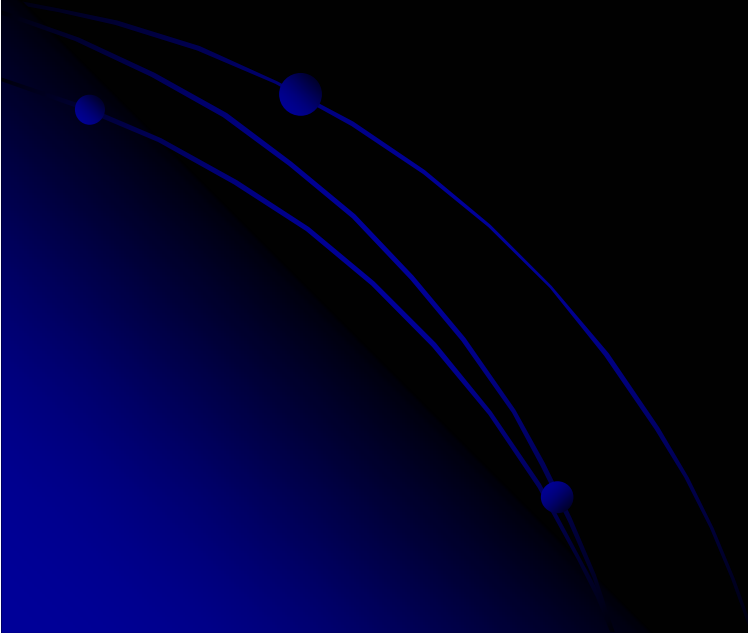


Night Sky Redux : Spring Galaxies from Canes Venatici to Virgo

SMAS April 07 Meeting



Prerequisites for Galaxy Hunting

- Become familiar with constellation shapes
- A dark sky! Mag 5.0 or better *required* for best results
- A good star chart (or accurate goto)
 - A computer-based star charting tool with multiple levels of zoom is useful for identifying and verifying targets
- An *accurate* finder(s)
- A picture of the galaxy, or a first view in another telescope, is often useful as a visual guide
- Use the right exit pupil (2 to 4 mm typically)
 - Good seeing needed for higher magnification, smaller exit pupil
- Patience!
- Having trouble making a positive id? Ask for help!

What is interesting?

- Some observers find galaxies boring (so sad)
- My ratings are subjective, determined from observations in the club's 20 inch, a 12.5 inch newt, memory of views in 8 inch and 9.25 inch SCTs, and Ed Gorney's 8 inch Celestron dob
- What do I personally find interesting?
 - Edge-on galaxies
 - Visible dust lanes and/or mottled/grainy structure
 - Neighboring bright stars or patterns of stars
 - Face-on spirals if arms are visible
 - Groups of galaxies in same fov of different shapes or sizes
- Use technology such as a Stellacam or CCD camera

M51

- Excellent spiral w/ companion (NGC 5195); a must see
- **Size:** 10.8'x6.6'
Mag: 8.9
Surface Brightness:
12.5 mag/min²
- Study the view to discern the spiral arms and connecting bridge



M63

- Sunflower Galaxy
- Bright core; averted vision may show mottling
- **Size:** 12.6'x7.5'
Mag: 9.3
Surface Brightness: 12.4 mag/min²
- Listed by Lord Rosse as one of 14 "spiral nebulae" discovered to 1850



M106

- Large, active spiral
- Shows extended halo with variations in brightness
- **Size:** 17.4'x6.6'
Mag: 9.1
Surface Brightness:
12.4 mag/min²
- At 21 million light years, one of the closest examples of a Seyfert (active) galaxy



NGC 5005

- Spiral with dark lanes
- Mottling and extended structure
- **Size:** 5.8'x2.9'
Mag: 10.6
Surface Brightness:
11.7 mag/min²
- You may spot NGC 5033 40' to the SE, which has a small bright core with lower surface brightness



NGC 4244

- Edge-on with grainy appearance
- Long extended object visible in 8 inch scopes
- **Size:** 15.9'x1.8'
- **Mag:** 10.7
- **Surface Brightness:** 12.6 mag/min²



NGC 4490

- Irregular shape with companion
- “Cocoon Galaxy”
- Very easy to find
- Target of much study due to the collision of the two galaxies
- **Size:** 6.4'x3.2'
Mag: 10.2
Surface Brightness:
11.9 mag/min²



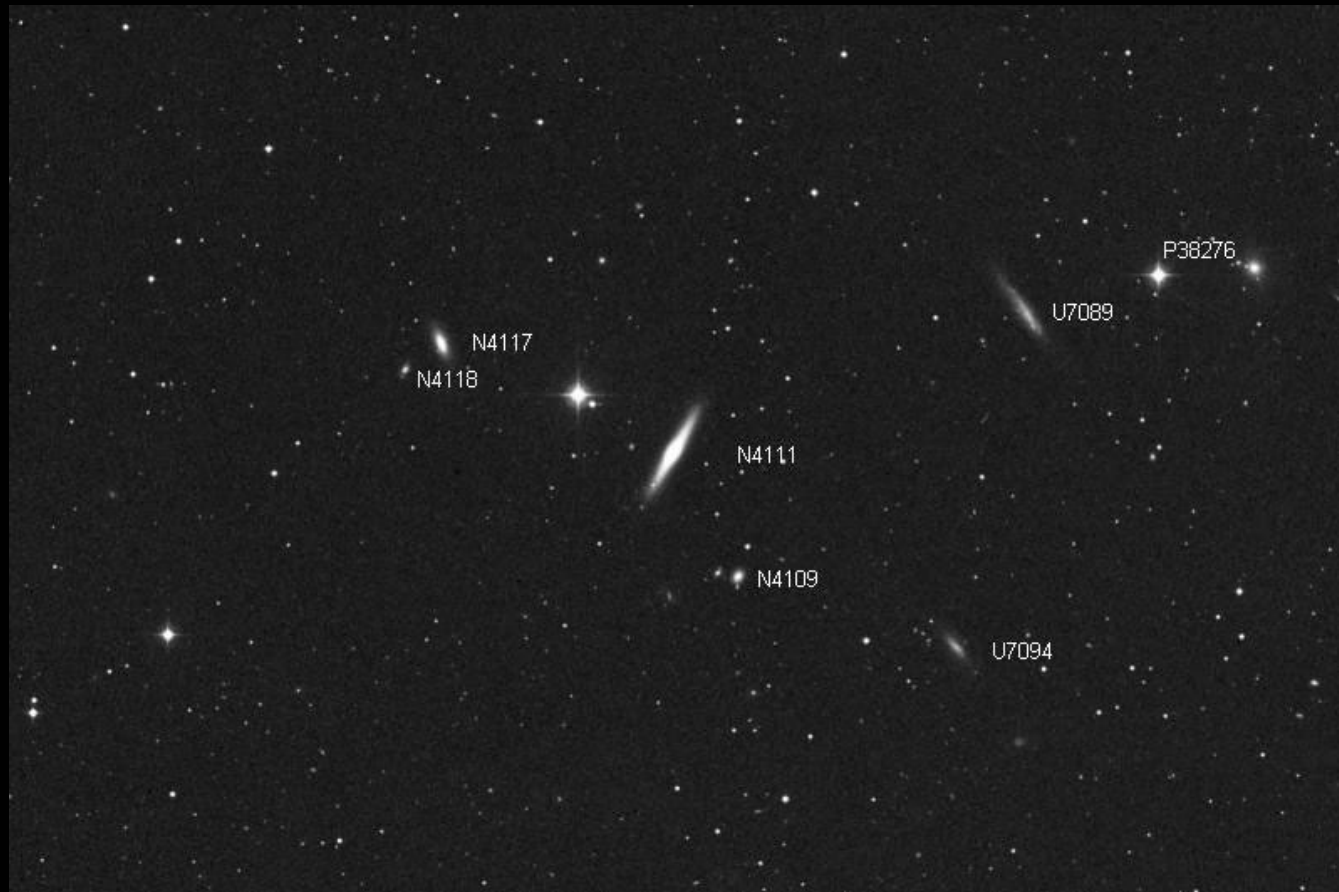
NGC 4449

- Irregular dwarf galaxy
~12 million light years distant
- Similar to our own LMC
- Shape is easily apparent in scopes
- **Size:** 6.2'x4.9'
- **Mag:** 10.0
- **Surface Brightness:**
11.5 mag/min²



NGC 4111

- Smallish edge-on with very bright core
- Attractive blue/orange double-star in same fov
- **Size:** 4.6'x1.0'
Mag: 11.7
Surface Brightness: 9.3 mag/min²



NGC 4631

- “The Whale Galaxy”
- Excellent edge-on with faint interacting companion galaxy; a must see
- **Size:** 15.2'x2.8'
Mag: 9.7
Surface Brightness: 12.6 mag/arcmin²
- You may spot NGC NGC 4656 just 30' to the SE, which is a faint edgewise galaxy with a hook-shaped end
- Detailed analyses have shown connecting bridge of hydrogen gas between 4631 and 4656



NGC 4565

- *Showcase* edge-on galaxy some 50 million light years distant
- Milky Way would appear similar if viewed in same fashion
- Study to observe the dark lane through nucleus
- **Size:** 14.9'x2.0'
Mag: 10.3
Surface Brightness: 12.2 mag/arcmin²



M64

- “Blackeye Galaxy”
- Dust near nucleus is visible even in smaller scopes
- Odd structure is believed to be due to a previous galaxy collision in the process of “settling down”
- **Size:** 10.3'x5.0'
Mag: 9.3
Surface Brightness:
11.7 mag/arcmin²



Break Time

- Other stuff in the same 'hood:
 - Globular clusters M3 and M53
 - Carbon stars “La Superba” (Y CVn) and SS Vir
- Not much besides galaxies going on in this part of the sky. Why?

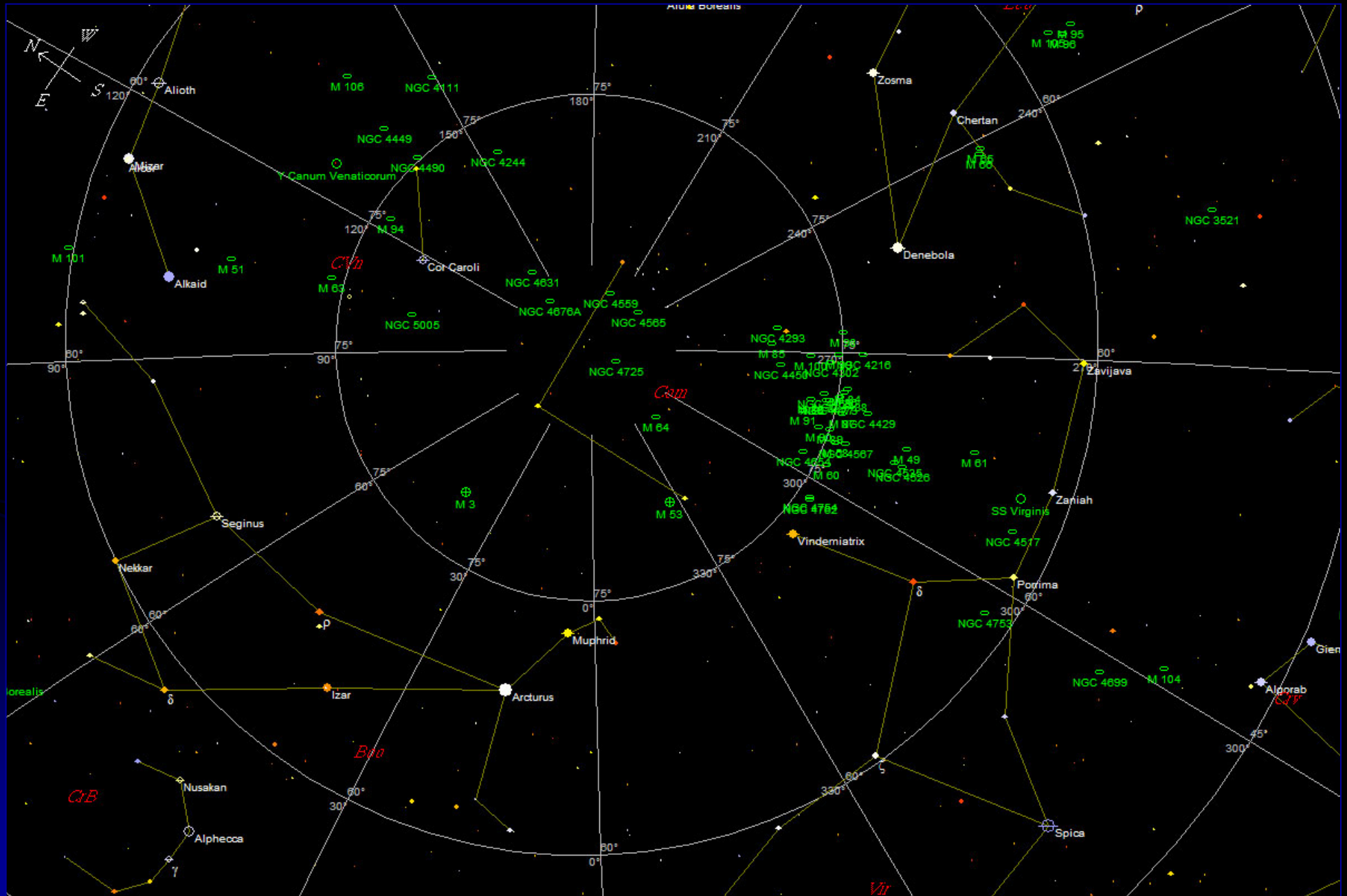


© Russell Croman



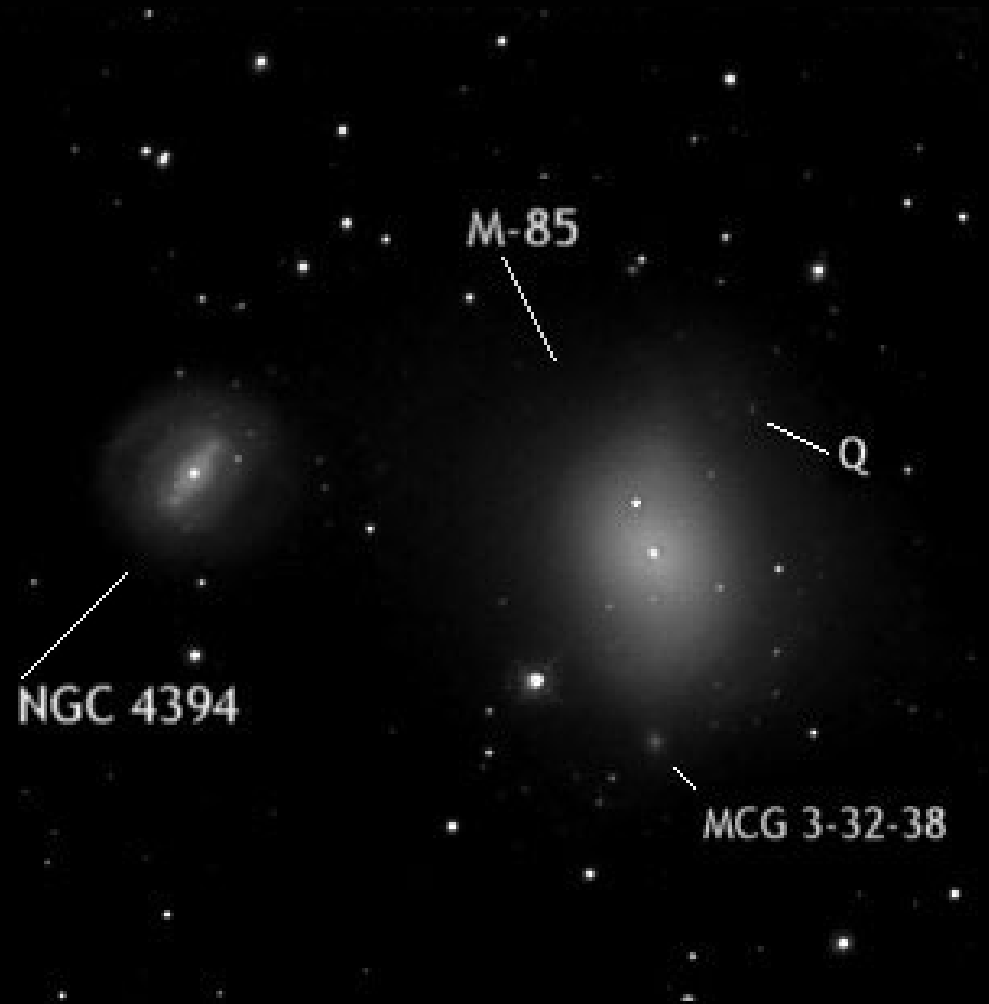
© Russell Croman

Galactic Pole



M85

- Long thought to be an elliptical, later studies have discovered lenticular (S0) structure
- Interesting due to bright star near stellar nucleus and neighboring galaxy NGC 4394
- **Size:** 7.4'x5.9'
Mag: 10.0
Surface Brightness: 11.8 mag/arcmin²



M100

- Large face-on spiral
- Low surface brightness makes discerning spiral structure a challenge
- **Size:** 7.5'x6.1'
Mag: 10.1
Surface Brightness: 13.2 mag/arcmin²
- One of the first targets studied by the HST; 20 Cepheids id'ed with a distance estimate of 56 million light years



M98

- Excellent object for 8 inch and larger scopes
- Bright core shows structure with a bright star nearby
- **Size:** 9.4'x2.3'
Mag: 10.9
Surface Brightness: 13.3 mag/arcmin²



Markarian's Chain

- Excellent grouping for binoculars and all telescopes
- Bright M84 and M86 lenticulars start the chain which winds to the NE
- At least 7 members appear to be gravitationally bound
- Part of the Virgo Supercluster some 70 million light years distant



Markarian's Chain Widefield



M88

- Nice spiral with visible structure that is easy to find by pushing NE from the end of Markarian's Chain
- **Size:** 6.8'x3.7'
- **Mag:** 10.2
- **Surface Brightness:** 12.6 mag/arcmin²



NGC 4654

- Irregularly-shaped spiral
- Averted vision reveals the asymmetric shape
- **Size:** 5.0'x3.1'
Mag: 11.1
Surface Brightness: 12.9 mag/arcmin²



NGC 4568 / 4567

- “Siamese Twins”
- Both galaxies easily visible even with low surface brightness
- **Size:** 4.6'x3.1'
Mag: 11.7 / 12.1
Surface Brightness:
14.1 / 13.9
mag/arcmin²



M60

- Bright elliptical with interacting spiral in halo
- M59 may be visible 25' W in the same fov
- **Size:** 7.6'x6.2'
- **Mag:** 9.8
- **Surface Brightness:** 12.0 mag/arcmin²
- M60 is estimated at 120,000 light years in diameter with the luminosity of 60 billion Suns
- Contains a 2 billion Sun central mass similar to M87



Virgo Cluster Widefield

~ 6 degrees



M91

M88

NGC4298/4302

Markarian's Chain

NGC4654

M90

M89

M87

M58

M60

NGC4567/4568

NGC4429

NGC 4762 / 4754

- Close pair of galaxies visible in the same fov
- Situated in a field of bright stars
- **NGC 4762**
Size: 8.6'x2.0'
Mag: 11.1
Surface Brightness:
11.9 mag/arcmin²
- **NGC 4754**
Size: 4.4'x2.4'
Mag: 11.5
Surface Brightness:
11.6 mag/arcmin²



Comet 9/P Tempel (Deep Impact)



NGC 4526

- Tilted lenticular with dark lane near nucleus
- Located between two bright stars in field of 3 in an “L” shape
- **Size:** 7.0'x2.5'
Mag: 9.7
Surface Brightness: 11.8 mag/arcmin²
- Supernova 1994D, a Type 1a, shown at lower left in the photograph



M49

- Interesting elliptical due to superimposed star very close to nucleus
- Faint neighboring galaxies may be visible in larger scopes
- **Size:** 9.8'x8.2'
- **Mag:** 9.3
- **Surface Brightness:** 12.7 mag/arcmin²



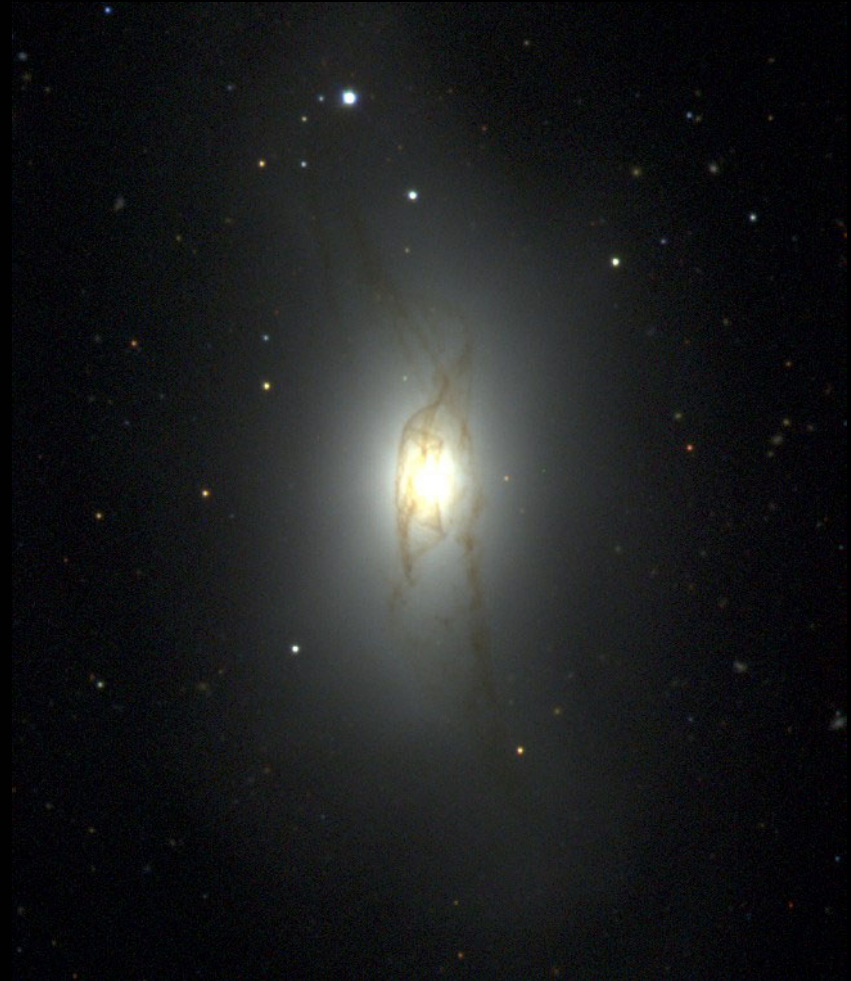
M61

- Asymmetric face-on spiral
- Easy to locate near 16 Vir
- Use averted vision to detect the shape
- **Size:** 6.5'x5.9'
- **Mag:** 10.1
- **Surface Brightness:** 12.8 mag/arcmin²



NGC 4753

- S0 type with dust lanes
- Larger scopes may reveal grainy texture in nucleus
- **Size:** 5.1'x2.6'
- **Mag:** 10.9
- **Surface Brightness:** 12.2 mag/arcmin²



M104

- “Sombrero Galaxy”
- A must see edge-on galaxy with visible dust lane
- **Size:** 8.6'x4.2'
Mag: 9.2
Surface Brightness:
11.5 mag/arcmin²



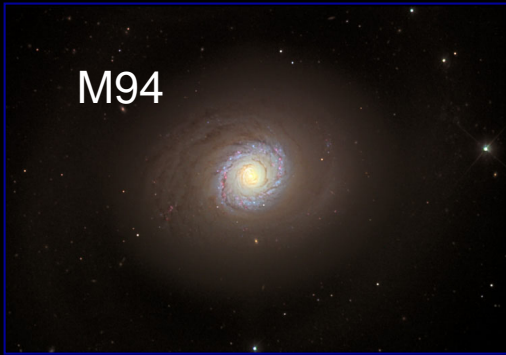
NGC 5746

- Bright edge-on spiral
- Easy to locate near bright 109 Vir
- Several foreground stars in disk
- **Size:** 6.9'x1.2'
- **Mag:** 11.3
- **Surface Brightness:** 13.1 mag/arcmin²
- 95 million ly distant



Others

M94



NGC 4450



NGC 4216



M99



M58



NGC 4535



NGC 4302/4298



NGC 4725



NGC 4699



Challenge Objects

- Two interacting pairs:
NGCs 5426/5427 and the
“The Antennae” NGCs
4038/4039
- NGCs 5426/5427 are 114
million ly distant (behind
Virgo cluster at 60-70)
 - Each about 3 arcsec in
apparent size
- The Antennae were
discovered by Herschel in
1785 and first classified as
a planetary nebula
 - See if you can observe
some of the star formation
knots



Resources

- Most pictures courtesy of the Kitt Peak Visitor Center's observing program:
<http://www.noao.edu/outreach/aop/observers/galaxy.html>
- Excellent resource for exploring the Virgo cluster:
<http://www.anzwers.org/free/universe/galgrps/vir.html>
- As always, the Night Sky Observer's Guide is recommended

