

64 Additional Bright Galaxies

The Astronomy Logbook Project

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Preface

This is a log book for observers wanting to see more bright galaxies in the sky, but have already finished the Bright Galaxies logbook, or have more aperture power, or want to try something more adventurous.

This is a compilation of observation log forms for each of the objects accompanied by useful information about the object, 3 star charts, and an image from the Digitized Sky Surveys. It may gain more features as time progresses.

The book contains 64 objects to add to the 180 objects from the “Bright Galaxies Logbook”. All of the galaxies listed in this logbook are expected to be visually observable with an 8-inch (200mm) telescope, from reasonably dark (Bortle 4) skies. Of course, many of them are visible in smaller aperture too, so you can still use this logbook if you run out of objects.

Galaxies were programmatically chosen from the SAC database (<http://www.saguaroastro.org/content/downloads.htm>) by applying the following filters:

- Galaxy not a Messier object
- Galaxy is marked pB in Dreyer’s descriptions
- Galaxy is brighter than 11.0 mag (to avoid tiny, high-surface brightness galaxies)

Since there was no human intervention involved, there could be errors. However, I checked that most of the galaxies I considered significant, that were not present in the “Bright Galaxies Logbook” are present in this extension.

Many of these galaxies may not be visible at your latitude. The book is hemisphere-neutral, and just lists objects irrespective of southern / northern declination. It is important to note that objects low in the horizon are made substantially more difficult by airmass.

The book’s content and structure is inspired by the Bangalore Astronomical Society’s (<http://bas.org.in>) observer certification programs. The idea for this particular logbook came from Mr. Naveen Nanjundappa.

Hope you will enjoy observing these galaxies!

–Akarsh Simha

Legal

Most Importantly

- **You may not use this compilation for commercial / profit-making purposes!** This is because this compilation uses images from the Digitized Sky Surveys, and data from Dr. Wolfgang Steinicke's Revised NGC / IC. Please see <http://gsss.stsci.edu/Acknowledgements/DSSCopyrights.htm> and the NGC/IC section of <http://www.klima-luft.de/steinicke/> (in the German) or http://www.klima-luft.de/steinicke/index_e.htm (in English) for details.
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¹i.e. at the MAST website: <http://archive.stsci.edu/>

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- **Star Catalog Data** used in the star charts come from three major catalogs: *Hipparcos*, *Tycho 2*, and *USNO NOMAD* and rendered using *KStars*.

- *Hipparcos* and *Tycho 2* were obtained from the Astronomical Data Center run by the NASA. While the data center is now closed, at the time of download, the website said:

“All ADC data are public domain unless otherwise stated in the “ReadMe” file. The data are for scientific use only and have no commercial value.”

As of January 2013, an archive of the old website is still accessible here: http://web.archive.org/web/20060908091808/http://adc.astro.umd.edu/adc/questions_feedback.html#policies1

- *USNO NOMAD* was obtained from the US Naval Observatory (<http://www.nofs.navy.mil/nomad/>).

The “Privacy and Security Notice” on USNO’s website (<http://ad.usno.navy.mil/privacy.shtml>) reads:

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No explicit statement is made about the NOMAD catalog in particular.

- **Deep-Sky Object Data** used in the star charts and the data table come mostly from the Revised NGC/IC catalog by Wolfgang Steinicke, and that data is Copyright (c) 2003 Wolfgang Steinicke. The visual magnitudes for objects, however, come from a newer version of the Revised NGC/IC catalog by Wolfgang Steinicke, released in January 2013, and that data is Copyright (c) 2003-2013 Wolfgang Steinicke (steinicke-zehnle@t-online.de). When unavailable, the visual magnitudes have been substituted with blue magnitudes, also from the same catalog.

The data has been made freely available for **non-commercial use**.

Data for non-NGC/IC objects is not from Dr. Steinicke’s catalog, and was collected manually by hand from various sources, most notably SIMBAD and the SAC database.

The Dreyer and SAC descriptions, and magnitudes wherever available come from the Saguaro Astronomy Club (SAC) database, and it is freely available for non-commercial use.

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The Bangalore Astronomical Society



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Austin Astronomical Society



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Please note that the presence of the logo of the AAS does not indicate any form of endorsement of this project by them.

The Digitized Sky Survey

The images used in this compilation come from the Digitized Sky Survey plates, in particular, those from the POSS-II and UKSTU surveys.

The Digitized Sky Survey was produced at the Space Telescope Science Institute under U.S. Government grant NAG W-2166. The images of these surveys are based on photographic data obtained using the Oschin Schmidt Telescope on Palomar Mountain and the UK Schmidt Telescope. The plates were processed into the present compressed digital form with the permission of these institutions.

The Second Palomar Observatory Sky Survey (POSS-II) was made by the California Institute of Technology with funds from the National Science Foundation, the National Aeronautics and Space Administration, the National Geographic Society, the Sloan Foundation, the Samuel Oschin Foundation, and the Eastman Kodak Corporation. The Oschin Schmidt Telescope is operated by the California Institute of Technology and Palomar Observatory.

The UK Schmidt Telescope was operated by the Royal Observatory Edinburgh, with funding from the UK Science and Engineering Research Council (later the UK Particle Physics and Astronomy Research Council), until 1988 June, and thereafter by the Anglo-Australian Observatory. The blue plates of the southern Sky Atlas and its Equatorial Extension (together known as the SERC-J), the near-IR plates (SERC-I), as well as the Equatorial Red (ER), and the Second Epoch [red] Survey (SES) were all taken with the UK Schmidt telescope at the AAO.

The images themselves were downloaded from the Mikulski Archive for Space Telescopes (MAST; <http://archive.stsci.edu/>).

The makers thank the DSS for making sky imagery freely available for non-profit activities, and also thank MAST for the excellent web service provided by them.

Deep-Sky Object Data

The makers thank Dr. Wolfgang Steinicke for providing the Revised NGC / IC catalog under terms making it free for non-commercial use.

The Dreyer and SAC descriptions, and some of the data for non-NGC/IC objects, come from the Saguaro Astronomy Club database. The makers thank the Saguaro Astronomy Club for providing their compilation for free non-commercial use.

KStars and other open-source tools



The makers particularly thank, the developers of KStars, (<http://edu.kde.org/kstars>) the software that made the rendition of star maps used in this compilation possible and made available, in an easy form, the data used in this compilation. KStars was also used to fetch appropriate DSS URLs for the objects. KStars is a cross-platform astronomy software licensed under the GNU General Public License v2 (<https://www.gnu.org/licenses/gpl-2.0>). It qualifies as free software.

The typesetting of the charts was done using \LaTeX . `xmlstarlet` was used to parse XML for object descriptions generated by KStars. Inkscape and ImageMagick were used to convert between graphics formats. Inkscape was also used to generate several of the graphics used here. Several tools from the standard GNU suite, such as `bash`, `wget`, `sed` and `awk` proved very useful.

This compilation was generated using only free and open source software.

Credits

This is a list of people who contributed to this project, in no order of significance (except possibly chronological). (Feel free to add your name to the list if you forked this / made a derivative work!)

- Akarsh Simha (akarshsimha@gmail.com) – **original idea**; also responsible for creating the script that generates logbooks
- Kumar Appaiah – Several educative lessons on git, emacs, sed, and awk that made this compilation possible.
- Naveen Nanjundappa – several valuable suggestions
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- Joyce D Lynch – permission to use the AAS logo
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- Many members of the Austin Astronomical Society who have contributed through their encouragement, support and feedback!

1

Glossary of Technical Terms

Some of the technical terms used in the compilation are explained *in brief* here. Many resources that offer more detailed explanations and further information are available on the internet. You could alternatively also use KStars' AstroInfo project, accessible from the KStars Help Menu. See <http://edu.kde.org/kstars> for more.

- **Right Ascension and Declination** together constitute the **Equatorial Geocentric Coordinates** used in astronomy. It is a *coordinate system* used to designate positions in the sky.

Just like the location of a point on the earth is specified by the latitude and longitude, the location of a point in the sky is specified using the Right Ascension (RA) and Declination (Dec). Usually, these are denoted by the symbols α and δ .

The declination is simply a projection of the earth's latitudes onto the sky. For example, the north celestial pole lies at a declination of $+90^\circ$, and is in the direction vertically above when standing at the north pole of the earth, which has a latitude of $+90^\circ$. Southern declinations are considered negative. Declination is usually measured in degrees.

Unlike longitude, RA is measured in hours. Just like an arbitrary longitude is chosen to be zero degrees (namely the prime meridian), a point called the *First point of Aries* (usually denoted γ) is chosen to be the zero for RA. 1 hour corresponds to 15 degrees.

- **Precession; Epoch; J2000.0:** The axis about which the earth rotates is not stationary. Just like a spinning top, the earth wobbles causing the axis itself to move. This wobbling of the axis of the earth is described by motions called *precession* and *nutation*. Precession is the dominant of the two. As a result of precession, the pole star of today, Polaris, will no longer be near the pole several centuries later.

The earth's axis traces a circle in the sky over a period of 26000 years. This might sound like a small effect over a couple years, but astronomical positions are measured with rather high precision. Thus, precession effects must be taken into account.

Most catalogs of stars and deep-sky objects list the RA and Dec of objects, but the RA and Dec of these objects actually vary because of precession. To remedy this, the catalogs provide RA and Dec at a specific instant in time, called an *epoch*. Once the RA and Dec are known at this epoch, the RA and Dec at any other time may be calculated.

A very common epoch is *J2000.0* which occurred at the beginning of the year 2000. Most catalogs specify the RA and Dec at this instant of time. Already in the year 2013, we can see noticeable differences in the current coordinates when compared to the catalog coordinates at 2000.0

- **Units of Angular Measure** are important, because distances and sizes in the sky are measured as an angle subtended at the earth.

For instance, the moon and the sun are both about $\frac{1}{2}^\circ$ in (angular) diameter – they subtend an angle of $\frac{1}{2}^\circ$ at the center of the earth.

The degree is the most common unit of angular measure. A degree is subdivided into 60 arcminutes. Arcminute is often denoted with a small apostrophe-like marking: $1^\circ = 60'$. An arcminute is further divided into 60 arcseconds. An arcsecond is often denoted with a double apostrophe: $1' = 60''$. Thus $1^\circ = 3600''$.

The earth rotates through 360° about its axis in 24 hours of time. Thus every hour of time corresponds to 15° of rotation of the earth. Thus, often in astronomy, the *hour* is used as a measure of angle, exactly equal to 15° . The sky, as viewed from earth, actually goes back to the same position in about 23 hours and 56 minutes, a duration known as the *sidereal day*, because the revolution of the earth adds to the rotation of the earth. However, when hour is used as a measure of angle, it is exactly equal to 15° . 60 minutes (of time) comprise an hour, and 60 seconds (of time) comprise a minute.

Angles are sometimes quoted as decimal values in degrees or hours (eg: 31.25°). The same angle may be quoted as a combination of integer degrees, (arc)minutes and (arc)seconds (eg: $31^\circ 15' 0''$) or hours, minutes (of time) and seconds (of time).

In this compilation, RA is usually specified in the hours-minutes-seconds system, whereas Declination is usually specified in the degrees-minutes-seconds system.

- **Magnitude scale** is almost always used in astronomy to express the brightnesses of astronomical objects. It's a logarithmic scale of brightness, which means increments in magnitude actually amount to multiplicative factors in brightness. In particular, in the magnitude scale, a difference of 5 in magnitude corresponds to $100\times$ in brightness. The other important thing to note – the higher the magnitude of a star / object, the *fainter* it is! A magnitude 6 star is a $100x$ fainter than a magnitude 1 star.

If two stars have magnitudes m_1 and m_2 , the ratio of their brightnesses is given by

$$\frac{I_2}{I_1} = 10^{0.4(m_1 - m_2)} \quad (1.1)$$

Even if the object is an extended object (unlike a star, which almost always appears like a point through telescopes), the magnitude includes all the “light” (flux) from the object, no matter what the size of the object is. For extended objects, a definition of **surface brightness** is more convenient. Surface brightness, often measured in “magnitudes per square arcsecond” is a measure of how bright an object’s surface is. So a large object “A” with the same magnitude as a small object “B”, will still have a much larger (i.e. fainter) surface brightness than object “B”.

2

Understanding and Using the Log Form

2.1 Description of the form

- **The title** carries the common name of the object (if any) and the primary catalog number
- **The subtitle** specifies the *type* of the object (eg: Planetary Nebula, Galaxy etc) and the constellation in which it lies.
- **Icons indicating observability** are shown on the right of the page.



Objects that are expected to be visible from dark sites with small binoculars (eg: 10×50) are indicated with this binocular icon.



Objects that are expected to be visible to the naked eye from dark skies (\sim Bortle 3) are marked with this eye icon.



Objects that are expected to be visible from city sites with smaller telescopes (eg: $4'' \sim 6''$) are indicated with this city skyline icon, accompanied by a small telescope icon.



If the object is also expected to be visible in binoculars from city skies, a tiny version of the same binocular icon is displayed just above the telescope icon, next to the city skyline icon.



If the object is also expected to be visible with the naked eye from city skies, a tiny version of the same eye icon is displayed next to the city skyline icon.

— If no icon is displayed, it indicates that the object most likely requires a telescope from dark skies, or data is unavailable about its visibility. Note that this should not discourage more advanced observers to attempt the object from city skies or with binoculars. Please consult various online forums for more information. Cloudy Nights (<http://www.cloudynights.com/ubbthreads/ubbthreads.php>) is one such forum.

- **The data table** lists some useful data about the object.

The first two rows list the RA and Dec, first current as of the date of compilation, and then J2000.0.

The “Size” field lists the size of the object in arcminutes. Imagine fitting the object into a rectangle in the sky. The larger (usually first) dimension, called the *major axis* specifies the length of the rectangle. The smaller dimension (*minor axis*) specifies the breadth of the rectangle. For example, 8' × 3' means that the object will roughly fit into a rectangle with a length of 8 arcminutes and a breadth of 3 arcminutes in the sky.

The “Position Angle” field specifies the orientation of the major axis of the object (the “length” of the rectangle mentioned above). It is measured in degrees, from North towards East. If it says 90°, it usually is invalid / unknown.

The “Magnitude” field specifies the magnitude of the object. Usually, this is the visual magnitude and not the blue (“photographic” magnitude), except for some objects, usually indicated in the preface. Note this carefully, because the visual and blue magnitudes may differ somewhat substantially.

The “Other Designation” field carries an alternate catalog designation of the object when available.

- **The sky chart** shows a map of the sky around the object.

North is upwards in the map.

The circle in the center represents a **circle of 1° diameter** on the sky.

The black dots are stars. The green / red symbol in the center of the 1° circle represents the object. An effort is made to represent the size of the object accurately.

The lines connecting stars are constellation lines, and help you visualize the constellations. Note that these are not standard and may differ across star charts. Always look up the name / designation of the star (or the RA/Dec of the object) to match against other charts.

The fainter jagged, but solid, lines are the boundaries of constellations as defined by the IAU.

The broken / dashed lines running up-down are lines of constant right ascension, just like longitudes on a map of the earth.

The broken / dashed lines running left-right are lines of constant declination, just like latitudes on a map of the earth. If you see a thick horizontal line that extends through to the ends of the map, that represents the celestial equator. The celestial equator line has numbers marking hours of right ascension.

The text in all block capitals (dark green) are the name of the constellation. Many a time you may see the text crossing a constellation boundary line – the **name always refers to the constellation to the right side** of the name.

- **A DSS image** is provided to give you a rough idea of what the object looks like. The appearance through your equipment, of course, could be drastically different depending on its capabilities! The DSS Image is an actual photo of the object taken with a fairly large, professional astronomical telescope. It is usually good to get a rough idea of what features may be visible and what may not be. Of course, it takes practice to realize which features in a DSS image you may actually expect to see through your telescope!

The dimensions of the region of the sky in the image (in arcminutes) are specified below the image (eg: $30' \times 15'$). The first dimension is the width.

Most of the time, blue POSS2/UKSTU DSS images are used. Red DSS images are used when the blue plates are unavailable. Blue plates will usually provide a better estimate of the observability of objects than red plates, as the eye is more sensitive to blue when in night-vision mode (“scotopic” vision). However, it should be borne in mind that DSS images are not really calibrated. The letters ‘B’, ‘R’ and ‘I’ in the caption of the DSS image, alongside the dimensions, indicate that the image is blue, red and infrared (respectively).

In the DSS images, **north is upwards**, as with the map.

- **The Observation Log** is where you log your own observations. Fill out the details as per your wishes. If you are using this logbook to earn a certification from some organization, please look up the organization’s guidelines for logging. Sometimes, the log form may indicate fields that are required by the certifying organization – but please double check the organization’s guidelines to be sure.

2.2 Using the form

2.2.1 Wide-field Charts

To use these forms, you will need to have wide-field star charts showing the constellations handy. Preferably the chart should have RA and Declination markings.

If you do not have a star atlases, you may purchase several commercially available star atlases, or print out the Free Mag 7 Star Atlas hosted at http://www.cloudynights.com/item.php?item_id=1052.

You could also use the wide-field star charts for the month, generated by this website: <http://skymaps.com/>.

Note that some of the wide-field star charts are designed to be held above your head and used – the cardinal points on the map may align up correctly only if you hold them above your head.

You may alternately also use computer software to obtain wide-field views. There are several free, open-source options, the most recommended for this purpose being Stellarium. Stellarium may be obtained for a variety of operating systems at <http://www.stellarium.org>. Other recommended options include KStars – <http://edu.kde.org/kstars> and SkyChart – <http://www.ap-i.net/skychart/start>, which also run on a variety of operating systems.

2.2.2 Visibility of Objects

To check if an object is visible at your latitude, you could find the lowest declination you can see by the formula

$$\text{Lowest Observable Declination} = 90^\circ - \text{Observation Latitude.} \quad (2.1)$$

Substitute your latitude without the sign, irrespective of whether it is northern or southern. In the southern hemisphere, you’ll get the lowest northern declination visible. In the northern hemisphere, you’ll get the lowest southern declination visible.

If the object is in the opposite hemisphere to where you are observing, check that its declination is closer to zero than the Lowest Observable Declination you calculated above.

Often, you cannot observe objects that are too close to the horizon. The atmosphere itself limits your observations somewhat to about 5° above the horizon (this is a very ballpark figure). Light-pollution domes can make things worse. Just subtract the number of degrees you lose near the horizon from the Lowest Observable Declination you calculated, to make your estimate more practical. High altitudes can sometimes help lower the horizon, so observing from a high altitude could add a few degrees to the Lowest Observable Declination.

Objects that do not qualify the criterion you calculate above can never be seen from your latitude, unless you fly pretty high above the ground! So you can eliminate such objects from your observing list, or save them for a cross-continental trip to the other hemisphere (or a long trip to a more tropical region).

Other objects, while visible from your latitude, may not be visible at the given time of the year etc. The best way to determine whether an object is visible at a given time from a given latitude is to use astronomy software. That is why knowing constellations is very helpful – so you can quickly figure out if a certain object is visible by checking if the constellation in which it resides is visible. Wide-field star charts generated for a given night (you need one for the evening and one for the early morning next day) will be able to help you quickly check up on visible constellations, so you can plan your observation.

If you like rough estimates, you can make one by knowing the RA of the sun. Block off 1 hour after sunset and before sunrise. 1 hour of time (almost exactly) corresponds to 1 hour of RA so if the object's RA lies outside this twilight zone, you are likely to be able to observe it. This kind of an estimate does not work well at high latitudes, at times away from the equinoxes. The use of computer software is strongly recommended.

2.2.3 Locating the Constellations, finding a reference star

First, make sure you are aware of the cardinal directions around you.

In the northern hemisphere, an easy way to identify north is to look for the Big Dipper, a famous asterism of 7 stars, that is part of the constellation Ursa Major. If the Big Dipper is not visible, Cassiopeia is a good alternative. The constellation has the shape of an M, Σ , W or \mathcal{Z} depending on the orientation.

In the southern hemisphere, you may look for the Southern Cross (Crux) to identify south.

Once you have identified north / south, also identify east / west and find out if your wide-field chart is designed to be held above your head and used.

Use your wide-field star atlas to identify the constellation patterns in the sky. Remember that the constellation patterns differ across various sky maps.

Prominent patterns that are easy to identify are the Great Square of Pegasus, Cassiopeia, Orion, the head of Taurus the bull, Auriga, the Southern Cross, the Big Dipper, Corvus, Scorpius, the Teapot in Sagittarius. Use these as landmarks to find your way around the sky.

Identify a bright star (the bigger the circles, the brighter the stars they represent), which we will refer to as the *reference star*, within the finder chart embedded in the log. Locate the star in your wide-field charts, and thereby locate it on the sky.

2.2.4 Finding the object

Once you have located the reference star, recalling that the sky maps have north on the top, orient the book correctly to map what you see in the sky with the sky chart in the logbook.

Then, a variety of options are at your disposal. One is to try to find the location of the object in the sky precisely, by using a bunch of stars, and point the telescope / binoculars to that location. For example, if you see on the chart that the object is exactly between two stars, you could just point your telescope exactly to that location on the sky, using the two stars for reference. Another technique is *star hopping* – work a route from the reference star to the object using various other stars as landmarks.

Many an internet resource can help explain these techniques better.

Finally, you may need to pan the telescope a bit, or move your binoculars around a bit to actually locate the object.

Remember that many telescopes and some finder scopes produce inverted or mirrored images. Some people often find it useful to identify unambiguous patterns that have directionality to them of stars and just position relatively. Others like to orient the map correctly, and then account for the reflection or inversion

of their telescopes in their head. If you would rather have an erect field, there are erecting prisms available from many vendors for standard (1.25" and 2") telescope focusers.

If the object is rather faint, you may need to precisely zero in on it by using the star field around the object. To see the star field around the object, the easiest way is to use software. The DSS images may occasionally help you in this regard.

2.2.5 Observing the object

Averted vision, also known as *peripheral vision* is an important observing technique. Use internet resources to understand and master this technique.

Note that the magnitude is not a true indicator of the brightness of the object as seen with a telescope. A large object "A" with the same magnitude as a fainter object "B", will appear much fainter than "B" because the light is spread over a larger area.

In the description provided in the logging form, for some objects, you may notice a number of abbreviations specified. These constitute J L E Dreyer's description of the object, and these descriptions are very helpful to get a feel for what the object actually looks like. Note that J L E Dreyer had larger telescopes and was observing from dark skies when making these descriptions. However, the descriptions are more apt than magnitudes when determining how bright an object is. Many resources on the internet have explanations for the abbreviations used in Dreyer's descriptions. Here is one such resource: <http://spider.seds.org/ngc/des.html>.

3

List of Objects by Constellation

NOTE: Numbers in square brackets are page numbers

Carina

NGC 3136 [57]

Andromeda

NGC 404 (Mirach's Ghost) [21]

Cassiopeia

NGC 185 [17]

Aquarius

NGC 7184 [133]

Centaurus

NGC 4373 [89]

NGC 4696 [107]

NGC 4709 [109]

NGC 4936 [113]

NGC 5419 [117]

Ara

NGC 6221 [125]

Cepheus

NGC 6951 [129]

Aries

NGC 821 [25]

Cetus

NGC 1087 [29]

Camelopardalis

NGC 2146 [49]

NGC 2336 [53]

Coma Berenices

NGC 4394 [91]

NGC 4459 [93]

NGC 4473 (Markarian Chain) [95]

NGC 4477 (Markarian Chain) [97]

NGC 4689 [105]

Canes Venatici

NGC 4244 [83]

NGC 4656 (Hockey Stick Galaxies) [103]

NGC 5371 [115]

Corvus

NGC 4038 (Antennae Galaxies) [77]

Canis Major

NGC 2207 [51]

Dorado

NGC 1546 [43]

NGC 1947 [47]

Draco

NGC 4125 [81]

Eridanus

NGC 1232 [31]

Fornax

NGC 1371 [35]

NGC 1385 [37]

NGC 986 [27]

Grus

IC 5267 [137]

NGC 7582 (Grus Quartet) [143]

Horologium

NGC 1448 [39]

NGC 1527 [41]

Hydra

NGC 2986 [55]

NGC 3904 [75]

Indus

NGC 7090 [131]

Leo

NGC 3227 [63]

NGC 3628 [67]

Lupus

NGC 5643 [121]

Ophiuchus

NGC 6384 [127]

Pegasus

NGC 7479 [139]

Pisces

NGC 488 [23]

Reticulum

NGC 1313 [33]

NGC 1574 [45]

Sculptor

NGC 300 [19]

NGC 7507 [141]

Tucana

NGC 7205 [135]

Ursa Major

NGC 3184 [59]

NGC 3198 [61]

NGC 3359 [65]

NGC 3631 [69]

NGC 3718 [71]

NGC 3726 [73]

NGC 4096 [79]

NGC 5474 [119]

Virgo

NGC 4261 [85]

NGC 4267 [87]

NGC 4527 [99]

NGC 4612 [101]

NGC 4762 [[111](#)]
NGC 5838 [[123](#)]

4

List of Objects by Type

NOTE: Numbers in square brackets are page numbers

Galaxy

- IC 5267 [137]
- NGC 1087 [29]
- NGC 1232 [31]
- NGC 1313 [33]
- NGC 1371 [35]
- NGC 1385 [37]
- NGC 1448 [39]
- NGC 1527 [41]
- NGC 1546 [43]
- NGC 1574 [45]
- NGC 185 [17]
- NGC 1947 [47]
- NGC 2146 [49]
- NGC 2207 [51]
- NGC 2336 [53]
- NGC 2986 [55]
- NGC 300 [19]
- NGC 3136 [57]
- NGC 3184 [59]
- NGC 3198 [61]
- NGC 3227 [63]
- NGC 3359 [65]
- NGC 3628 [67]
- NGC 3631 [69]
- NGC 3718 [71]
- NGC 3726 [73]
- NGC 3904 [75]
- NGC 4038 (Antennae Galaxies) [77]
- NGC 404 (Mirach's Ghost) [21]
- NGC 4096 [79]
- NGC 4125 [81]
- NGC 4244 [83]
- NGC 4261 [85]
- NGC 4267 [87]
- NGC 4373 [89]
- NGC 4394 [91]
- NGC 4459 [93]
- NGC 4473 (Markarian Chain) [95]
- NGC 4477 (Markarian Chain) [97]
- NGC 4527 [99]
- NGC 4612 [101]
- NGC 4656 (Hockey Stick Galaxies) [103]
- NGC 4689 [105]
- NGC 4696 [107]
- NGC 4709 [109]
- NGC 4762 [111]
- NGC 488 [23]
- NGC 4936 [113]
- NGC 5371 [115]
- NGC 5419 [117]
- NGC 5474 [119]
- NGC 5643 [121]
- NGC 5838 [123]
- NGC 6221 [125]
- NGC 6384 [127]
- NGC 6951 [129]
- NGC 7090 [131]
- NGC 7184 [133]
- NGC 7205 [135]
- NGC 7479 [139]
- NGC 7507 [141]
- NGC 7582 (Grus Quartet) [143]
- NGC 821 [25]
- NGC 986 [27]

5

List of Common Names

The following table is ordered alphabetically by common name.

Table 5.1: Objects by common name

| Common Name | Catalog Designation | Page |
|-----------------------|---------------------|------|
| Antennae Galaxies | NGC 4038 | 77 |
| Grus Quartet | NGC 7582 | 143 |
| Hockey Stick Galaxies | NGC 4656 | 103 |
| Markarian Chain | NGC 4473 | 95 |
| Markarian Chain | NGC 4477 | 97 |
| Mirach's Ghost | NGC 404 | 21 |

Checklist of Objects

Use this checklist to look up page numbers, to look up essential information, and to make entries of the dates of your first and subsequent observations.

Table 6.1: Checklist of Objects

| Sl. No. | Object | Type | Constellation | Mag. | Size | Page | Obs. Date | Second Obs. |
|---------|--------------------------|--------|----------------|------|-------------|------|-----------|-------------|
| 1 | NGC 185 | Galaxy | Cassiopeia | 9.2 | 8' × 7' | 17 | | |
| 2 | NGC 300 | Galaxy | Sculptor | 8.1 | 19' × 12.9' | 19 | | |
| 3 | NGC 404 (Mirach's Ghost) | Galaxy | Andromeda | 10 | 3.5' × 3.5' | 21 | | |
| 4 | NGC 488 | Galaxy | Pisces | 10 | 5.4' × 3.9' | 23 | | |
| 5 | NGC 821 | Galaxy | Aries | 11 | 2.4' × 1.7' | 25 | | |
| 6 | NGC 986 | Galaxy | Fornax | 11 | 4' × 3.2' | 27 | | |
| 7 | NGC 1087 | Galaxy | Cetus | 11 | 3.9' × 2.3' | 29 | | |
| 8 | NGC 1232 | Galaxy | Eridanus | 9.9 | 7.4' × 6.5' | 31 | | |
| 9 | NGC 1313 | Galaxy | Reticulum | 8.7 | 9.2' × 7.2' | 33 | | |
| 10 | NGC 1371 | Galaxy | Fornax | 11 | 5.6' × 3.9' | 35 | | |
| 11 | NGC 1385 | Galaxy | Fornax | 11 | 3.6' × 2.2' | 37 | | |
| 12 | NGC 1448 | Galaxy | Horologium | 11 | 7.6' × 1.7' | 39 | | |
| 13 | NGC 1527 | Galaxy | Horologium | 11 | 3.9' × 1.5' | 41 | | |
| 14 | NGC 1546 | Galaxy | Dorado | 11 | 3.2' × 1.9' | 43 | | |
| 15 | NGC 1574 | Galaxy | Reticulum | 10 | 4' × 3.6' | 45 | | |
| 16 | NGC 1947 | Galaxy | Dorado | 11 | 3' × 2.6' | 47 | | |
| 17 | NGC 2146 | Galaxy | Camelopardalis | 11 | 5.4' × 2.9' | 49 | | |

Continued on the following page

Table 6.1: Checklist of Objects

| Sl. No. | Object | Type | Constellation | Mag. | Size | Page | Obs. Date | Second Obs. |
|---------|----------------------------------|--------|----------------|------|--------------|------|-----------|-------------|
| 18 | NGC 2207 | Galaxy | Canis Major | 11 | 3.9' × 2.2' | 51 | | |
| 19 | NGC 2336 | Galaxy | Camelopardalis | 10 | 7.1' × 3.9' | 53 | | |
| 20 | NGC 2986 | Galaxy | Hydra | 11 | 3.2' × 2.6' | 55 | | |
| 21 | NGC 3136 | Galaxy | Carina | 11 | 3.1' × 2.1' | 57 | | |
| 22 | NGC 3184 | Galaxy | Ursa Major | 9.8 | 7.4' × 6.9' | 59 | | |
| 23 | NGC 3198 | Galaxy | Ursa Major | 10 | 8.5' × 3.3' | 61 | | |
| 24 | NGC 3227 | Galaxy | Leo | 10 | 4.1' × 3.9' | 63 | | |
| 25 | NGC 3359 | Galaxy | Ursa Major | 11 | 7.2' × 4.4' | 65 | | |
| 26 | NGC 3628 | Galaxy | Leo | 9.5 | 13.1' × 3.1' | 67 | | |
| 27 | NGC 3631 | Galaxy | Ursa Major | 10 | 5' × 3.7' | 69 | | |
| 28 | NGC 3718 | Galaxy | Ursa Major | 11 | 8.1' × 4' | 71 | | |
| 29 | NGC 3726 | Galaxy | Ursa Major | 10 | 6' × 4.1' | 73 | | |
| 30 | NGC 3904 | Galaxy | Hydra | 11 | 2.7' × 2' | 75 | | |
| 31 | NGC 4038 (Antennae Galaxies) | Galaxy | Corvus | 10 | 3.4' × 1.7' | 77 | | |
| 32 | NGC 4096 | Galaxy | Ursa Major | 11 | 6.5' × 1.8' | 79 | | |
| 33 | NGC 4125 | Galaxy | Draco | 9.7 | 5.8' × 3.2' | 81 | | |
| 34 | NGC 4244 | Galaxy | Canes Venatici | 10 | 16.6' × 1.9' | 83 | | |
| 35 | NGC 4261 | Galaxy | Virgo | 10 | 4.1' × 3.6' | 85 | | |
| 36 | NGC 4267 | Galaxy | Virgo | 11 | 3' × 2.8' | 87 | | |
| 37 | NGC 4373 | Galaxy | Centaurus | 11 | 3.6' × 2.6' | 89 | | |
| 38 | NGC 4394 | Galaxy | Coma Berenices | 11 | 3.4' × 3.2' | 91 | | |
| 39 | NGC 4459 | Galaxy | Coma Berenices | 10 | 3.5' × 2.7' | 93 | | |
| 40 | NGC 4473 (Markarian Chain) | Galaxy | Coma Berenices | 10 | 4.5' × 2.5' | 95 | | |
| 41 | NGC 4477 (Markarian Chain) | Galaxy | Coma Berenices | 10 | 3.7' × 3.3' | 97 | | |
| 42 | NGC 4527 | Galaxy | Virgo | 10 | 6.2' × 2.1' | 99 | | |
| 43 | NGC 4612 | Galaxy | Virgo | 12 | 2.7' × 2' | 101 | | |
| 44 | NGC 4656 (Hockey Stick Galaxies) | Galaxy | Canes Venatici | 10 | 15.3' × 2.4' | 103 | | |
| 45 | NGC 4689 | Galaxy | Coma Berenices | 11 | 4.3' × 3.5' | 105 | | |
| 46 | NGC 4696 | Galaxy | Centaurus | 10 | 4.7' × 3.3' | 107 | | |
| 47 | NGC 4709 | Galaxy | Centaurus | 11 | 2.3' × 2' | 109 | | |
| 48 | NGC 4762 | Galaxy | Virgo | 10 | 8.7' × 1.7' | 111 | | |
| 49 | NGC 4936 | Galaxy | Centaurus | 11 | 2.7' × 2.3' | 113 | | |
| 50 | NGC 5371 | Galaxy | Canes Venatici | 11 | 4.2' × 3.4' | 115 | | |
| 51 | NGC 5419 | Galaxy | Centaurus | 11 | 4.1' × 3.3' | 117 | | |
| 52 | NGC 5474 | Galaxy | Ursa Major | 11 | 4.7' × 4.7' | 119 | | |

Continued on the following page

Table 6.1: Checklist of Objects

| Sl. No. | Object | Type | Constellation | Mag. | Size | Page | Obs. Date | Second Obs. |
|---------|-------------------------|--------|---------------|------|-------------|------|-----------|-------------|
| 53 | NGC 5643 | Galaxy | Lupus | 10 | 4.7' × 4.2' | 121 | | |
| 54 | NGC 5838 | Galaxy | Virgo | 11 | 4.2' × 1.5' | 123 | | |
| 55 | NGC 6221 | Galaxy | Ara | 9.9 | 3.5' × 2.5' | 125 | | |
| 56 | NGC 6384 | Galaxy | Ophiuchus | 10 | 6.2' × 4.1' | 127 | | |
| 57 | NGC 6951 | Galaxy | Cepheus | 11 | 3.9' × 3.2' | 129 | | |
| 58 | NGC 7090 | Galaxy | Indus | 11 | 7.3' × 1.2' | 131 | | |
| 59 | NGC 7184 | Galaxy | Aquarius | 11 | 5.9' × 1.3' | 133 | | |
| 60 | NGC 7205 | Galaxy | Tucana | 11 | 4' × 2' | 135 | | |
| 61 | IC 5267 | Galaxy | Grus | 10 | 5.2' × 3.9' | 137 | | |
| 62 | NGC 7479 | Galaxy | Pegasus | 11 | 4' × 3.1' | 139 | | |
| 63 | NGC 7507 | Galaxy | Sculptor | 10 | 2.8' × 2.7' | 141 | | |
| 64 | NGC 7582 (Grus Quartet) | Galaxy | Grus | 11 | 5' × 2.3' | 143 | | |

7

Logging Forms

This section contains the actual logging forms.

Note that the page numbers for each chart are listed in the Checklist section.

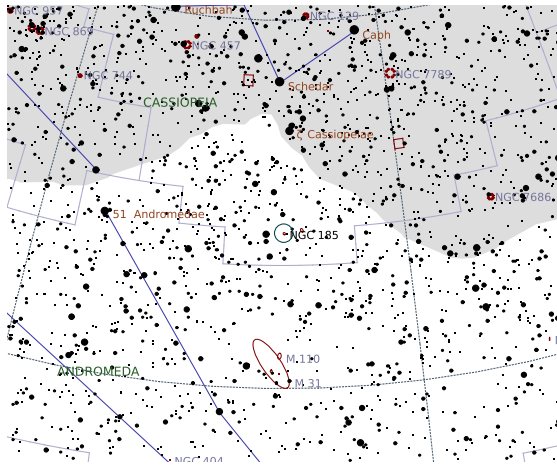
NGC 185

Galaxy in Cassiopeia

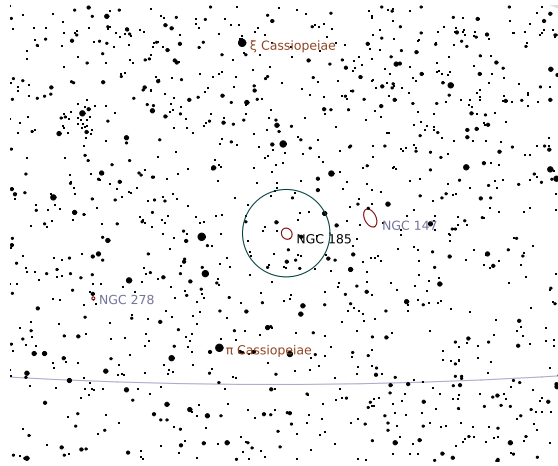
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 00 ^h 39 ^m 40 ^s | Declination (current) | 48° 24' 44" |
| Right Ascension (J2000.0) | 00 ^h 38 ^m 57 ^s | Declination (J2000.0) | 48° 20' 14" |
| Size | 8' × 7' | Position Angle | 55° |
| Magnitude | 9.2 | Other Designation | — |

Description: Dreyer: pB;vL;iR;vgmbM;r

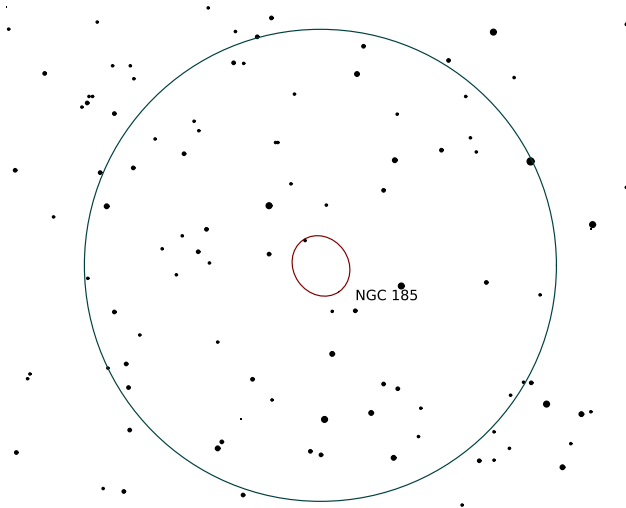
SAC: H II 707;Dwarf elliptical; Member Local Group



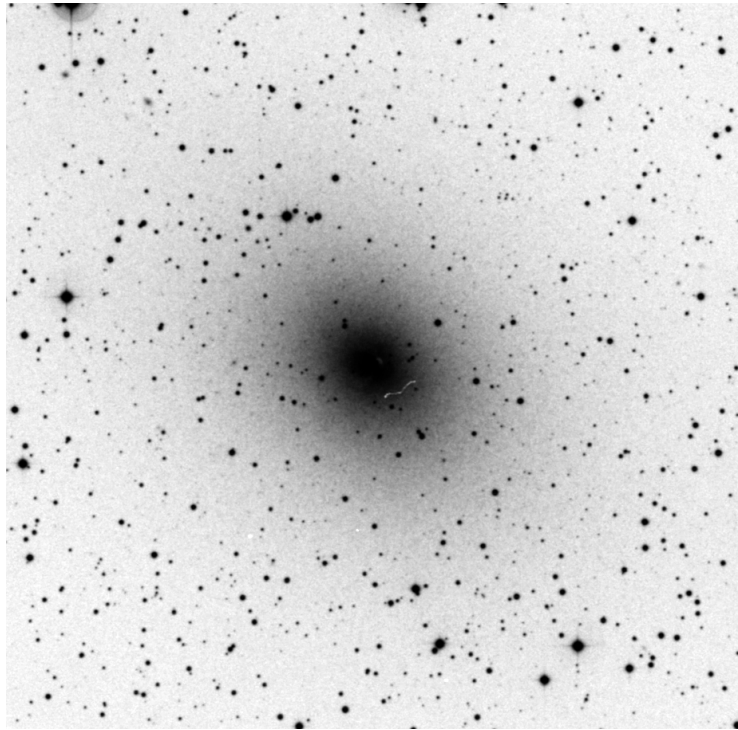
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.6' × 15.3')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

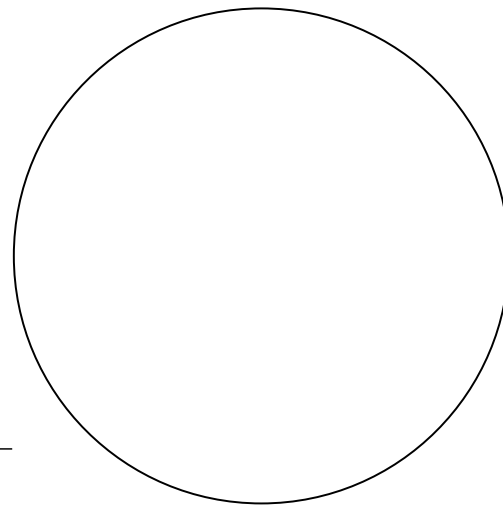
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

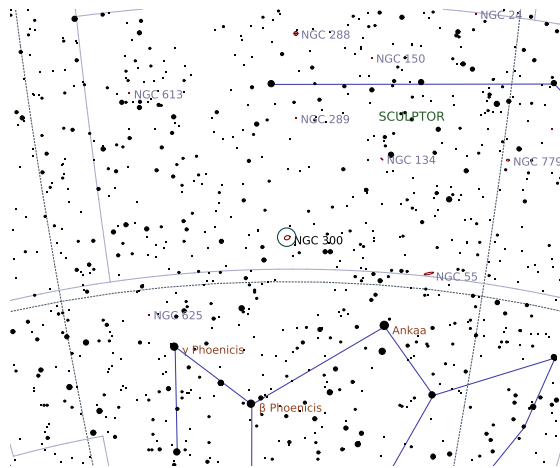
NGC 300

Galaxy in Sculptor

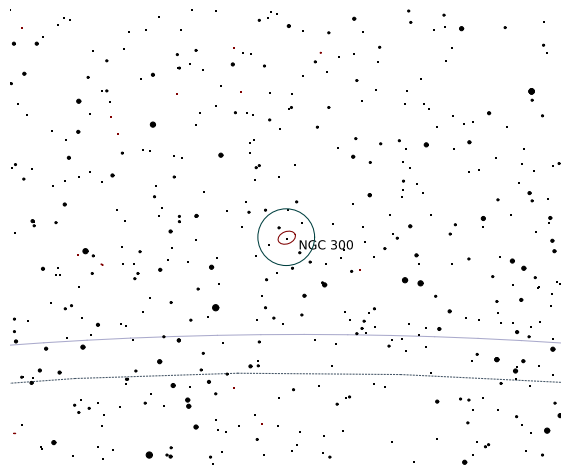
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 00 ^h 55 ^m 29 ^s | Declination (current) | −37° 36′ 57″ |
| Right Ascension (J2000.0) | 00 ^h 54 ^m 53 ^s | Declination (J2000.0) | −37° 41′ 03″ |
| Size | 19′ × 12.9′ | Position Angle | −21° |
| Magnitude | 8.1 | Other Designation | — |

Description: Dreyer: pB;vL;vmiE;vgpmB

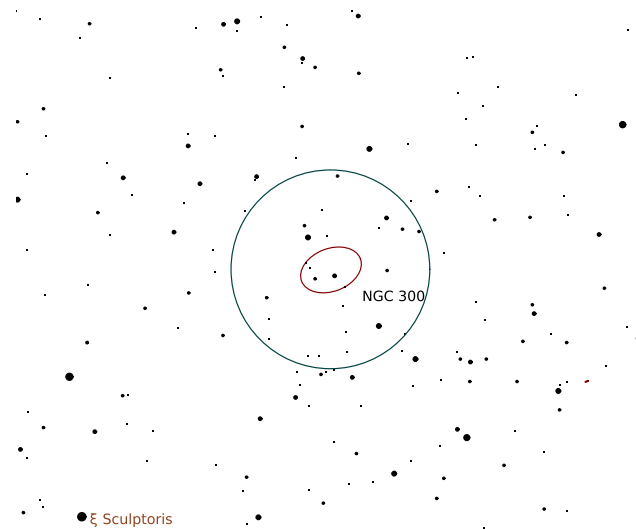
SAC: Large S-shaped; loose structured spiral



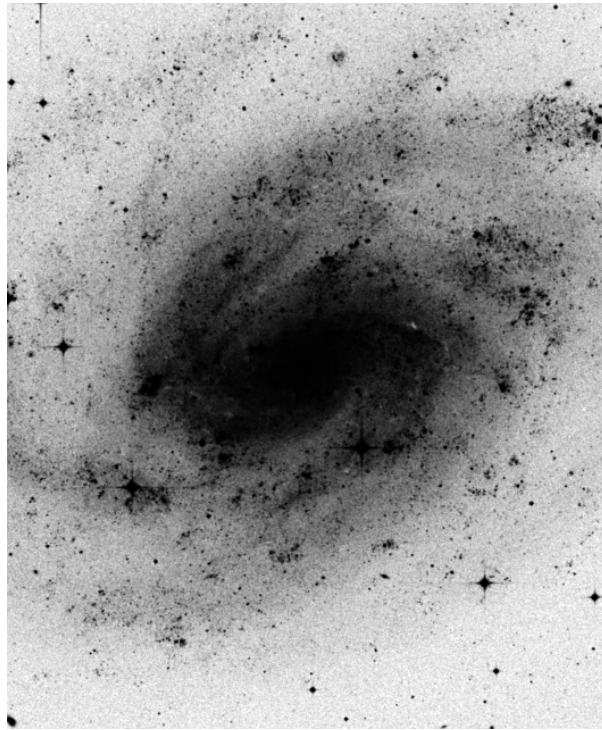
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 18.1')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

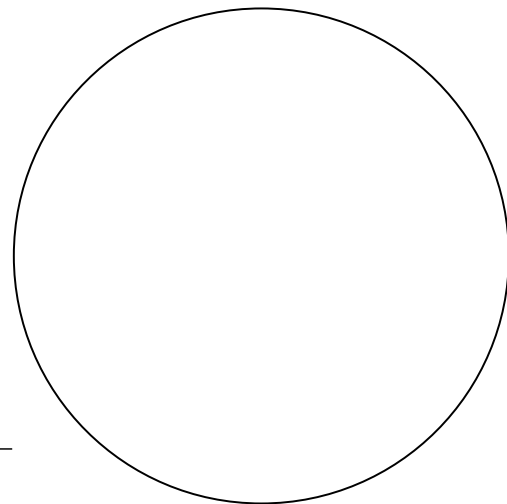
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

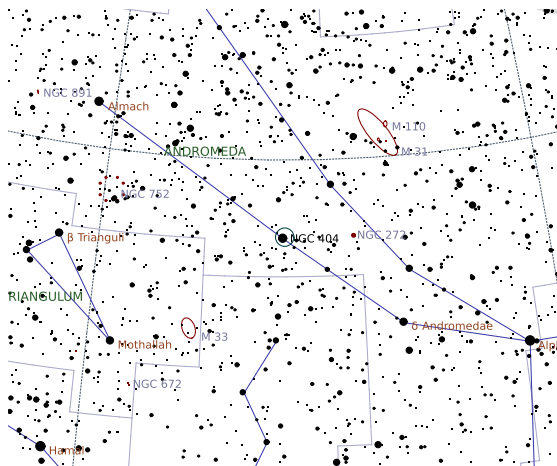
NGC 404 (Mirach's Ghost)

Galaxy in Andromeda

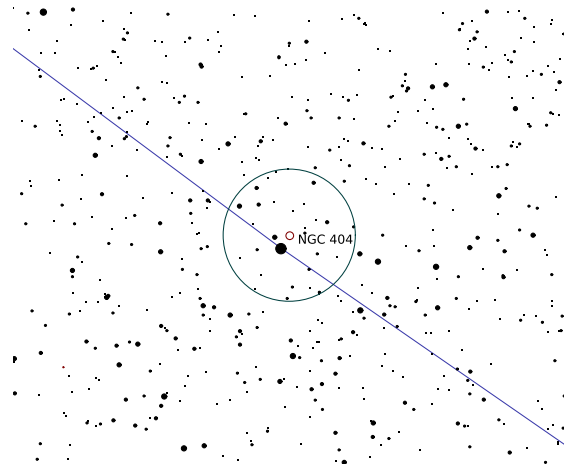
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 01 ^h 10 ^m 10 ^s | Declination (current) | 35° 47' 25" |
| Right Ascension (J2000.0) | 01 ^h 09 ^m 26 ^s | Declination (J2000.0) | 35° 43' 06" |
| Size | 3.5' × 3.5' | Position Angle | 90° |
| Magnitude | 10 | Other Designation | – |

Description: Dreyer: pB;cL;R;gbM

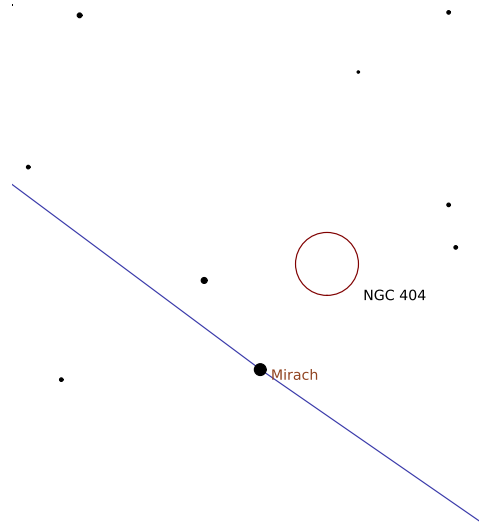
SAC: H II 224;UGC 718;Beta AND sf 6'



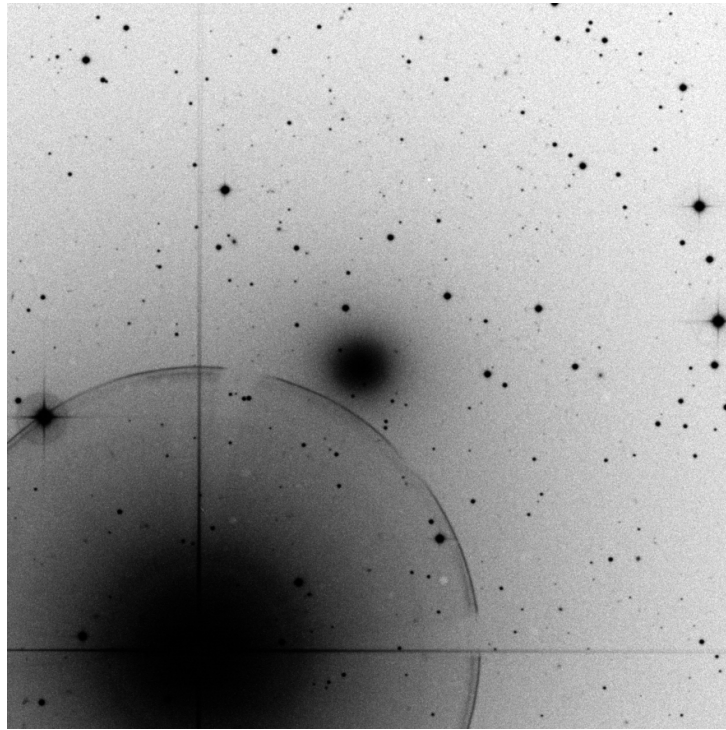
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

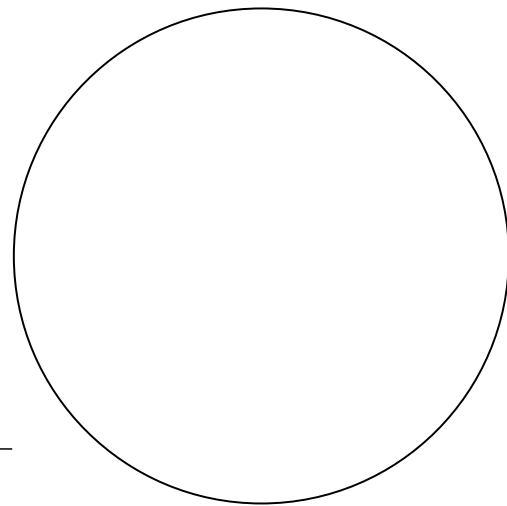
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

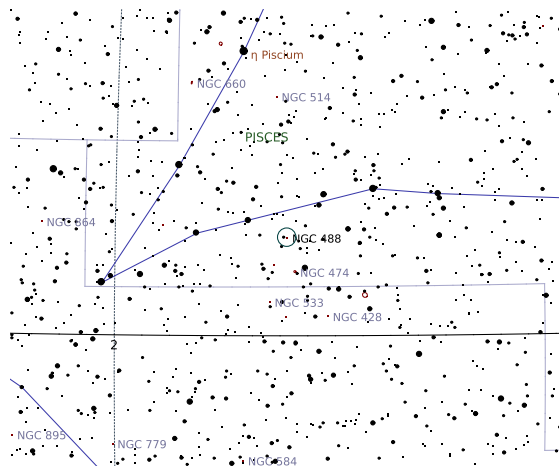
NGC 488

Galaxy in Pisces

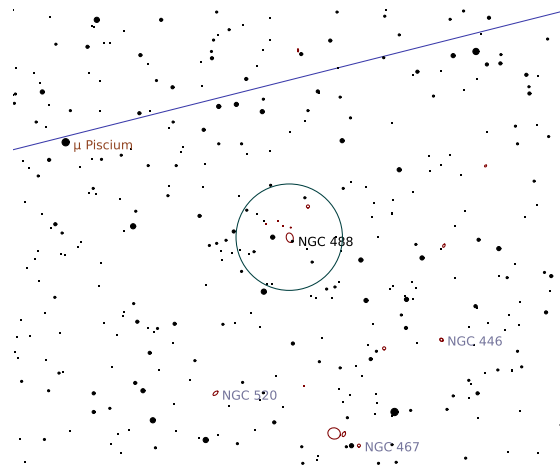
| | | | |
|---------------------------|---|-----------------------|------------|
| Right Ascension (current) | 01 ^h 22 ^m 27 ^s | Declination (current) | 5° 19' 26" |
| Right Ascension (J2000.0) | 01 ^h 21 ^m 46 ^s | Declination (J2000.0) | 5° 15' 21" |
| Size | 5.4' × 3.9' | Position Angle | 75° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;L;R;svmbM;*8F10'

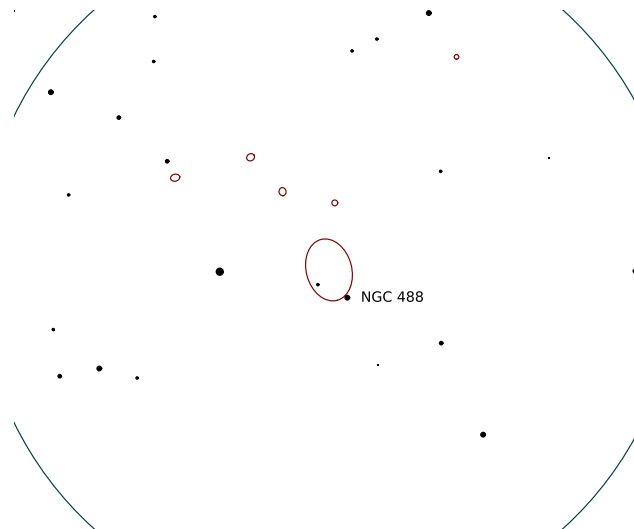
SAC: delicate spiral pattern



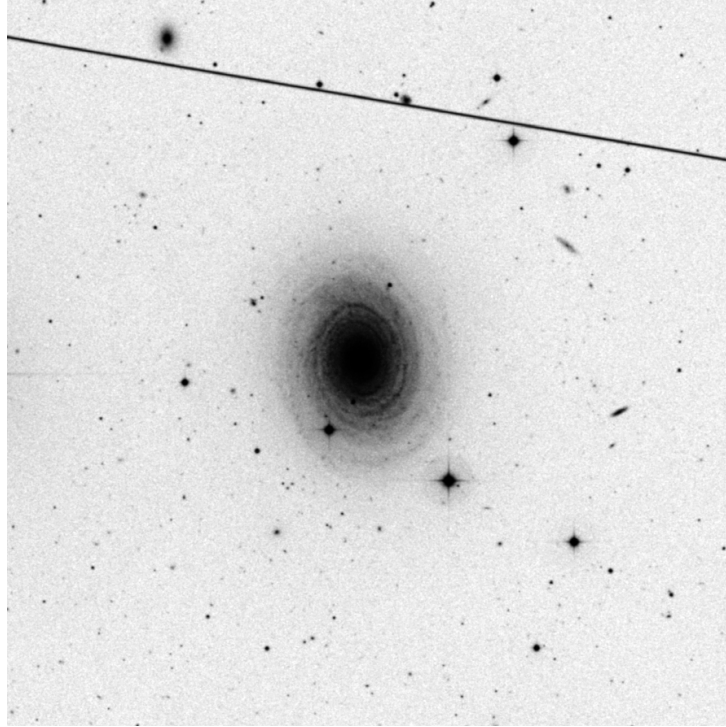
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

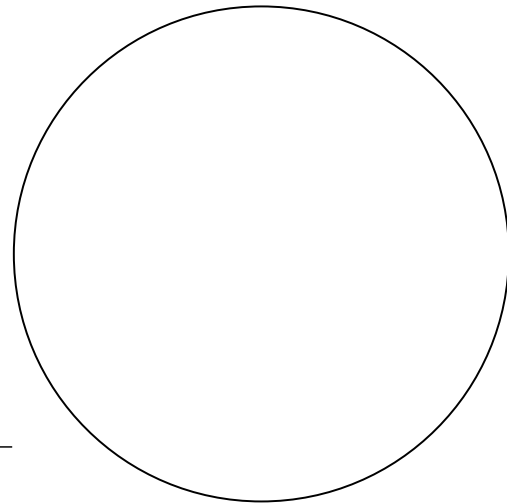
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

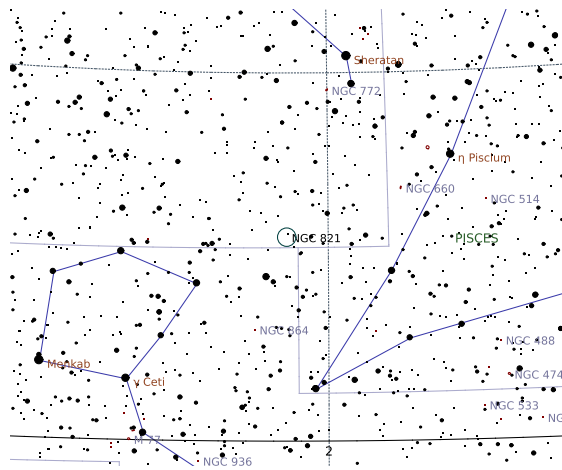
NGC 821

Galaxy in Aries

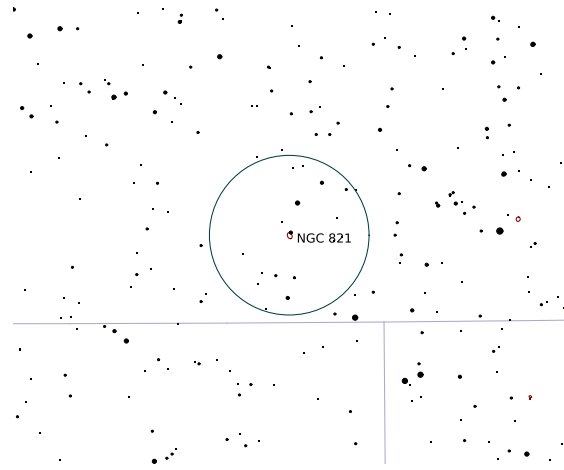
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 02 ^h 09 ^m 03 ^s | Declination (current) | 11° 03' 20" |
| Right Ascension (J2000.0) | 02 ^h 08 ^m 21 ^s | Declination (J2000.0) | 10° 59' 39" |
| Size | 2.4' × 1.7' | Position Angle | 65° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;vS;v1E;svmbM;* np

SAC: H I 152;UGC 1631



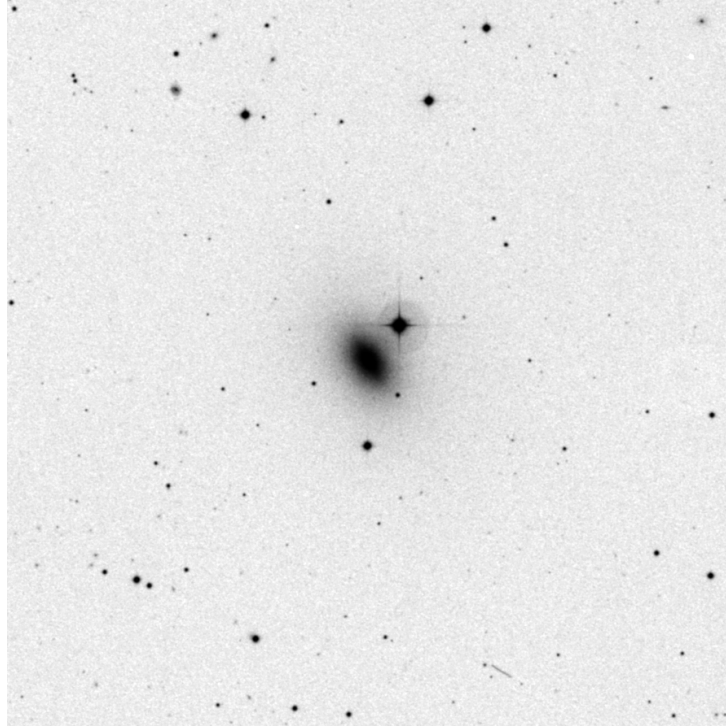
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

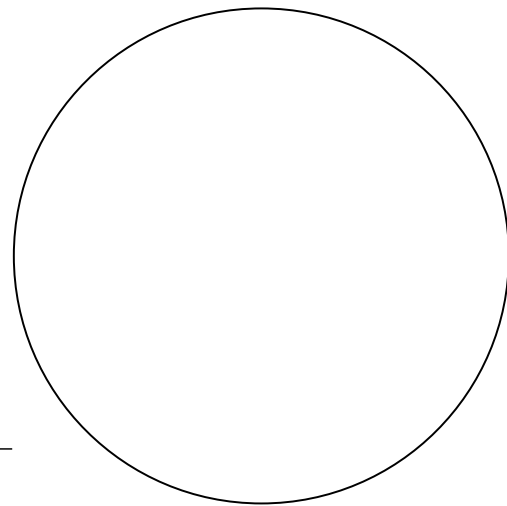
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



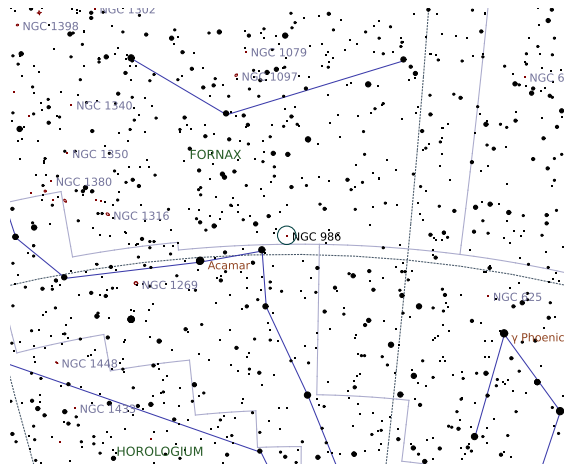
Sketch

NGC 986

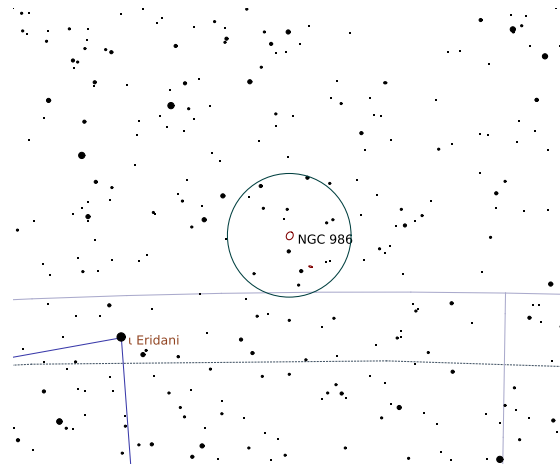
Galaxy in Fornax

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 02 ^h 34 ^m 05 ^s | Declination (current) | −38° 59′ 34″ |
| Right Ascension (J2000.0) | 02 ^h 33 ^m 34 ^s | Declination (J2000.0) | −39° 02′ 45″ |
| Size | 4′ × 3.2′ | Position Angle | −60° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;L;pmE;sbM;BI-N



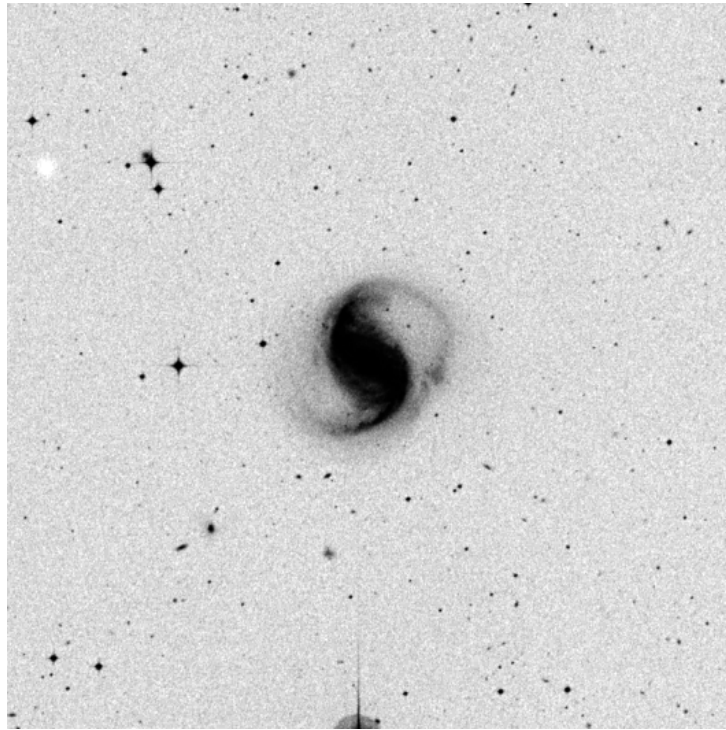
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

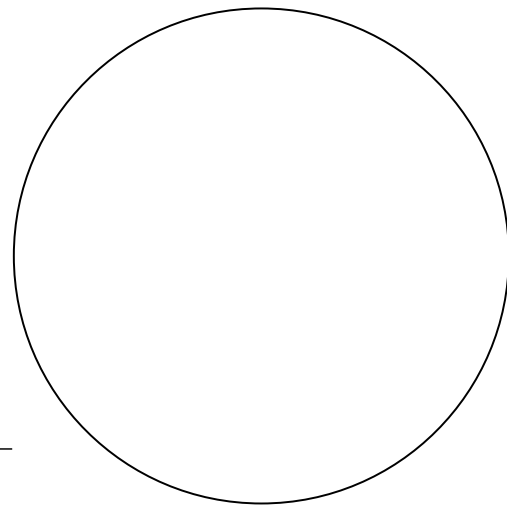
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

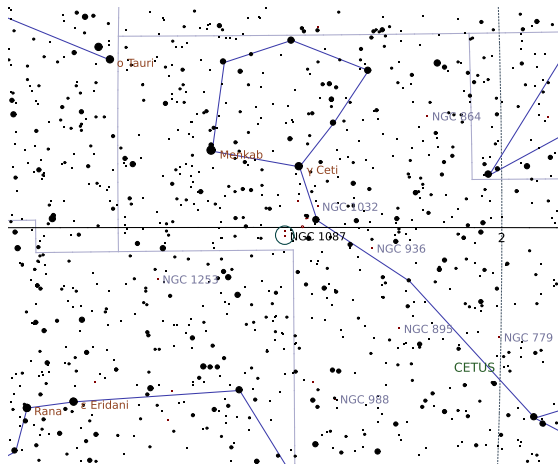
NGC 1087

Galaxy in Cetus

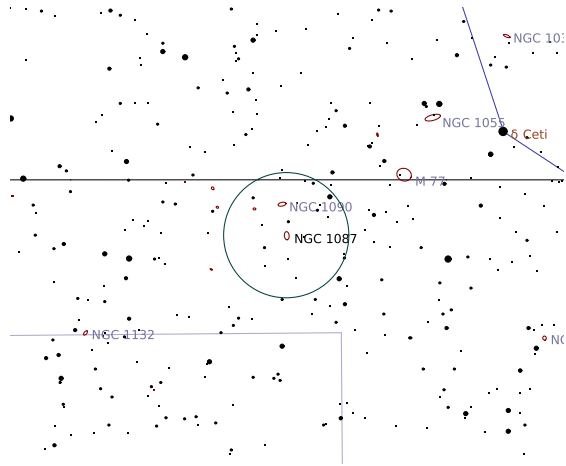
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 02 ^h 47 ^m 05 ^s | Declination (current) | −0° 26′ 46″ |
| Right Ascension (J2000.0) | 02 ^h 46 ^m 25 ^s | Declination (J2000.0) | −0° 29′ 57″ |
| Size | 3.9′ × 2.3′ | Position Angle | 85° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;cL;lE;mbM

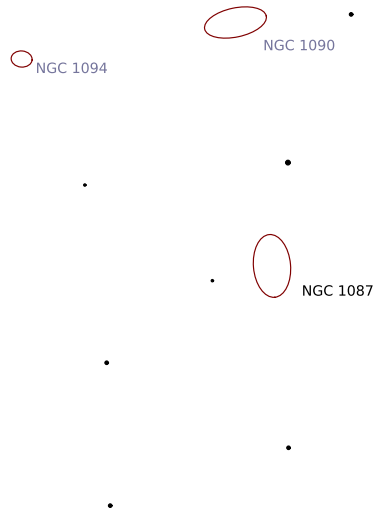
SAC: H II 466;In NGC1068 grp;P w NGC1090 @15′ and NGC1094 @ 20′



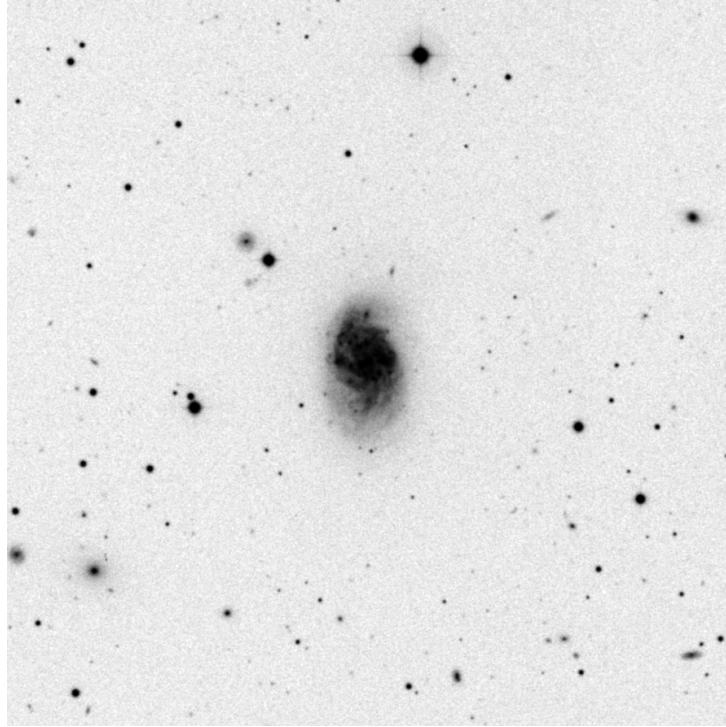
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

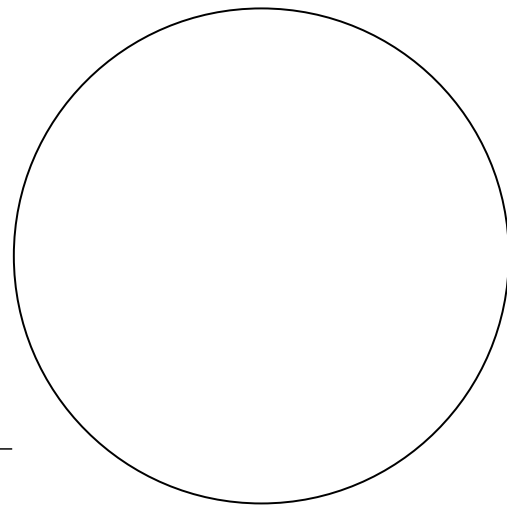
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

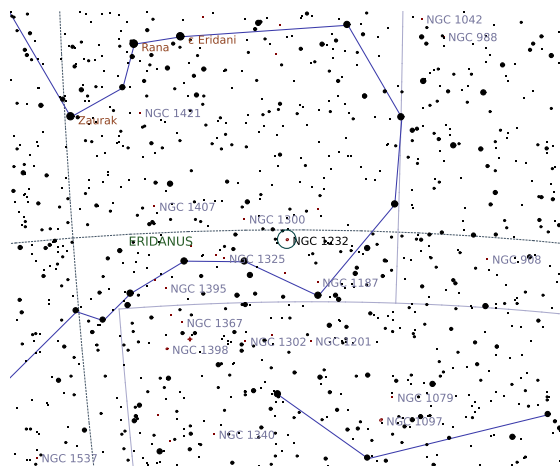
NGC 1232

Galaxy in Eridanus

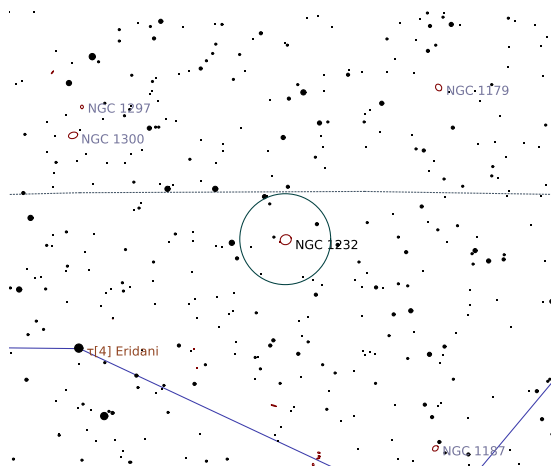
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 03 ^h 10 ^m 21 ^s | Declination (current) | -20° 32' 00" |
| Right Ascension (J2000.0) | 03 ^h 09 ^m 45 ^s | Declination (J2000.0) | -20° 34' 45" |
| Size | 7.4' × 6.5' | Position Angle | -18° |
| Magnitude | 9.9 | Other Designation | - |

Description: Dreyer: pB;cL;R;gbM;r

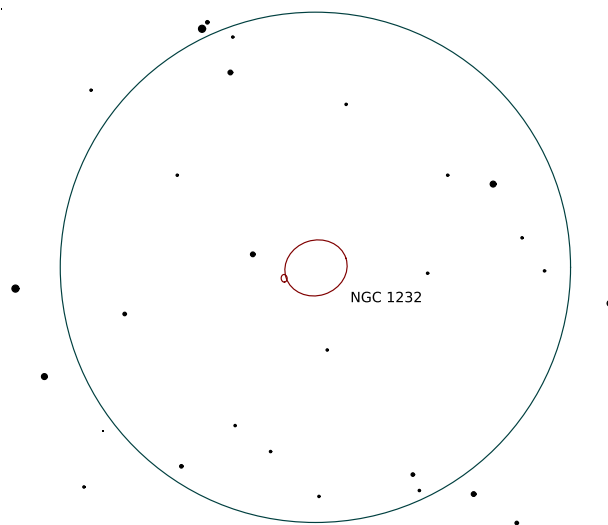
SAC: H II 258;Excellent face-on spiral



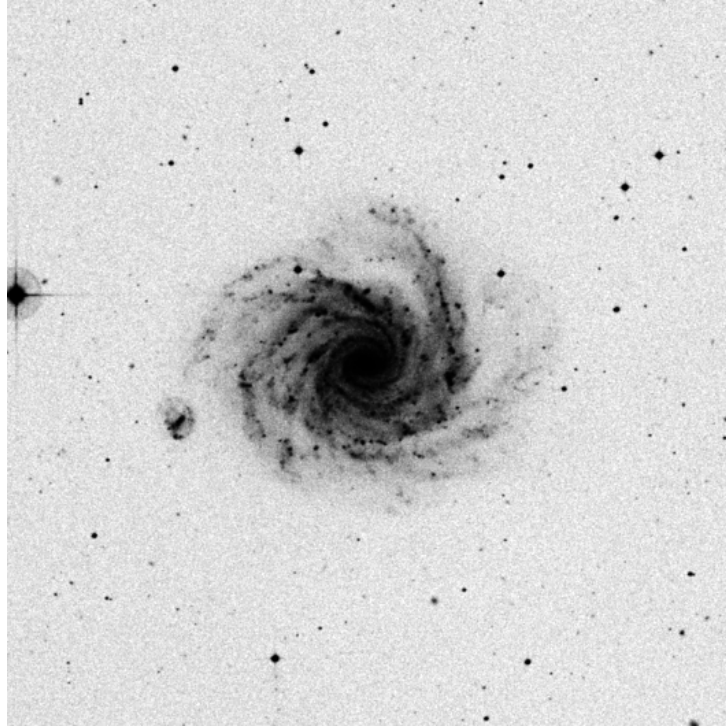
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

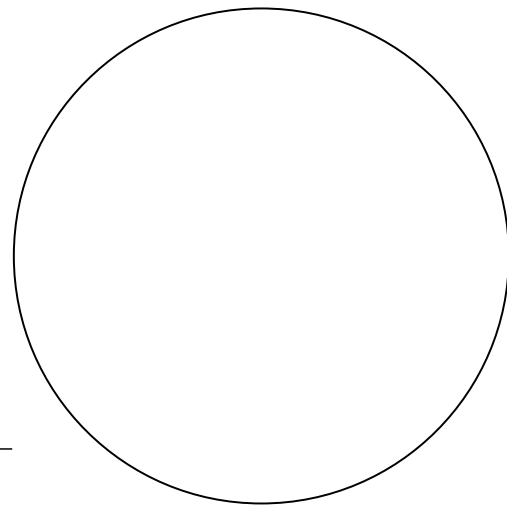
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

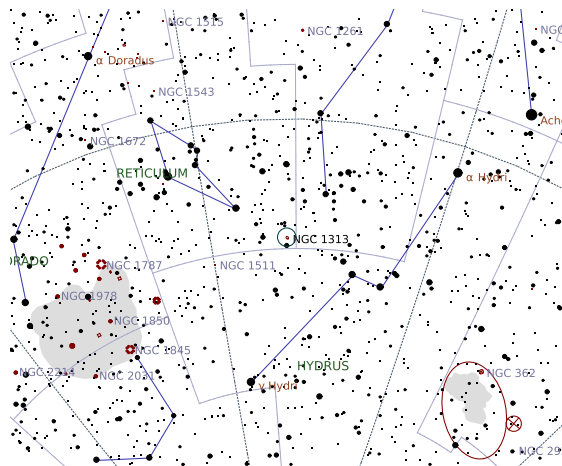
NGC 1313

Galaxy in Reticulum

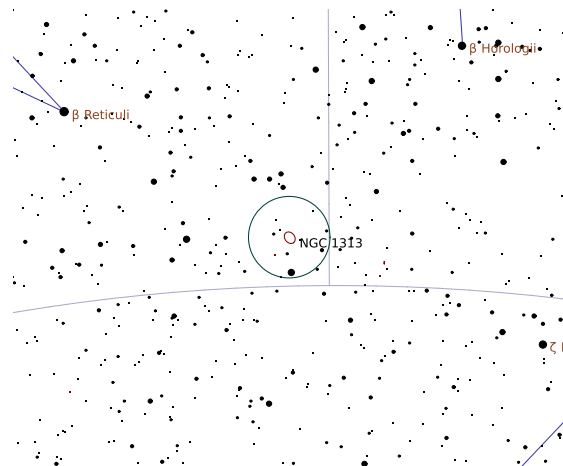
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 03 ^h 18 ^m 25 ^s | Declination (current) | −66° 27′ 13″ |
| Right Ascension (J2000.0) | 03 ^h 18 ^m 16 ^s | Declination (J2000.0) | −66° 29′ 43″ |
| Size | 9.2′ × 7.2′ | Position Angle | 52° |
| Magnitude | 8.7 | Other Designation | — |

Description: Dreyer: pB;L;E;vgbM;r

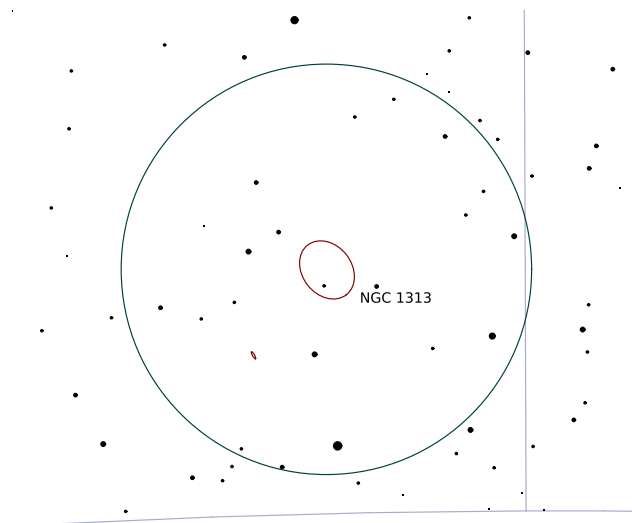
SAC: Nuclear bar



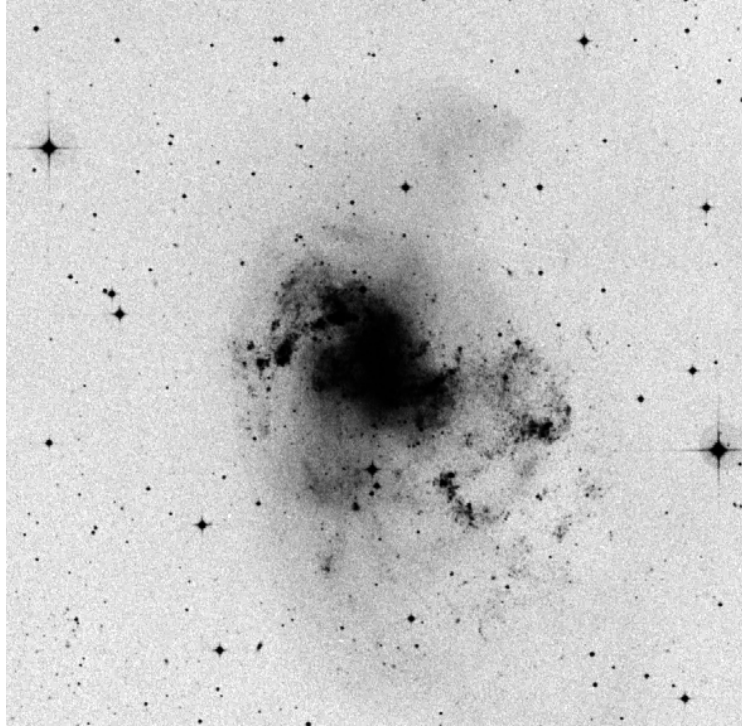
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (16.7' × 16.3')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

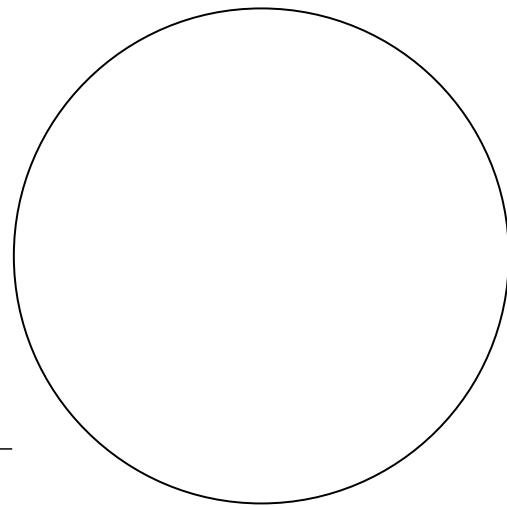
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

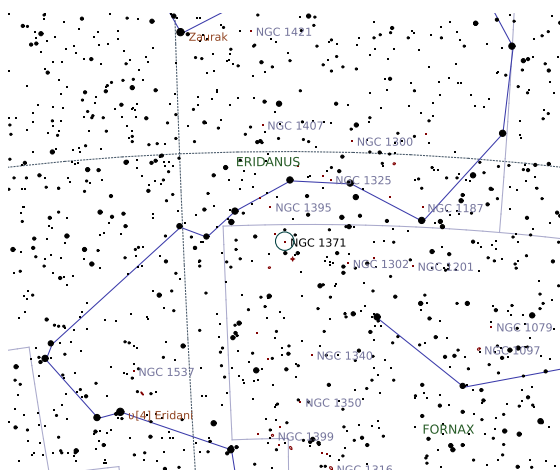
NGC 1371

Galaxy in Fornax

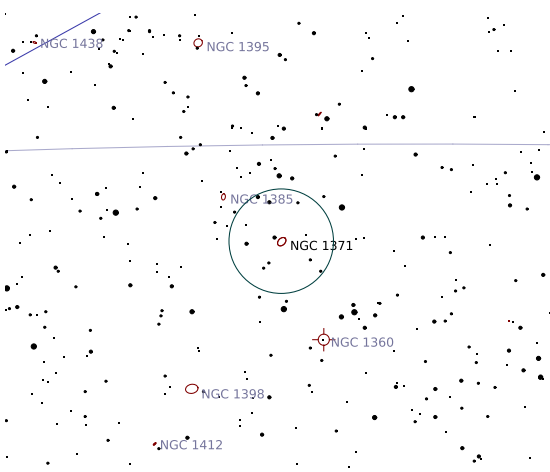
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 03 ^h 35 ^m 35 ^s | Declination (current) | -24° 53' 39" |
| Right Ascension (J2000.0) | 03 ^h 35 ^m 01 ^s | Declination (J2000.0) | -24° 56' 00" |
| Size | 5.6' × 3.9' | Position Angle | -45° |
| Magnitude | 11 | Other Designation | - |

Description: Dreyer: pB;pL;v1E;psbM

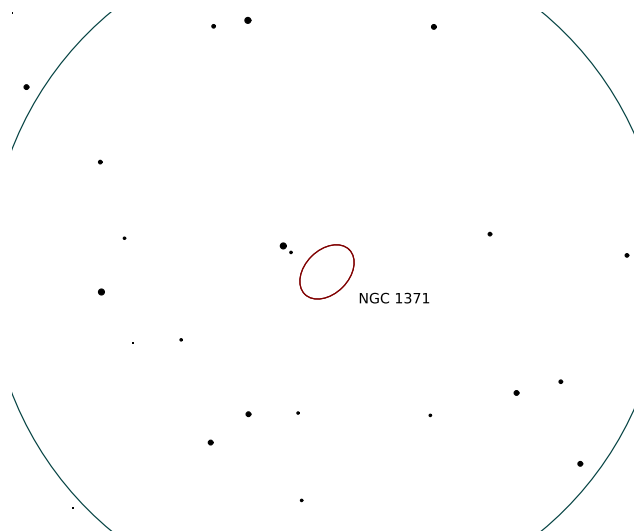
SAC: H II 262



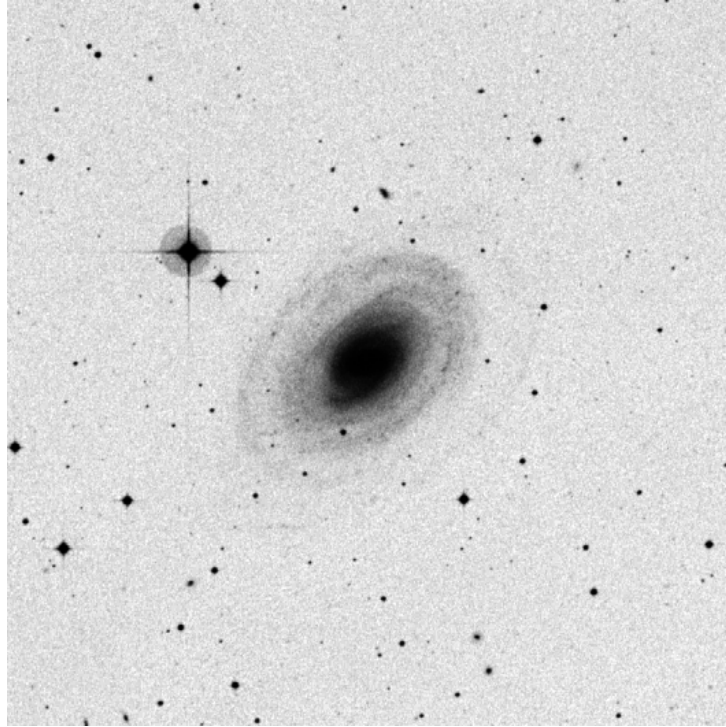
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

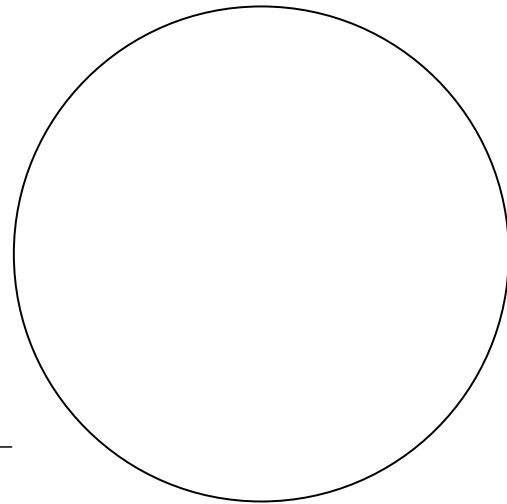
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

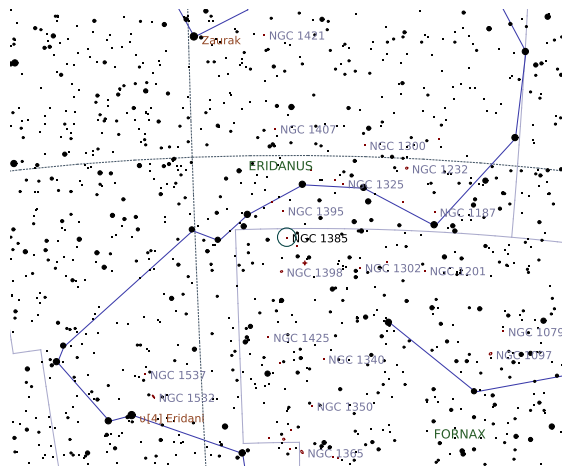
NGC 1385

Galaxy in Fornax

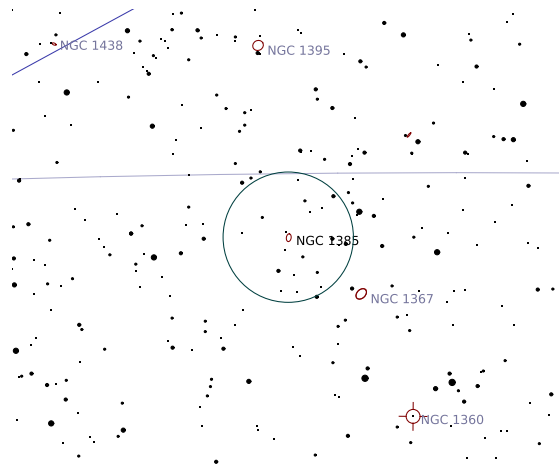
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 03 ^h 38 ^m 02 ^s | Declination (current) | -24° 27' 51" |
| Right Ascension (J2000.0) | 03 ^h 37 ^m 28 ^s | Declination (J2000.0) | -24° 30' 10" |
| Size | 3.6' × 2.2' | Position Angle | -81° |
| Magnitude | 11 | Other Designation | - |

Description: Dreyer: pB;pS;R;gpmbM

SAC: H II 263



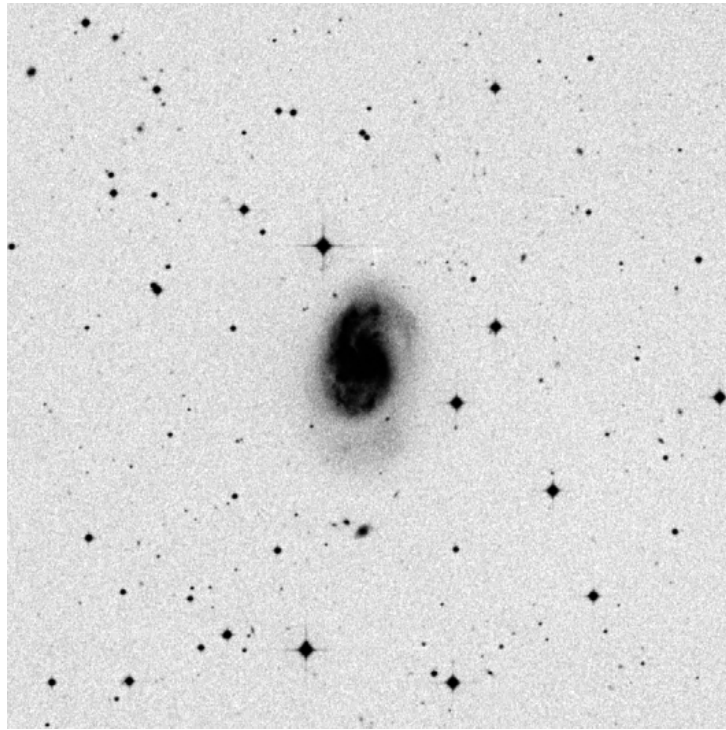
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

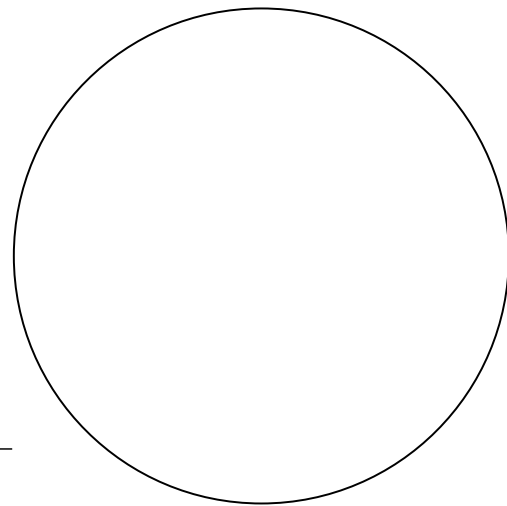
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

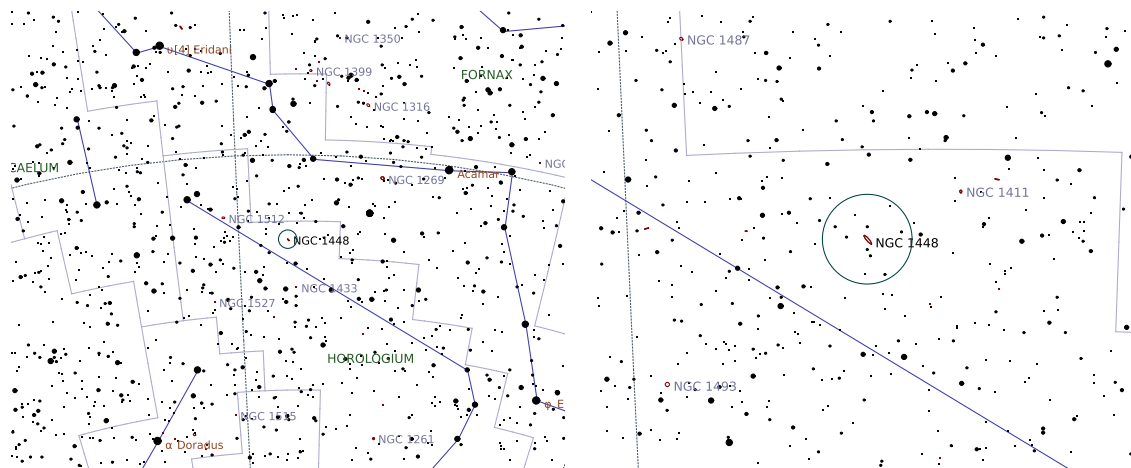
NGC 1448

Galaxy in Horologium

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 03 ^h 44 ^m 57 ^s | Declination (current) | −44° 36′ 37″ |
| Right Ascension (J2000.0) | 03 ^h 44 ^m 31 ^s | Declination (J2000.0) | −44° 38′ 45″ |
| Size | 7.6′ × 1.7′ | Position Angle | 49° |
| Magnitude | 11 | Other Designation | — |

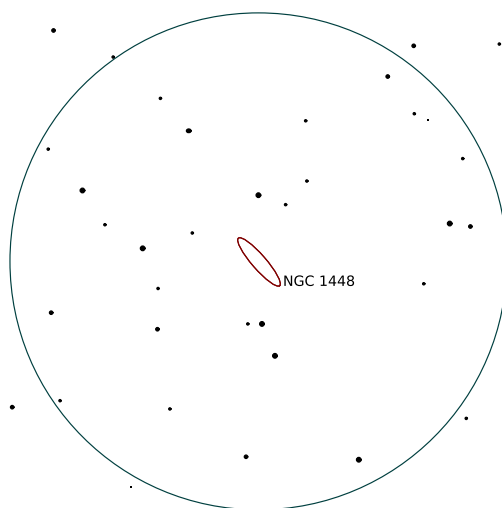
Description: Dreyer: pB;L;vmE222

SAC: Nearly edge-on

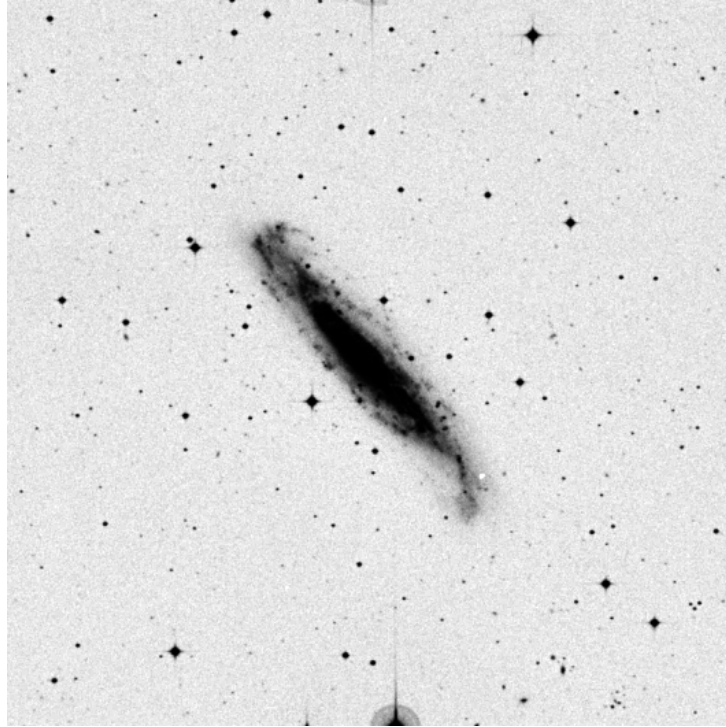


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

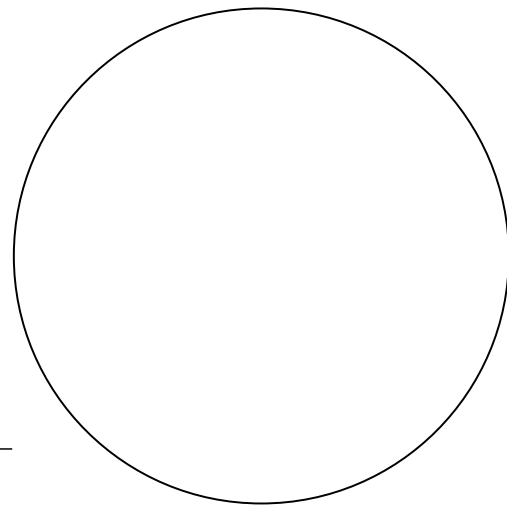
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



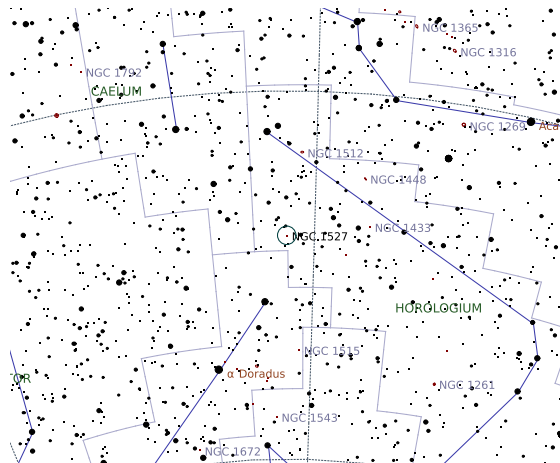
Sketch

NGC 1527

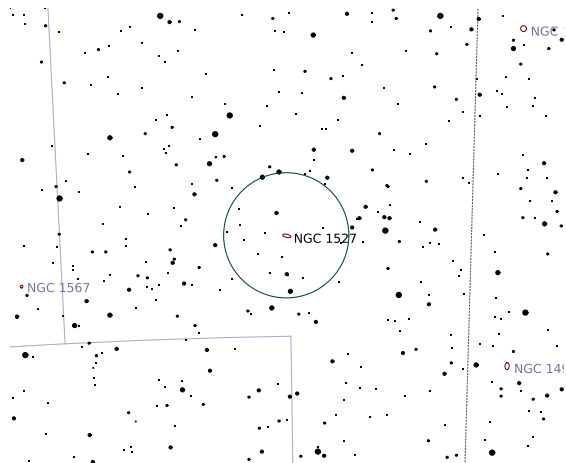
Galaxy in Horologium

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 04 ^h 08 ^m 47 ^s | Declination (current) | -47° 52' 05" |
| Right Ascension (J2000.0) | 04 ^h 08 ^m 24 ^s | Declination (J2000.0) | -47° 53' 48" |
| Size | 3.9' × 1.5' | Position Angle | 12° |
| Magnitude | 11 | Other Designation | — |

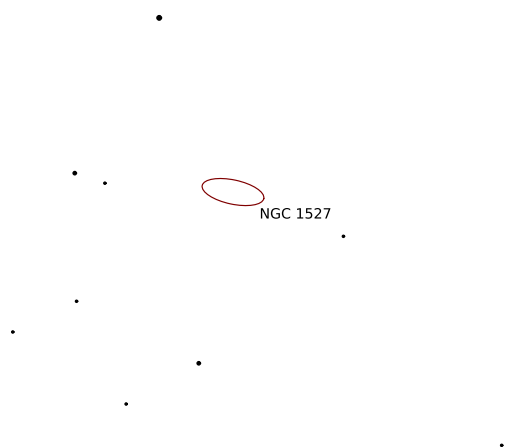
Description: Dreyer: pB;pS;E77;vsmbMRN



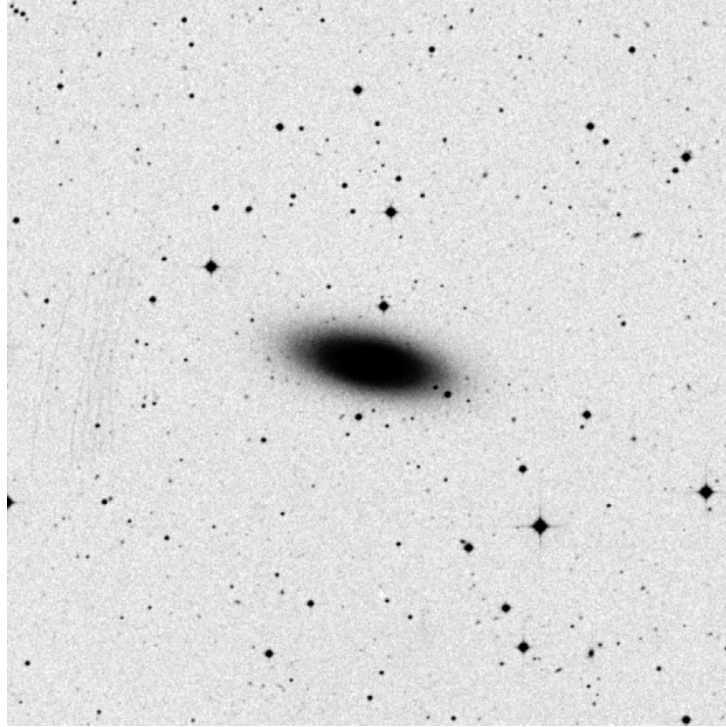
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

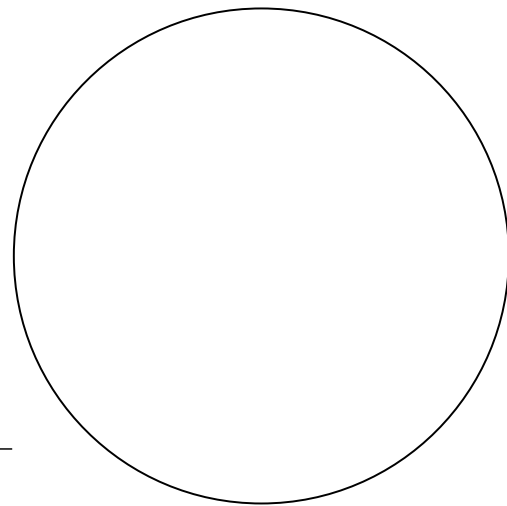
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



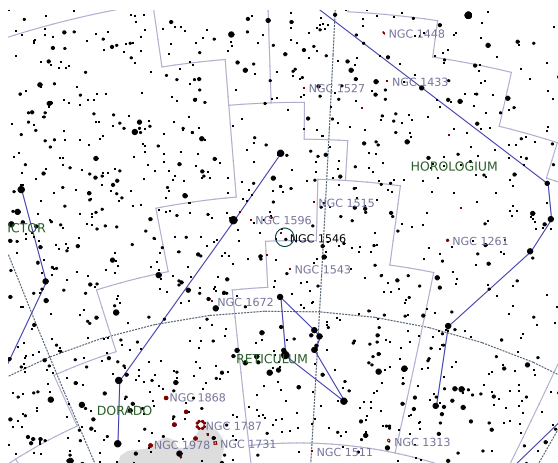
Sketch

NGC 1546

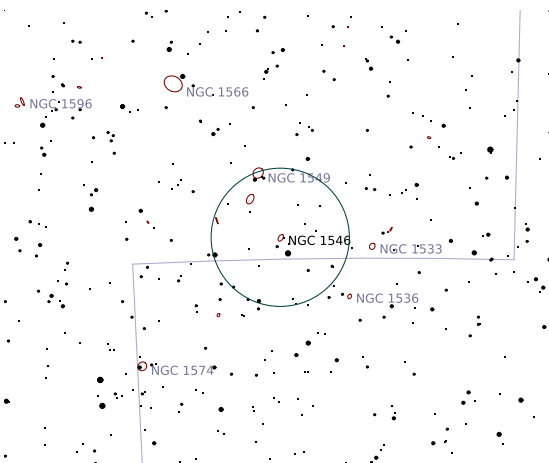
Galaxy in Dorado

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 04 ^h 14 ^m 53 ^s | Declination (current) | -56° 02' 01" |
| Right Ascension (J2000.0) | 04 ^h 14 ^m 36 ^s | Declination (J2000.0) | -56° 03' 37" |
| Size | 3.2' × 1.9' | Position Angle | -57° |
| Magnitude | 11 | Other Designation | - |

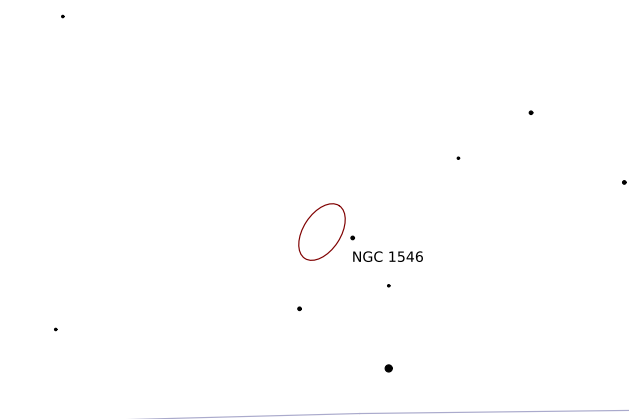
Description: Dreyer: pB;1E;gbMEN; **p



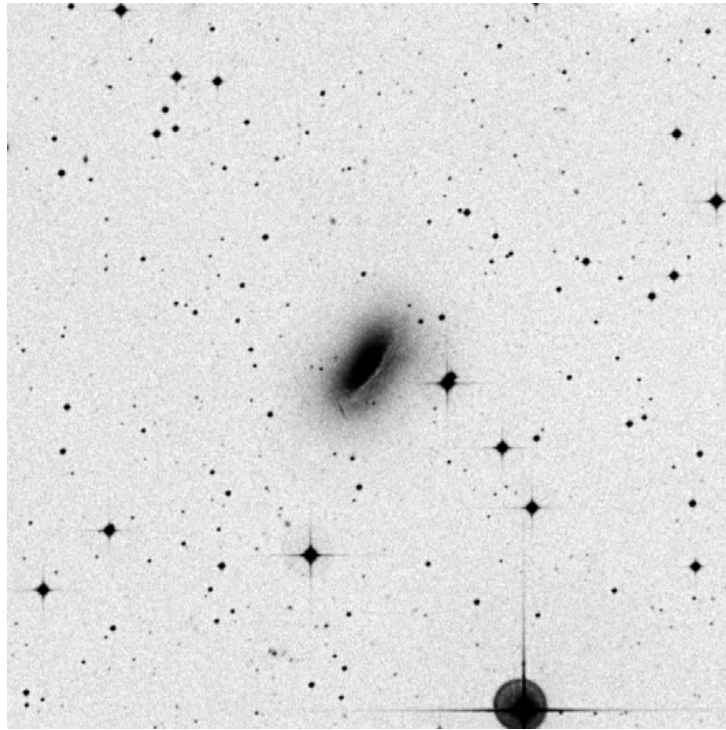
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

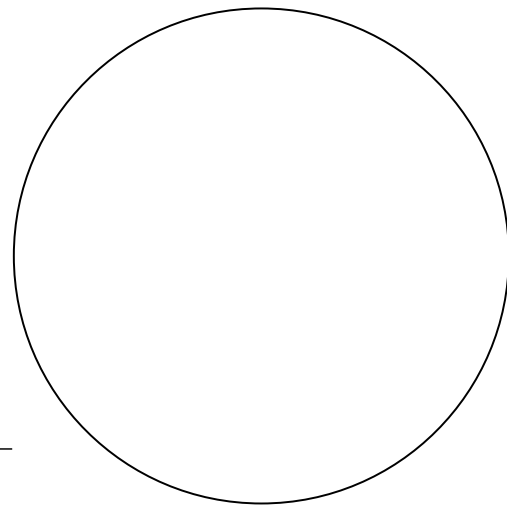
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



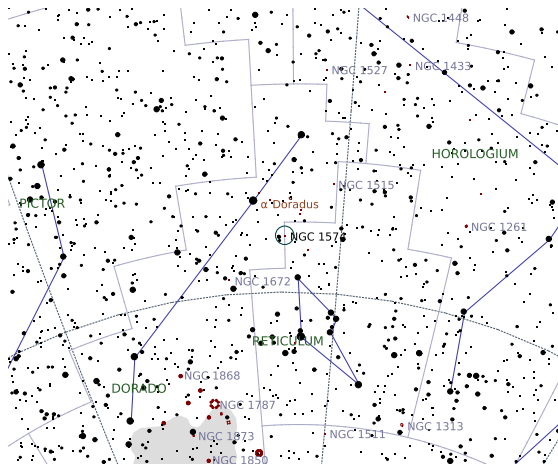
Sketch

NGC 1574

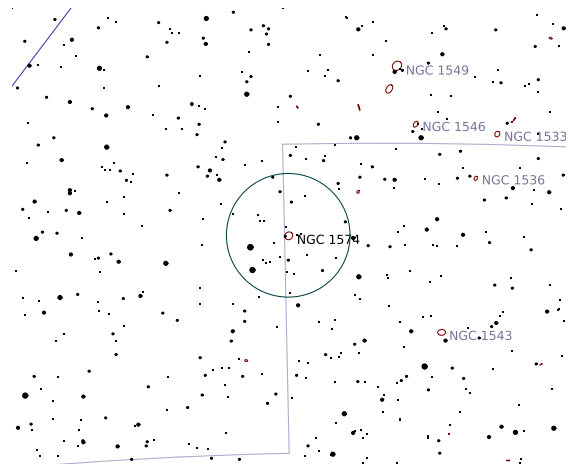
Galaxy in Reticulum

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 04 ^h 22 ^m 14 ^s | Declination (current) | -56° 57' 00" |
| Right Ascension (J2000.0) | 04 ^h 21 ^m 58 ^s | Declination (J2000.0) | -56° 58' 28" |
| Size | 4' × 3.6' | Position Angle | -44° |
| Magnitude | 10 | Other Designation | — |

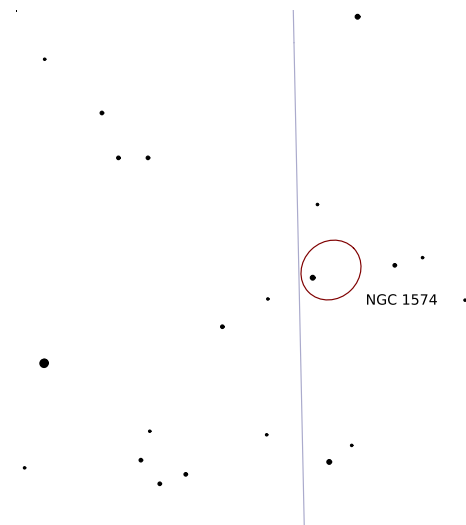
Description: Dreyer: pB;S;R;pgbM;2S* sf



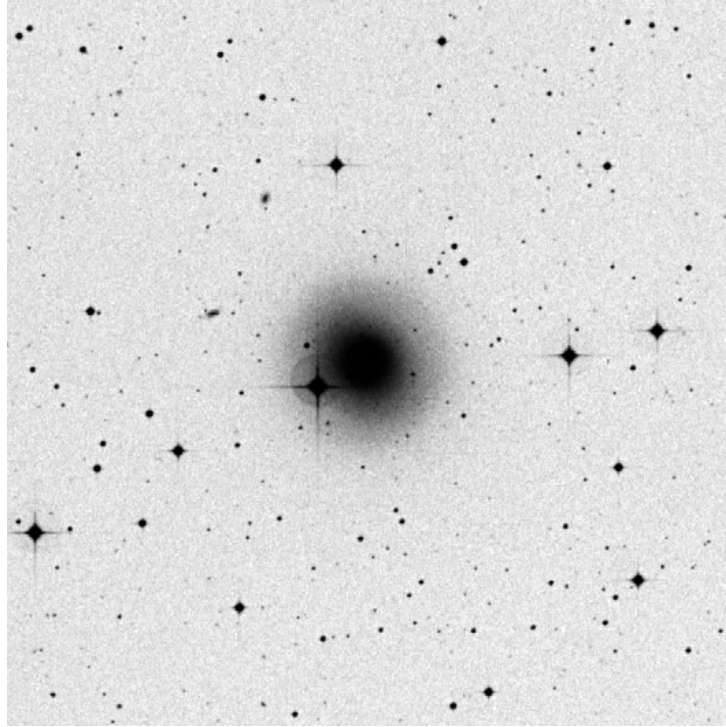
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

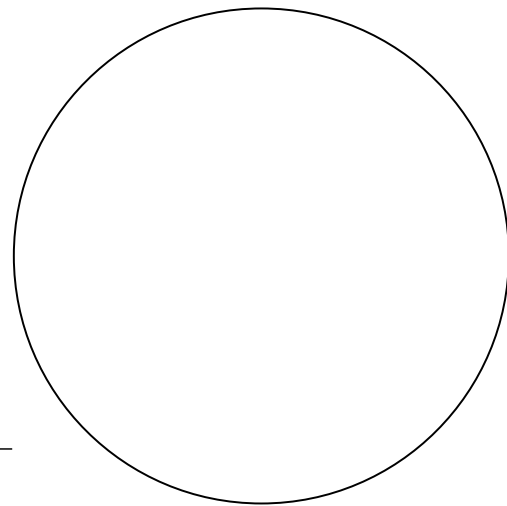
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



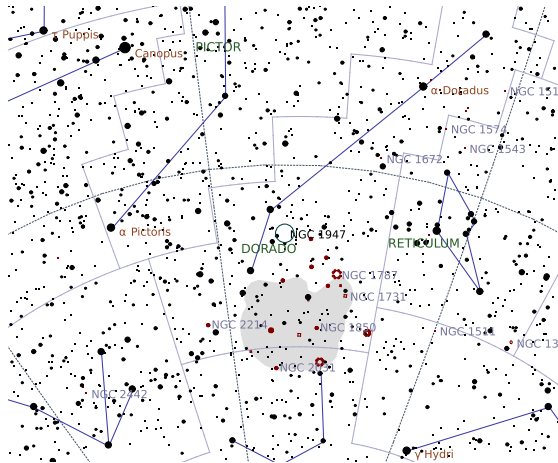
Sketch

NGC 1947

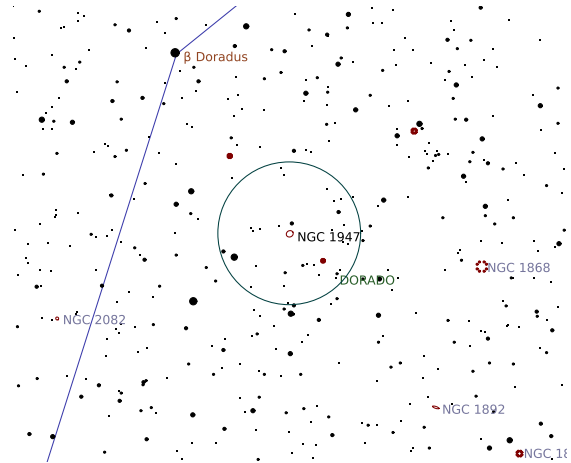
Galaxy in Dorado

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 05 ^h 26 ^m 53 ^s | Declination (current) | −63° 45′ 22″ |
| Right Ascension (J2000.0) | 05 ^h 26 ^m 47 ^s | Declination (J2000.0) | −63° 45′ 39″ |
| Size | 3′ × 2.6′ | Position Angle | −29° |
| Magnitude | 11 | Other Designation | — |

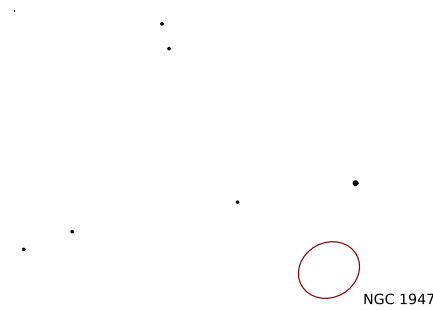
Description: Dreyer: pB;L;R;glbM;*9 np



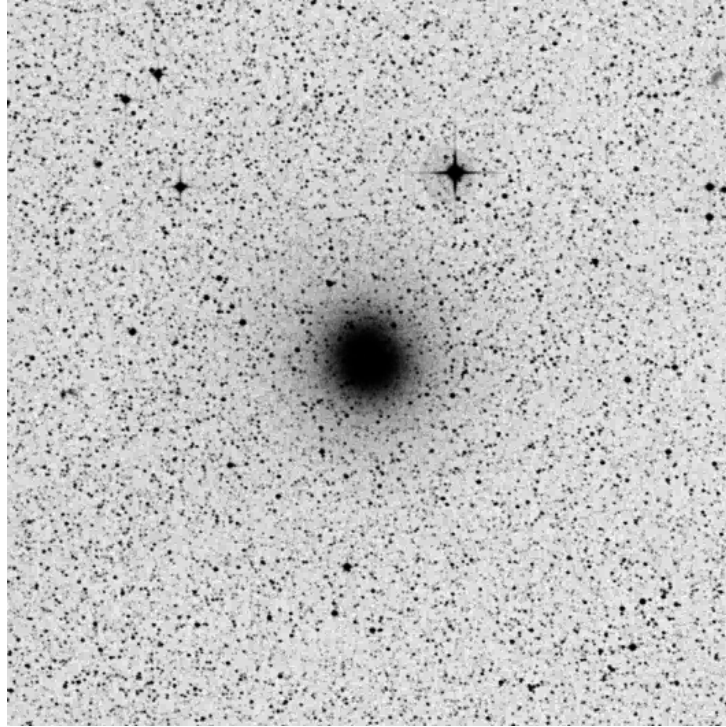
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

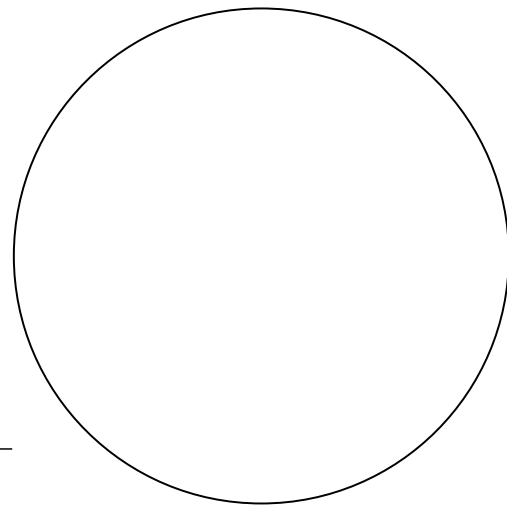
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

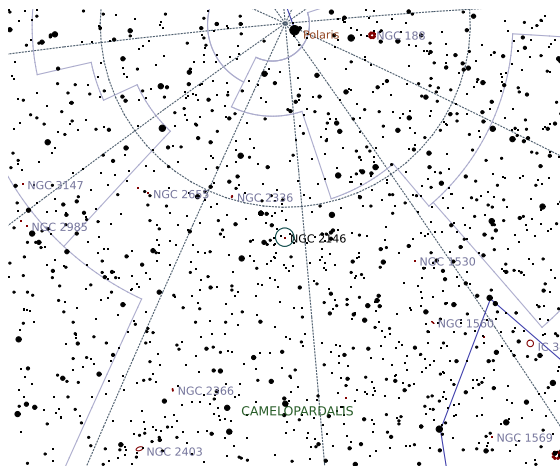
NGC 2146

Galaxy in Camelopardalis

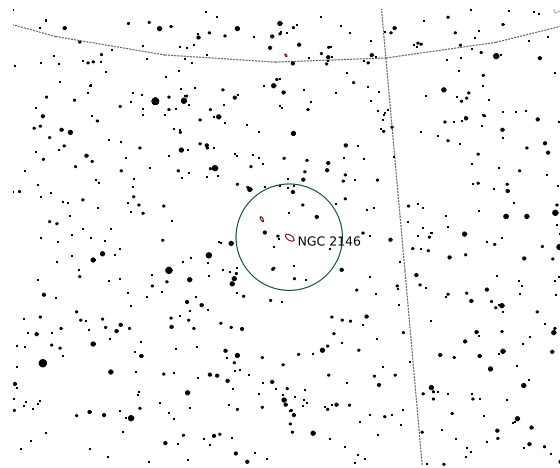
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 06 ^h 20 ^m 50 ^s | Declination (current) | 78° 21' 04" |
| Right Ascension (J2000.0) | 06 ^h 18 ^m 38 ^s | Declination (J2000.0) | 78° 21' 21" |
| Size | 5.4' × 2.9' | Position Angle | 34° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;2'1;1E

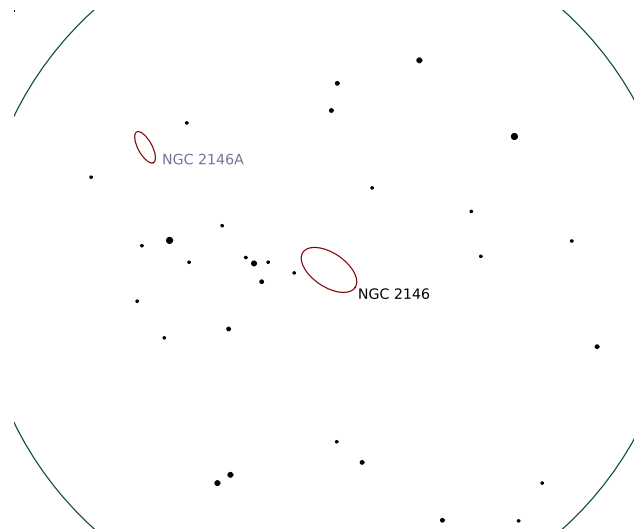
SAC: extreme broad spiral arms;2 main smooth arms;1 w dark lane



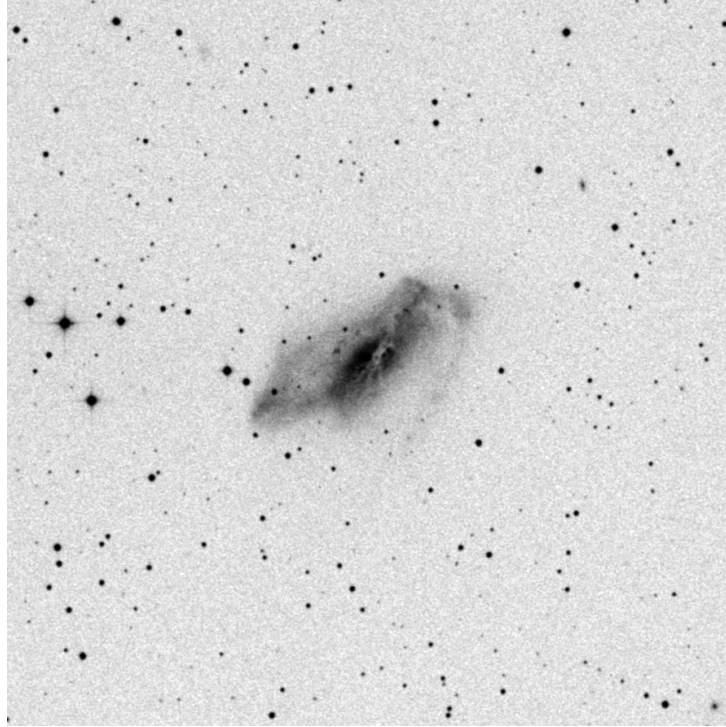
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

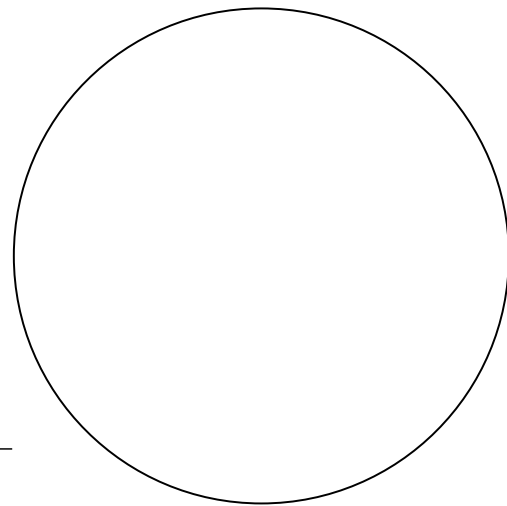
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

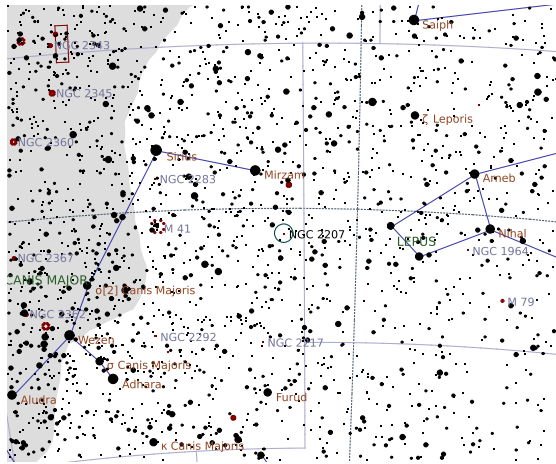
NGC 2207

Galaxy in Canis Major

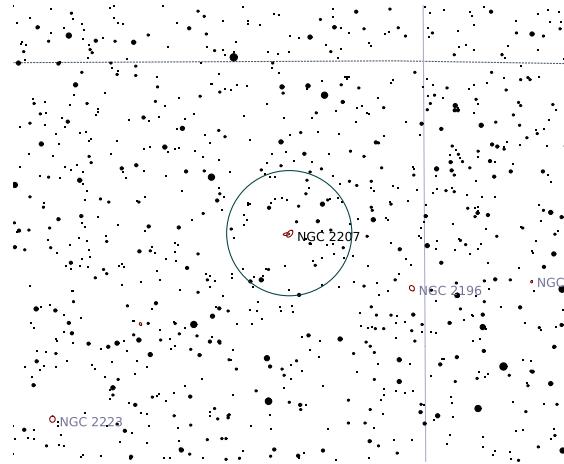
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 06 ^h 16 ^m 56 ^s | Declination (current) | -21° 22' 57" |
| Right Ascension (J2000.0) | 06 ^h 16 ^m 21 ^s | Declination (J2000.0) | -21° 22' 22" |
| Size | 3.9' × 2.2' | Position Angle | -51° |
| Magnitude | 11 | Other Designation | - |

Description: Dreyer: pB;pL;mE87;pslbMRN;biN;ring surrounding

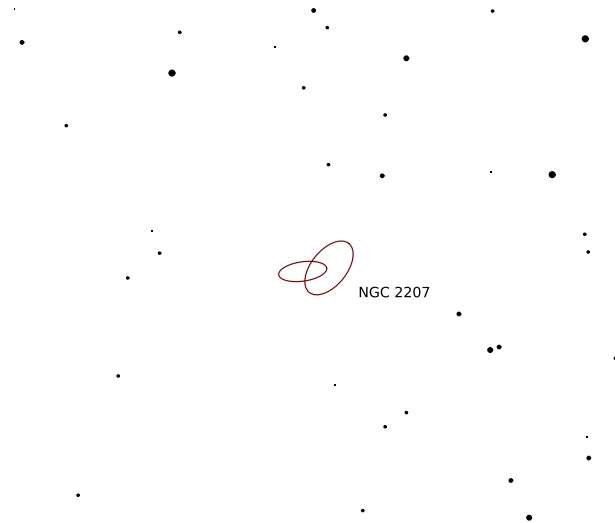
SAC: Double galaxy or interacting pair



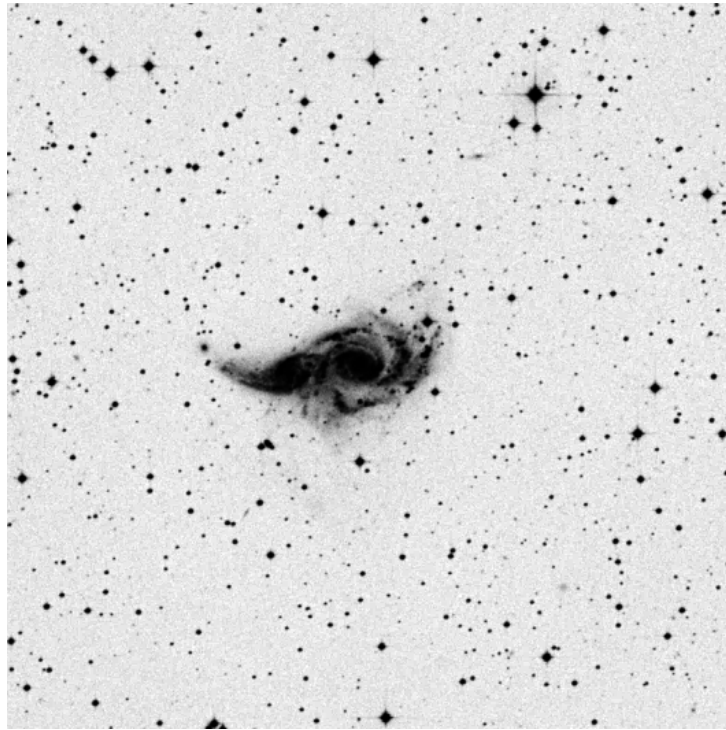
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

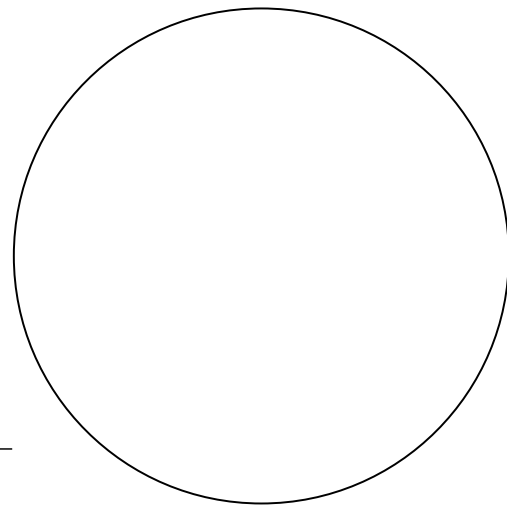
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

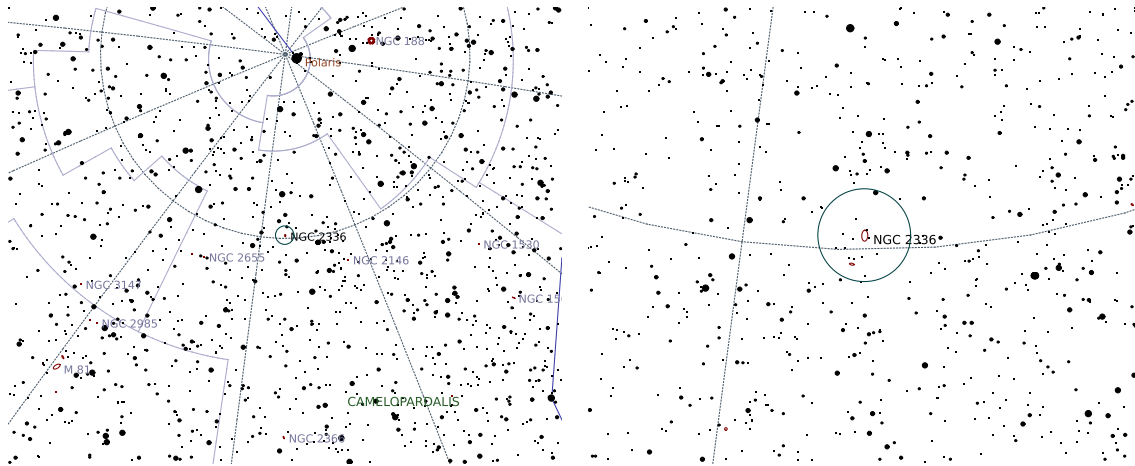
NGC 2336

Galaxy in Camelopardalis

| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 07 ^h 29 ^m 26 ^s | Declination (current) | 80° 09' 06" |
| Right Ascension (J2000.0) | 07 ^h 27 ^m 03 ^s | Declination (J2000.0) | 80° 10' 40" |
| Size | 7.1' × 3.9' | Position Angle | -88° |
| Magnitude | 10 | Other Designation | - |

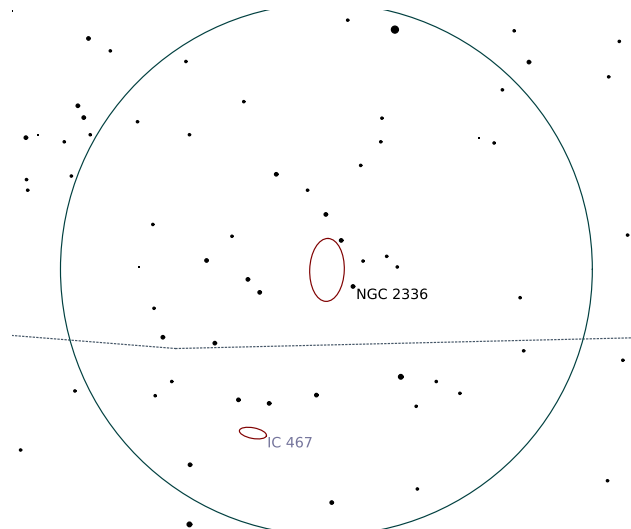
Description: Dreyer: pB;pL;R;2*11 nr

SAC: weak bar;many weak filam arms w knots; P w IC 467

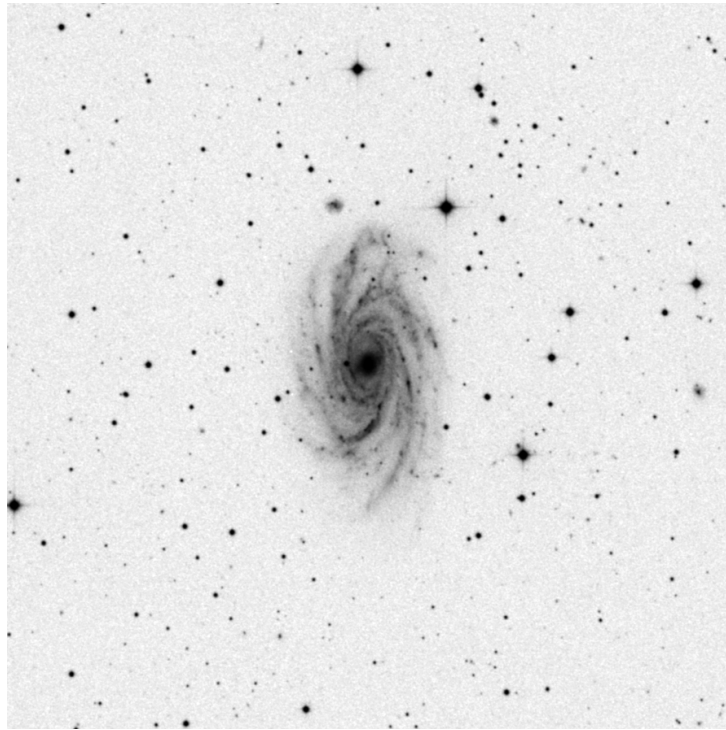


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

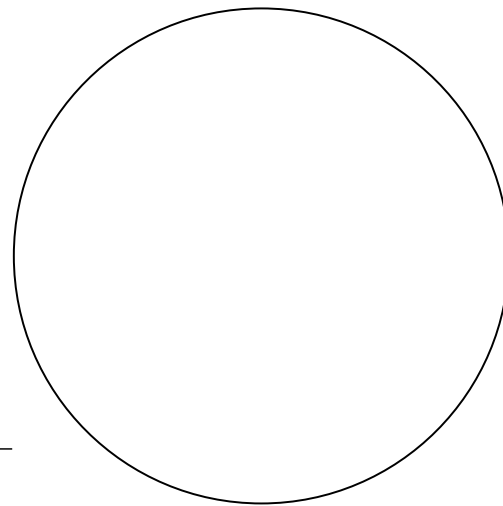
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

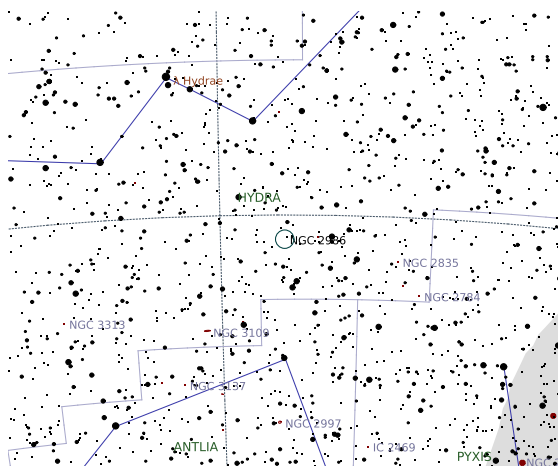
NGC 2986

Galaxy in Hydra

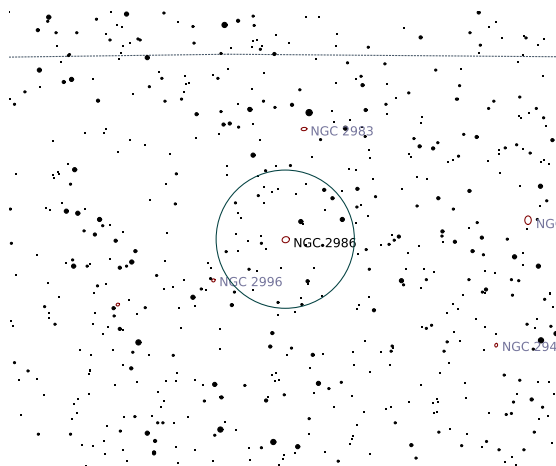
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 09 ^h 44 ^m 53 ^s | Declination (current) | -21° 20' 32" |
| Right Ascension (J2000.0) | 09 ^h 44 ^m 15 ^s | Declination (J2000.0) | -21° 16' 41" |
| Size | 3.2' × 2.6' | Position Angle | -15° |
| Magnitude | 11 | Other Designation | - |

Description: Dreyer: pB;pS;iR;mbM

SAC: H II 311



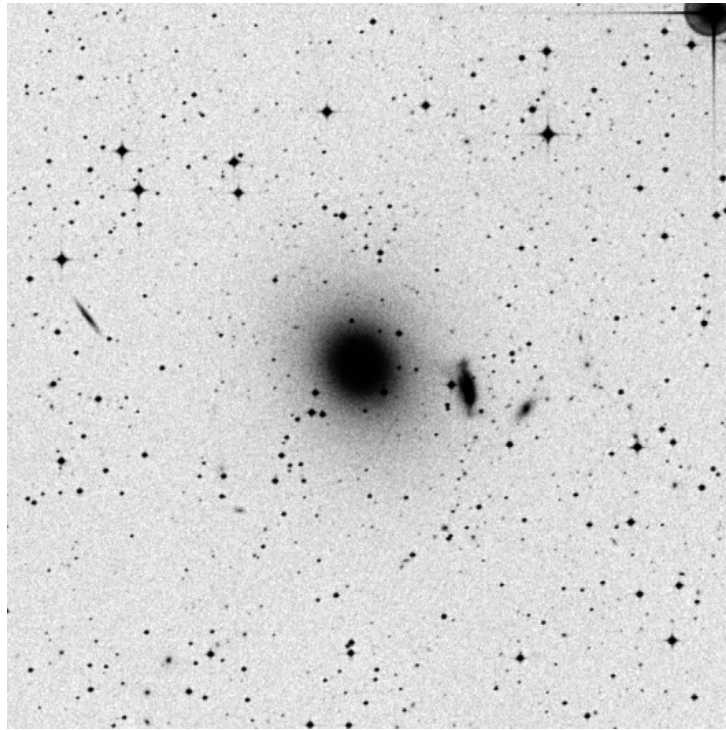
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

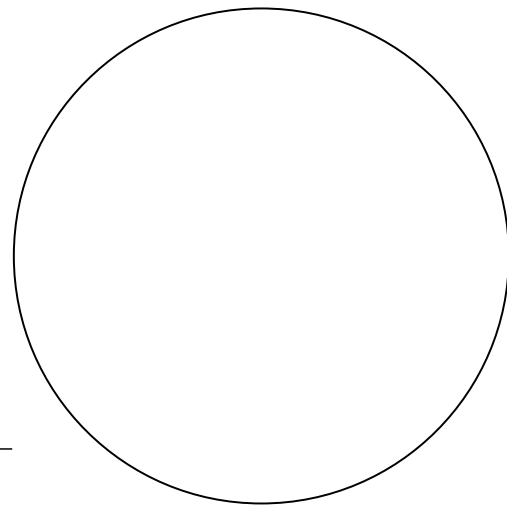
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



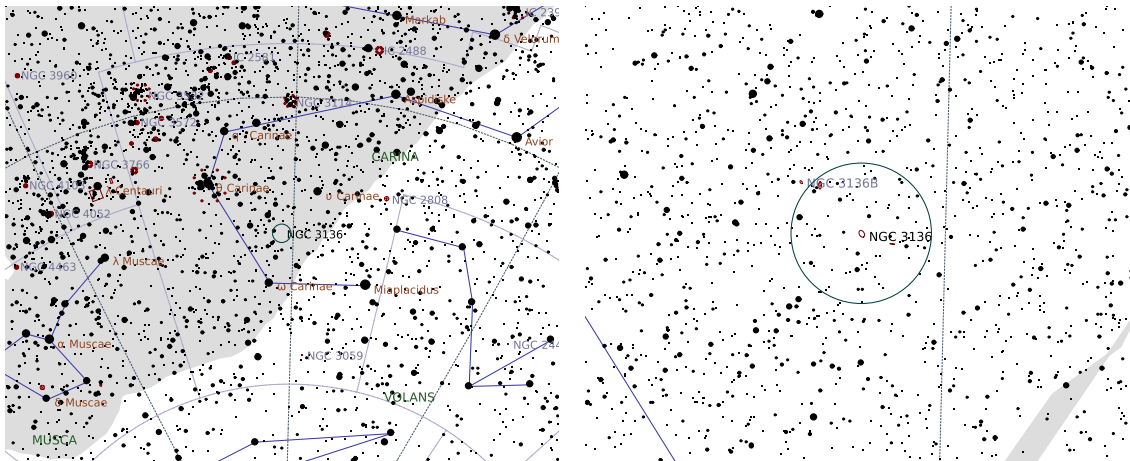
Sketch

NGC 3136

Galaxy in Carina

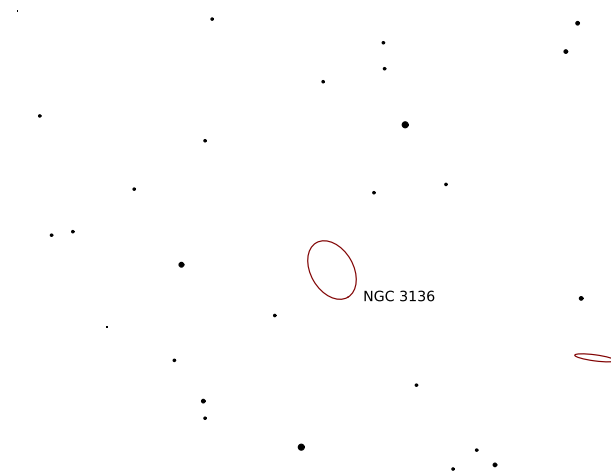
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 10 ^h 06 ^m 12 ^s | Declination (current) | −67° 26′ 36″ |
| Right Ascension (J2000.0) | 10 ^h 05 ^m 48 ^s | Declination (J2000.0) | −67° 22′ 39″ |
| Size | 3.1′ × 2.1′ | Position Angle | 60° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;pS;R;gbM;*13n

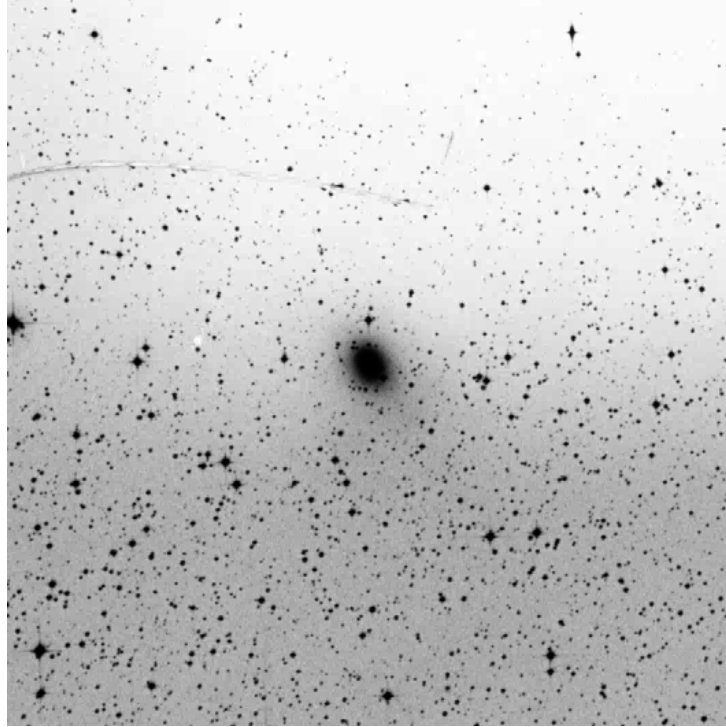


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

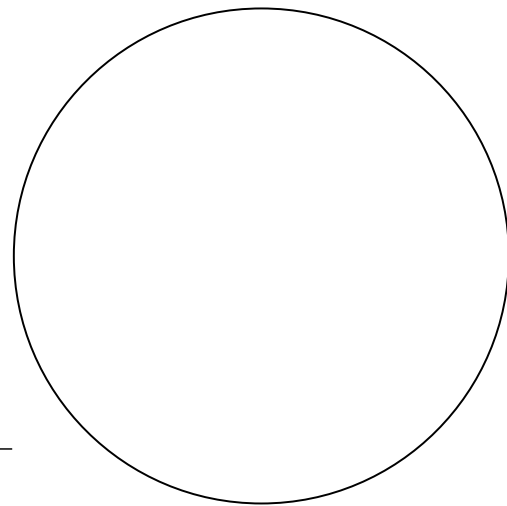
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

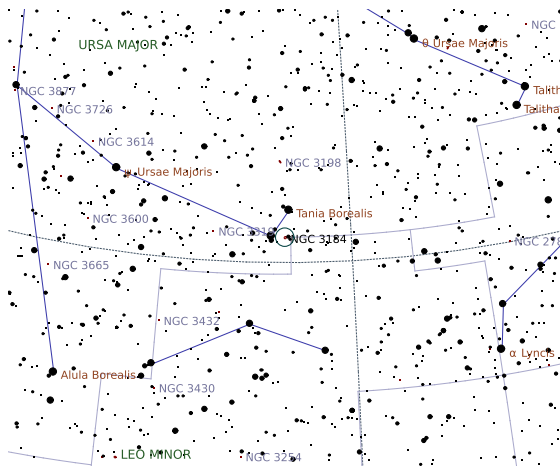
NGC 3184

Galaxy in Ursa Major

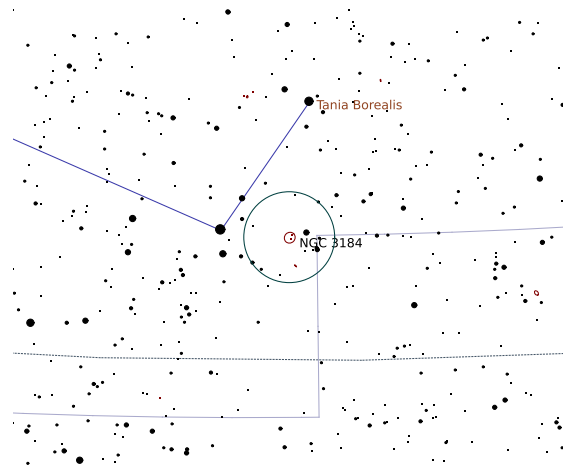
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 10 ^h 19 ^m 06 ^s | Declination (current) | 41° 21' 10" |
| Right Ascension (J2000.0) | 10 ^h 18 ^m 17 ^s | Declination (J2000.0) | 41° 25' 24" |
| Size | 7.4' × 6.9' | Position Angle | -45° |
| Magnitude | 9.8 | Other Designation | — |

Description: Dreyer: pB;vL;R;vgbM

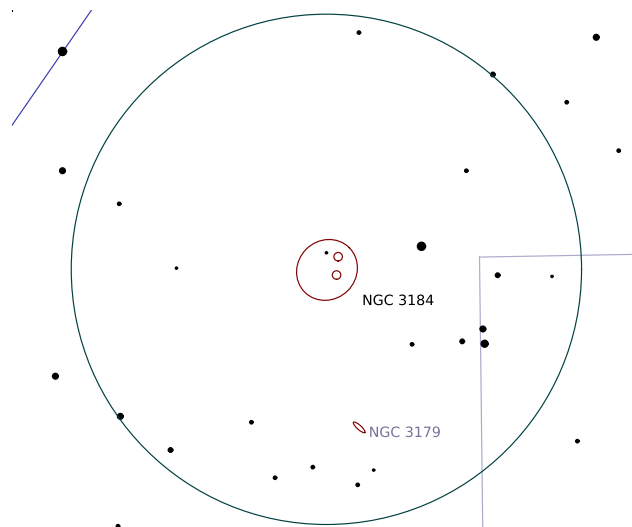
SAC: H I 168;svBN;smooth lens w spiral pattern of dark markings



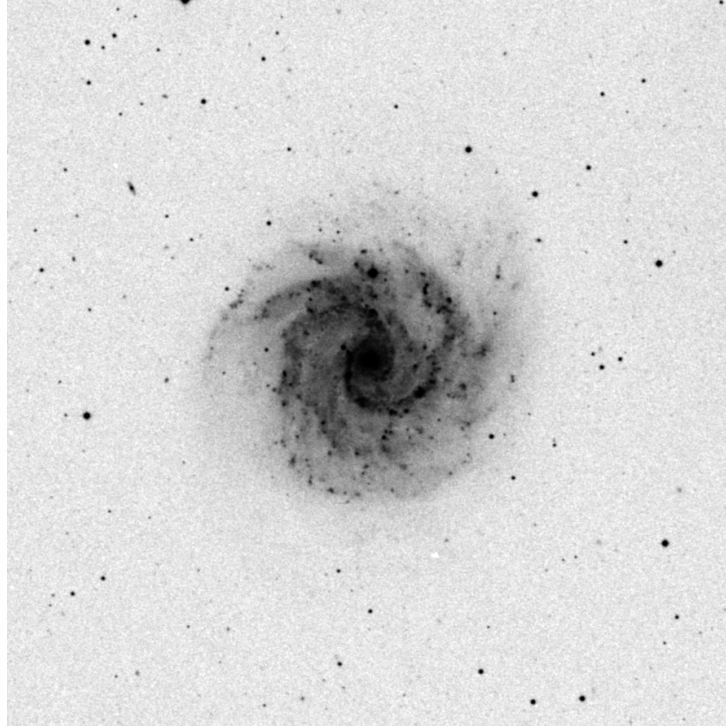
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

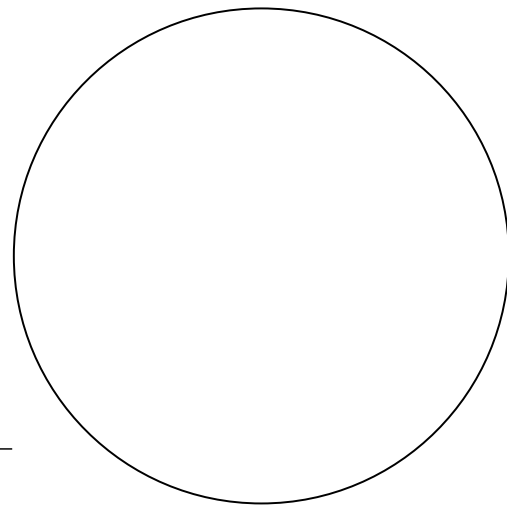
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

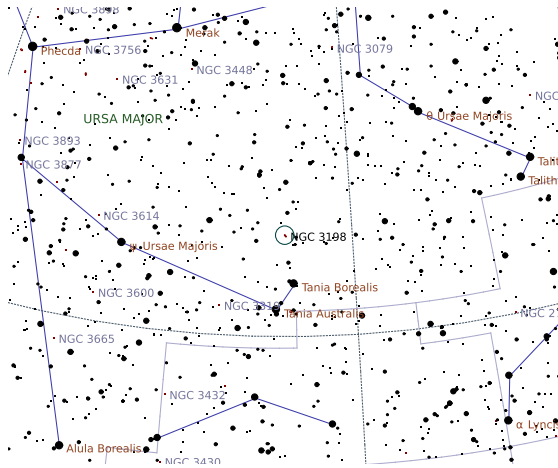
NGC 3198

Galaxy in Ursa Major

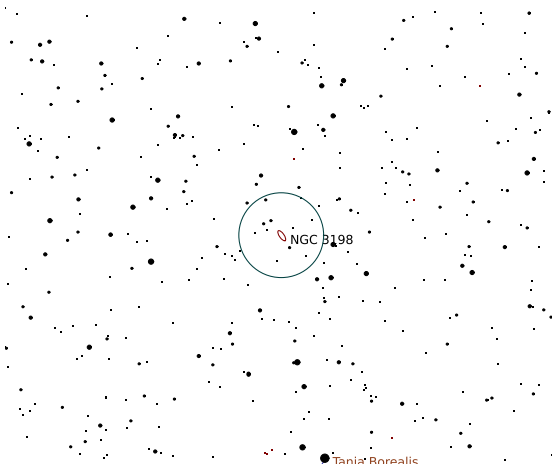
| | | | |
|---------------------------|---|-----------------------|-----------------------|
| Right Ascension (current) | $10^{\text{h}} 20^{\text{m}} 44^{\text{s}}$ | Declination (current) | $45^{\circ} 28' 45''$ |
| Right Ascension (J2000.0) | $10^{\text{h}} 19^{\text{m}} 54^{\text{s}}$ | Declination (J2000.0) | $45^{\circ} 33' 00''$ |
| Size | $8.5' \times 3.3'$ | Position Angle | 55° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;vL;mE 45;vgbM

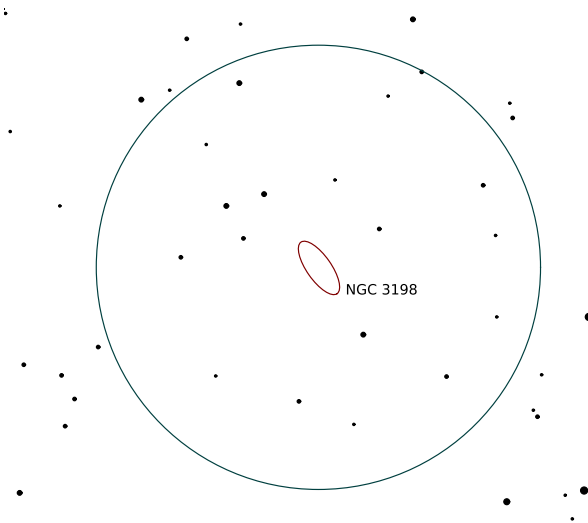
SAC: H I 199;svBN in bar partly obscured on one side



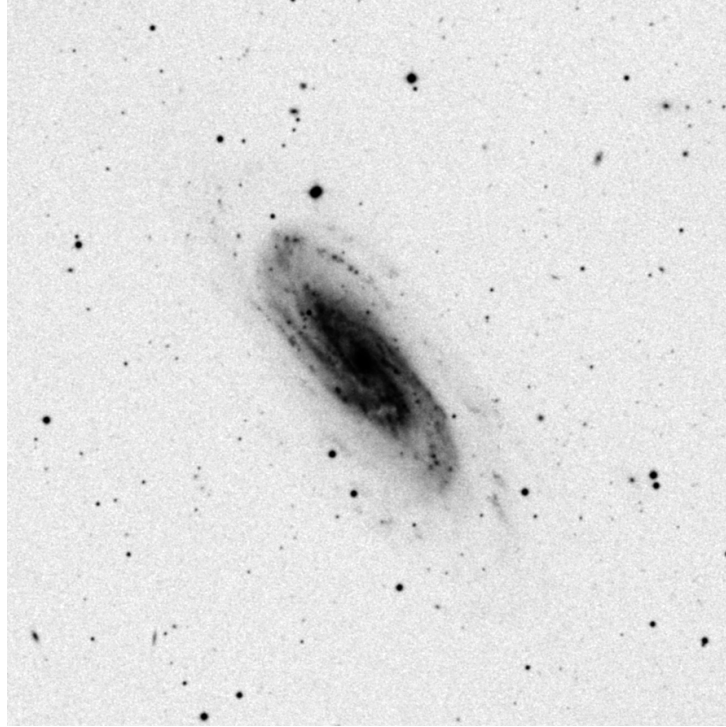
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

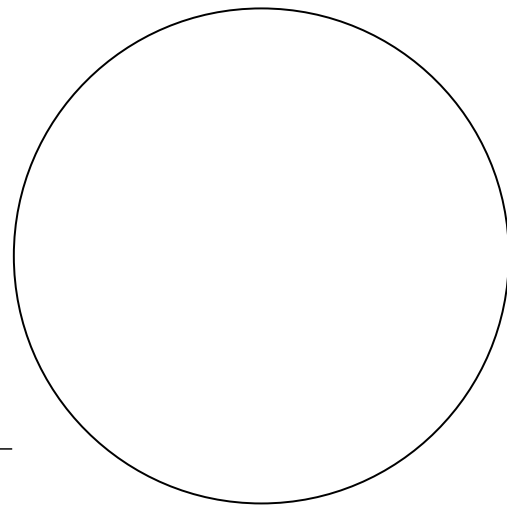
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

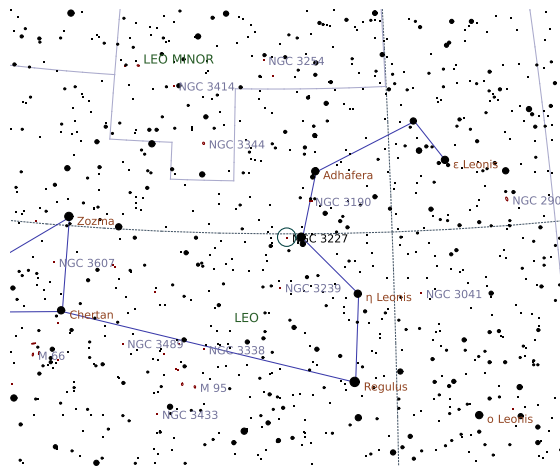
NGC 3227

Galaxy in Leo

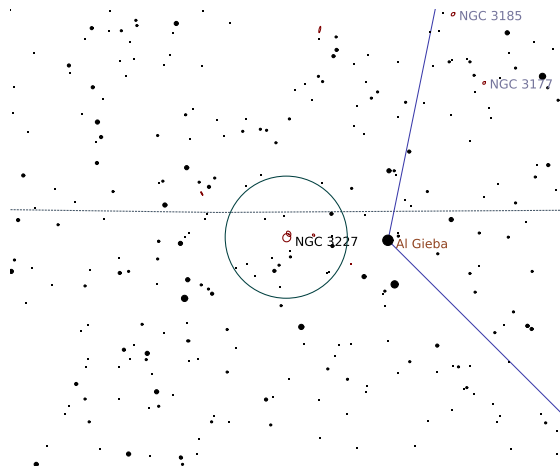
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 10 ^h 24 ^m 15 ^s | Declination (current) | 19° 47' 39" |
| Right Ascension (J2000.0) | 10 ^h 23 ^m 30 ^s | Declination (J2000.0) | 19° 51' 55" |
| Size | 4.1' × 3.9' | Position Angle | −60° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;cL;R;D

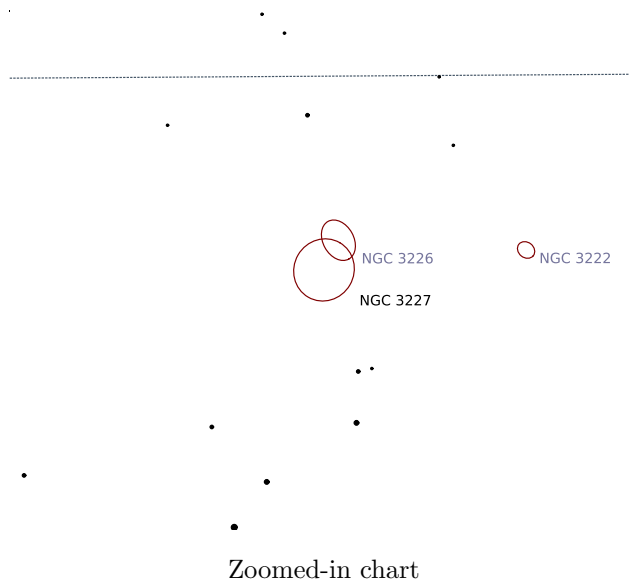
SAC: H II 29;P w NGC 3226;vF env surr system;50' E of Gamma Leo



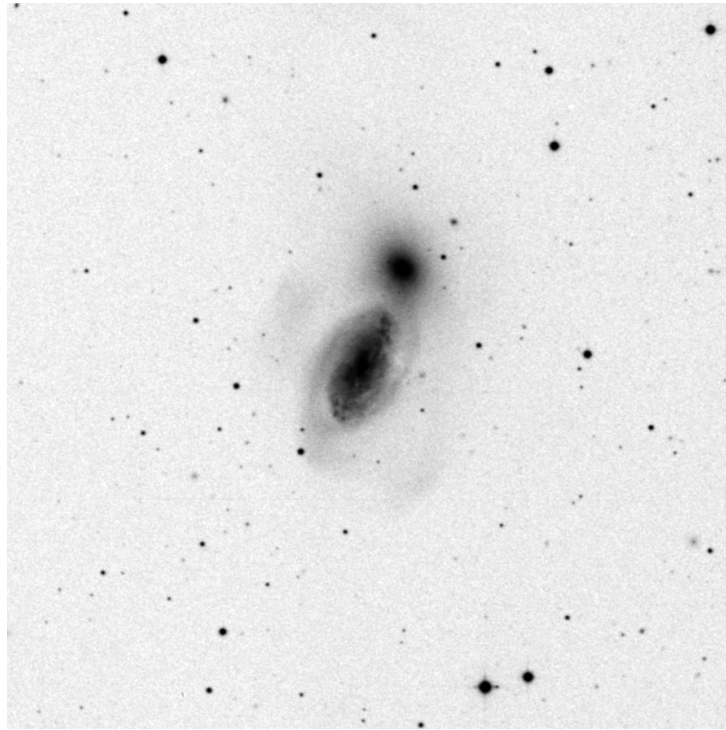
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

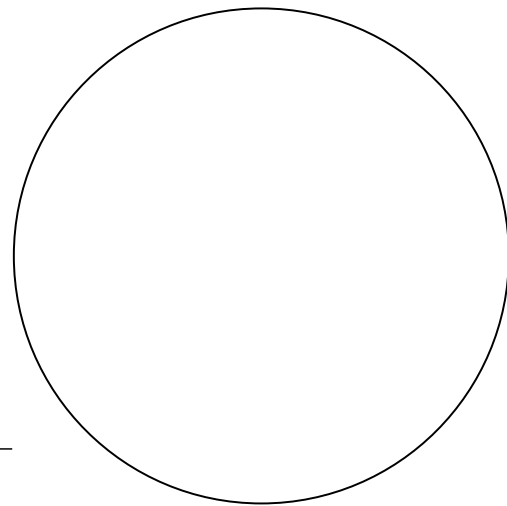
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

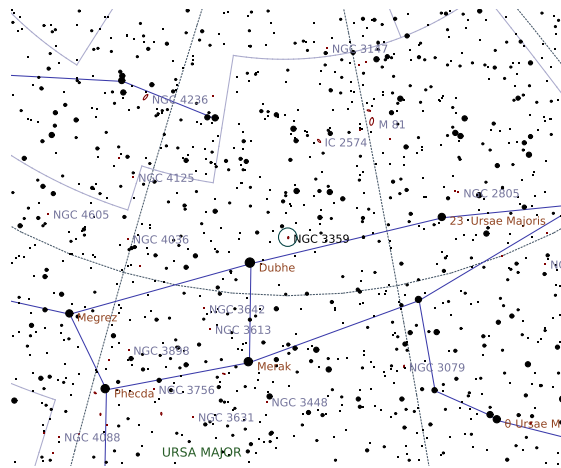
NGC 3359

Galaxy in Ursa Major

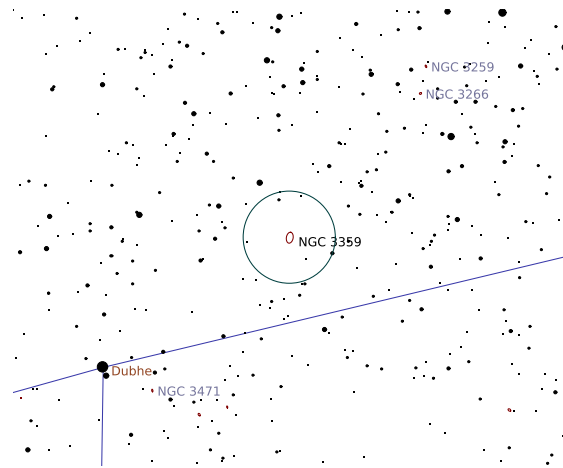
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 10 ^h 47 ^m 30 ^s | Declination (current) | 63° 08' 57" |
| Right Ascension (J2000.0) | 10 ^h 46 ^m 36 ^s | Declination (J2000.0) | 63° 13' 24" |
| Size | 7.2' × 4.4' | Position Angle | −80° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;L;E 0;glbM

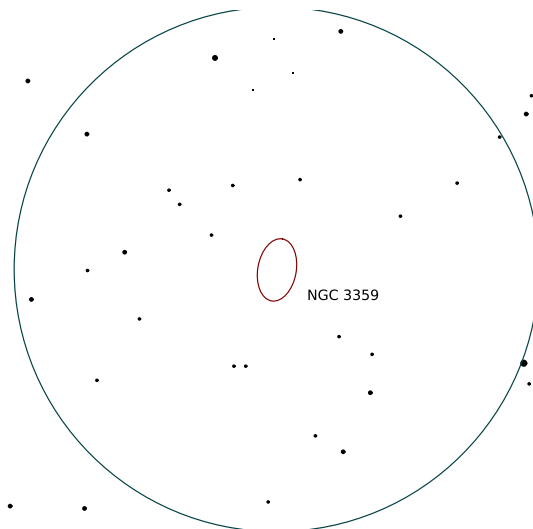
SAC: H V 52



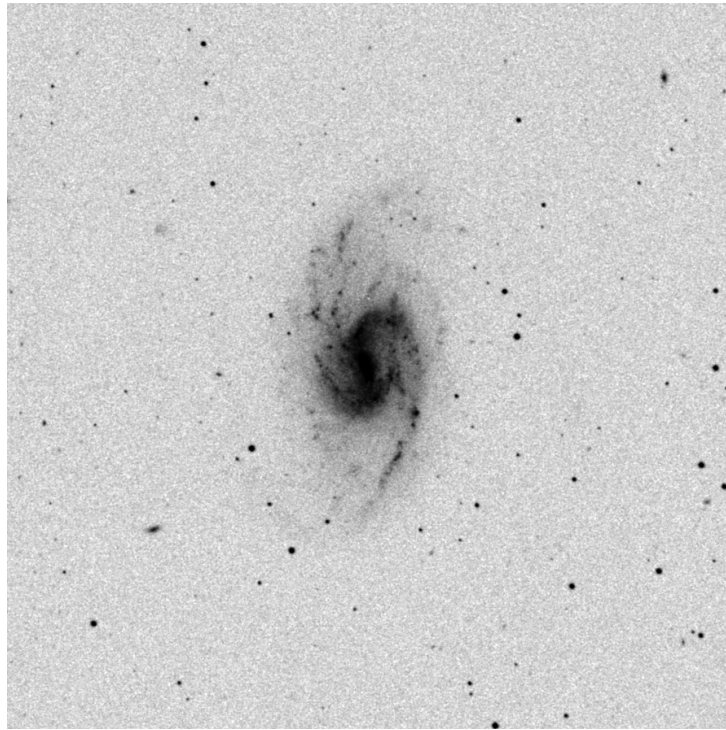
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

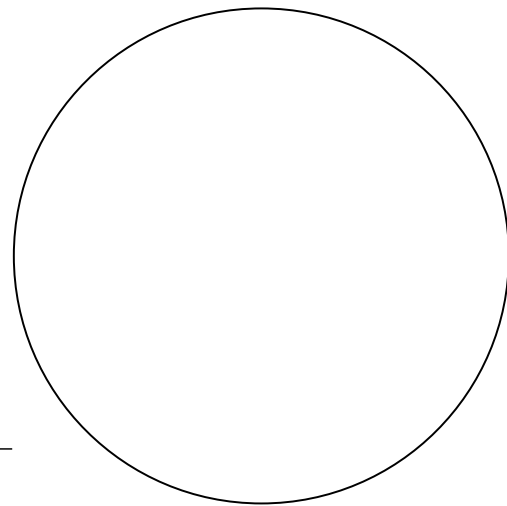
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

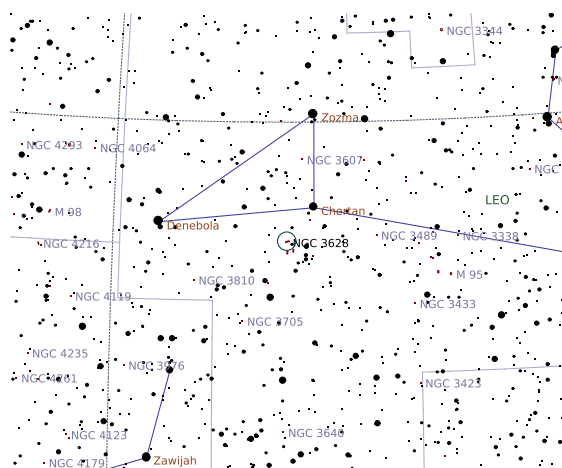
NGC 3628

Galaxy in Leo

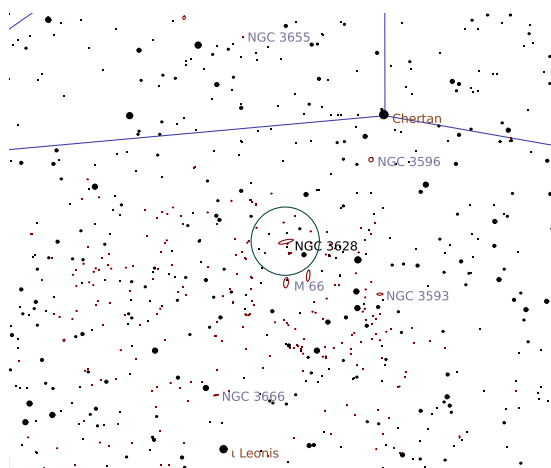
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 11 ^h 20 ^m 59 ^s | Declination (current) | 13° 30' 49" |
| Right Ascension (J2000.0) | 11 ^h 20 ^m 16 ^s | Declination (J2000.0) | 13° 35' 24" |
| Size | 13.1' × 3.1' | Position Angle | -14° |
| Magnitude | 9.5 | Other Designation | — |

Description: Dreyer: pB;vL;vmE 102

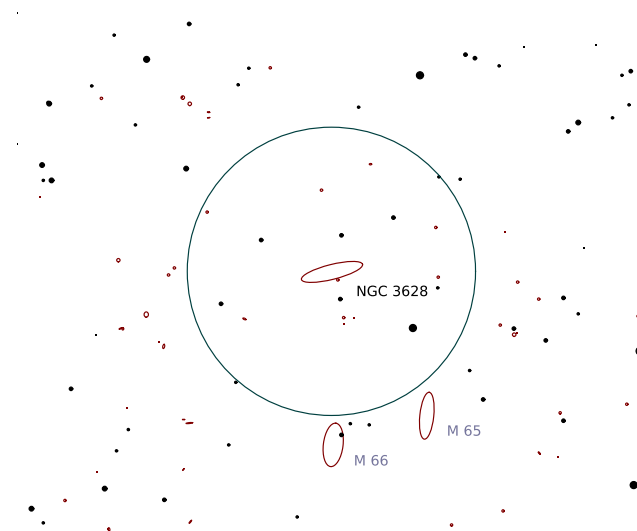
SAC: H V 8;Leo group;disturbed



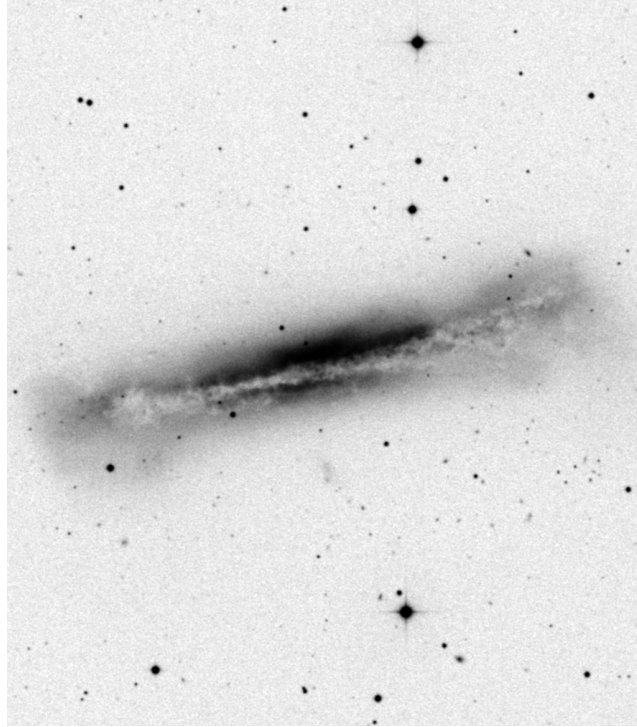
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 17.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

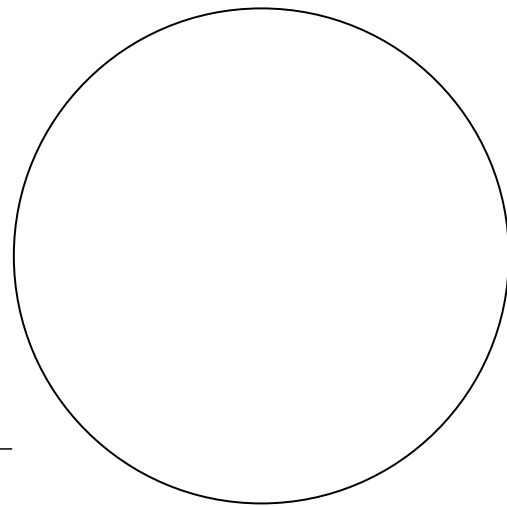
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

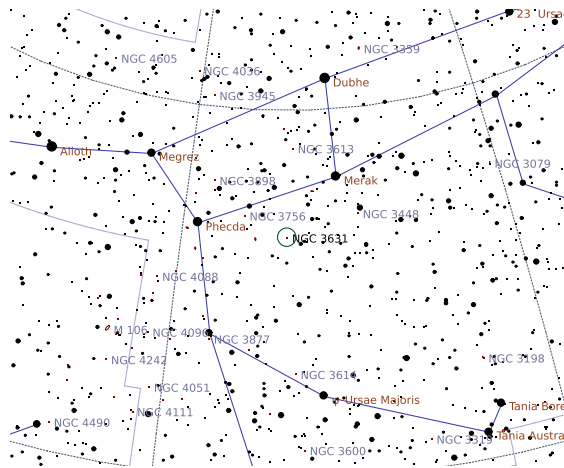
NGC 3631

Galaxy in Ursa Major

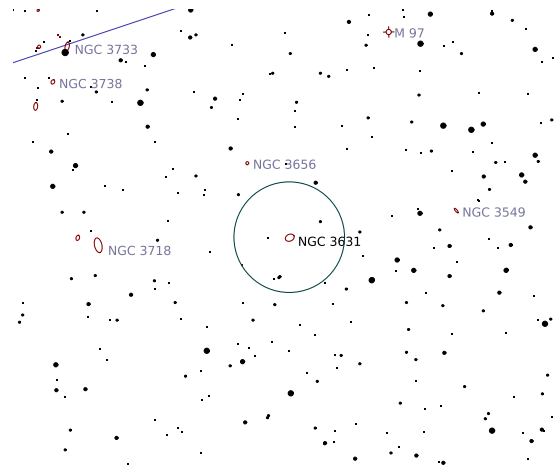
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 11 ^h 21 ^m 48 ^s | Declination (current) | 53° 05' 33" |
| Right Ascension (J2000.0) | 11 ^h 21 ^m 02 ^s | Declination (J2000.0) | 53° 10' 11" |
| Size | 5' × 3.7' | Position Angle | -24° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;L;R;svmbMrN

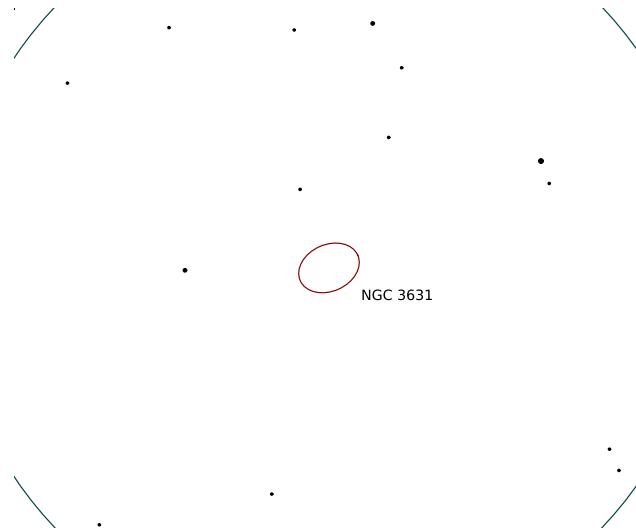
SAC: H I 226;SN 1964a;UGC 6360;Arp 27



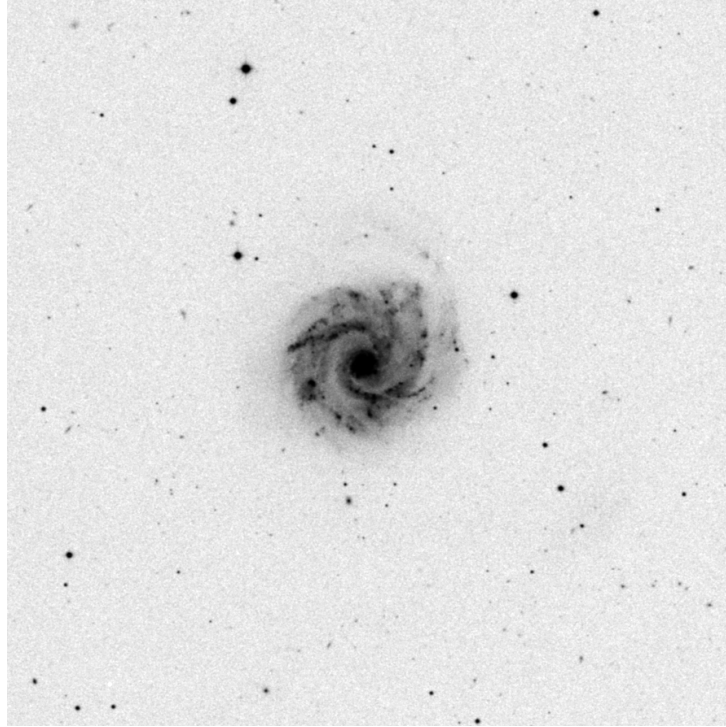
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

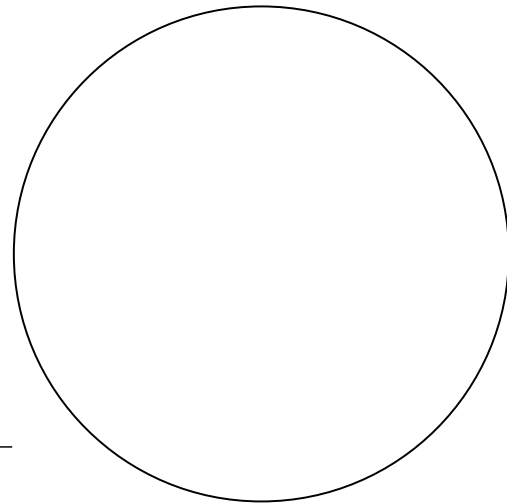
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

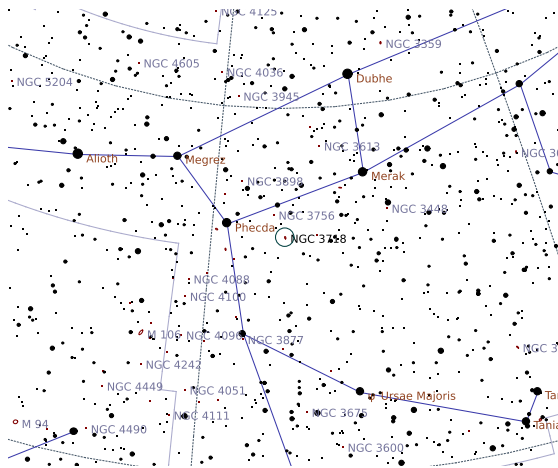
NGC 3718

Galaxy in Ursa Major

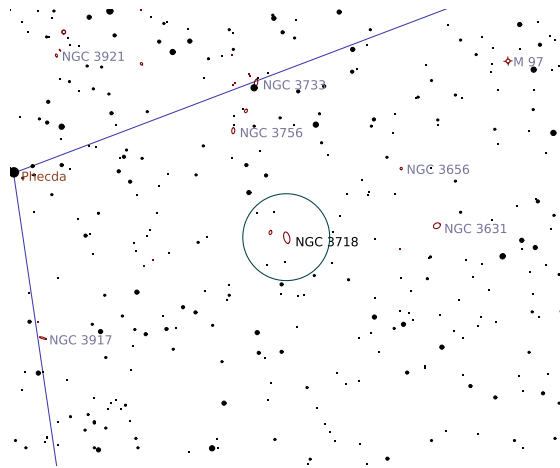
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 11 ^h 33 ^m 19 ^s | Declination (current) | 52° 59' 21" |
| Right Ascension (J2000.0) | 11 ^h 32 ^m 34 ^s | Declination (J2000.0) | 53° 04' 02" |
| Size | 8.1' × 4' | Position Angle | 75° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;vL;R;vglbM

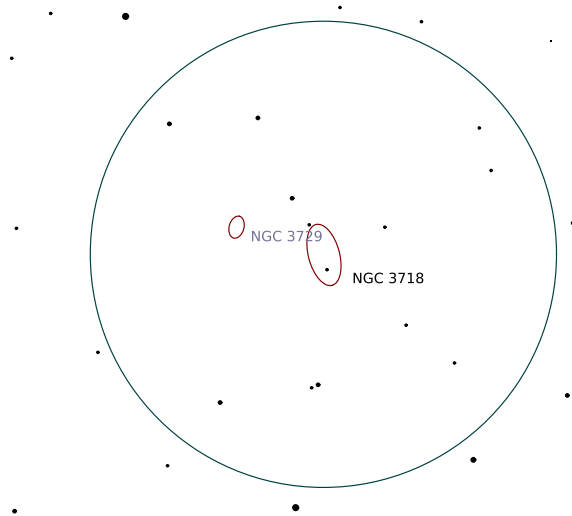
SAC: H I 221;P w NGC 3729 at 11.5'ENE;cent dust lane sprl arms



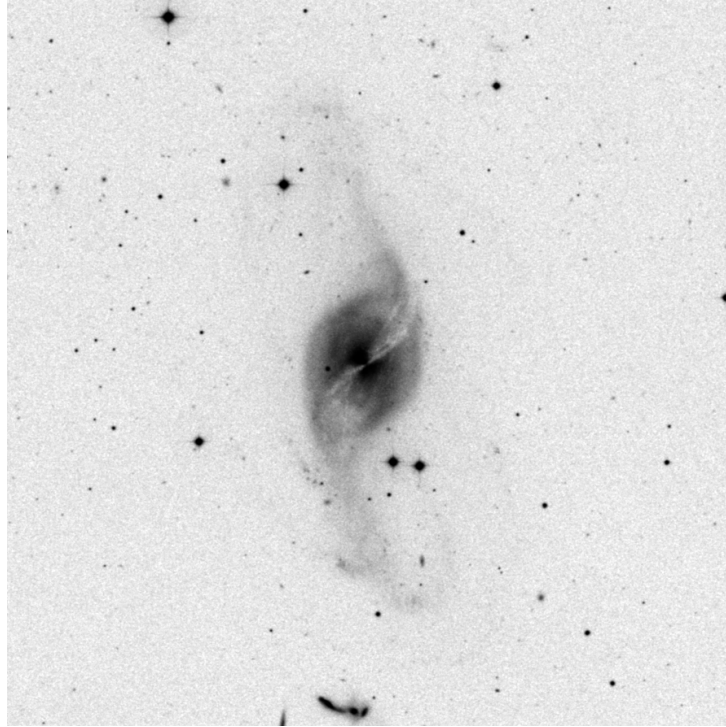
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

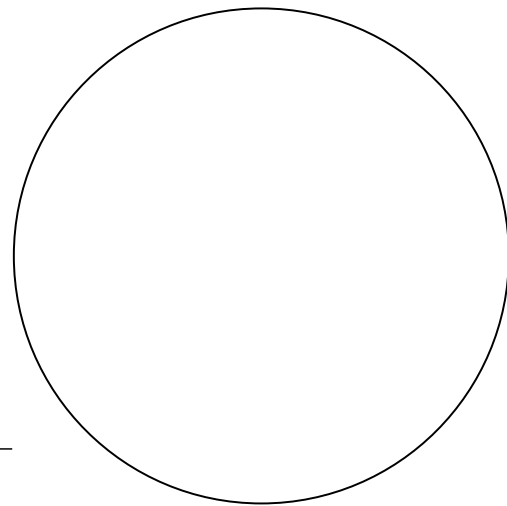
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

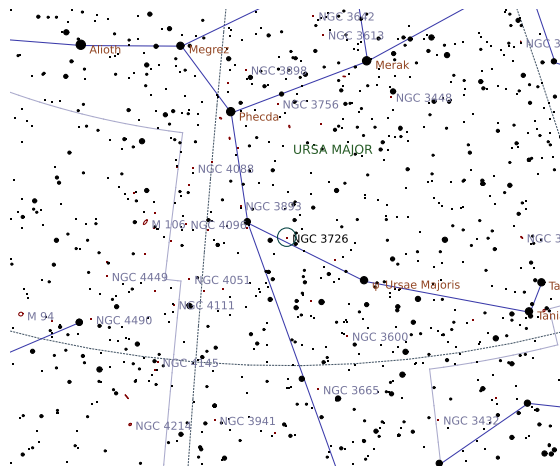
NGC 3726

Galaxy in Ursa Major

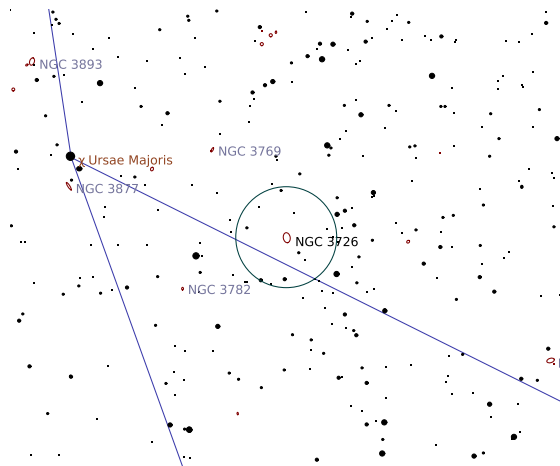
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 11 ^h 34 ^m 04 ^s | Declination (current) | 46° 56' 59" |
| Right Ascension (J2000.0) | 11 ^h 33 ^m 20 ^s | Declination (J2000.0) | 47° 01' 40" |
| Size | 6' × 4.1' | Position Angle | 80° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;vL;1E 0;vsmbM *15;*11 n

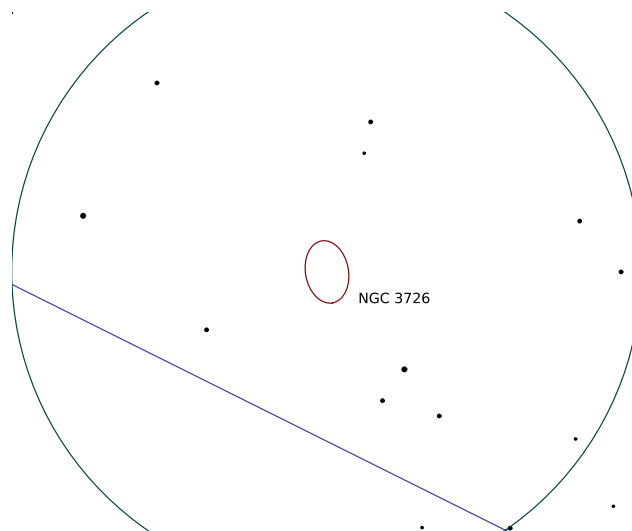
SAC: H II 730;well defined spiral pattern



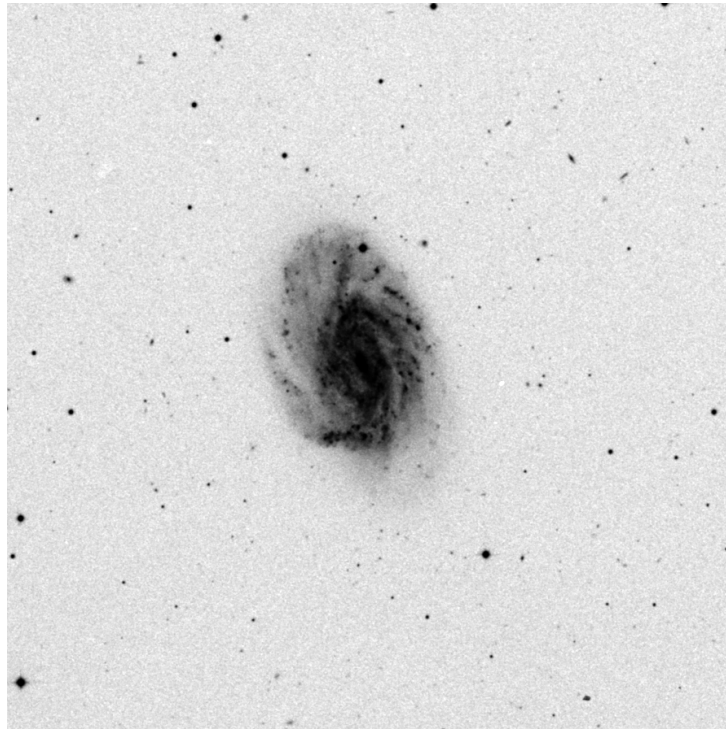
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

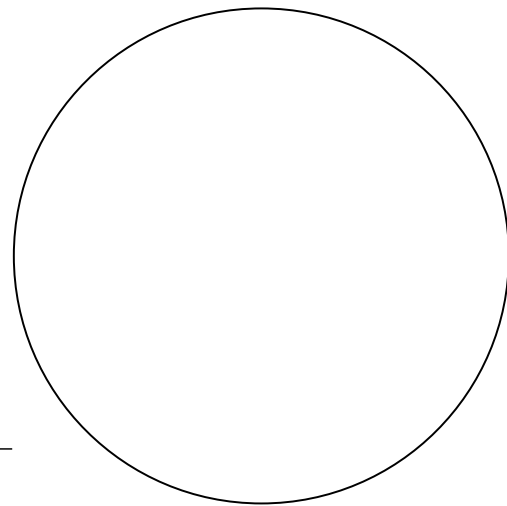
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

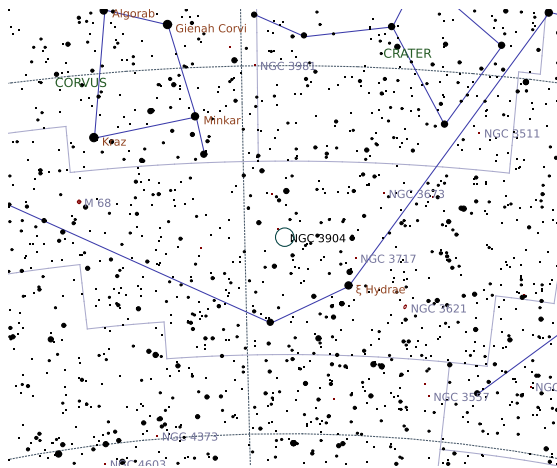
NGC 3904

Galaxy in Hydra

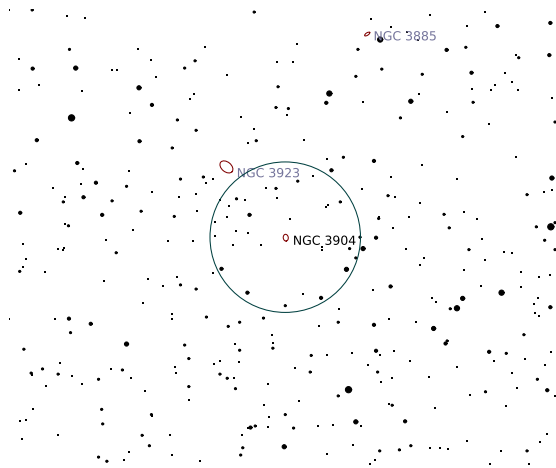
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 11 ^h 49 ^m 55 ^s | Declination (current) | −29° 21′ 05″ |
| Right Ascension (J2000.0) | 11 ^h 49 ^m 13 ^s | Declination (J2000.0) | −29° 16′ 37″ |
| Size | 2.7′ × 2′ | Position Angle | 82° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;S;R;mbM

SAC: H II 864



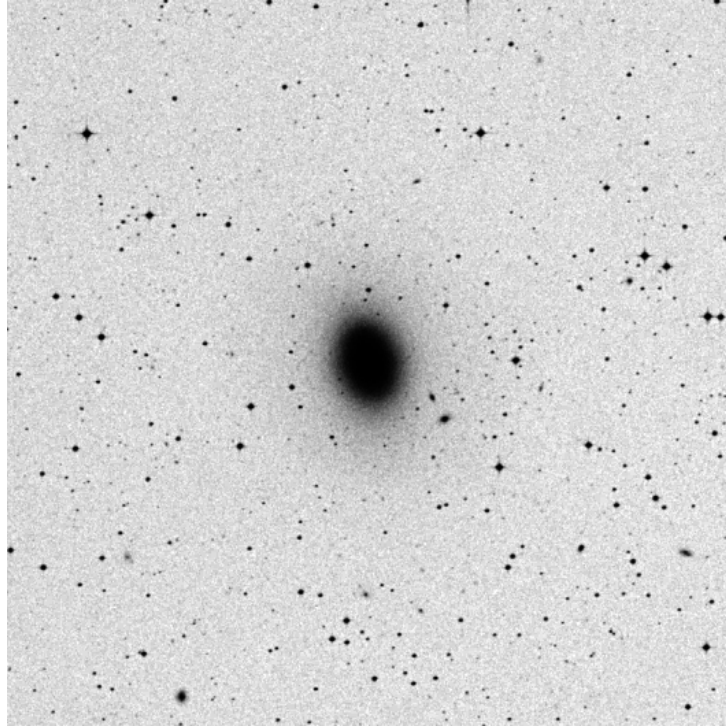
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

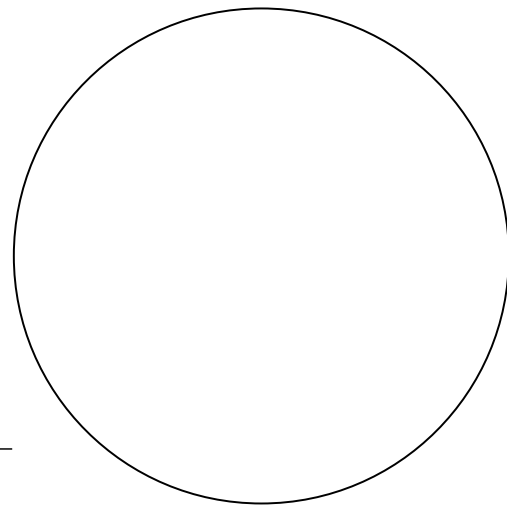
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

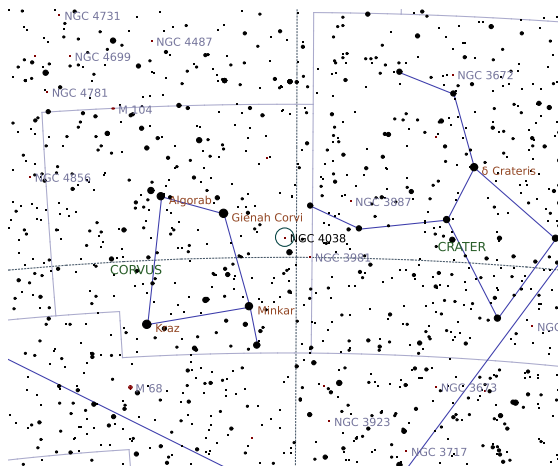
NGC 4038 (Antennae Galaxies)

Galaxy in Corvus

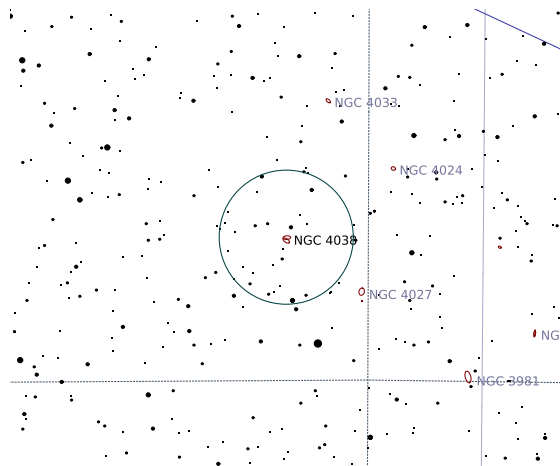
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 12 ^h 02 ^m 34 ^s | Declination (current) | -18° 56' 22" |
| Right Ascension (J2000.0) | 12 ^h 01 ^m 52 ^s | Declination (J2000.0) | -18° 51' 52" |
| Size | 3.4' × 1.7' | Position Angle | -4° |
| Magnitude | 10 | Other Designation | - |

Description: Dreyer: pB;cL;R;vgbM

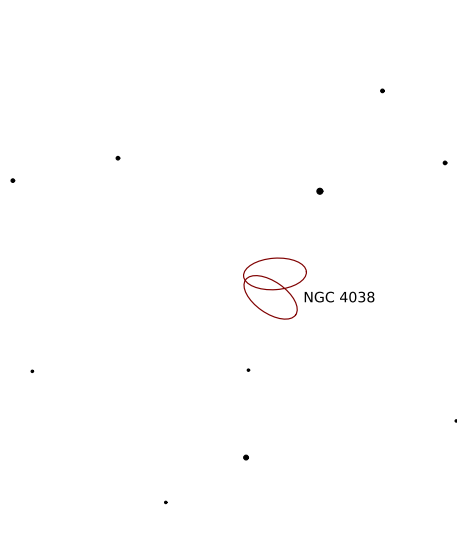
SAC: H IV 28;Ringtail Galaxy;two filaments



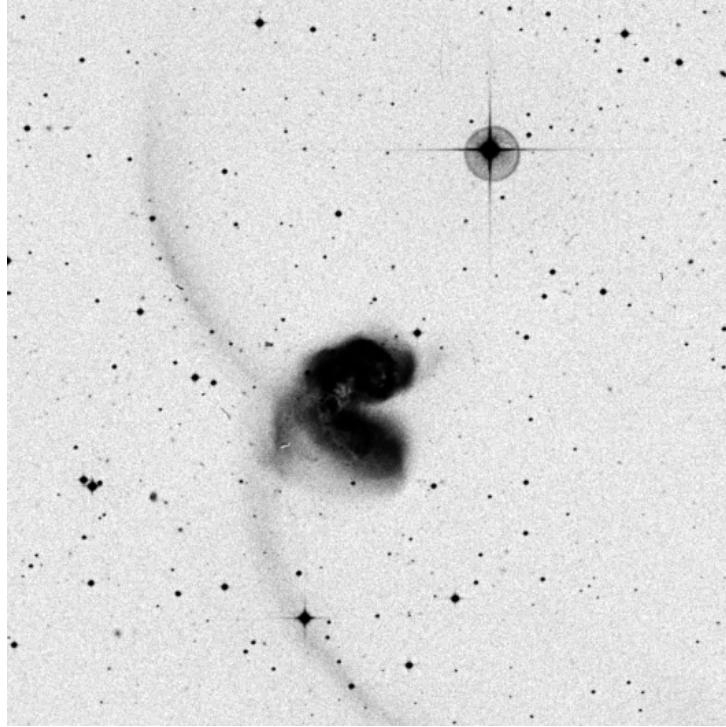
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

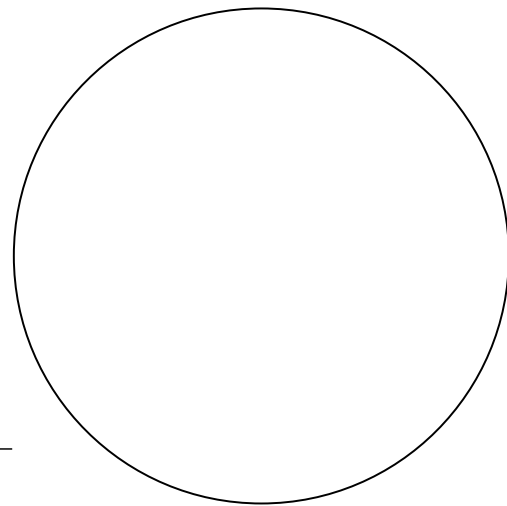
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

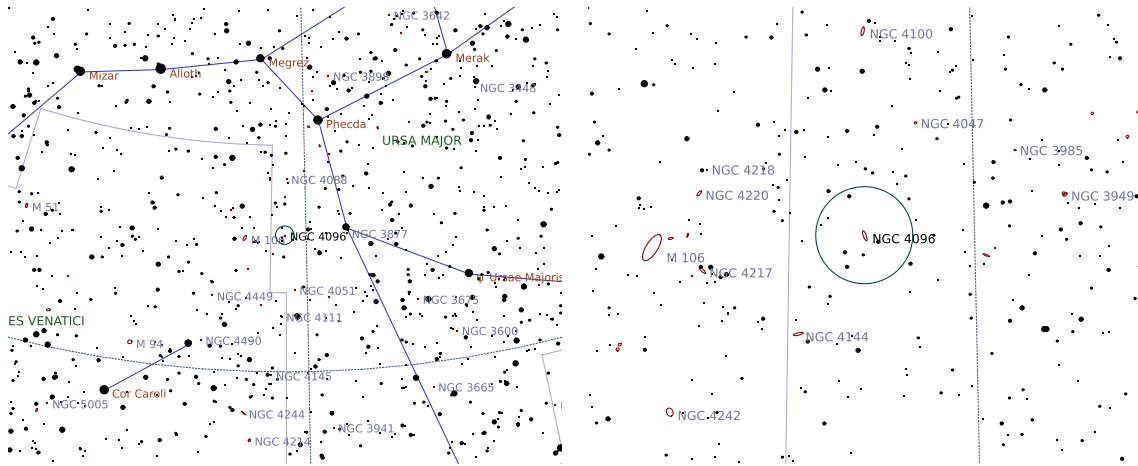
NGC 4096

Galaxy in Ursa Major

| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 06 ^m 41 ^s | Declination (current) | 47° 23' 50" |
| Right Ascension (J2000.0) | 12 ^h 06 ^m 00 ^s | Declination (J2000.0) | 47° 28' 33" |
| Size | 6.5' × 1.8' | Position Angle | 70° |
| Magnitude | 11 | Other Designation | — |

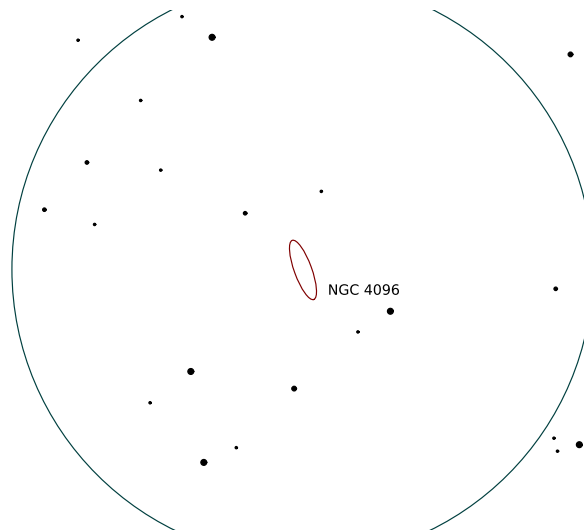
Description: Dreyer: pB;vL;mE32;sBN or bar

SAC: H I 207;nearly edge on

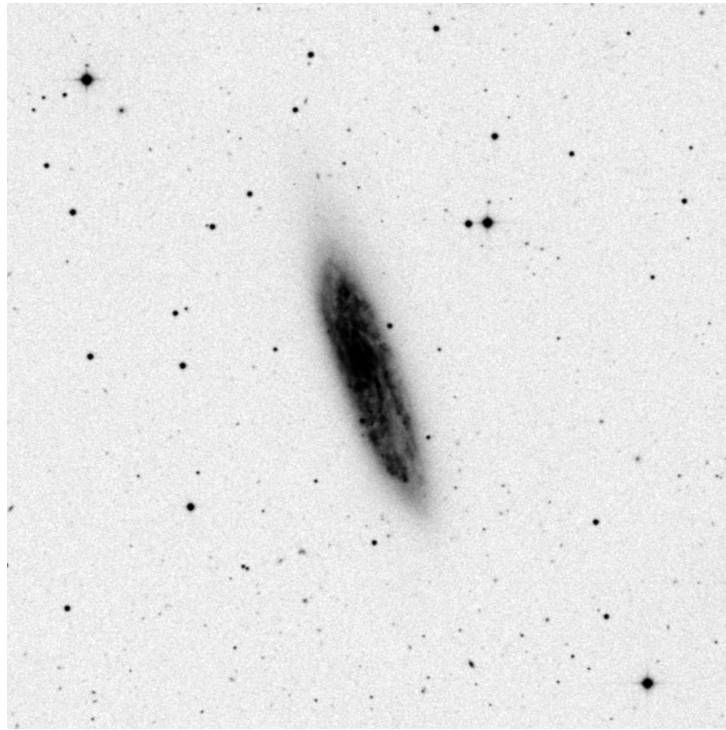


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

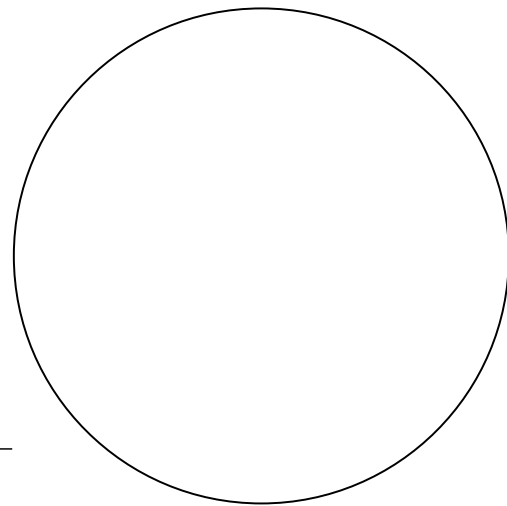
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



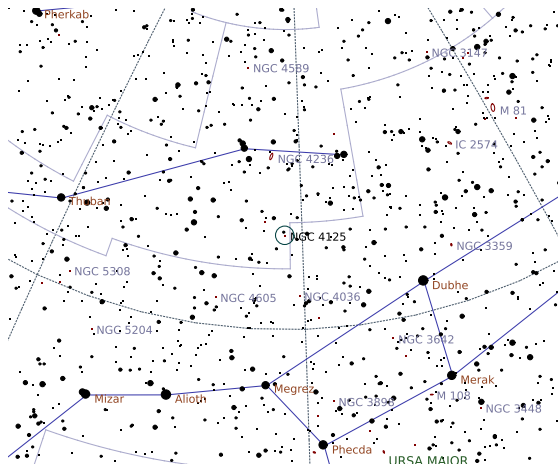
Sketch

NGC 4125

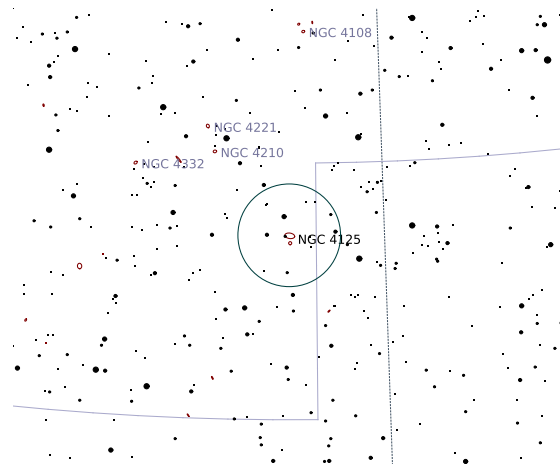
Galaxy in Draco

| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 08 ^m 46 ^s | Declination (current) | 65° 05' 44" |
| Right Ascension (J2000.0) | 12 ^h 08 ^m 05 ^s | Declination (J2000.0) | 65° 10' 28" |
| Size | 5.8' × 3.2' | Position Angle | 9° |
| Magnitude | 9.7 | Other Designation | — |

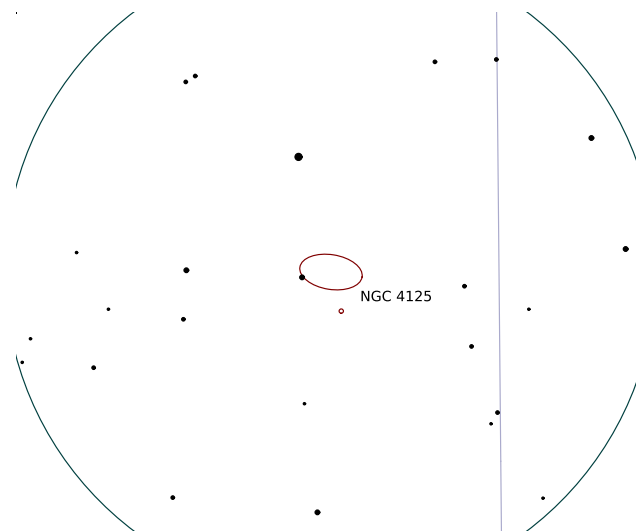
Description: Dreyer: pB;pL;cE;mbM



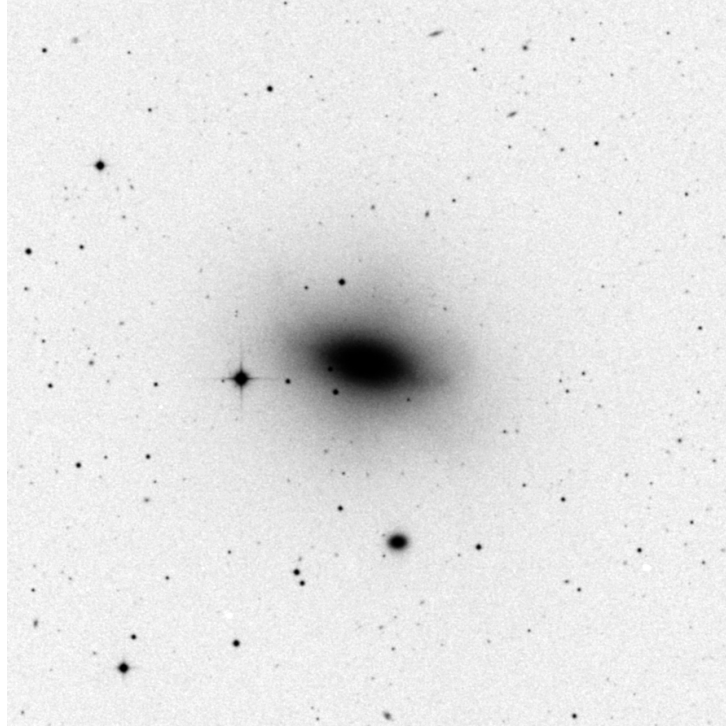
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

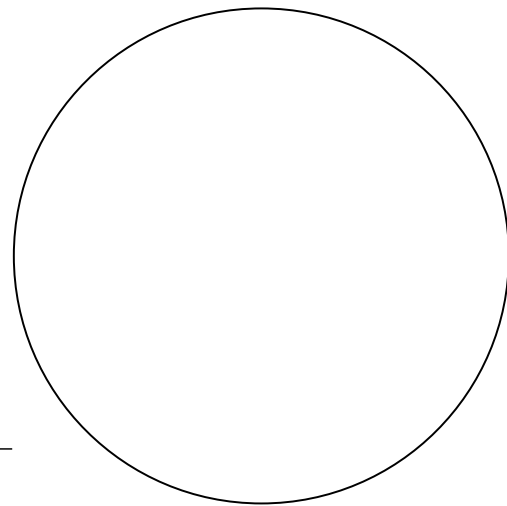
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

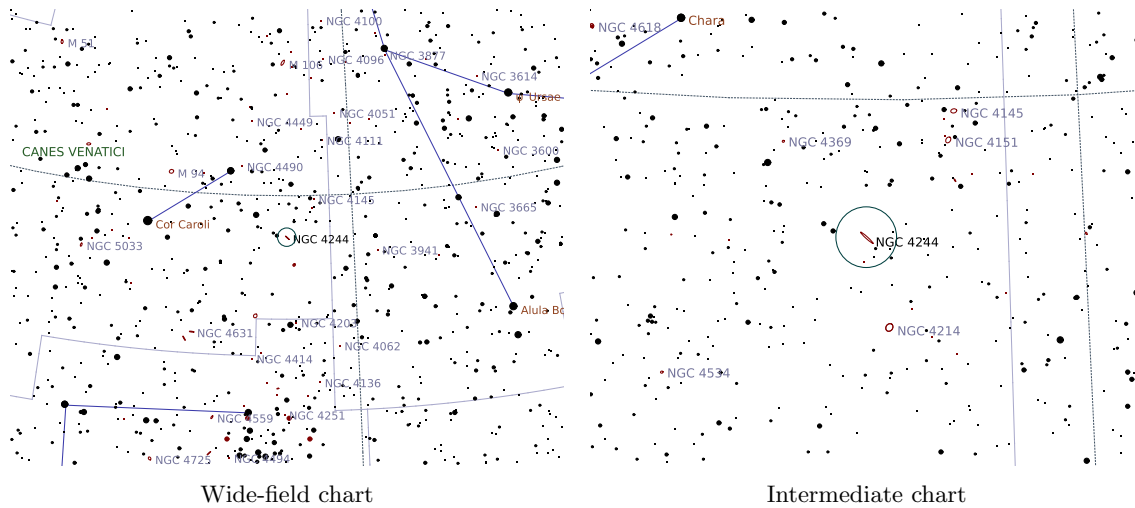
NGC 4244

Galaxy in Canes Venatici

| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 18 ^m 10 ^s | Declination (current) | 37° 43' 46" |
| Right Ascension (J2000.0) | 12 ^h 17 ^m 29 ^s | Declination (J2000.0) | 37° 48' 28" |
| Size | 16.6' × 1.9' | Position Angle | 42° |
| Magnitude | 10 | Other Designation | — |

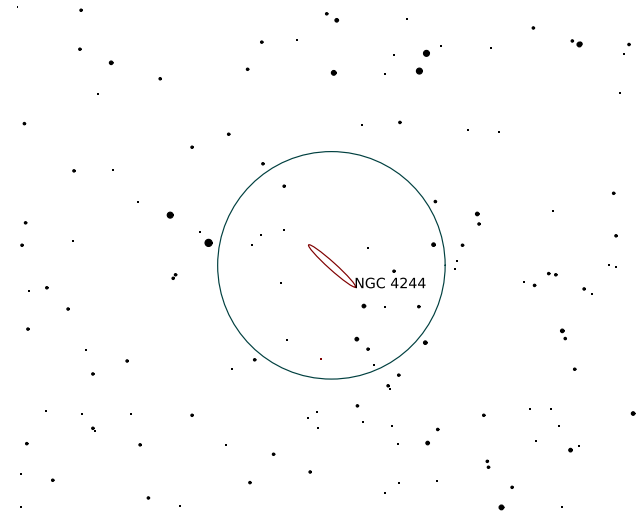
Description: Dreyer: pB;vL;eE43;vgbM;vsBN or *?

SAC: H V 41

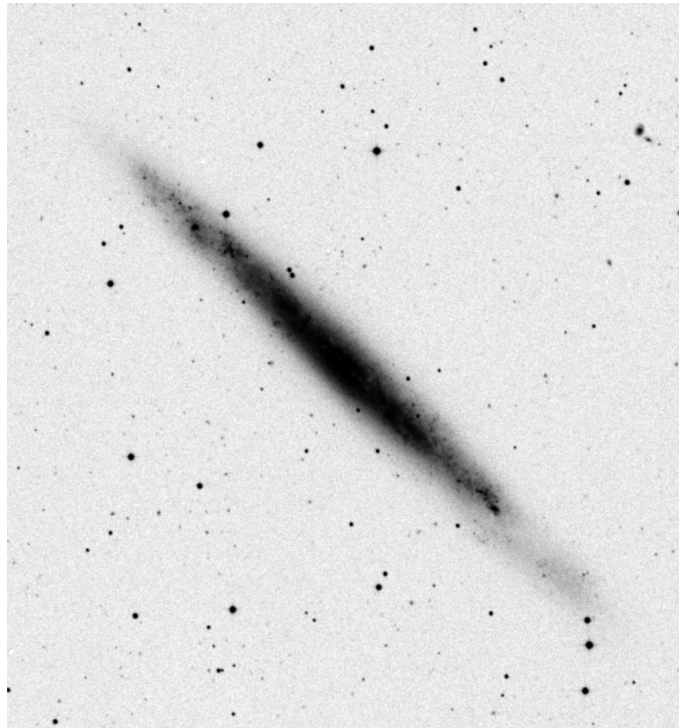


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (17.5' × 18.6')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

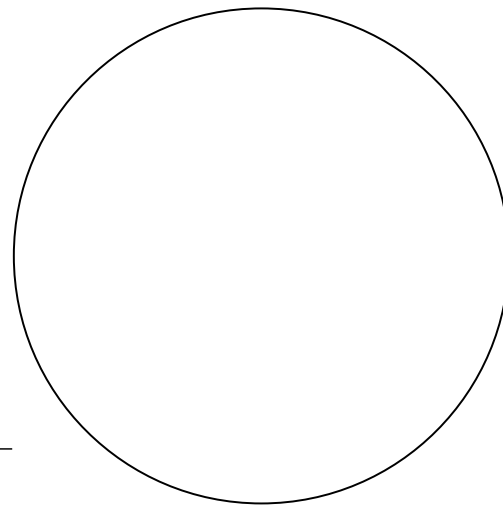
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

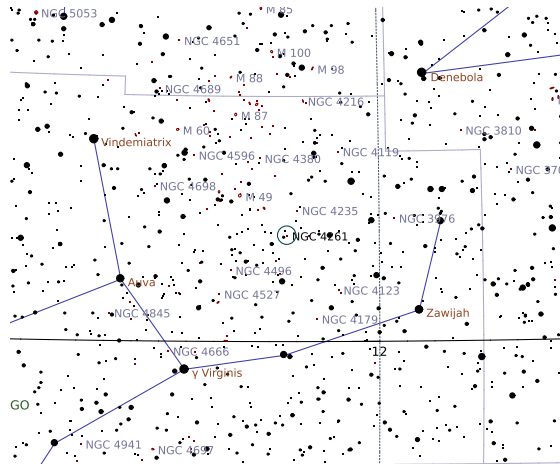
NGC 4261

Galaxy in Virgo

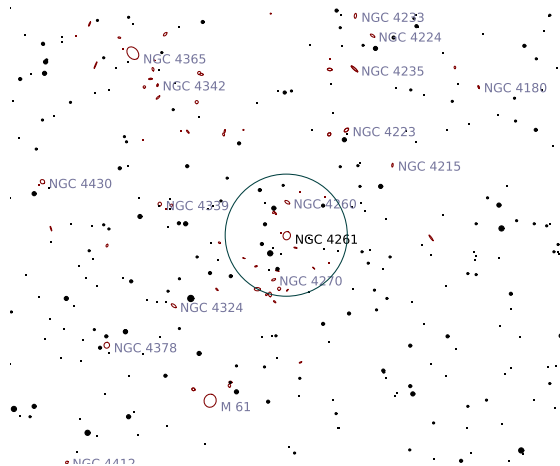
| | | | |
|---------------------------|---|-----------------------|------------|
| Right Ascension (current) | 12 ^h 20 ^m 04 ^s | Declination (current) | 5° 44' 52" |
| Right Ascension (J2000.0) | 12 ^h 19 ^m 23 ^s | Declination (J2000.0) | 5° 49' 28" |
| Size | 4.1' × 3.6' | Position Angle | -70° |
| Magnitude | 10 | Other Designation | - |

Description: Dreyer: pB;pS;R;gbM

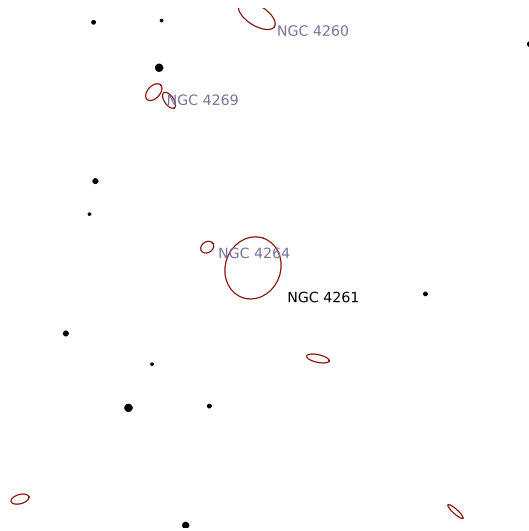
SAC: H II 139;NGC 4264 @ 3.4';NGC 4257 @ 7.1';UGC 7360;3C270



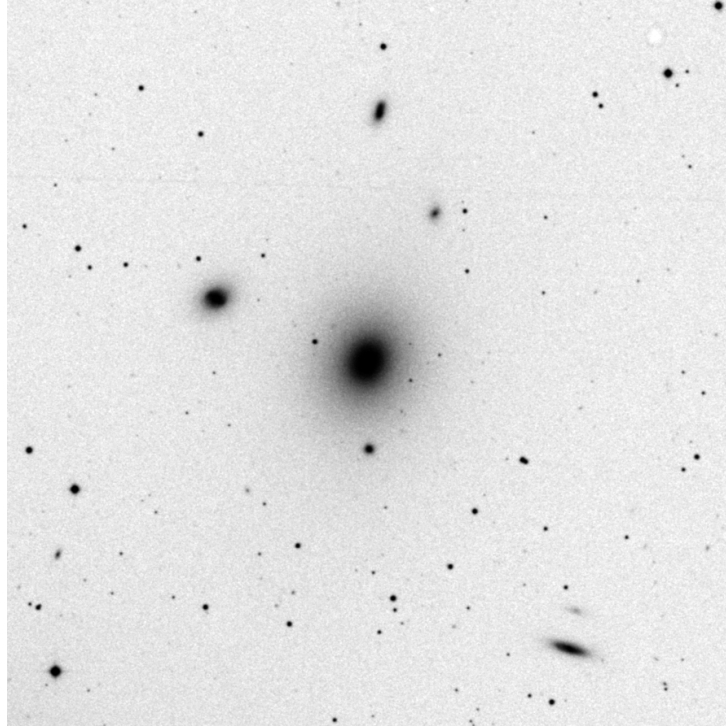
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

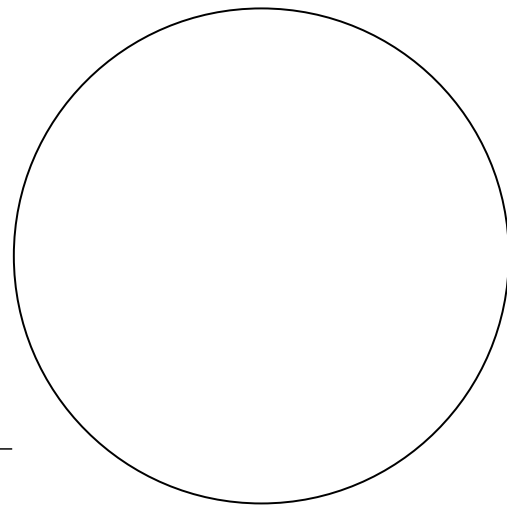
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

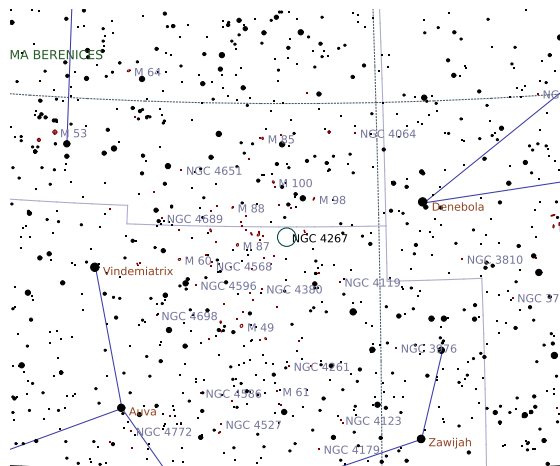
NGC 4267

Galaxy in Virgo

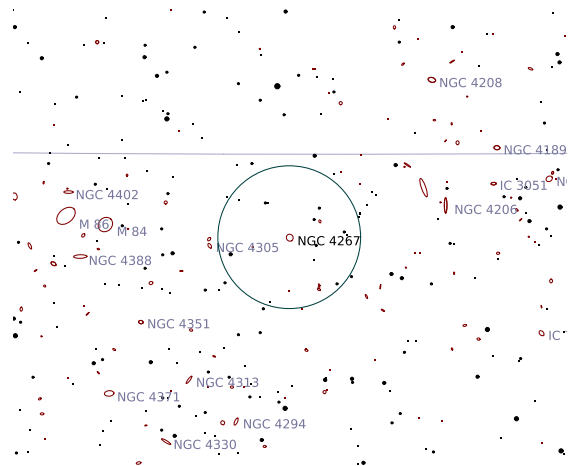
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 20 ^m 26 ^s | Declination (current) | 12° 43' 17" |
| Right Ascension (J2000.0) | 12 ^h 19 ^m 45 ^s | Declination (J2000.0) | 12° 47' 54" |
| Size | 3' × 2.8' | Position Angle | 57° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;vS;R;vsmbM

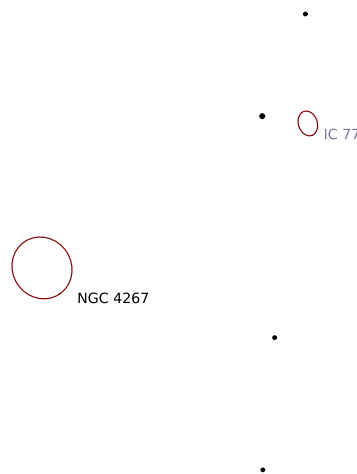
SAC: H II 166



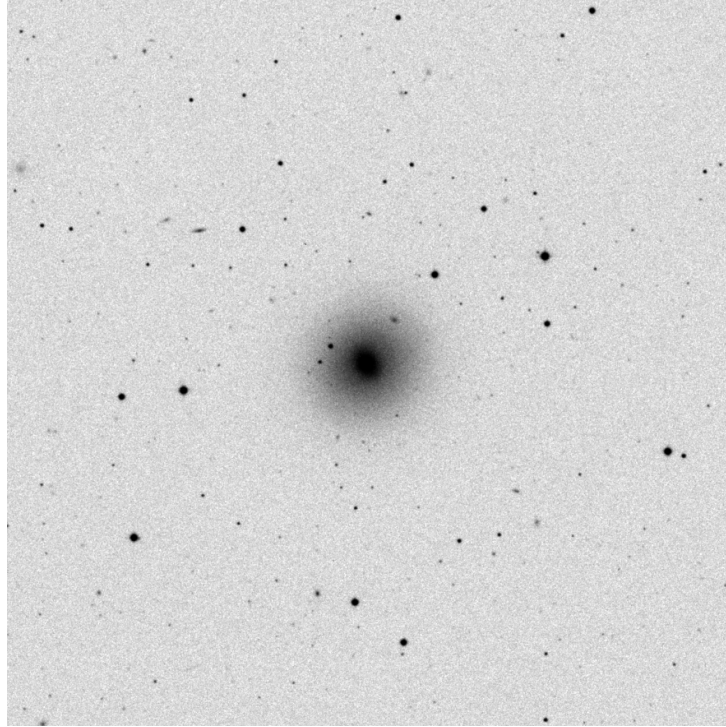
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

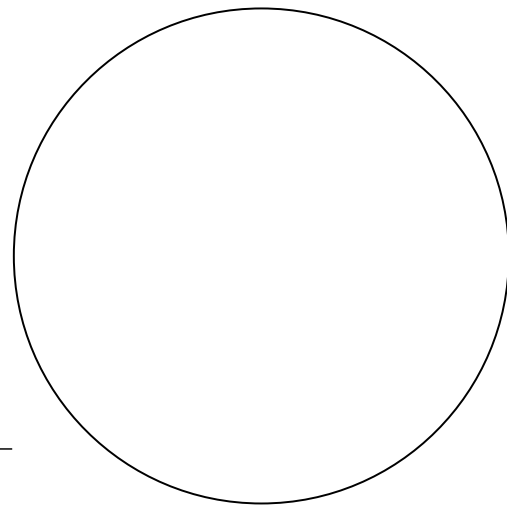
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



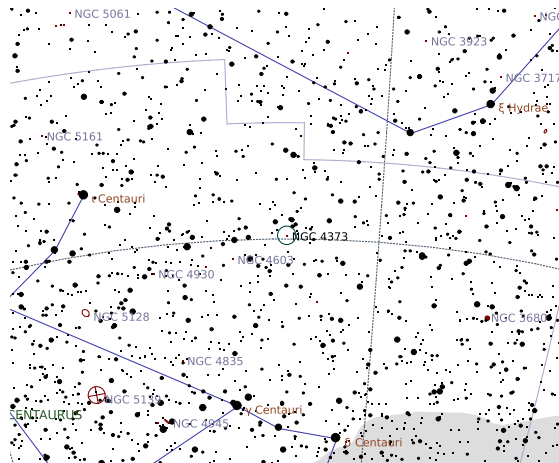
Sketch

NGC 4373

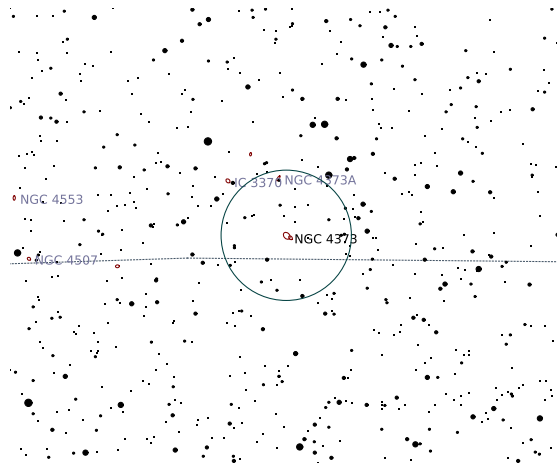
Galaxy in Centaurus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 12 ^h 26 ^m 01 ^s | Declination (current) | −39° 50′ 00″ |
| Right Ascension (J2000.0) | 12 ^h 25 ^m 17 ^s | Declination (J2000.0) | −39° 45′ 38″ |
| Size | 3.6′ × 2.6′ | Position Angle | 47° |
| Magnitude | 11 | Other Designation | — |

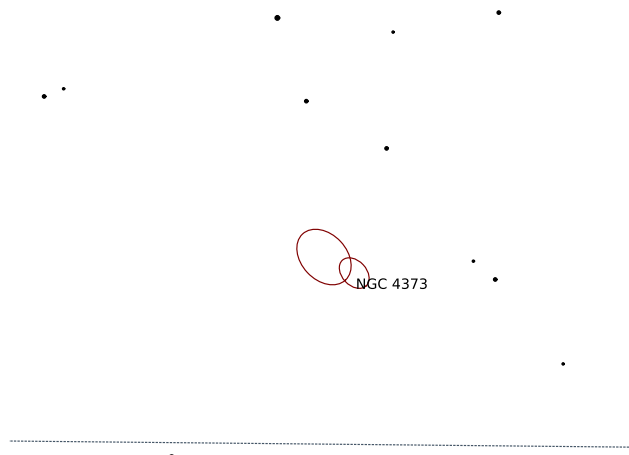
Description: Dreyer: pB;S;R;pgvmbM



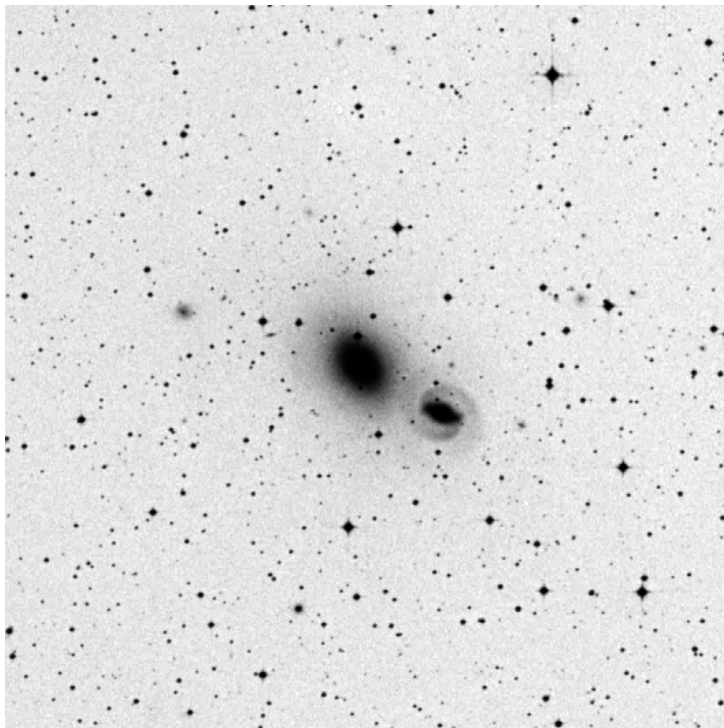
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

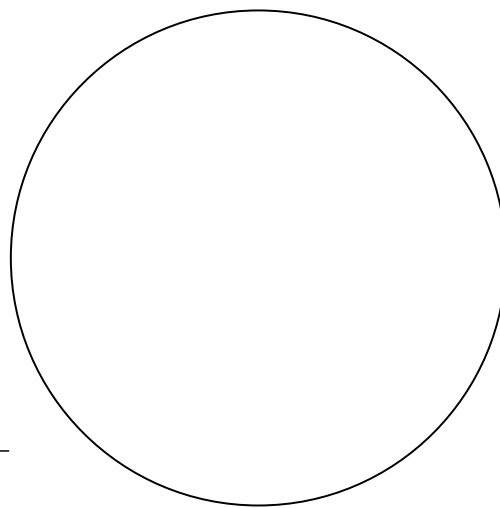
Equipment Details: _____

* Seeing: _____

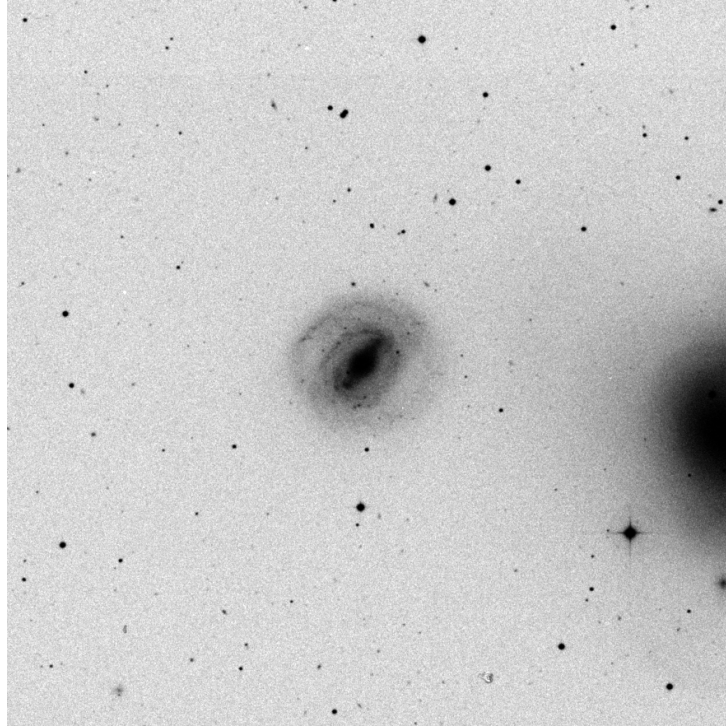
Observation Location: _____

FOV: _____

* Description: _____



Sketch



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

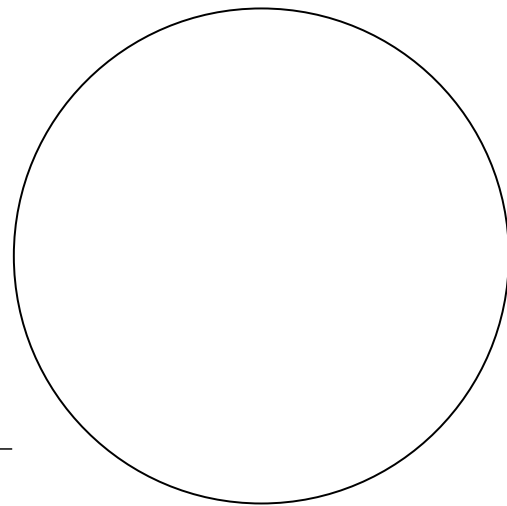
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

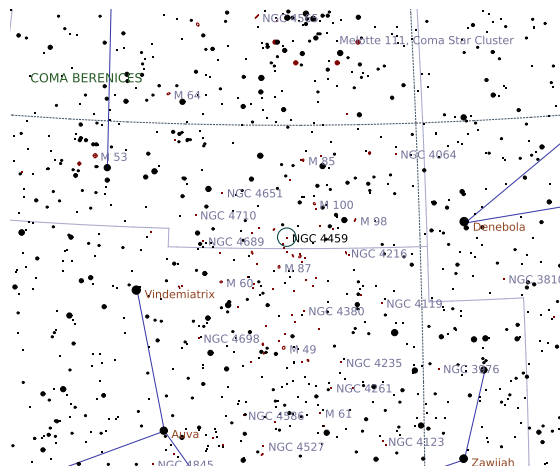
NGC 4459

Galaxy in Coma Berenices

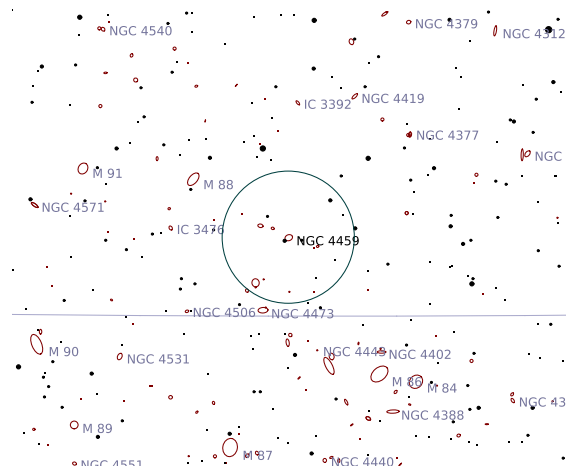
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 29 ^m 41 ^s | Declination (current) | 13° 54' 07" |
| Right Ascension (J2000.0) | 12 ^h 29 ^m 00 ^s | Declination (J2000.0) | 13° 58' 43" |
| Size | 3.5' × 2.7' | Position Angle | −20° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;pL;iR;bM;r;*8 sf 2'

SAC: H I 161;comp @ 2.2';NGC 4468 @ 8.5';NGC 4474 @ 13.5'



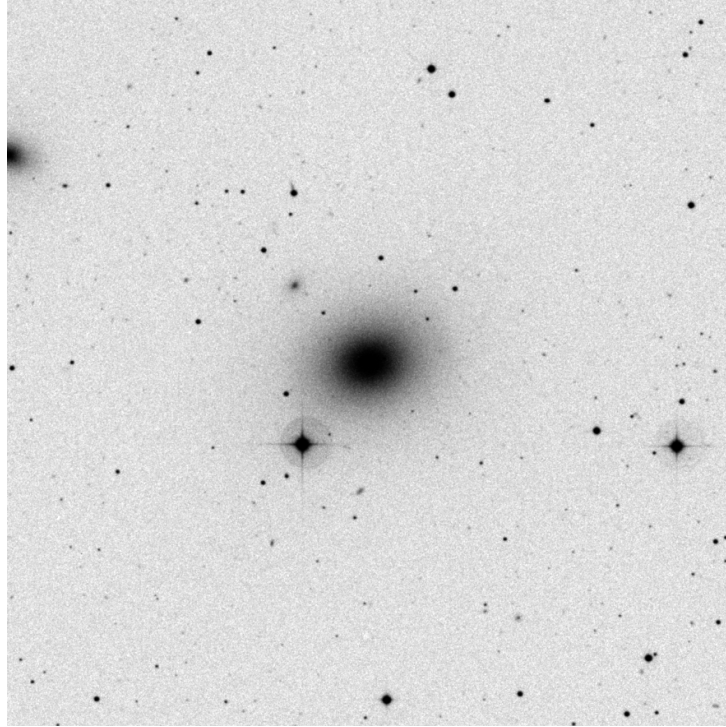
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

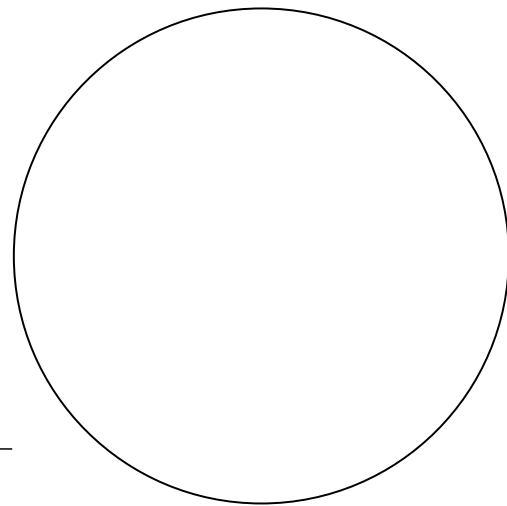
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

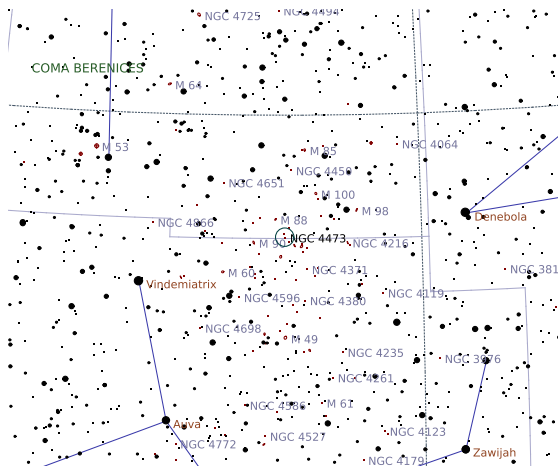
NGC 4473 (Markarian Chain)

Galaxy in Coma Berenices

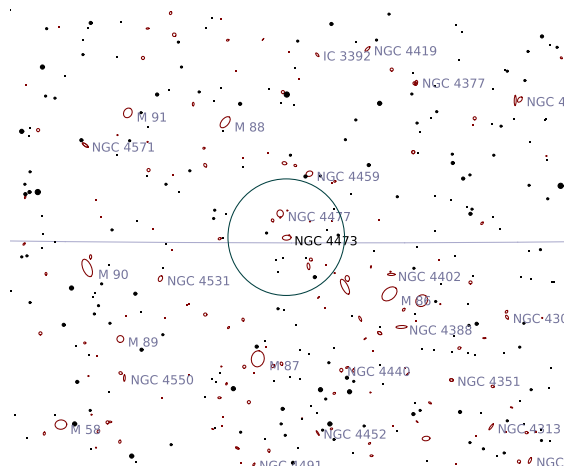
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 30 ^m 29 ^s | Declination (current) | 13° 21' 11" |
| Right Ascension (J2000.0) | 12 ^h 29 ^m 48 ^s | Declination (J2000.0) | 13° 25' 47" |
| Size | 4.5' × 2.5' | Position Angle | -4° |
| Magnitude | 10 | Other Designation | - |

Description: Dreyer: pB

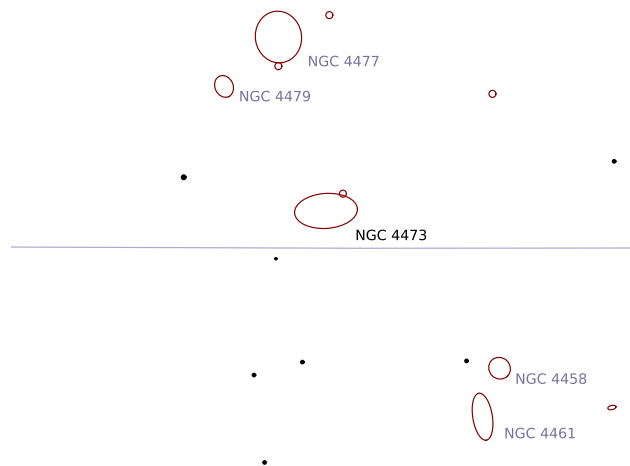
SAC: H II 114; Markarian's chain



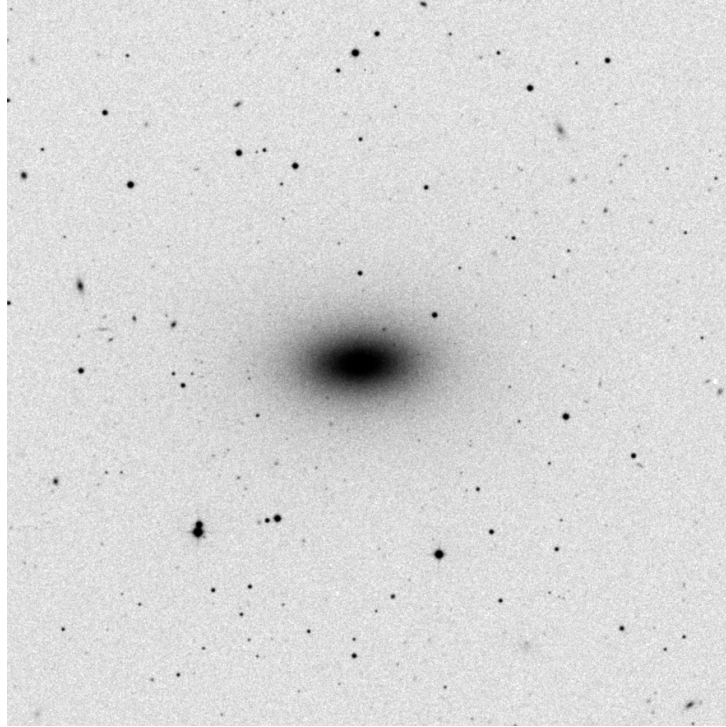
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

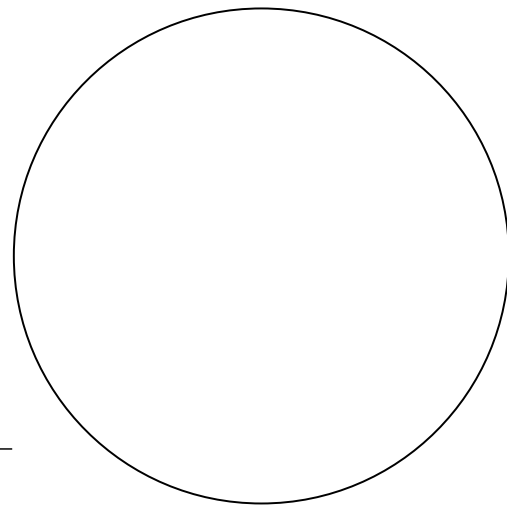
Equipment Details: _____

* Seeing: _____

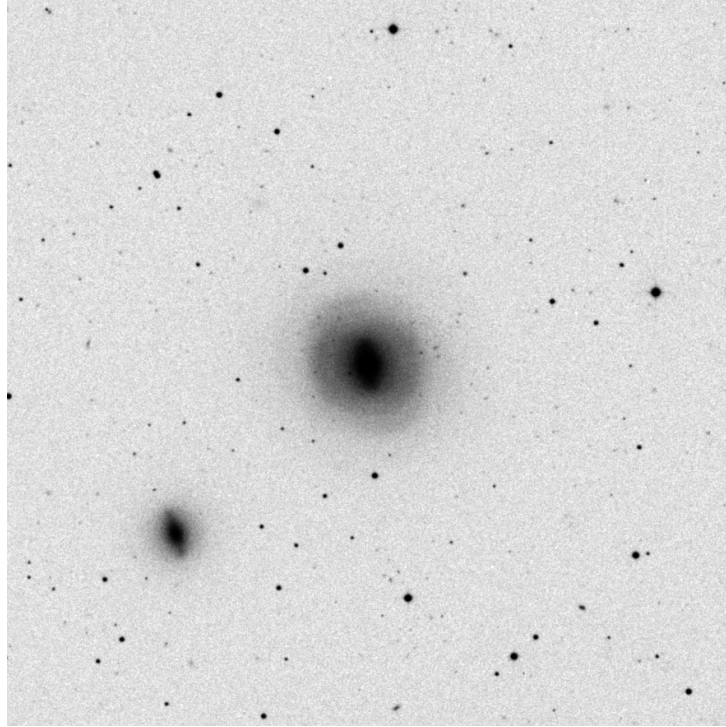
Observation Location: _____

FOV: _____

* Description: _____



Sketch



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

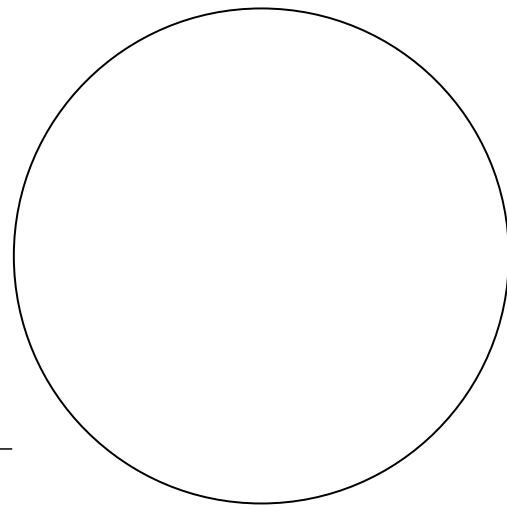
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

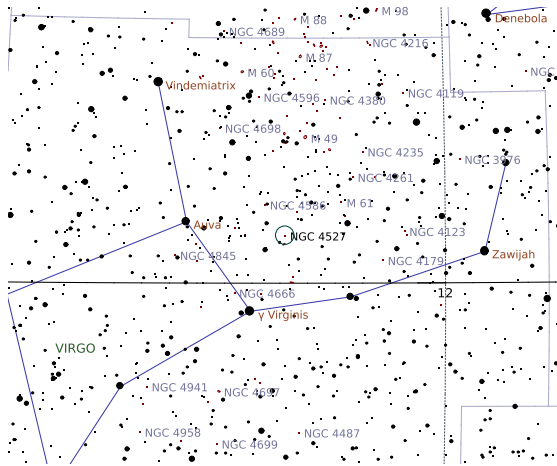
NGC 4527

Galaxy in Virgo

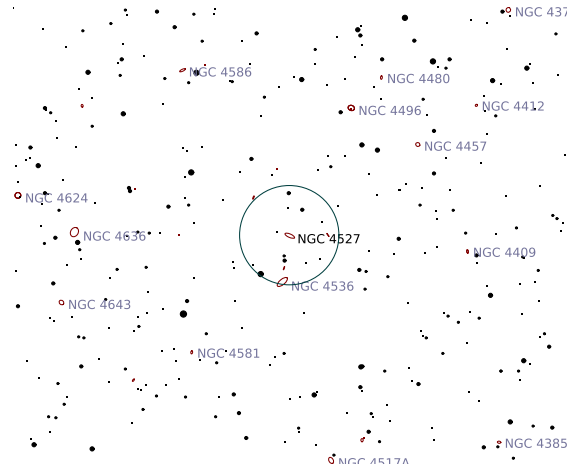
| | | | |
|---------------------------|---|-----------------------|------------|
| Right Ascension (current) | 12 ^h 34 ^m 49 ^s | Declination (current) | 2° 34' 40" |
| Right Ascension (J2000.0) | 12 ^h 34 ^m 08 ^s | Declination (J2000.0) | 2° 39' 12" |
| Size | 6.2' × 2.1' | Position Angle | 23° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;L;pmE69;mbM;vseBN or *

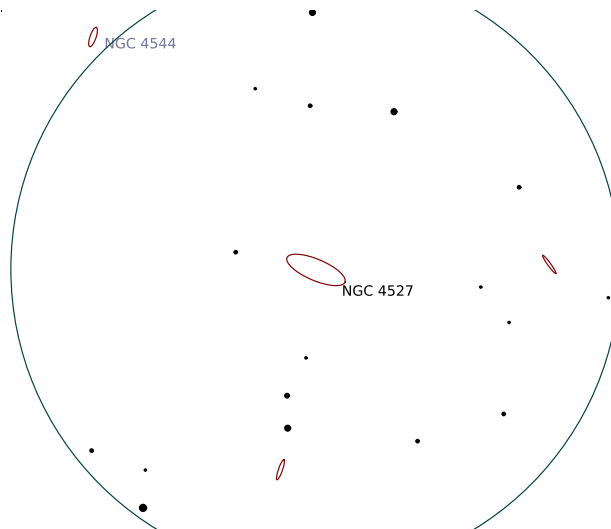
SAC: H II 37;SN 1915a;NGC 4536 @ 29



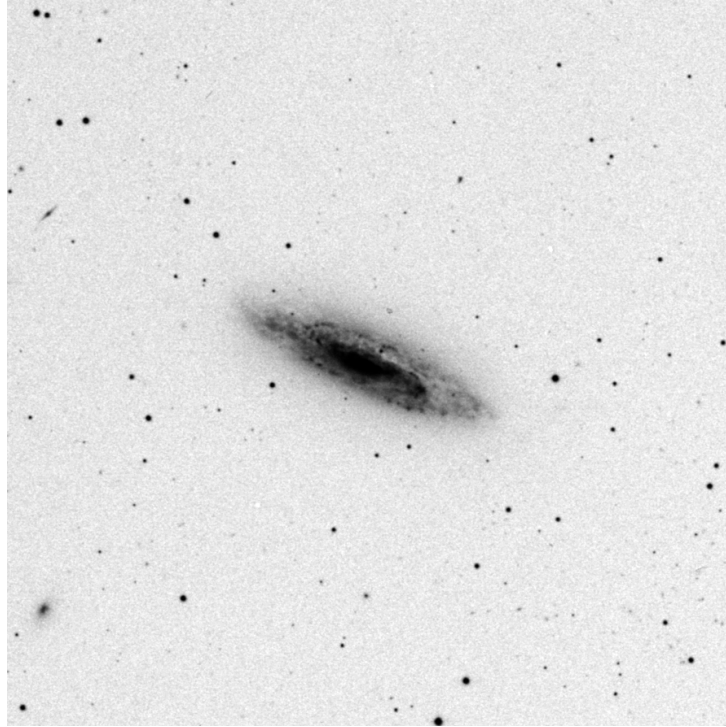
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

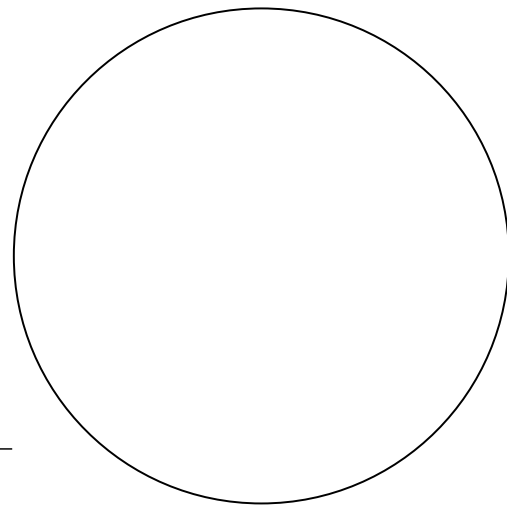
Equipment Details: _____

* Seeing: _____

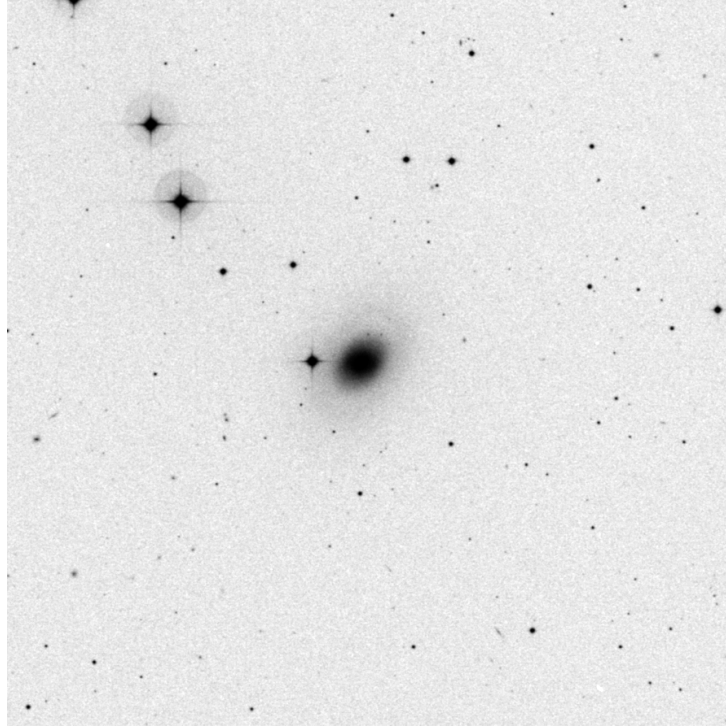
Observation Location: _____

FOV: _____

* Description: _____



Sketch



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

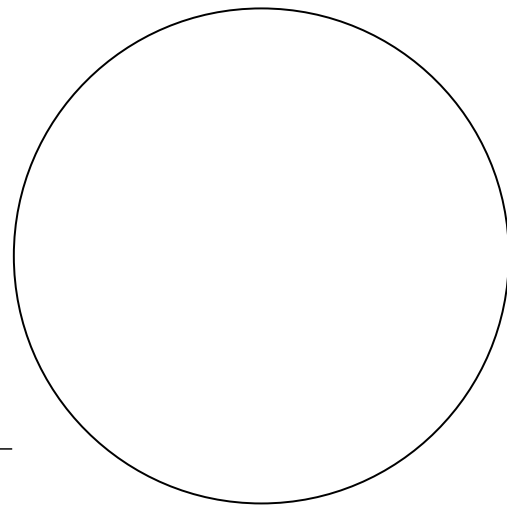
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

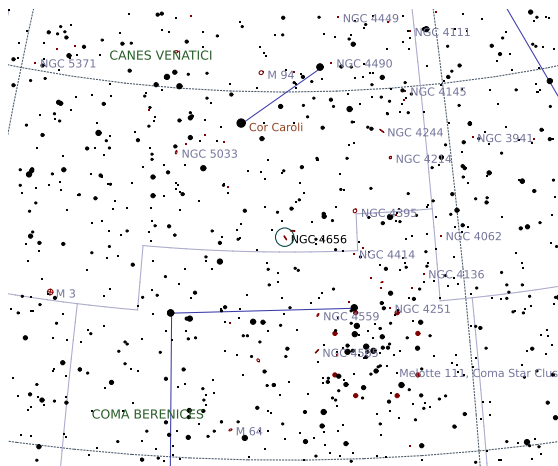
NGC 4656 (Hockey Stick Galaxies)

Galaxy in Canes Venatici

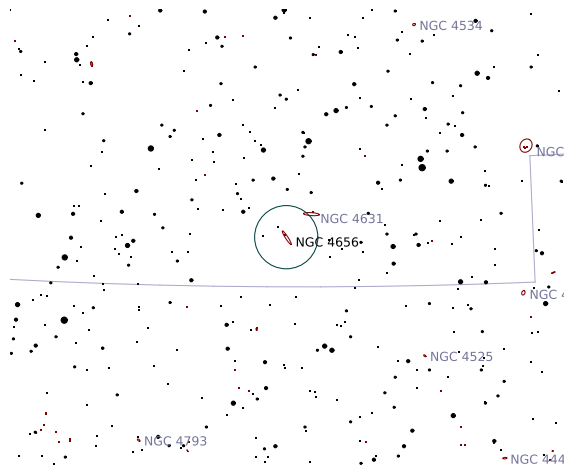
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 12 ^h 44 ^m 37 ^s | Declination (current) | 32° 05' 34" |
| Right Ascension (J2000.0) | 12 ^h 43 ^m 58 ^s | Declination (J2000.0) | 32° 10' 11" |
| Size | 15.3' × 2.4' | Position Angle | 57° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;L;vmE34;sp of 2

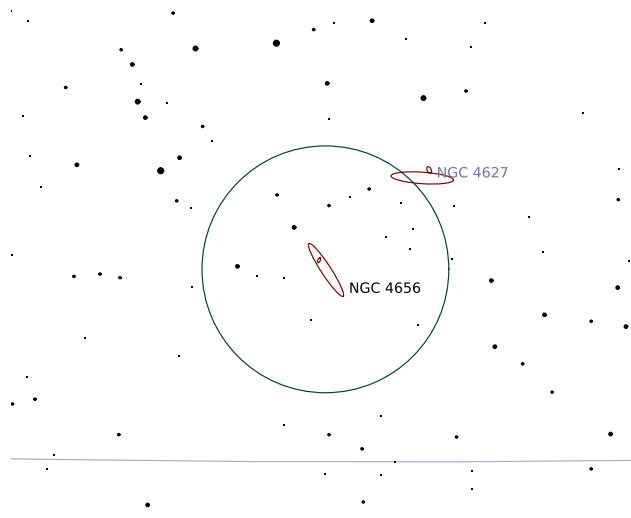
SAC: H I 176;NGC 4657 superimposed



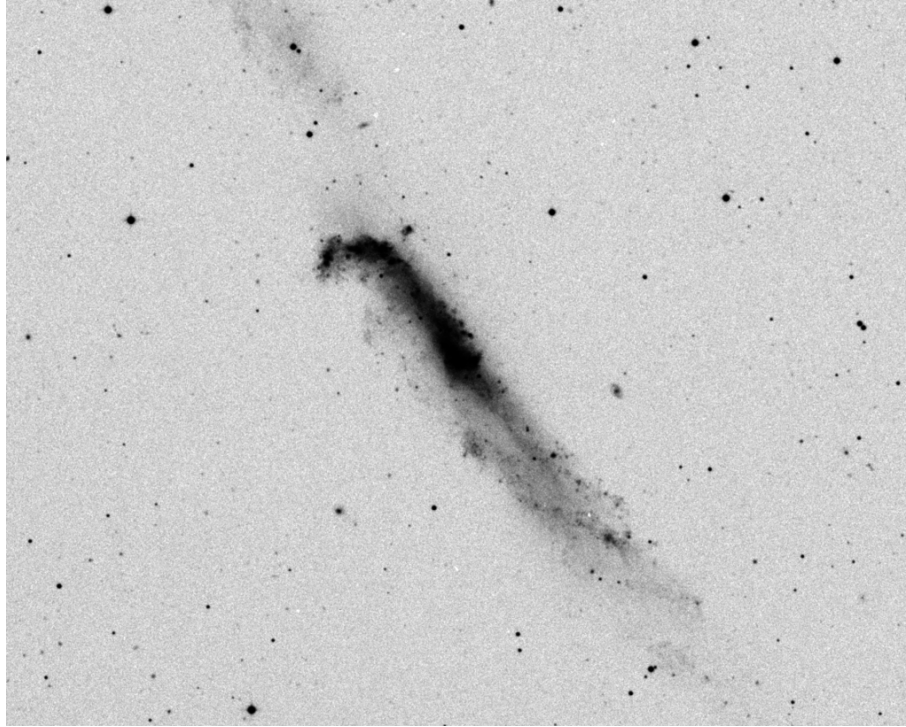
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (19.1' × 15.3')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

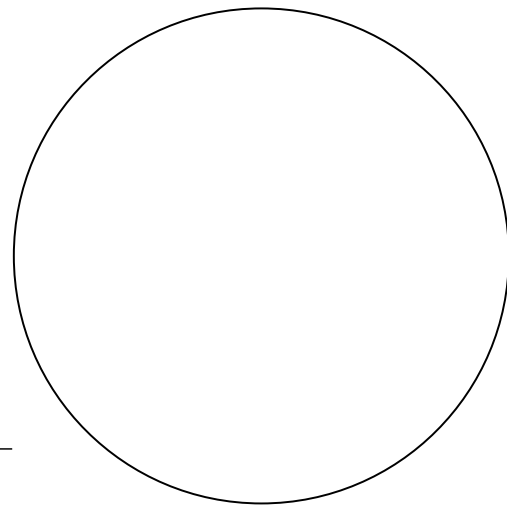
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

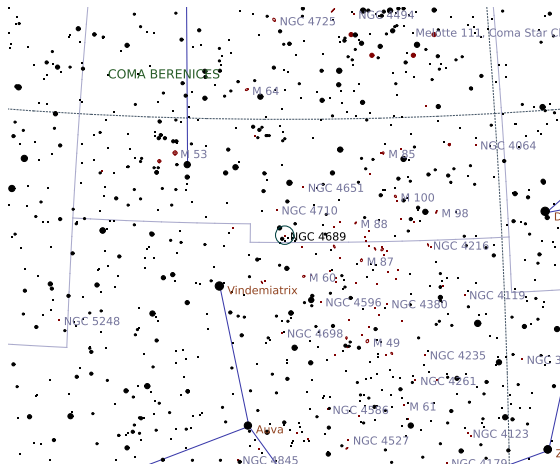
NGC 4689

Galaxy in Coma Berenices

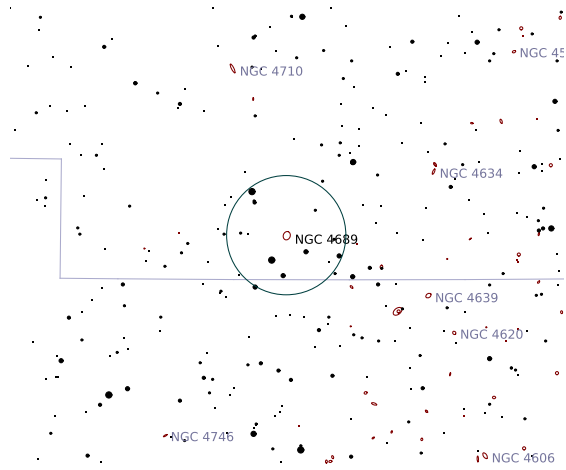
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 12 ^h 48 ^m 26 ^s | Declination (current) | 13° 41' 12'' |
| Right Ascension (J2000.0) | 12 ^h 47 ^m 45 ^s | Declination (J2000.0) | 13° 45' 44'' |
| Size | 4.3' × 3.5' | Position Angle | -70° |
| Magnitude | 11 | Other Designation | - |

Description: Dreyer: pB;vL;E;vglbM;r

SAC: H II 128



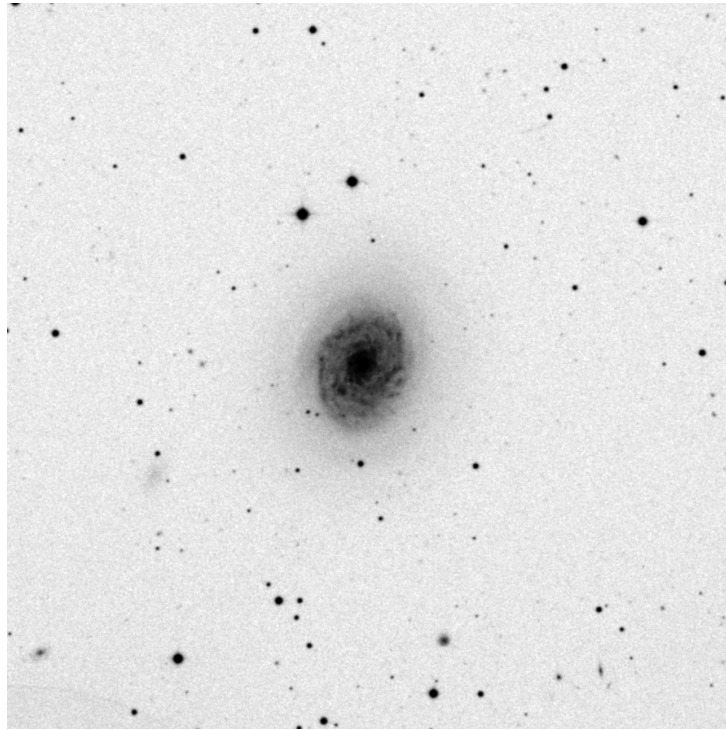
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

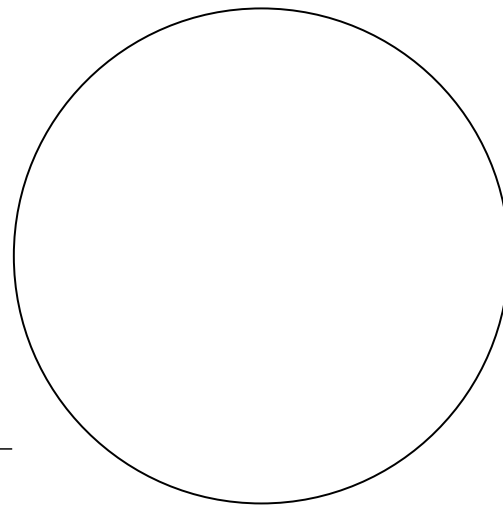
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



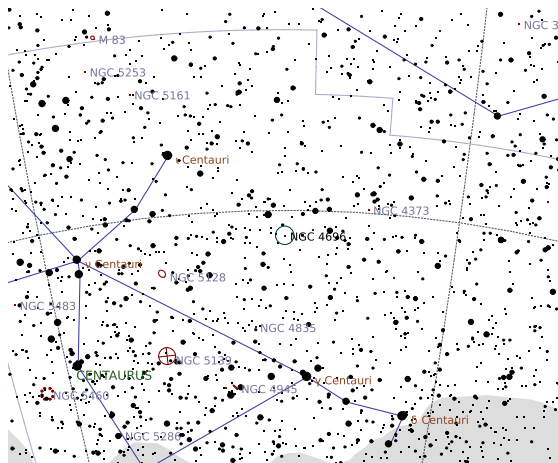
Sketch

NGC 4696

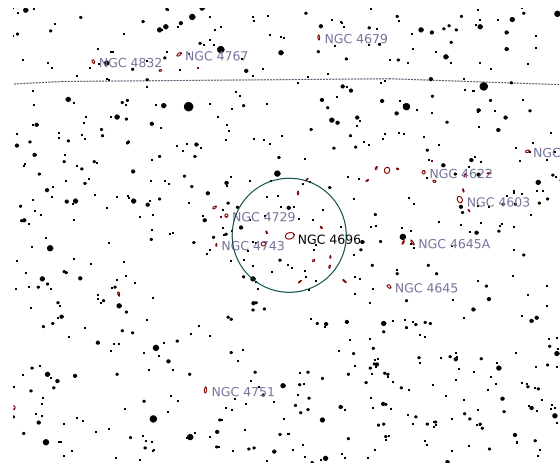
Galaxy in Centaurus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 12 ^h 49 ^m 34 ^s | Declination (current) | -41° 22' 58" |
| Right Ascension (J2000.0) | 12 ^h 48 ^m 49 ^s | Declination (J2000.0) | -41° 18' 42" |
| Size | 4.7' × 3.3' | Position Angle | -17° |
| Magnitude | 10 | Other Designation | - |

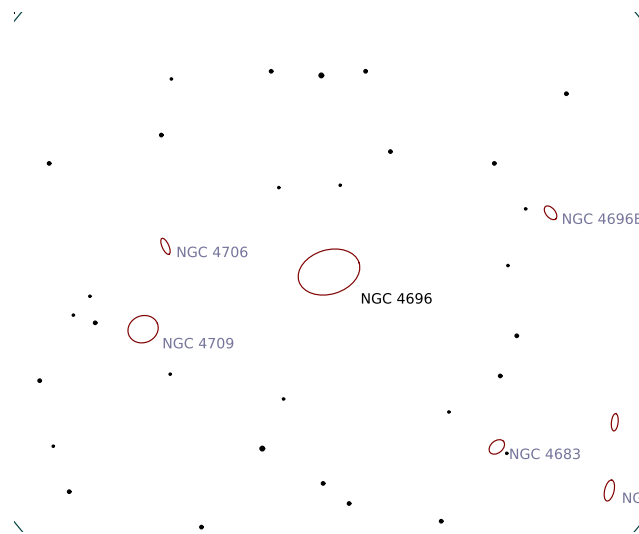
Description: Dreyer: pB;L;R;gbM;r



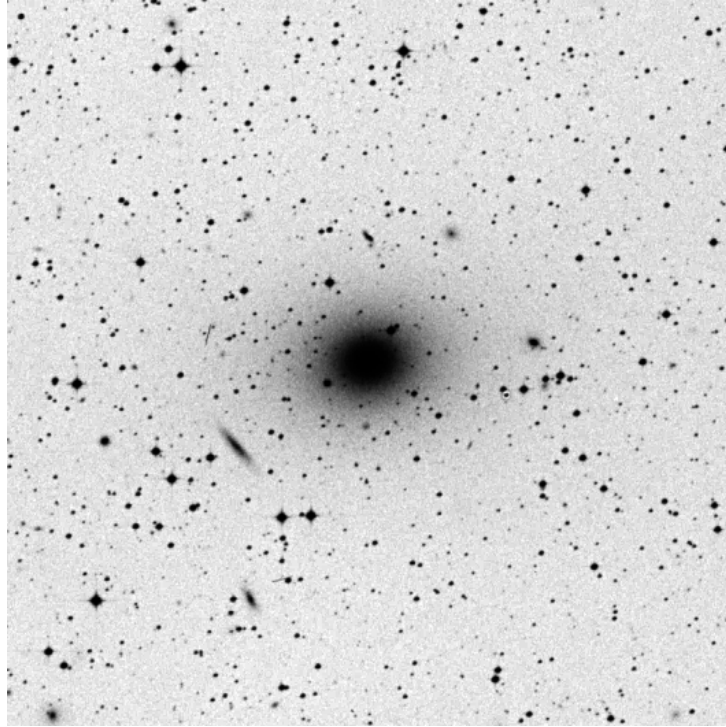
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

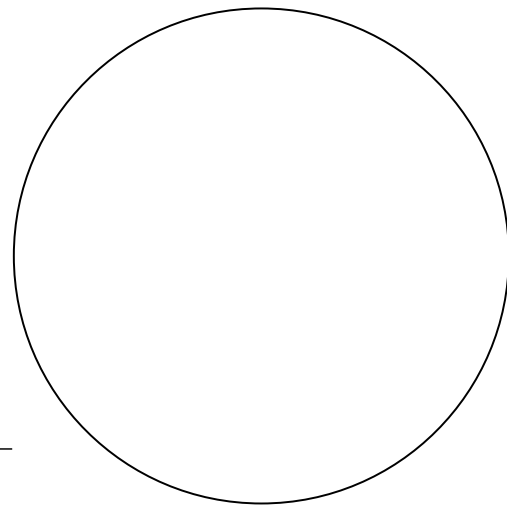
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



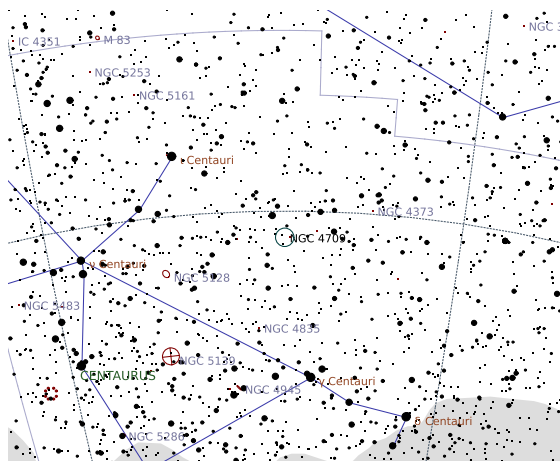
Sketch

NGC 4709

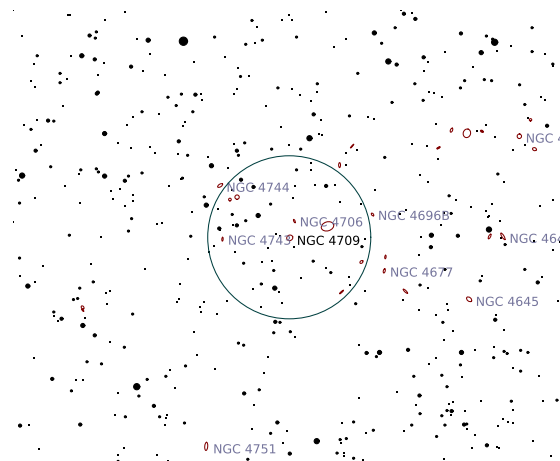
Galaxy in Centaurus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 12 ^h 50 ^m 49 ^s | Declination (current) | -41° 27' 12" |
| Right Ascension (J2000.0) | 12 ^h 50 ^m 03 ^s | Declination (J2000.0) | -41° 22' 57" |
| Size | 2.3' × 2' | Position Angle | -22° |
| Magnitude | 11 | Other Designation | — |

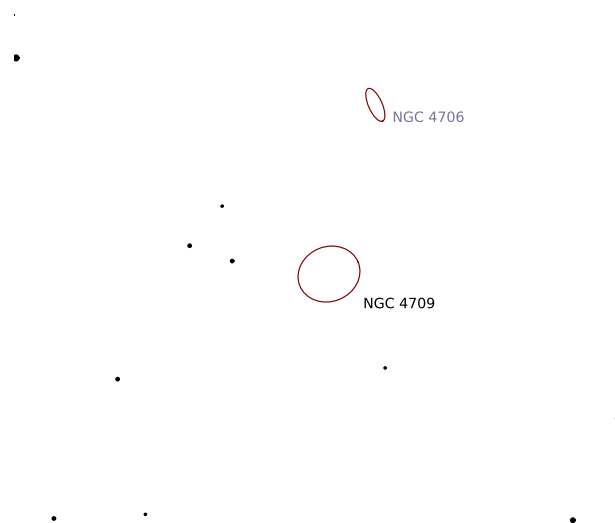
Description: Dreyer: pB;cS;R;gbM



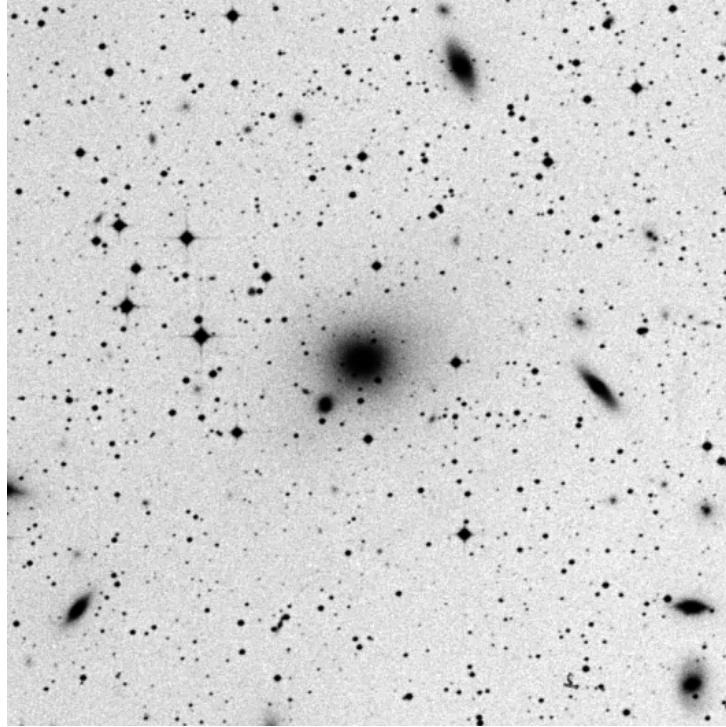
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

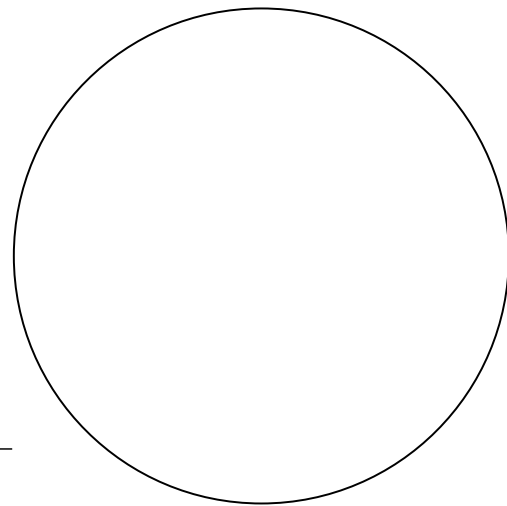
Equipment Details: _____

* Seeing: _____

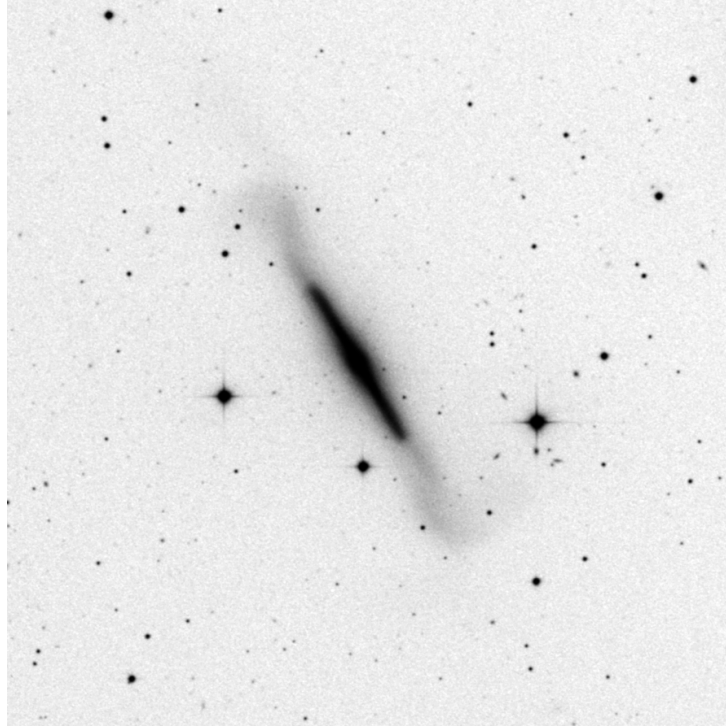
Observation Location: _____

FOV: _____

* Description: _____



Sketch



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

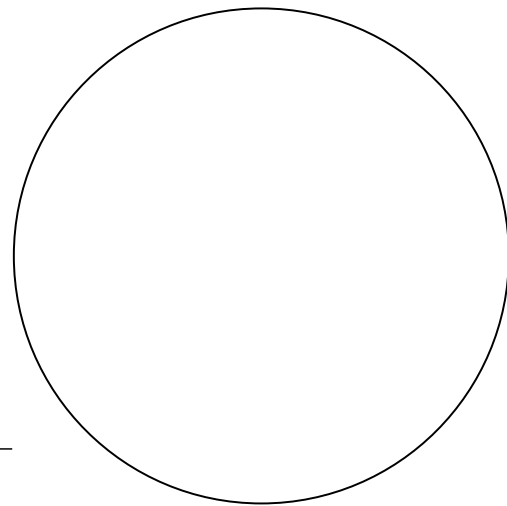
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



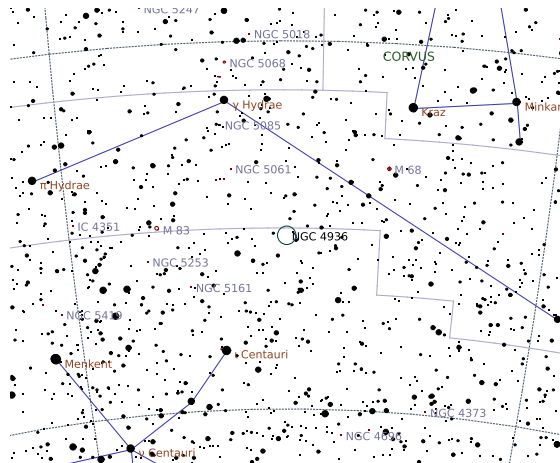
Sketch

NGC 4936

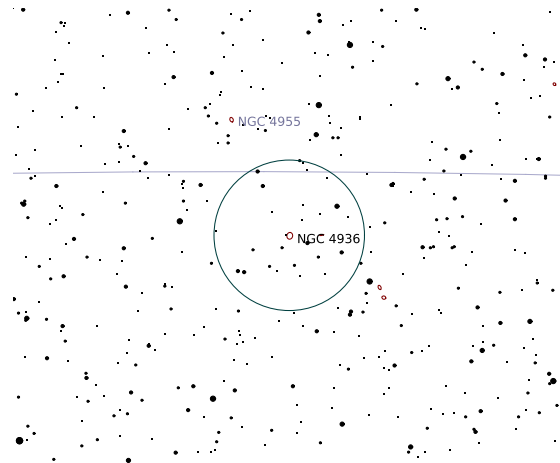
Galaxy in Centaurus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 13 ^h 05 ^m 02 ^s | Declination (current) | −30° 35′ 49″ |
| Right Ascension (J2000.0) | 13 ^h 04 ^m 17 ^s | Declination (J2000.0) | −30° 31′ 36″ |
| Size | 2.7′ × 2.3′ | Position Angle | −78° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;S;R;bM;* f 6sec



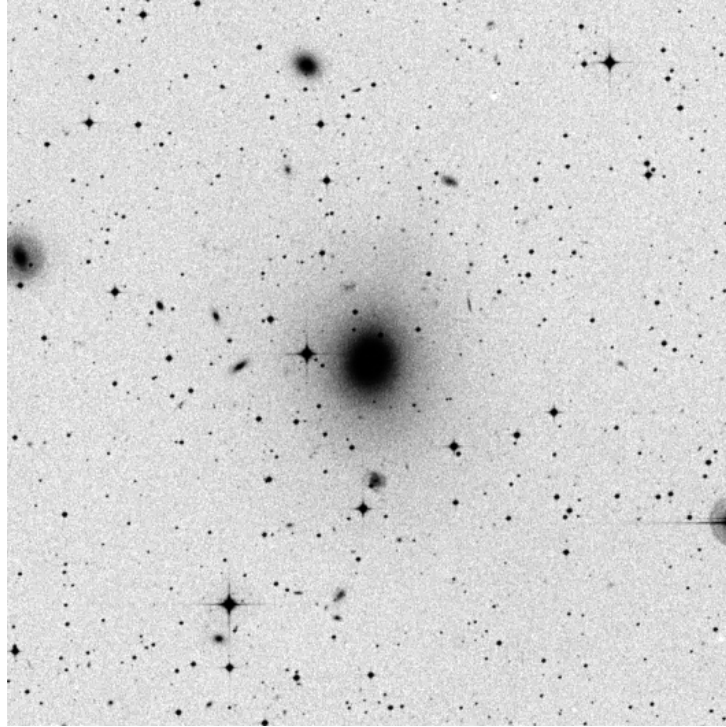
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

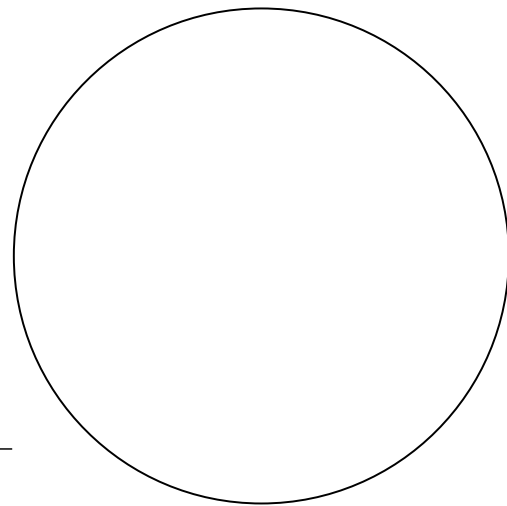
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

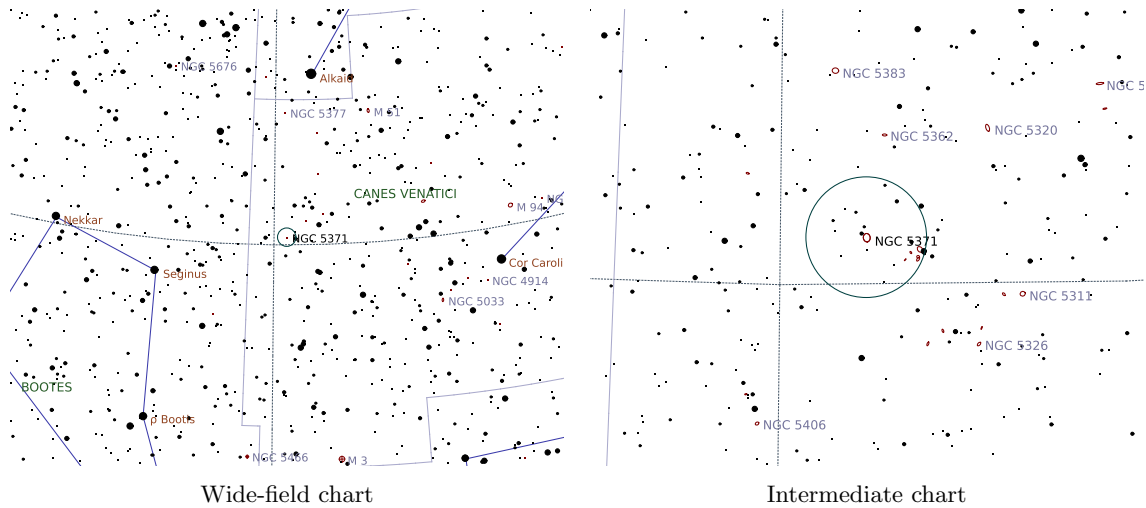
NGC 5371

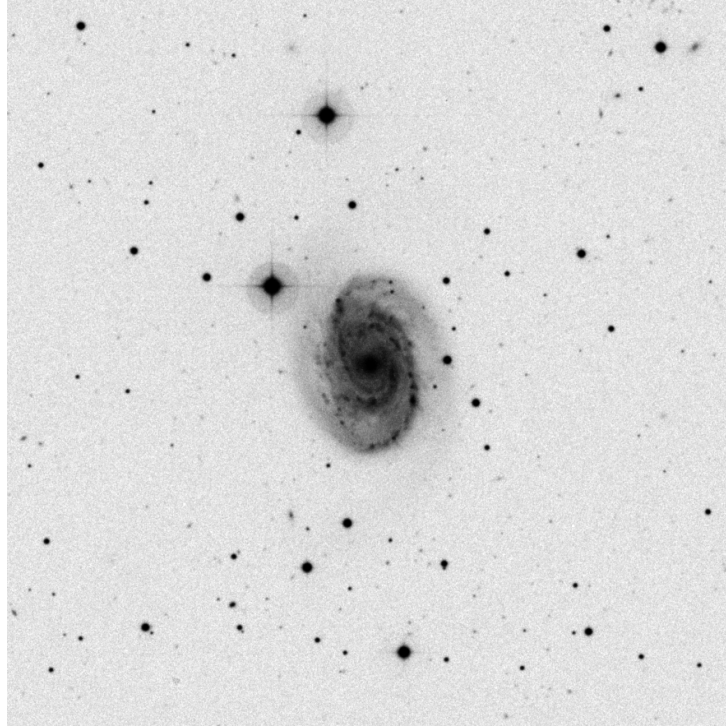
Galaxy in Canes Venatici

| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 13 ^h 56 ^m 14 ^s | Declination (current) | 40° 23' 34" |
| Right Ascension (J2000.0) | 13 ^h 55 ^m 40 ^s | Declination (J2000.0) | 40° 27' 44" |
| Size | 4.2' × 3.4' | Position Angle | 82° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;L;R;bMFN

SAC: vsB diff N;weak bar;sev knotty filam reg arms





DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

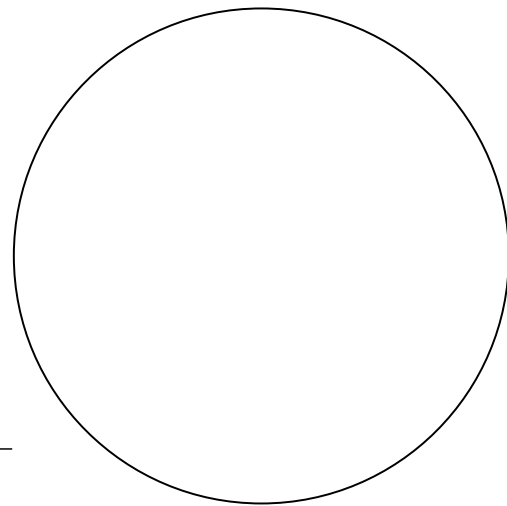
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



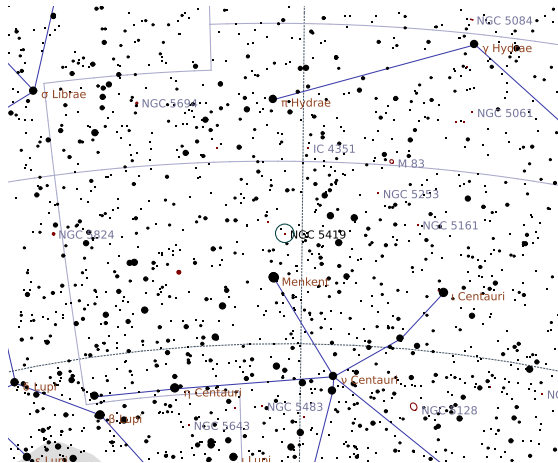
Sketch

NGC 5419

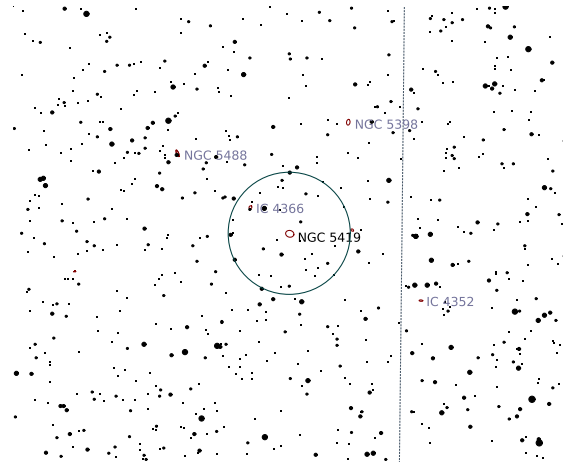
Galaxy in Centaurus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 14 ^h 04 ^m 26 ^s | Declination (current) | −34° 02′ 24″ |
| Right Ascension (J2000.0) | 14 ^h 03 ^m 38 ^s | Declination (J2000.0) | −33° 58′ 42″ |
| Size | 4.1′ × 3.3′ | Position Angle | 13° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;pL;R;gpmbM



Wide-field chart

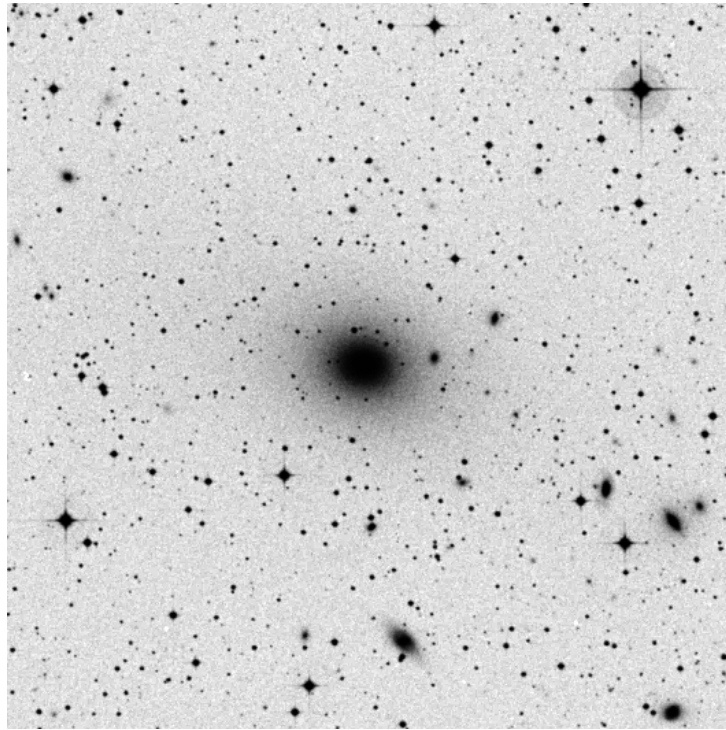


Intermediate chart

IC 4366

NGC 5419

Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

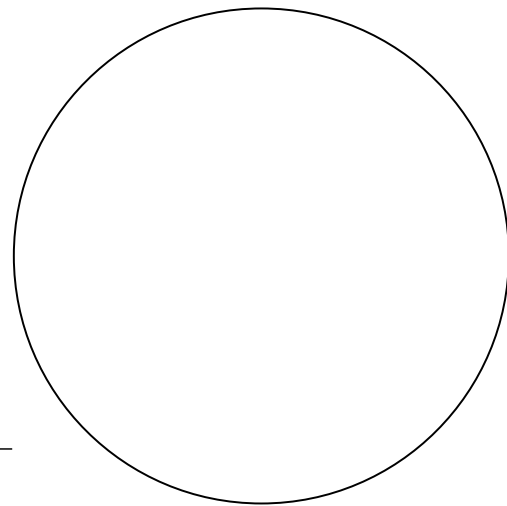
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

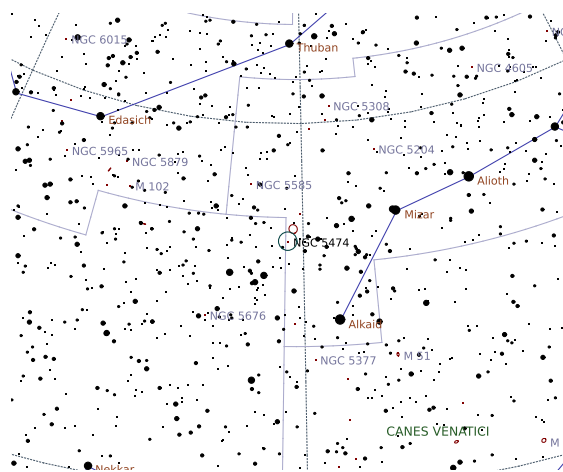
NGC 5474

Galaxy in Ursa Major

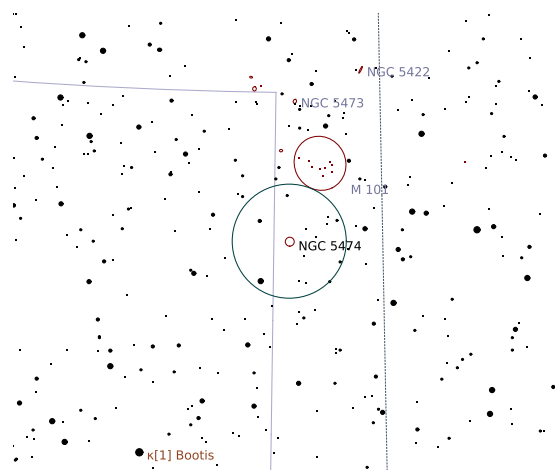
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 14 ^h 05 ^m 29 ^s | Declination (current) | 53° 35' 40" |
| Right Ascension (J2000.0) | 14 ^h 05 ^m 01 ^s | Declination (J2000.0) | 53° 39' 46" |
| Size | 4.7' × 4.7' | Position Angle | 90° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;L;bM;P w M101

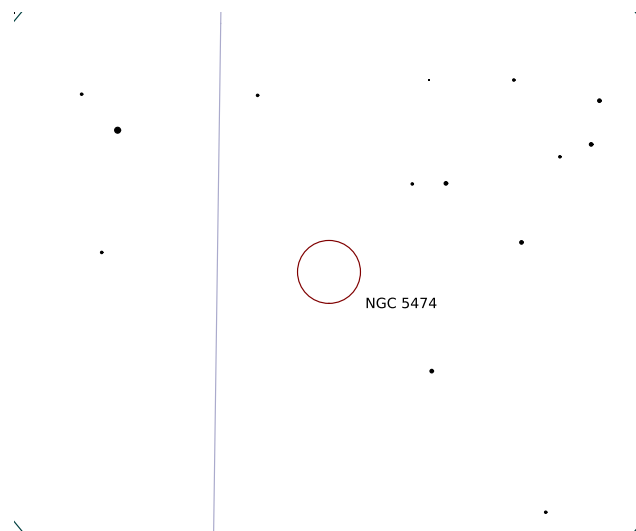
SAC: H I 214;low surf. bright;smooth part res cent w vsFN;strongly asym



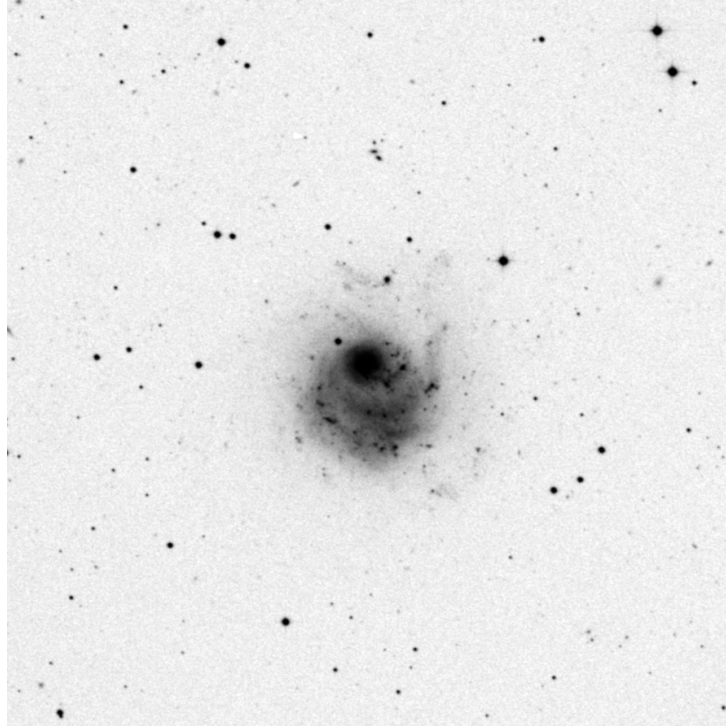
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

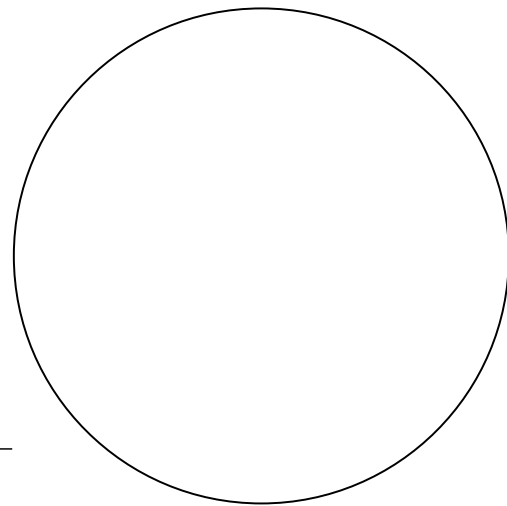
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



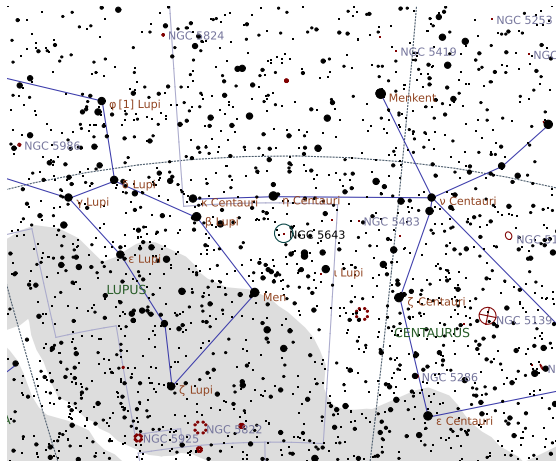
Sketch

NGC 5643

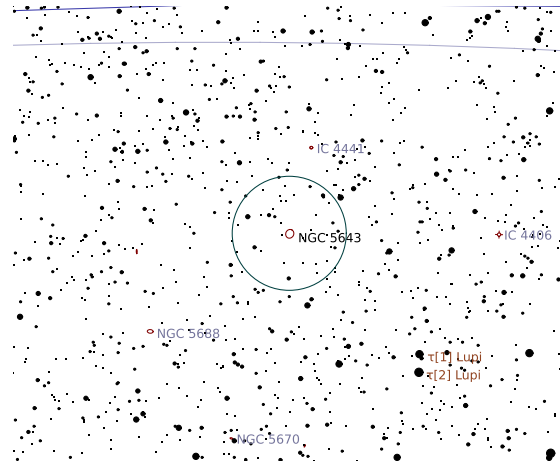
Galaxy in Lupus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 14 ^h 33 ^m 32 ^s | Declination (current) | −44° 13′ 46″ |
| Right Ascension (J2000.0) | 14 ^h 32 ^m 40 ^s | Declination (J2000.0) | −44° 10′ 28″ |
| Size | 4.7′ × 4.2′ | Position Angle | −63° |
| Magnitude | 10 | Other Designation | — |

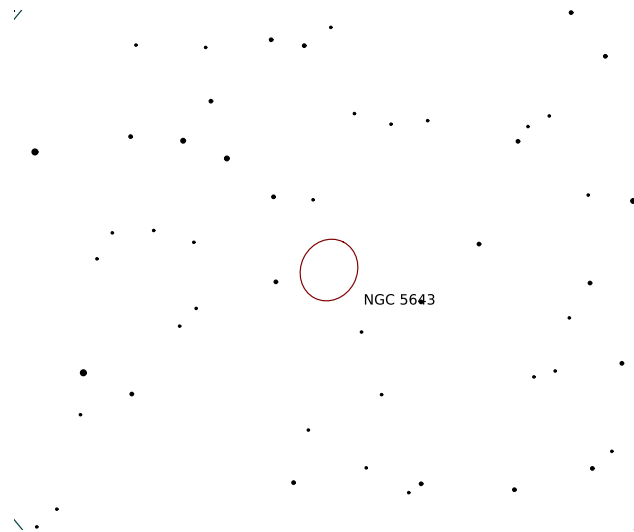
Description: Dreyer: pB;L;R;vg1bM;st inv



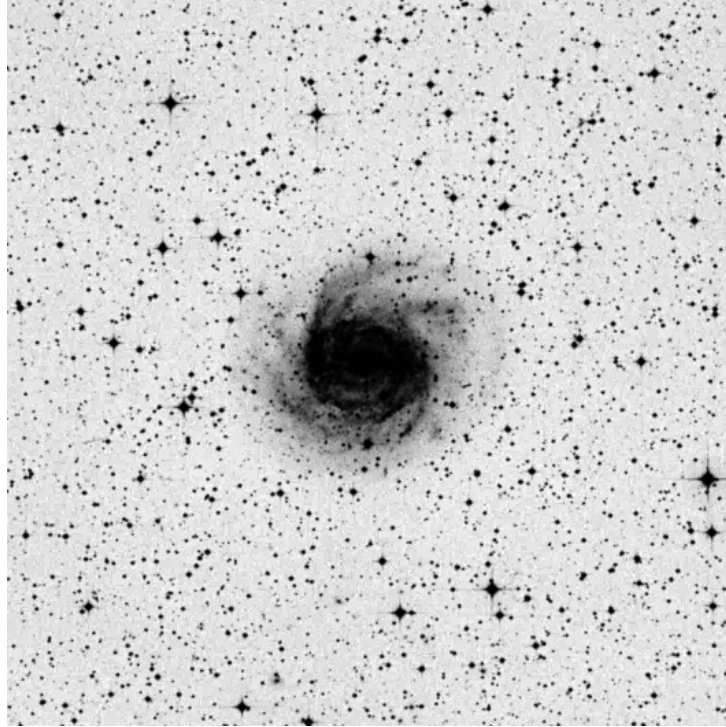
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

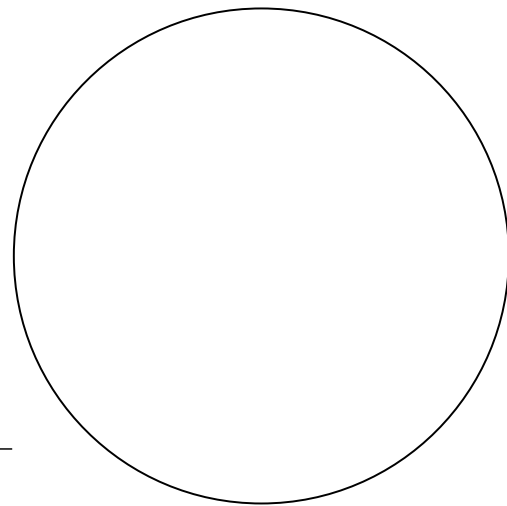
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

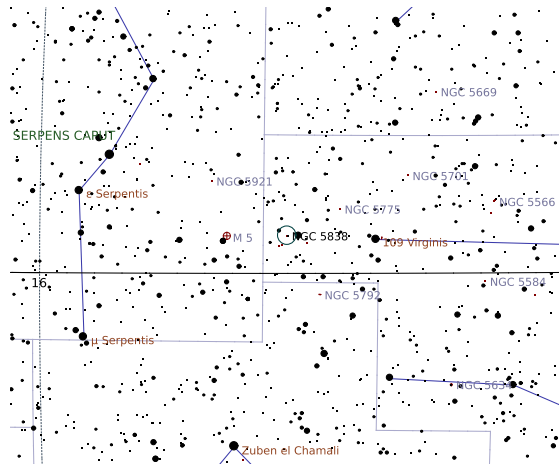
NGC 5838

Galaxy in Virgo

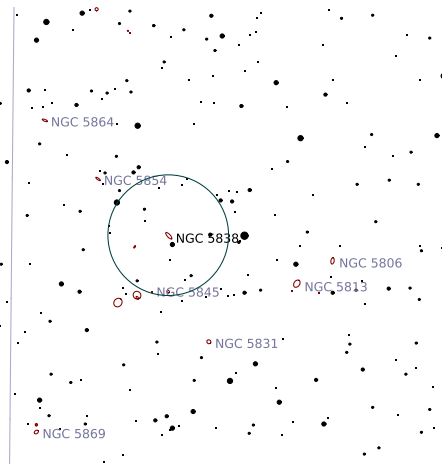
| | | | |
|---------------------------|---|-----------------------|------------|
| Right Ascension (current) | 15 ^h 06 ^m 06 ^s | Declination (current) | 2° 02' 47" |
| Right Ascension (J2000.0) | 15 ^h 05 ^m 26 ^s | Declination (J2000.0) | 2° 05' 56" |
| Size | 4.2' × 1.5' | Position Angle | 47° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;pS

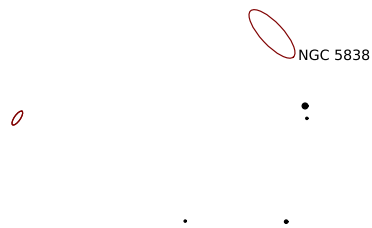
SAC: H II 542; In NGC 5846 grp; P w NGC 5848 at 18'



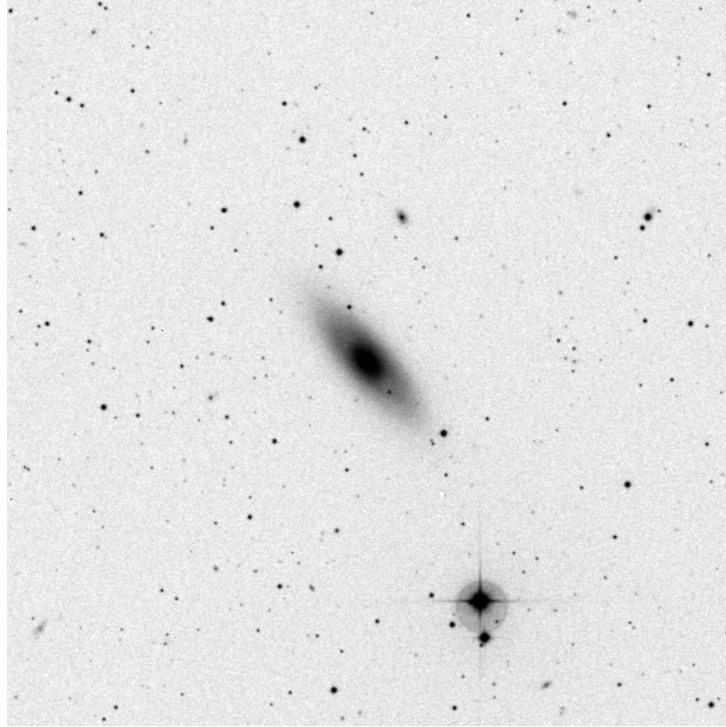
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

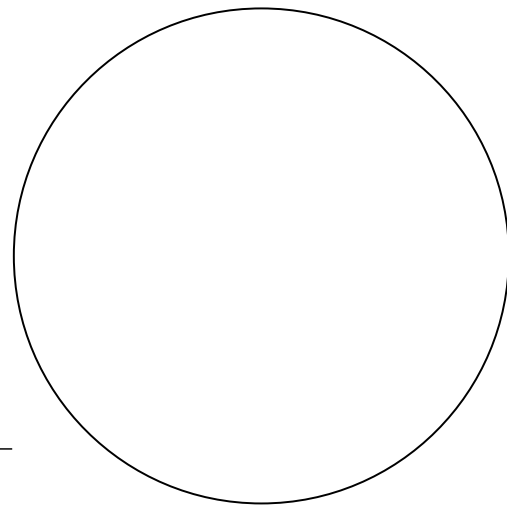
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



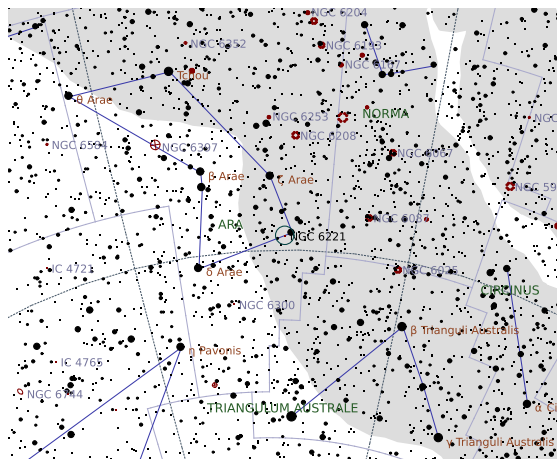
Sketch

NGC 6221

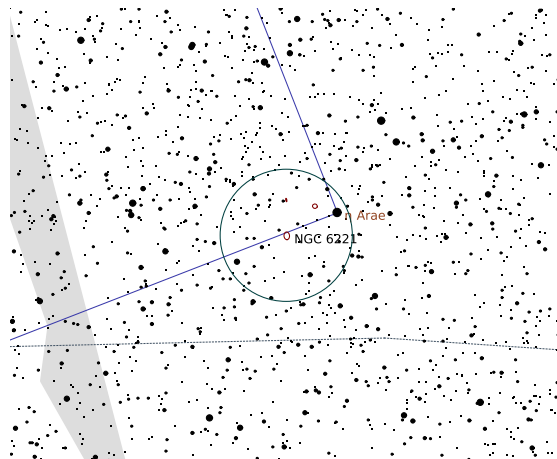
Galaxy in Ara

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 16 ^h 53 ^m 55 ^s | Declination (current) | −59° 14′ 05″ |
| Right Ascension (J2000.0) | 16 ^h 52 ^m 46 ^s | Declination (J2000.0) | −59° 13′ 06″ |
| Size | 3.5′ × 2.5′ | Position Angle | 85° |
| Magnitude | 9.9 | Other Designation | — |

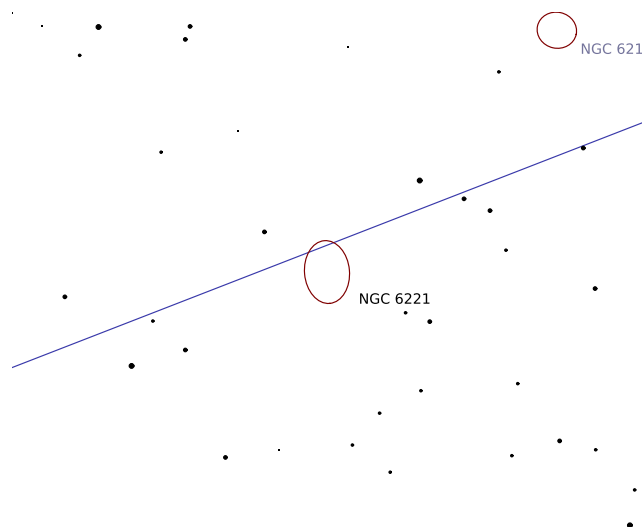
Description: Dreyer: pB;cL;R;glbM;rr



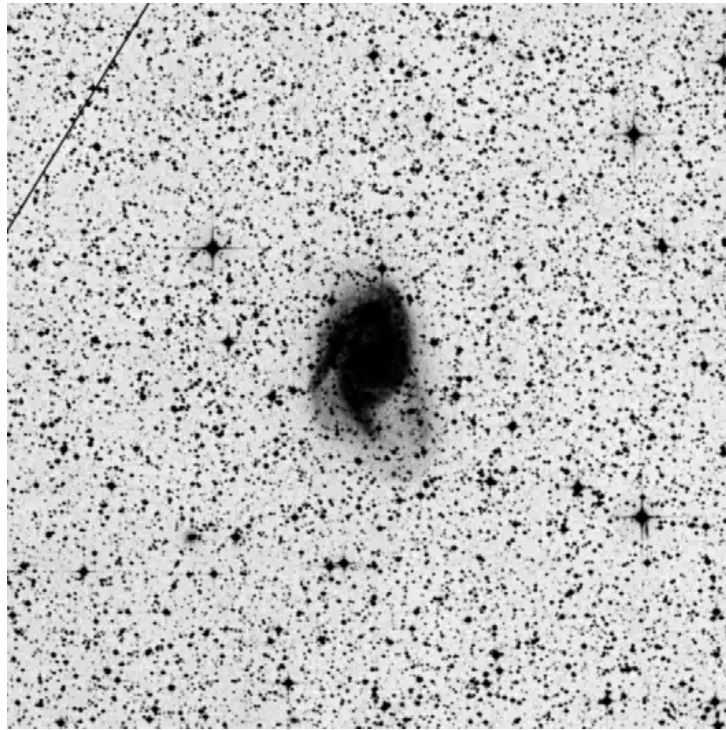
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

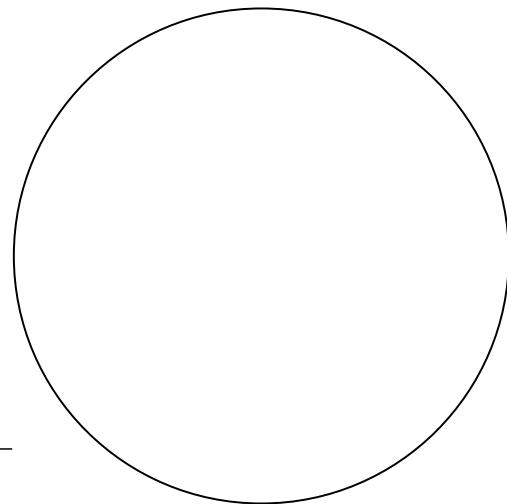
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

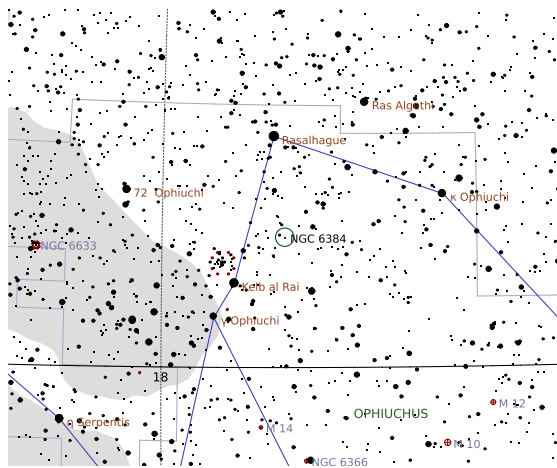
NGC 6384

Galaxy in Ophiuchus

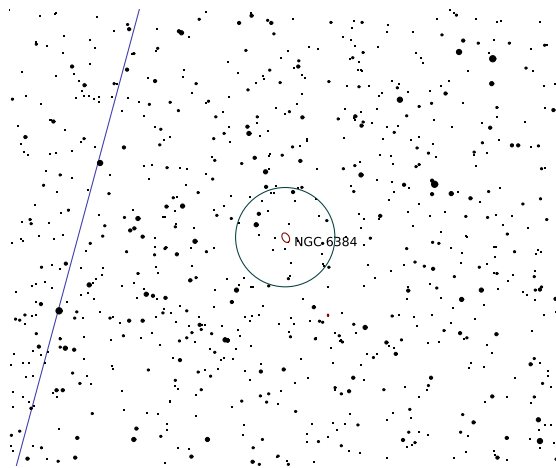
| | | | |
|---------------------------|---|-----------------------|------------|
| Right Ascension (current) | 17 ^h 33 ^m 02 ^s | Declination (current) | 7° 03' 04" |
| Right Ascension (J2000.0) | 17 ^h 32 ^m 24 ^s | Declination (J2000.0) | 7° 03' 39" |
| Size | 6.2' × 4.1' | Position Angle | 60° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;S;v1E

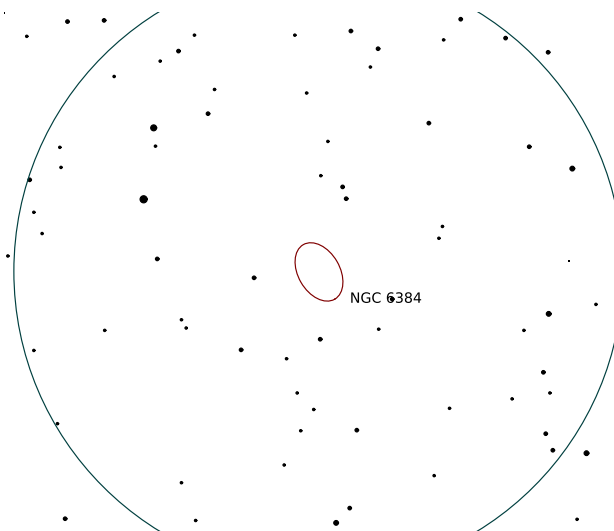
SAC: sBN in faint bar



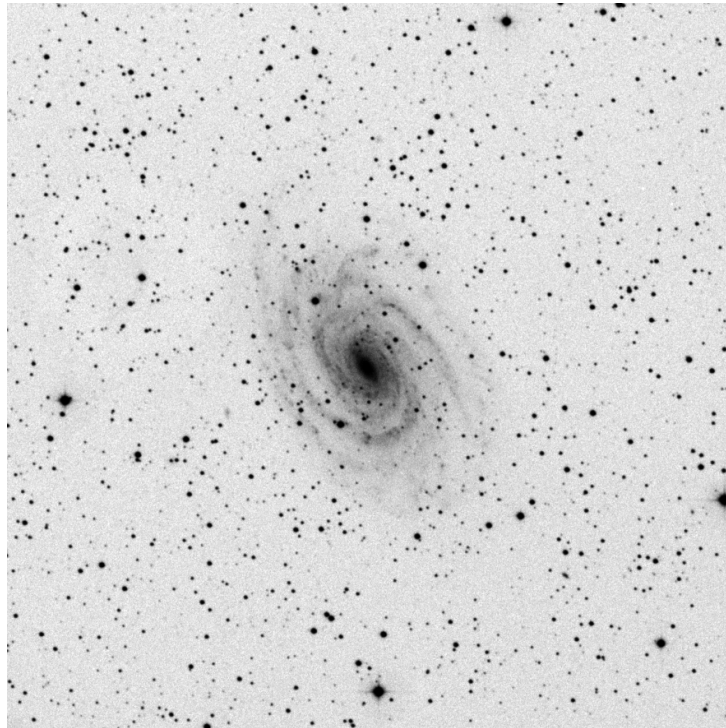
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

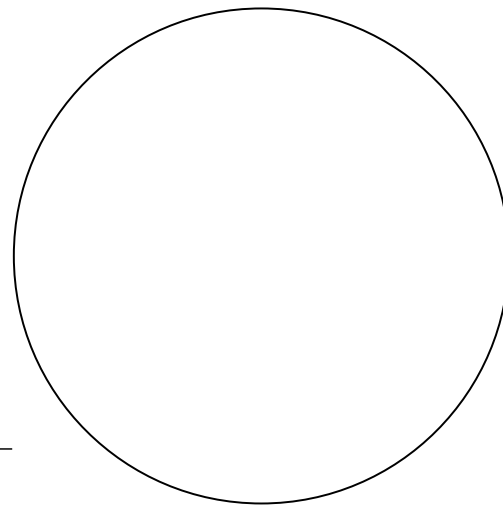
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



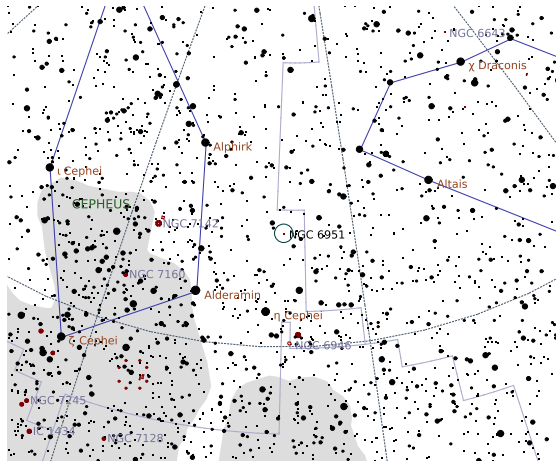
Sketch

NGC 6951

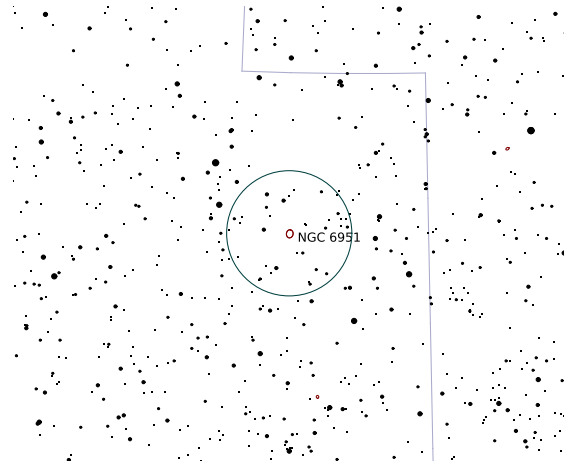
Galaxy in Cepheus

| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 20 ^h 37 ^m 21 ^s | Declination (current) | 66° 09' 10" |
| Right Ascension (J2000.0) | 20 ^h 37 ^m 14 ^s | Declination (J2000.0) | 66° 06' 21" |
| Size | 3.9' × 3.2' | Position Angle | −80° |
| Magnitude | 11 | Other Designation | — |

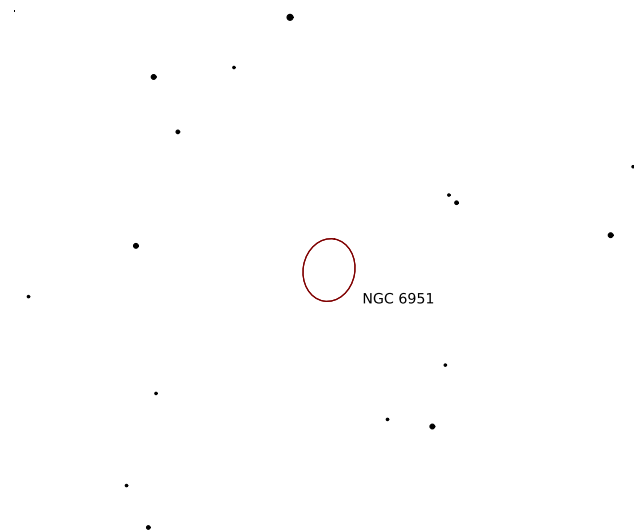
Description: Dreyer: pB;pL;lE



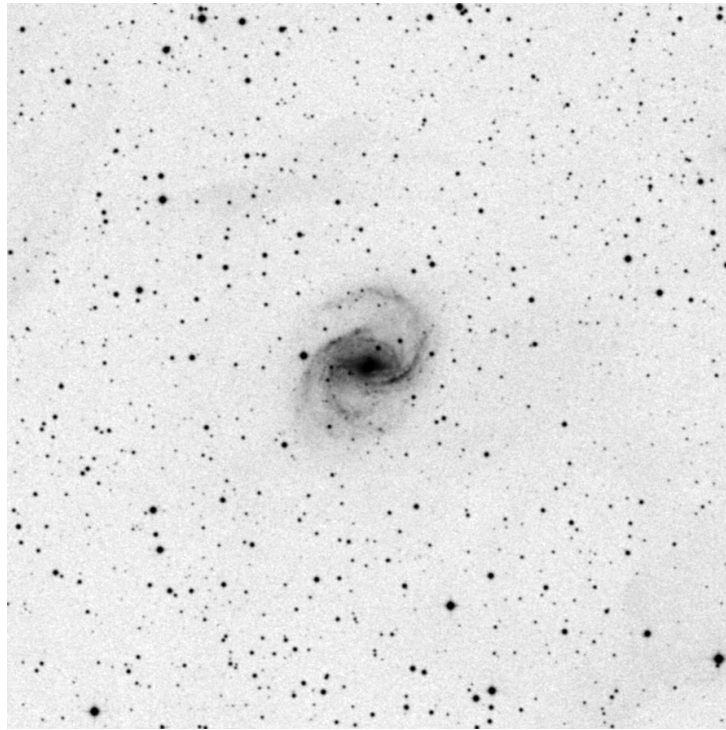
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

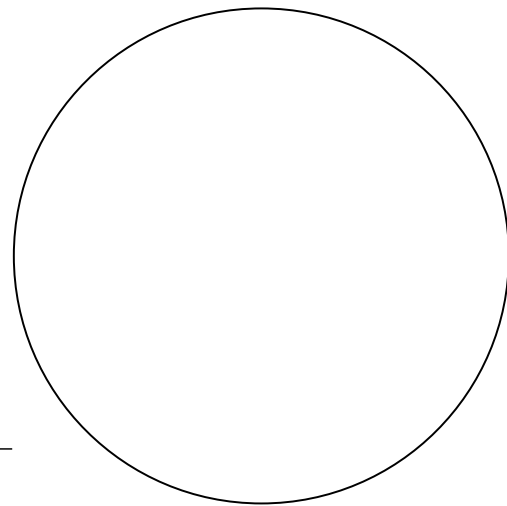
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



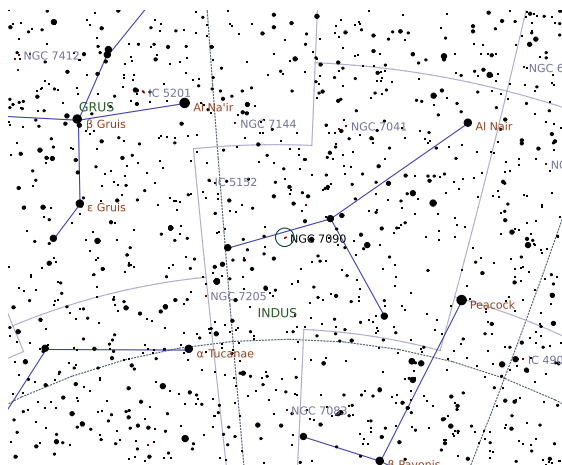
Sketch

NGC 7090

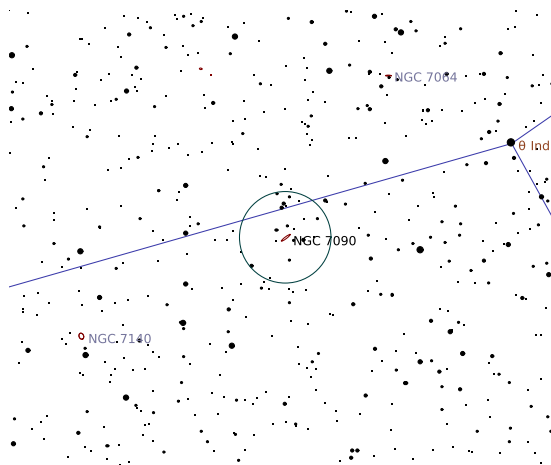
Galaxy in Indus

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 21 ^h 37 ^m 20 ^s | Declination (current) | −54° 29′ 41″ |
| Right Ascension (J2000.0) | 21 ^h 36 ^m 27 ^s | Declination (J2000.0) | −54° 33′ 18″ |
| Size | 7.3′ × 1.2′ | Position Angle | −37° |
| Magnitude | 11 | Other Designation | — |

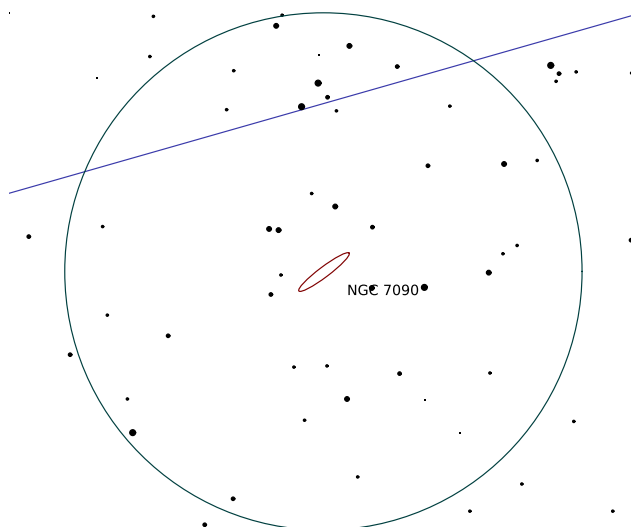
Description: Dreyer: pB;pL;vmE127;g;ps1bM



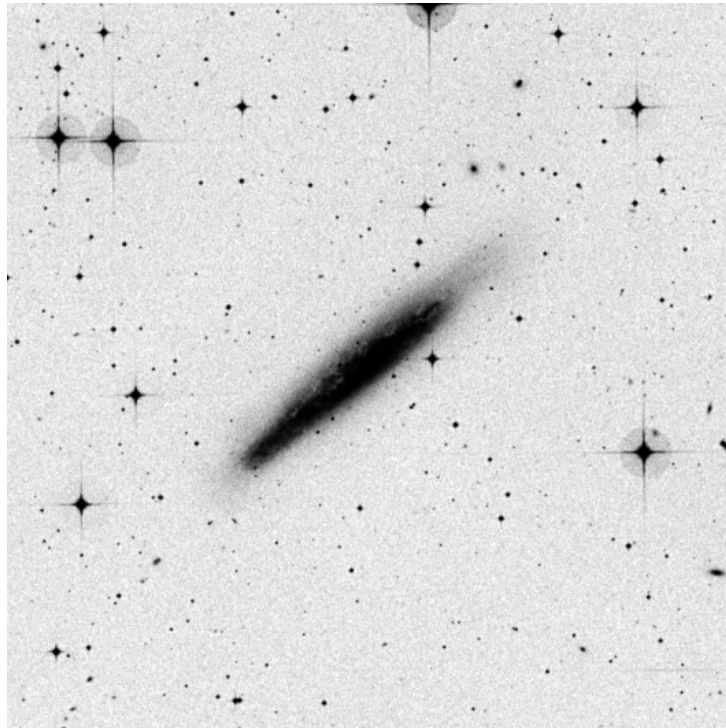
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

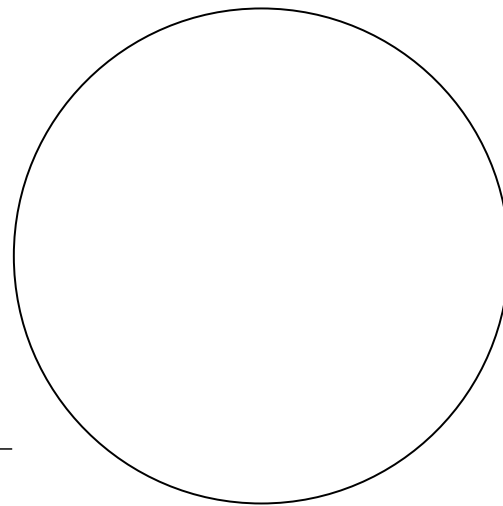
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

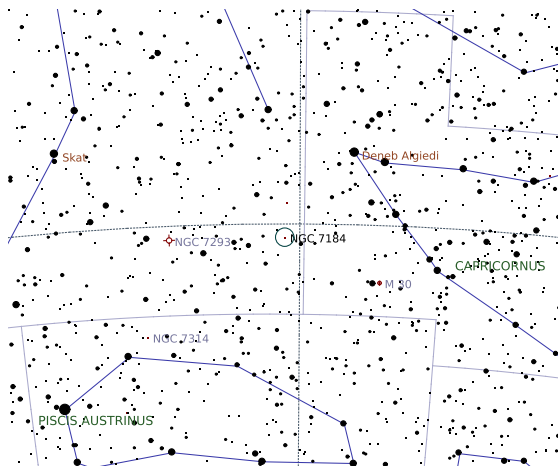
NGC 7184

Galaxy in Aquarius

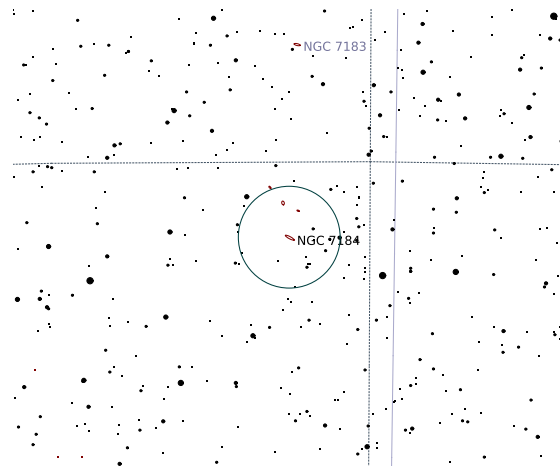
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 22 ^h 03 ^m 22 ^s | Declination (current) | −20° 44′ 54″ |
| Right Ascension (J2000.0) | 22 ^h 02 ^m 39 ^s | Declination (J2000.0) | −20° 48′ 45″ |
| Size | 5.9′ × 1.3′ | Position Angle | 28° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;pL;mE64;bet 3*;er

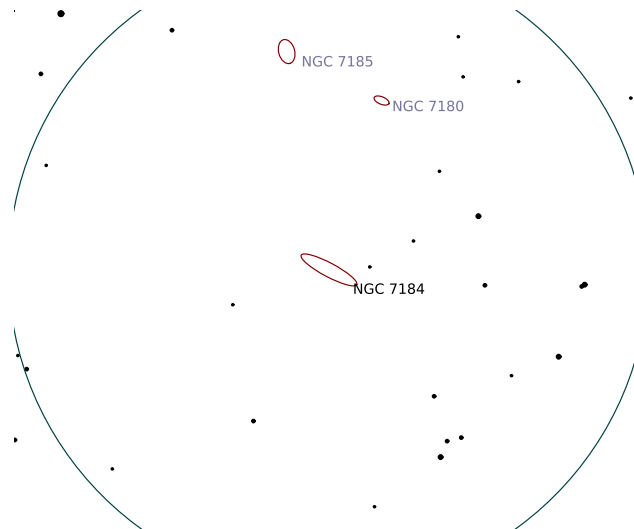
SAC: H II 1;With Saturn-like inner ring



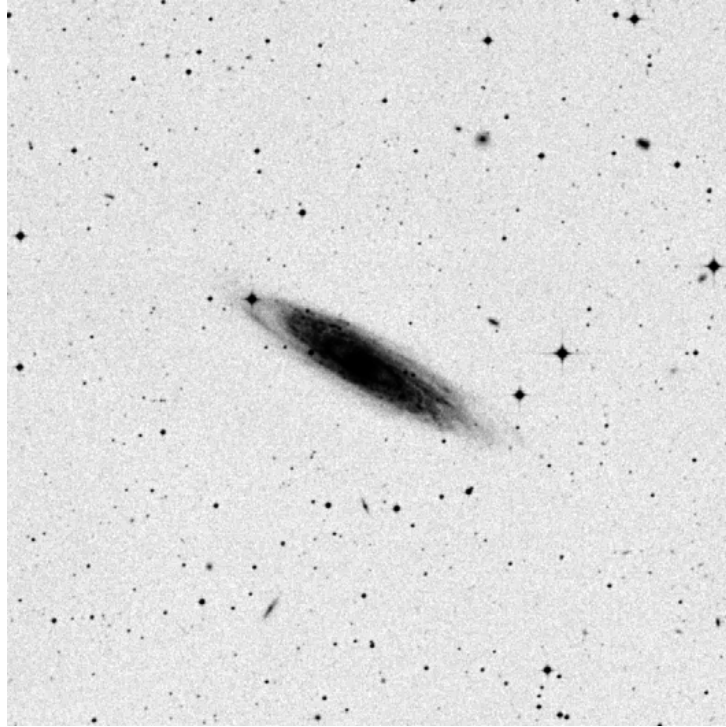
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

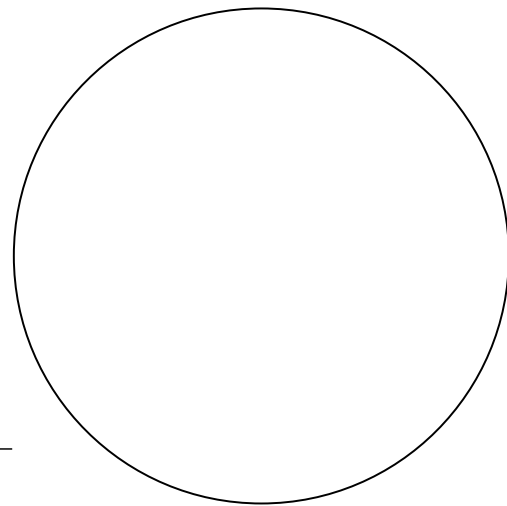
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



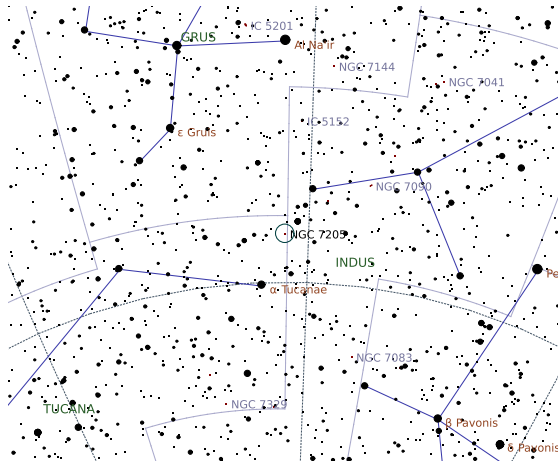
Sketch

NGC 7205

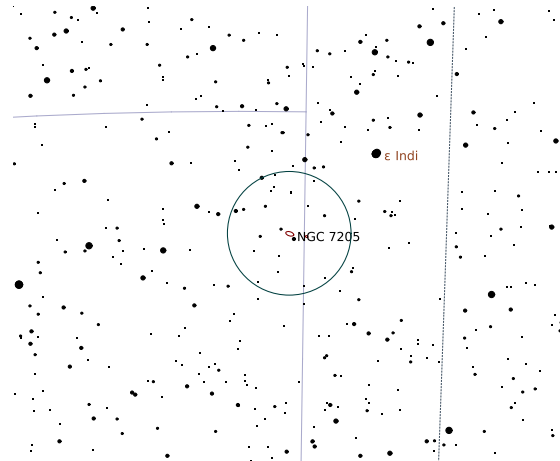
Galaxy in Tucana

| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 22 ^h 09 ^m 24 ^s | Declination (current) | −57° 22′ 39″ |
| Right Ascension (J2000.0) | 22 ^h 08 ^m 33 ^s | Declination (J2000.0) | −57° 26′ 33″ |
| Size | 4′ × 2′ | Position Angle | 17° |
| Magnitude | 11 | Other Designation | — |

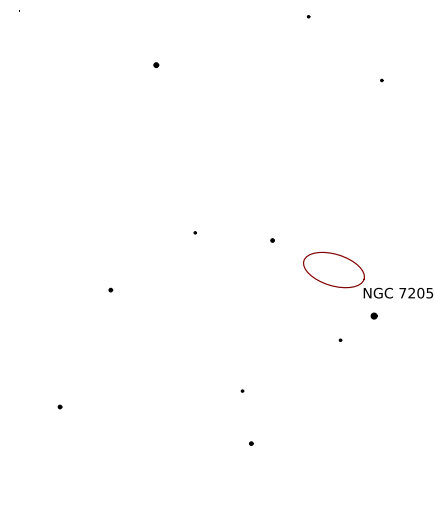
Description: Dreyer: pB;L;cE;gps1bM



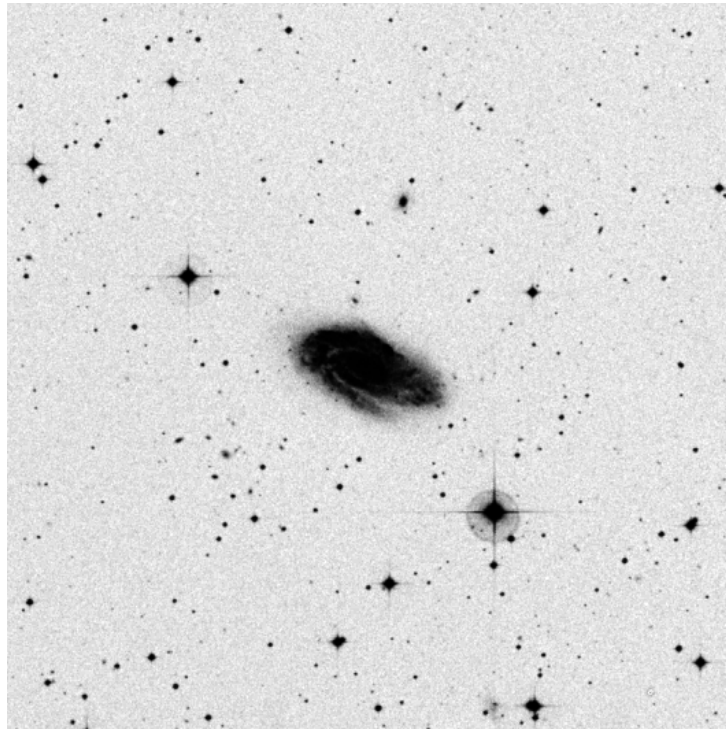
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

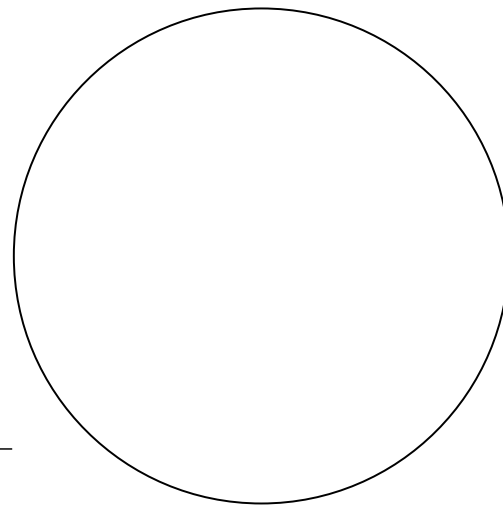
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

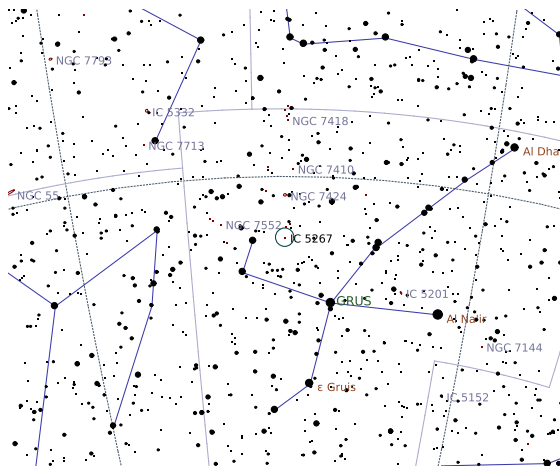
IC 5267

Galaxy in Grus

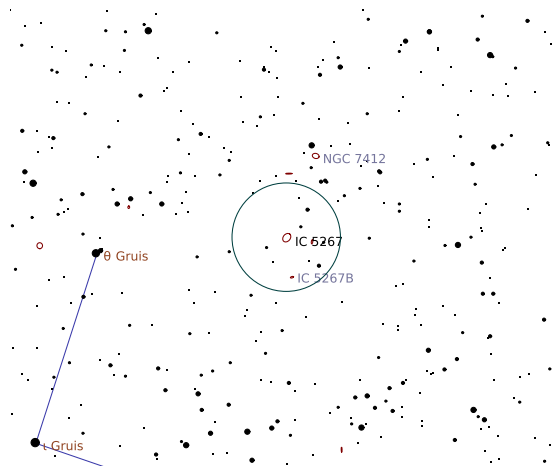
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 22 ^h 57 ^m 56 ^s | Declination (current) | −43° 19′ 34″ |
| Right Ascension (J2000.0) | 22 ^h 57 ^m 13 ^s | Declination (J2000.0) | −43° 23′ 45″ |
| Size | 5.2′ × 3.9′ | Position Angle | −50° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;S;R;mbM

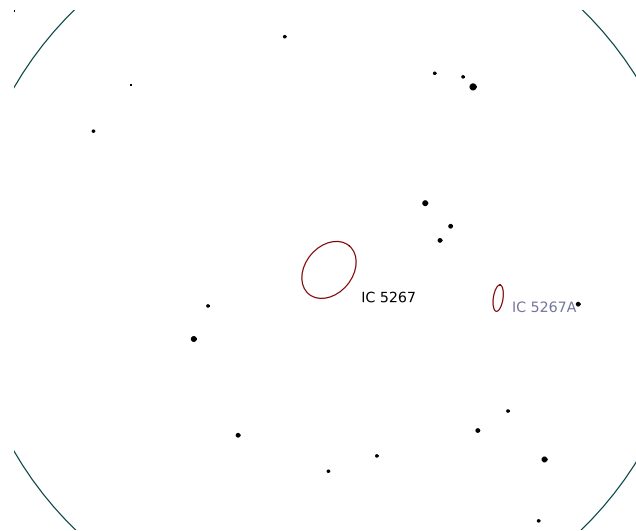
SAC: Brightest in group



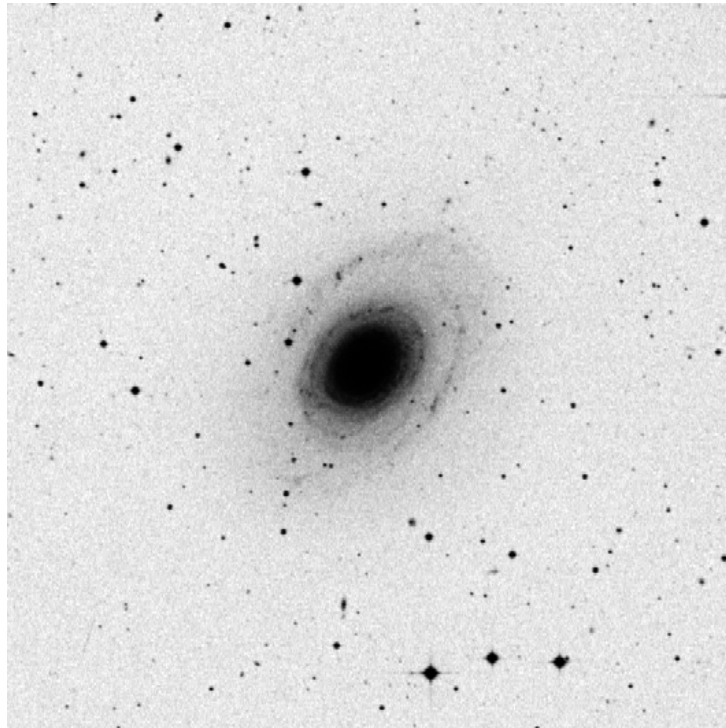
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

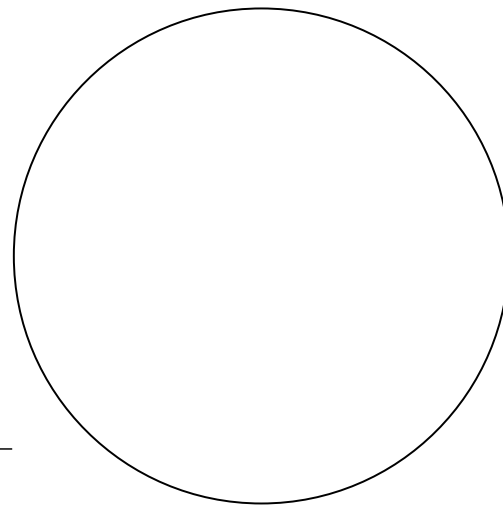
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

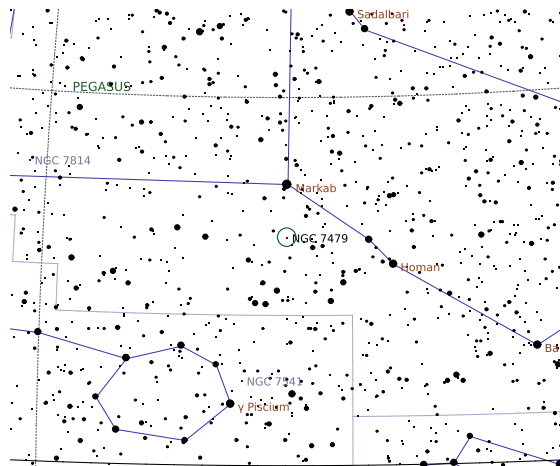
NGC 7479

Galaxy in Pegasus

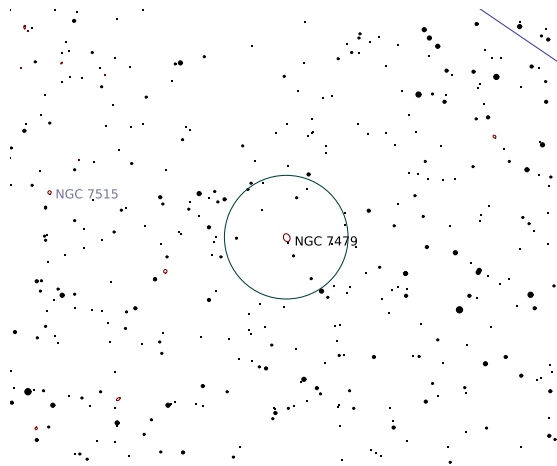
| | | | |
|---------------------------|---|-----------------------|-------------|
| Right Ascension (current) | 23 ^h 05 ^m 35 ^s | Declination (current) | 12° 23' 38" |
| Right Ascension (J2000.0) | 23 ^h 04 ^m 56 ^s | Declination (J2000.0) | 12° 19' 20" |
| Size | 4' × 3.1' | Position Angle | 65° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;cL;mE12;bet 2 st

SAC: H I 55;excellent barred spiral



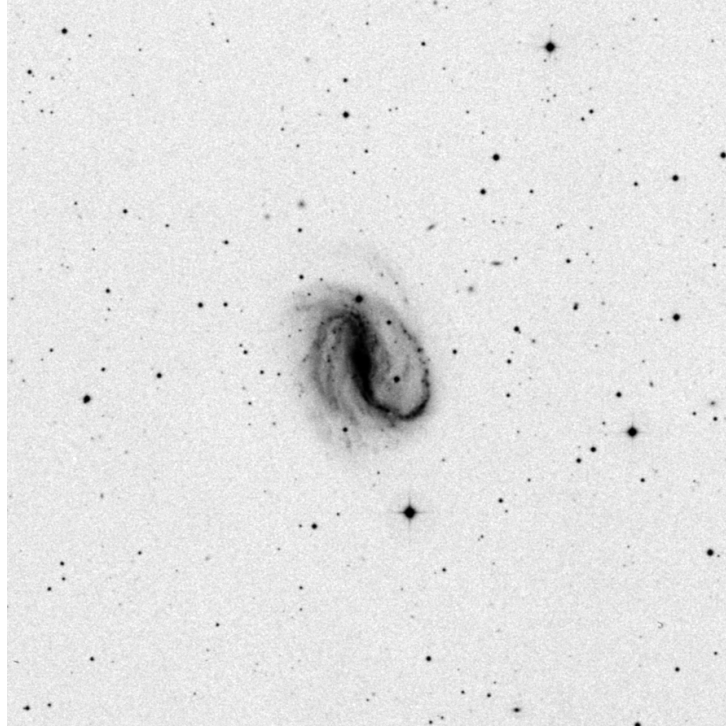
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

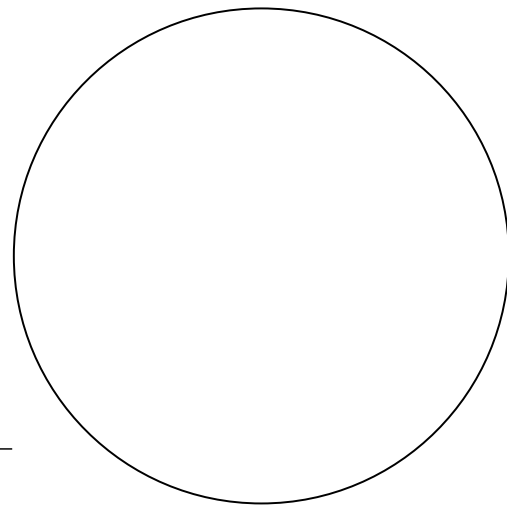
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

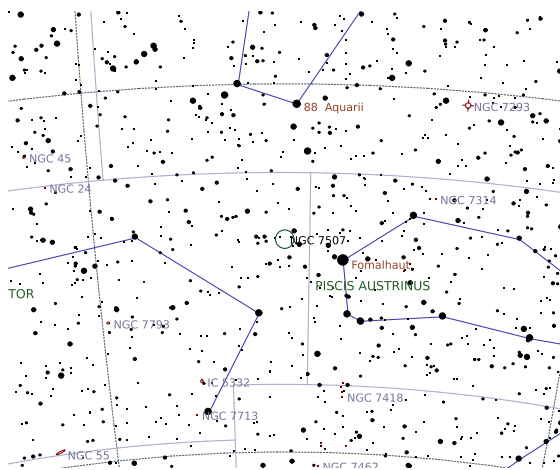
NGC 7507

Galaxy in Sculptor

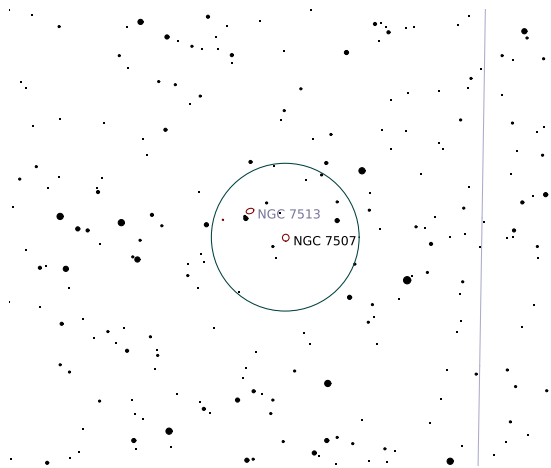
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 23 ^h 12 ^m 48 ^s | Declination (current) | −28° 28′ 04″ |
| Right Ascension (J2000.0) | 23 ^h 12 ^m 07 ^s | Declination (J2000.0) | −28° 32′ 19″ |
| Size | 2.8′ × 2.7′ | Position Angle | 90° |
| Magnitude | 10 | Other Designation | — |

Description: Dreyer: pB;cS;R;psvmbM;*10 np

SAC: H II 2



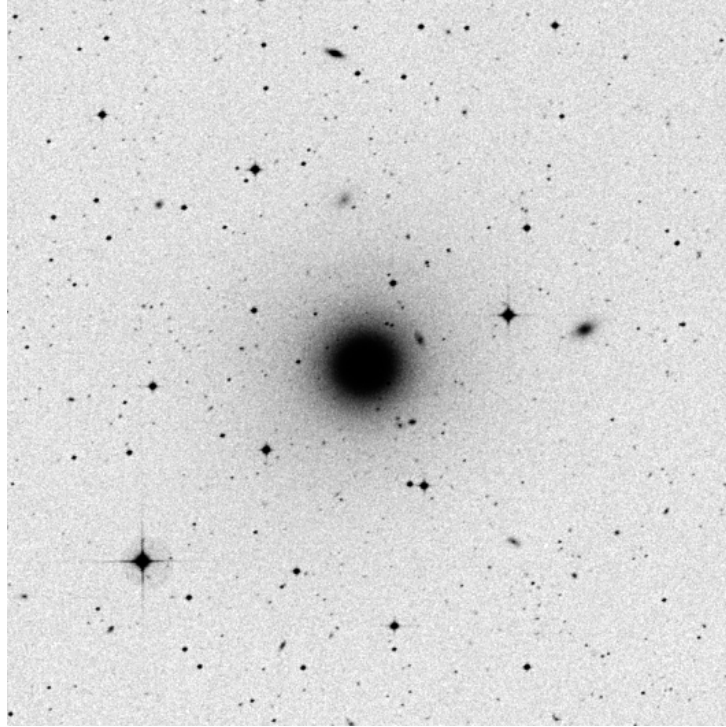
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

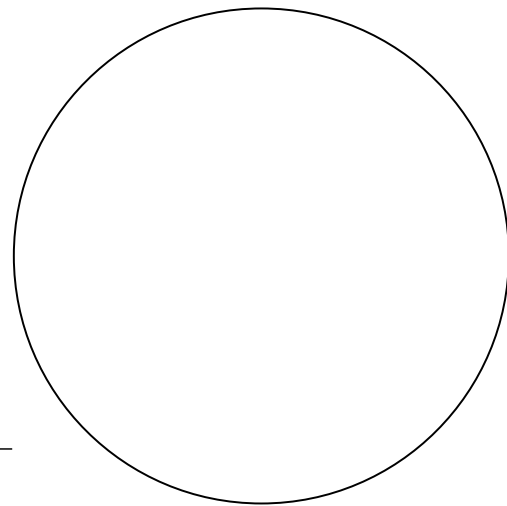
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch

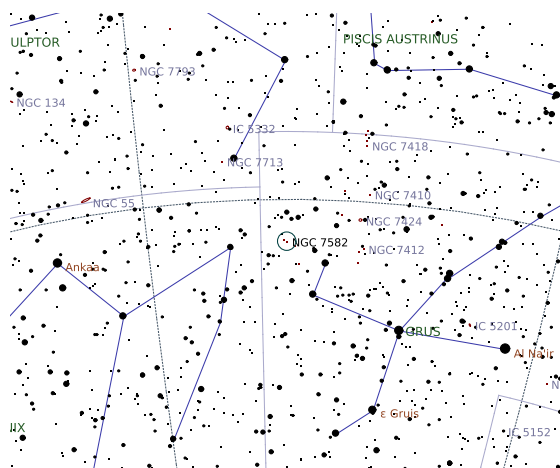
NGC 7582 (Grus Quartet)

Galaxy in Grus

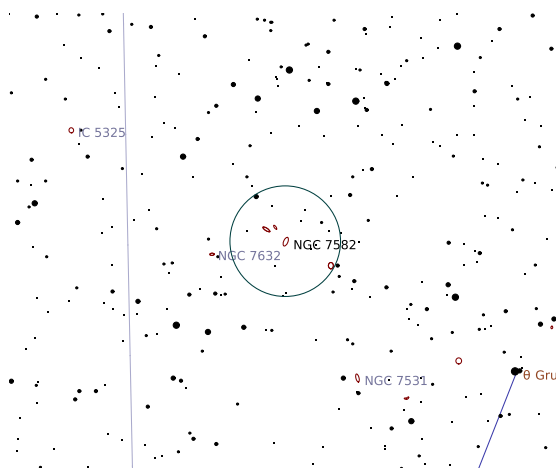
| | | | |
|---------------------------|---|-----------------------|--------------|
| Right Ascension (current) | 23 ^h 19 ^m 05 ^s | Declination (current) | −42° 17′ 56″ |
| Right Ascension (J2000.0) | 23 ^h 18 ^m 23 ^s | Declination (J2000.0) | −42° 22′ 11″ |
| Size | 5′ × 2.3′ | Position Angle | −67° |
| Magnitude | 11 | Other Designation | — |

Description: Dreyer: pB;L;pmE;gbM

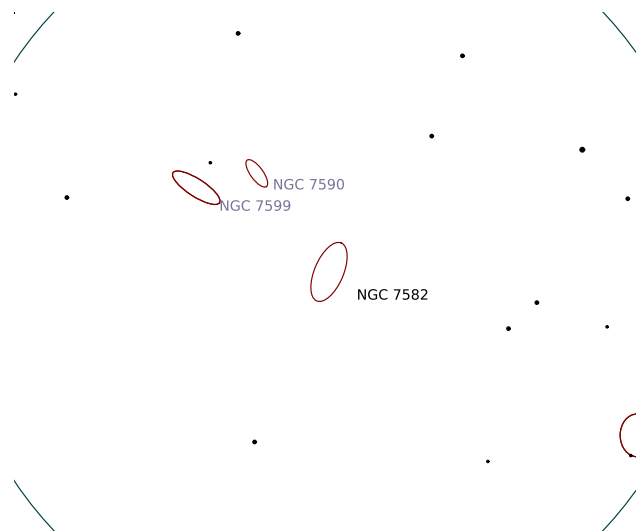
SAC: Group w NGC 7590 & 7599



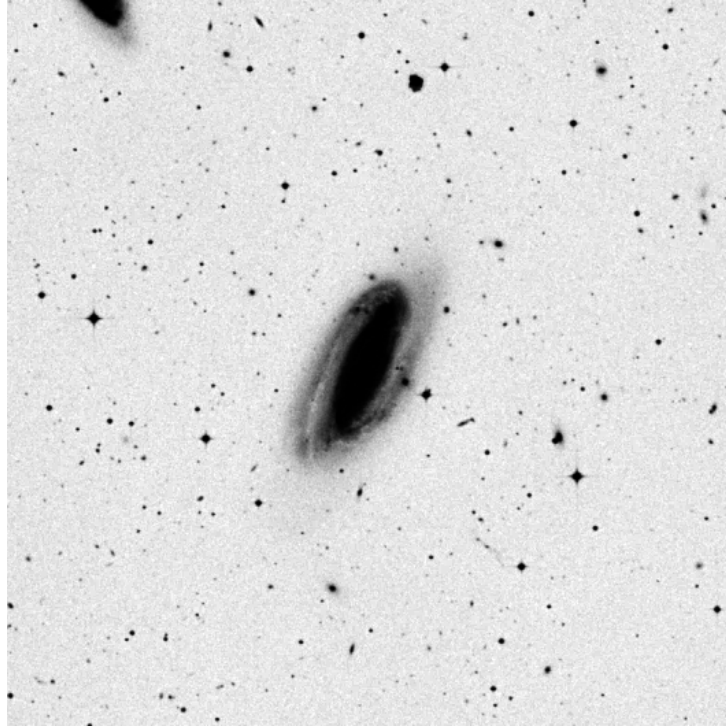
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

* Date: _____

* Time: _____

* Aperture: _____

* Power: _____

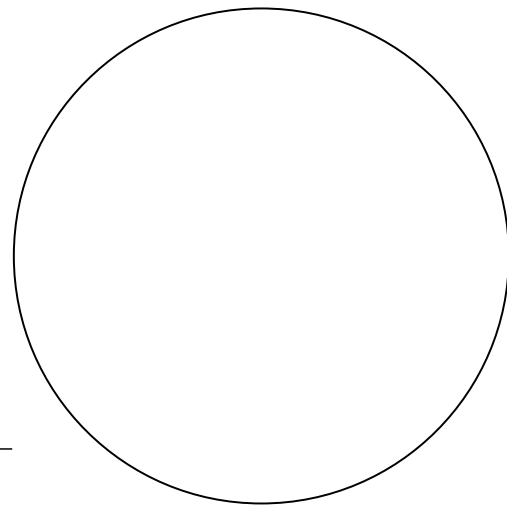
Equipment Details: _____

* Seeing: _____

Observation Location: _____

FOV: _____

* Description: _____



Sketch