



# Only 109 More Objects to Go

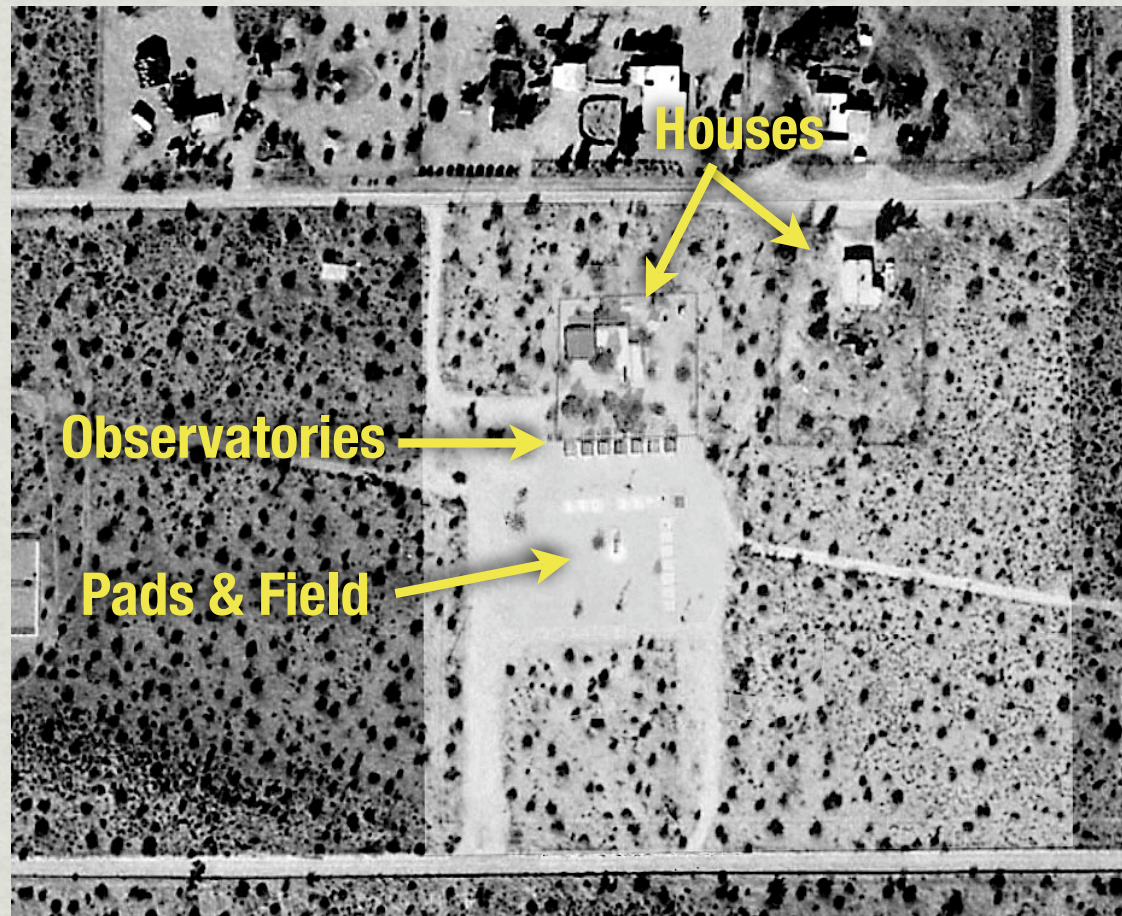
## Chronicling a Photographic Messier Marathon

# Background

- \* Ralph Megna is the Chairman of the Board of Trustees of the Riverside Astronomical Society
- \* Frank Boecker is Co-Director of Membership for the Riverside Astronomical Society
- \* Our effort at a photographic Messier Marathon took place at the RAS dark sky site, the Goat Mountain Astronomical Research Station (GMARS) near Landers, California on March 8th, 2008
- \* Used the Megnaritaville Observatory

# A bit about GMARS...

- \* Established 2002
- \* Now 10 acres
- \* 8 private structures
  - \* 6 observatories
  - \* 2 warm rooms
- \* 18 telescope pads
- \* 1100 sf stationhouse
- \* Huge garage
- \* Second house to be part of future work



# Observatories at GMARS

**Megnaritaville Observatory**



# Megnaritaville Observatory

- \* Finished in January 2008
- \* 14-in LX200R



- \* Got its name from spooft by Bob Stephens

# Extreme Astronomy?

- \* A photographic Messier Marathon is less about imaging than it is about planning and logistics
- \* Capturing 110 targets in a single night basically means an average of one object every six minutes
  - \* Slew, find, frame, shoot, QC (reshoot?)
- \* Predictable problems: Observatory walls, twilight
- \* Gotchas: Wind, clouds, trees, technology crashes

# Gearing Up

- \* Choosing camera and scope combination is a set of trades between field of view and focal length
- \* Enormous range of sizes in Messier List
  - \* Largest M-object: Andromeda Galaxy - 178 arc m - demands huge field of view
  - \* Smallest M-object: Ring Nebula - 1.4 arc m - needs very long focal length
- \* Quickly became clear that more than one scope/camera system was going to be needed

# The Telescopes

- ✦ Meade 14-inch LX200R with .63 reducer
- ✦ William Optics 66mm SD with .8 reducer/flattener
- ✦ StellarVue F50 finder



# The Cameras

- \* Primary Concerns

- \* Imaging area (size of detector)
- \* Ease of use
- \* Computer control
- \* Download time over USB
- \* Simple processing of color image

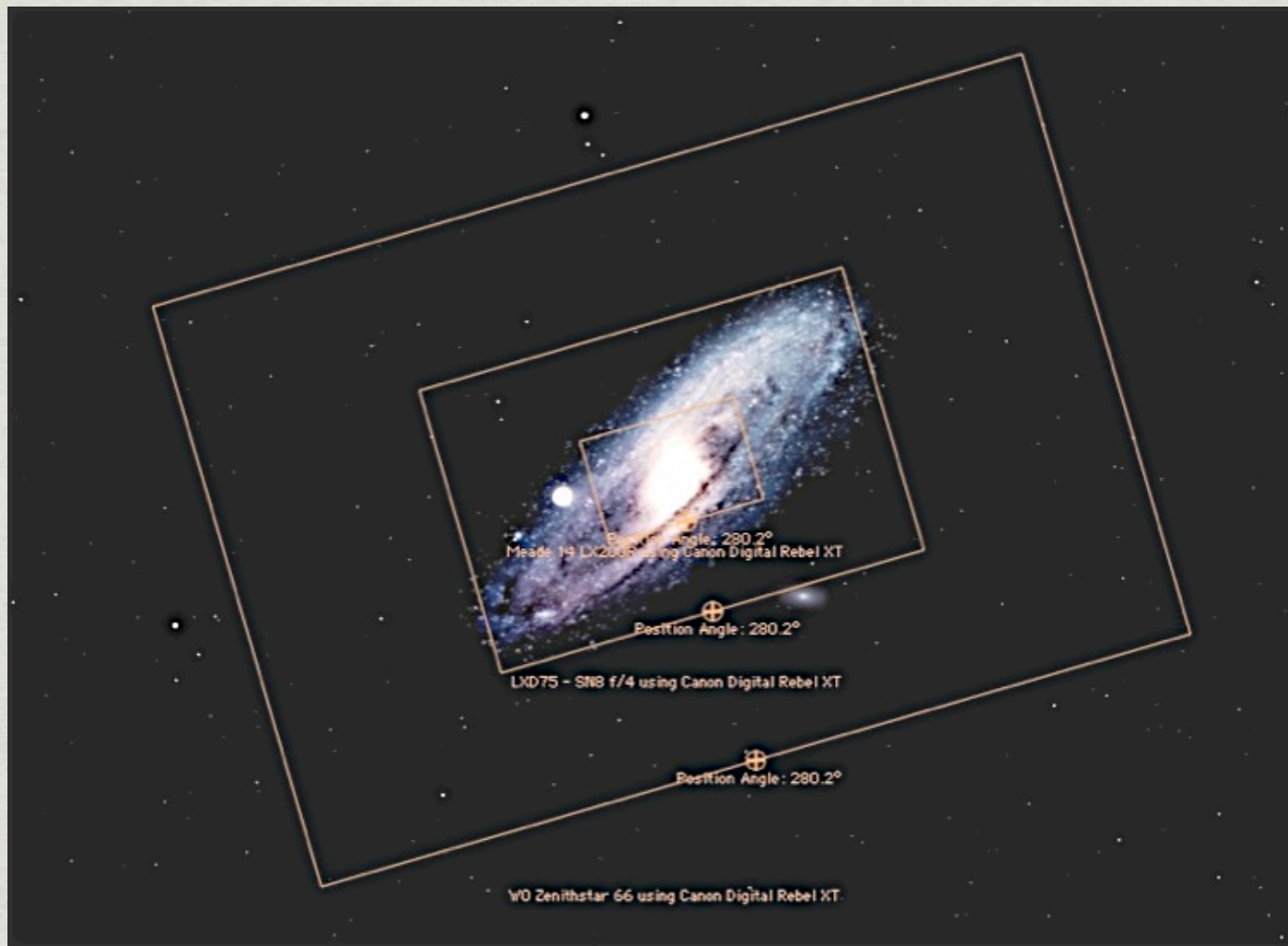
- \* Choice: Canon XTi (400D)

- \* Base imaging parameter: 90 sec shots at ISO 800

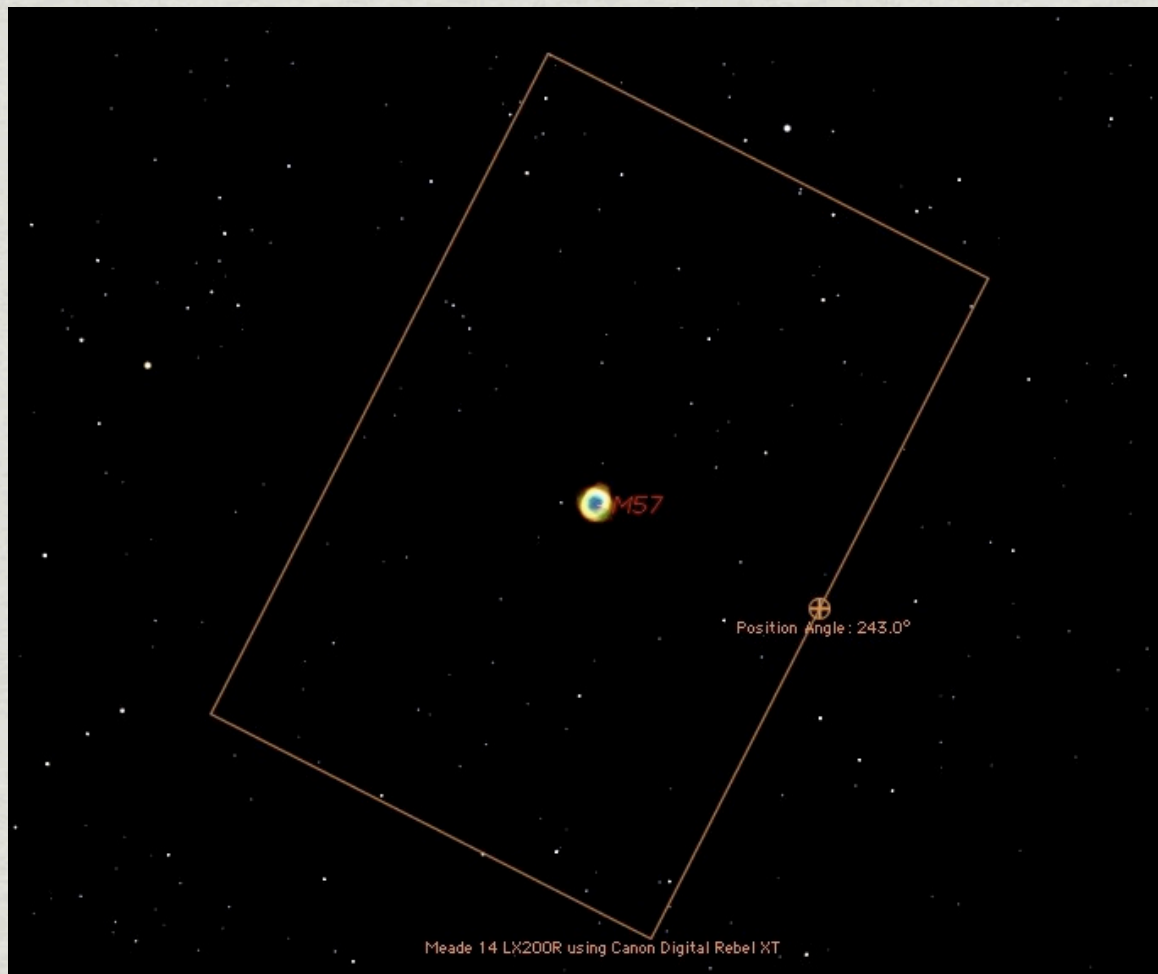
- \* High quality, large JPEGs, saved to card and computer



# Field: M31 through 66SD



# Field: M57 through 14-in

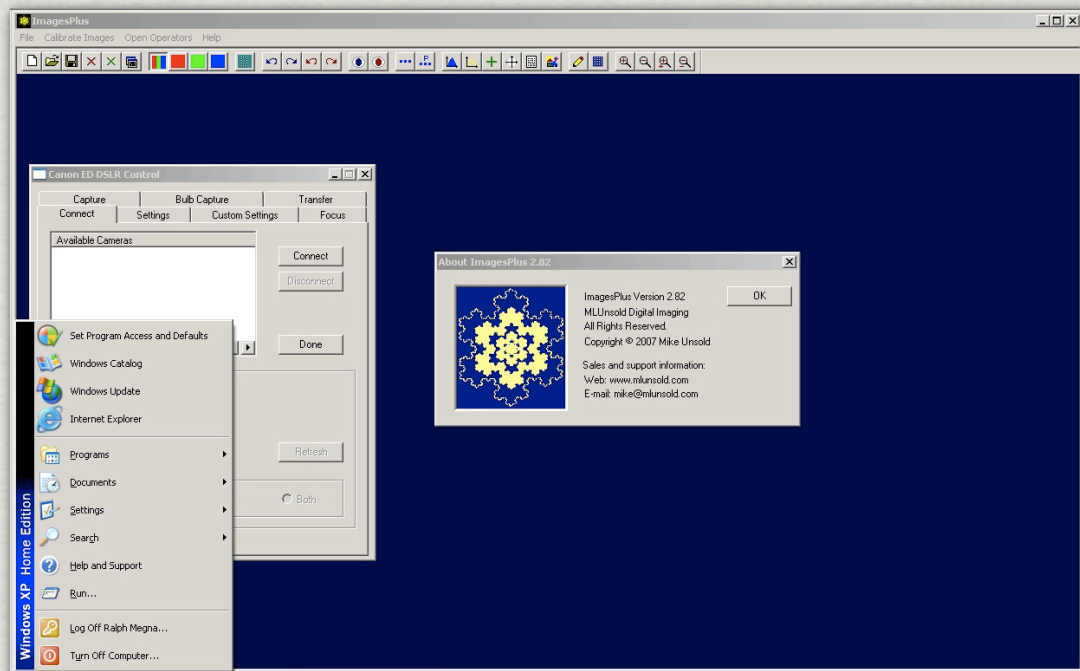


# Field: M51 through 14-in



# Software: Camera Control

- ✱ Mike Unsold's ImagesPlus
- ✱ Very flexible DSLR control software
- ✱ One camera (66) ran on dedicated XP laptop
- ✱ Other camera (14) ran in Parallels session on Mac



# Software: Scope Control

\* AstroPlanner  
by Paul Rodman

\* Run on Mac  
(Windows version, too)

\* Provided:

- \* List management
- \* Slew control
- \* FOV information
- \* Logging pad

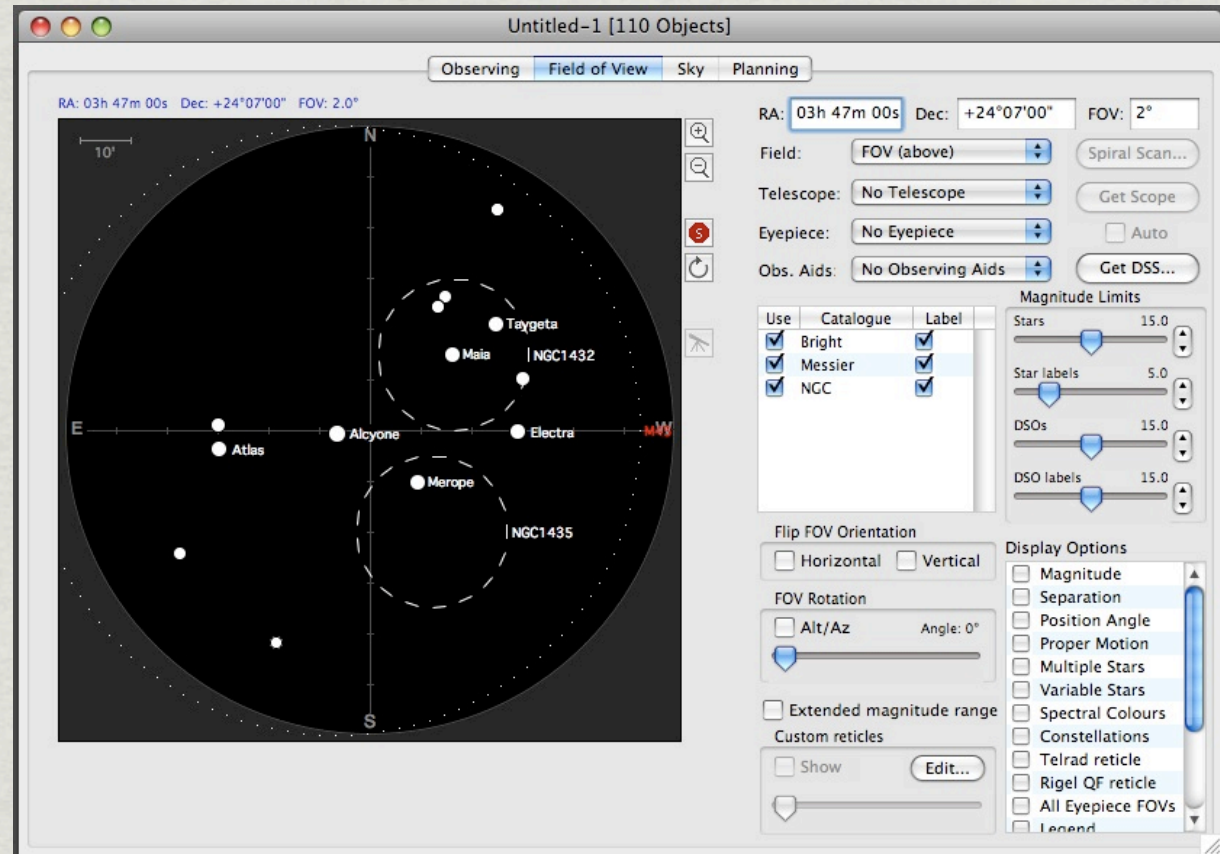
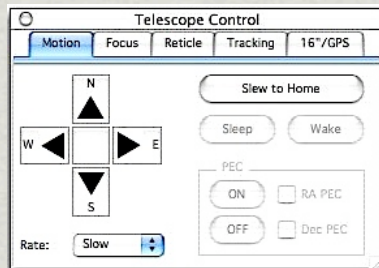
The screenshot shows the AstroPlanner software interface. At the top, there are tabs for 'Observing', 'Field of View', 'Sky', and 'Planning'. Below these are various settings and status indicators, including 'Current Telescope', 'Current Site', and 'Current Seeing'. A table of objects is displayed, with columns for ID, Name, Type, R.A., Dec, Azimuth, Altitude, Rise, Transit, Set, Visible, Obs, Rating, ODM, and Mag. The table lists objects like NGC2068, NGC1904, NGC6093, Bode's Galaxy, Cigar Galaxy, and others. Below the table, there are controls for slewing to an object, creating new objects, and showing the field of view. On the right side, there are fields for 'User Obs. #1', 'User Obs. #2', 'Observation Notes', 'Focal Length', 'Field of View', 'Magnification', 'Seeing', and 'Transparency'.

ID	Name	Type	R.A.	Dec	Azimuth	Altitude	Rise	Transit	Set	Visible	Obs	Rating	ODM	Mag
M78	NGC2068	D Neb	05h 46.8m	+00°05'	98°	11°	14h 22m	20h 25m	02h 28m	Yes				8.▲
M79	NGC1904	Globular	05h 24.2m	-24°31'	121°	1°	15h 11m	20h 02m	00h 53m	Yes				8.
M80	NGC6093	Globular	16h 17.0m	-22°59'	268°	-42°	01h 58m	06h 55m	11h 51m					8.
M81	Bode's Galaxy	Galaxy	09h 55.6m	+69°04'	14°	18°	Circum	00h 33m	Circum	Yes				7.
M82	Cigar Galaxy, Ursa Major A	Galaxy	09h 55.9m	+69°41'	14°	18°	Circum	00h 34m	Circum	Yes				9.
M83	Southern Pinwheel Galaxy	Galaxy	13h 37.0m	-29°52'	286°	-78°	23h 43m	04h 15m	08h 47m					8.
M84	NGC4374, UGC7494	Galaxy	12h 25.1m	+12°53'	5°	-43°	20h 25m	03h 03m	09h 41m					10.
M85	NGC4382, UGC7508	Galaxy	12h 25.4m	+18°11'	5°	-38°	20h 09m	03h 03m	09h 58m					10.
M86	NGC4406, UGC7532	Galaxy	12h 26.2m	+12°57'	5°	-43°	20h 25m	03h 04m	09h 43m					9.
M87	Smoking Gun, Virgo A	Galaxy	12h 30.8m	+12°23'	4°	-43°	20h 32m	03h 09m	09h 46m					9.
M88	NGC4501, UGC7675	Galaxy	12h 32.0m	+14°25'	3°	-41°	20h 27m	03h 10m	09h 53m					10.
M89	NGC4552, UGC7760	Galaxy	12h 35.7m	+12°33'	2°	-43°	20h 36m	03h 14m	09h 51m					10.
M90	NGC4569, UGC7786	Galaxy	12h 36.8m	+13°10'	2°	-43°	20h 35m	03h 15m	09h 54m					10.
M91	Missing Messier Object	Galaxy	12h 35.4m	+14°30'	2°	-41°	20h 30m	03h 13m	09h 56m					10.

# AstroPlanner Features

☀ FOV detail

☀ Telescope Control Palette



# AstroPlanner Features

Messier\_Marathon-GMARS-final [113 Objects]

Observing | Field of View | Sky | Planning

Can't connect: USA28X1b1P1.1 unavailable  
 Voice control

Current Telescope: No Telescope specified | Current Site: GMARS | Current Seeing: Not specified | Fix Date...

Observer: Ralph

Right Ascension | Declination | Azimuth | Altitude

HighLight: Observed (Any)

Sun: Set: 18:48 Rise: 06:58  
 Twilight: Civ: 19:17 Naut: 19:46 Astro: 20:15

ID	Name	Type	R.A.	Dec	Altitude	Rise	Transit	Set	Visible	Mag	Size	Const
M77		Galaxy	02h 42.7m	-00° 01'	53°	05h 58m	16h 00m	22h 03m	Yes	10.5	7x6	Cvt
M74	The Phantom	Galaxy	01h 36.7m	+15° 47'	71°	06h 07m	14h 54m	21h 42m	Yes	10.5	10.2x9.5	Psc
M33	Triangulum Pinwheel Galaxy	Galaxy	01h 33.9m	+30° 39'	86°	07h 13m	14h 52m	22h 30m	Yes	7.0	73x45	Tri
M31	Andromeda Galaxy	Galaxy	00h 42.7m	+41° 16'	76°	05h 29m	14h 00m	22h 32m	Yes	4.5	178	And
M32		Galaxy	00h 42.7m	+40° 52'	76°	05h 31m	14h 00m	22h 29m	Yes	10.0	8x6	And
M110		Galaxy	00h 40.4m	+41° 41'	75°	05h 24m	13h 58m	22h 32m	Yes	10.0	17x10	And
M52	The Scorpion	Open	23h 24.2m	+61° 35'	55°	Circum	12h 42m	Circum	Yes	8.0	13	Cap
M103		Open	01h 33.2m	+60° 42'	64°	Circum	14h 51m	Circum	Yes	7.0	6	Cap
M76	Little Dumbbell Nebula	P Neb	01h 42.4m	+51° 34'	73°	04h 54m	15h 00m	01h 06m	Yes	12.0	2.7x1.8	P
M34		Open	02h 42.0m	+42° 47'	76°	07h 18m	16h 00m	00h 41m	Yes	6.0	35	P
M45	Pleiades, Seven Sisters	Open	03h 47.0m	+24° 07'	62°	06h 50m	17h 05m	00h 19m	Yes	1.4	110	T
M79		Globular	05h 24.5m	-24° 33'	11°	13h 52m	18h 42m	23h 33m	Yes	8.5	8.7	L
M42	Orion Nebula	Open+E Neb	05h 35.4m	-05° 27'	23°	13h 05m	18h 53m	00h 41m	Yes	5.0	85x60	O
M43	part of Orion Nebula	E Neb	05h 35.6m	-05° 16'	23°	13h 05m	18h 53m	00h 42m	Yes	7.0	20x15	O
M78		D Neb	05h 46.7m	+00° 03'	24°	13h 01m	19h 04m	01h 07m	Yes	8.0	8x6	O
M1	Crab Nebula	SNR	05h 34.5m	+22° 01'	30°	11h 45m	19h 52m	01h 59m	Yes	9.0	6x4	Tou
M35		Open	06h 08.9m	+24° 20'	33°	12h 11m	19h 27m	02h 42m	Yes	5.5	28	Cen
M37		Open	05h 52.4m	+32° 33'	39°	11h 23m	19h 10m	02h 57m	Yes	6.0	24	Aur
M36		Open	05h 36.1m	+34° 08'	43°	11h 00m	18h 54m	02h 48m	Yes	6.5	12	Aur
M38		Open	05h 28.7m	+35° 50'	45°	10h 44m	18h 46m	02h 48m	Yes	7.0	21	Aur

Local: 14:59:43 | GMT/UTC: 21:59:43 | Local Solar: 01:45:43  
 Date: 3/14/08 | Moon: Rise: 11:46 Set: 02:10 Illum: 52.0%

30x30' 1G

Stew To Object | Telescope not connected | Sync to Object | Create New Object | Show Field of View

Observations: 2008/03/08 8:11 PM

GMARS | LX200R 14-inch | No Eyepiece | No Filter | No Observing Aids | Rating: Not rated

User Obs. #1: | User Obs. #2: | Focal Length: n/a | Field of View: n/a | Magnification: n/a

Observation Notes: (Julian Date: 2454534.67451)  
 3 shots - focusing

Seeing: | Transparency:

AstroPlanner © 2002-7 Langa, Inc.

✳ DSS images for object confirmation

# Marathon Night Realities

- \* Winds gusting to over 25 mph
- \* Observatory provides some protection, but dust is everywhere
- \* Thin clouds at sunset (and sunrise) provide additional challenge
- \* Early date (March 8th) means first objects much easier than last
- \* Change to PDT at 2 AM



# Seduced by Test Images

- \* Expected wind gusts to turn the LX200 into a tuning fork
- \* But... test images on Sirius were stable
- \* First target (M77) imaged by 6:47 PM
- \* Last at (M73) 6:14 AM
- \* 106 confirmed objects



# Stuff that Worked

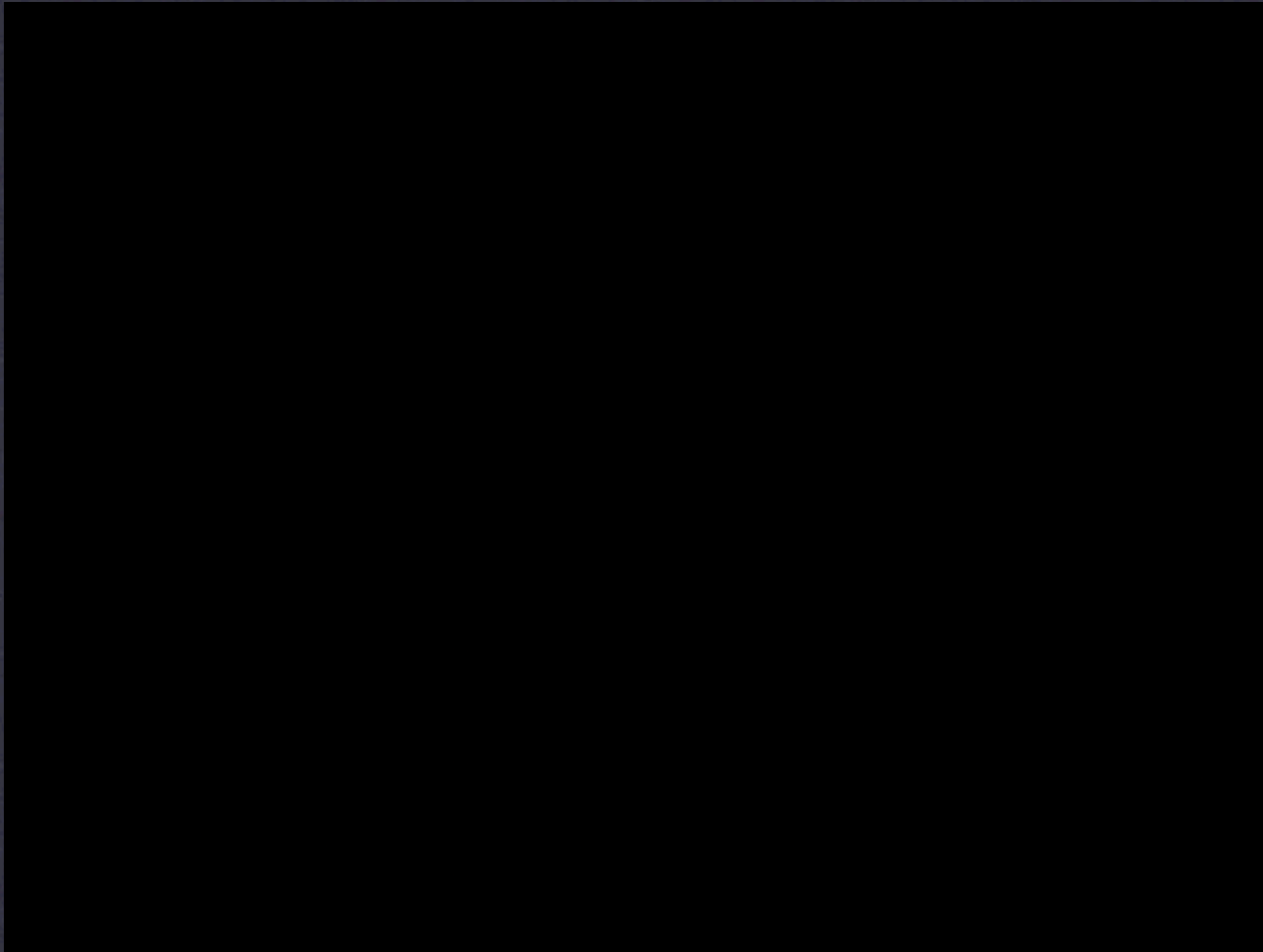
- \* Observatory provided effective wind, light block
- \* Two people better than one
- \* Meade LX200 slewing accuracy generally OK
- \* Tandem scopes provided redundancy as well as widely different plate scales
- \* Canon DSLR & ImagesPlus mostly good choices
- \* AstroPlanner provided great scope management

# Lessons Learned

- \* 66mm refractor was too short; 80 or 90 would have been better and still provided needed FOV
- \* Messier list order needs refinement
- \* Slightly longer exposures (most at 90 sec) would have improved many galaxy, nebula shots
  - \* Will shoot 48-bit RAWs to allow better stretching
- \* Weirdness with camera, memory card, software
  - \* Will download image to computer, no card in camera
- \* Need to stay on top of focus, especially on LX200
- \* Need to keep moving

# What to Do with Images?

- \* Messier Marathon: The Movie
  - \* Produced on Mac using iMovie
  - \* Processing nearly 100 images was daunting
  - \* Found perfect music: “Drops of Jupiter” by Train
  - \* Presents story from afternoon to the next morning



# MESSIER MARATHON: THE MOVIE

ASTROIMAGES BY RALPH MEGNA & FRANK BOECKER - TERRESTRIAL PHOTOS BY BOB STEPHENS

# For More Information

- \* Email me: [ralph@macastronomy.com](mailto:ralph@macastronomy.com)
- \* Web Site: [www.macastronomy.com/messier.html](http://www.macastronomy.com/messier.html)
- \* On RAS: [www.rivastro.org](http://www.rivastro.org)

