

# 68 Globular Clusters

The Astronomy Logbook Project

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# Preface

This is a log book for observers wanting to see some of the brighter globular clusters. All of the globular clusters listed in this logbook are expected to be visually observable with an 8-inch (200mm) telescope, from reasonably dark (Bortle 4) skies. Most of them may be easily seen in a 4" (100mm) or a 6" (150mm) telescope, but there are occasional, more difficult objects.

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.

In making this logbook, globular clusters that met the following criteria were chosen from the SAC database (<http://www.saguaroaastro.org/content/downloads.htm>):

- Globular cluster is not a Messier object
- Globular cluster belongs to the NGC / IC catalogs
- Globular cluster is marked brighter than 'pretty faint' in Dreyer descriptions (with a few hand-picked exceptions)

Please note that some of the more fainter objects could have been included by accident. If you found some particular object exceptionally tough / invisible, please report them to me via email at ([akarshsimha@gmail.com](mailto:akarshsimha@gmail.com)).

Note that the **magnitudes for most of these globular clusters are clearly wrong**. This is a known issue. This is because data is unavailable in ready form at the moment in KStars. Until this is fixed, please trust the Dreyer descriptions and other internet resources to determine observability.

Also note that when blue DSS images were unavailable *red POSS II / UKSTU plates* have been used instead. This is the case for a handful number of objects. Unfortunately, the present system does not permit this to be explicitly mentioned.

It will be very useful to be able to read Dreyer's descriptions, that have been provided on the log forms. <http://obs.nineplanets.org/ngc.html> is a good resource to learn about them.

Many of these globular clusters 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 globular clusters!

– 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](http://www.klima-luft.de/steinicke/index_e.htm) (in English) for details.
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<sup>1</sup>i.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](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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Akarsh Simha may be reached at [akarshsimha@gmail.com](mailto:akarshsimha@gmail.com).

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# Acknowledgements

## The Bangalore Astronomical Society



The makers of this compilation acknowledge the Bangalore Astronomical Society (BAS) for the inspiration behind this idea. In particular, the makers thank the council members of the BAS during 2013.

## Austin Astronomical Society



Akarsh Simha would like to thank Austin Astronomical Society for keeping his astronomy spirit alive, and providing some of the motivation much required to complete these logbooks. The members of the AAS gave him much necessary encouragement, many many valuable suggestions, and shared his excitement at the finished product. Austin Astronomical Society's webpage is found at <http://austinastro.org>.

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  $\text{\LaTeX}$ . `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.
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# 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  $\alpha$  and  $\delta$ .

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  $\gamma$ ) 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  $360^\circ$  about its axis in 24 hours of time. Thus every hour of time corresponds to  $15^\circ$  of rotation of the earth. Thus, often in astronomy, the *hour* is used as a measure of angle, exactly equal to  $15^\circ$ . 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  $15^\circ$ . 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:  $31.25^\circ$ ). 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:  $10 \times 50$ ) 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,  $8' \times 3'$  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  $90^\circ$ , 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  $1^\circ$  diameter** on the sky.

The black dots are stars. The green / red symbol in the center of the  $1^\circ$  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](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  $5^\circ$  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,  $\Sigma$ , W or  $\text{Z}$  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

### Apus

NGC 6101 [69]

### Aquila

NGC 6749 [143]

NGC 6760 [147]

### Ara

NGC 6352 [93]

NGC 6362 [97]

NGC 6397 [101]

### Bootes

NGC 5466 [53]

### Carina

NGC 2808 [35]

### Centaurus

NGC 5139 (Omega Centauri) [49]

NGC 5286 [51]

### Columba

NGC 1851 [27]

### Coma Berenices

NGC 4147 [39]

NGC 4153 [41]

NGC 5053 [47]

### Corona Australis

NGC 6496 [111]

NGC 6541 [123]

### Delphinus

NGC 6934 [149]

NGC 7006 [151]

### Dorado

NGC 1855 [29]

### Hercules

NGC 6229 [75]

### Horologium

NGC 1261 [23]

**Hydra**

NGC 5694 [57]

**Libra**

NGC 5897 [61]

**Lupus**

NGC 5824 [59]

NGC 5927 [63]

NGC 5986 [67]

**Lynx**

NGC 2419 (Intergalactic Wanderer) [33]

**Mensa**

NGC 1841 [25]

**Musca**

NGC 4372 [43]

NGC 4833 [45]

**Norma**

NGC 5946 [65]

**Ophiuchus**

NGC 6235 [77]

NGC 6284 [79]

NGC 6287 [81]

NGC 6293 [83]

NGC 6304 [85]

NGC 6316 [87]

NGC 6325 [89]

NGC 6342 [91]

NGC 6356 [95]

NGC 6401 [103]

NGC 6517 [113]

**Pavo**

NGC 6752 [145]

**Puppis**

NGC 2298 [31]

**Sagittarius**

NGC 6440 [105]

NGC 6522 [115]

NGC 6528 [117]

NGC 6540 [121]

NGC 6558 [125]

NGC 6569 [127]

NGC 6624 [131]

NGC 6638 [133]

NGC 6642 [135]

NGC 6652 [137]

NGC 6723 [141]

**Scorpius**

NGC 6139 [71]

NGC 6144 [73]

NGC 6388 [99]

NGC 6441 [107]

NGC 6453 [109]

**Sculptor**

NGC 288 [19]

**Scutum**

NGC 6712 [139]

**Serpens Cauda**

NGC 6535 [119]

**Telescopium**

NGC 6584 [129]

## **Tucana**

NGC 104 (47 Tucanae) [[17](#)]

NGC 362 [[21](#)]

## **Vela**

NGC 3201 [[37](#)]

## **Virgo**

NGC 5634 [[55](#)]

# 4

## List of Objects by Type

NOTE: Numbers in square brackets are page numbers

	NGC 6304 [85]
	NGC 6316 [87]
	NGC 6325 [89]
	NGC 6342 [91]
	NGC 6352 [93]
	NGC 6356 [95]
	NGC 6362 [97]
	NGC 6388 [99]
	NGC 6397 [101]
	NGC 6401 [103]
	NGC 6440 [105]
	NGC 6441 [107]
	NGC 6453 [109]
	NGC 6496 [111]
	NGC 6517 [113]
	NGC 6522 [115]
	NGC 6528 [117]
	NGC 6535 [119]
	NGC 6540 [121]
	NGC 6541 [123]
	NGC 6558 [125]
	NGC 6569 [127]
	NGC 6584 [129]
	NGC 6624 [131]
	NGC 6638 [133]
	NGC 6642 [135]
	NGC 6652 [137]
	NGC 6712 [139]
	NGC 6723 [141]
	NGC 6749 [143]
	NGC 6752 [145]
	NGC 6760 [147]
	NGC 6934 [149]
	NGC 7006 [151]
<b>Globular Cluster</b>	
NGC 104 (47 Tucanae) [17]	
NGC 1261 [23]	
NGC 1841 [25]	
NGC 1851 [27]	
NGC 1855 [29]	
NGC 2298 [31]	
NGC 2419 (Intergalactic Wanderer) [33]	
NGC 2808 [35]	
NGC 288 [19]	
NGC 3201 [37]	
NGC 362 [21]	
NGC 4147 [39]	
NGC 4153 [41]	
NGC 4372 [43]	
NGC 4833 [45]	
NGC 5053 [47]	
NGC 5139 (Omega Centauri) [49]	
NGC 5286 [51]	
NGC 5466 [53]	
NGC 5634 [55]	
NGC 5694 [57]	
NGC 5824 [59]	
NGC 5897 [61]	
NGC 5927 [63]	
NGC 5946 [65]	
NGC 5986 [67]	
NGC 6101 [69]	
NGC 6139 [71]	
NGC 6144 [73]	
NGC 6229 [75]	
NGC 6235 [77]	
NGC 6284 [79]	
NGC 6287 [81]	
NGC 6293 [83]	

# 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
47 Tucanae	NGC 104	17
Intergalactic Wanderer	NGC 2419	33
Omega Centauri	NGC 5139	49

# 6

## 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 104 (47 Tucanae)	Globular Cluster	Tucana	4	50' × 50'	17		
2	NGC 288	Globular Cluster	Sculptor	8.1	13' × 13'	19		
3	NGC 362	Globular Cluster	Tucana	6.8	14' × 14'	21		
4	NGC 1261	Globular Cluster	Horologium	8.3	6.8' × 6.8'	23		
5	NGC 1841	Globular Cluster	Mensa	14	2.4' × 2.4'	25		
6	NGC 1851	Globular Cluster	Columba	7.1	12' × 12'	27		
7	NGC 1855	Globular Cluster	Dorado	10	0' × 0'	29		
8	NGC 2298	Globular Cluster	Puppis	9.3	5' × 5'	31		
9	NGC 2419 (Intergalactic Wanderer)	Globular Cluster	Lynx	10	4.6' × 4.6'	33		
10	NGC 2808	Globular Cluster	Carina	6.2	14' × 14'	35		
11	NGC 3201	Globular Cluster	Vela	6.9	20' × 20'	37		
12	NGC 4147	Globular Cluster	Coma Berenices	10	4.4' × 4.4'	39		
13	NGC 4153	Globular Cluster	Coma Berenices	10	4.4' × 4.4'	41		
14	NGC 4372	Globular Cluster	Musca	7.2	5' × 5'	43		
15	NGC 4833	Globular Cluster	Musca	8.4	14' × 14'	45		
16	NGC 5053	Globular Cluster	Coma Berenices	9	10' × 10'	47		
17	NGC 5139 (Omega Centauri)	Globular Cluster	Centaurus	5.3	55' × 55'	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 5286	Globular Cluster	Centaurus	7.4	11' × 11'	51		
19	NGC 5466	Globular Cluster	Bootes	9.2	9' × 9'	53		
20	NGC 5634	Globular Cluster	Virgo	9.5	5.5' × 5.5'	55		
21	NGC 5694	Globular Cluster	Hydra	10	4.3' × 4.3'	57		
22	NGC 5824	Globular Cluster	Lupus	9.1	7.4' × 7.4'	59		
23	NGC 5897	Globular Cluster	Libra	8.4	11' × 11'	61		
24	NGC 5927	Globular Cluster	Lupus	8	6' × 6'	63		
25	NGC 5946	Globular Cluster	Norma	8.4	3' × 3'	65		
26	NGC 5986	Globular Cluster	Lupus	7.6	9.6' × 9.6'	67		
27	NGC 6101	Globular Cluster	Apus	9.2	5' × 5'	69		
28	NGC 6139	Globular Cluster	Scorpius	9.1	8.2' × 8.2'	71		
29	NGC 6144	Globular Cluster	Scorpius	9	7.4' × 7.4'	73		
30	NGC 6229	Globular Cluster	Hercules	9.4	4.5' × 4.5'	75		
31	NGC 6235	Globular Cluster	Ophiuchus	8.9	5' × 5'	77		
32	NGC 6284	Globular Cluster	Ophiuchus	8.9	6.2' × 6.2'	79		
33	NGC 6287	Globular Cluster	Ophiuchus	9.3	4.8' × 4.8'	81		
34	NGC 6293	Globular Cluster	Ophiuchus	8.3	8.2' × 8.2'	83		
35	NGC 6304	Globular Cluster	Ophiuchus	8.3	8' × 8'	85		
36	NGC 6316	Globular Cluster	Ophiuchus	8.1	5.4' × 5.4'	87		
37	NGC 6325	Globular Cluster	Ophiuchus	10	4.1' × 4.1'	89		
38	NGC 6342	Globular Cluster	Ophiuchus	9.5	4.4' × 4.4'	91		
39	NGC 6352	Globular Cluster	Ara	7.8	9' × 9'	93		
40	NGC 6356	Globular Cluster	Ophiuchus	8.2	10' × 10'	95		
41	NGC 6362	Globular Cluster	Ara	8.1	15' × 15'	97		
42	NGC 6388	Globular Cluster	Scorpius	6.8	10.4' × 10.4'	99		
43	NGC 6397	Globular Cluster	Ara	5.3	31' × 31'	101		
44	NGC 6401	Globular Cluster	Ophiuchus	7.4	4.8' × 4.8'	103		
45	NGC 6440	Globular Cluster	Sagittarius	9.3	4.4' × 4.4'	105		
46	NGC 6441	Globular Cluster	Scorpius	7.2	9.6' × 9.6'	107		
47	NGC 6453	Globular Cluster	Scorpius	10	7.6' × 7.6'	109		
48	NGC 6496	Globular Cluster	Corona Australis	8.6	5.6' × 5.6'	111		
49	NGC 6517	Globular Cluster	Ophiuchus	10	4' × 4'	113		
50	NGC 6522	Globular Cluster	Sagittarius	9.9	9.4' × 9.4'	115		
51	NGC 6528	Globular Cluster	Sagittarius	9.6	5' × 5'	117		
52	NGC 6535	Globular Cluster	Serpens Cauda	9.3	3.4' × 3.4'	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 6540	Globular Cluster	Sagittarius	9.3	1.5' × 1.5'	121		
54	NGC 6541	Globular Cluster	Corona Australis	6.3	15' × 15'	123		
55	NGC 6558	Globular Cluster	Sagittarius	8.6	4.2' × 4.2'	125		
56	NGC 6569	Globular Cluster	Sagittarius	8.4	6.4' × 6.4'	127		
57	NGC 6584	Globular Cluster	Telescopium	7.9	6.6' × 6.6'	129		
58	NGC 6624	Globular Cluster	Sagittarius	7.6	8.8' × 8.8'	131		
59	NGC 6638	Globular Cluster	Sagittarius	9.2	7.3' × 7.3'	133		
60	NGC 6642	Globular Cluster	Sagittarius	8.9	5.8' × 5.8'	135		
61	NGC 6652	Globular Cluster	Sagittarius	8.5	6' × 6'	137		
62	NGC 6712	Globular Cluster	Scutum	8.1	9.8' × 9.8'	139		
63	NGC 6723	Globular Cluster	Sagittarius	6.8	13' × 13'	141		
64	NGC 6749	Globular Cluster	Aquila	12	4' × 4'	143		
65	NGC 6752	Globular Cluster	Pavo	5.3	29' × 29'	145		
66	NGC 6760	Globular Cluster	Aquila	9	9.6' × 9.6'	147		
67	NGC 6934	Globular Cluster	Delphinus	8.9	7.1' × 7.1'	149		
68	NGC 7006	Globular Cluster	Delphinus	11	3.6' × 3.6'	151		

# 7

## Logging Forms

This section contains the actual logging forms.

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

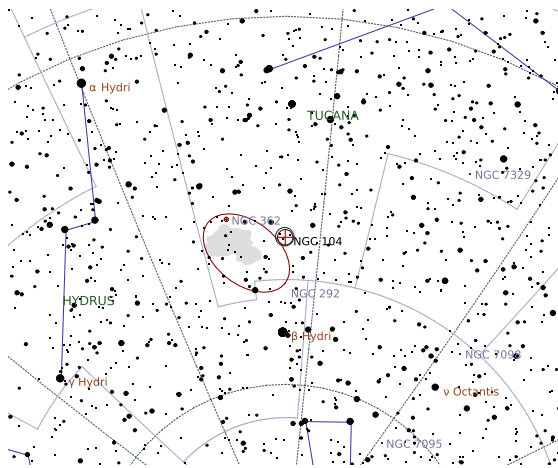
# NGC 104 (47 Tucanae)

## Globular Cluster in Tucana

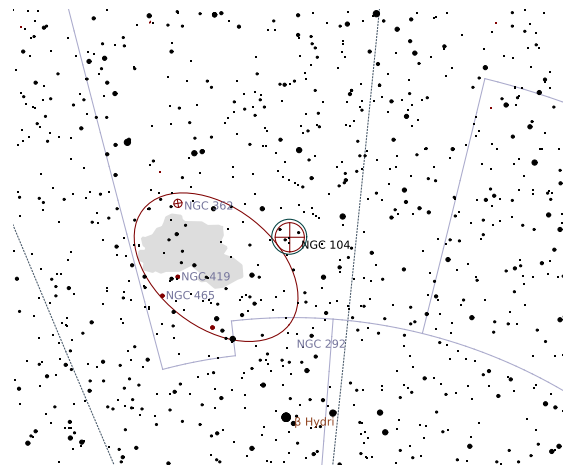
Right Ascension (current)	00 <sup>h</sup> 24 <sup>m</sup> 36 <sup>s</sup>	Declination (current)	−72° 00′ 37″
Right Ascension (J2000.0)	00 <sup>h</sup> 24 <sup>m</sup> 05 <sup>s</sup>	Declination (J2000.0)	−72° 04′ 49″
Size	50′ × 50′	Position Angle	90°
Magnitude	4	Other Designation	–

**Description:** Dreyer: !! vB;vL;eRi;vmCM

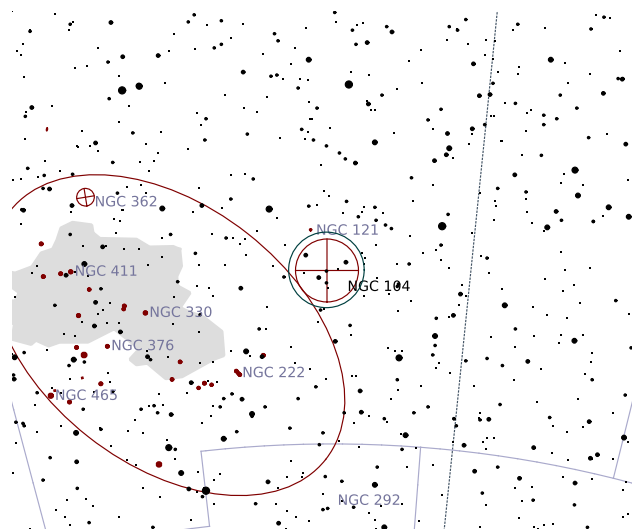
**SAC:** X-ray source;\* mags 11...;splendid cluster



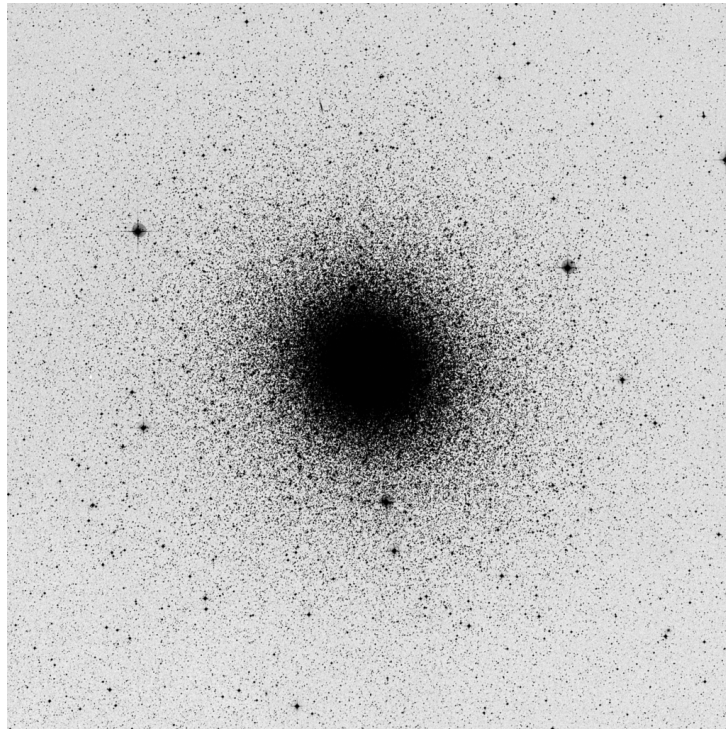
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (55.0' × 55.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

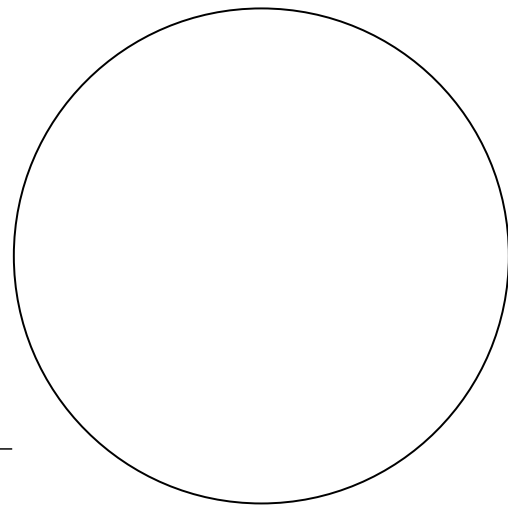
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

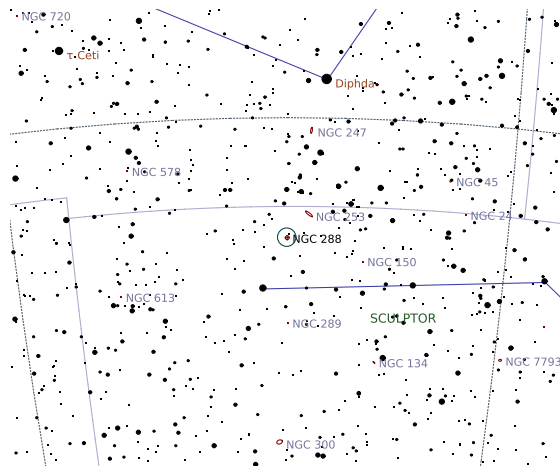
# NGC 288

## Globular Cluster in Sculptor

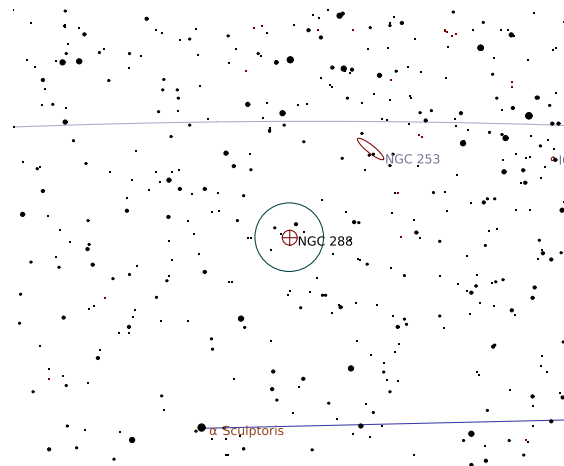
Right Ascension (current)	00 <sup>h</sup> 53 <sup>m</sup> 24 <sup>s</sup>	Declination (current)	−26° 31′ 02″
Right Ascension (J2000.0)	00 <sup>h</sup> 52 <sup>m</sup> 46 <sup>s</sup>	Declination (J2000.0)	−26° 35′ 10″
Size	13′ × 13′	Position Angle	90°
Magnitude	8.1	Other Designation	—

**Description:** Dreyer: B;L;1E;st 12...16

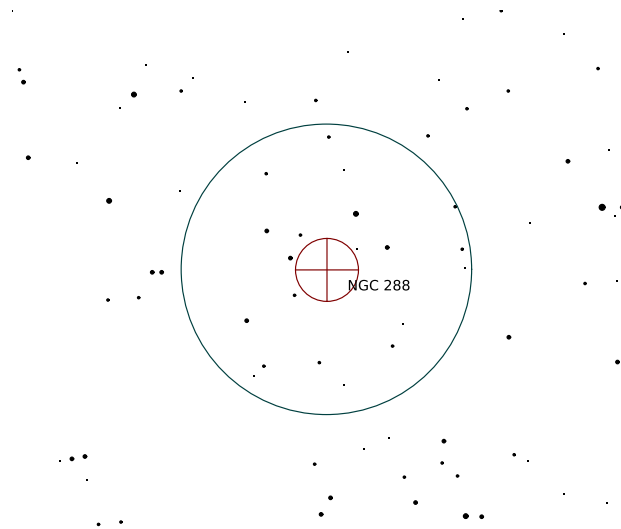
**SAC:** H VI 20;loose structured globular



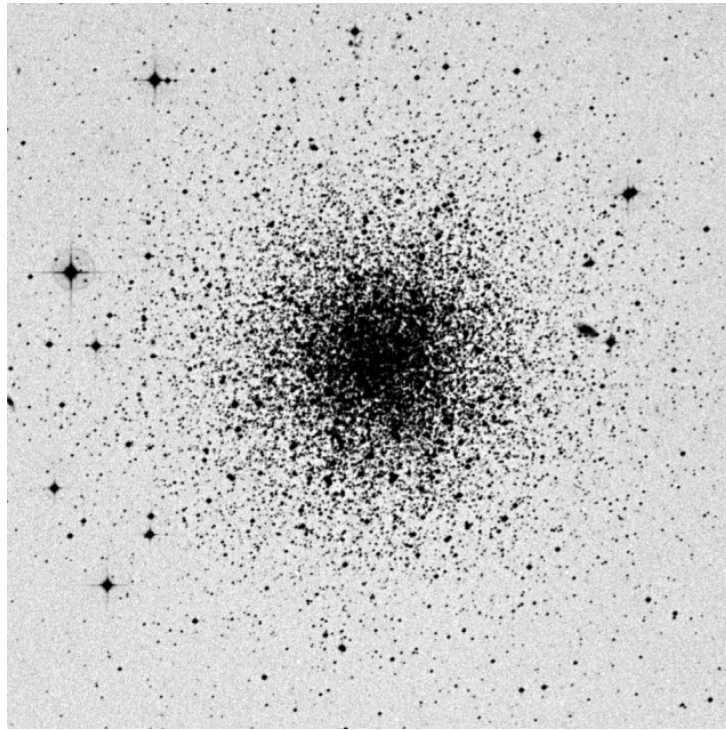
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (18.0' × 18.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

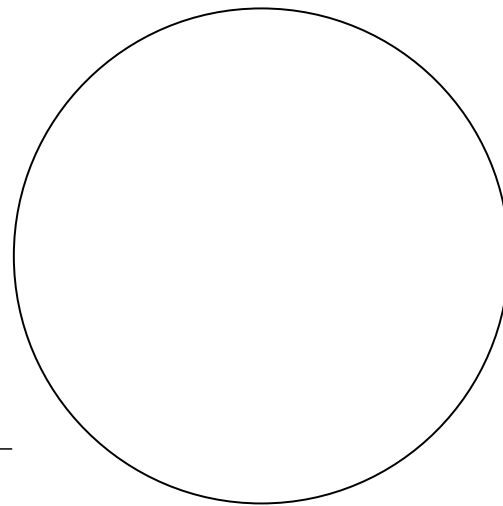
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



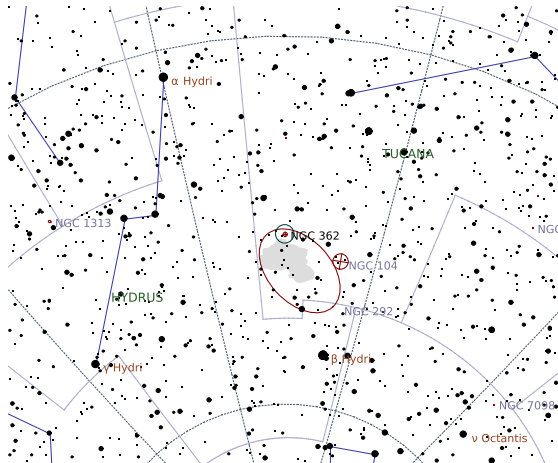
Sketch

# NGC 362

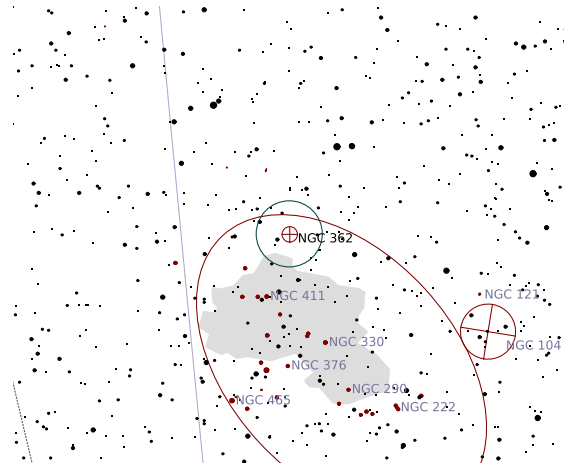
Globular Cluster in Tucana

Right Ascension (current)	01 <sup>h</sup> 03 <sup>m</sup> 38 <sup>s</sup>	Declination (current)	−70° 46′ 52″
Right Ascension (J2000.0)	01 <sup>h</sup> 03 <sup>m</sup> 14 <sup>s</sup>	Declination (J2000.0)	−70° 50′ 52″
Size	14′ × 14′	Position Angle	90°
Magnitude	6.8	Other Designation	—

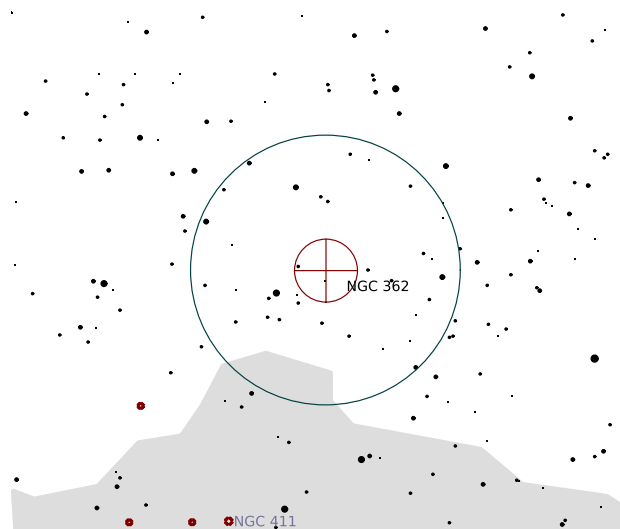
**Description:** Dreyer: vB;vL;vC;vmbM



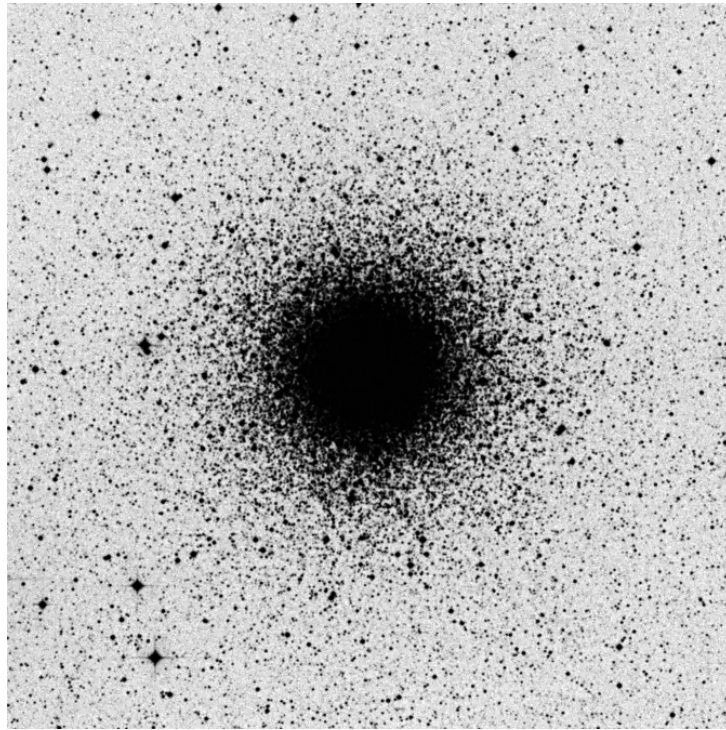
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (19.0' × 19.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

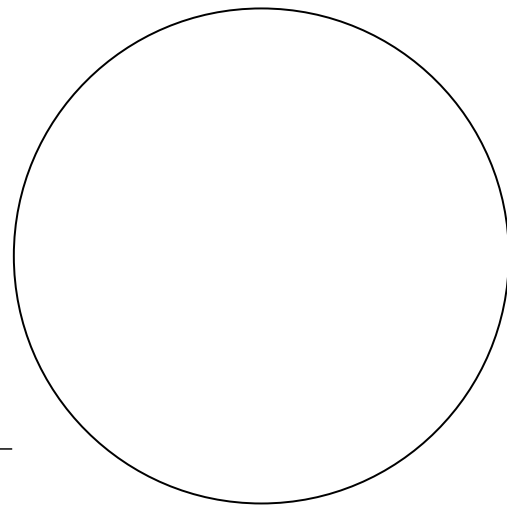
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

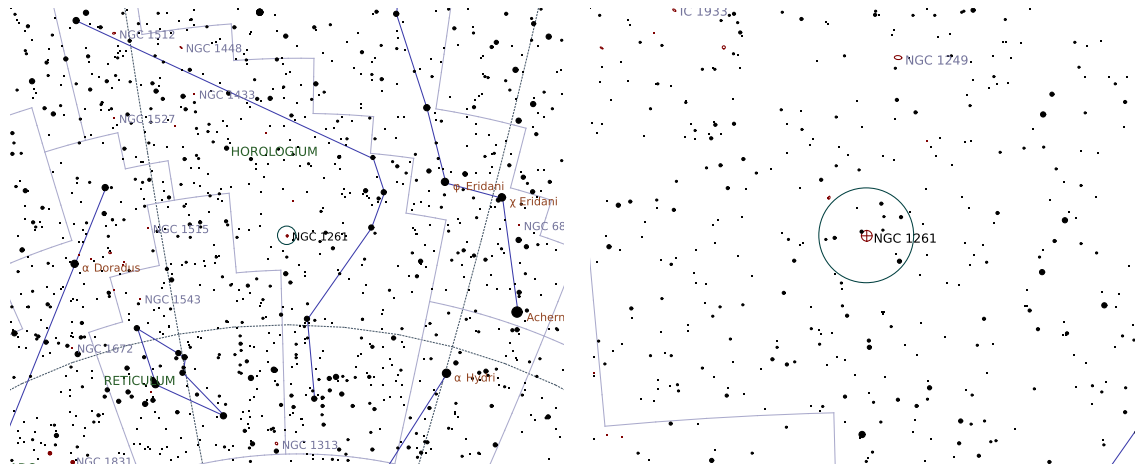


# NGC 1261

## Globular Cluster in Horologium

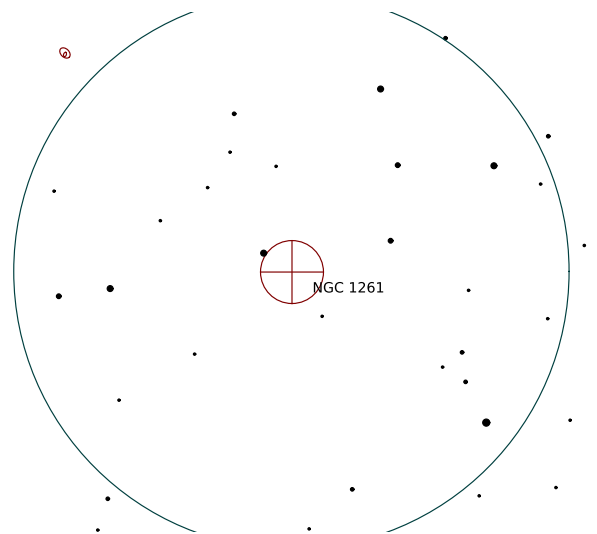
Right Ascension (current)	03 <sup>h</sup> 12 <sup>m</sup> 36 <sup>s</sup>	Declination (current)	−55° 10′ 22″
Right Ascension (J2000.0)	03 <sup>h</sup> 12 <sup>m</sup> 15 <sup>s</sup>	Declination (J2000.0)	−55° 12′ 59″
Size	6.8′ × 6.8′	Position Angle	90°
Magnitude	8.3	Other Designation	—

**Description:** Dreyer: B;L;R;rr

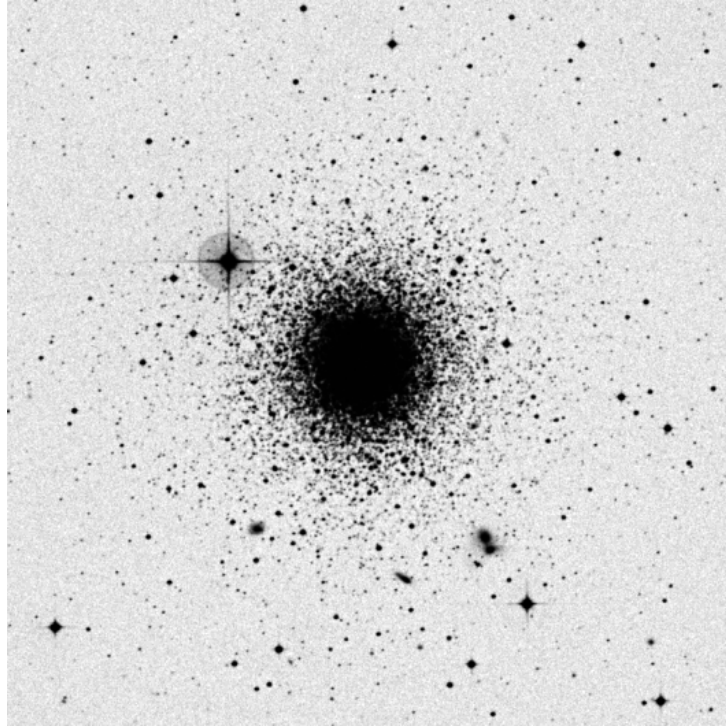


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

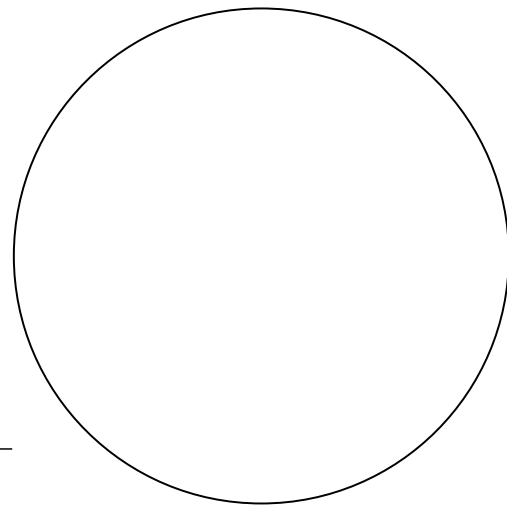
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



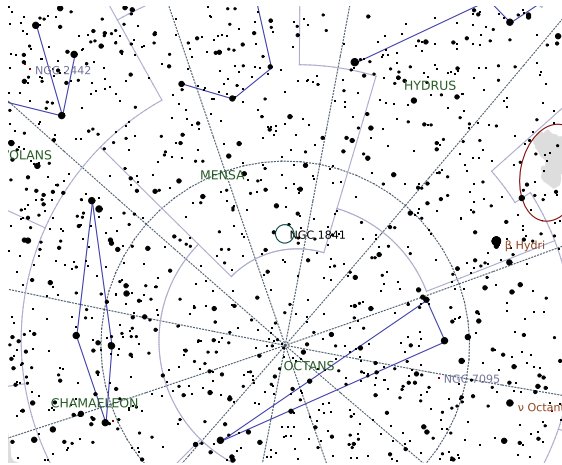
Sketch

# NGC 1841

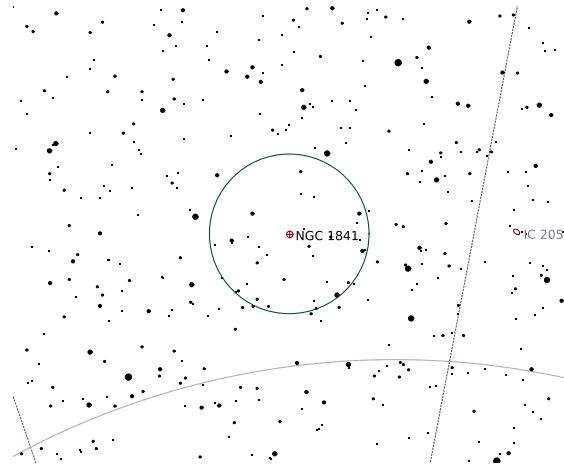
## Globular Cluster in Mensa

Right Ascension (current)	04 <sup>h</sup> 43 <sup>m</sup> 27 <sup>s</sup>	Declination (current)	−83° 58′ 40″
Right Ascension (J2000.0)	04 <sup>h</sup> 45 <sup>m</sup> 23 <sup>s</sup>	Declination (J2000.0)	−83° 59′ 49″
Size	2.4′ × 2.4′	Position Angle	90°
Magnitude	14	Other Designation	–

**Description:** Dreyer: pF;L;iR;vsbM;r



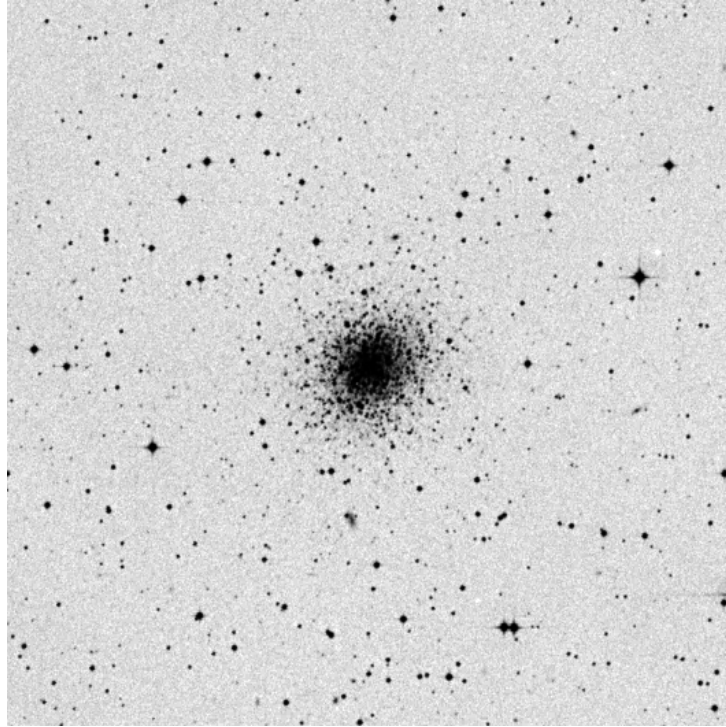
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

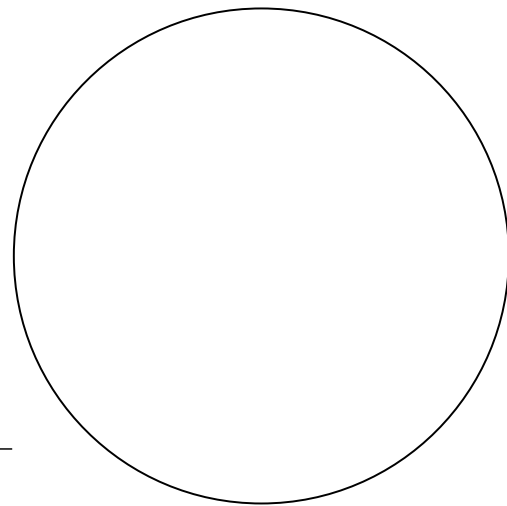
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

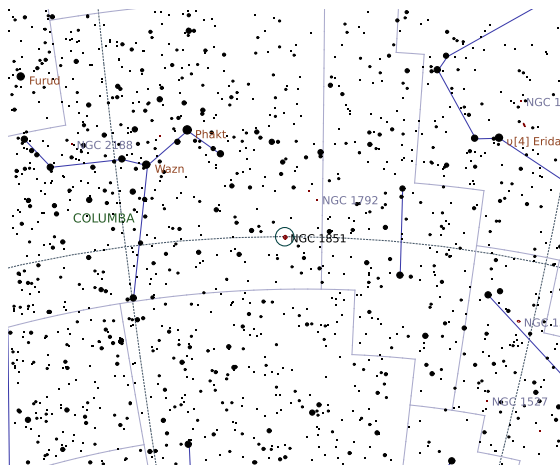
# NGC 1851

## Globular Cluster in Columba

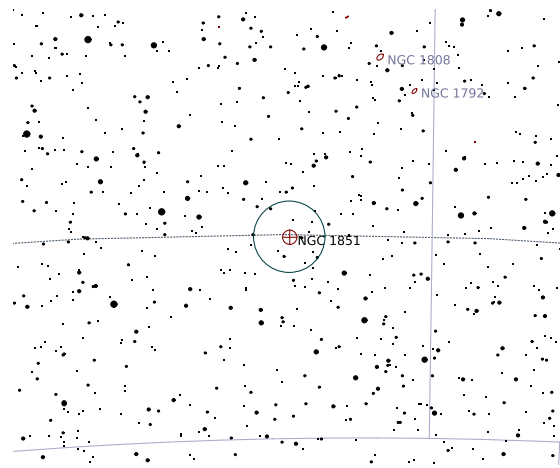
Right Ascension (current)	05 <sup>h</sup> 14 <sup>m</sup> 33 <sup>s</sup>	Declination (current)	-40° 02' 15"
Right Ascension (J2000.0)	05 <sup>h</sup> 14 <sup>m</sup> 06 <sup>s</sup>	Declination (J2000.0)	-40° 02' 48"
Size	12' × 12'	Position Angle	90°
Magnitude	7.1	Other Designation	–

**Description:** Dreyer: !vB;vL;R;vsvvbM;rrr

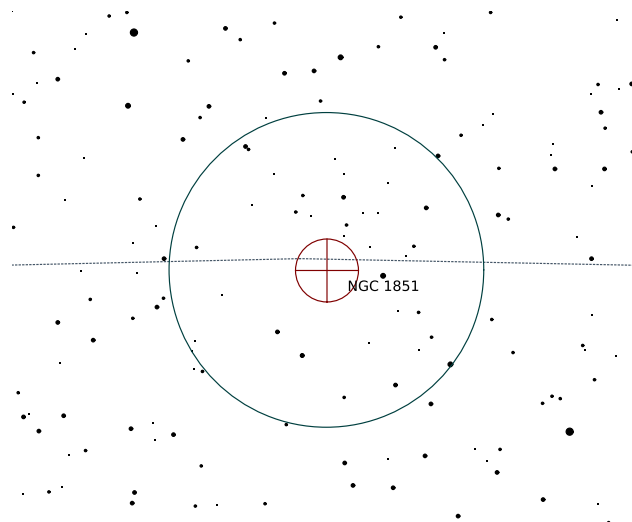
**SAC:** X-ray source;vRi w F\*



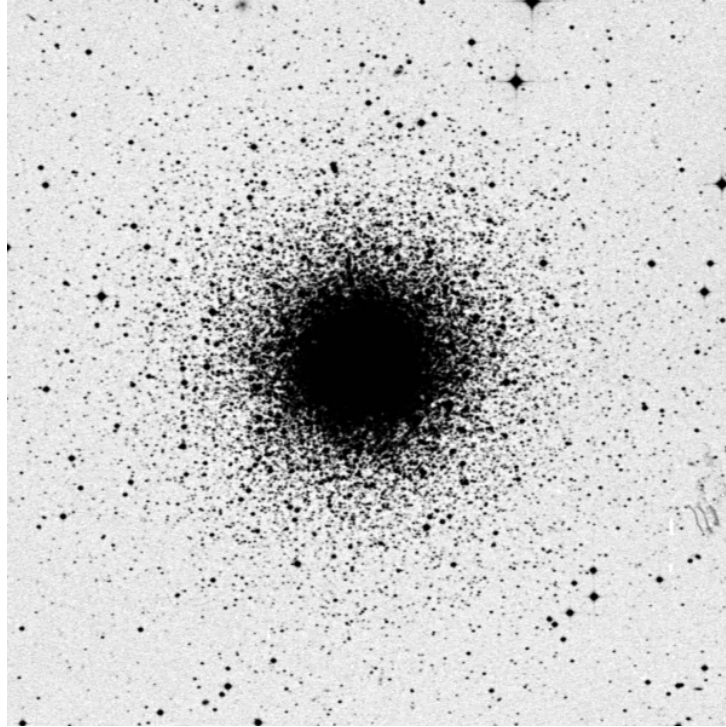
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (17.0' × 17.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

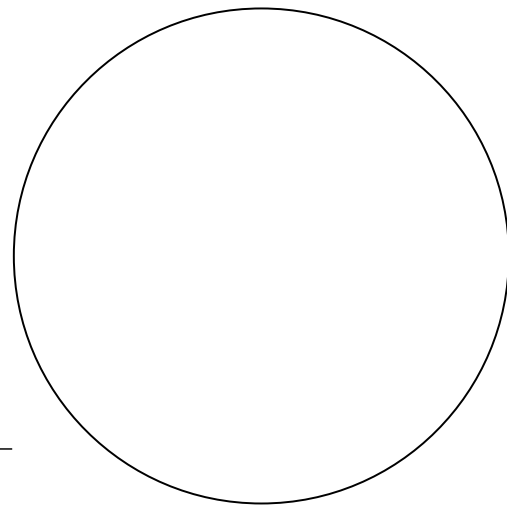
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



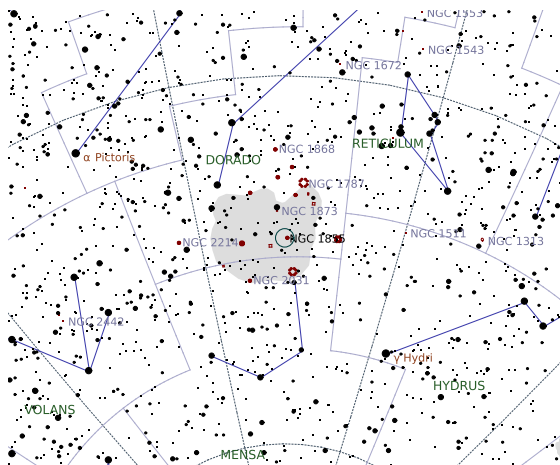
Sketch

# NGC 1855

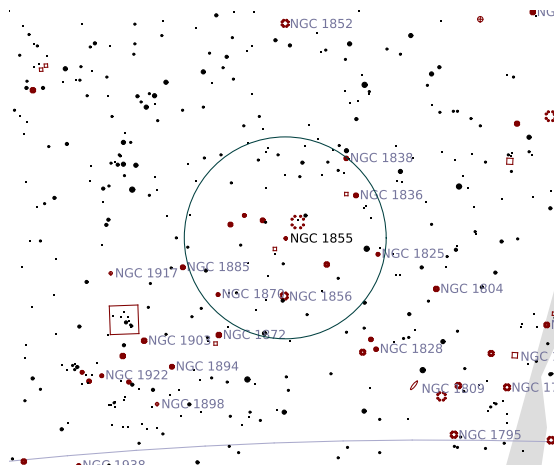
## Globular Cluster in Dorado

Right Ascension (current)	05 <sup>h</sup> 09 <sup>m</sup> 17 <sup>s</sup>	Declination (current)	−68° 50′ 15″
Right Ascension (J2000.0)	05 <sup>h</sup> 09 <sup>m</sup> 20 <sup>s</sup>	Declination (J2000.0)	−68° 50′ 51″
Size	0′ × 0′	Position Angle	90°
Magnitude	10	Other Designation	—

**Description:** Dreyer: C1;vB;L;R;st 12



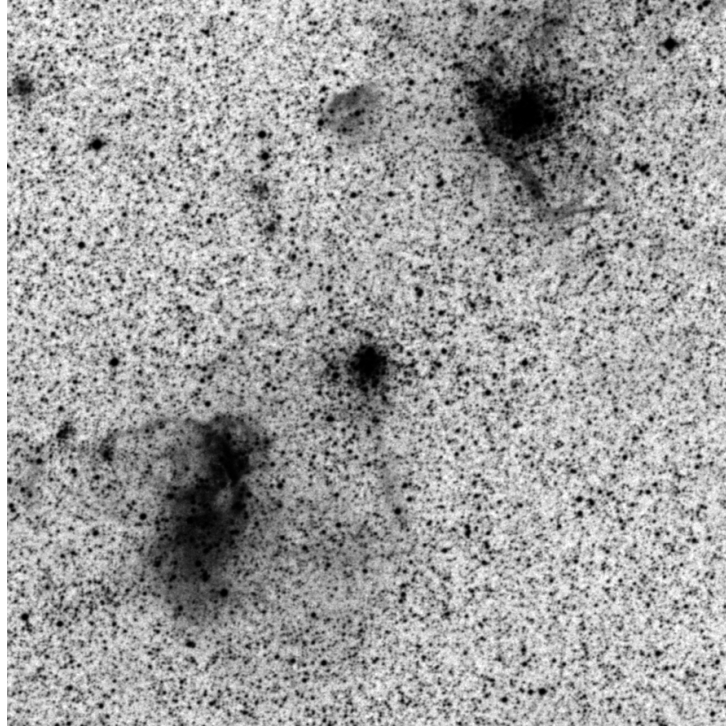
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

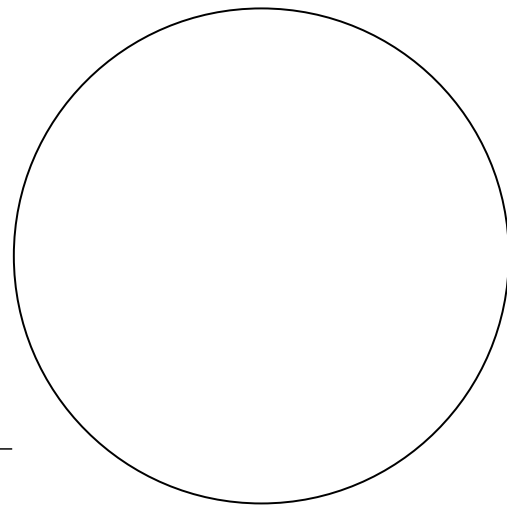
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch



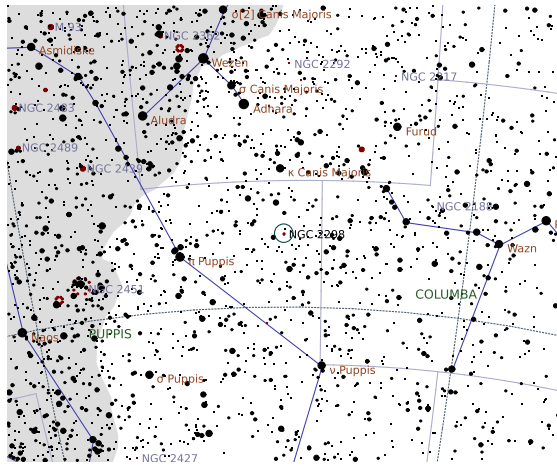
# NGC 2298

## Globular Cluster in Puppis

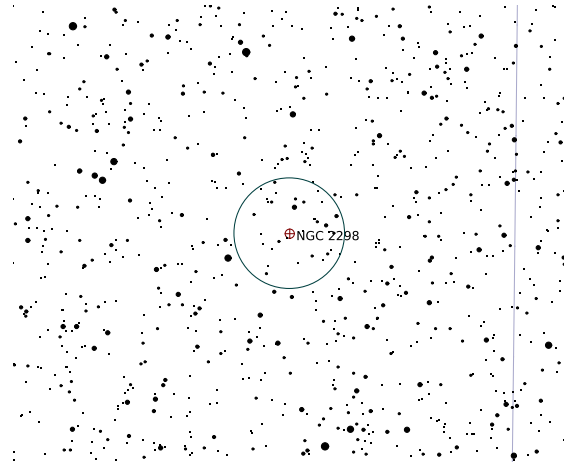
Right Ascension (current)	06 <sup>h</sup> 49 <sup>m</sup> 28 <sup>s</sup>	Declination (current)	−36° 01′ 31″
Right Ascension (J2000.0)	06 <sup>h</sup> 48 <sup>m</sup> 59 <sup>s</sup>	Declination (J2000.0)	−36° 00′ 17″
Size	5′ × 5′	Position Angle	90°
Magnitude	9.3	Other Designation	—

**Description:** Dreyer: B;pL;iR;gbM;rr

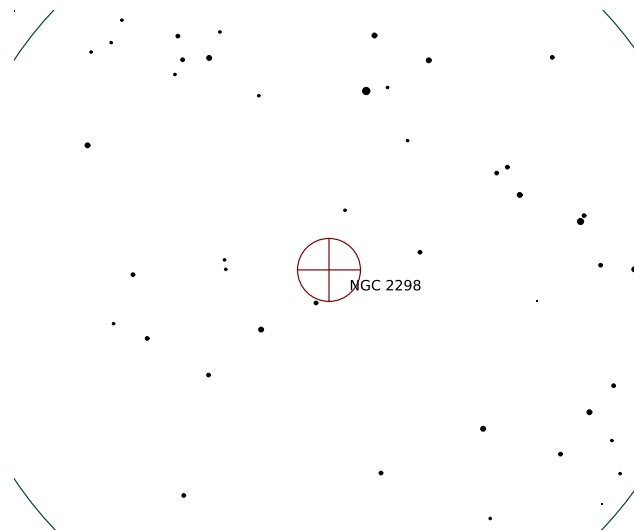
**SAC:** Stars eF



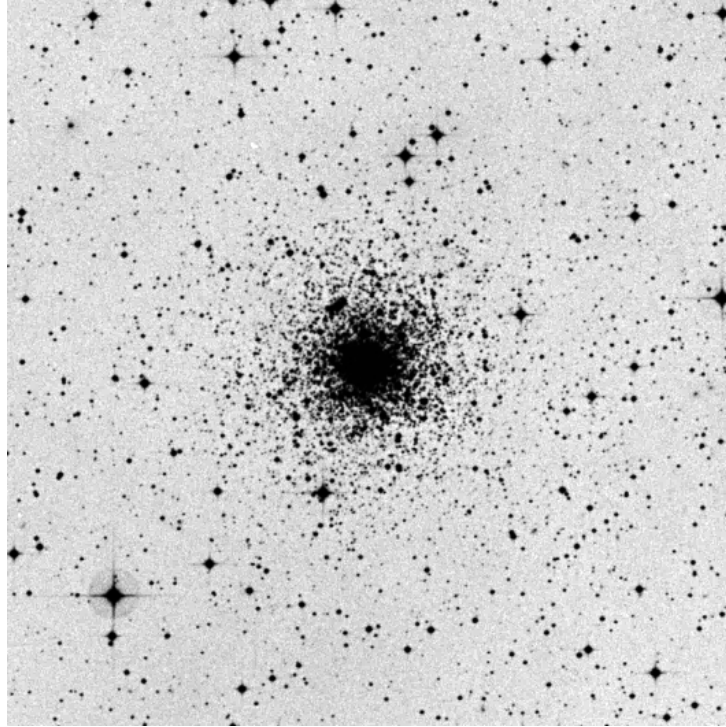
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

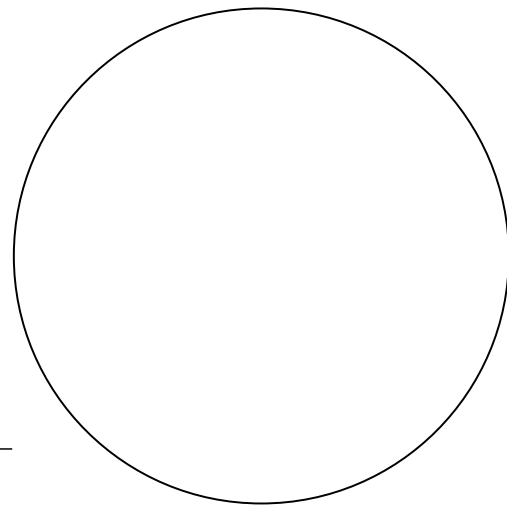
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

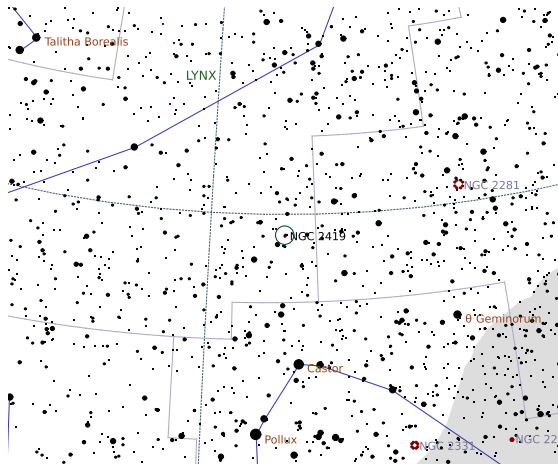
# NGC 2419 (Intergalactic Wanderer)

Globular Cluster in Lynx

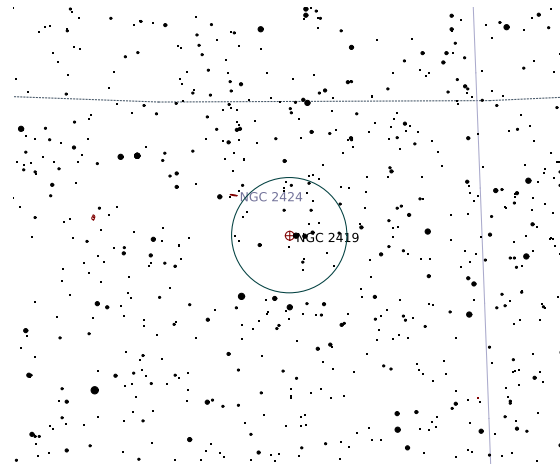
Right Ascension (current)	07 <sup>h</sup> 39 <sup>m</sup> 03 <sup>s</sup>	Declination (current)	38° 50' 59"
Right Ascension (J2000.0)	07 <sup>h</sup> 38 <sup>m</sup> 08 <sup>s</sup>	Declination (J2000.0)	38° 52' 57"
Size	4.6' × 4.6'	Position Angle	90°
Magnitude	10	Other Designation	—

**Description:** Dreyer: pB;pL;lE 90deg;vgbM;\*7-8 267deg;4' dist

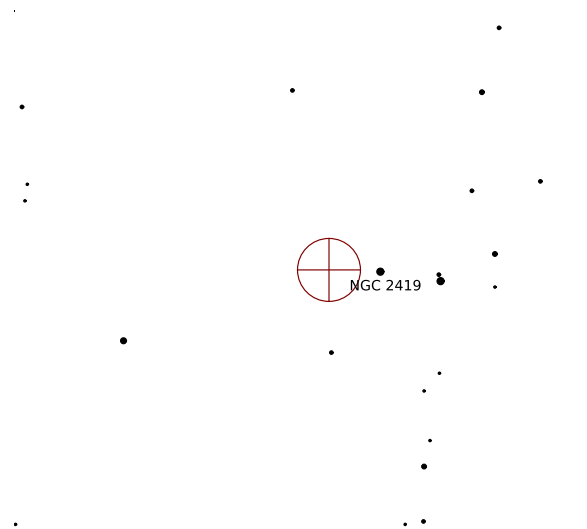
**SAC:** H I 218;Most distant globular;Brightest AASlogo.eps AASlogo-eps-converted-to.pdf Acknowledgements.tex Austin.



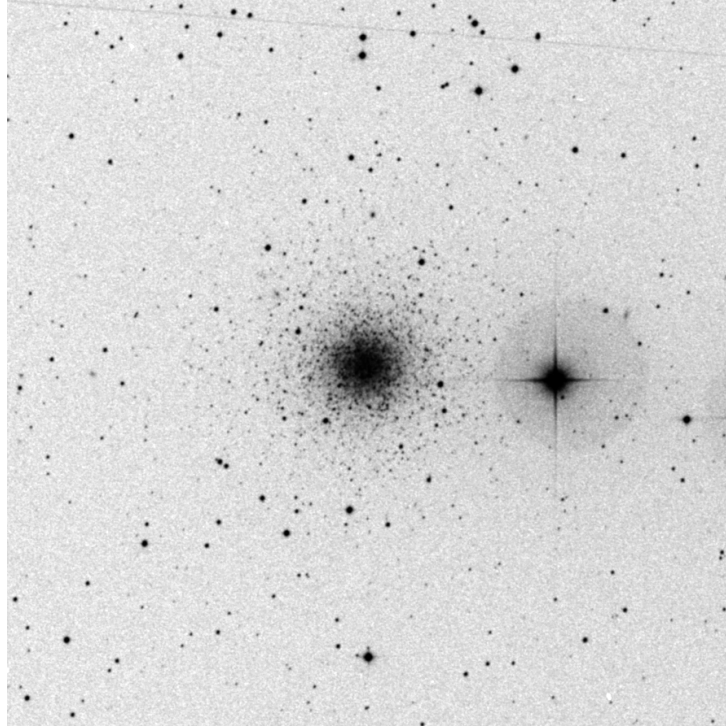
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

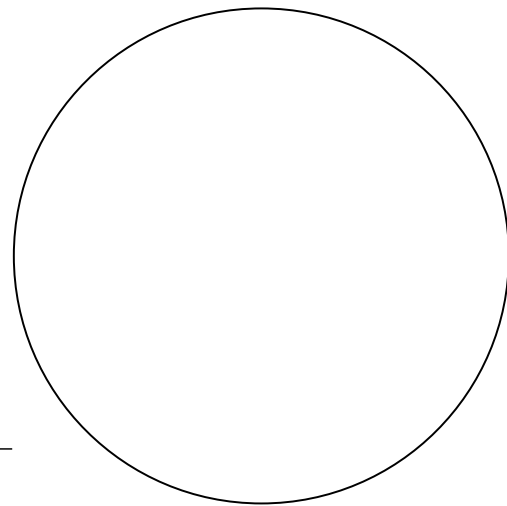
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



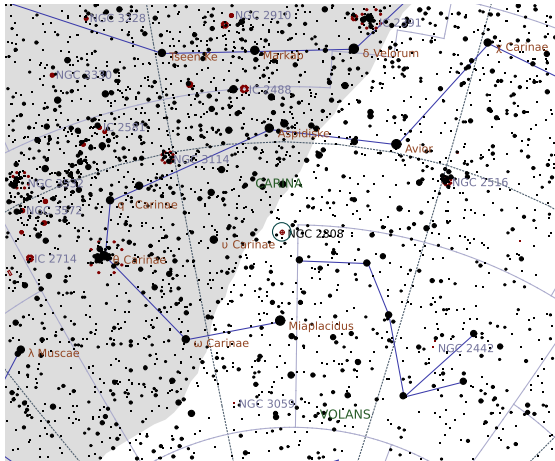
Sketch

# NGC 2808

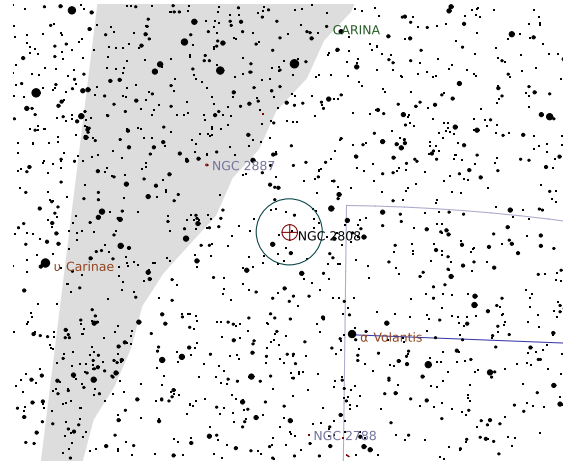
## Globular Cluster in Carina

Right Ascension (current)	09 <sup>h</sup> 12 <sup>m</sup> 21 <sup>s</sup>	Declination (current)	−64° 55′ 11″
Right Ascension (J2000.0)	09 <sup>h</sup> 12 <sup>m</sup> 02 <sup>s</sup>	Declination (J2000.0)	−64° 51′ 45″
Size	14′ × 14′	Position Angle	90°
Magnitude	6.2	Other Designation	–

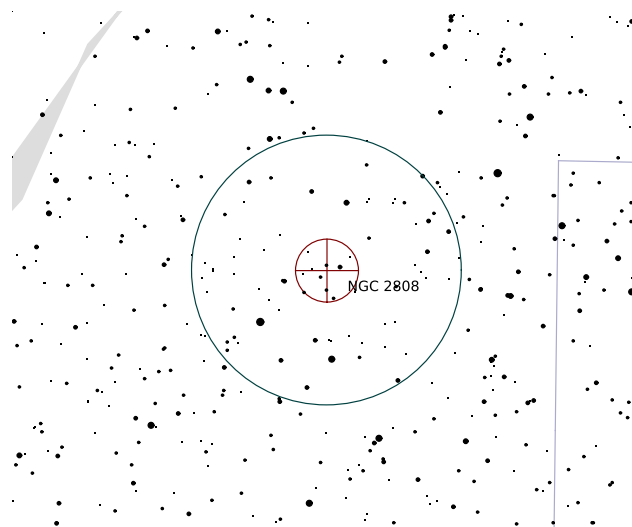
Description: Dreyer: ! vL;eRi;vgeCM 45 sec d;st 13...15



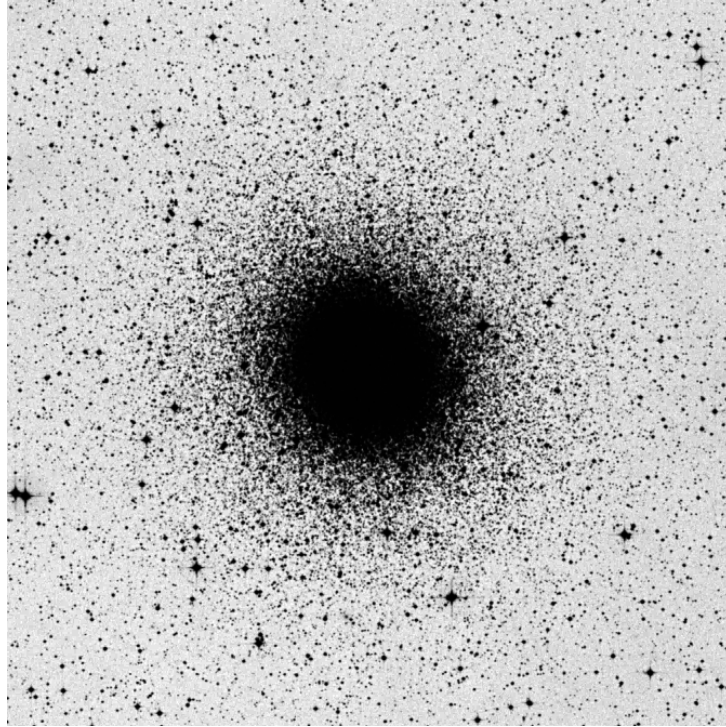
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (19.0' × 19.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

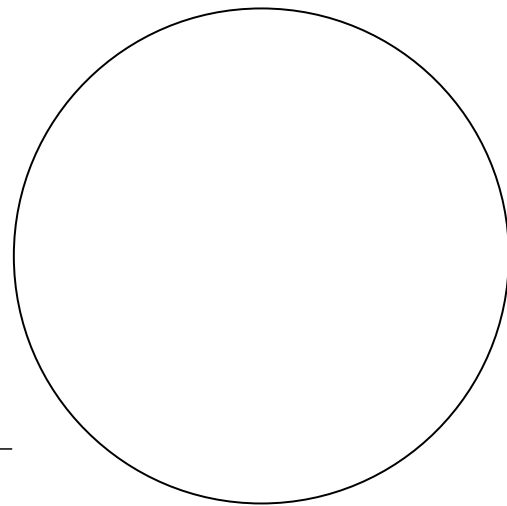
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

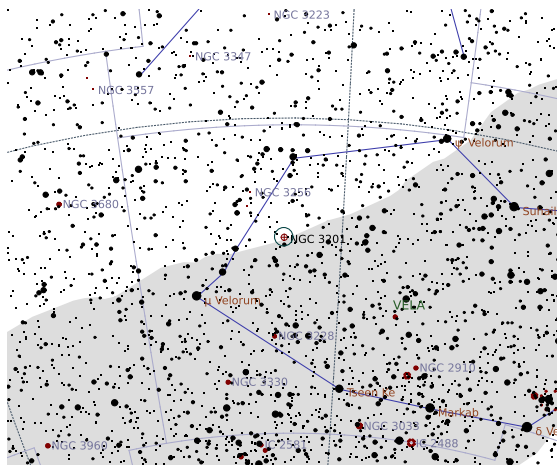
# NGC 3201

## Globular Cluster in Vela

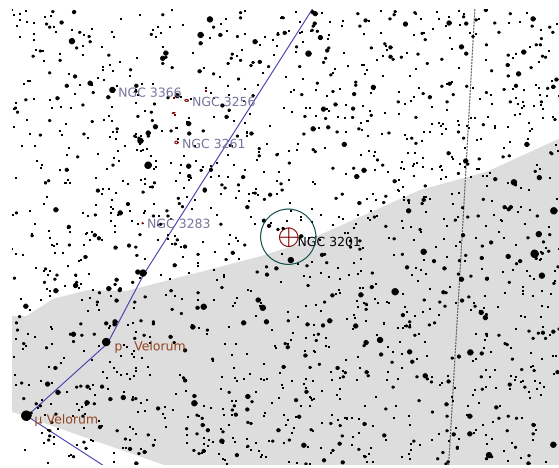
Right Ascension (current)	10 <sup>h</sup> 18 <sup>m</sup> 11 <sup>s</sup>	Declination (current)	−46° 28′ 43″
Right Ascension (J2000.0)	10 <sup>h</sup> 17 <sup>m</sup> 36 <sup>s</sup>	Declination (J2000.0)	−46° 24′ 38″
Size	20′ × 20′	Position Angle	90°
Magnitude	6.9	Other Designation	–

**Description:** Dreyer: vL;iR;1CM;st 13...16

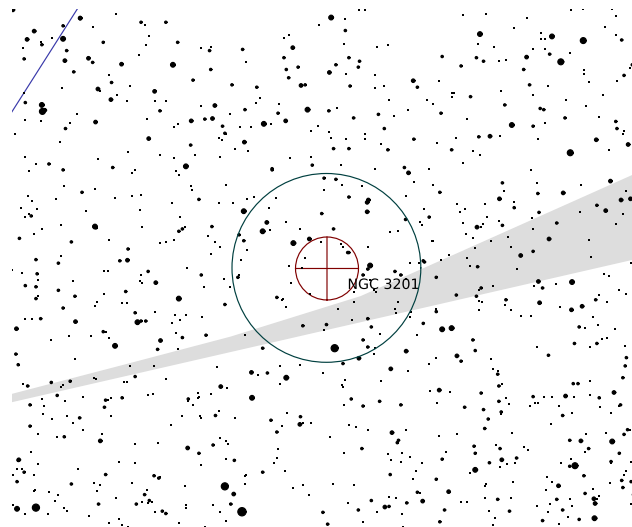
**SAC:** \* mags 13...; loose structured globular



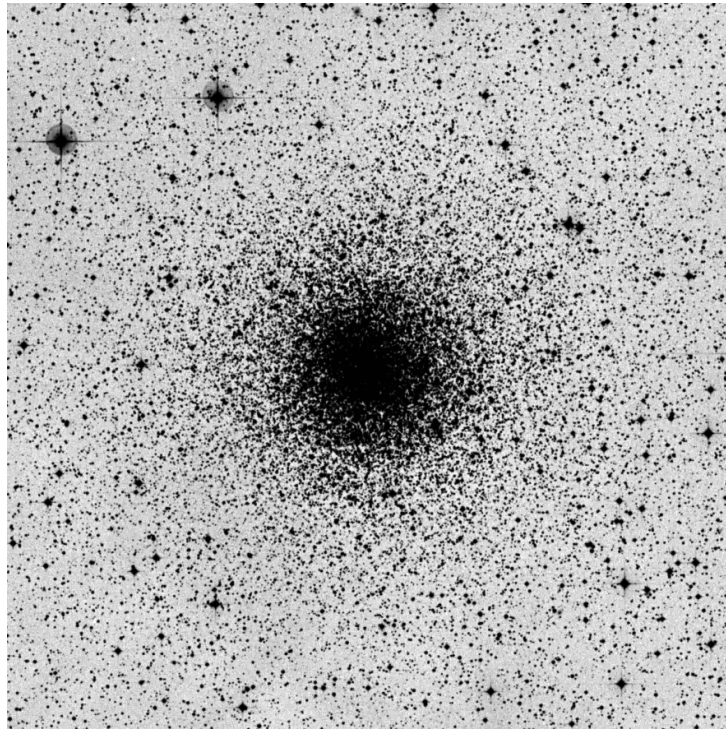
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (25.0' × 25.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

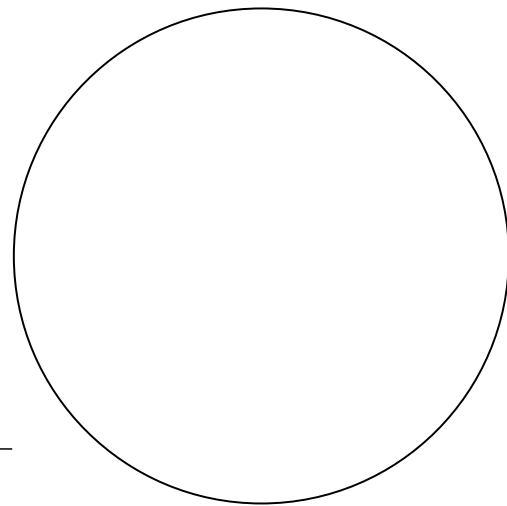
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch



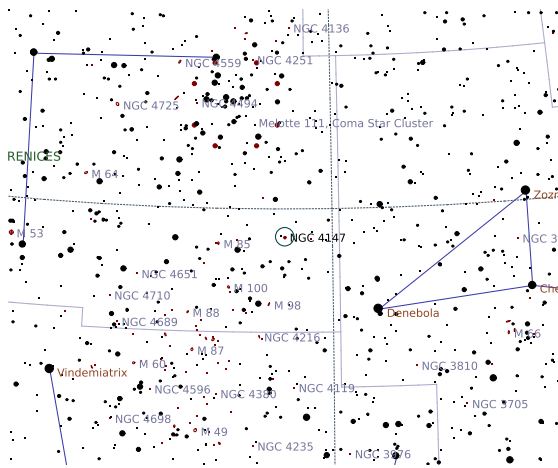
# NGC 4147

Globular Cluster in Coma Berenices

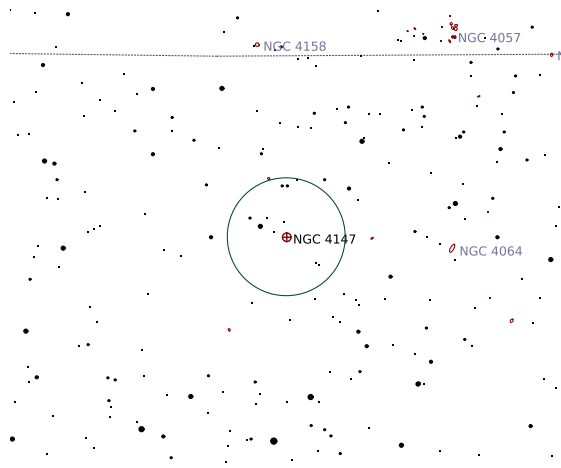
Right Ascension (current)	12 <sup>h</sup> 10 <sup>m</sup> 47 <sup>s</sup>	Declination (current)	18° 27' 54"
Right Ascension (J2000.0)	12 <sup>h</sup> 10 <sup>m</sup> 06 <sup>s</sup>	Declination (J2000.0)	18° 32' 33"
Size	4.4' × 4.4'	Position Angle	90°
Magnitude	10	Other Designation	—

Description: Dreyer: vB;pL;R;gbM;rrr

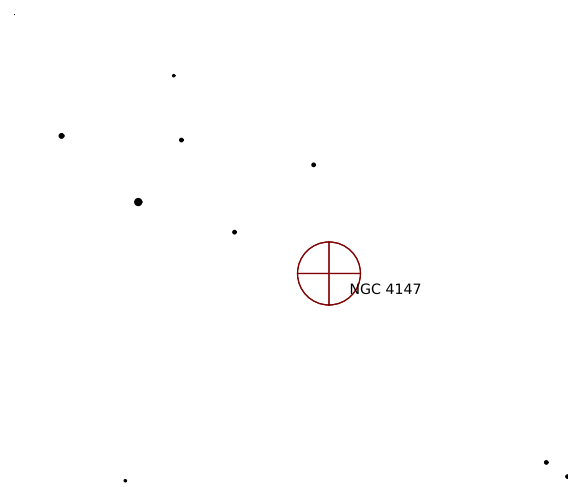
SAC: H I 19;Stars F



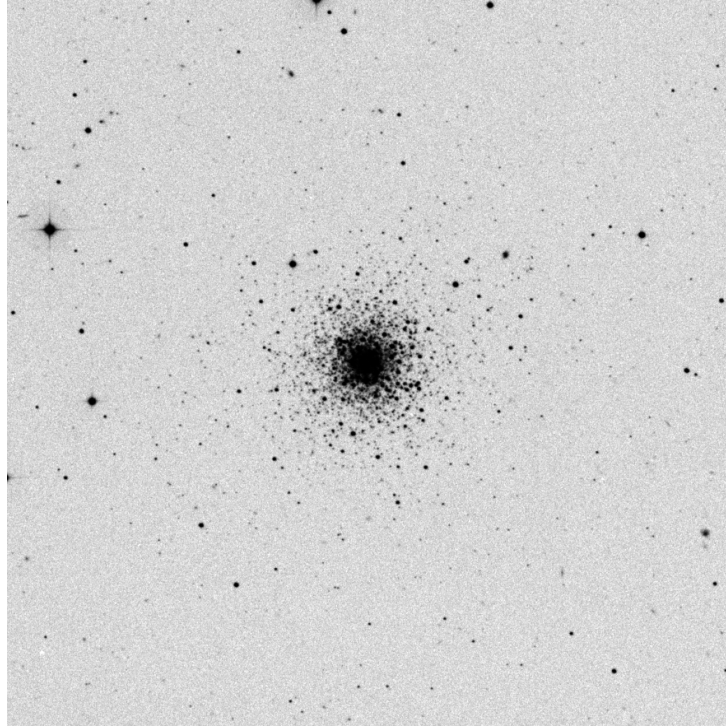
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

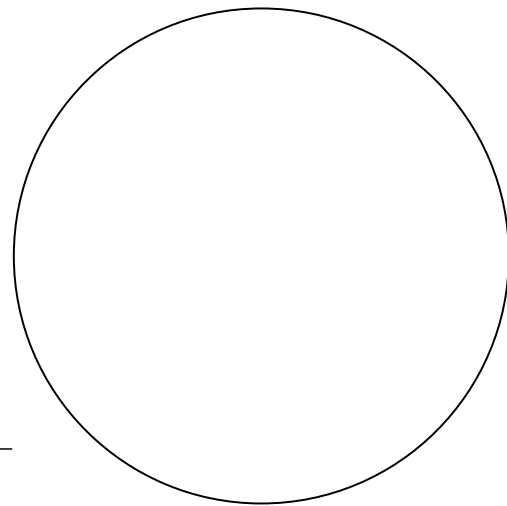
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

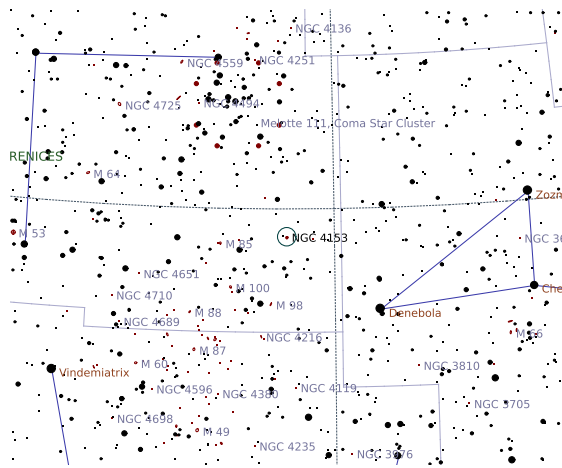
# NGC 4153

Globular Cluster in Coma Berenices

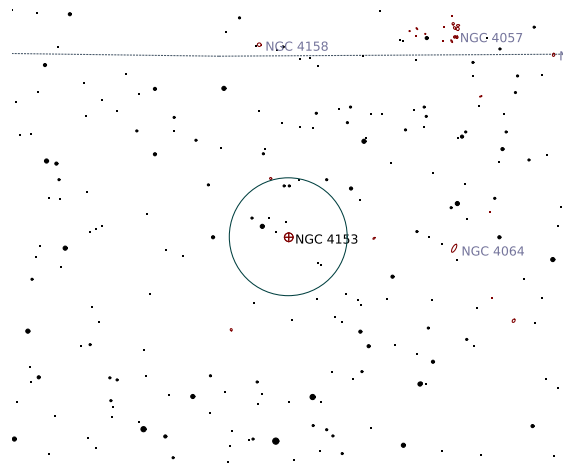
Right Ascension (current)	12 <sup>h</sup> 10 <sup>m</sup> 47 <sup>s</sup>	Declination (current)	18° 27' 54"
Right Ascension (J2000.0)	12 <sup>h</sup> 10 <sup>m</sup> 06 <sup>s</sup>	Declination (J2000.0)	18° 32' 33"
Size	4.4' × 4.4'	Position Angle	90°
Magnitude	10	Other Designation	—

**Description:** Dreyer: B;pL;E;bM

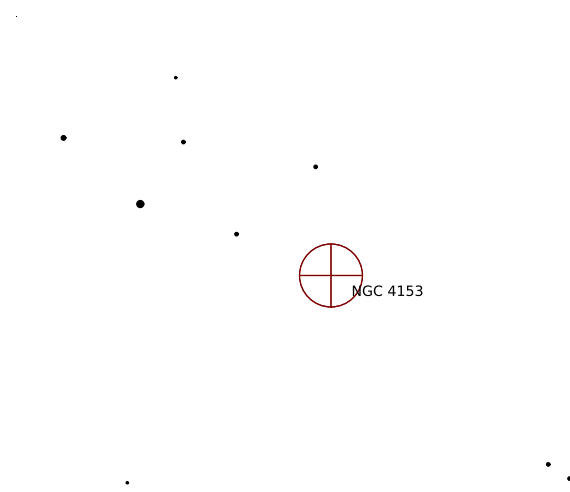
**SAC:** H I 11; equals NGC 4147; best possible ID



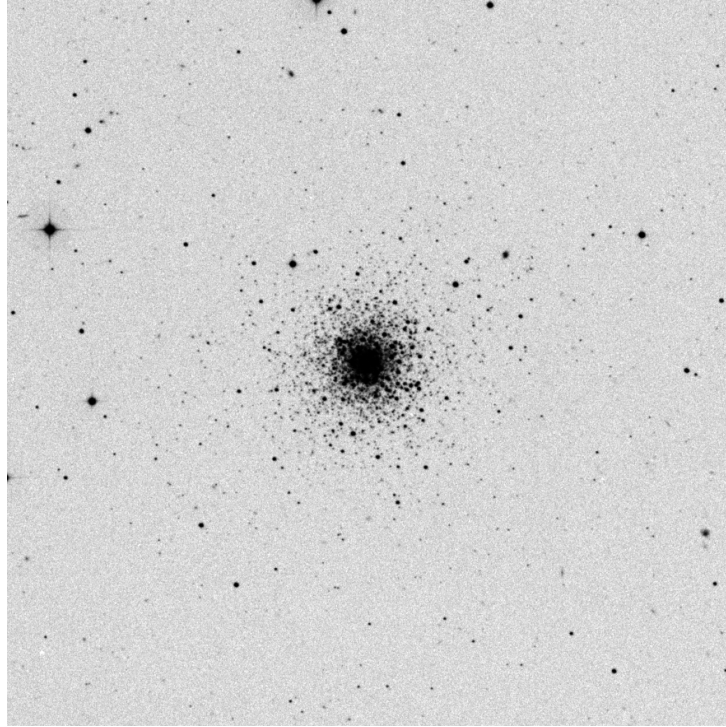
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

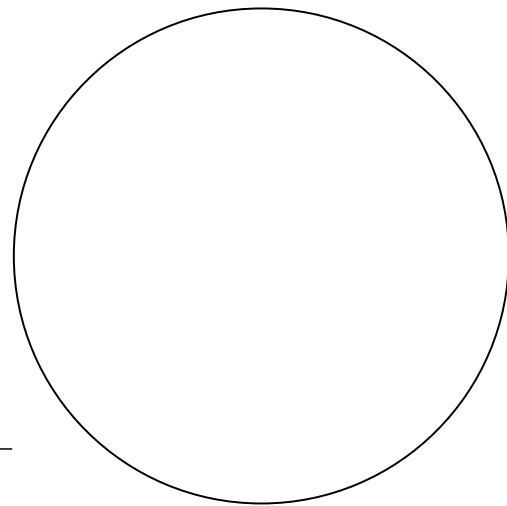
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



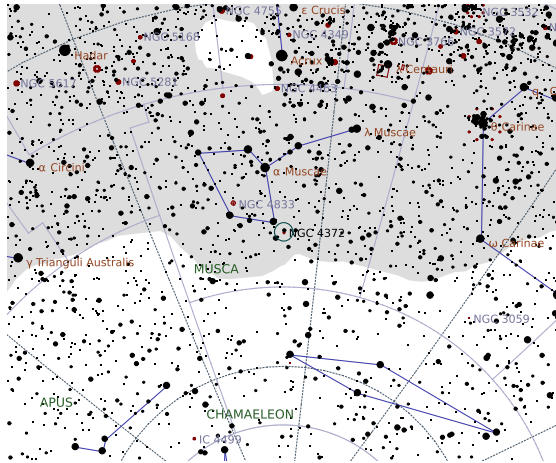
Sketch

# NGC 4372

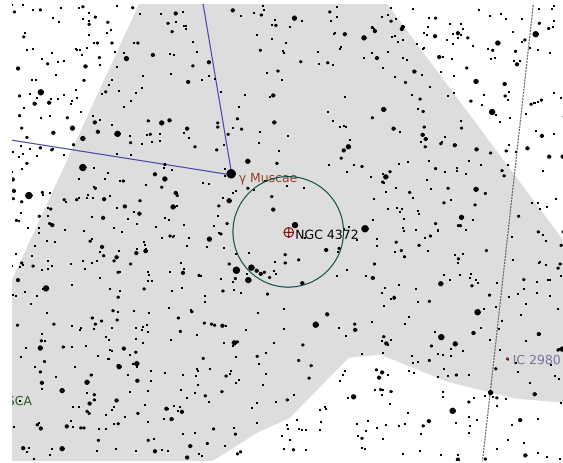
Globular Cluster in Musca

Right Ascension (current)	12 <sup>h</sup> 26 <sup>m</sup> 36 <sup>s</sup>	Declination (current)	−72° 43′ 45″
Right Ascension (J2000.0)	12 <sup>h</sup> 25 <sup>m</sup> 45 <sup>s</sup>	Declination (J2000.0)	−72° 39′ 31″
Size	5′ × 5′	Position Angle	90°
Magnitude	7.2	Other Designation	–

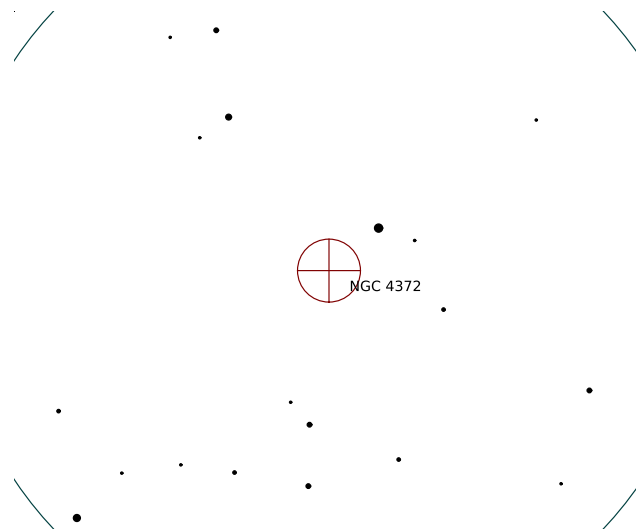
Description: Dreyer: pF;L;R;\* 12...16



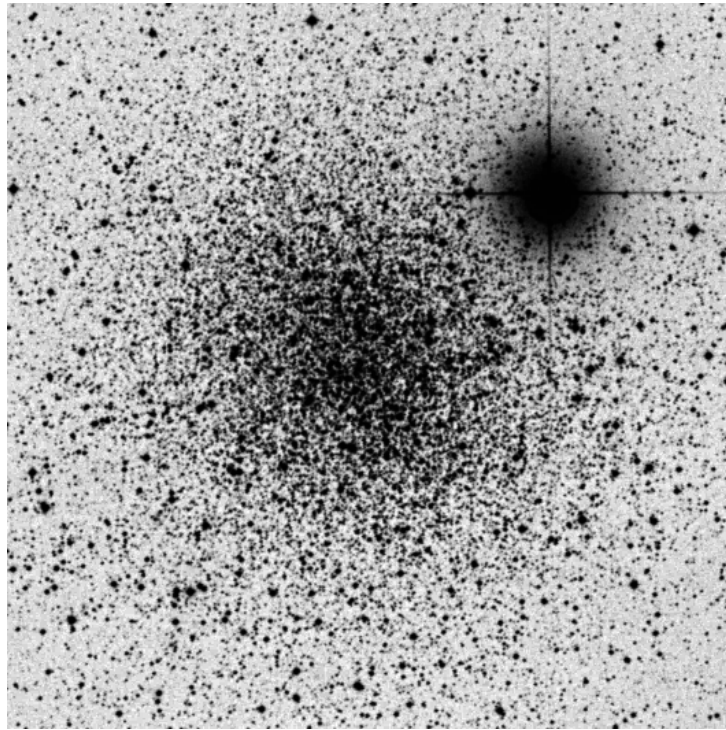
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

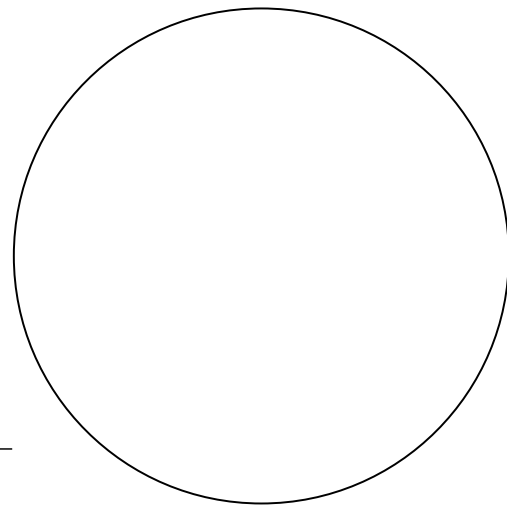
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

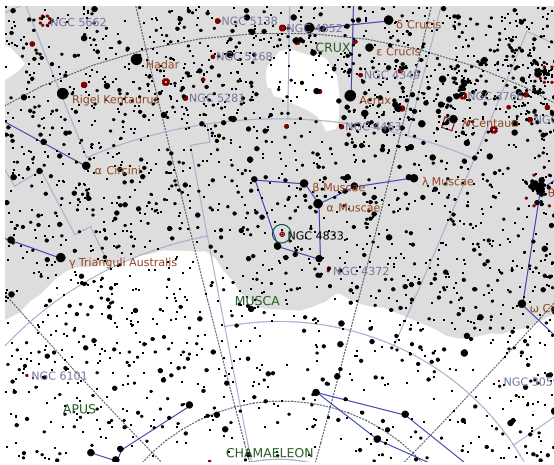
# NGC 4833

## Globular Cluster in Musca

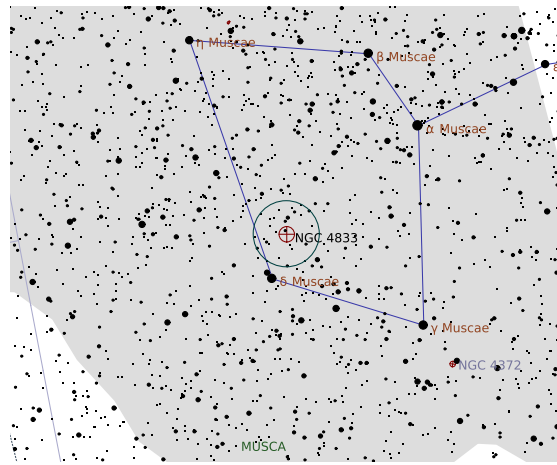
Right Ascension (current)	13 <sup>h</sup> 00 <sup>m</sup> 32 <sup>s</sup>	Declination (current)	−70° 56′ 32″
Right Ascension (J2000.0)	12 <sup>h</sup> 59 <sup>m</sup> 35 <sup>s</sup>	Declination (J2000.0)	−70° 52′ 27″
Size	14′ × 14′	Position Angle	90°
Magnitude	8.4	Other Designation	–

**Description:** Dreyer: B;L;R;g;vsbM;st 12

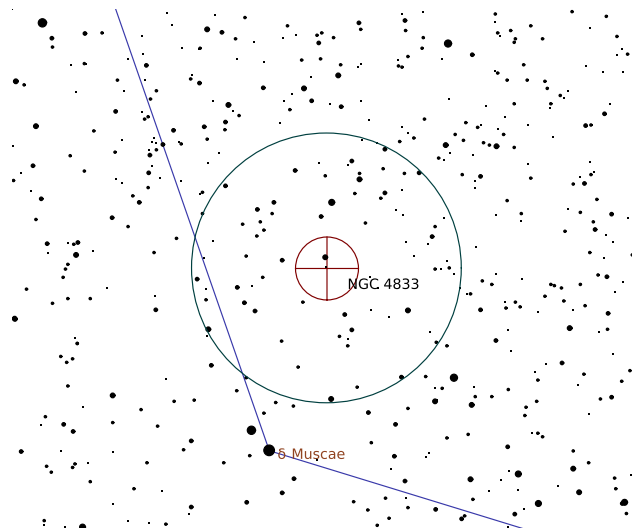
**SAC:** DRKNB Dark Doodad to the west



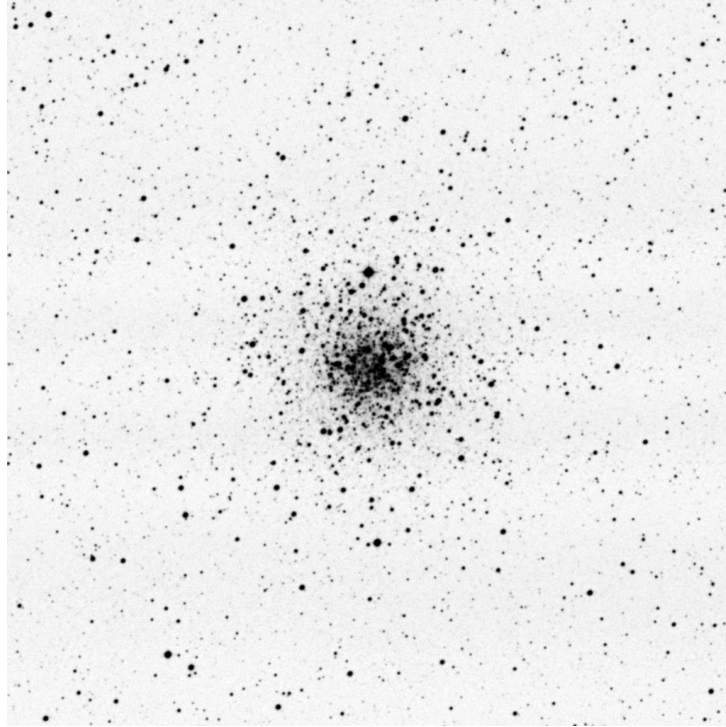
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (19.0' × 19.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

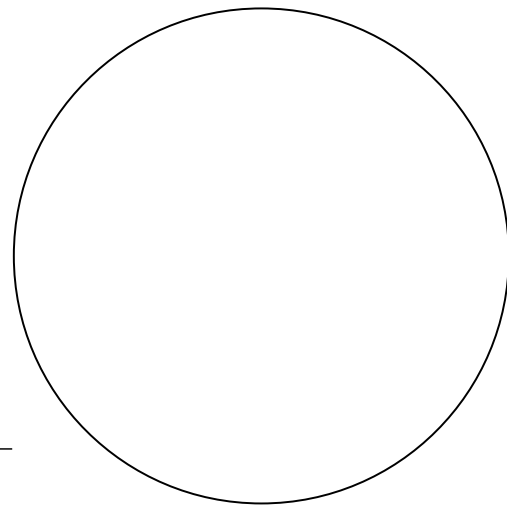
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**



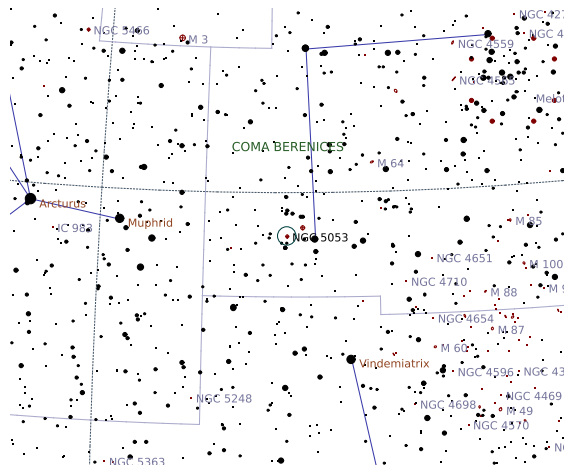
# NGC 5053

## Globular Cluster in Coma Berenices

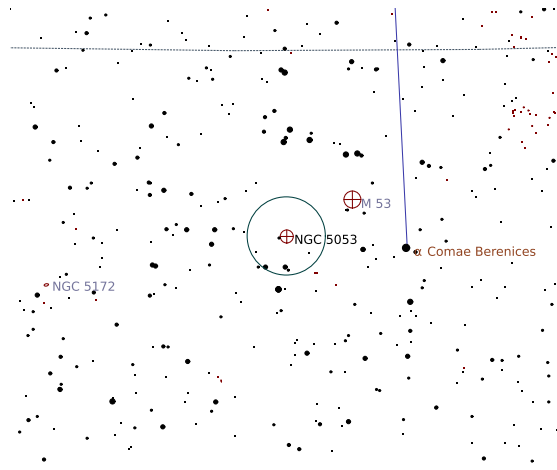
Right Ascension (current)	13 <sup>h</sup> 17 <sup>m</sup> 06 <sup>s</sup>	Declination (current)	17° 37' 31"
Right Ascension (J2000.0)	13 <sup>h</sup> 16 <sup>m</sup> 27 <sup>s</sup>	Declination (J2000.0)	17° 41' 55"
Size	10' × 10'	Position Angle	90°
Magnitude	9	Other Designation	—

**Description:** (Challenge!) **Dreyer:** C1;vF;pL;iR;vgbM;st 15

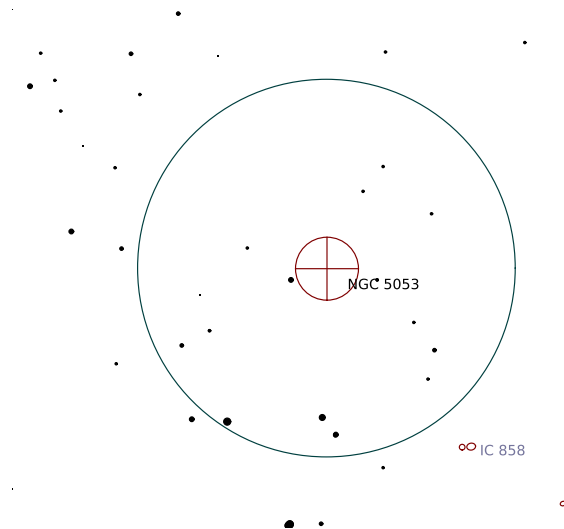
**SAC:** H VI 7;Low surf brightness;1 deg sf M 53



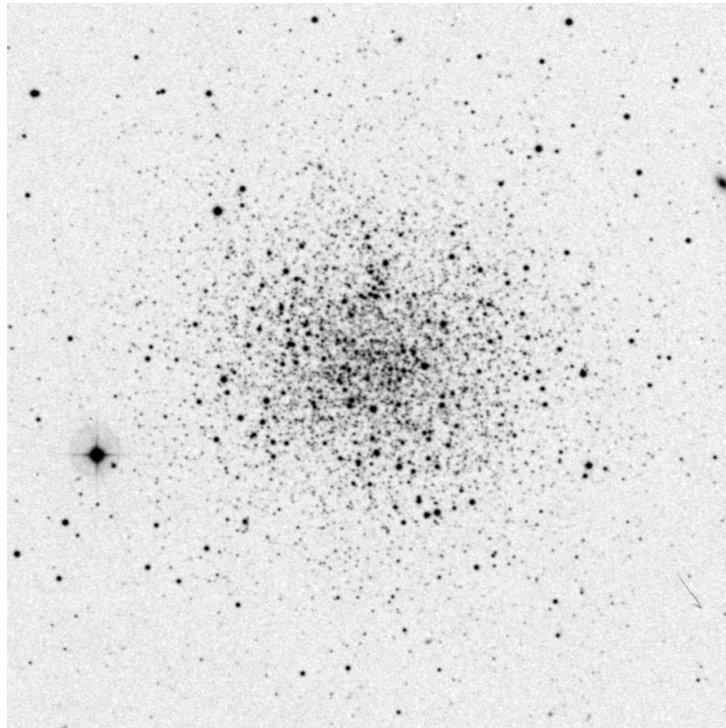
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

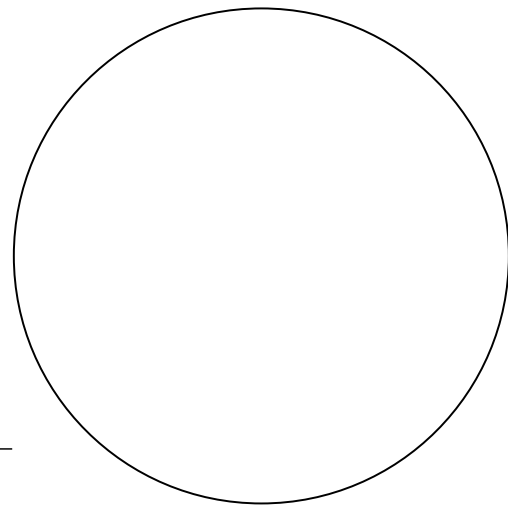
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

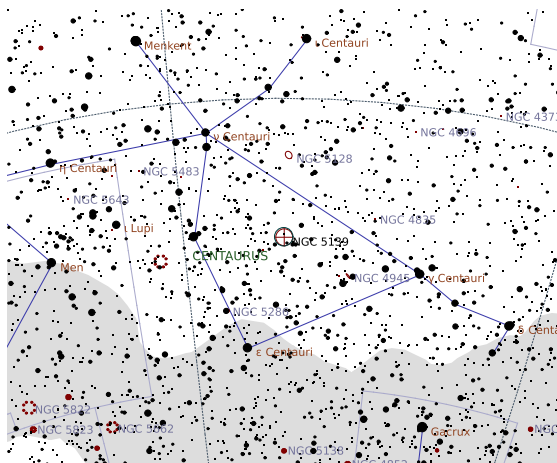
# NGC 5139 (Omega Centauri)

## Globular Cluster in Centaurus

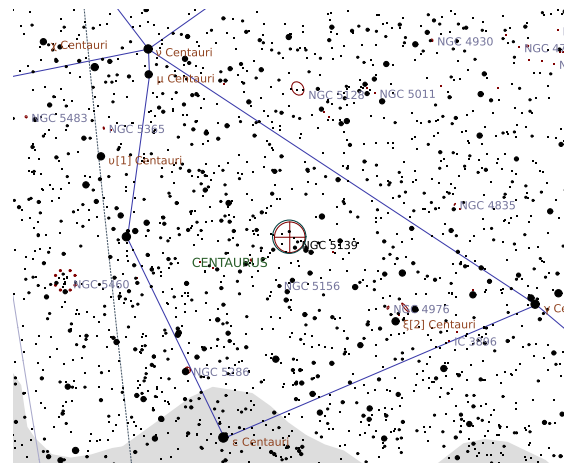
Right Ascension (current)	13 <sup>h</sup> 27 <sup>m</sup> 36 <sup>s</sup>	Declination (current)	−47° 32′ 50″
Right Ascension (J2000.0)	13 <sup>h</sup> 26 <sup>m</sup> 47 <sup>s</sup>	Declination (J2000.0)	−47° 28′ 51″
Size	55′ × 55′	Position Angle	90°
Magnitude	5.3	Other Designation	—

**Description:** Dreyer: !!!eL;B;eRi;vvC

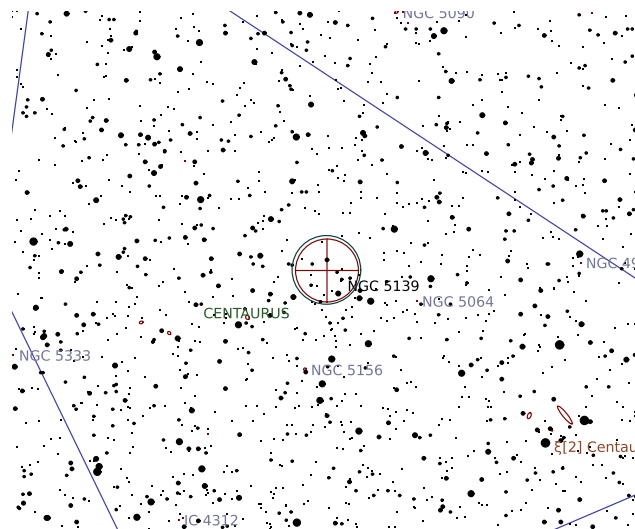
**SAC:** Stars mags 11...;finest globular;magnificent object



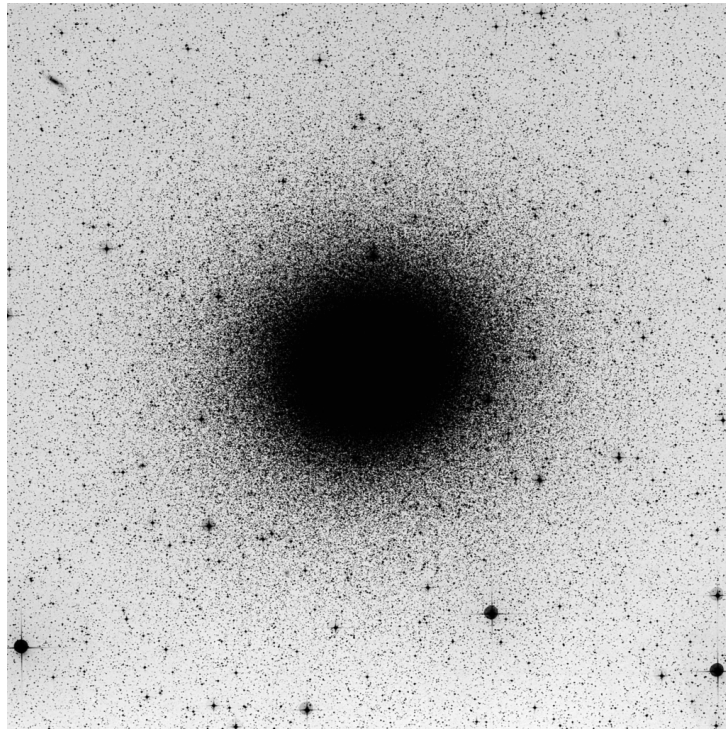
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (60.0' × 60.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

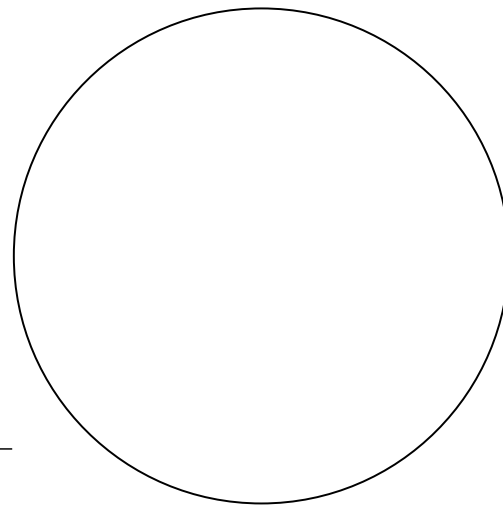
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



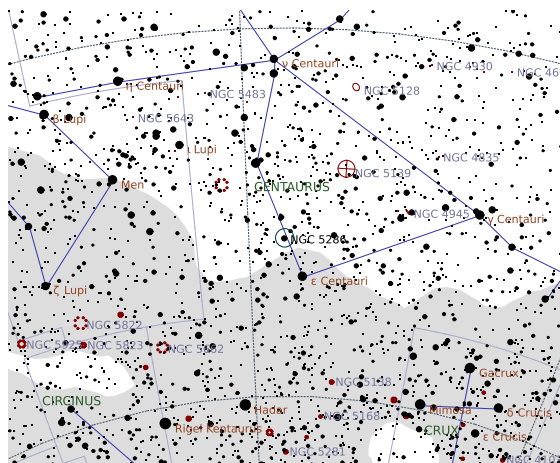
**Sketch**

# NGC 5286

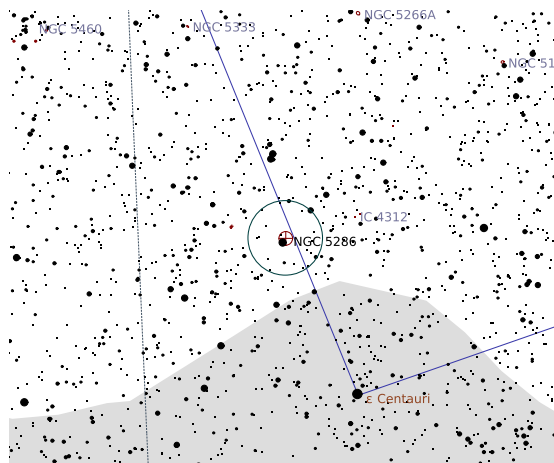
## Globular Cluster in Centaurus

Right Ascension (current)	13 <sup>h</sup> 47 <sup>m</sup> 18 <sup>s</sup>	Declination (current)	−51° 26′ 09″
Right Ascension (J2000.0)	13 <sup>h</sup> 46 <sup>m</sup> 26 <sup>s</sup>	Declination (J2000.0)	−51° 22′ 22″
Size	11′ × 11′	Position Angle	90°
Magnitude	7.4	Other Designation	–

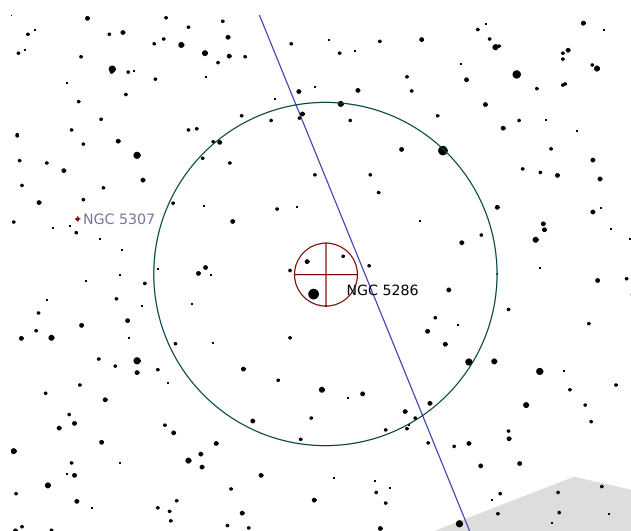
Description: Dreyer: vB;pL;R;rrr;st 15



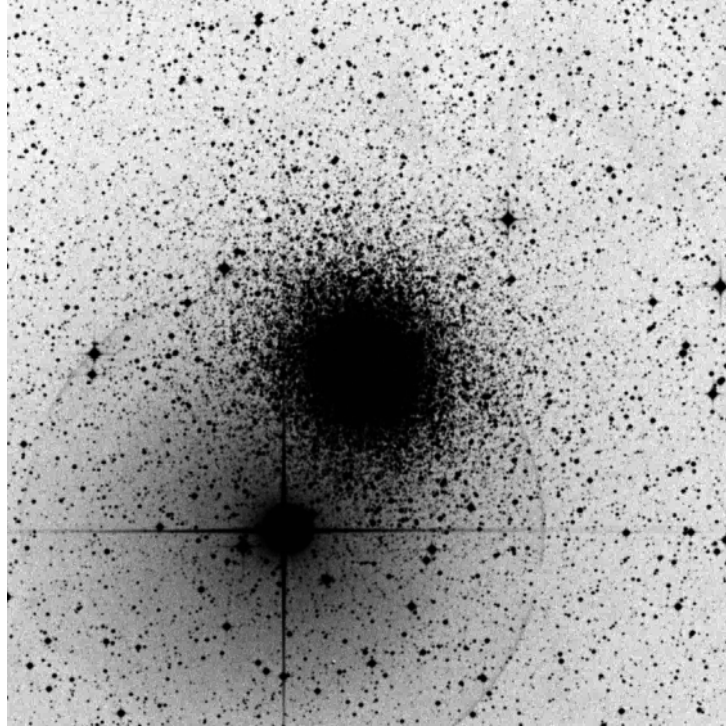
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (16.0' × 16.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

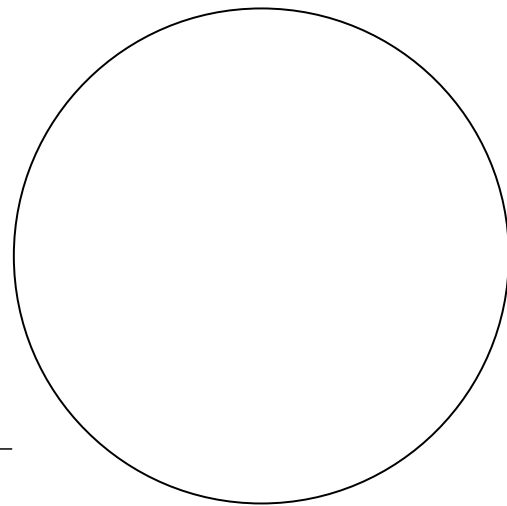
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

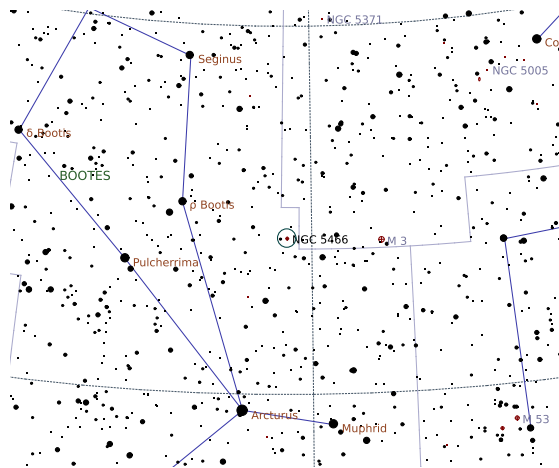
# NGC 5466

## Globular Cluster in Bootes

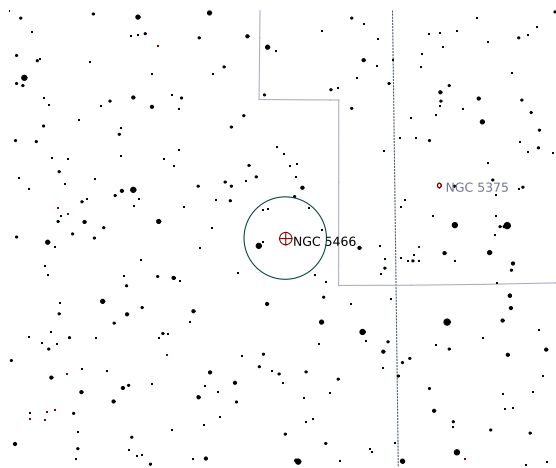
Right Ascension (current)	14 <sup>h</sup> 06 <sup>m</sup> 03 <sup>s</sup>	Declination (current)	28° 28' 05"
Right Ascension (J2000.0)	14 <sup>h</sup> 05 <sup>m</sup> 27 <sup>s</sup>	Declination (J2000.0)	28° 32' 06"
Size	9' × 9'	Position Angle	90°
Magnitude	9.2	Other Designation	—

**Description:** (Challenge!) **Dreyer:** C1;L;vRi;vmC;st 11...

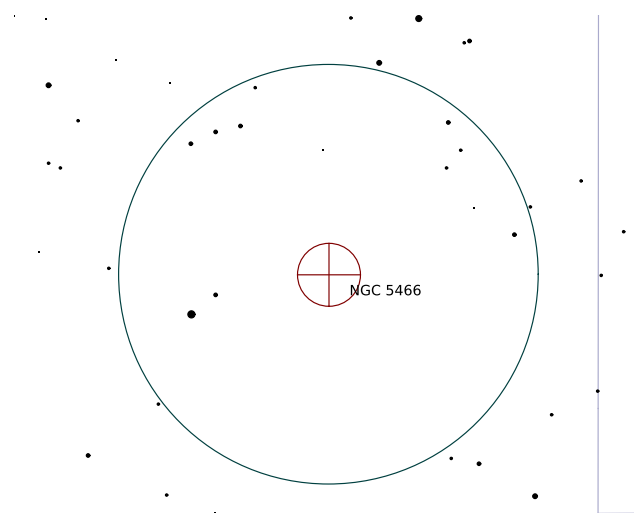
**SAC:** H VI 9



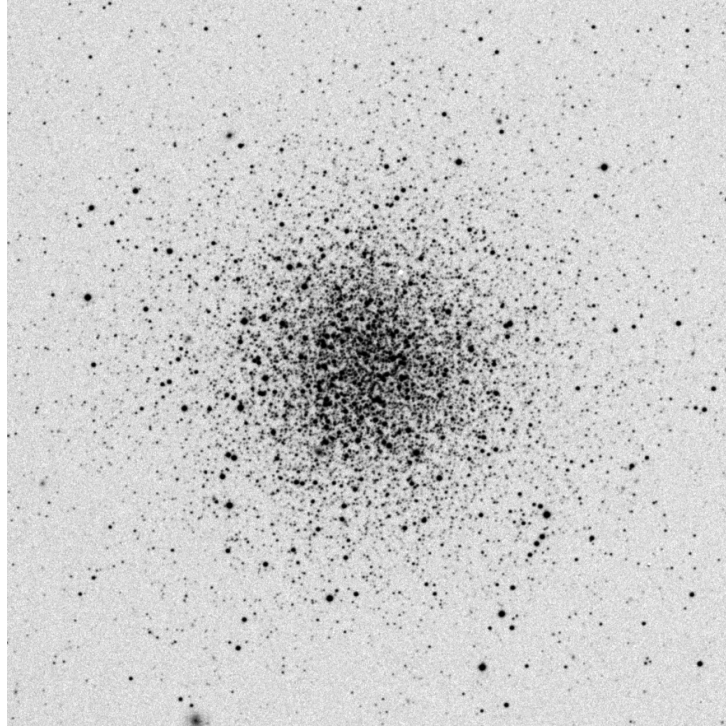
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

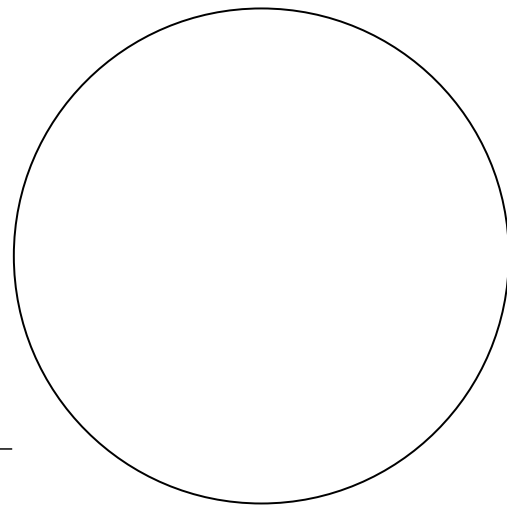
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch



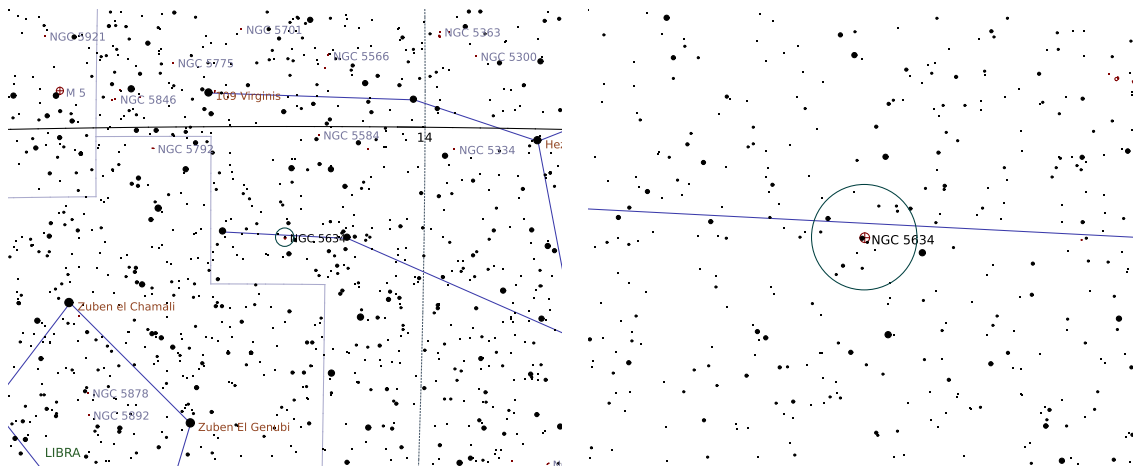
# NGC 5634

Globular Cluster in Virgo

Right Ascension (current)	14 <sup>h</sup> 30 <sup>m</sup> 19 <sup>s</sup>	Declination (current)	−6° 02′ 07″
Right Ascension (J2000.0)	14 <sup>h</sup> 29 <sup>m</sup> 37 <sup>s</sup>	Declination (J2000.0)	−5° 58′ 33″
Size	5.5′ × 5.5′	Position Angle	90°
Magnitude	9.5	Other Designation	—

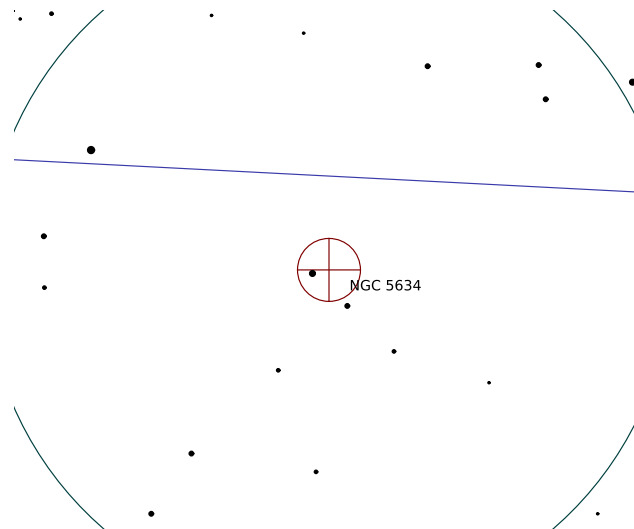
**Description:** Dreyer: vB;cL;R;gbM;rrr;st 19...; \*8 sf

**SAC:** H I 70;11 mag star on E edge

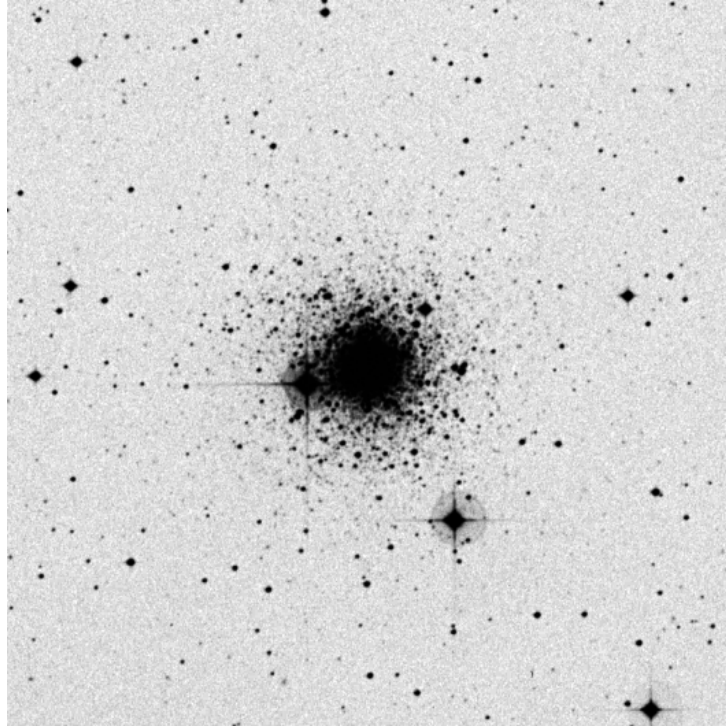


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

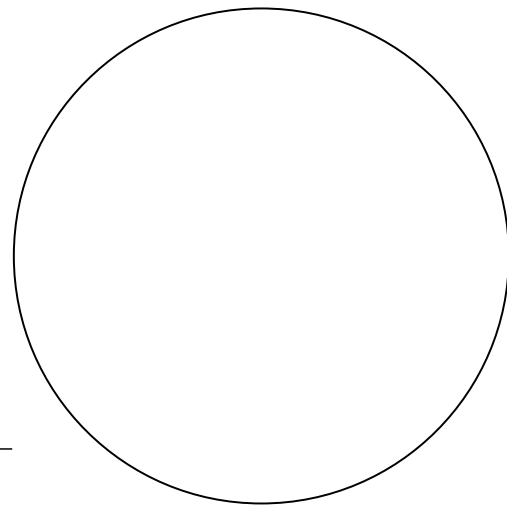
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

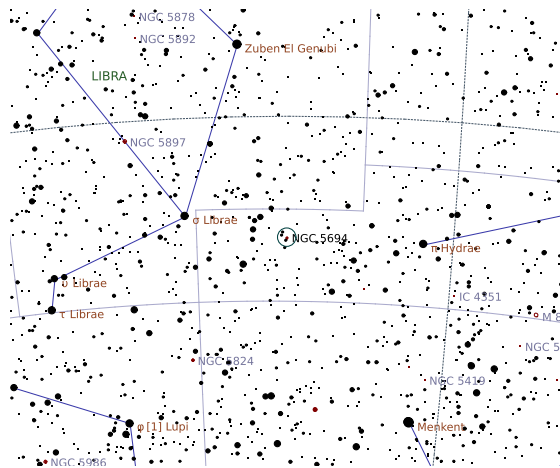
# NGC 5694

## Globular Cluster in Hydra

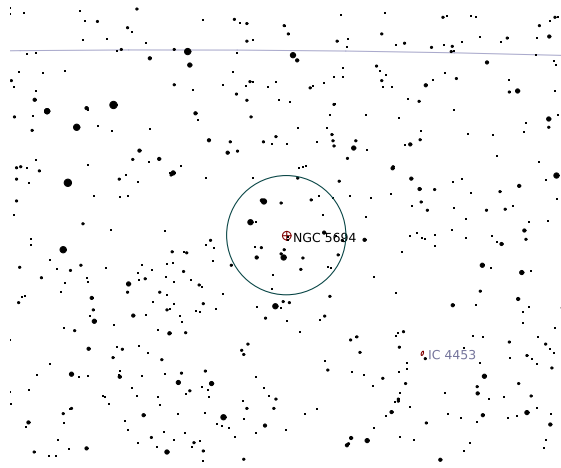
Right Ascension (current)	14 <sup>h</sup> 40 <sup>m</sup> 23 <sup>s</sup>	Declination (current)	−26° 35′ 35″
Right Ascension (J2000.0)	14 <sup>h</sup> 39 <sup>m</sup> 36 <sup>s</sup>	Declination (J2000.0)	−26° 32′ 16″
Size	4.3′ × 4.3′	Position Angle	90°
Magnitude	10	Other Designation	—

**Description:** Dreyer: cB;cS;R;psbM;r;\* 9.5 sp

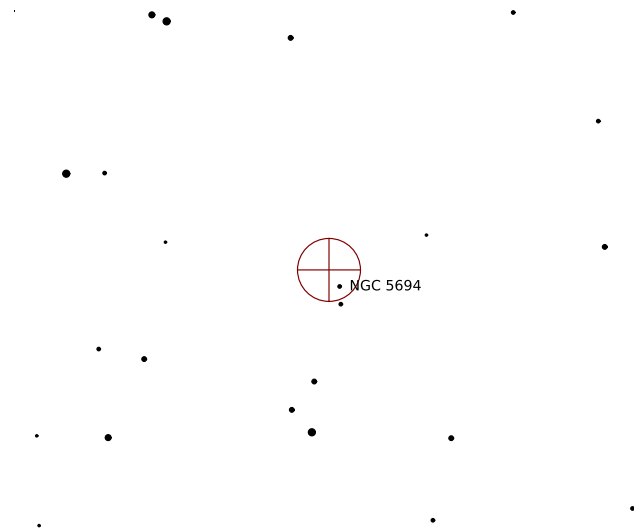
**SAC:** H II 196;Rich w eF stars;distant globular



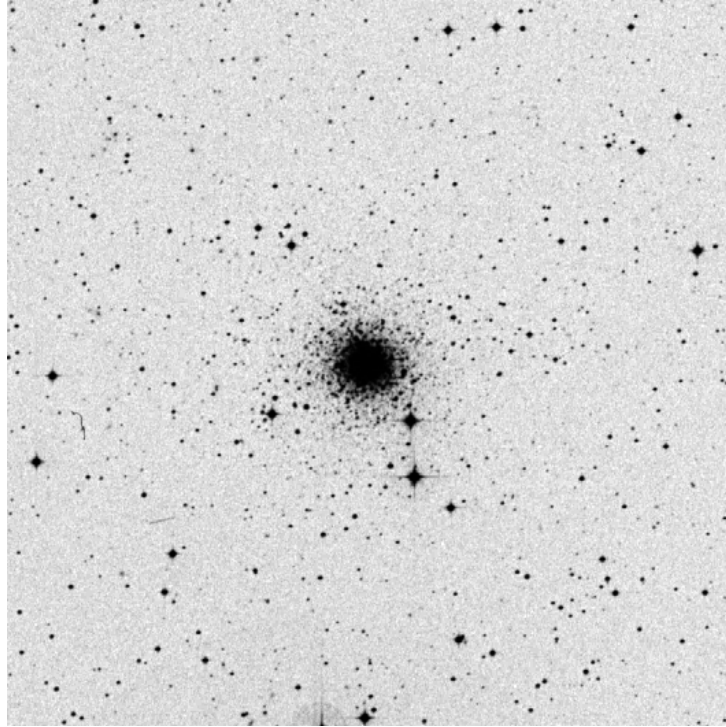
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

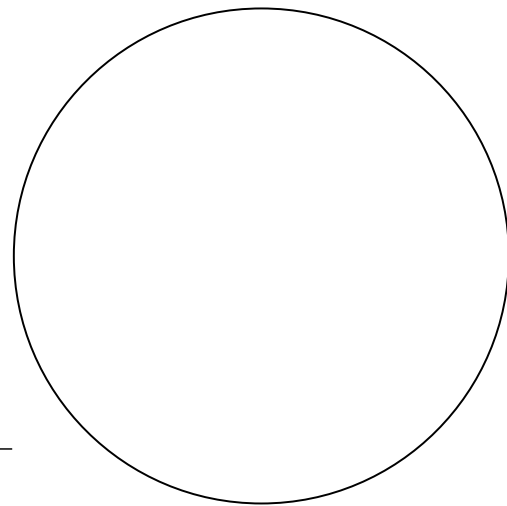
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



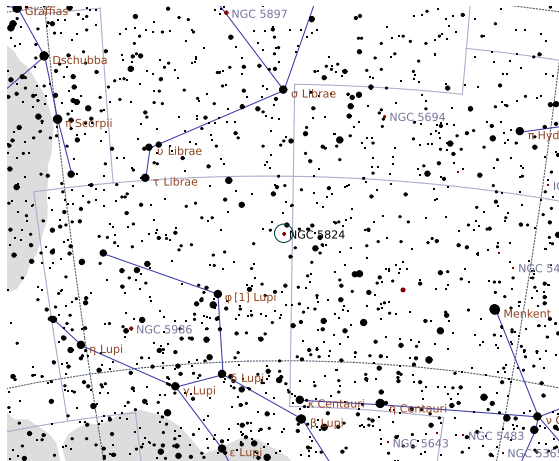
**Sketch**

# NGC 5824

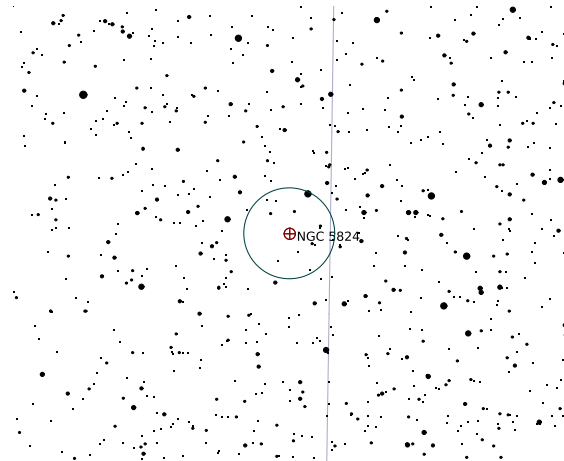
## Globular Cluster in Lupus

Right Ascension (current)	15 <sup>h</sup> 04 <sup>m</sup> 47 <sup>s</sup>	Declination (current)	−33° 06′ 59″
Right Ascension (J2000.0)	15 <sup>h</sup> 03 <sup>m</sup> 58 <sup>s</sup>	Declination (J2000.0)	−33° 04′ 02″
Size	7.4′ × 7.4′	Position Angle	90°
Magnitude	9.1	Other Designation	—

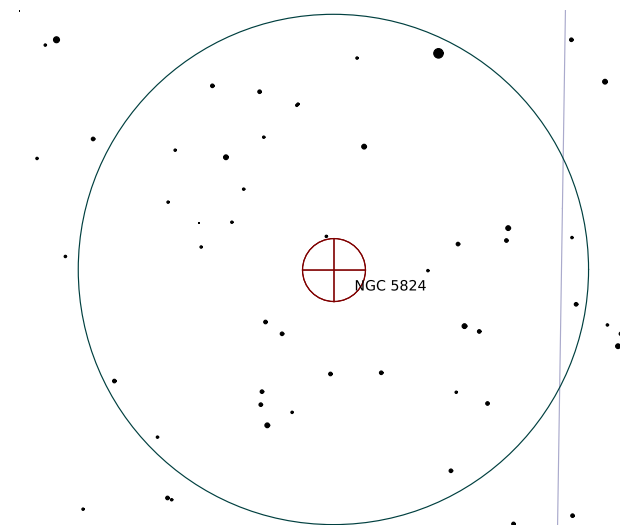
Description: Dreyer: pB;S;Stell Nuc



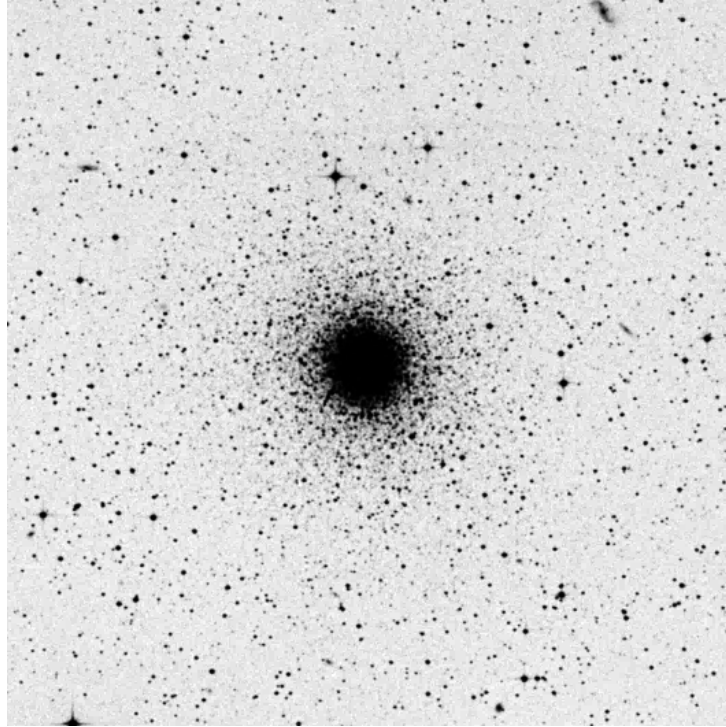
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

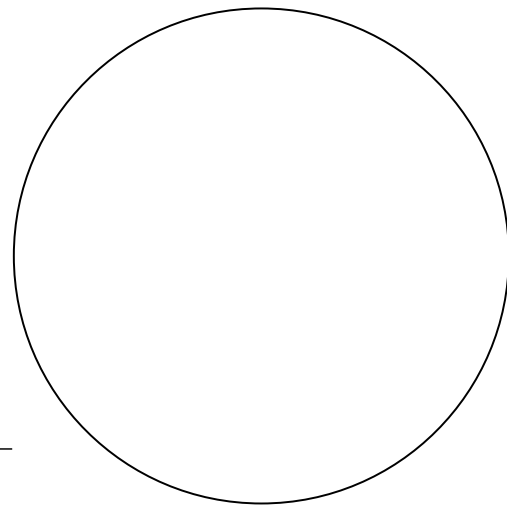
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

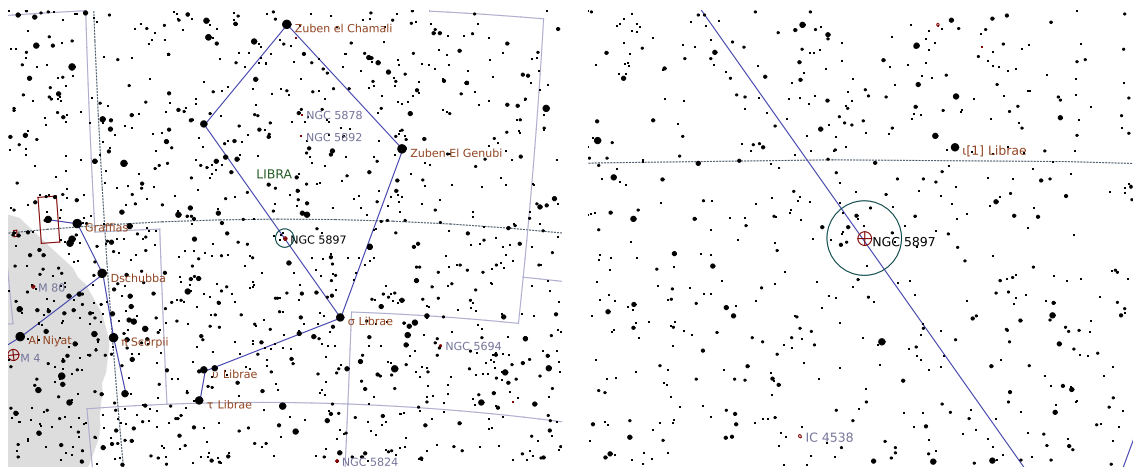
# NGC 5897

## Globular Cluster in Libra

Right Ascension (current)	15 <sup>h</sup> 18 <sup>m</sup> 10 <sup>s</sup>	Declination (current)	-21° 03' 24"
Right Ascension (J2000.0)	15 <sup>h</sup> 17 <sup>m</sup> 24 <sup>s</sup>	Declination (J2000.0)	-21° 00' 35"
Size	11' × 11'	Position Angle	90°
Magnitude	8.4	Other Designation	—

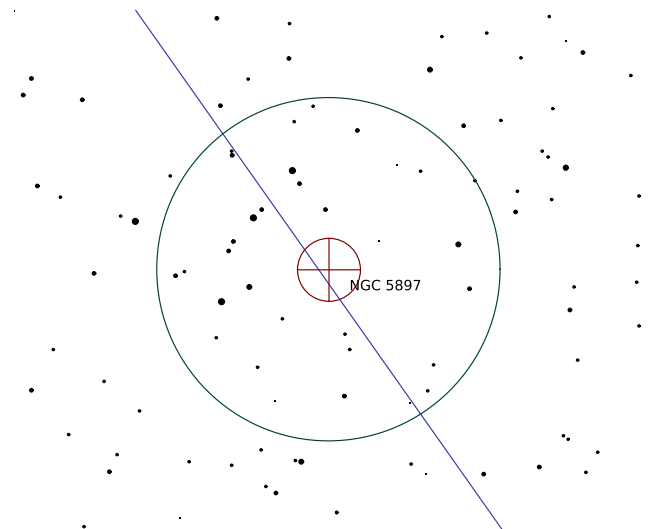
**Description:** (Rather tough) **Dreyer:** pF;L;viR;vgbM;rrr

**SAC:** H VI 19

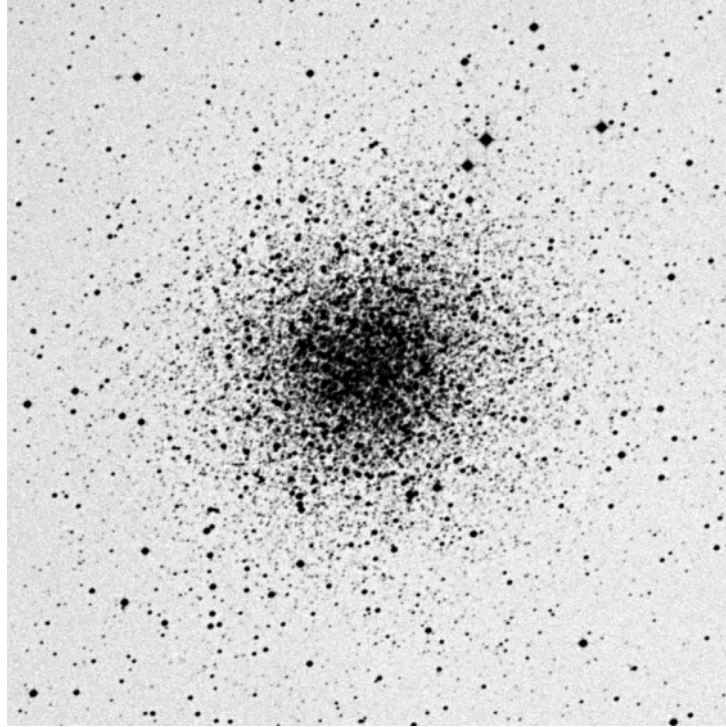


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (16.0' × 16.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

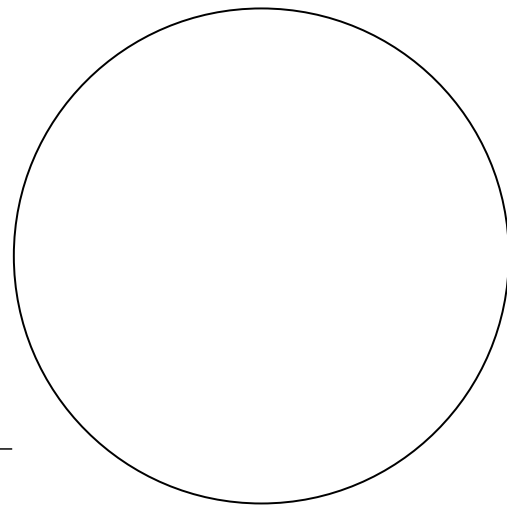
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

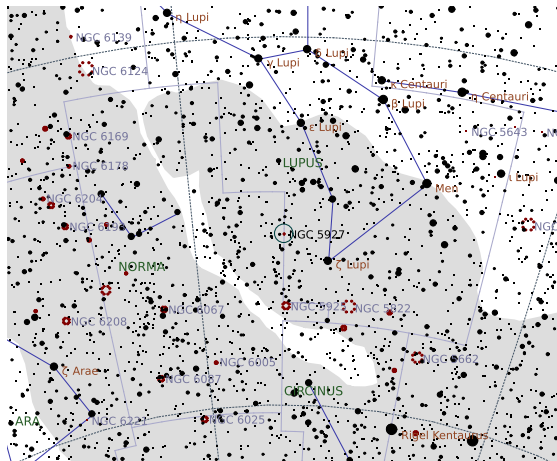


# NGC 5927

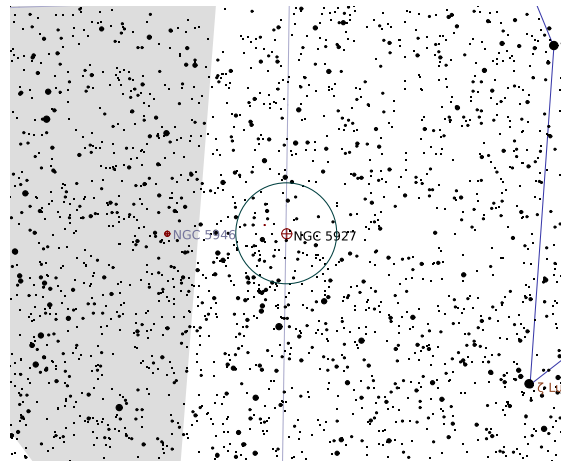
## Globular Cluster in Lupus

Right Ascension (current)	15 <sup>h</sup> 28 <sup>m</sup> 58 <sup>s</sup>	Declination (current)	-50° 42' 49"
Right Ascension (J2000.0)	15 <sup>h</sup> 28 <sup>m</sup> 00 <sup>s</sup>	Declination (J2000.0)	-50° 40' 20"
Size	6' × 6'	Position Angle	90°
Magnitude	8	Other Designation	—

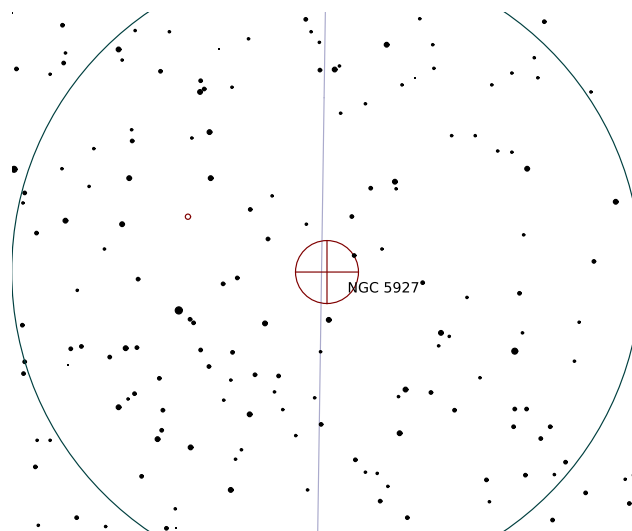
**Description:** Dreyer: cB;L;R;vgbM;rrr;st 15



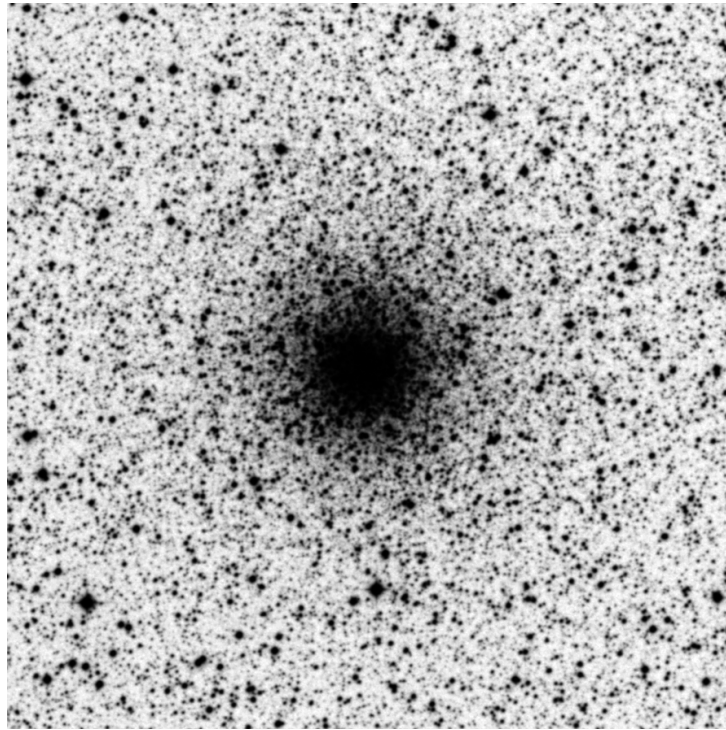
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

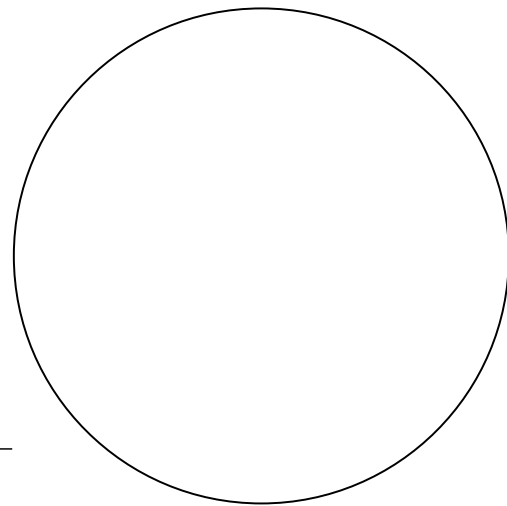
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



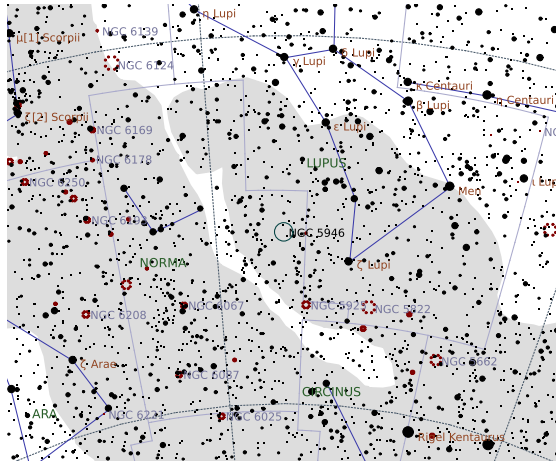
**Sketch**

# NGC 5946

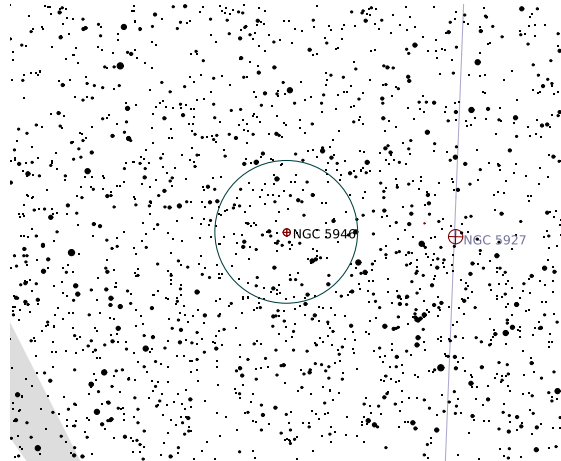
## Globular Cluster in Norma

Right Ascension (current)	15 <sup>h</sup> 36 <sup>m</sup> 27 <sup>s</sup>	Declination (current)	−50° 41′ 54″
Right Ascension (J2000.0)	15 <sup>h</sup> 35 <sup>m</sup> 28 <sup>s</sup>	Declination (J2000.0)	−50° 39′ 32″
Size	3′ × 3′	Position Angle	90°
Magnitude	8.4	Other Designation	–

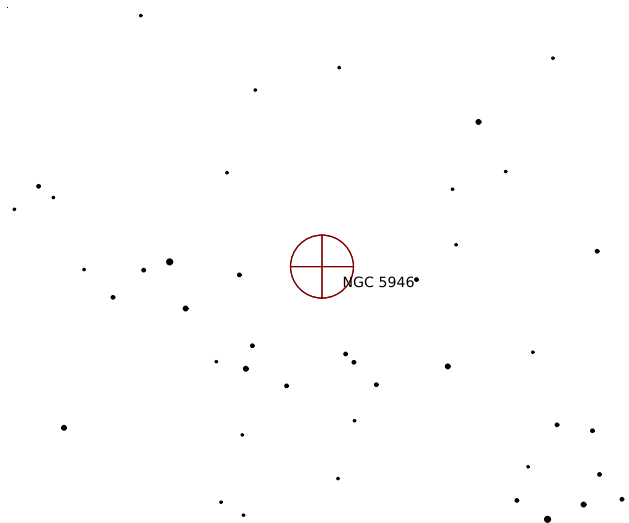
Description: Dreyer: cB;pL;R;vglbM;rrr;st 16



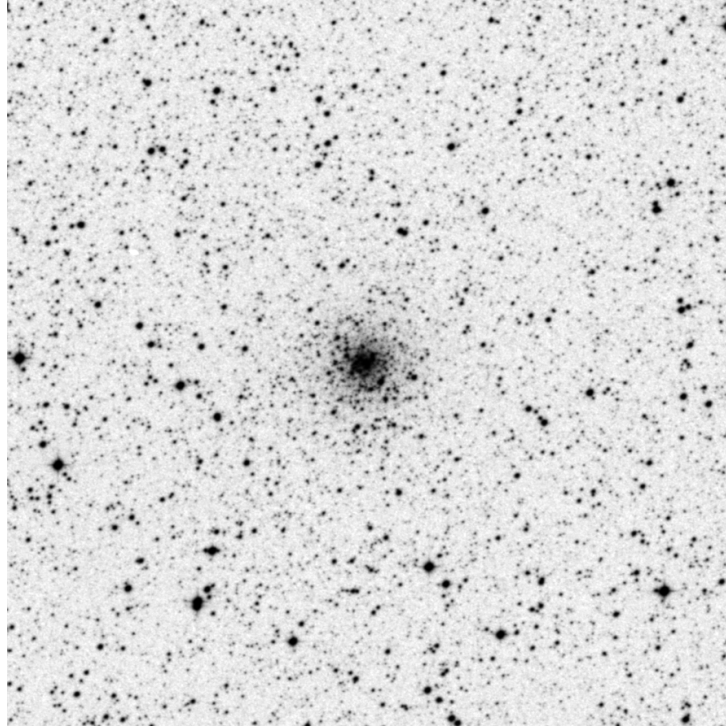
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

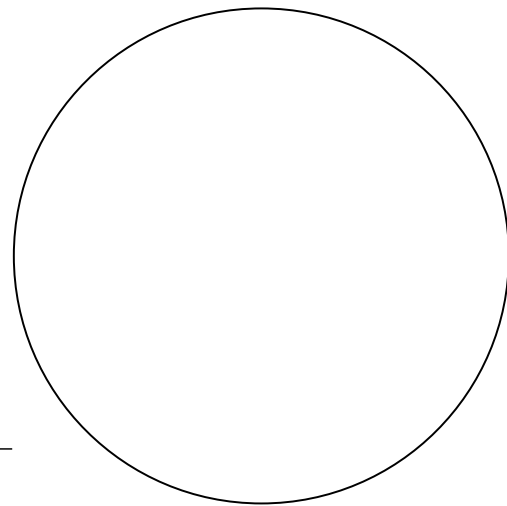
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



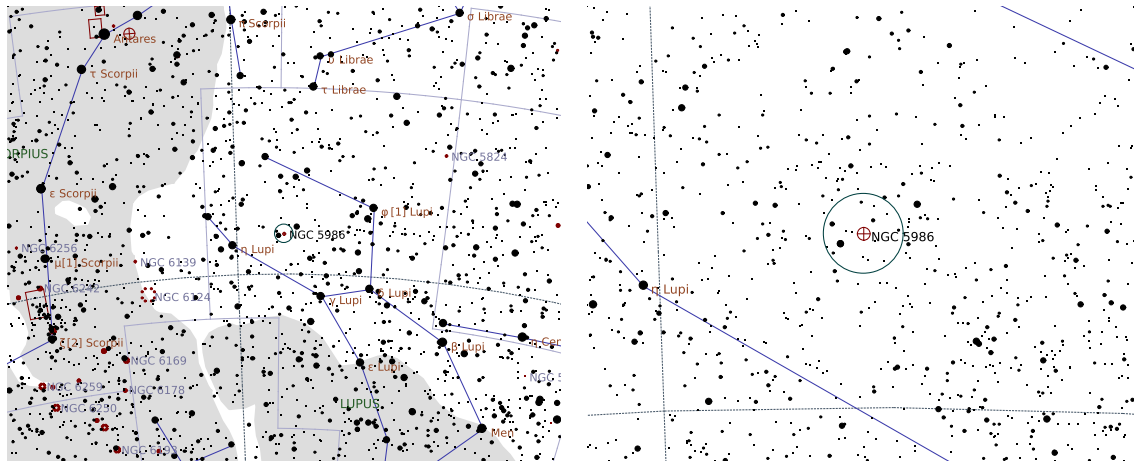
**Sketch**

# NGC 5986

## Globular Cluster in Lupus

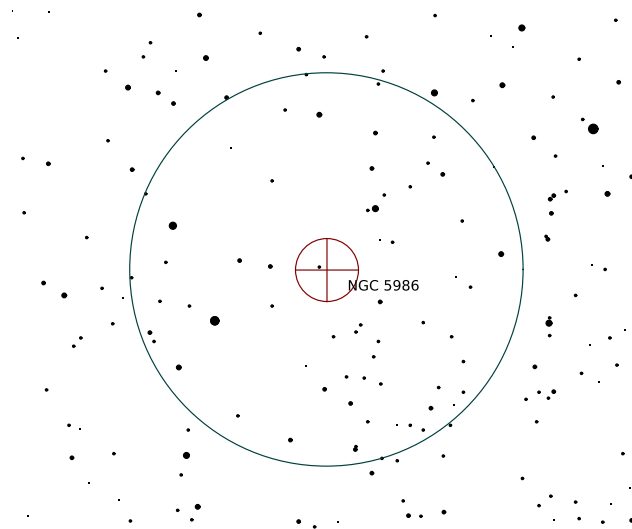
Right Ascension (current)	15 <sup>h</sup> 46 <sup>m</sup> 55 <sup>s</sup>	Declination (current)	−37° 49′ 24″
Right Ascension (J2000.0)	15 <sup>h</sup> 46 <sup>m</sup> 03 <sup>s</sup>	Declination (J2000.0)	−37° 47′ 08″
Size	9.6′ × 9.6′	Position Angle	90°
Magnitude	7.6	Other Designation	—

**Description:** Dreyer: !;vB;L;R;vbgM;st 13...15

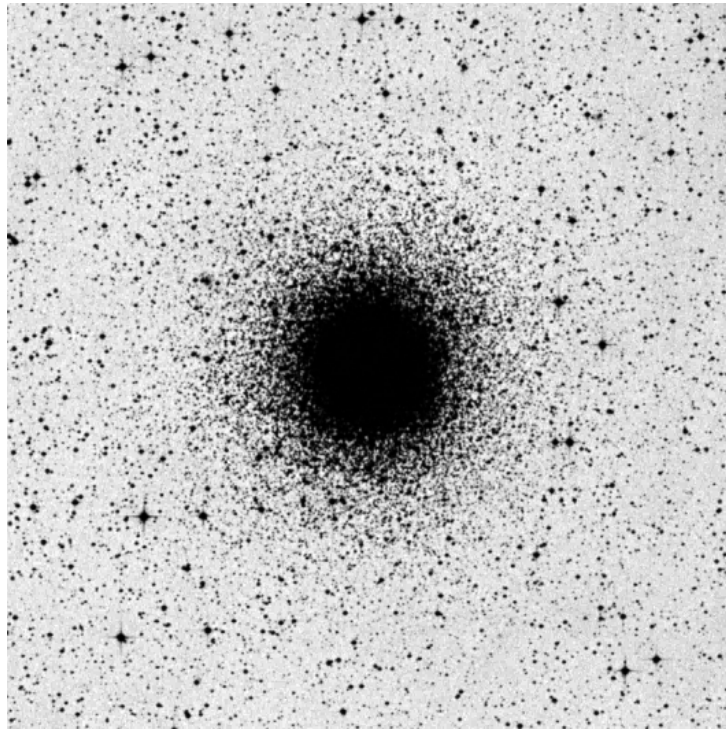


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

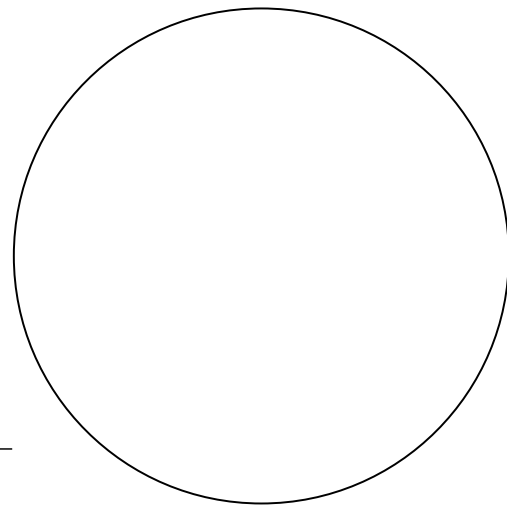
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



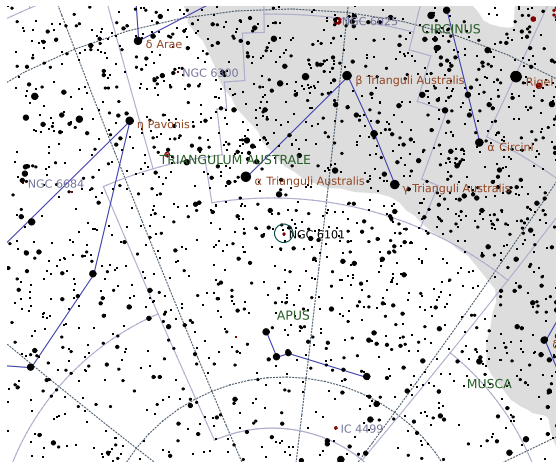
Sketch

# NGC 6101

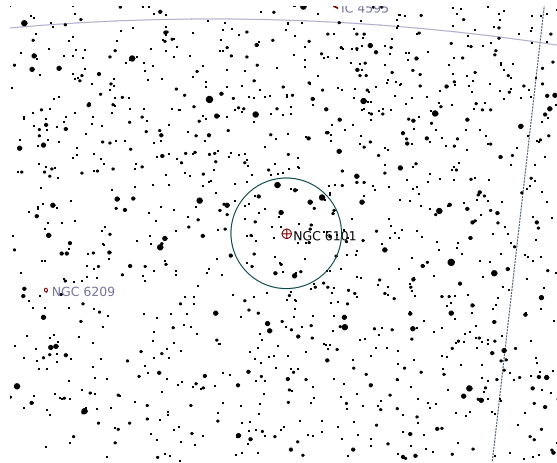
## Globular Cluster in Apus

Right Ascension (current)	16 <sup>h</sup> 27 <sup>m</sup> 19 <sup>s</sup>	Declination (current)	−72° 13′ 30″
Right Ascension (J2000.0)	16 <sup>h</sup> 25 <sup>m</sup> 48 <sup>s</sup>	Declination (J2000.0)	−72° 12′ 04″
Size	5′ × 5′	Position Angle	90°
Magnitude	9.2	Other Designation	—

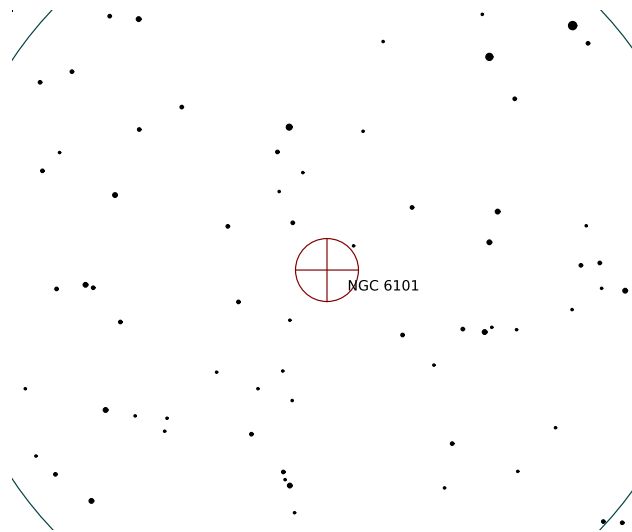
**Description:** Dreyer: pF;L;iR;vgbM;\*14



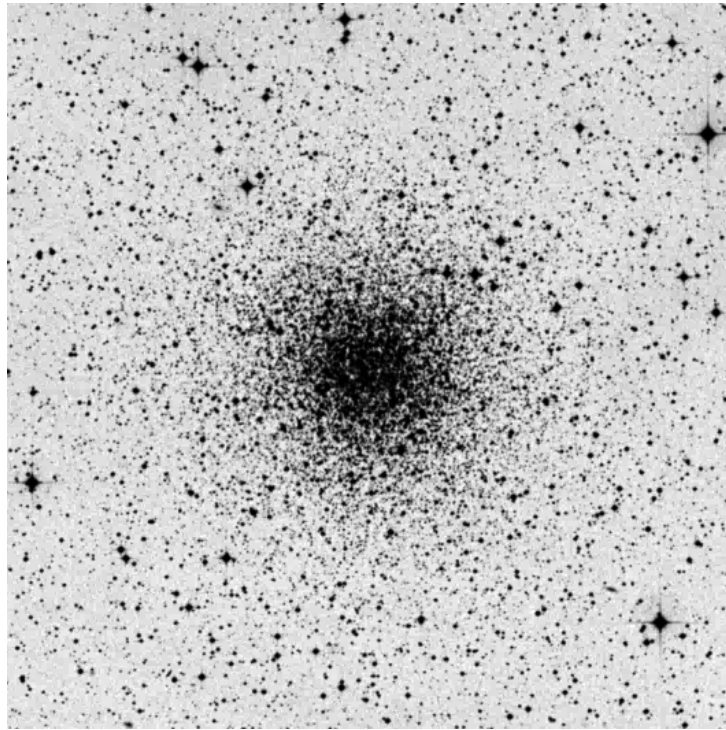
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

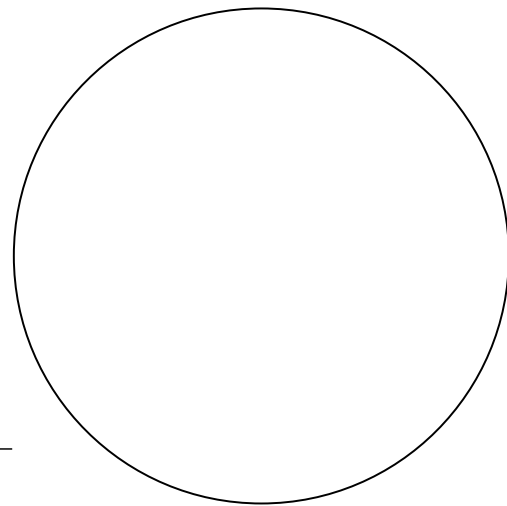
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

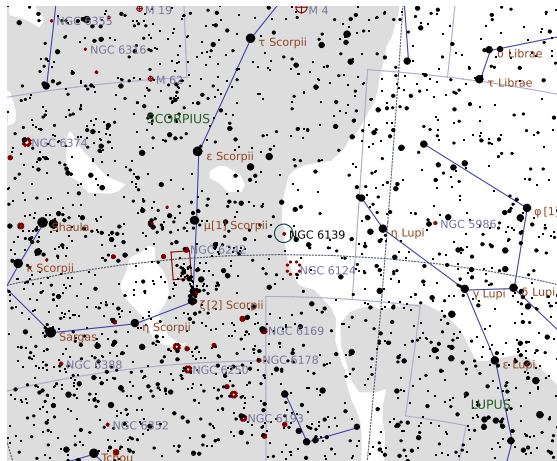


# NGC 6139

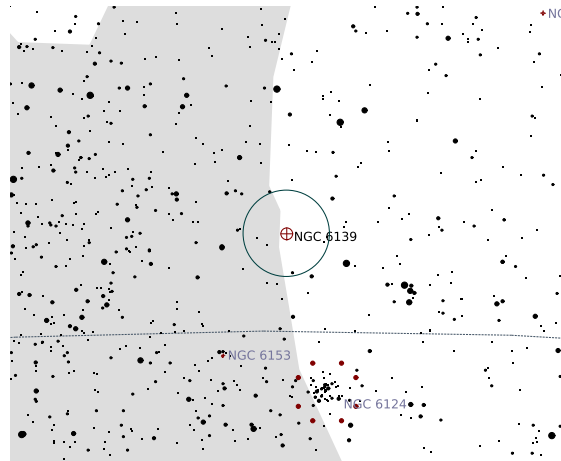
## Globular Cluster in Scorpius

Right Ascension (current)	16 <sup>h</sup> 28 <sup>m</sup> 34 <sup>s</sup>	Declination (current)	−38° 52′ 27″
Right Ascension (J2000.0)	16 <sup>h</sup> 27 <sup>m</sup> 40 <sup>s</sup>	Declination (J2000.0)	−38° 50′ 54″
Size	8.2′ × 8.2′	Position Angle	90°
Magnitude	9.1	Other Designation	—

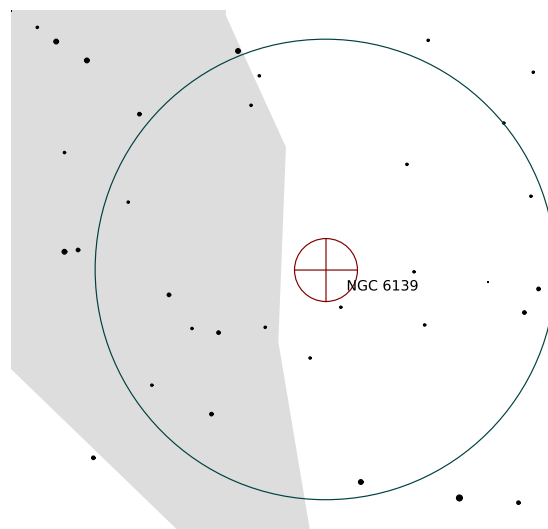
Description: Dreyer: B;pL;R;psbM;rr



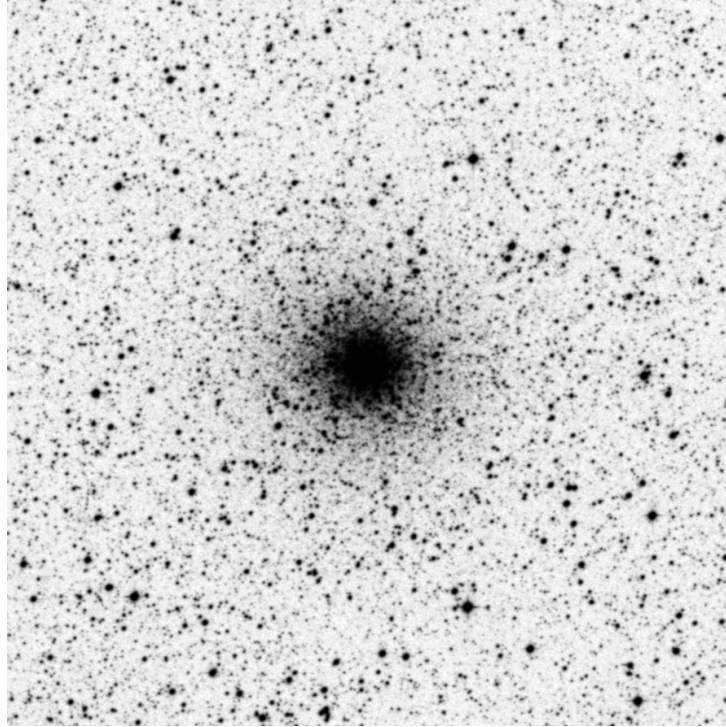
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

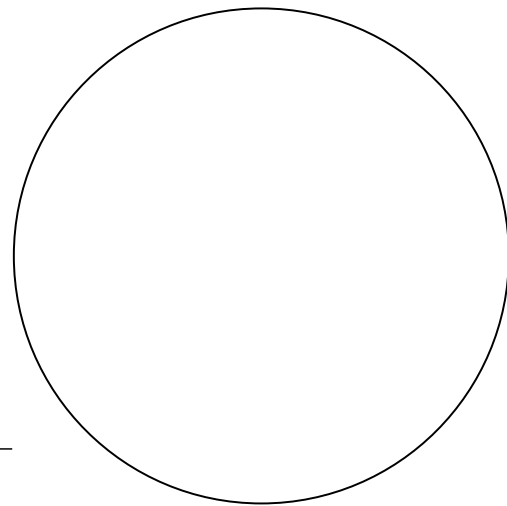
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

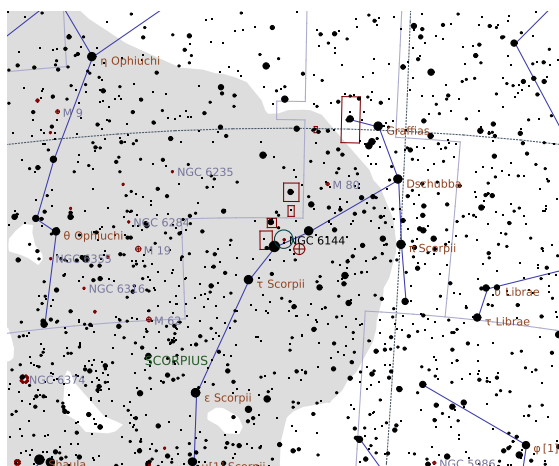
# NGC 6144

## Globular Cluster in Scorpius

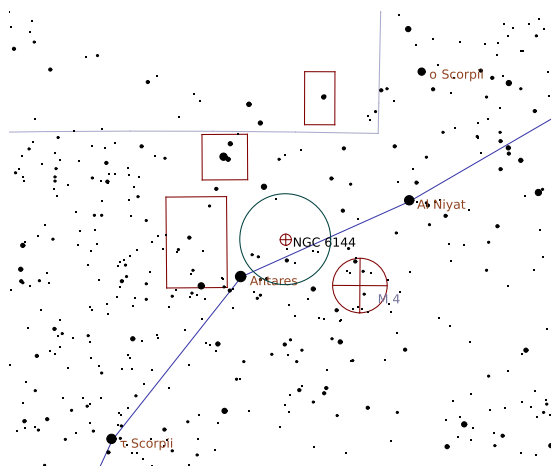
Right Ascension (current)	16 <sup>h</sup> 28 <sup>m</sup> 02 <sup>s</sup>	Declination (current)	−26° 03′ 04″
Right Ascension (J2000.0)	16 <sup>h</sup> 27 <sup>m</sup> 14 <sup>s</sup>	Declination (J2000.0)	−26° 01′ 27″
Size	7.4′ × 7.4′	Position Angle	90°
Magnitude	9	Other Designation	—

**Description:** Dreyer: C1; cL; mC; gbM; rrr

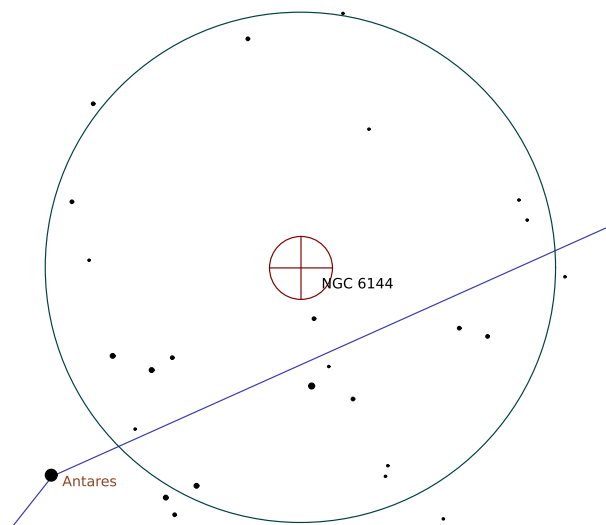
**SAC:** H VI 10



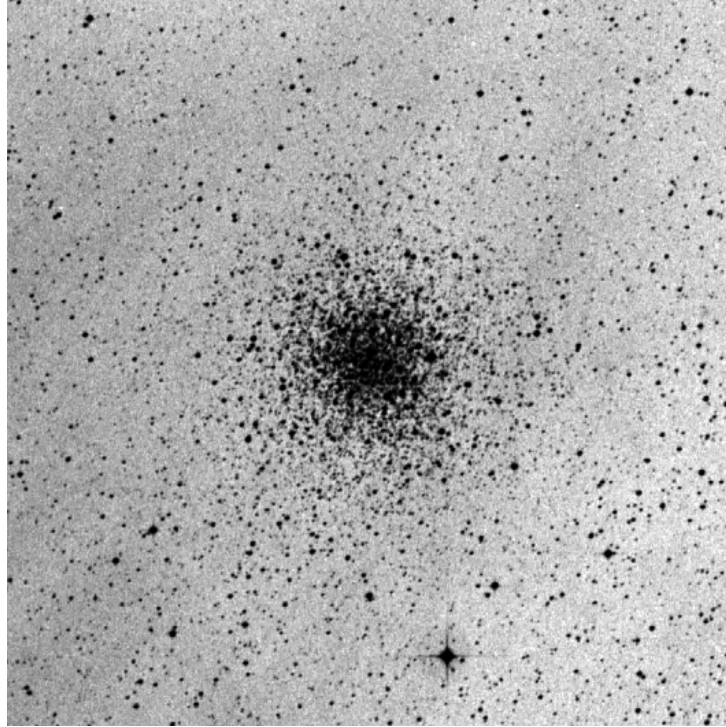
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

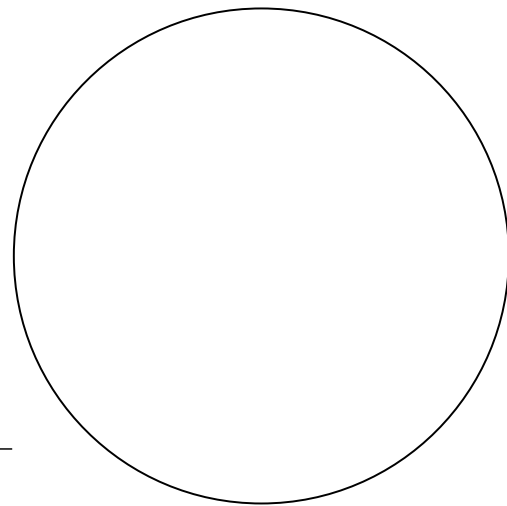
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

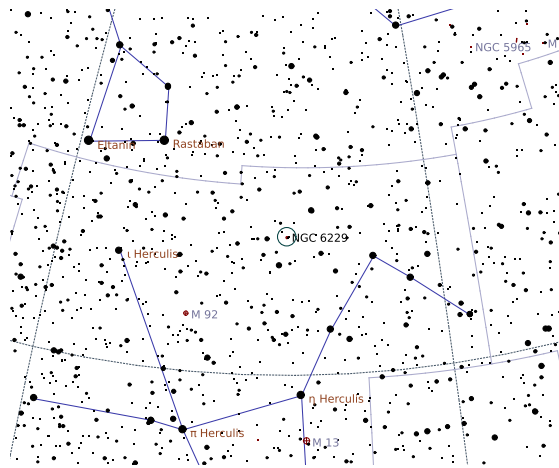
# NGC 6229

## Globular Cluster in Hercules

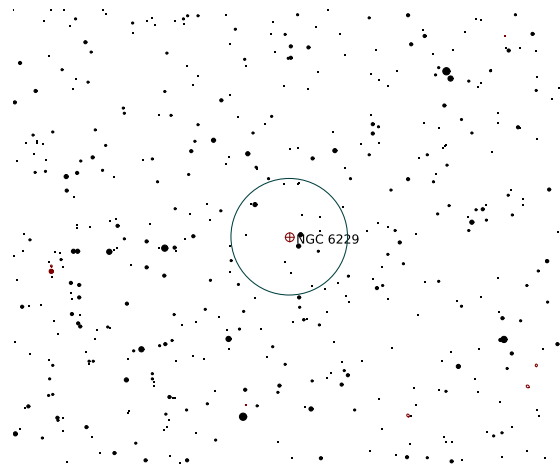
Right Ascension (current)	16 <sup>h</sup> 47 <sup>m</sup> 19 <sup>s</sup>	Declination (current)	47° 30' 05"
Right Ascension (J2000.0)	16 <sup>h</sup> 46 <sup>m</sup> 58 <sup>s</sup>	Declination (J2000.0)	47° 31' 42"
Size	4.5' × 4.5'	Position Angle	90°
Magnitude	9.4	Other Designation	–

**Description:** Dreyer: vB;L;R;disc;r

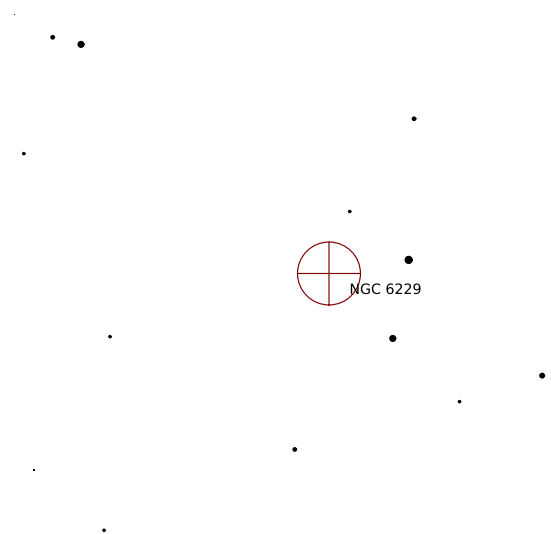
**SAC:** H IV 50;Wm. Herschel placed in Planetary category by mistake



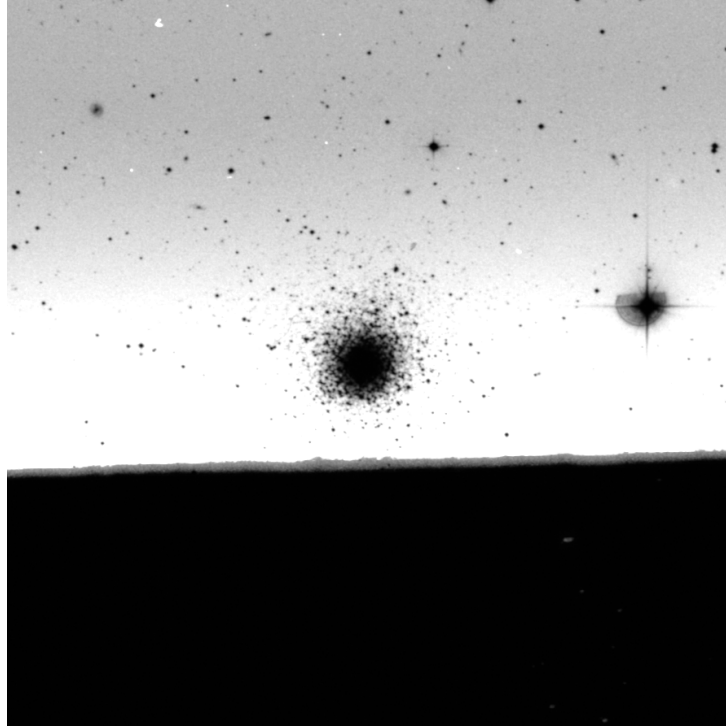
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

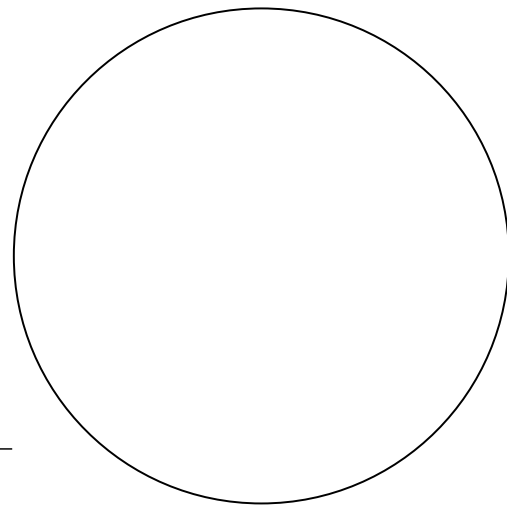
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

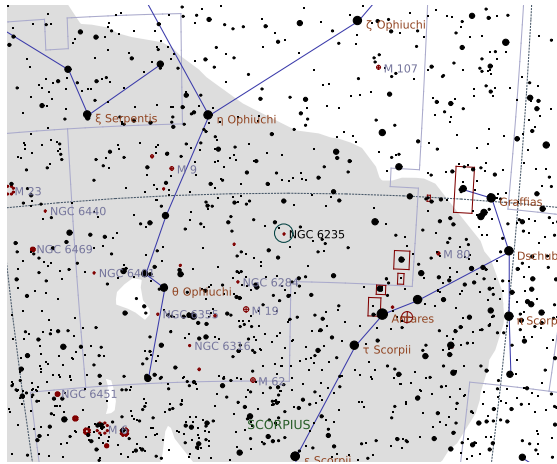
# NGC 6235

## Globular Cluster in Ophiuchus

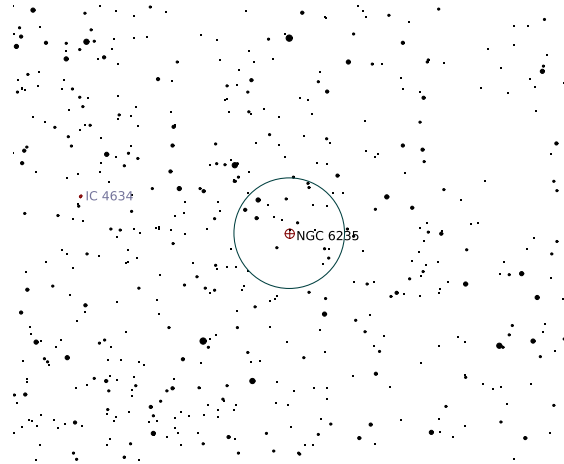
Right Ascension (current)	16 <sup>h</sup> 54 <sup>m</sup> 12 <sup>s</sup>	Declination (current)	-22° 11' 46"
Right Ascension (J2000.0)	16 <sup>h</sup> 53 <sup>m</sup> 25 <sup>s</sup>	Declination (J2000.0)	-22° 10' 36"
Size	5' × 5'	Position Angle	90°
Magnitude	8.9	Other Designation	—

Description: Dreyer: pB;cL;iR;rrr;\*14...16

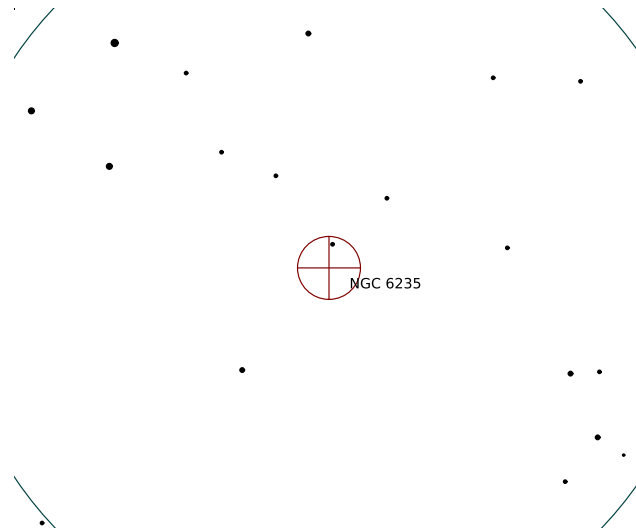
SAC: H II 584



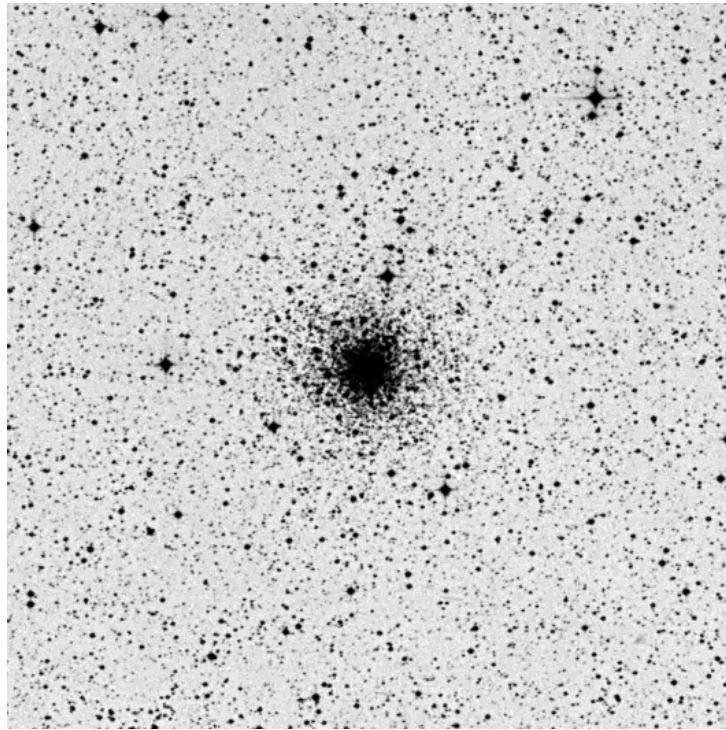
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

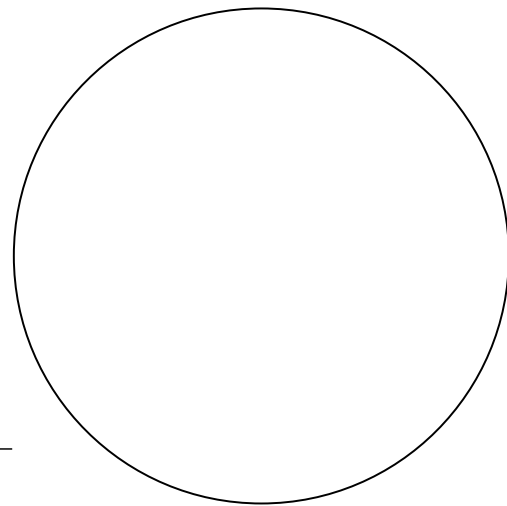
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch



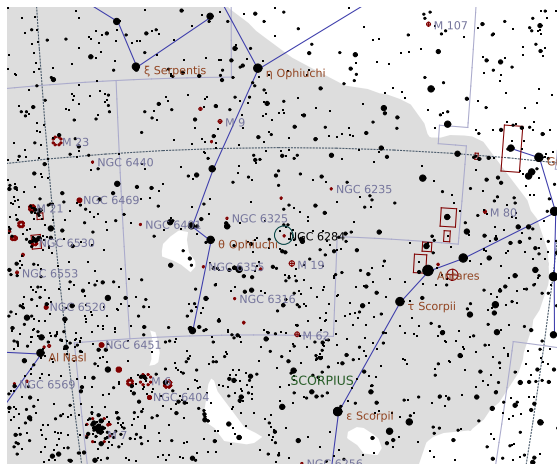
# NGC 6284

## Globular Cluster in Ophiuchus

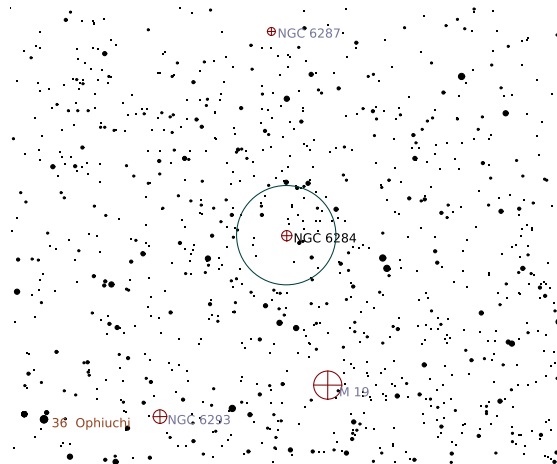
Right Ascension (current)	17 <sup>h</sup> 05 <sup>m</sup> 16 <sup>s</sup>	Declination (current)	−24° 46′ 48″
Right Ascension (J2000.0)	17 <sup>h</sup> 04 <sup>m</sup> 28 <sup>s</sup>	Declination (J2000.0)	−24° 45′ 51″
Size	6.2′ × 6.2′	Position Angle	90°
Magnitude	8.9	Other Designation	—

**Description:** Dreyer: B;L;R;CM;st16...

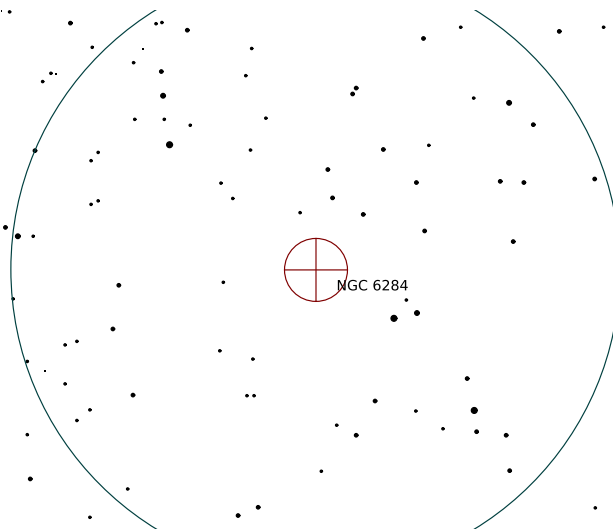
**SAC:** H VI 11



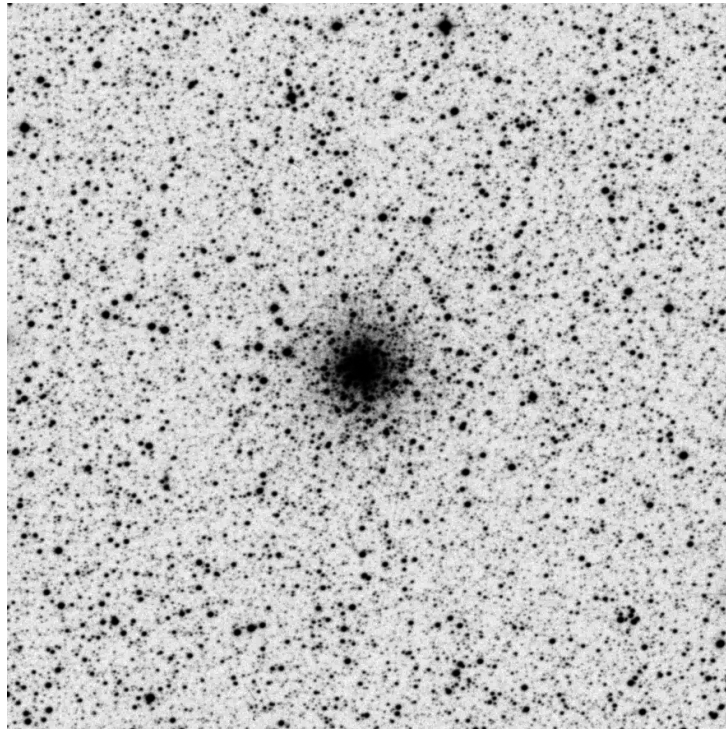
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

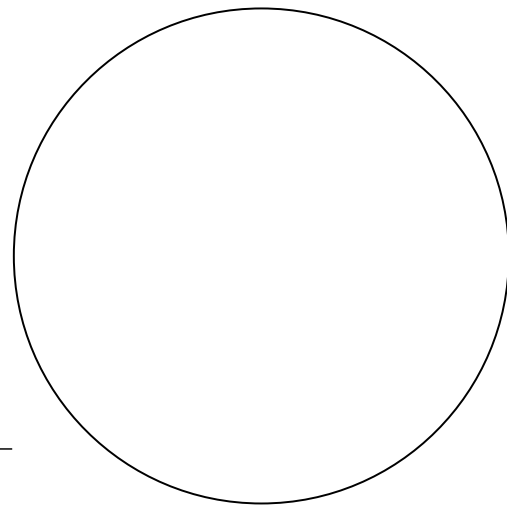
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

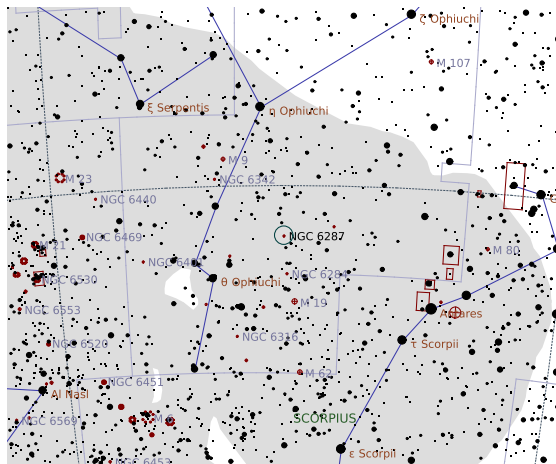
# NGC 6287

## Globular Cluster in Ophiuchus

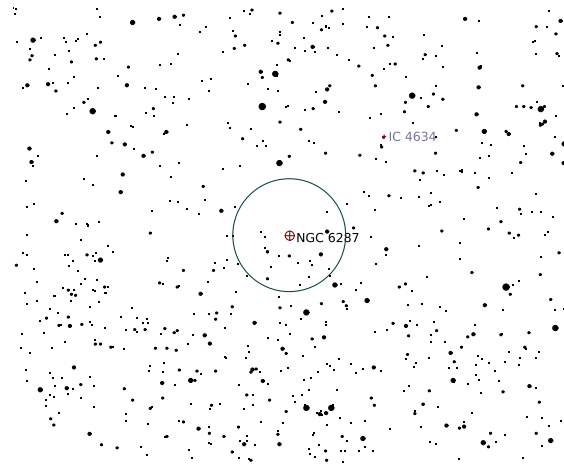
Right Ascension (current)	17 <sup>h</sup> 05 <sup>m</sup> 56 <sup>s</sup>	Declination (current)	−22° 43′ 24″
Right Ascension (J2000.0)	17 <sup>h</sup> 05 <sup>m</sup> 09 <sup>s</sup>	Declination (J2000.0)	−22° 42′ 27″
Size	4.8′ × 4.8′	Position Angle	90°
Magnitude	9.3	Other Designation	—

**Description:** Dreyer: cB;L;R;gpmCM;rrr

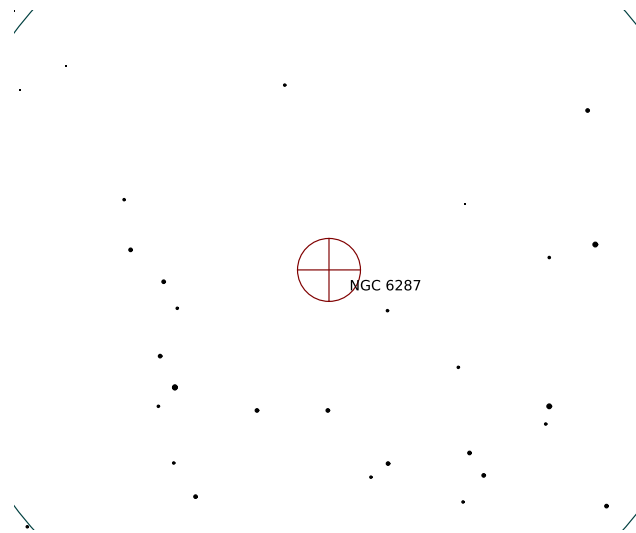
**SAC:** H II 195



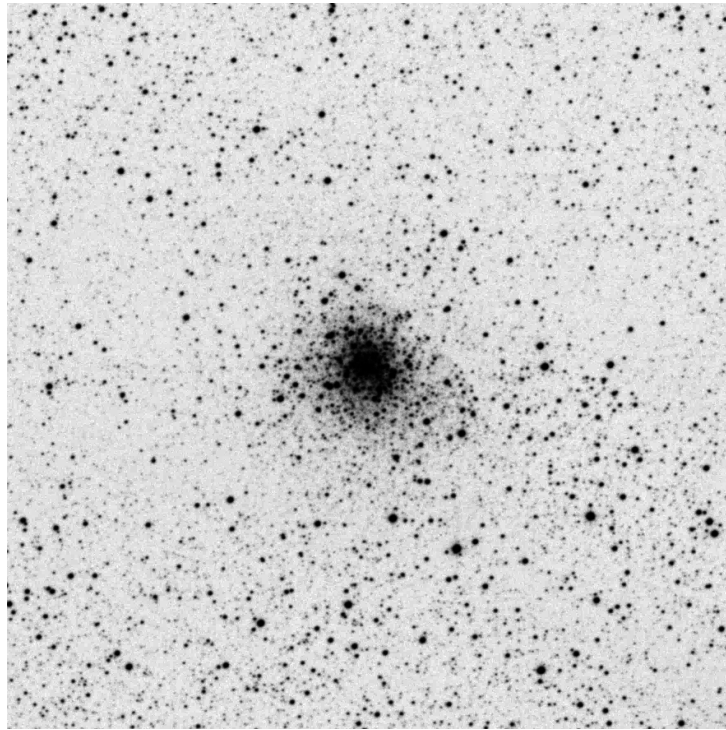
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

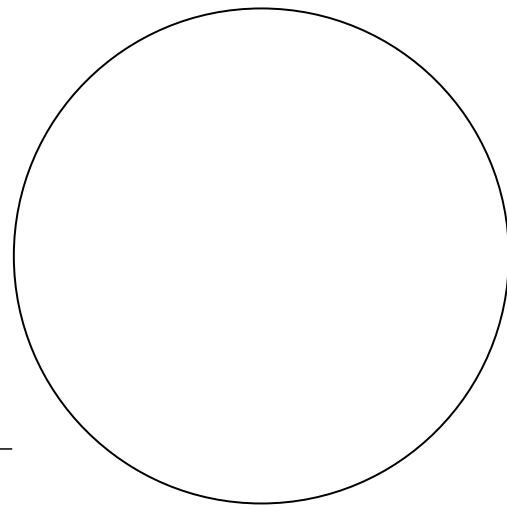
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

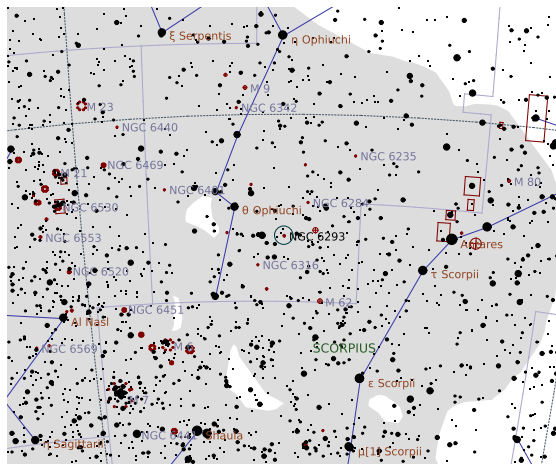
# NGC 6293

## Globular Cluster in Ophiuchus

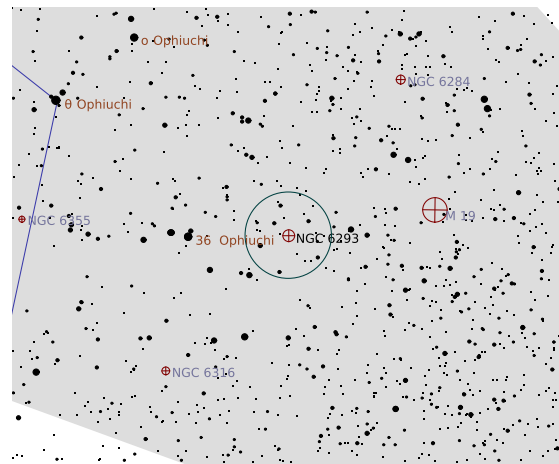
Right Ascension (current)	17 <sup>h</sup> 10 <sup>m</sup> 59 <sup>s</sup>	Declination (current)	−26° 35′ 42″
Right Ascension (J2000.0)	17 <sup>h</sup> 10 <sup>m</sup> 10 <sup>s</sup>	Declination (J2000.0)	−26° 34′ 52″
Size	8.2′ × 8.2′	Position Angle	90°
Magnitude	8.3	Other Designation	—

**Description:** Dreyer: vB;L;R;psbM;st16

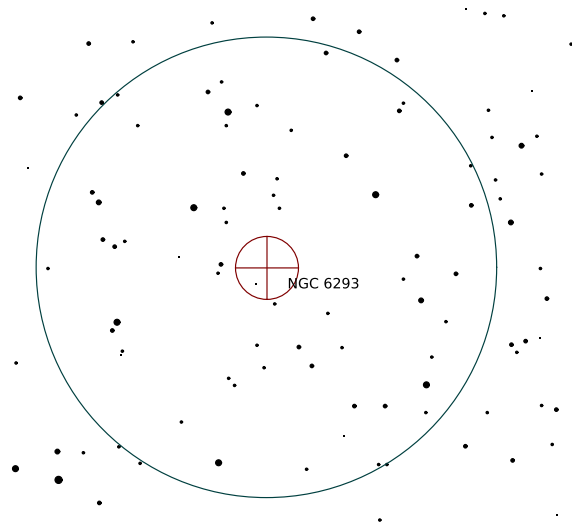
**SAC:** H VI 12



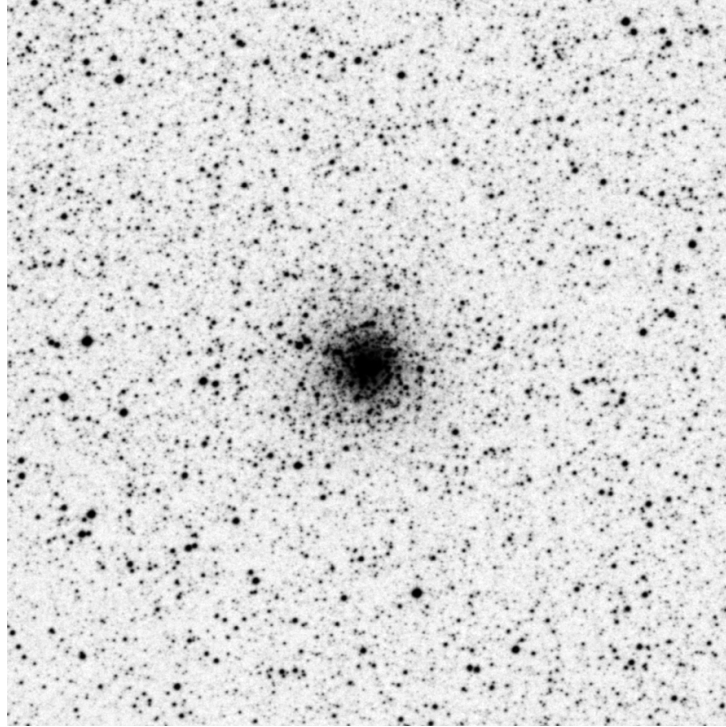
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

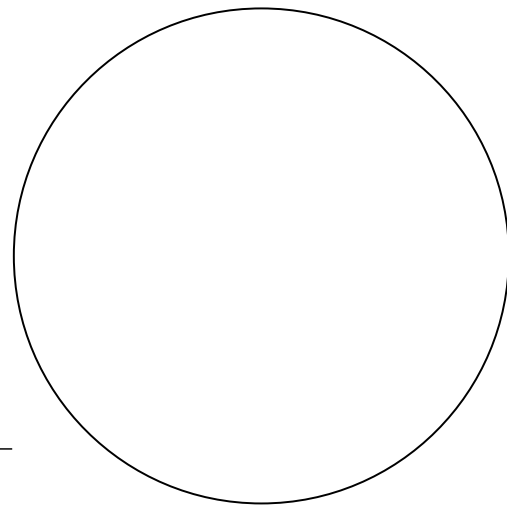
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

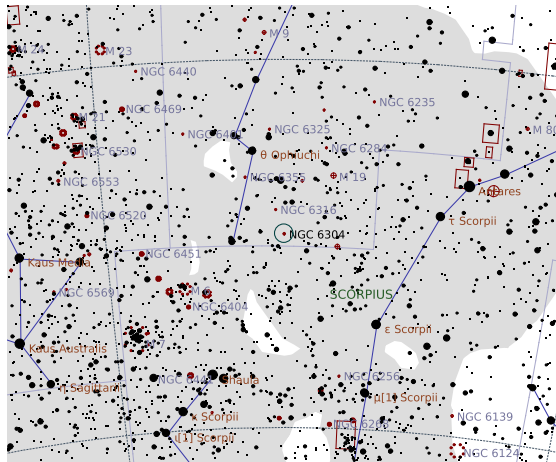
# NGC 6304

## Globular Cluster in Ophiuchus

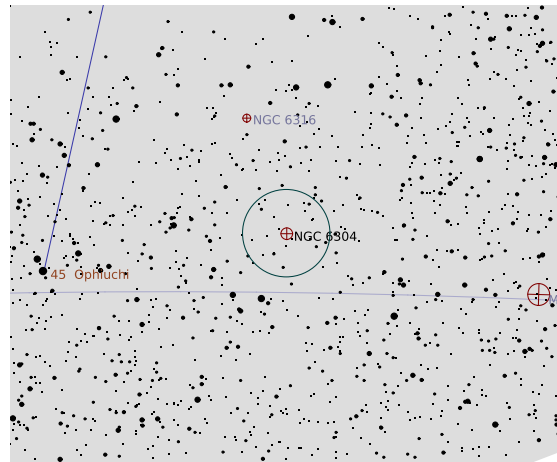
Right Ascension (current)	17 <sup>h</sup> 15 <sup>m</sup> 22 <sup>s</sup>	Declination (current)	−29° 28′ 26″
Right Ascension (J2000.0)	17 <sup>h</sup> 14 <sup>m</sup> 32 <sup>s</sup>	Declination (J2000.0)	−29° 27′ 42″
Size	8′ × 8′	Position Angle	90°
Magnitude	8.3	Other Designation	—

**Description:** Dreyer: B;cL;R;1bM;rrr

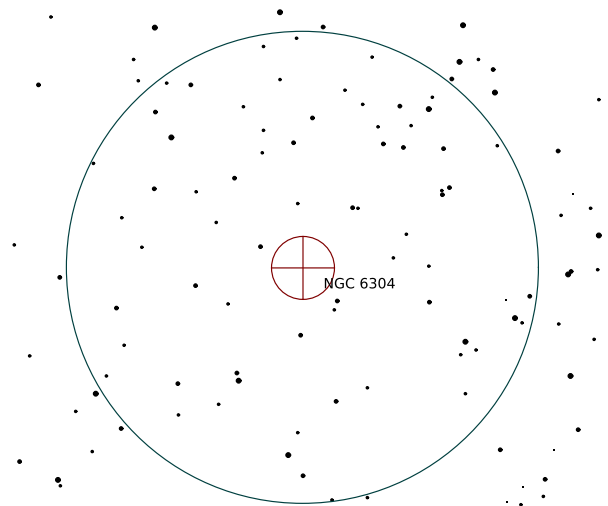
**SAC:** H I 147



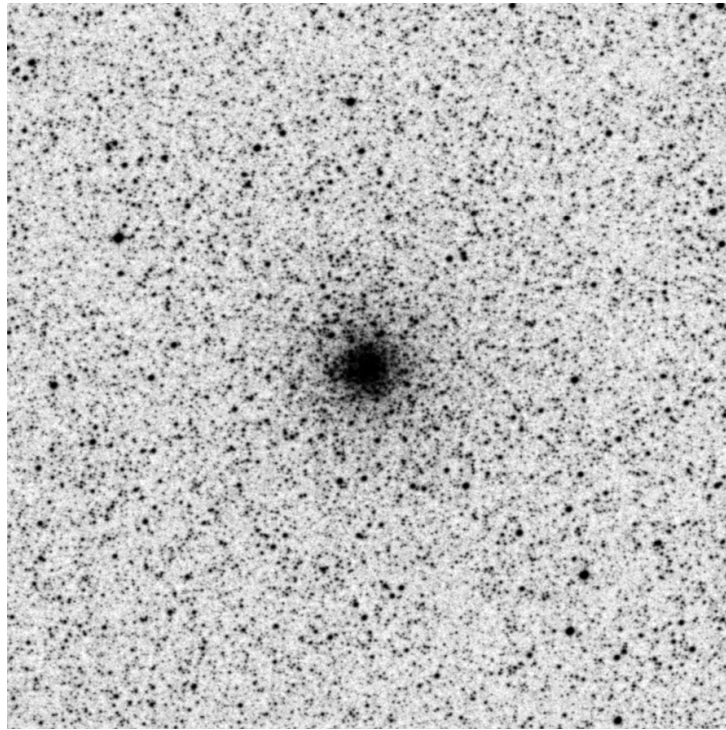
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

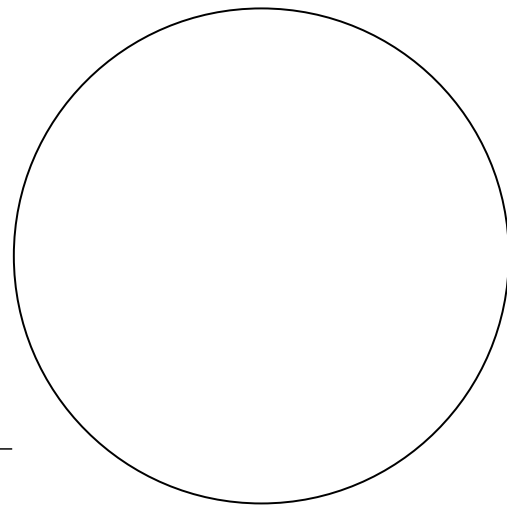
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**



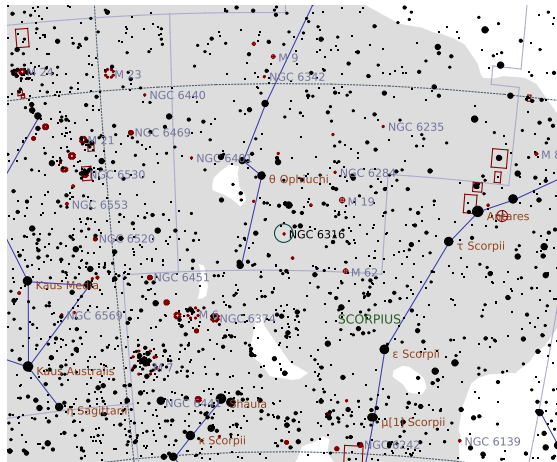
# NGC 6316

## Globular Cluster in Ophiuchus

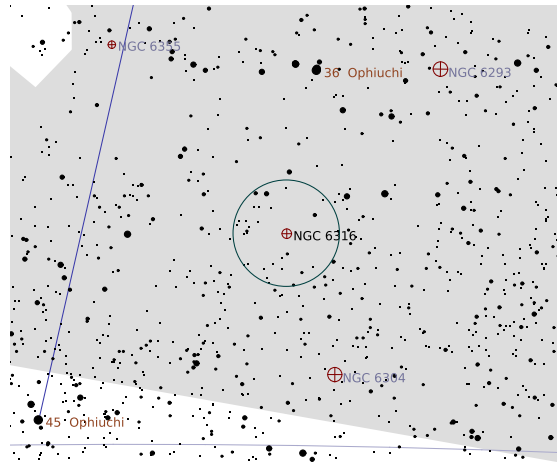
Right Ascension (current)	17 <sup>h</sup> 17 <sup>m</sup> 26 <sup>s</sup>	Declination (current)	-28° 09' 04"
Right Ascension (J2000.0)	17 <sup>h</sup> 16 <sup>m</sup> 37 <sup>s</sup>	Declination (J2000.0)	-28° 08' 22"
Size	5.4' × 5.4'	Position Angle	90°
Magnitude	8.1	Other Designation	—

**Description:** Dreyer: cB;pS;R;gvmBM

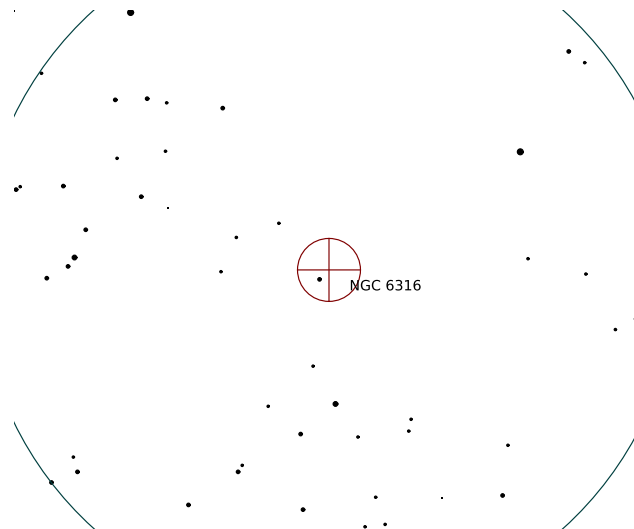
**SAC:** H I 45



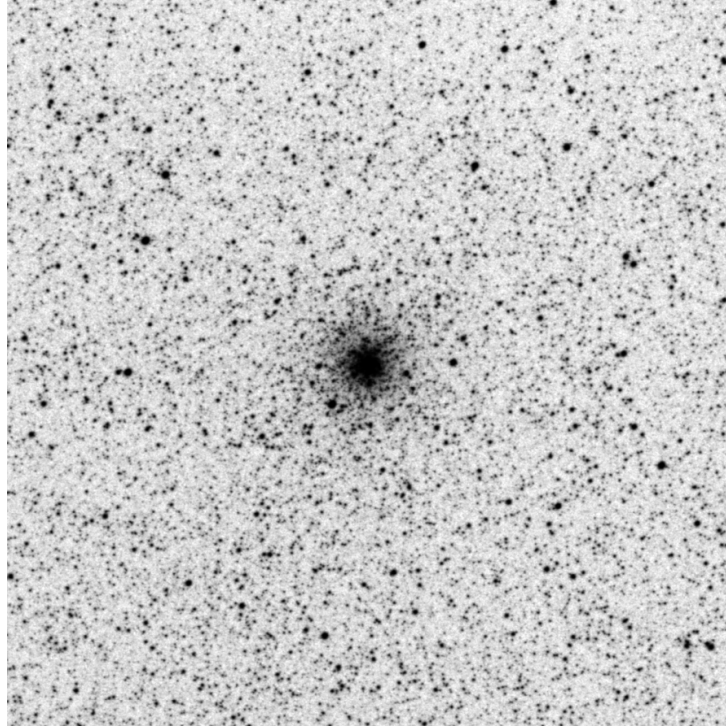
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

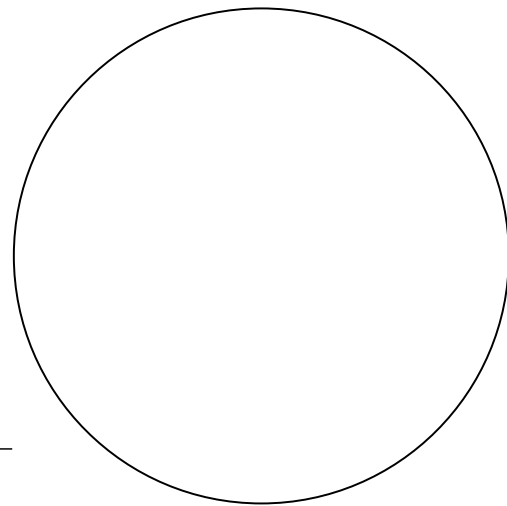
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



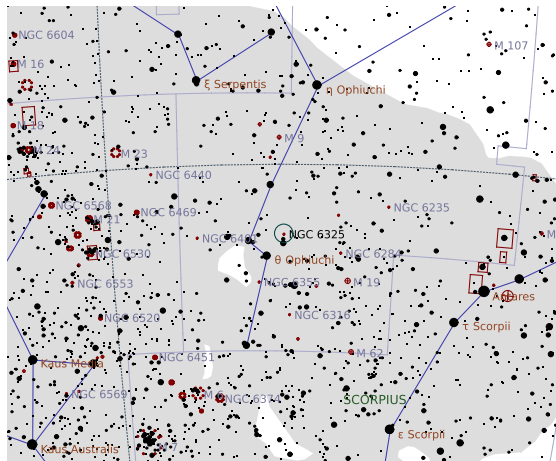
**Sketch**

# NGC 6325

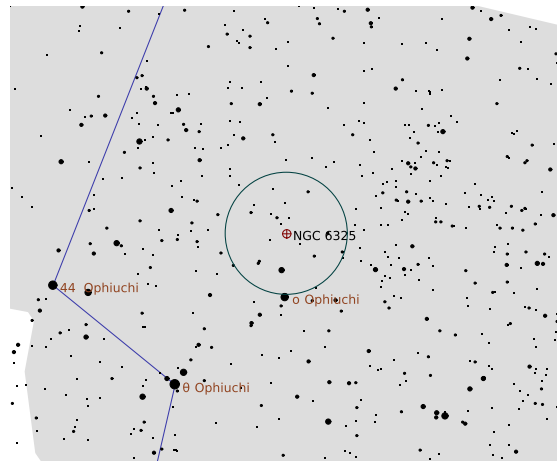
## Globular Cluster in Ophiuchus

Right Ascension (current)	17 <sup>h</sup> 18 <sup>m</sup> 47 <sup>s</sup>	Declination (current)	−23° 46′ 37″
Right Ascension (J2000.0)	17 <sup>h</sup> 17 <sup>m</sup> 59 <sup>s</sup>	Declination (J2000.0)	−23° 45′ 55″
Size	4.1′ × 4.1′	Position Angle	90°
Magnitude	10	Other Designation	—

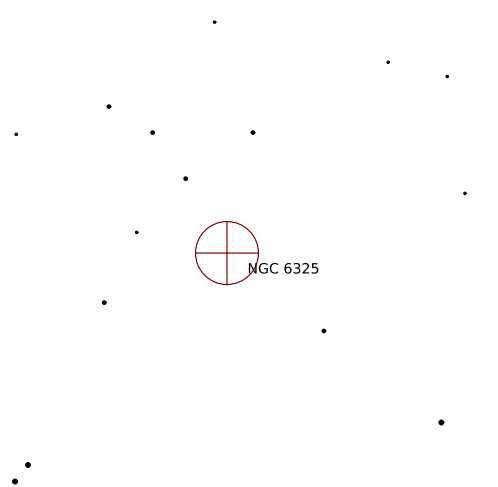
Description: Dreyer: pF;L;R;rr



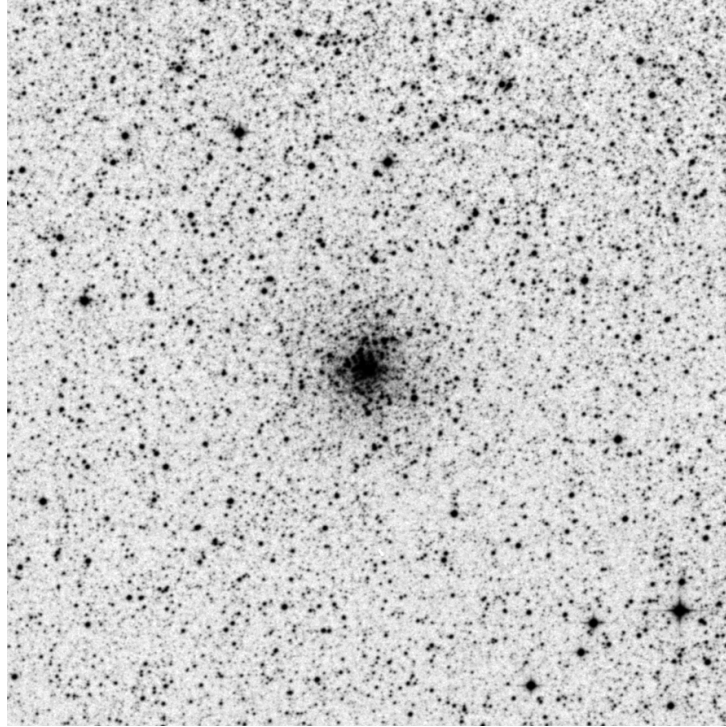
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

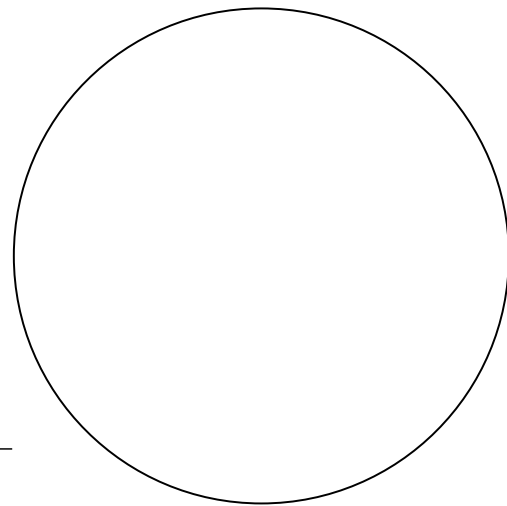
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

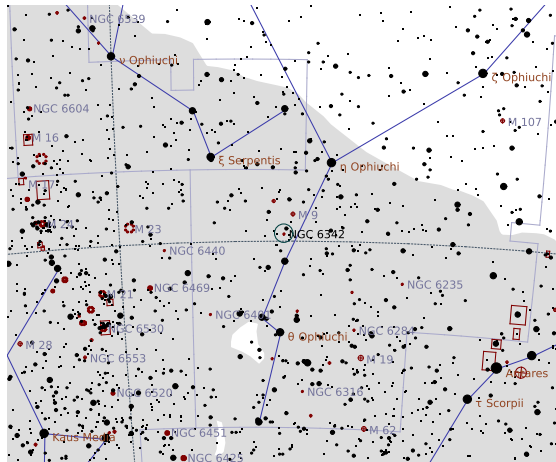
# NGC 6342

## Globular Cluster in Ophiuchus

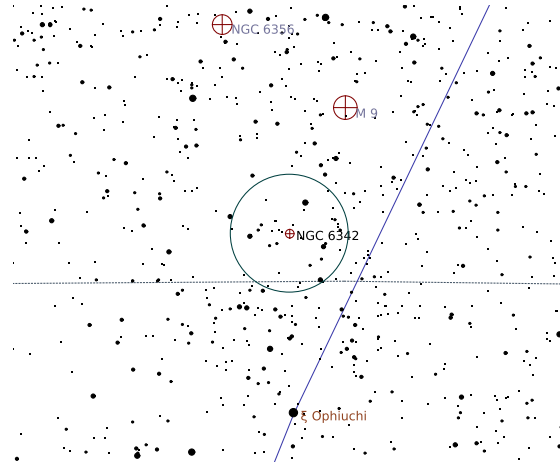
Right Ascension (current)	17 <sup>h</sup> 21 <sup>m</sup> 56 <sup>s</sup>	Declination (current)	−19° 35′ 51″
Right Ascension (J2000.0)	17 <sup>h</sup> 21 <sup>m</sup> 10 <sup>s</sup>	Declination (J2000.0)	−19° 35′ 12″
Size	4.4′ × 4.4′	Position Angle	90°
Magnitude	9.5	Other Designation	—

**Description:** Dreyer: cB;pS;lE;eR

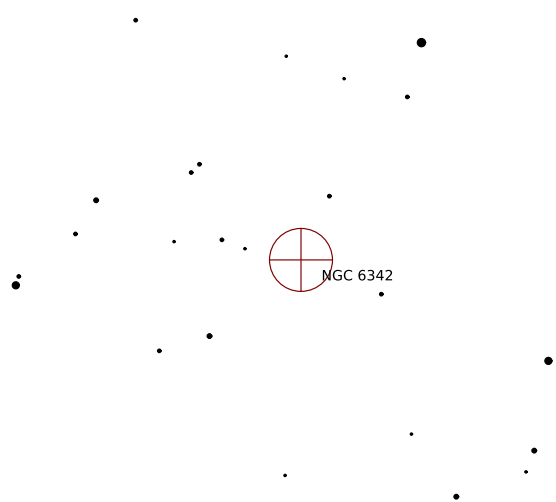
**SAC:** H I 149



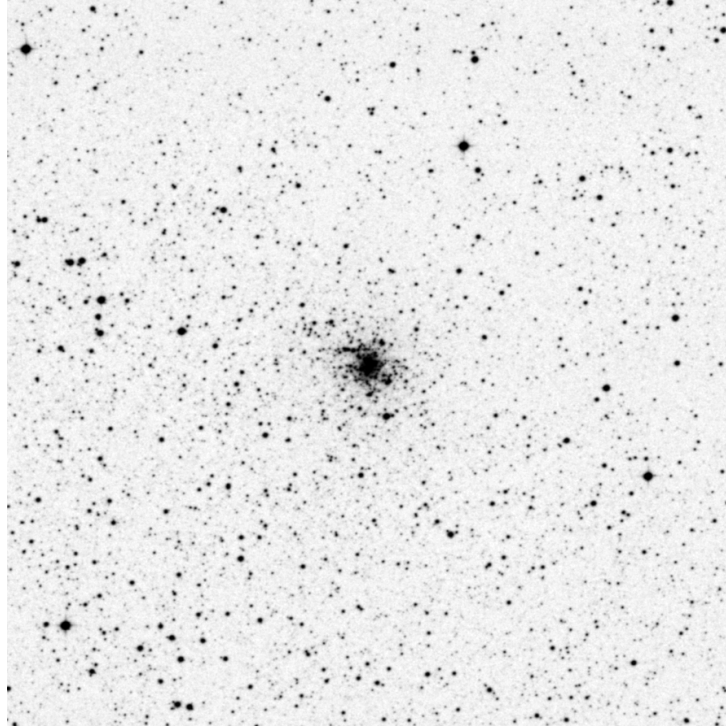
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

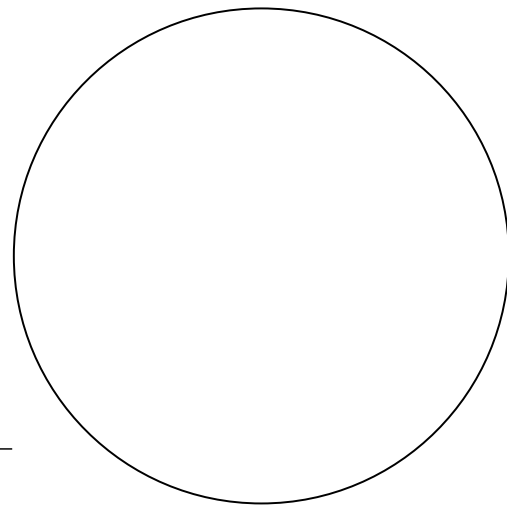
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

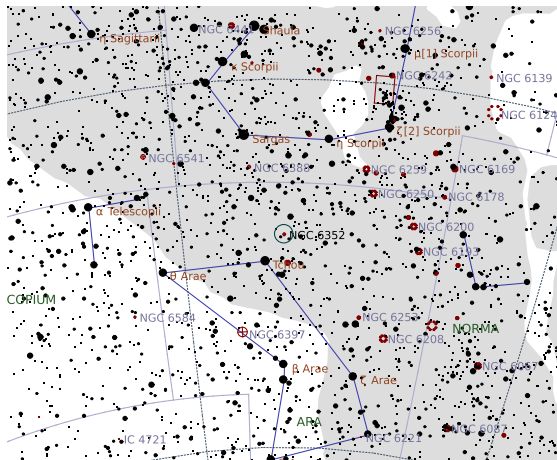
# NGC 6352

## Globular Cluster in Ara

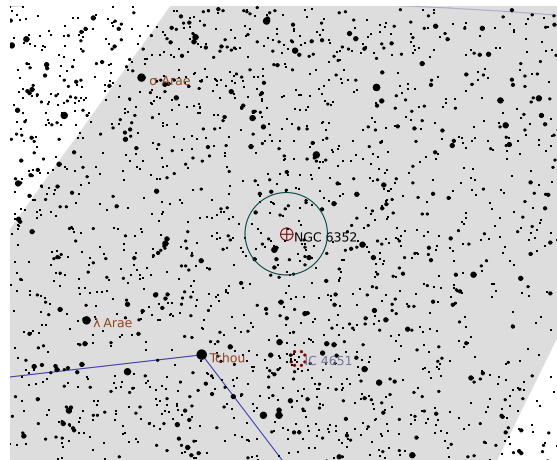
Right Ascension (current)	17 <sup>h</sup> 26 <sup>m</sup> 29 <sup>s</sup>	Declination (current)	−48° 25′ 46″
Right Ascension (J2000.0)	17 <sup>h</sup> 25 <sup>m</sup> 29 <sup>s</sup>	Declination (J2000.0)	−48° 25′ 20″
Size	9′ × 9′	Position Angle	90°
Magnitude	7.8	Other Designation	–

**Description:** Dreyer: pF;L

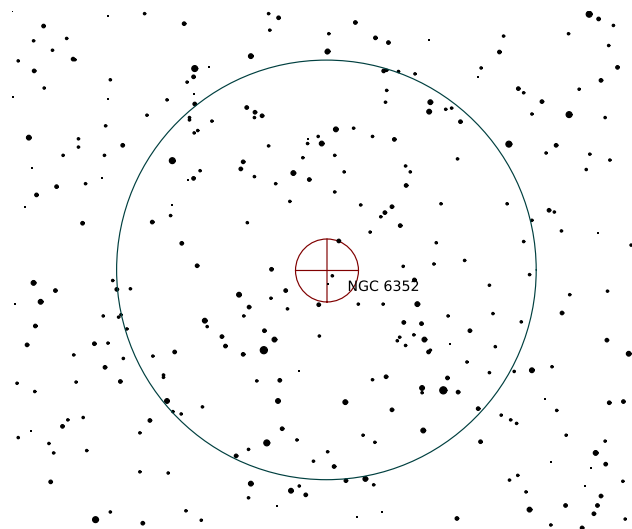
**SAC:** globular ESO 228-SC003



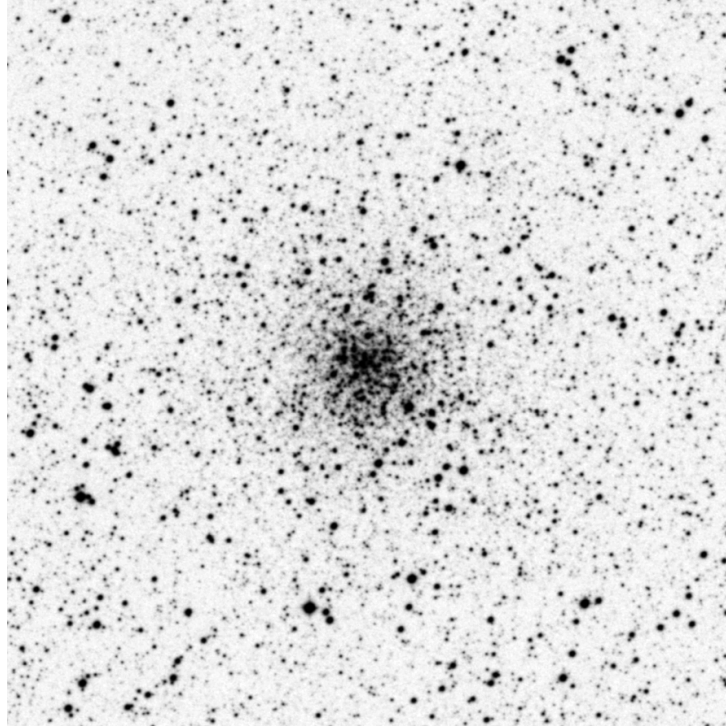
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

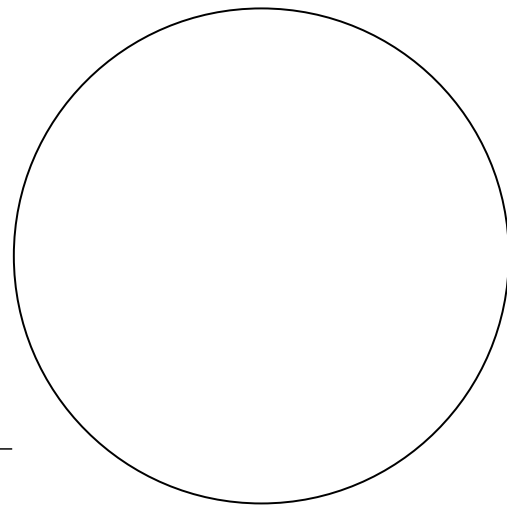
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**



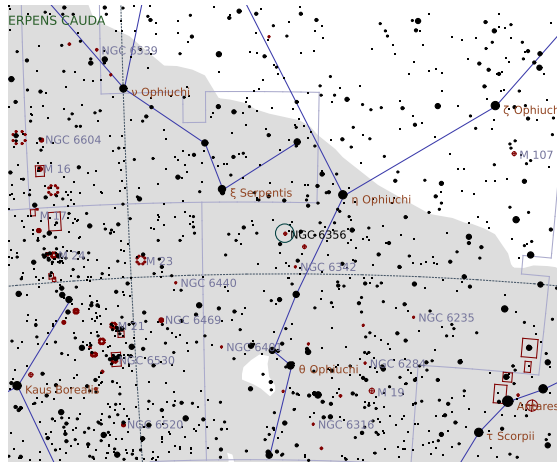
# NGC 6356

## Globular Cluster in Ophiuchus

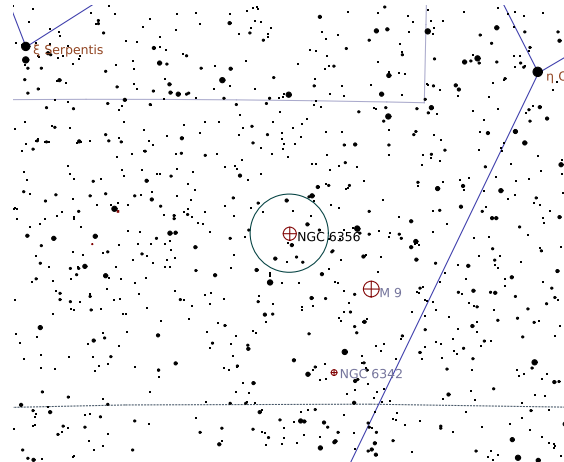
Right Ascension (current)	17 <sup>h</sup> 24 <sup>m</sup> 21 <sup>s</sup>	Declination (current)	-17° 49' 22"
Right Ascension (J2000.0)	17 <sup>h</sup> 23 <sup>m</sup> 35 <sup>s</sup>	Declination (J2000.0)	-17° 48' 45"
Size	10' × 10'	Position Angle	90°
Magnitude	8.2	Other Designation	—

**Description:** Dreyer: vB;cL;vgvmBM;rrr

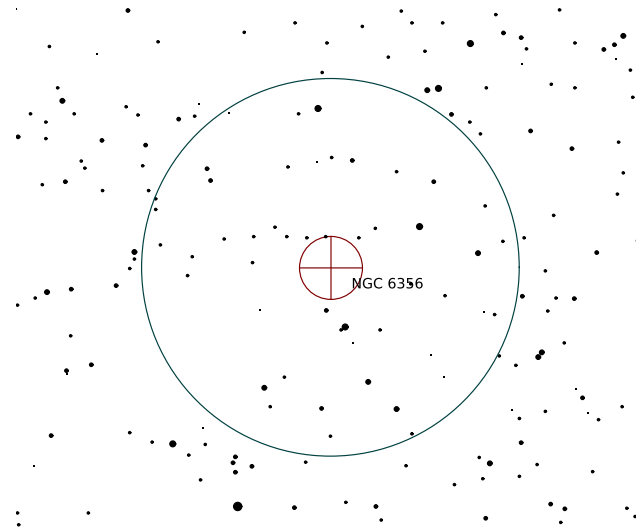
**SAC:** H I 48



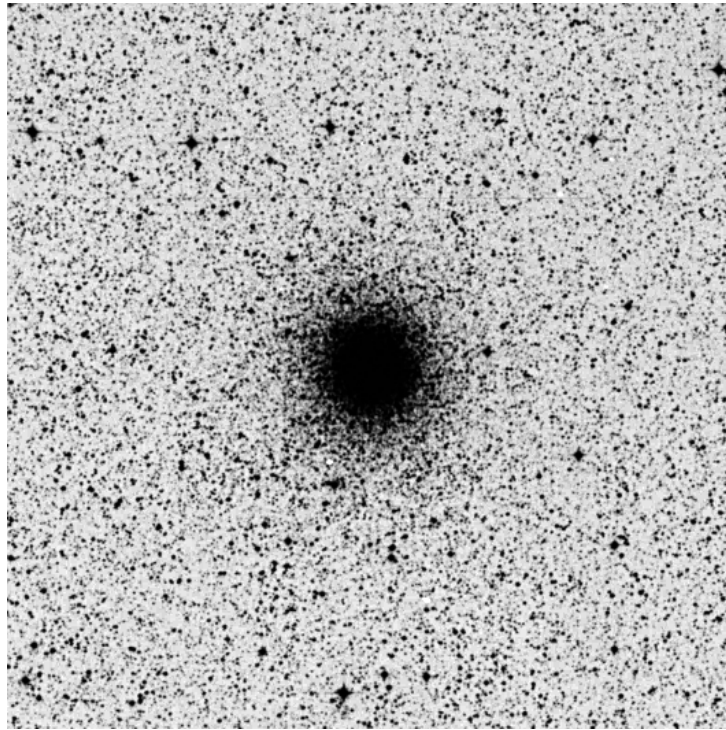
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

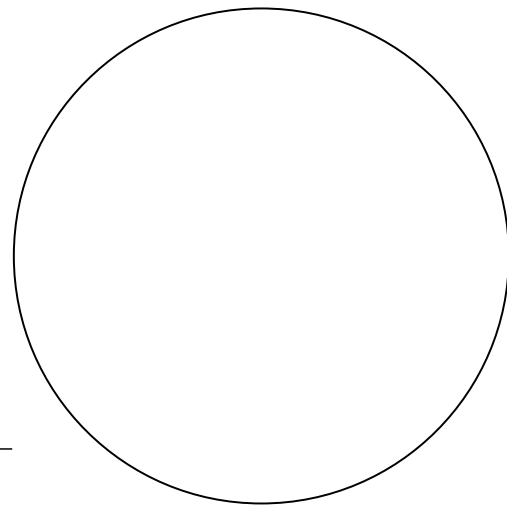
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



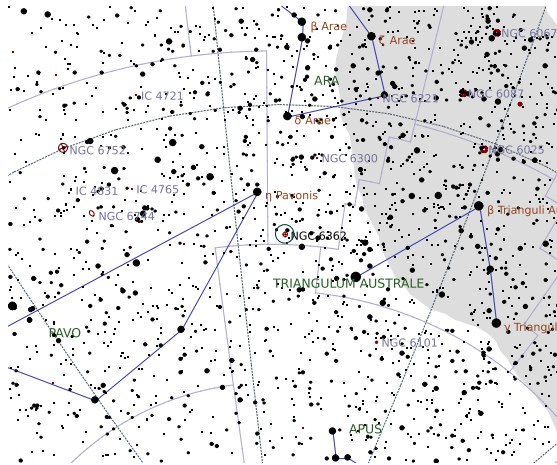
Sketch

# NGC 6362

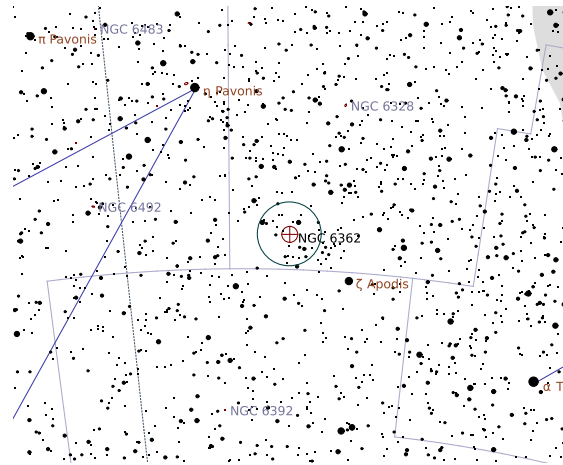
## Globular Cluster in Ara

Right Ascension (current)	17 <sup>h</sup> 33 <sup>m</sup> 15 <sup>s</sup>	Declination (current)	−67° 03′ 05″
Right Ascension (J2000.0)	17 <sup>h</sup> 31 <sup>m</sup> 54 <sup>s</sup>	Declination (J2000.0)	−67° 02′ 51″
Size	15′ × 15′	Position Angle	90°
Magnitude	8.1	Other Designation	–

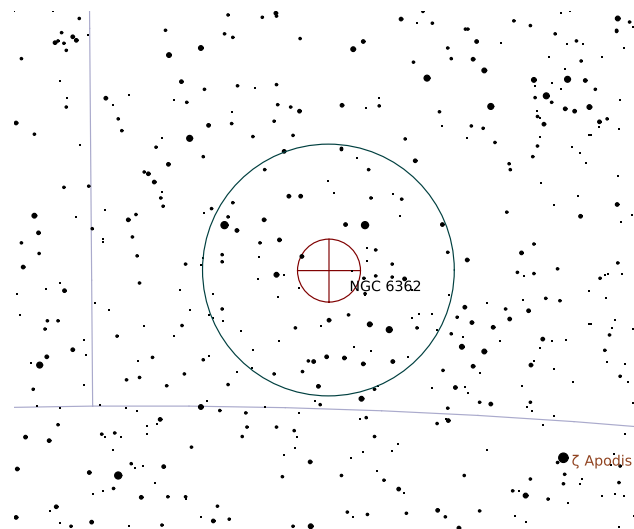
Description: Dreyer: B;L;vgmbM;rrr



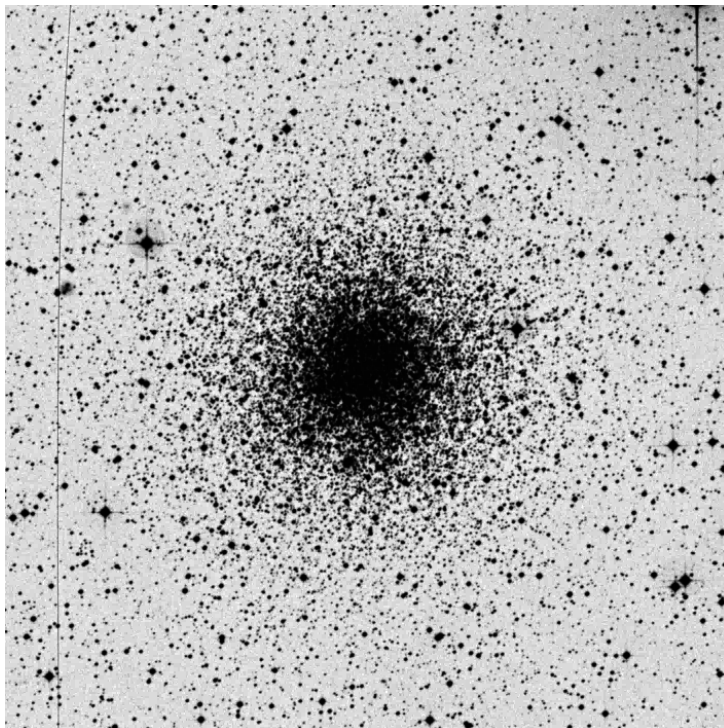
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (20.0' × 20.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

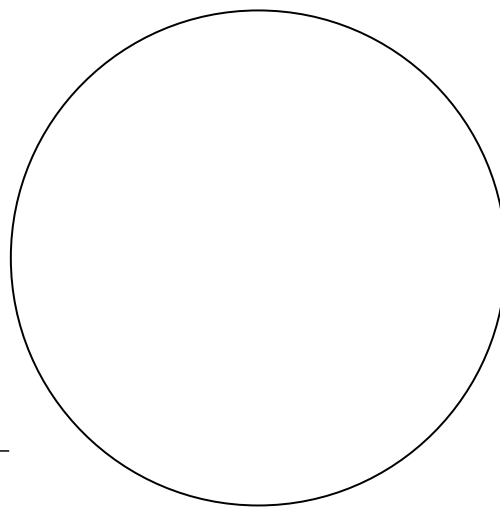
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



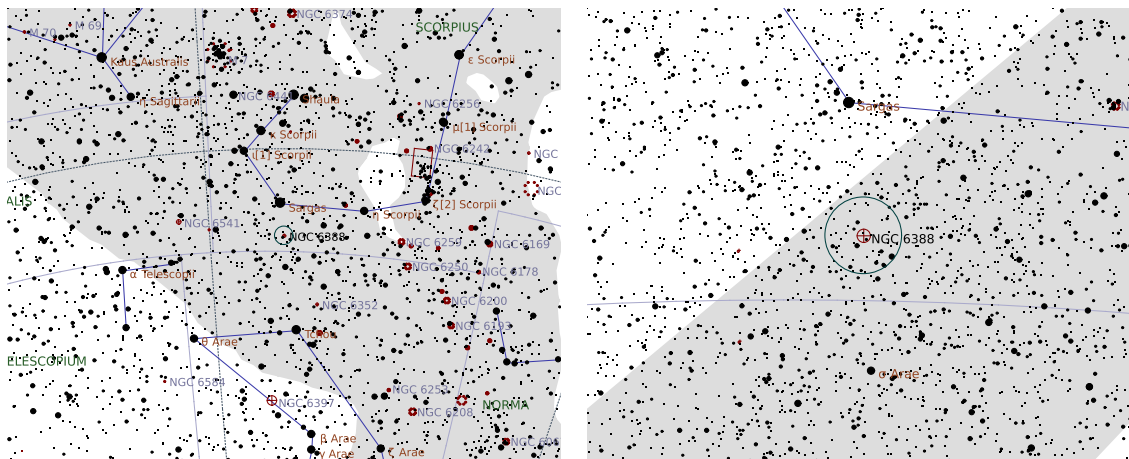
Sketch

# NGC 6388

## Globular Cluster in Scorpius

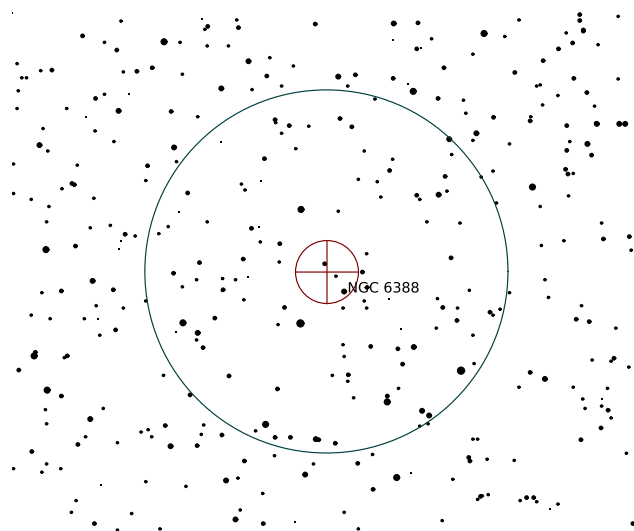
Right Ascension (current)	17 <sup>h</sup> 37 <sup>m</sup> 14 <sup>s</sup>	Declination (current)	−44° 44′ 19″
Right Ascension (J2000.0)	17 <sup>h</sup> 36 <sup>m</sup> 17 <sup>s</sup>	Declination (J2000.0)	−44° 44′ 04″
Size	10.4′ × 10.4′	Position Angle	90°
Magnitude	6.8	Other Designation	–

**Description:** Dreyer:  $\nu$ B;L;R;pg;psvmbM

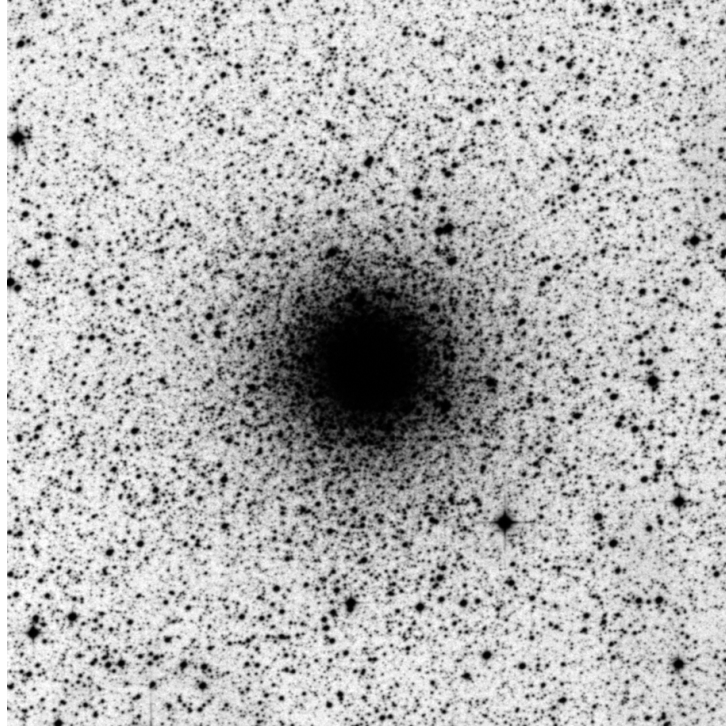


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.4' × 15.4')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

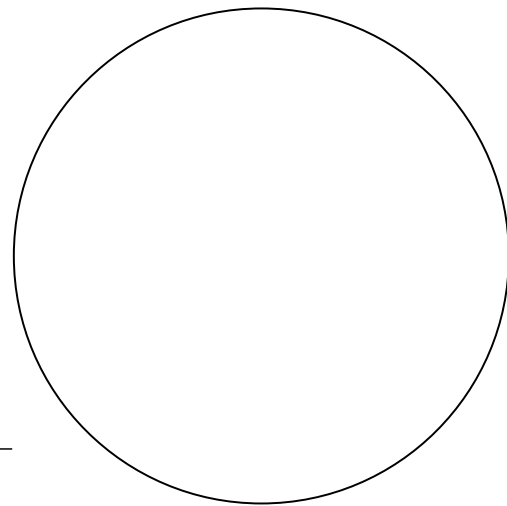
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

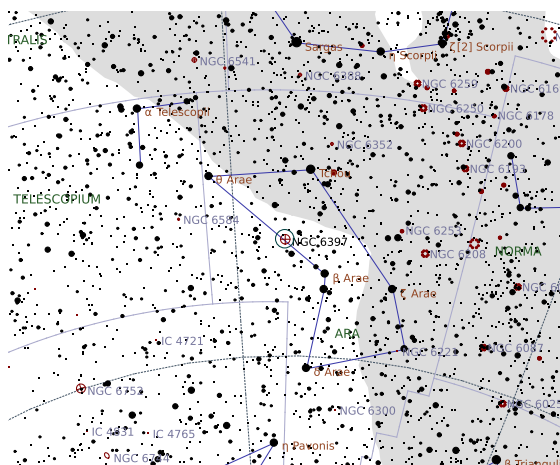
# NGC 6397

## Globular Cluster in Ara

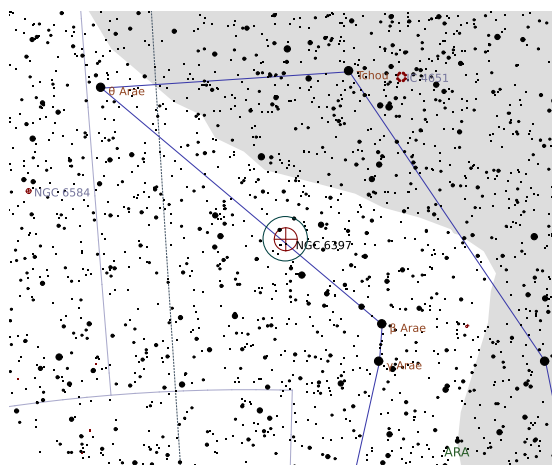
Right Ascension (current)	17 <sup>h</sup> 41 <sup>m</sup> 45 <sup>s</sup>	Declination (current)	−53° 40′ 30″
Right Ascension (J2000.0)	17 <sup>h</sup> 40 <sup>m</sup> 41 <sup>s</sup>	Declination (J2000.0)	−53° 40′ 23″
Size	31′ × 31′	Position Angle	90°
Magnitude	5.3	Other Designation	—

**Description:** Dreyer: B;vL;Ri;st 10..

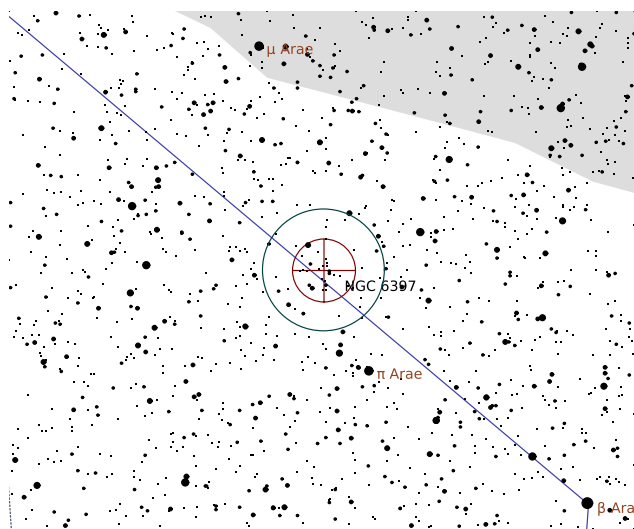
**SAC:** Poss nearest glob



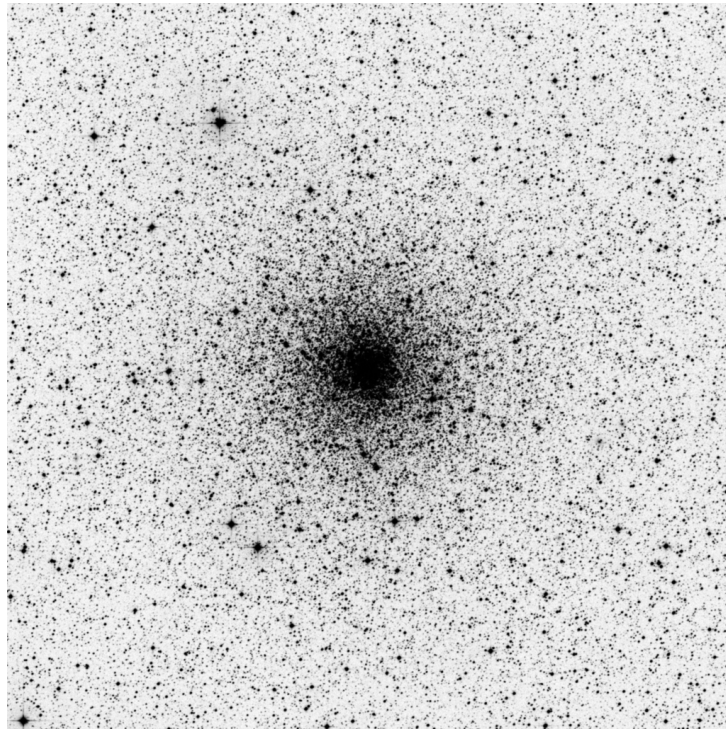
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (36.0' × 36.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

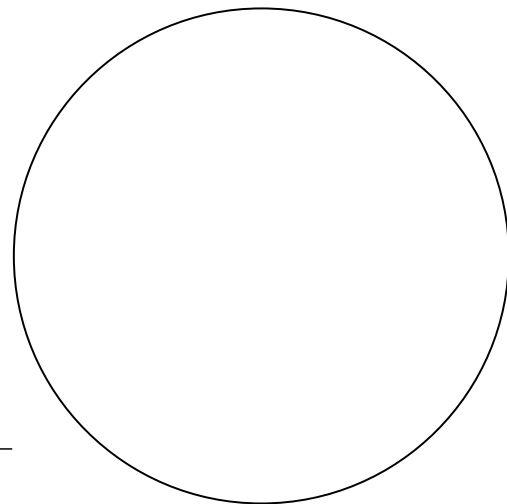
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**



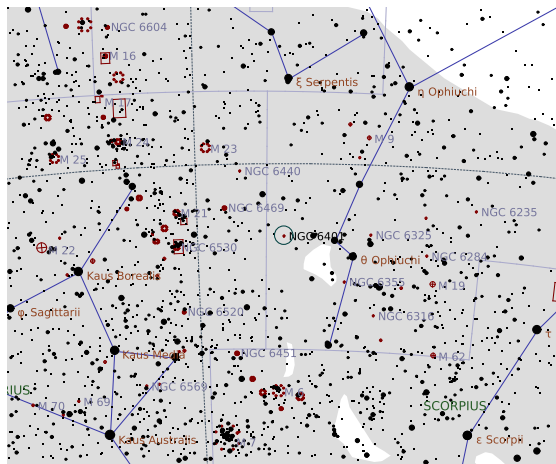
# NGC 6401

## Globular Cluster in Ophiuchus

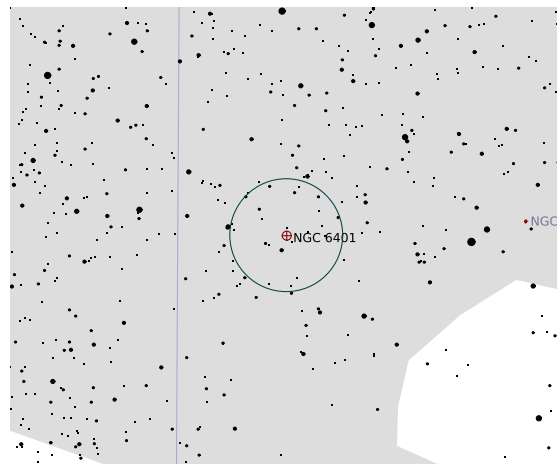
Right Ascension (current)	17 <sup>h</sup> 39 <sup>m</sup> 24 <sup>s</sup>	Declination (current)	−23° 54′ 48″
Right Ascension (J2000.0)	17 <sup>h</sup> 38 <sup>m</sup> 36 <sup>s</sup>	Declination (J2000.0)	−23° 54′ 30″
Size	4.8′ × 4.8′	Position Angle	90°
Magnitude	7.4	Other Designation	—

Description: Dreyer: pB;pL;R;\*12F inv

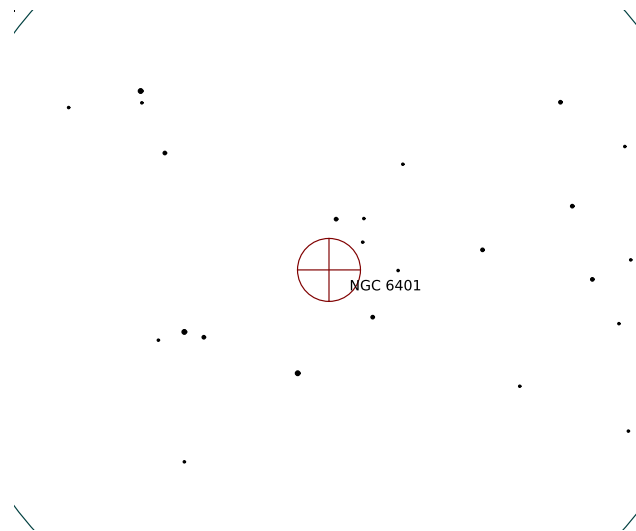
SAC: H I 44



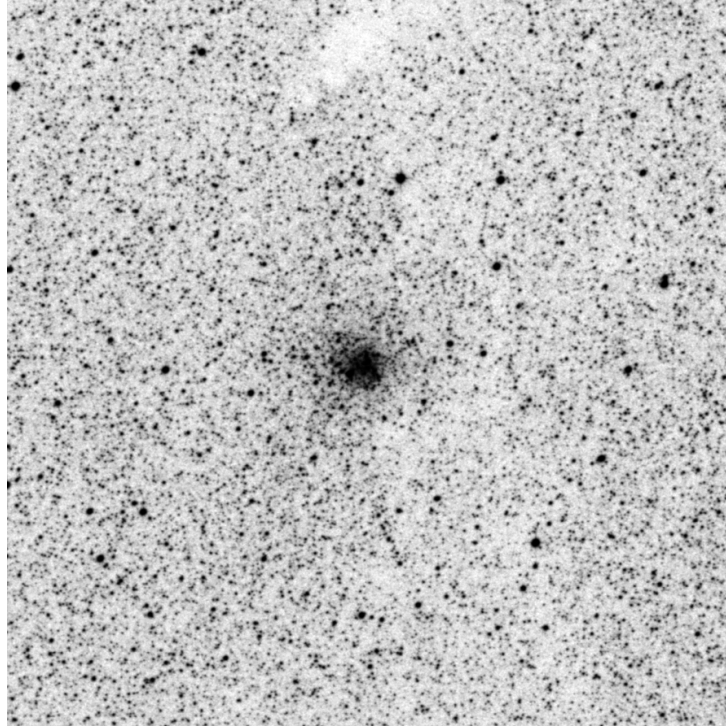
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

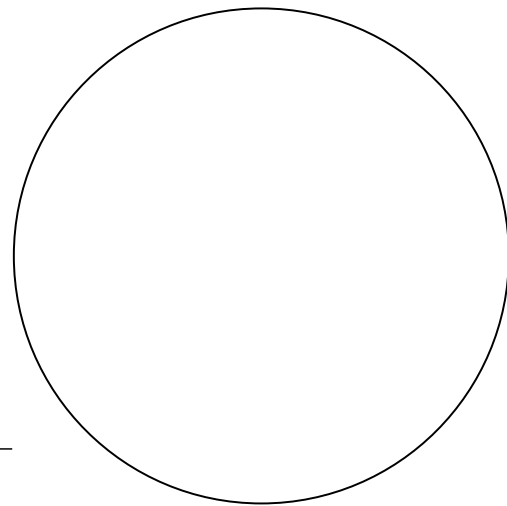
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

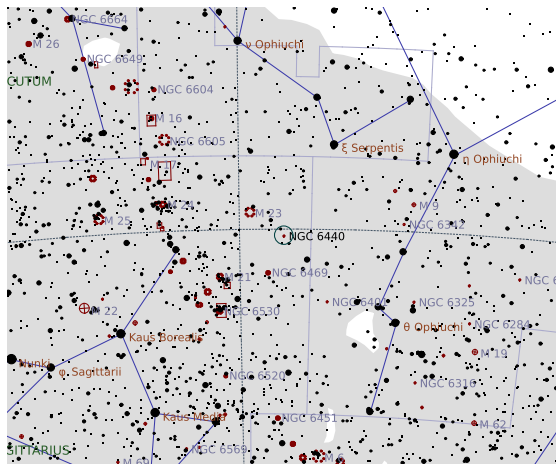
# NGC 6440

## Globular Cluster in Sagittarius

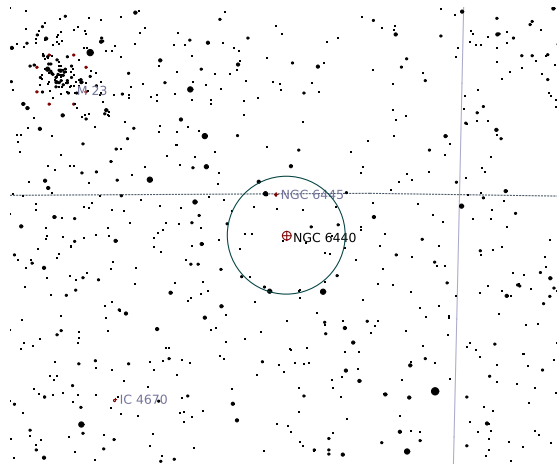
Right Ascension (current)	17 <sup>h</sup> 49 <sup>m</sup> 39 <sup>s</sup>	Declination (current)	−20° 21′ 39″
Right Ascension (J2000.0)	17 <sup>h</sup> 48 <sup>m</sup> 52 <sup>s</sup>	Declination (J2000.0)	−20° 21′ 32″
Size	4.4′ × 4.4′	Position Angle	90°
Magnitude	9.3	Other Designation	—

**Description:** Dreyer: pB;pL;R;bM

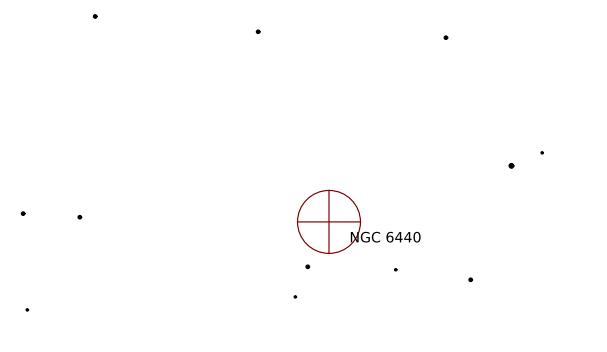
**SAC:** H I 150;\* eF



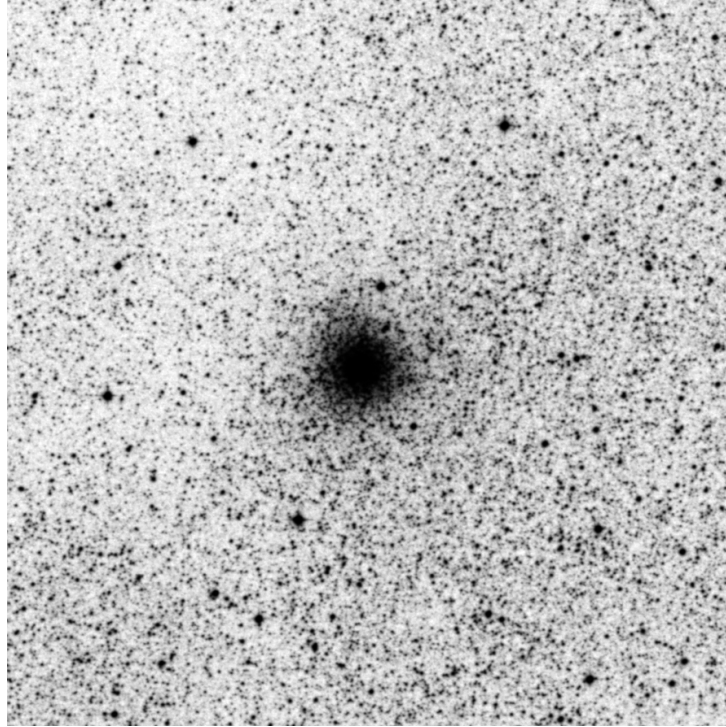
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

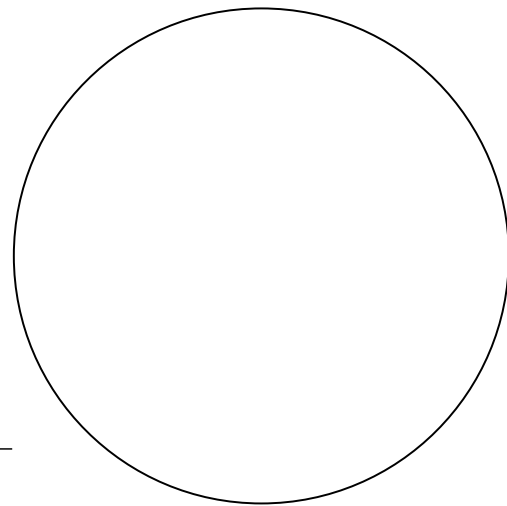
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



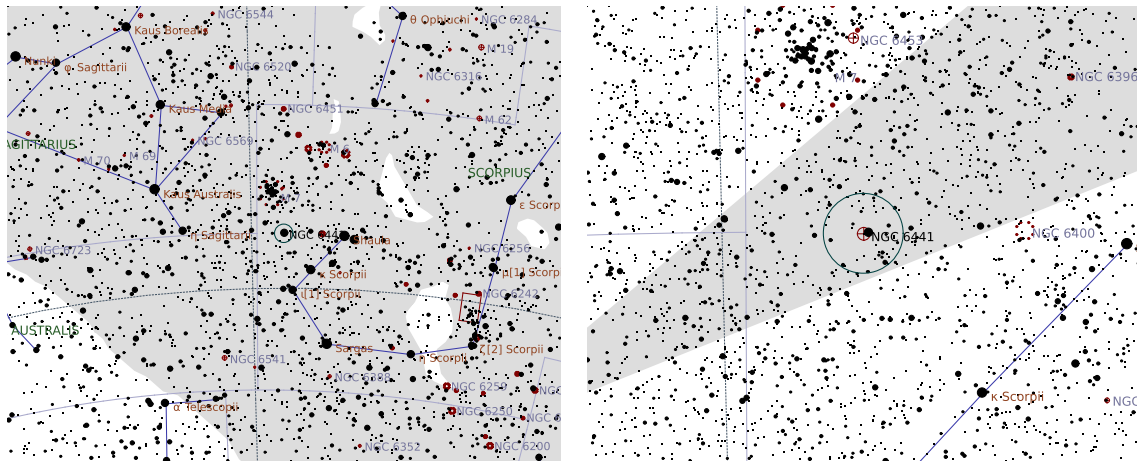
**Sketch**

# NGC 6441

## Globular Cluster in Scorpius

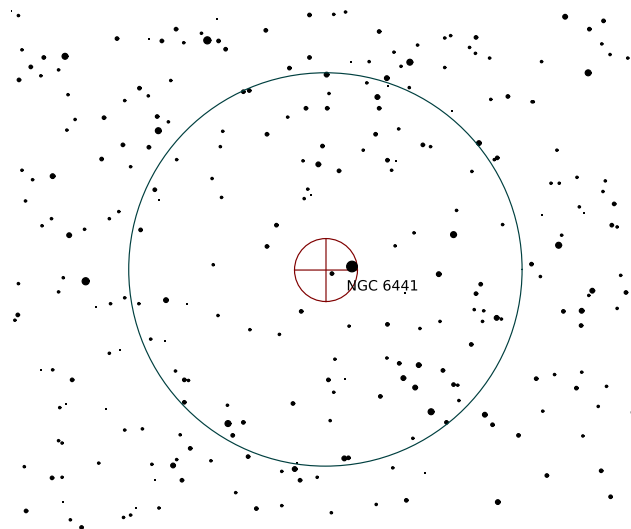
Right Ascension (current)	17 <sup>h</sup> 51 <sup>m</sup> 05 <sup>s</sup>	Declination (current)	−37° 03′ 03″
Right Ascension (J2000.0)	17 <sup>h</sup> 50 <sup>m</sup> 12 <sup>s</sup>	Declination (J2000.0)	−37° 03′ 02″
Size	9.6′ × 9.6′	Position Angle	90°
Magnitude	7.2	Other Designation	—

**Description:** Dreyer: vB;pL;R;vgmbM

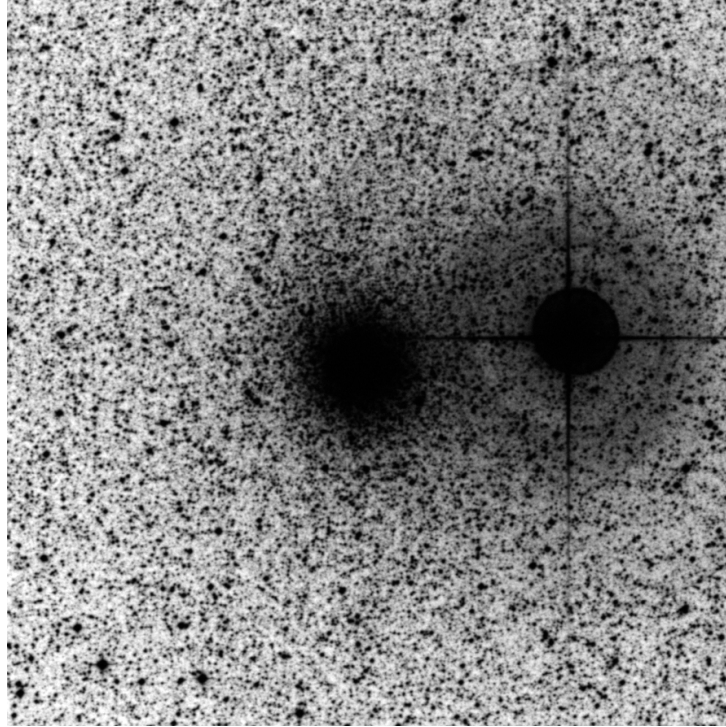


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

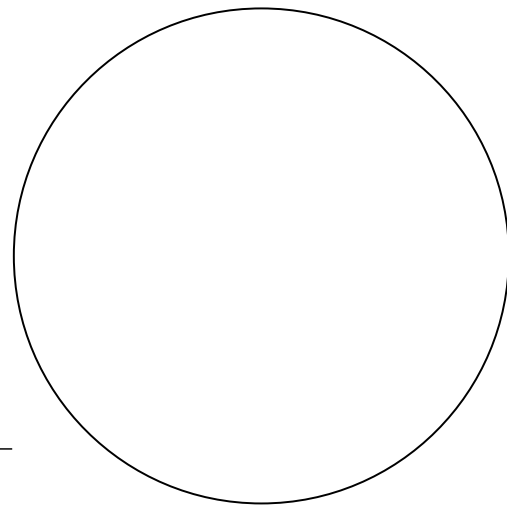
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



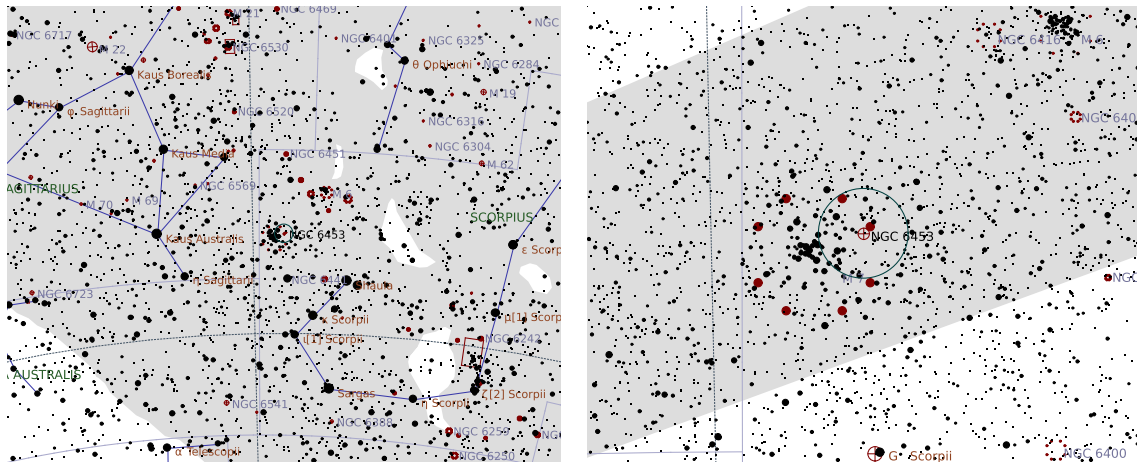
Sketch

# NGC 6453

## Globular Cluster in Scorpius

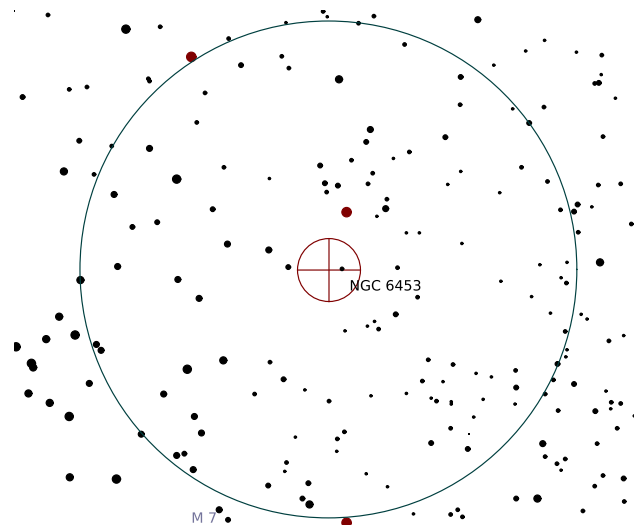
Right Ascension (current)	17 <sup>h</sup> 51 <sup>m</sup> 43 <sup>s</sup>	Declination (current)	−34° 35′ 54″
Right Ascension (J2000.0)	17 <sup>h</sup> 50 <sup>m</sup> 51 <sup>s</sup>	Declination (J2000.0)	−34° 35′ 53″
Size	7.6′ × 7.6′	Position Angle	90°
Magnitude	10	Other Designation	—

Description: Dreyer: C1; iR;pmbM;r

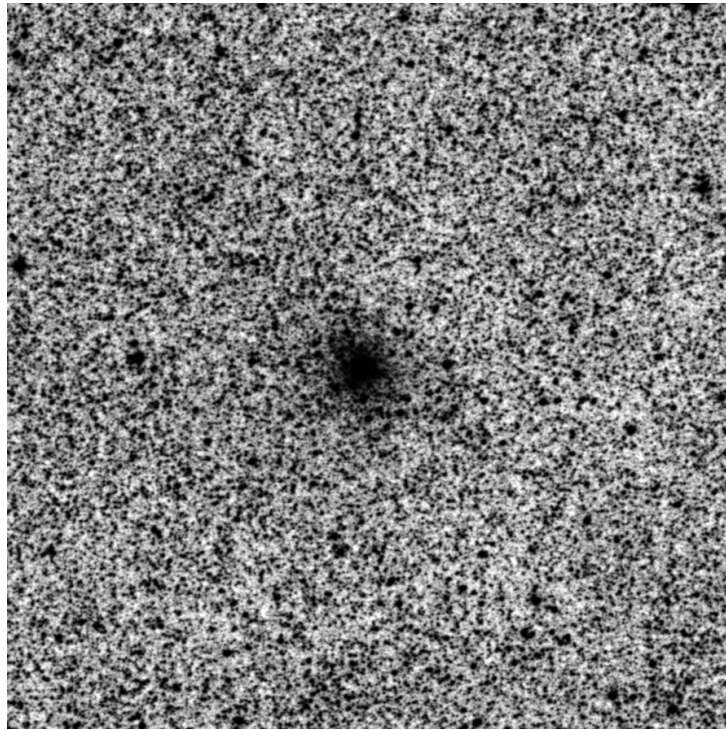


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

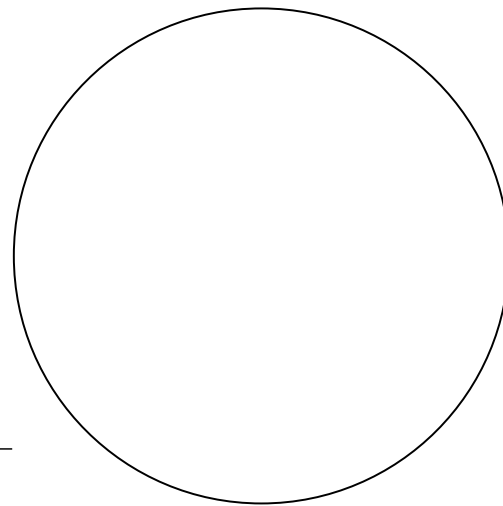
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

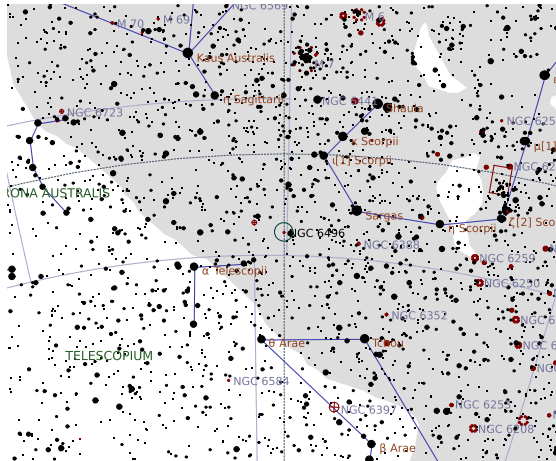


# NGC 6496

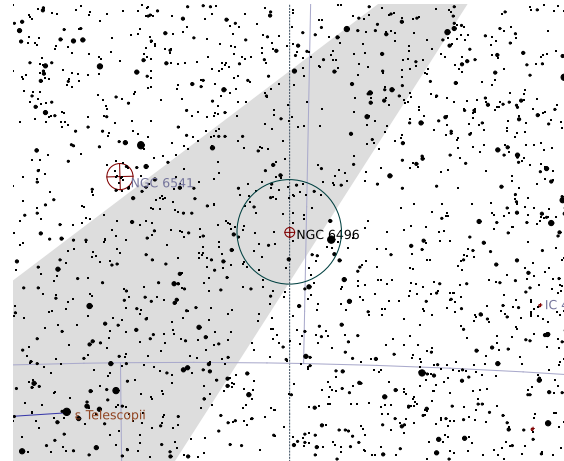
## Globular Cluster in Corona Australis

Right Ascension (current)	17 <sup>h</sup> 59 <sup>m</sup> 59 <sup>s</sup>	Declination (current)	−44° 15′ 41″
Right Ascension (J2000.0)	17 <sup>h</sup> 59 <sup>m</sup> 02 <sup>s</sup>	Declination (J2000.0)	−44° 15′ 52″
Size	5.6′ × 5.6′	Position Angle	90°
Magnitude	8.6	Other Designation	–

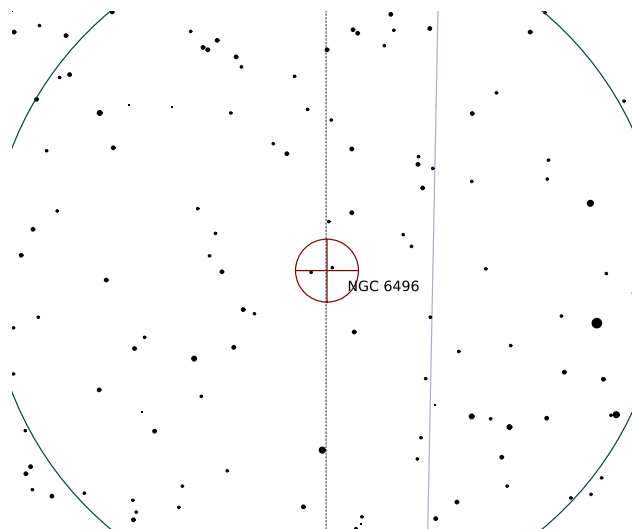
**Description:** Dreyer: neb+C1;pL;mE;gv1bM



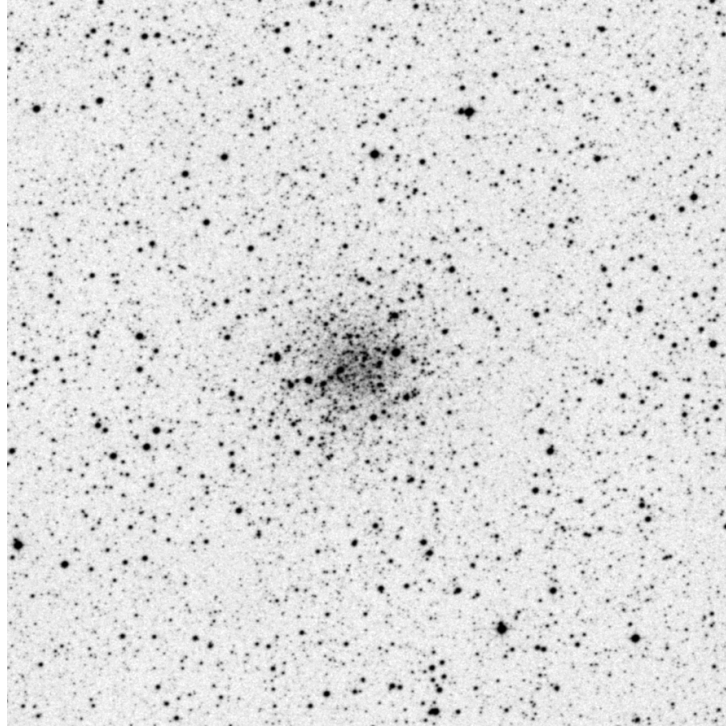
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

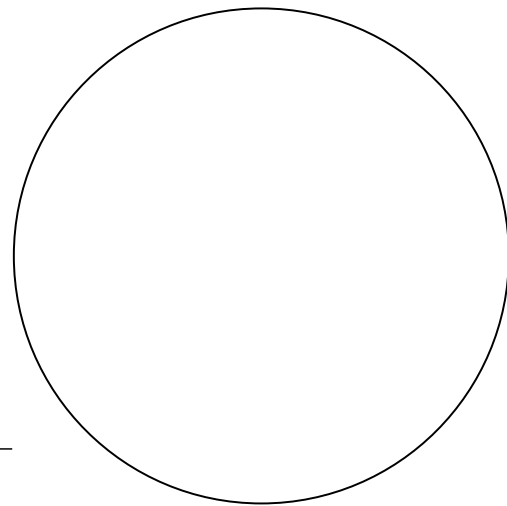
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

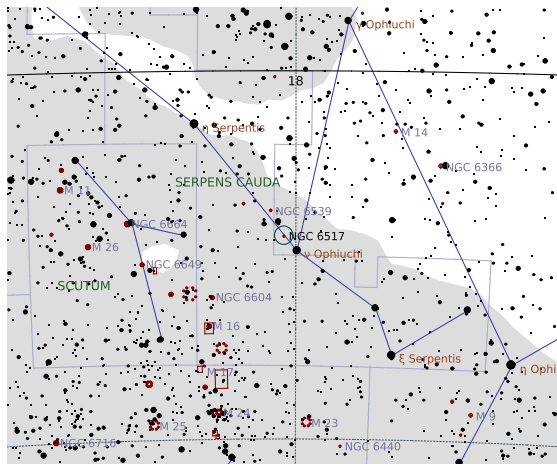
# NGC 6517

## Globular Cluster in Ophiuchus

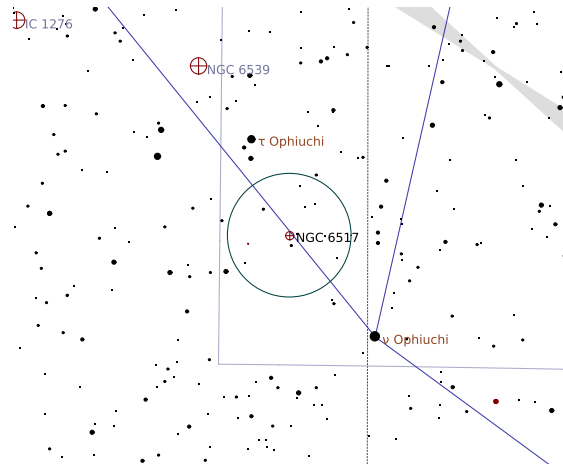
Right Ascension (current)	18 <sup>h</sup> 02 <sup>m</sup> 33 <sup>s</sup>	Declination (current)	−8° 57′ 25″
Right Ascension (J2000.0)	18 <sup>h</sup> 01 <sup>m</sup> 50 <sup>s</sup>	Declination (J2000.0)	−8° 57′ 30″
Size	4′ × 4′	Position Angle	90°
Magnitude	10	Other Designation	—

**Description:** Dreyer: pB;pL;R;rr

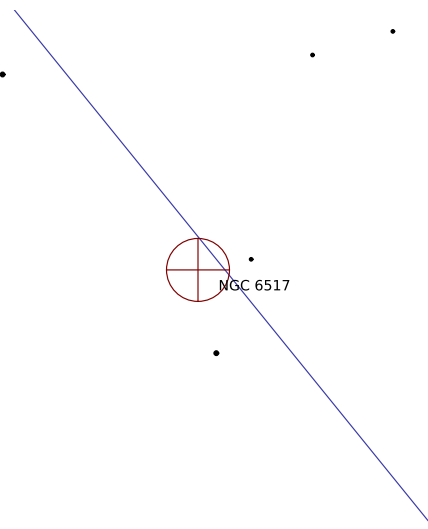
**SAC:** H II 199



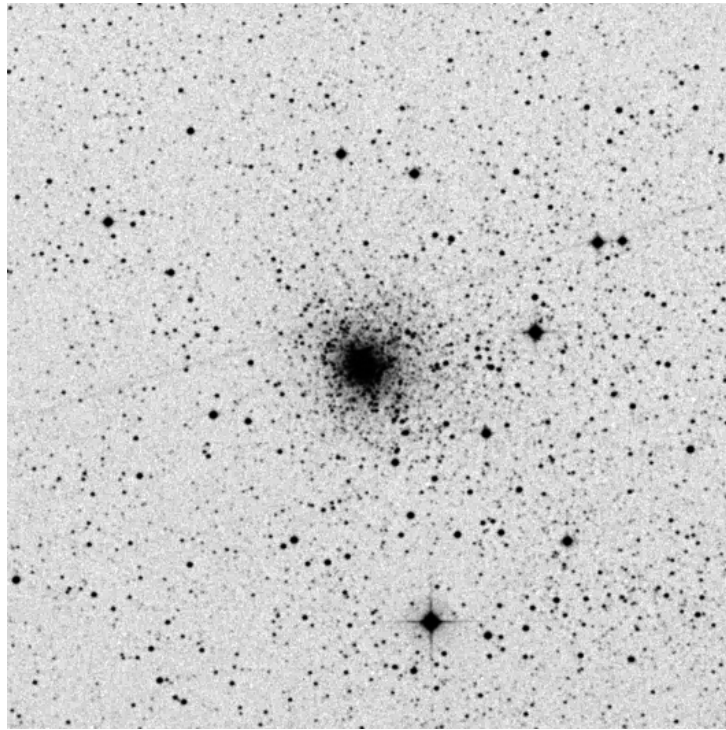
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

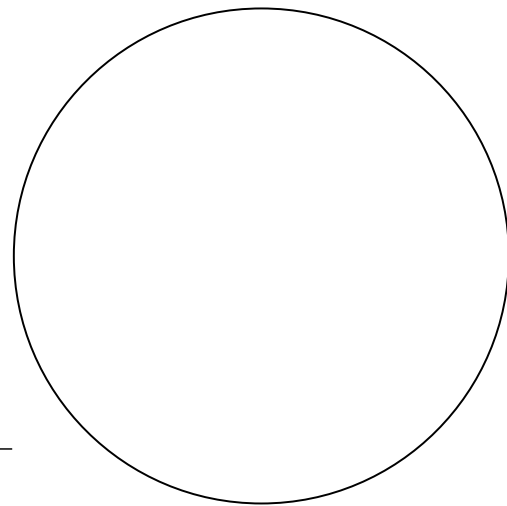
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

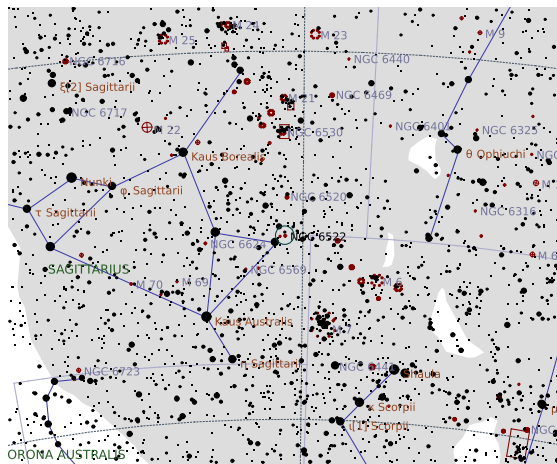
# NGC 6522

## Globular Cluster in Sagittarius

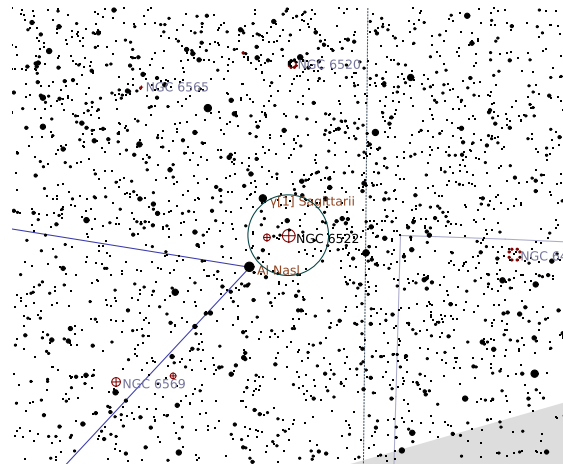
Right Ascension (current)	18 <sup>h</sup> 04 <sup>m</sup> 24 <sup>s</sup>	Declination (current)	−30° 01′ 48″
Right Ascension (J2000.0)	18 <sup>h</sup> 03 <sup>m</sup> 34 <sup>s</sup>	Declination (J2000.0)	−30° 02′ 00″
Size	9.4′ × 9.4′	Position Angle	90°
Magnitude	9.9	Other Designation	—

Description: Dreyer: B;pL;R;gvmBM;rrr

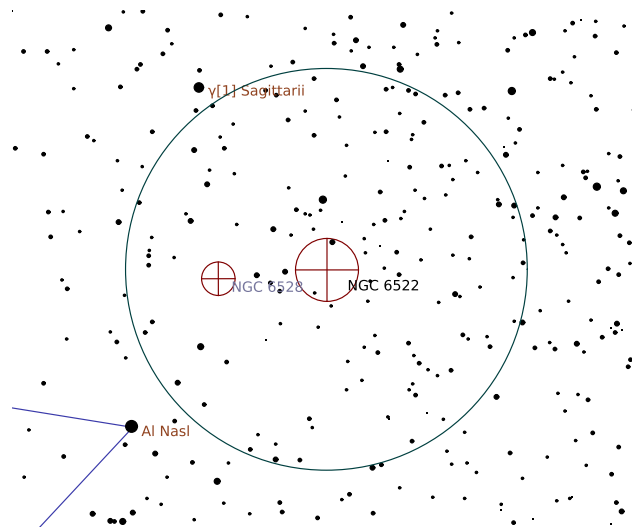
SAC: H I 49



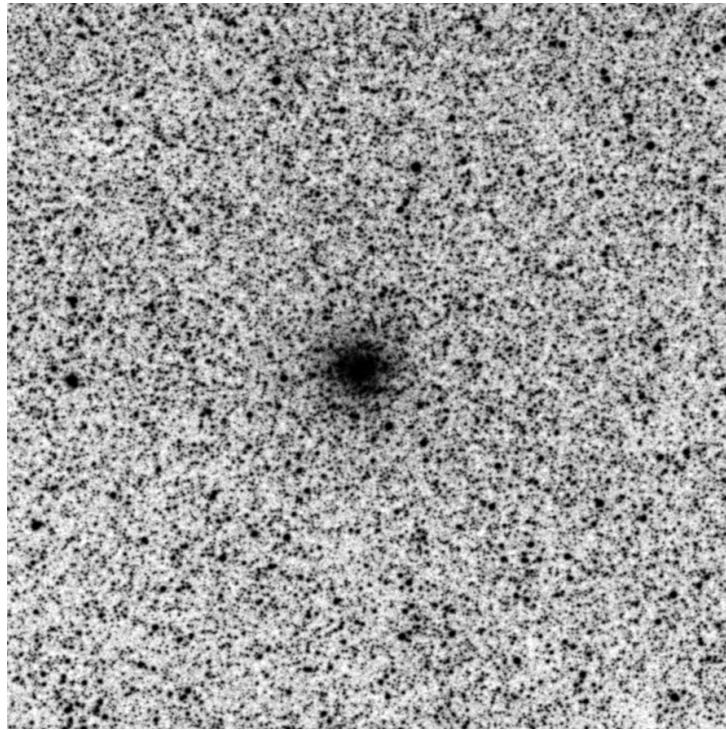
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

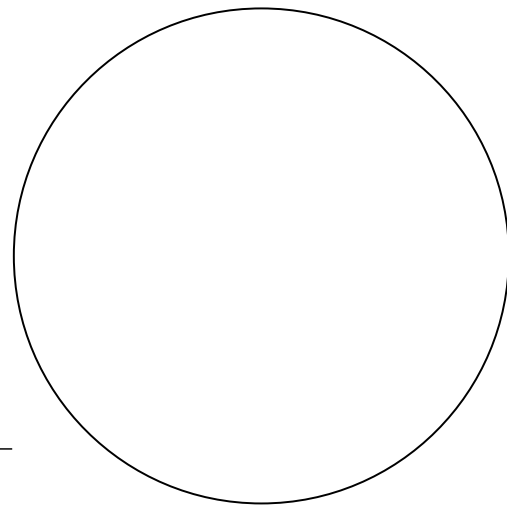
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

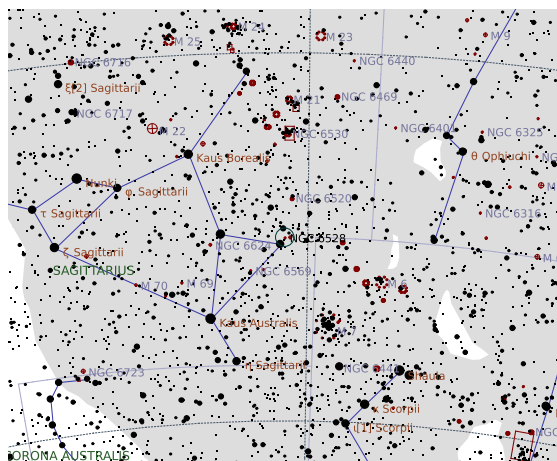
# NGC 6528

## Globular Cluster in Sagittarius

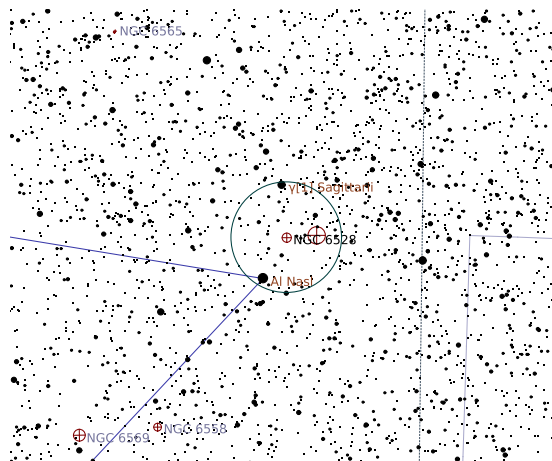
Right Ascension (current)	18 <sup>h</sup> 05 <sup>m</sup> 39 <sup>s</sup>	Declination (current)	−30° 03′ 05″
Right Ascension (J2000.0)	18 <sup>h</sup> 04 <sup>m</sup> 49 <sup>s</sup>	Declination (J2000.0)	−30° 03′ 19″
Size	5′ × 5′	Position Angle	90°
Magnitude	9.6	Other Designation	—

**Description:** Dreyer: pF;cS;R;gbM;rrr

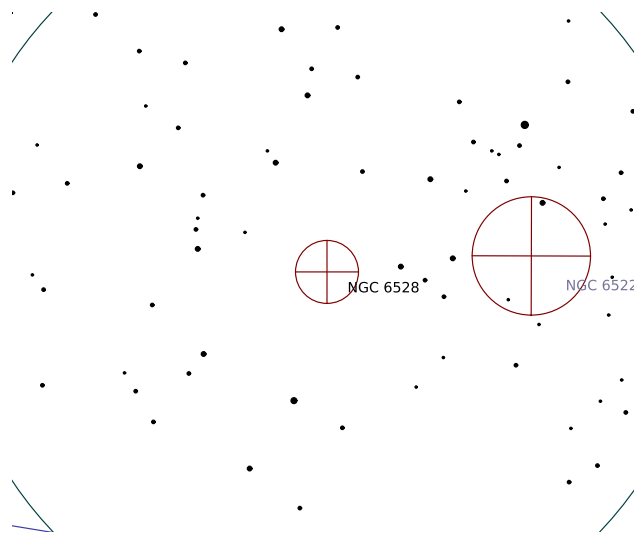
**SAC:** H II 200;\* mags 16...;Gamma Sgr in field



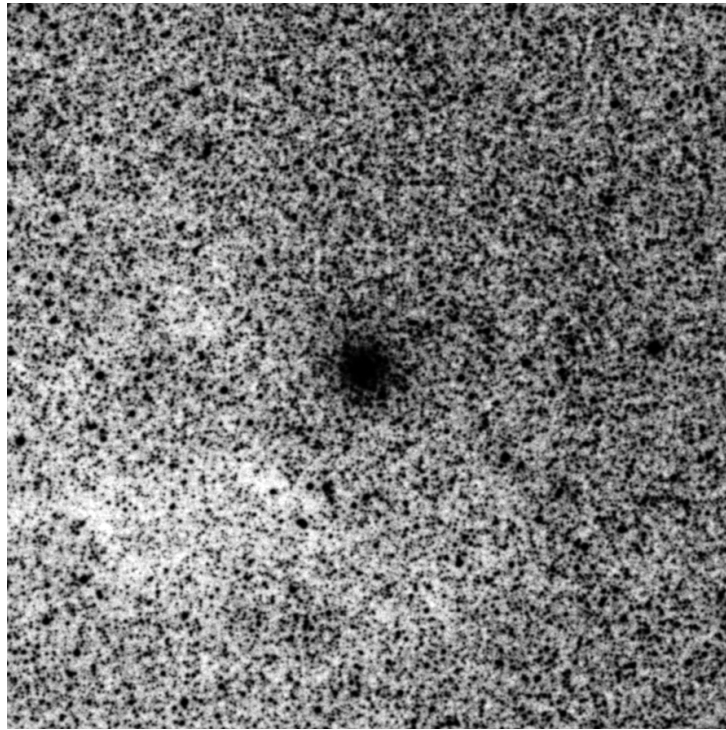
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

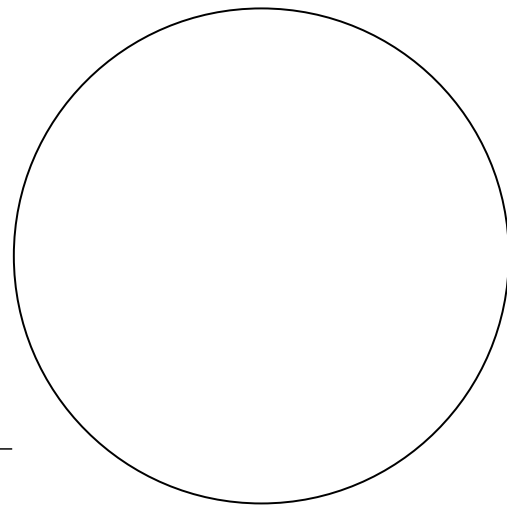
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

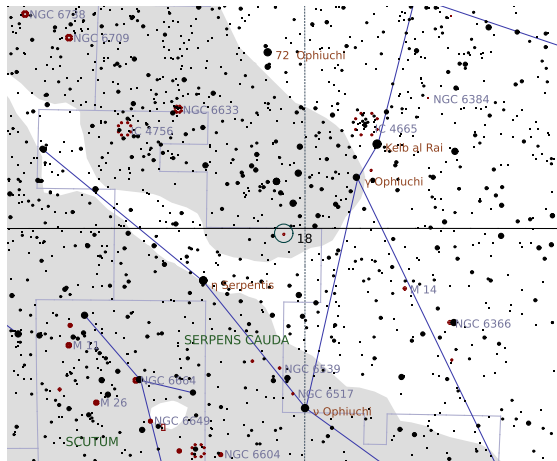


# NGC 6535

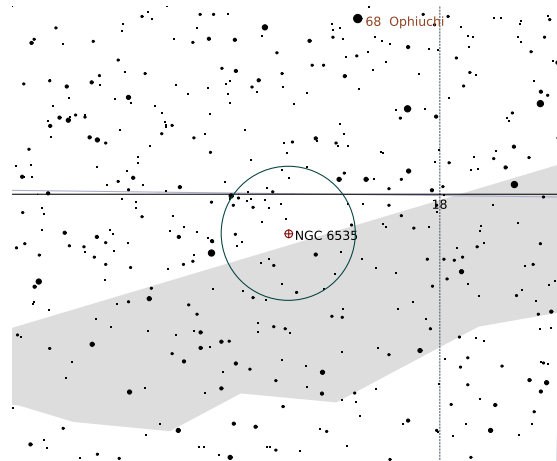
## Globular Cluster in Serpens Cauda

Right Ascension (current)	18 <sup>h</sup> 04 <sup>m</sup> 30 <sup>s</sup>	Declination (current)	−0° 17′ 42″
Right Ascension (J2000.0)	18 <sup>h</sup> 03 <sup>m</sup> 50 <sup>s</sup>	Declination (J2000.0)	−0° 17′ 47″
Size	3.4′ × 3.4′	Position Angle	90°
Magnitude	9.3	Other Designation	—

Description: Dreyer: pF;vS;vS neb \*p



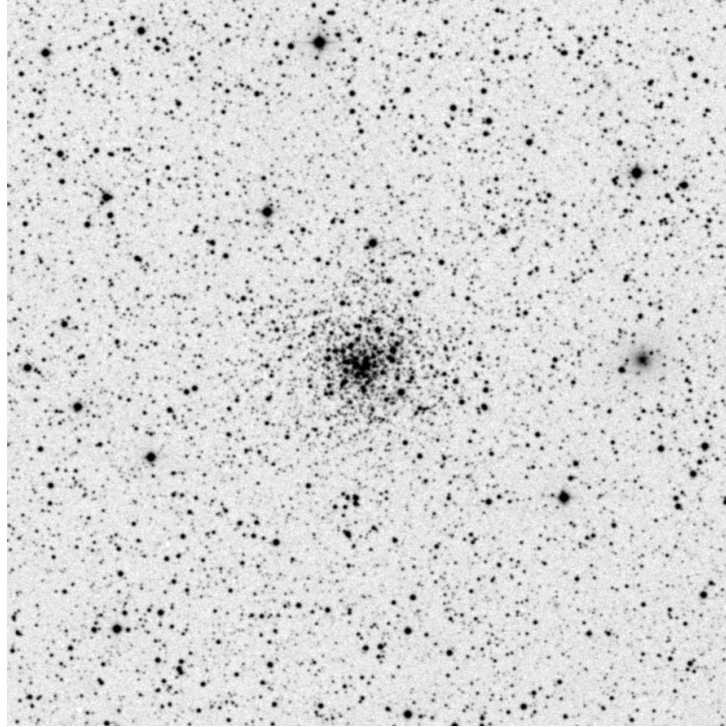
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

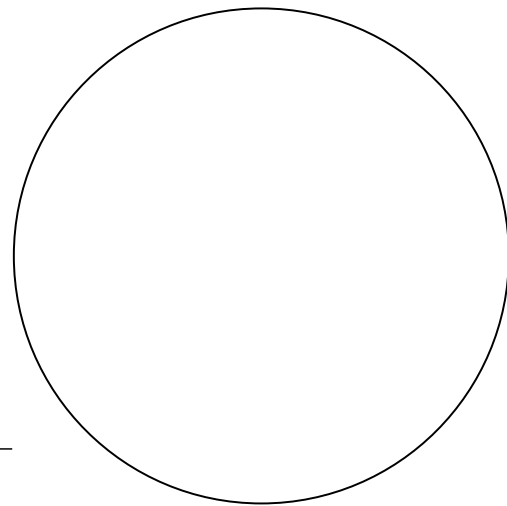
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

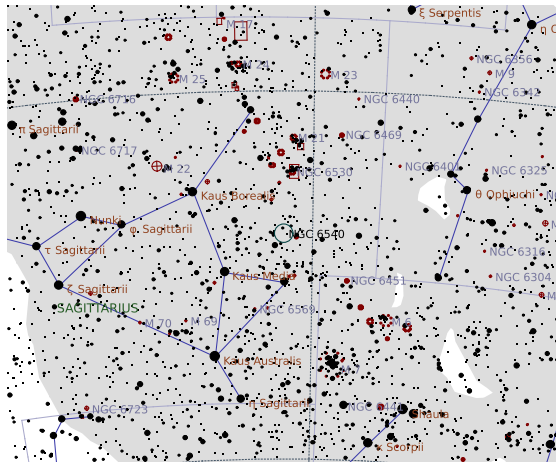
# NGC 6540

## Globular Cluster in Sagittarius

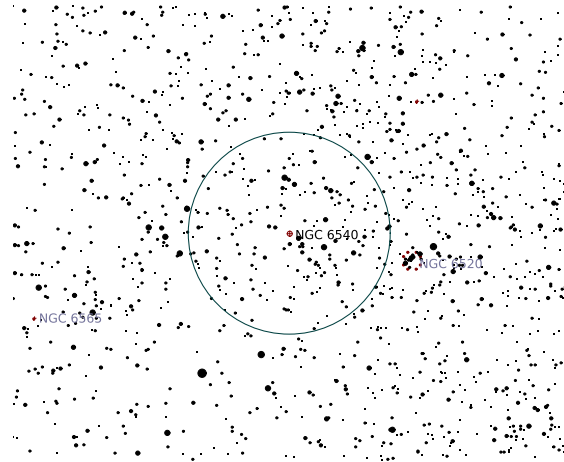
Right Ascension (current)	18 <sup>h</sup> 06 <sup>m</sup> 57 <sup>s</sup>	Declination (current)	-27° 45' 38"
Right Ascension (J2000.0)	18 <sup>h</sup> 06 <sup>m</sup> 08 <sup>s</sup>	Declination (J2000.0)	-27° 45' 53"
Size	1.5' × 1.5'	Position Angle	90°
Magnitude	9.3	Other Designation	—

**Description:** Dreyer: pF;S;1E;er or C1

**SAC:** H VII 202;12 F AASlogo.eps AASlogo-eps-converted-to.pdf Acknowledgements.tex Austin.eps Austin-eps-converted-



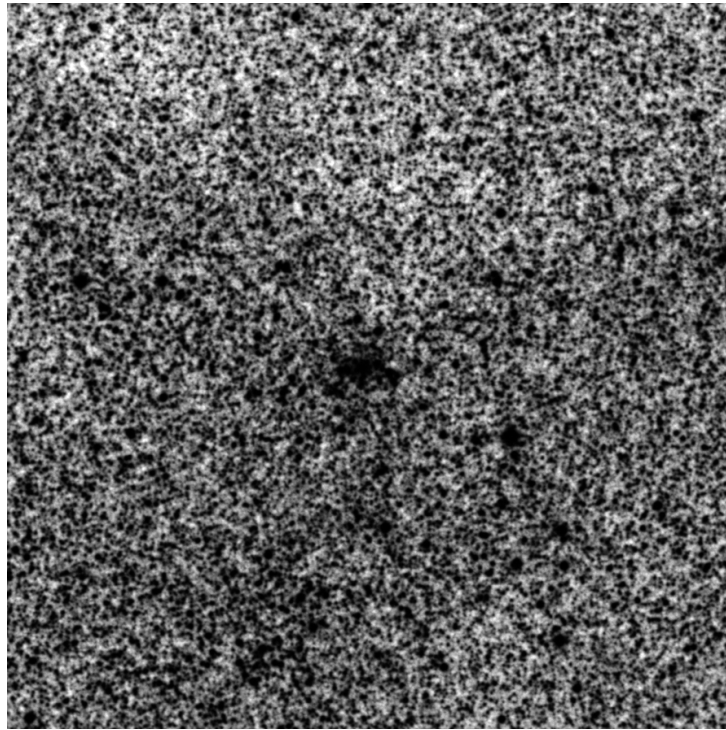
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

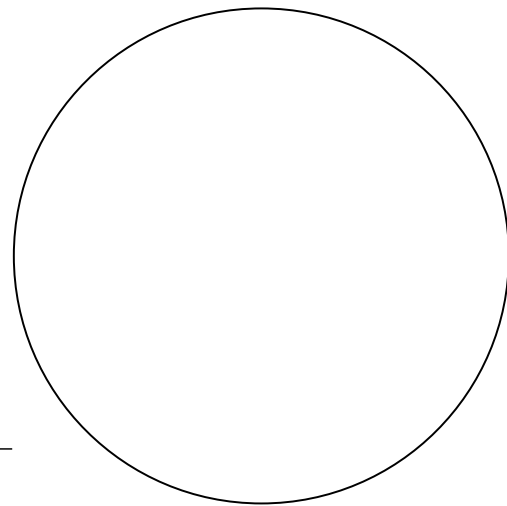
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

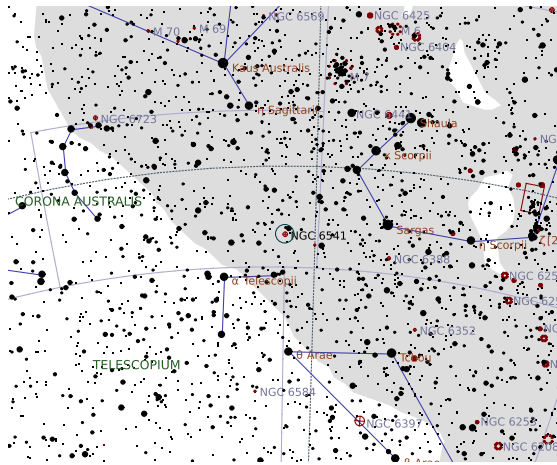
# NGC 6541

## Globular Cluster in Corona Australis

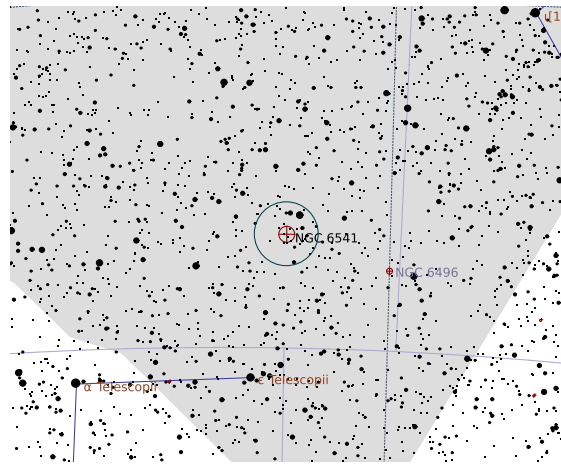
Right Ascension (current)	18 <sup>h</sup> 08 <sup>m</sup> 59 <sup>s</sup>	Declination (current)	−43° 42′ 19″
Right Ascension (J2000.0)	18 <sup>h</sup> 08 <sup>m</sup> 02 <sup>s</sup>	Declination (J2000.0)	−43° 42′ 40″
Size	15′ × 15′	Position Angle	90°
Magnitude	6.3	Other Designation	–

**Description:** Dreyer: B;R;eC;gbM;rrr

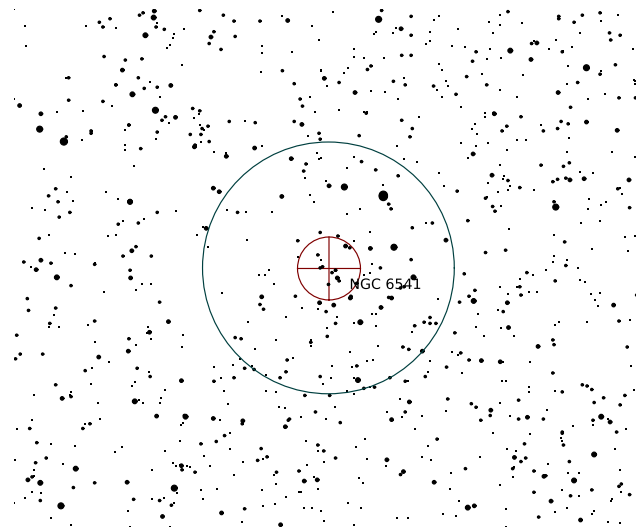
**SAC:** Stars mags 13...



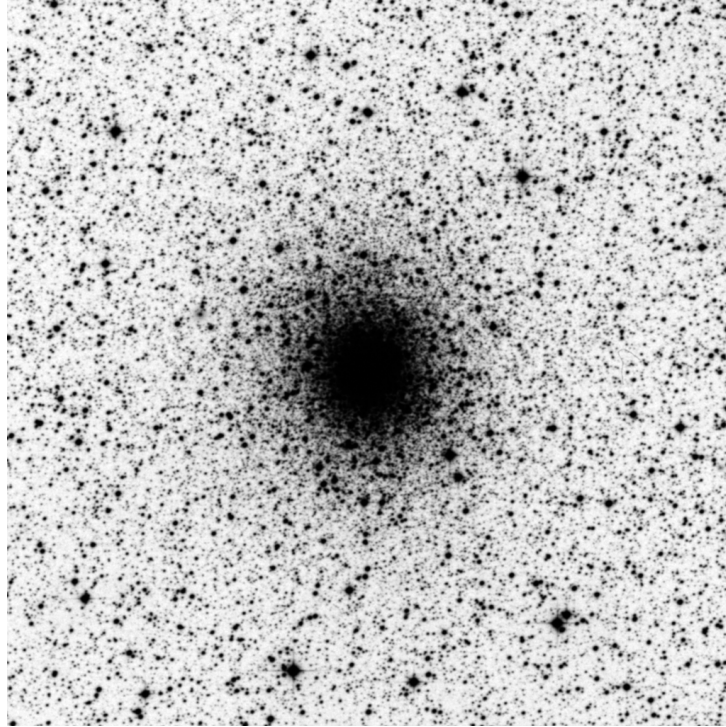
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (20.0' × 20.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

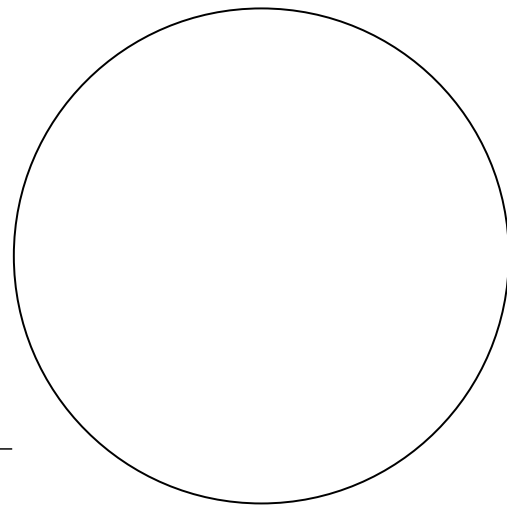
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



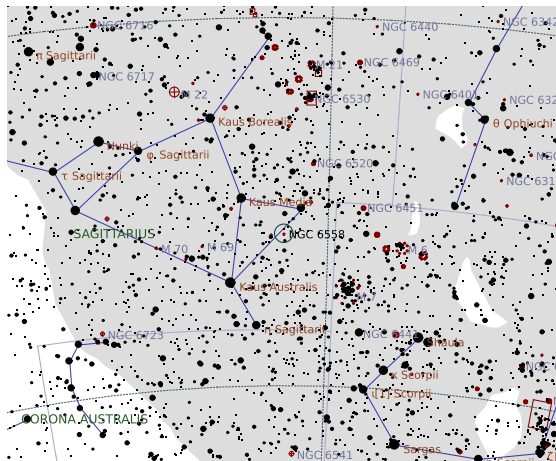
**Sketch**

# NGC 6558

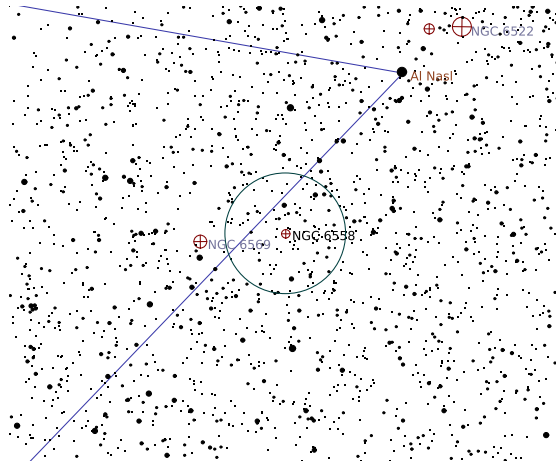
## Globular Cluster in Sagittarius

Right Ascension (current)	18 <sup>h</sup> 11 <sup>m</sup> 09 <sup>s</sup>	Declination (current)	−31° 45′ 26″
Right Ascension (J2000.0)	18 <sup>h</sup> 10 <sup>m</sup> 18 <sup>s</sup>	Declination (J2000.0)	−31° 45′ 47″
Size	4.2′ × 4.2′	Position Angle	90°
Magnitude	8.6	Other Designation	—

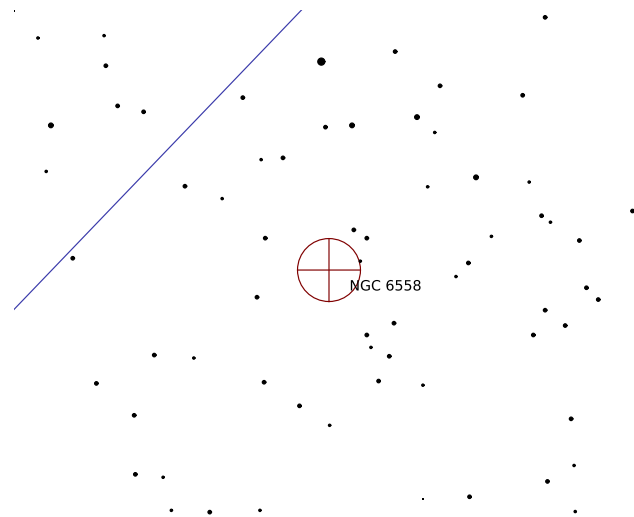
Description: Dreyer: pB;pL;R;glbM;rrr



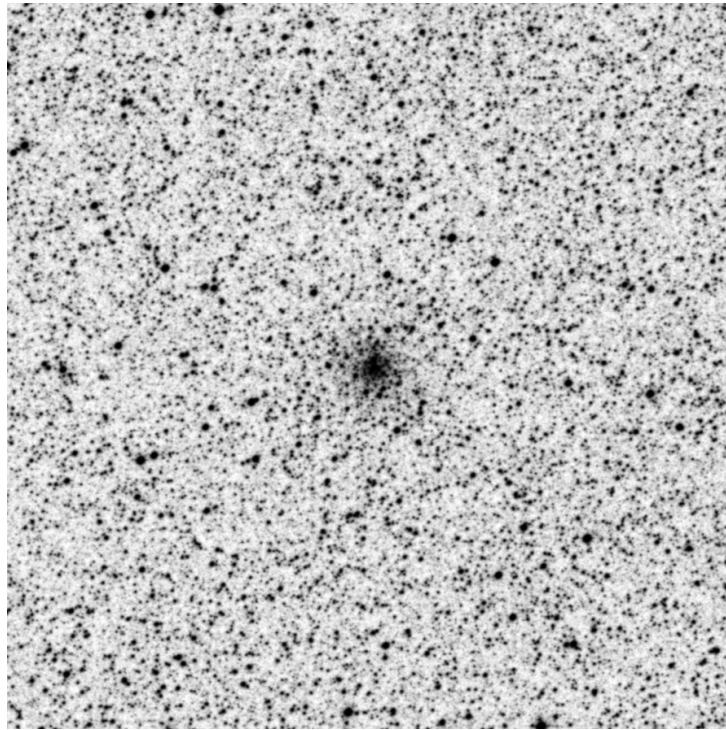
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

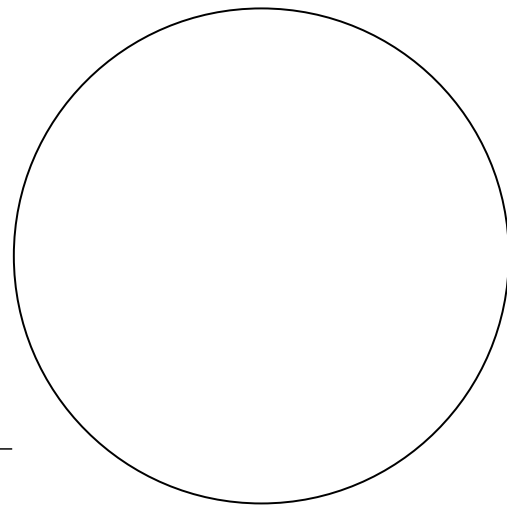
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch



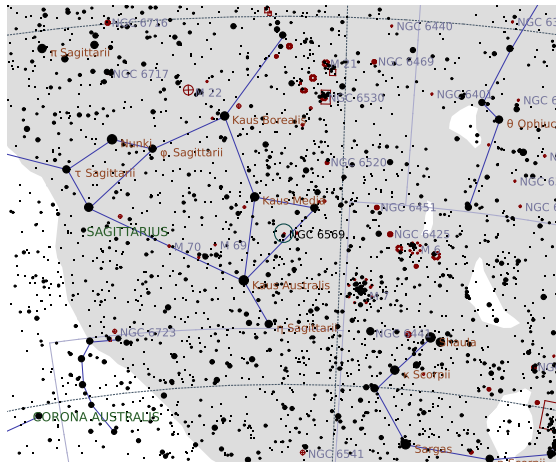
# NGC 6569

## Globular Cluster in Sagittarius

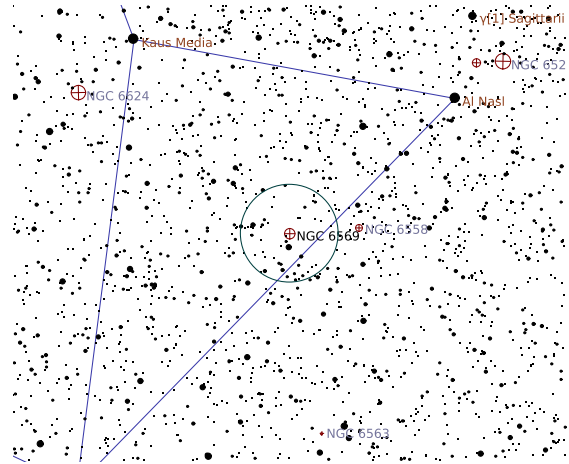
Right Ascension (current)	18 <sup>h</sup> 14 <sup>m</sup> 29 <sup>s</sup>	Declination (current)	−31° 49′ 09″
Right Ascension (J2000.0)	18 <sup>h</sup> 13 <sup>m</sup> 38 <sup>s</sup>	Declination (J2000.0)	−31° 49′ 33″
Size	6.4′ × 6.4′	Position Angle	90°
Magnitude	8.4	Other Designation	—

**Description:** Dreyer: cB;L;R;rrr;\*15..

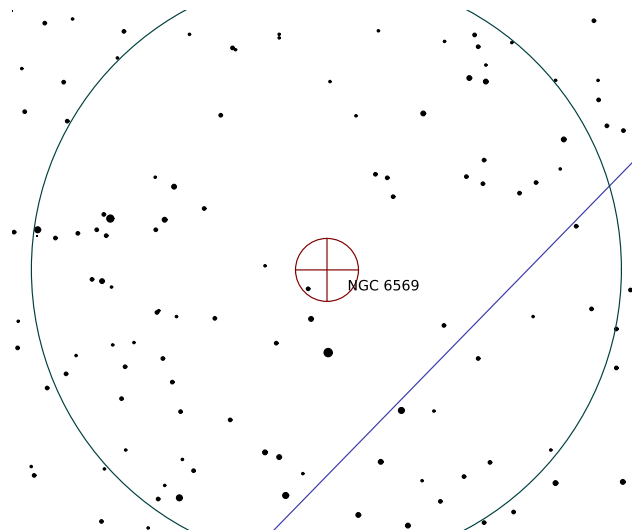
**SAC:** H II 201;D\* Burnham 1353 in field



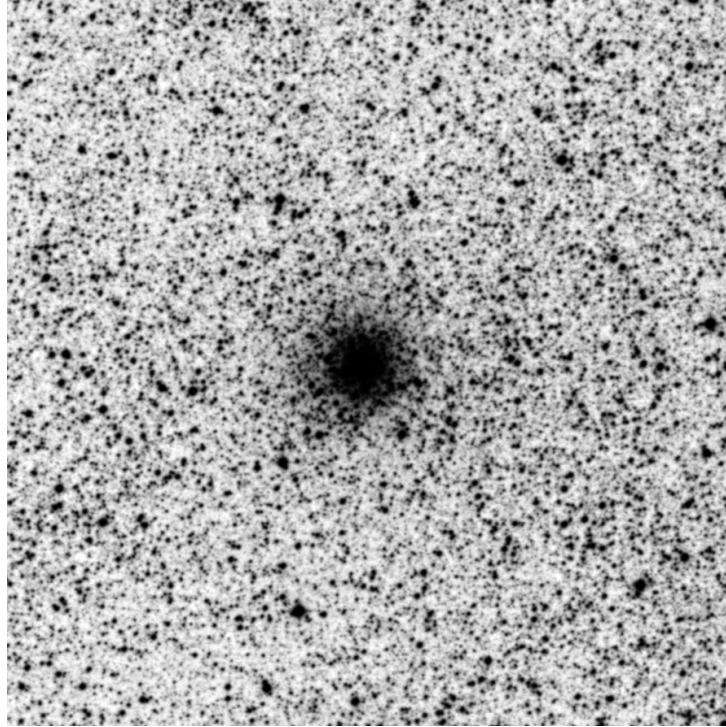
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

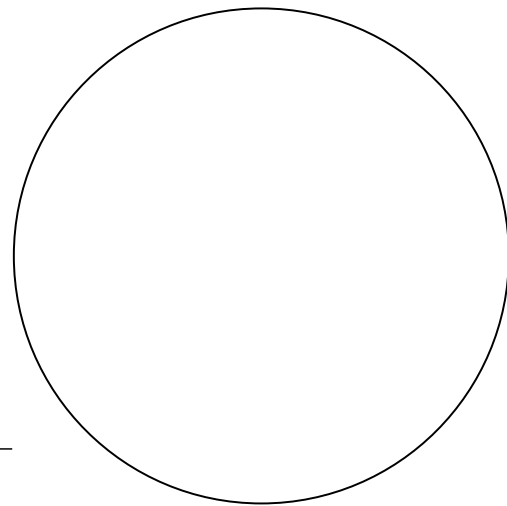
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



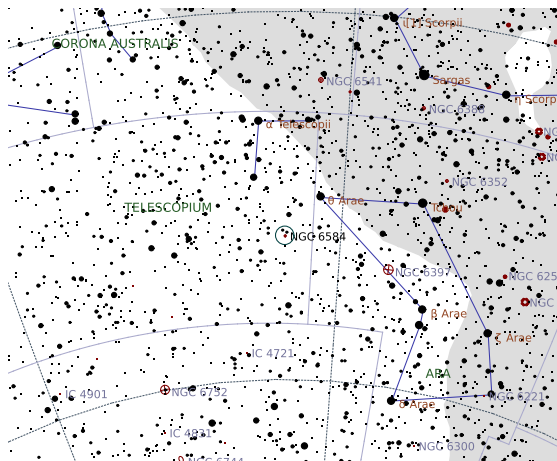
Sketch

# NGC 6584

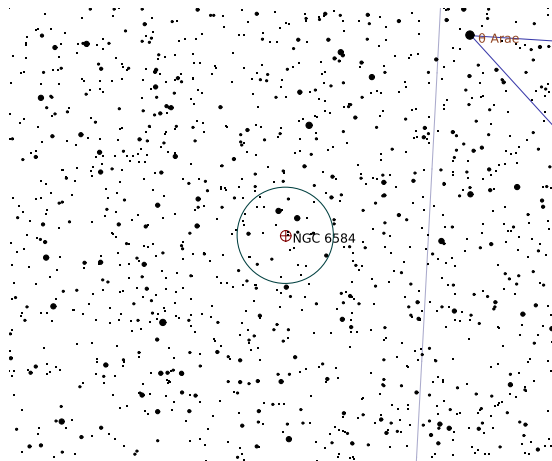
## Globular Cluster in Telescopium

Right Ascension (current)	18 <sup>h</sup> 19 <sup>m</sup> 39 <sup>s</sup>	Declination (current)	−52° 12′ 17″
Right Ascension (J2000.0)	18 <sup>h</sup> 18 <sup>m</sup> 37 <sup>s</sup>	Declination (J2000.0)	−52° 12′ 52″
Size	6.6′ × 6.6′	Position Angle	90°
Magnitude	7.9	Other Designation	—

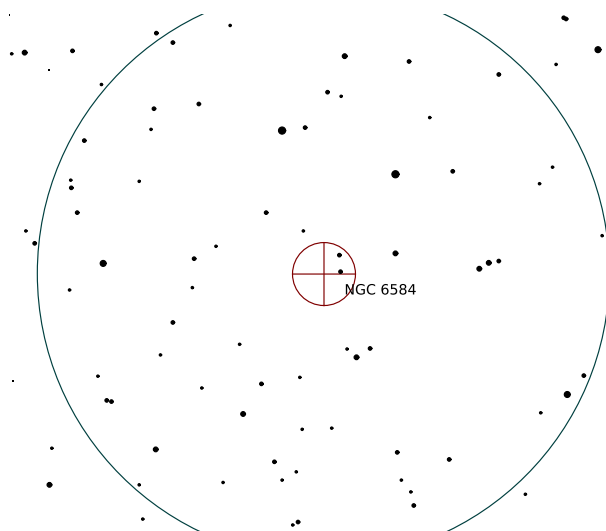
**Description:** Dreyer: cB; cL; R; gmbM; rrr



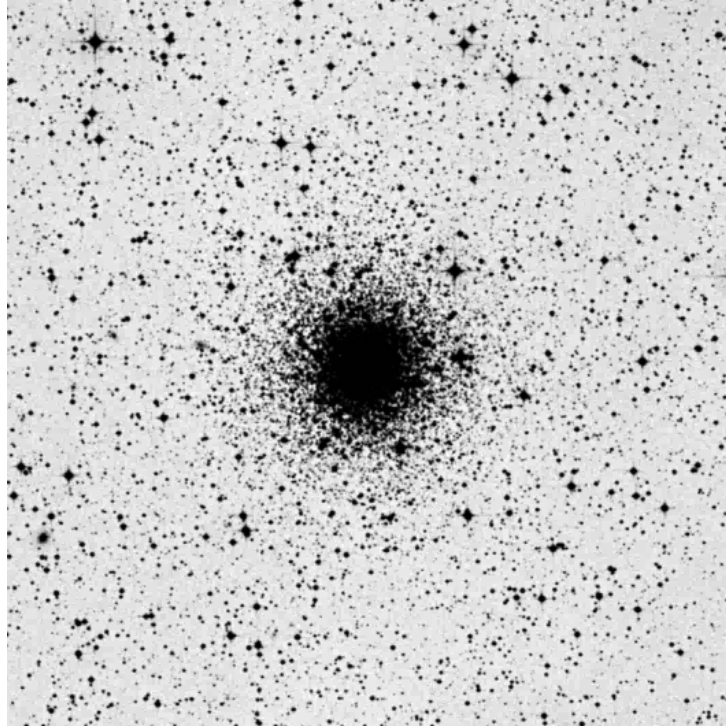
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

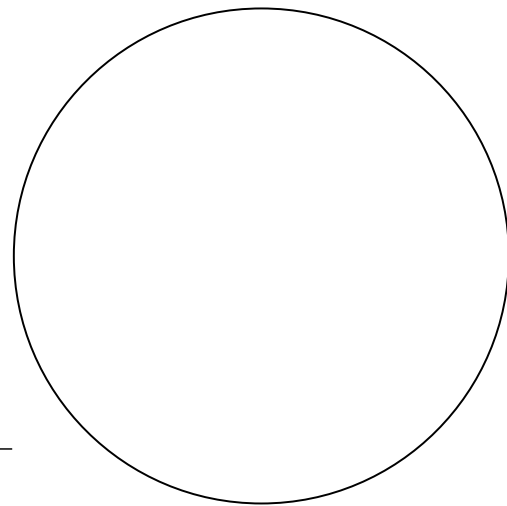
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

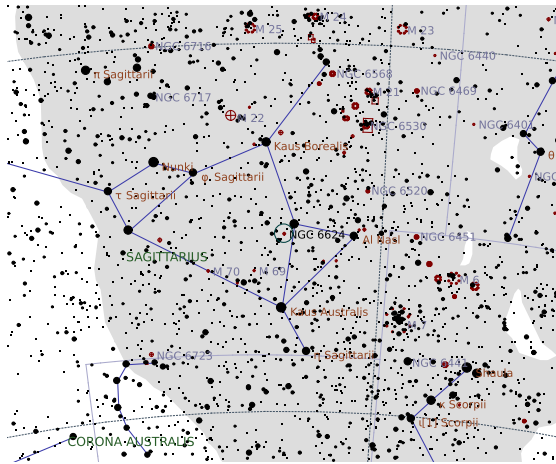
# NGC 6624

## Globular Cluster in Sagittarius

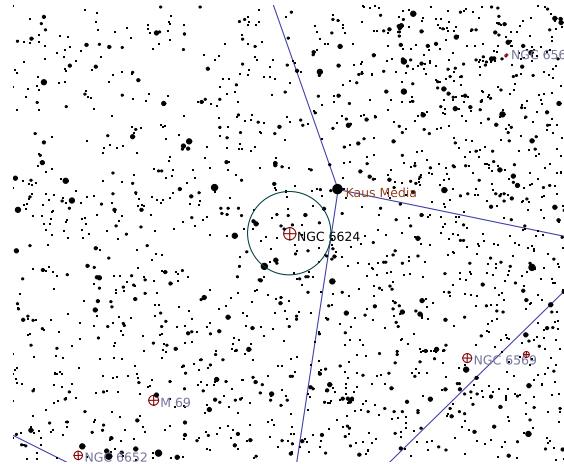
Right Ascension (current)	18 <sup>h</sup> 24 <sup>m</sup> 30 <sup>s</sup>	Declination (current)	−30° 21′ 03″
Right Ascension (J2000.0)	18 <sup>h</sup> 23 <sup>m</sup> 40 <sup>s</sup>	Declination (J2000.0)	−30° 21′ 38″
Size	8.8′ × 8.8′	Position Angle	90°
Magnitude	7.6	Other Designation	—

**Description:** Dreyer: vB;pL;R;rrr;st16..

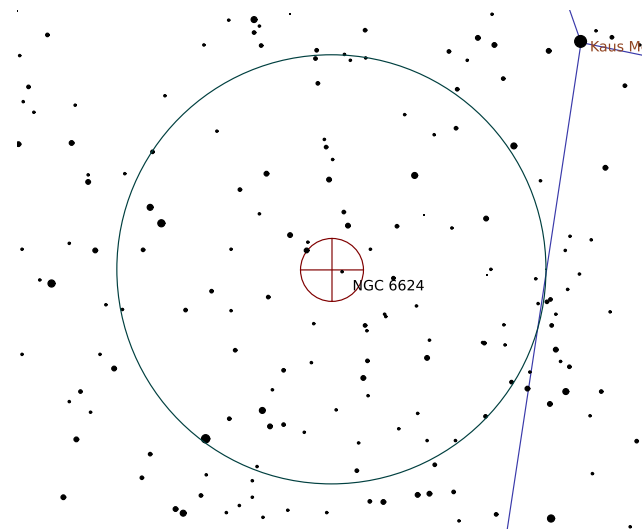
**SAC:** H I 50



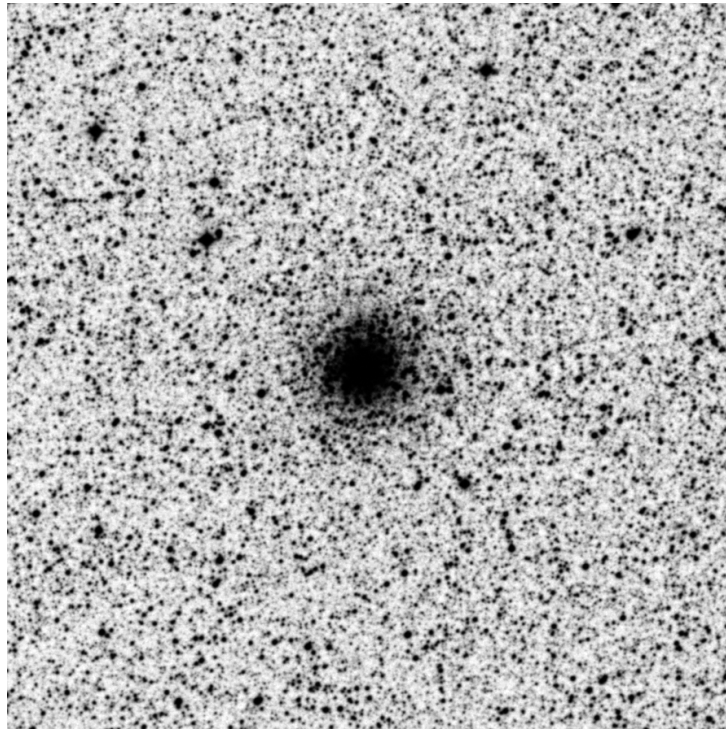
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

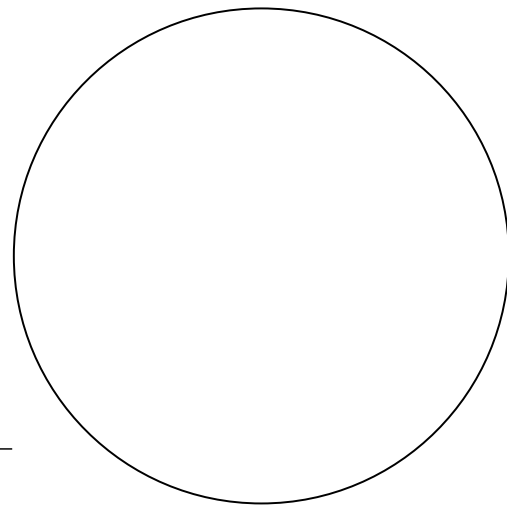
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

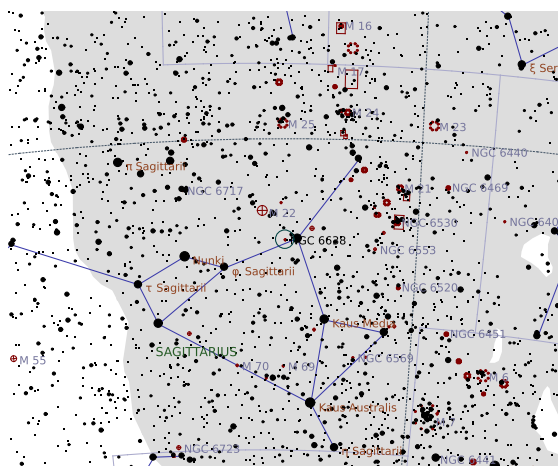
# NGC 6638

## Globular Cluster in Sagittarius

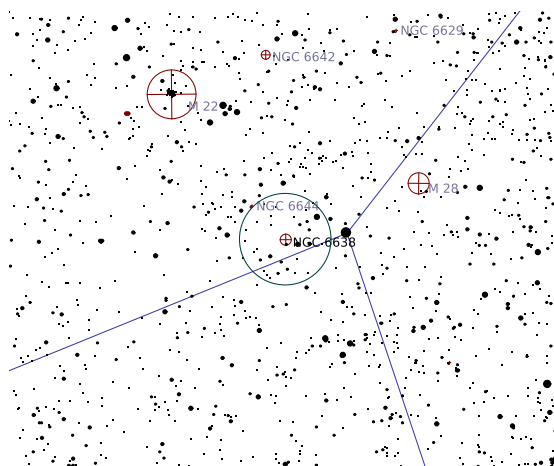
Right Ascension (current)	18 <sup>h</sup> 31 <sup>m</sup> 44 <sup>s</sup>	Declination (current)	−25° 29′ 03″
Right Ascension (J2000.0)	18 <sup>h</sup> 30 <sup>m</sup> 56 <sup>s</sup>	Declination (J2000.0)	−25° 29′ 45″
Size	7.3′ × 7.3′	Position Angle	90°
Magnitude	9.2	Other Designation	—

**Description:** Dreyer: B;S;R;rr

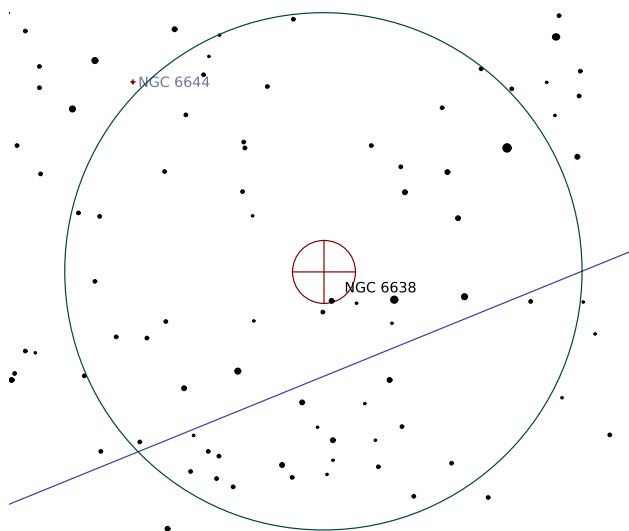
**SAC:** H I 51



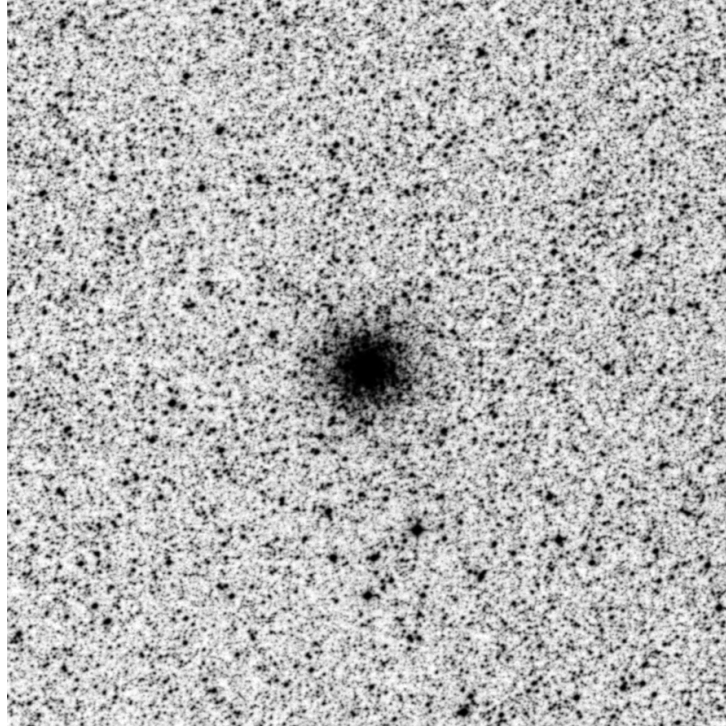
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

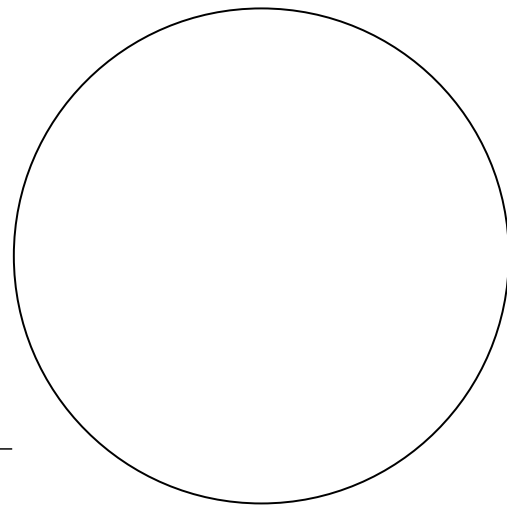
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**



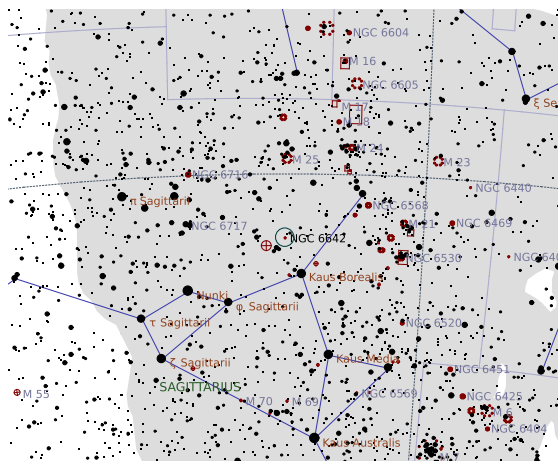
# NGC 6642

## Globular Cluster in Sagittarius

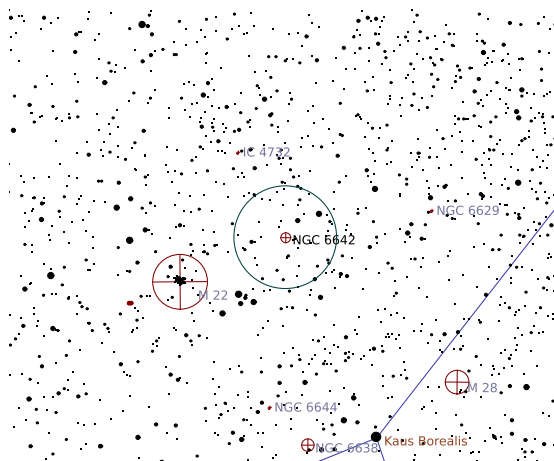
Right Ascension (current)	18 <sup>h</sup> 32 <sup>m</sup> 41 <sup>s</sup>	Declination (current)	−23° 27′ 50″
Right Ascension (J2000.0)	18 <sup>h</sup> 31 <sup>m</sup> 54 <sup>s</sup>	Declination (J2000.0)	−23° 28′ 33″
Size	5.8′ × 5.8′	Position Angle	90°
Magnitude	8.9	Other Designation	—

**Description:** Dreyer: pB;pL;iR;gpmbM

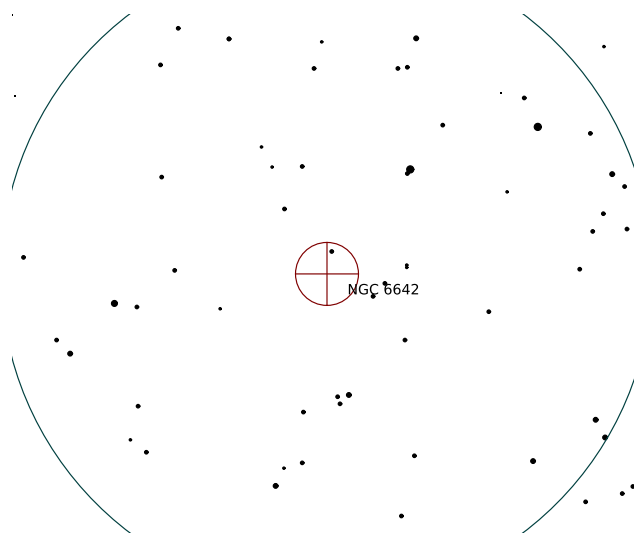
**SAC:** H II 205;\* mags 15....



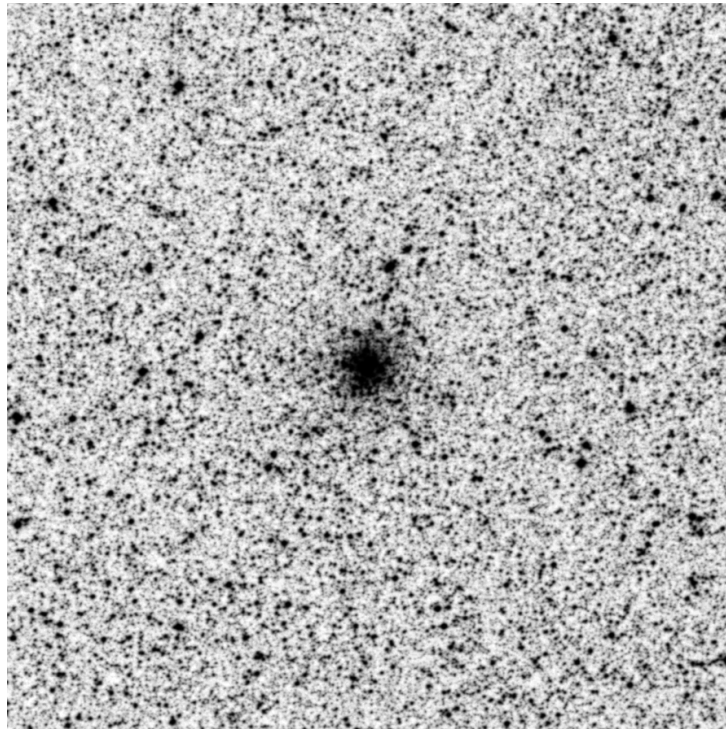
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

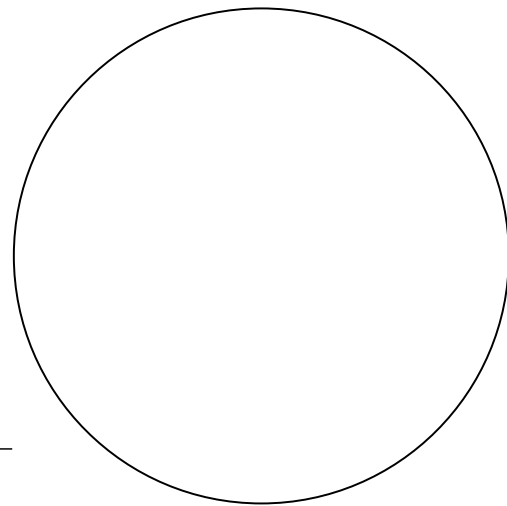
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



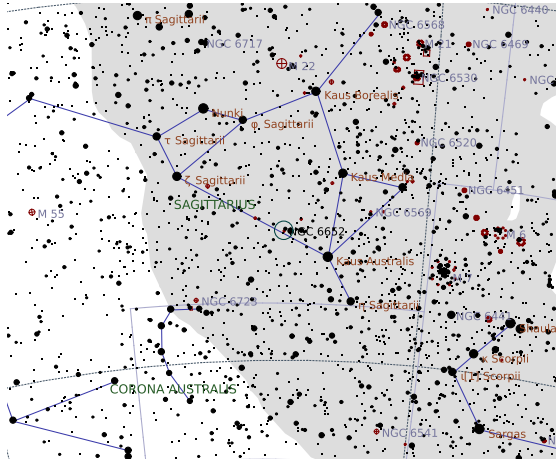
Sketch

# NGC 6652

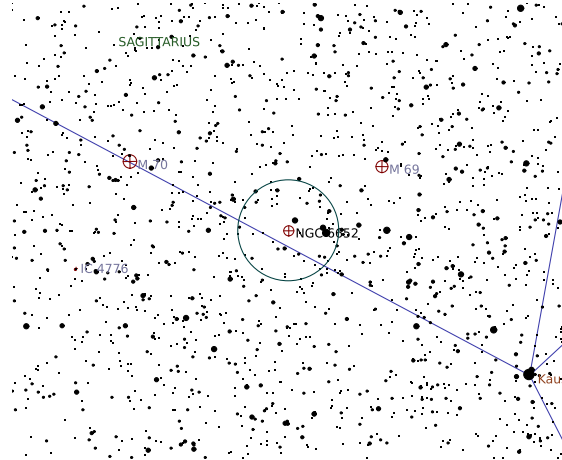
## Globular Cluster in Sagittarius

Right Ascension (current)	18 <sup>h</sup> 36 <sup>m</sup> 36 <sup>s</sup>	Declination (current)	−32° 58′ 33″
Right Ascension (J2000.0)	18 <sup>h</sup> 35 <sup>m</sup> 45 <sup>s</sup>	Declination (J2000.0)	−32° 59′ 23″
Size	6′ × 6′	Position Angle	90°
Magnitude	8.5	Other Designation	—

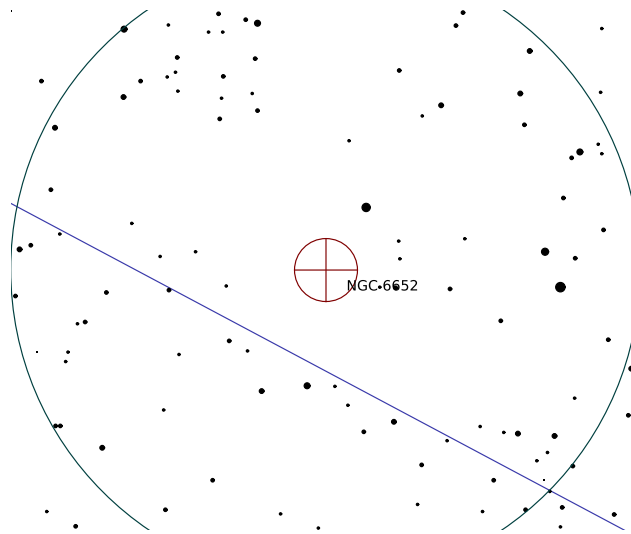
Description: Dreyer: B;S;1E;rrr;st15



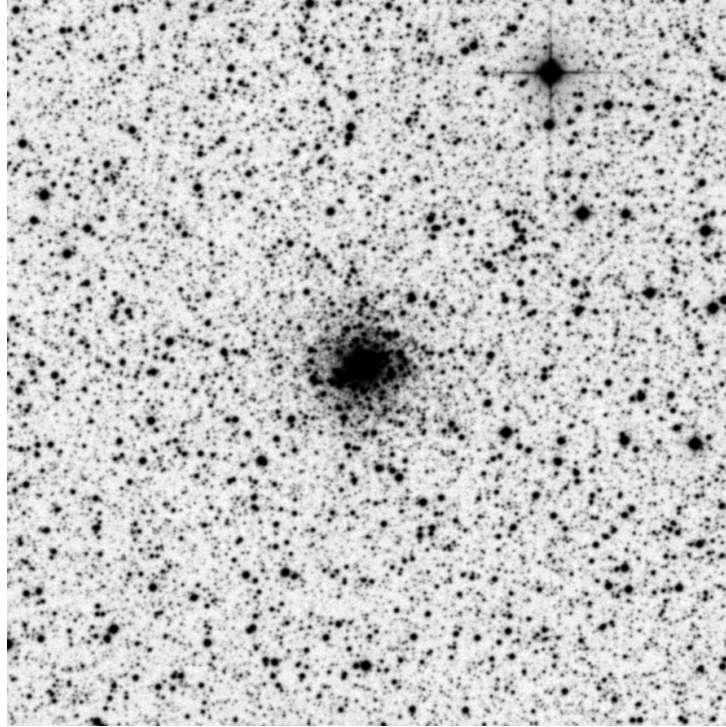
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

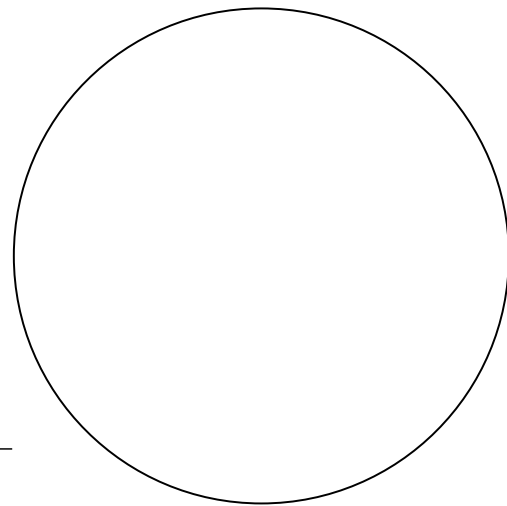
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch

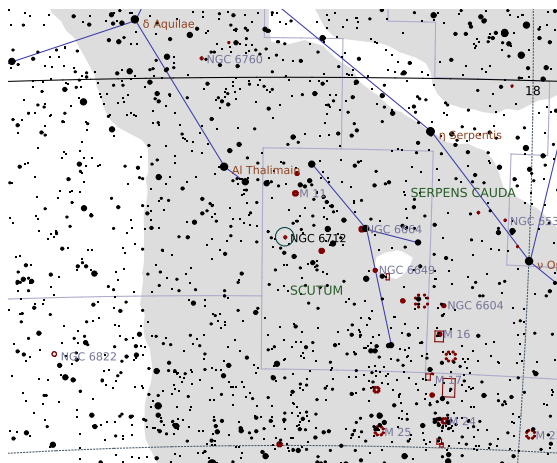
# NGC 6712

## Globular Cluster in Scutum

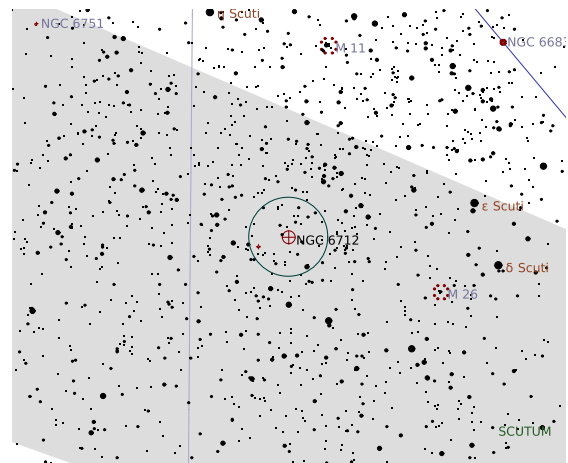
Right Ascension (current)	18 <sup>h</sup> 53 <sup>m</sup> 46 <sup>s</sup>	Declination (current)	−8° 41′ 17″
Right Ascension (J2000.0)	18 <sup>h</sup> 53 <sup>m</sup> 04 <sup>s</sup>	Declination (J2000.0)	−8° 42′ 20″
Size	9.8′ × 9.8′	Position Angle	90°
Magnitude	8.1	Other Designation	—

**Description:** Dreyer: pB;vL;irr;rrr

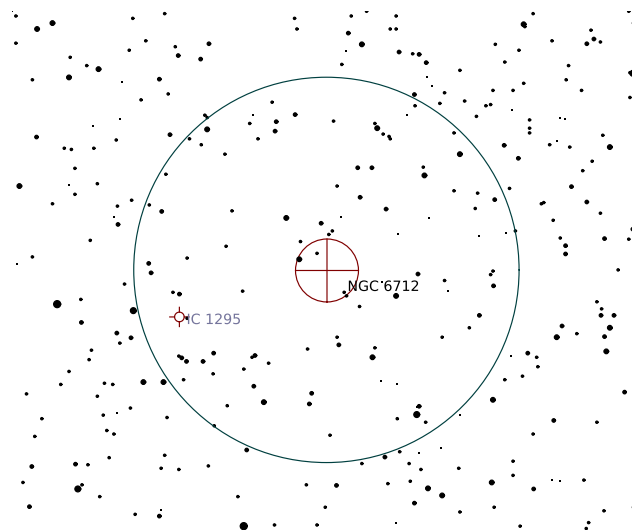
**SAC:** H I 47



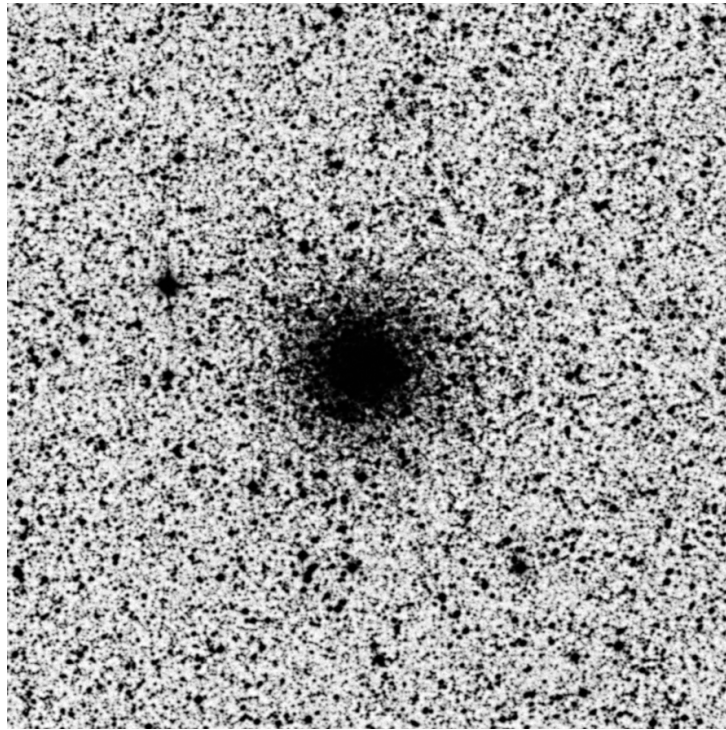
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

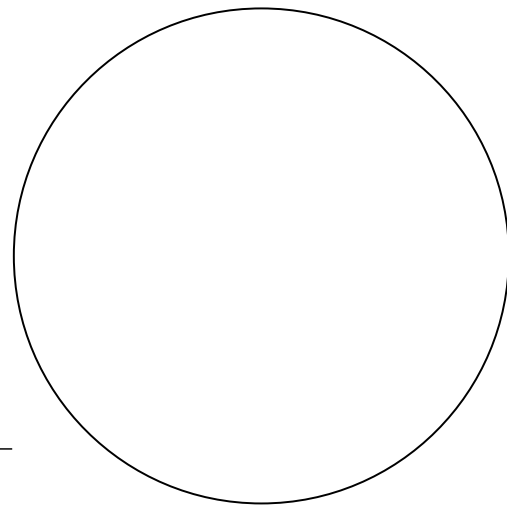
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



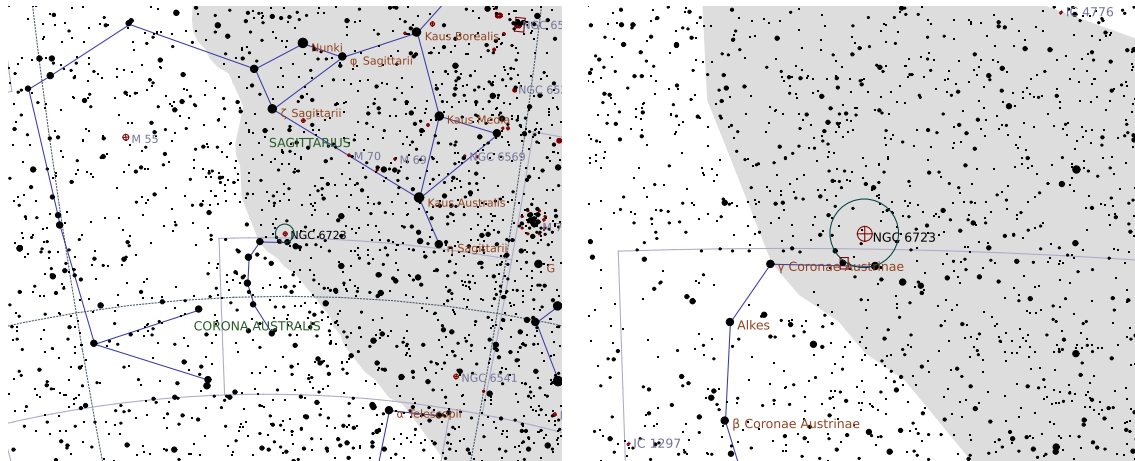
Sketch

# NGC 6723

## Globular Cluster in Sagittarius

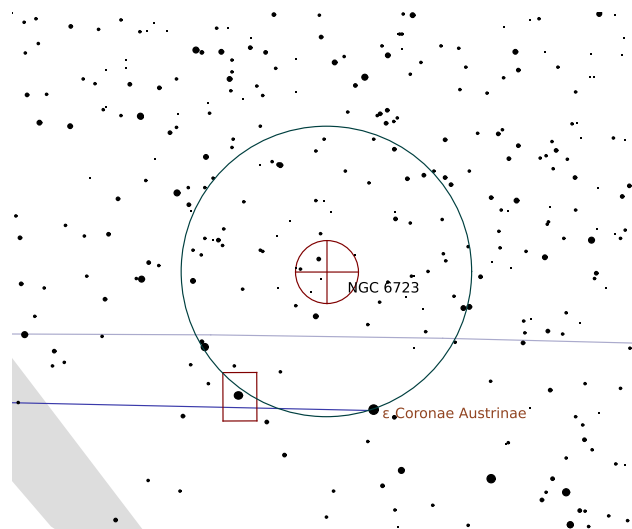
Right Ascension (current)	19 <sup>h</sup> 00 <sup>m</sup> 25 <sup>s</sup>	Declination (current)	−36° 36′ 35″
Right Ascension (J2000.0)	18 <sup>h</sup> 59 <sup>m</sup> 33 <sup>s</sup>	Declination (J2000.0)	−36° 37′ 52″
Size	13′ × 13′	Position Angle	90°
Magnitude	6.8	Other Designation	—

Description: Dreyer: vL;v1E;vgbM;rrr

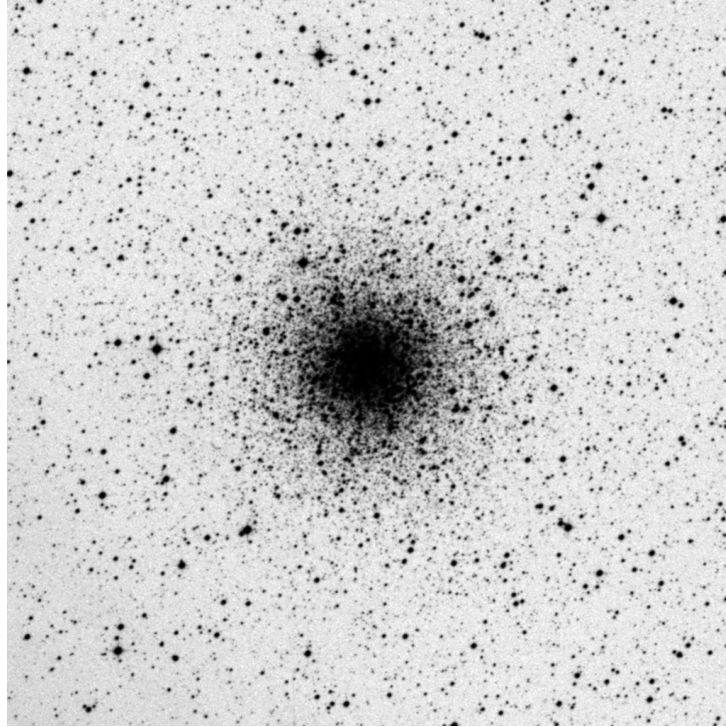


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (18.0' × 18.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

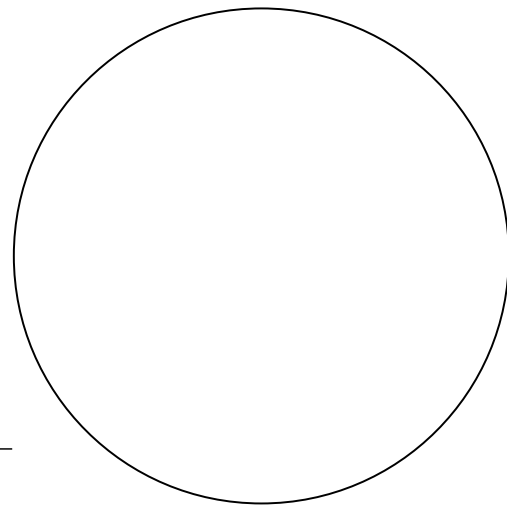
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**



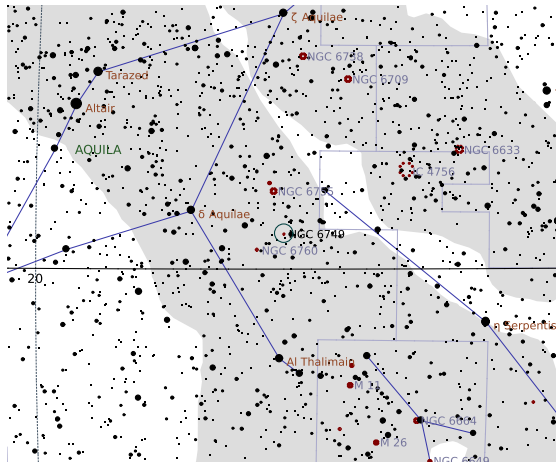
# NGC 6749

## Globular Cluster in Aquila

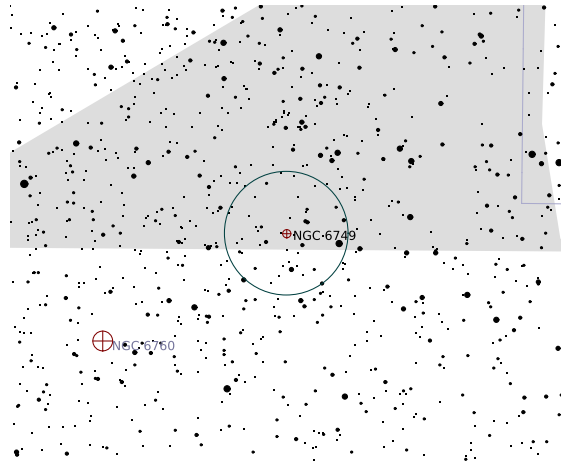
Right Ascension (current)	19 <sup>h</sup> 05 <sup>m</sup> 54 <sup>s</sup>	Declination (current)	1° 55' 19"
Right Ascension (J2000.0)	19 <sup>h</sup> 05 <sup>m</sup> 15 <sup>s</sup>	Declination (J2000.0)	1° 54' 05"
Size	4' × 4'	Position Angle	90°
Magnitude	12	Other Designation	–

**Description:** Dreyer: L;1C;st L&S

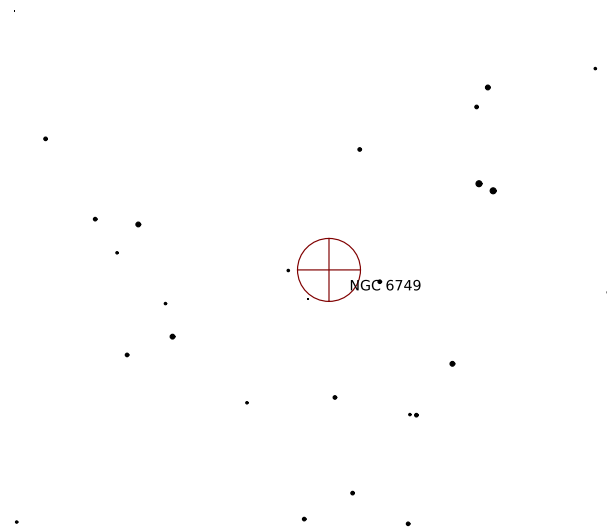
**SAC:** Globular absorbed by 7 mags; Berkley 42 mistaken for open cl



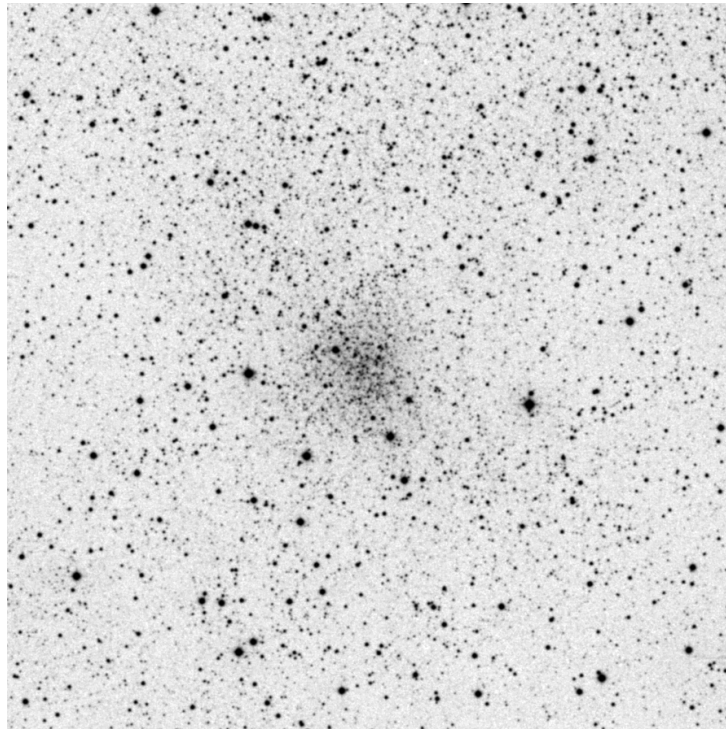
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

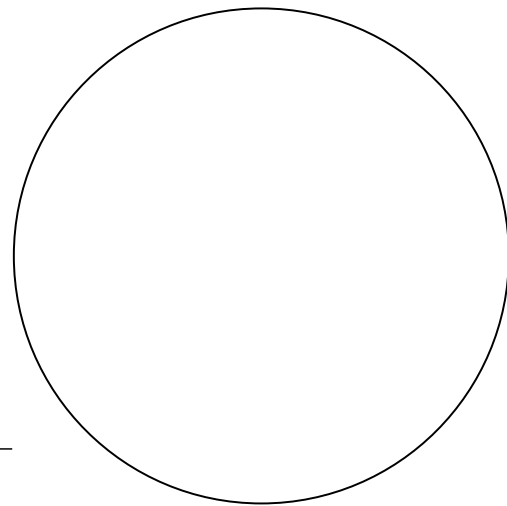
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

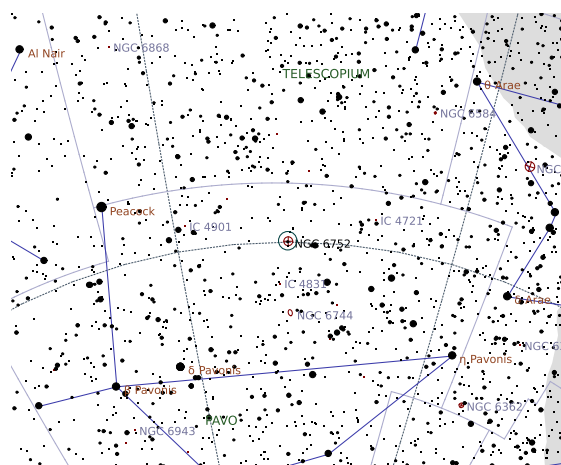
# NGC 6752

## Globular Cluster in Pavo

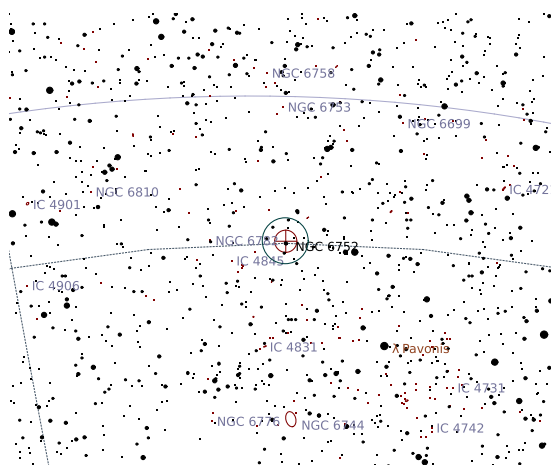
Right Ascension (current)	19 <sup>h</sup> 11 <sup>m</sup> 59 <sup>s</sup>	Declination (current)	−59° 57′ 19″
Right Ascension (J2000.0)	19 <sup>h</sup> 10 <sup>m</sup> 51 <sup>s</sup>	Declination (J2000.0)	−59° 58′ 53″
Size	29′ × 29′	Position Angle	90°
Magnitude	5.3	Other Designation	—

**Description:** Dreyer: B;vL;iR;st11..16

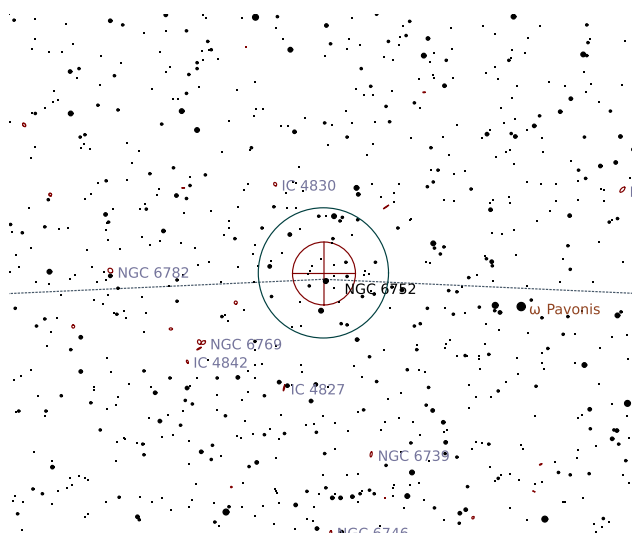
**SAC:** Fine cluster



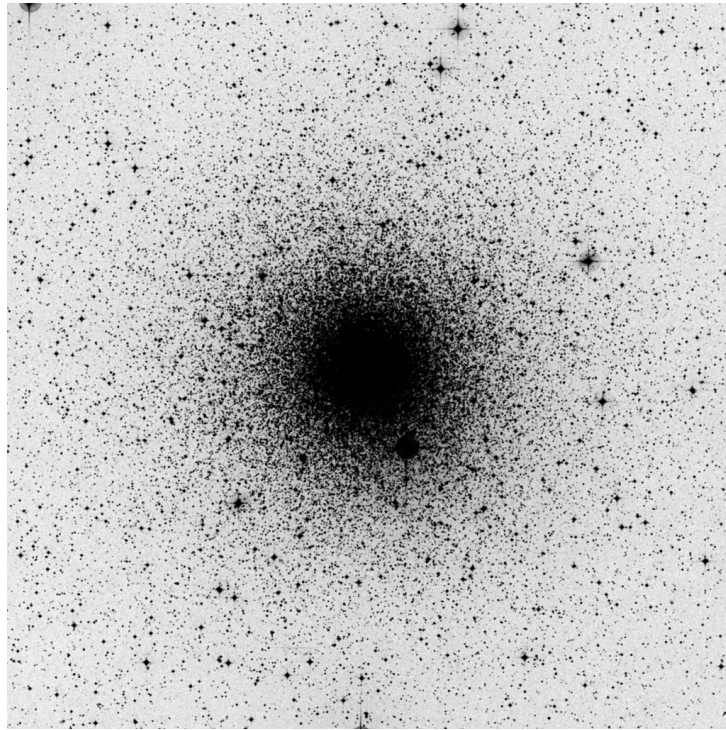
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (34.0' × 34.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

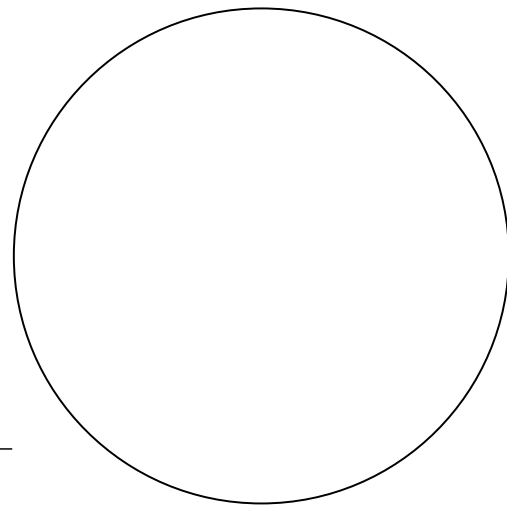
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



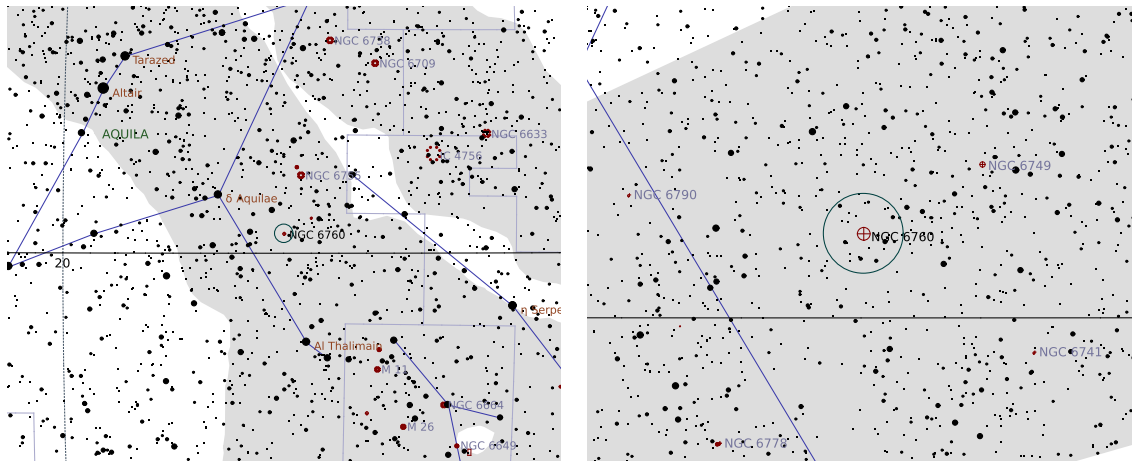
**Sketch**

# NGC 6760

## Globular Cluster in Aquila

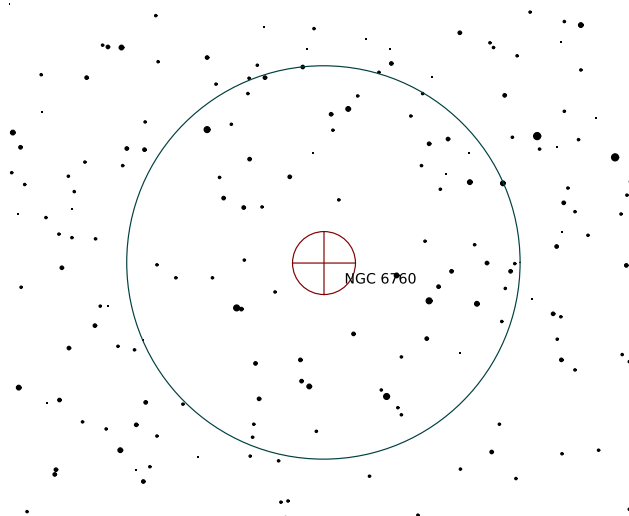
Right Ascension (current)	19 <sup>h</sup> 11 <sup>m</sup> 51 <sup>s</sup>	Declination (current)	1° 03' 13"
Right Ascension (J2000.0)	19 <sup>h</sup> 11 <sup>m</sup> 12 <sup>s</sup>	Declination (J2000.0)	1° 01' 52"
Size	9.6' × 9.6'	Position Angle	90°
Magnitude	9	Other Designation	—

Description: Dreyer: pB;pL;vg1bM (Auw. 44)

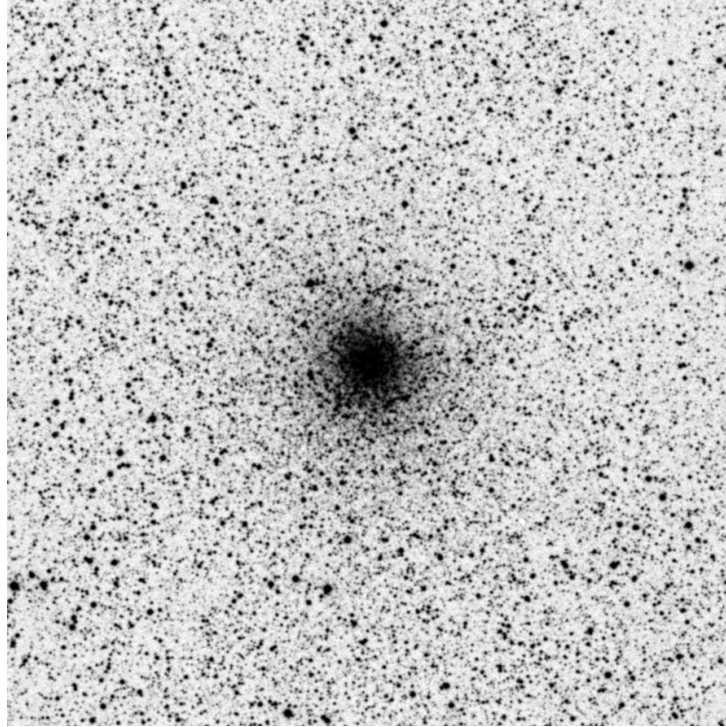


Wide-field chart

Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

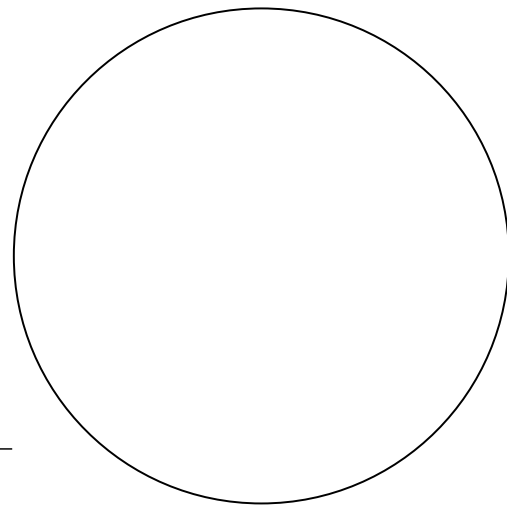
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



**Sketch**

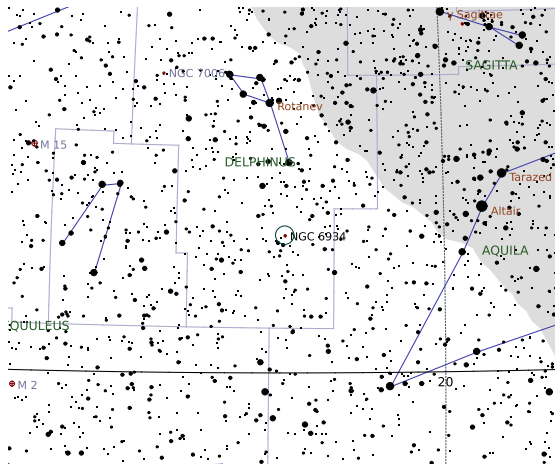
# NGC 6934

## Globular Cluster in Delphinus

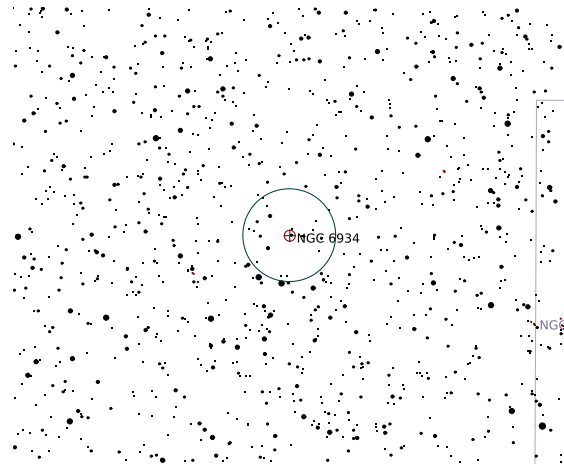
Right Ascension (current)	20 <sup>h</sup> 34 <sup>m</sup> 49 <sup>s</sup>	Declination (current)	7° 27' 02"
Right Ascension (J2000.0)	20 <sup>h</sup> 34 <sup>m</sup> 11 <sup>s</sup>	Declination (J2000.0)	7° 24' 17"
Size	7.1' × 7.1'	Position Angle	90°
Magnitude	8.9	Other Designation	—

**Description:** Dreyer: B;L;R;rrr;\*16...

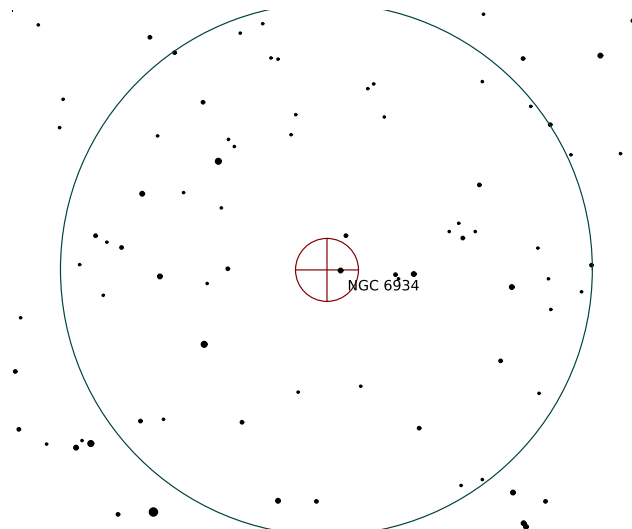
**SAC:** H I 103;\*10m 2' west



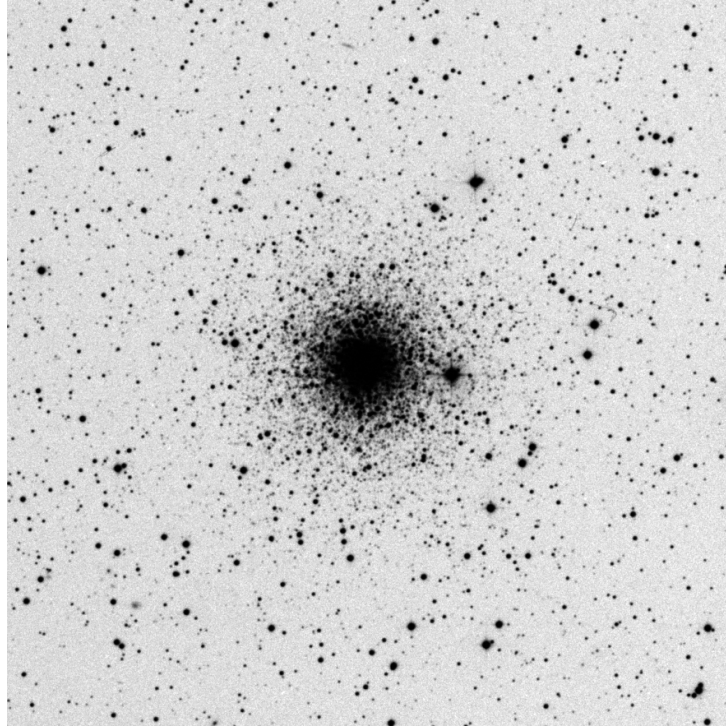
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

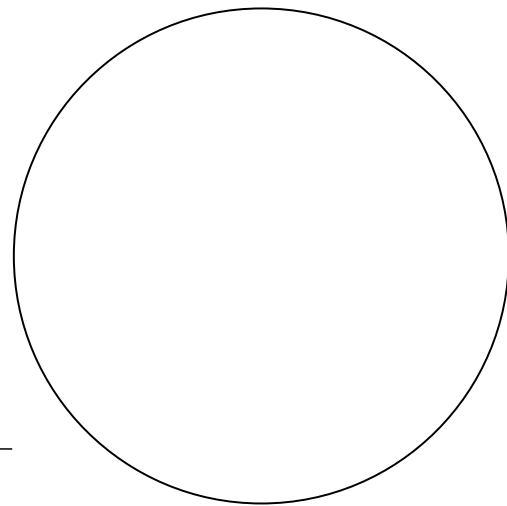
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch



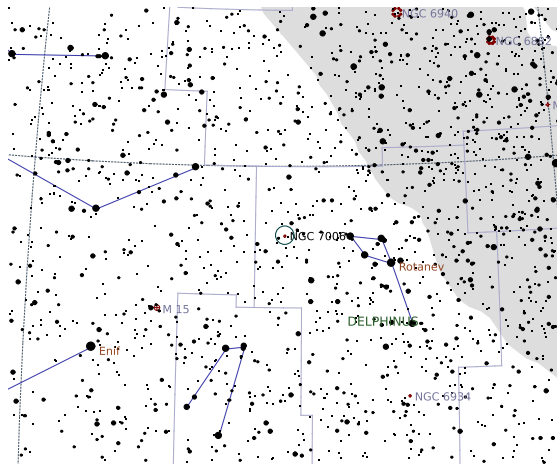
# NGC 7006

## Globular Cluster in Delphinus

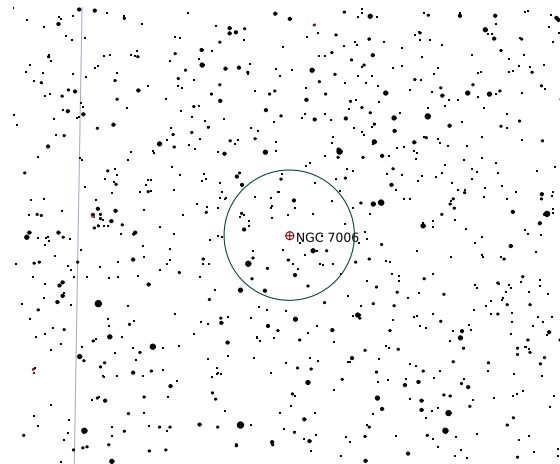
Right Ascension (current)	21 <sup>h</sup> 02 <sup>m</sup> 05 <sup>s</sup>	Declination (current)	16° 14' 26"
Right Ascension (J2000.0)	21 <sup>h</sup> 01 <sup>m</sup> 29 <sup>s</sup>	Declination (J2000.0)	16° 11' 17"
Size	3.6' × 3.6'	Position Angle	90°
Magnitude	11	Other Designation	—

**Description:** Dreyer: B;pL;R;gbM

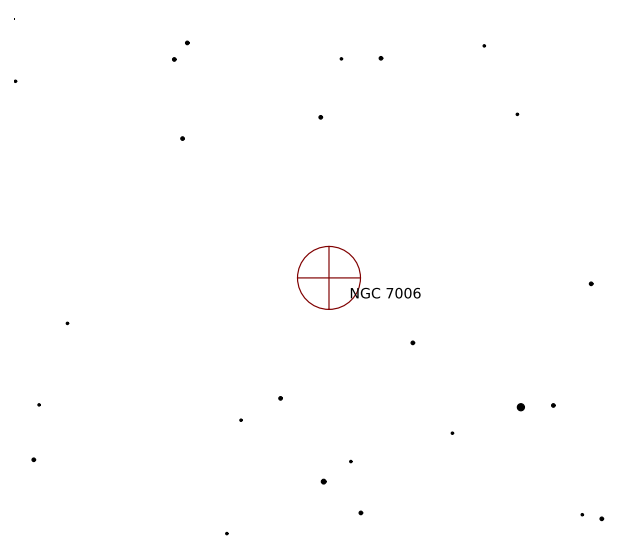
**SAC:** H I 52;Stars eF;very remote globular



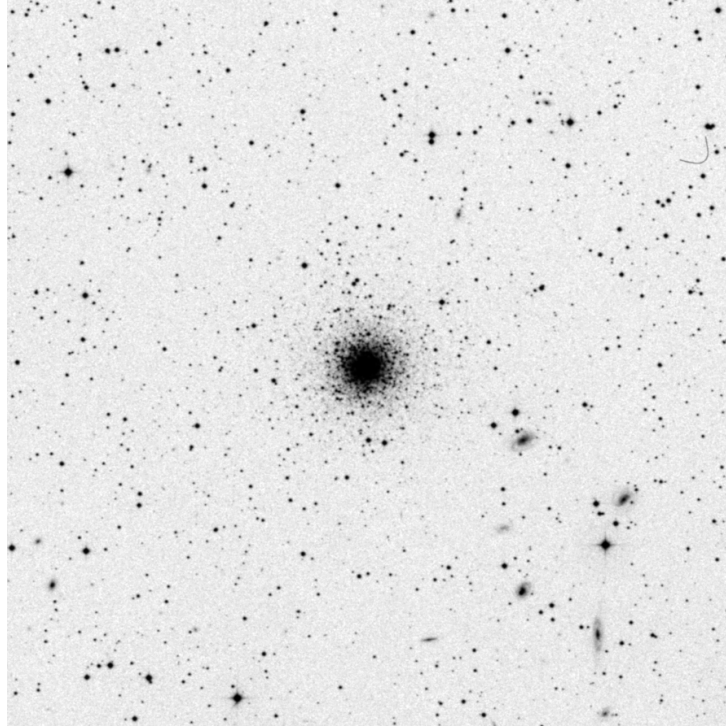
Wide-field chart



Intermediate chart



Zoomed-in chart



DSS Image (15.0' × 15.0')

\* Date: \_\_\_\_\_

\* Time: \_\_\_\_\_

\* Aperture: \_\_\_\_\_

\* Power: \_\_\_\_\_

Equipment Details: \_\_\_\_\_

\_\_\_\_\_

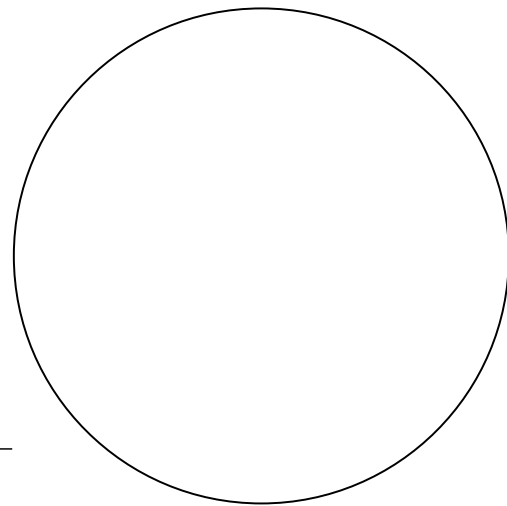
\* Seeing: \_\_\_\_\_

Observation Location: \_\_\_\_\_

FOV: \_\_\_\_\_

\* Description: \_\_\_\_\_

\_\_\_\_\_



Sketch