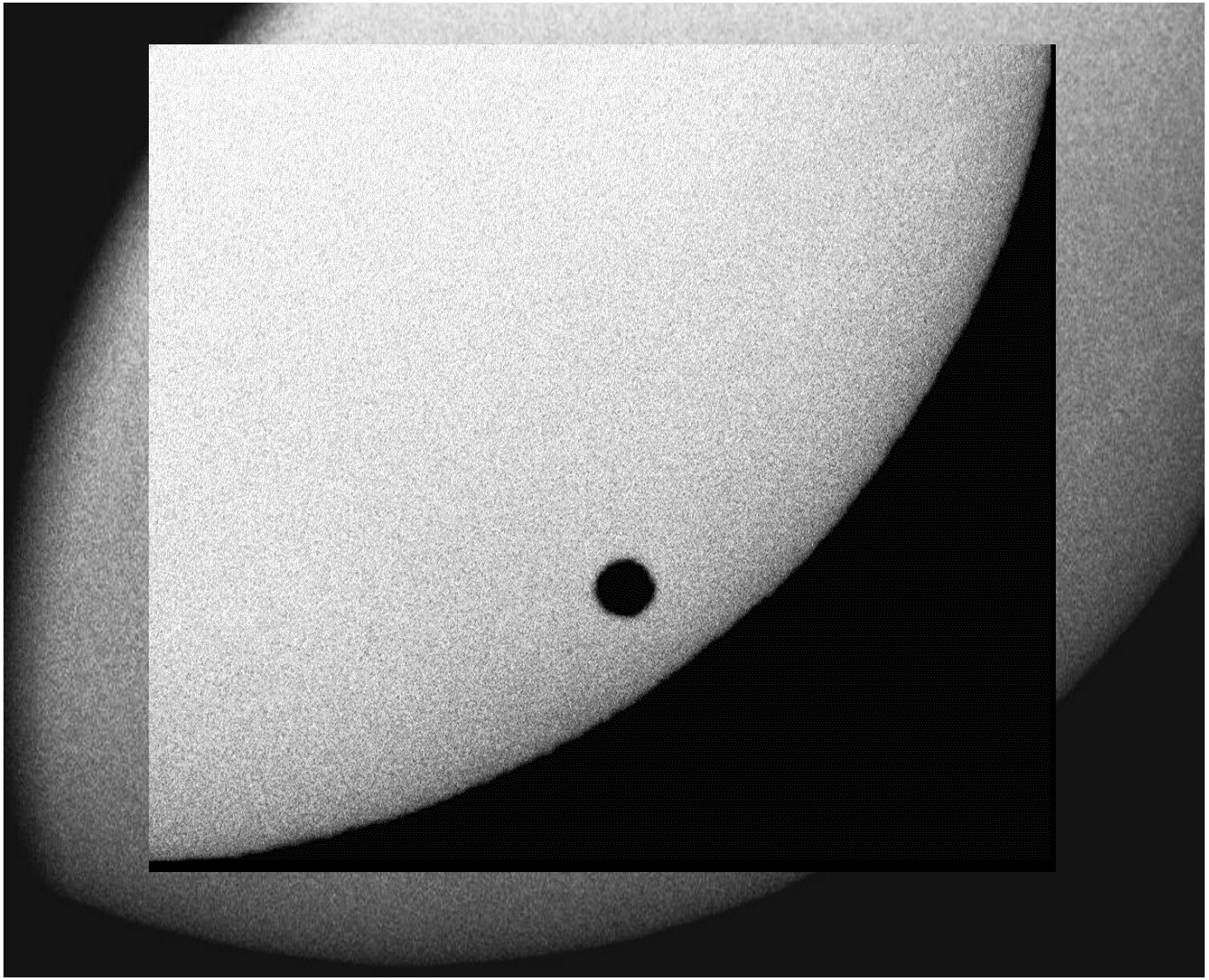
Desired Imaging time and Az-El

- Time specific event considerations
  - Pre sync time with official source
    - http://www.time.gov/timezone.cgi?Eastern/d/-5
    - http://www.docgoerlich.de/utcdate.php (for Gemini)
  - Set up earlier than usual, allow for contingencies
  - Take several test images if possible
- Examples

Double Iridium Flare

Lunar Eclipse Feb 20 2008

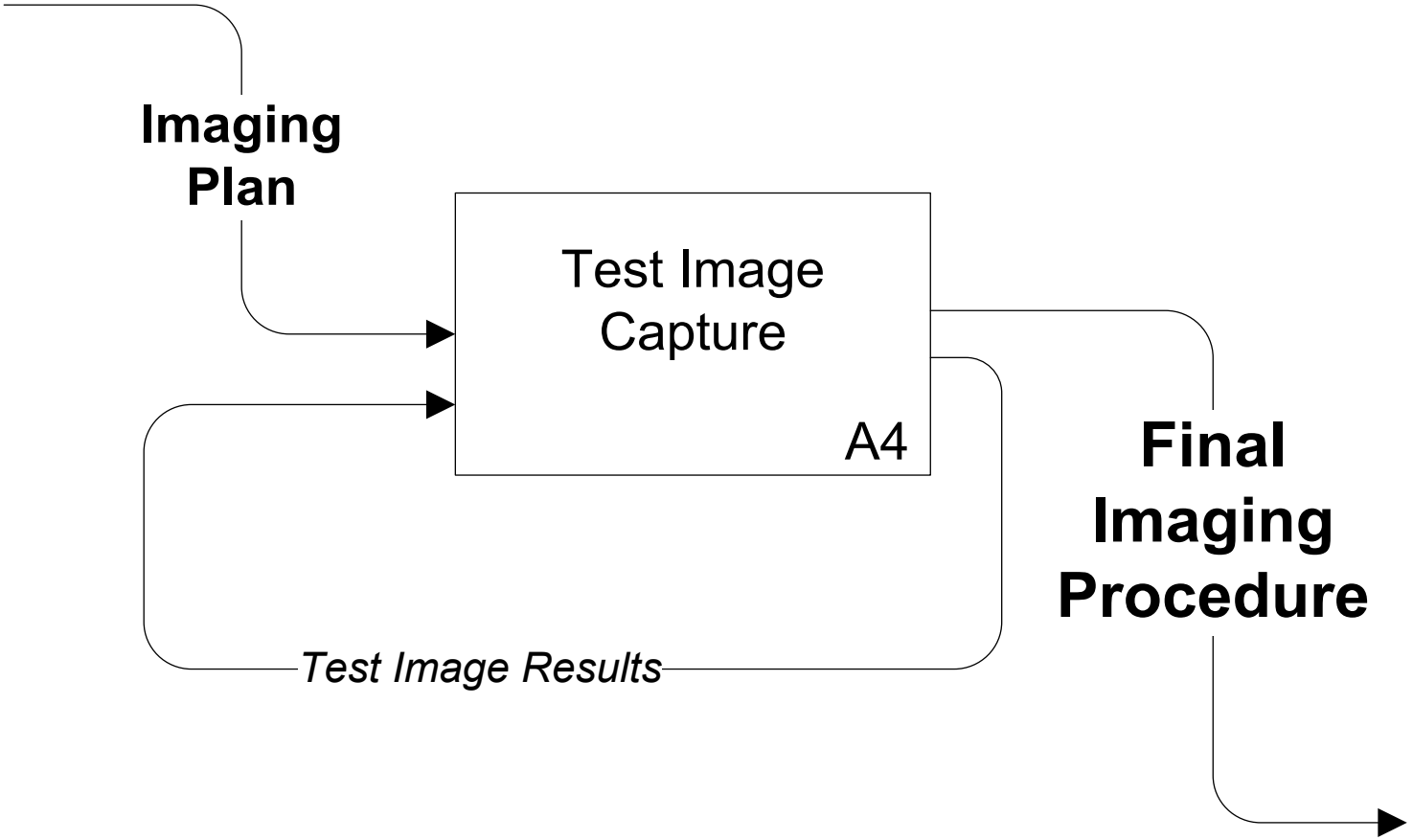
Venus Transit



Timed Events

- Other examples
  - Jupiter moon and shadow transits
  - Comets near other objects
  - ISS/Shuttle Passes
  - Solar Eclipse
- Potential Sources
  - Heavens-Above.com
  - http://www.minorplanetcenter.org/iau/Ephemerides/Comets/index.html
- Animated GIF Creator
  - http://www.myspacegens.com/handler.php?gen=animatedimage

Test Image Capture



Test Image Results

Check for Focus, Exposure and Composition

Test Image

- Focus
- Exposure
- Composition

- Zoom on nearby star
- Is histogram balanced?
  - No zero pixels
  - “No” saturated pixels
  - Reasonable sky glow
- 1st test image to confirm target and orientation (~3 min)
- Next test images shorter to confirm orientation adjustments (~1 min)

Adjustment

Refocus

Adjust sub image exposures

Re point telescope and rotate camera

Image Centering Example

On Camera Histogram


300"
00
100-8826
CF
M
ISO 1600
AWB
F 0, 0, 0, 0
RAW
14.5MB
sRGB
168/332
03/02/2011 23:45:57

Final Thoughts on Image Planning

"No amount of planning will ever replace dumb luck."

Jerry Lodriguss

- Plan the image but don't let the planning get in the way of a good picture!
- Learn from you previous images – apply it.
- Be flexible and creative, and above all…
- **Have fun!**


Questions?