

How Deep Into Space Can the Harken Observatory Telescope See ?



TELESCOPE: 12" LX200GPS-SMT
Manufacturer: Meade

Optical Design Schmidt-Cassegrain
Clear Aperture 305mm (12")
Primary Mirror Diameter 314mm (12.375")
Focal Length, Focal Ratio 3048mm f/10

Resolving Power (arc secs.) 0.38
Limiting Visual Magnitude (approx.) 15.0
Limiting Photographic Magnitude (approx.) 17.5
Image Scale (degs./inch) 0.48

2/11/2008

It can easily see all the planets as well as other objects in our solar system



Jupiter 43 light-minutes away

(comets and asteroids)

Comet SW-3 32 light-seconds
or about 6 million miles closest pass

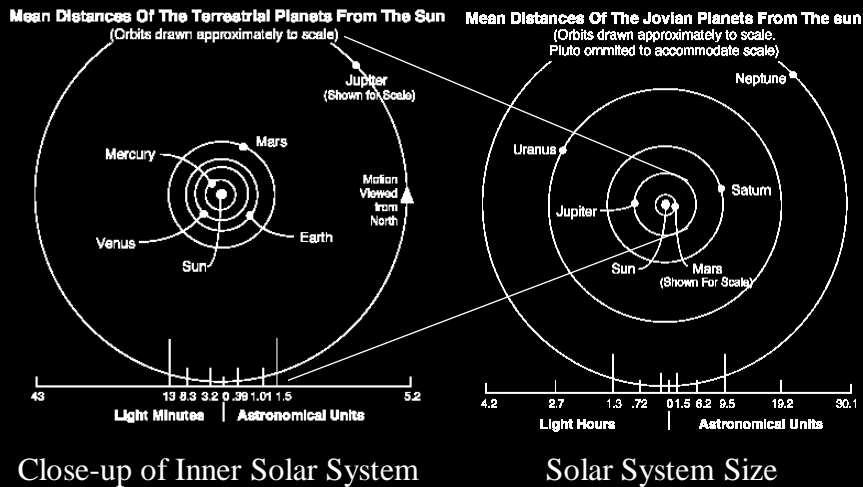


Saturn 79 light-minutes away

M57 (not in solar system 4100 l-y distant)

Careful observing techniques are required to image planetary details
but multiple moons are easily observed.

The Solar System is small, astronomically speaking...



Stars can be observed and vary in color due to their type, size and distance

Sirius (Class A bluish-white, 2.6x size of our sun) - 8.6 light-years distant

Antares (Class M red giant, diameter about the same as Mars is from the sun) - 603 light-years distant

- The telescope can “split” close double star (binary systems where two stars orbit each other)
- The electronic camera is capable of accurately measuring the brightness of a star and detecting variability due to unseen companion star or planet



Gas Nebulas are observed

Some are the birthplaces
of new stars....



1600 light-years distant



...while some are what remains
after a violent stellar explosion!

6300 light-years distant

What we mostly see in the night sky is in our own
galaxy - the Milky Way

The Milky Way is a rather typical
spiral galaxy



The Sun is located in a spiral arm.

Our Sun and Solar System
are only a small part of our
galaxy which has about
400 billion other stars
and is 100,000 l-y in diameter

We can observe many objects within our galaxy



M8 Lagoon Nebula
(giant interstellar gas cloud)
6,500 l-y



M13 Hercules Globular Cluster
(star cluster - 22,200 l-y)



M27 Dumbbell Nebula
(planetary nebula - 1,250 l-y)

... and many others, as well.

The Milky Way galaxy is part of a group of nearby galaxies referred to as the “Local Group”

The Local Group is the group of galaxies that includes our galaxy, the Milky Way. The group comprises over 30 galaxies, with its gravitational center located somewhere between the Milky Way and the Andromeda Galaxy. The galaxies of the Local Group cover a 10 million light year diameter. The group belongs to the Virgo Supercluster.

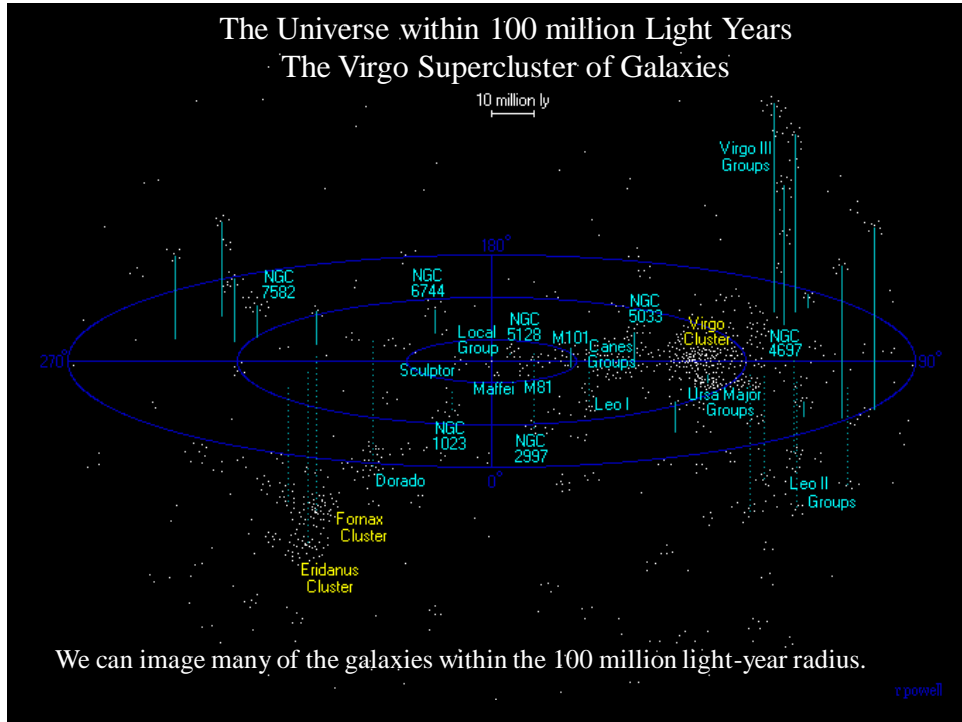
List of local group members:

Andromeda M31 (with M32, M110 satellite galaxies of Andromeda),
IC10 (irregular), Leo A, NGC147, NGC6822, Triangulum M33 is shown to right



The Andromeda galaxy is so large that only a small part of it would fill the field of our camera on the telescope. We could try imaging it with a low power telescope with guiding performed with the Meade LX200GPS.

These would make interesting observing subjects! Cepheid variable star light curves could perhaps be measured in local group galaxies.



Easily imaged objects of the Virgo Supercluster



M51 Whirlpool Galaxy
37 million l-y



M101 Pinwheel Galaxy
24 million l-y

Illustrations copied from internet sources:

<http://www.seds.org/hst/HDFWF3.html> Hubble Deep Field Image

<http://en.wikipedia.org> Fact and Figures

<http://www.atlasoftheuniverse.com/index.html> Virgo Supercluster and 200Ml-y

<http://www.solarviews.com/eng/solarsys.htm> Solar System diagram

<http://members.nova.org/~sol/chview/chv5.htm> Milky Way photo

<http://www.enchantedlearning.com/subjects/astronomy/solarsystem/where.shtml>

<http://members.nova.org/~sol/chview/chv5.htm>

<http://www.harkenobservatory.com/Images1/Forms/AllItems.aspx>
(Harken Observatory Images)

assembled presentation by R. Buchwald 5/27/2006