

Big Bear Valley Astronomical Society



May 2017 Agenda **and Minutes**

- ✓ **Welcome:**
 - New members or 1st time visitors?
 - Sarah Kettler
 - Members present: Wes, Vatch, John D., Claude, Teresa, Deanna, Byron, Randy, Lydia, Dick, Tom Christine, Jim, Bill.

- ✓ **Announcements:** none

- ✓ **Treasurer/Membership Report:**
 - \$782.50 and 42 paid members

- ✓ **Librarian Report :** Solar sunglasses are here!
 - Please email Deanna to borrow books/etc: deannapoulsen@mac.com

- ✓ **Comments, reports, discussions, reviews:**
 - Virtual Lecture- Tom McMahon, Engineering Manager for the LBT, with a virtual tour of the LBT Observatory.
 - Great presentation/ amazed about the actual size of the LBT
 - Star Party April 22 at Matt's House
 - Good attendance/great hot chocolate/good seeing
 - April 23 – AWB's GAM SunDay at Discovery Center
 - About 40 visitors/ good response
 - Discovery Center Star Party Fri April 21
 - LOTS of visitors/ need to turn off the parking lots lights next time(s)
 - BBSO Tour today
 - 15 visitors including some kids/good questions/comments

- ✓ **Activities**
 - Discovery Center Star Party Sat May 21 (correction: May 20) – No Lecture, just bring 'scopes!
Other dates: June 16, July 14, Aug 11
 - Will need presenters for June, July, and August
 - May 13 – Field Trip to Mt Wilson! We can still accommodate 4 more on the tour. Deposit is sent in, so we're a go! Carpool? Meet at the BB airport parking lot for caravan/car pool.
 - BBSO Tours now every 2nd and 4th Thursday at 2pm.
 - Additional Docents requested...please sign up if you've attended the intro training.

- ✓ **Chief observer report.**
 - What's up this month?
 - 3 comets visible via binoculars, with comet Johnson being the best. See attached starmap showing the comet's paths.

✓ **Scheduling:**

- RTMC Expo – Need Observatory Volunteers
 - Teresa now has about 7 names of club member who will staff the Domes.
 - Need contact with Matt at Camp Oakes to pre-test the 2 scopes.
- Next beginner talk?
 - Computerized Astronomy
- International SunDay Jun 18 – Participate? Conflict with Father's Day, no joy
- Urban Assault Friday Jun 2nd in the Village... confirmed
- Another Erwin Lake Public Event – Jun 17? Or July? Club voted for a July date tbd.
- Star Party Jun 24 – where?... confirmed date, but location tbd
- June virtual lecture on Spin Casting telescope mirrors

✓ **General Discussion**

✓ **Summary of Future calendar events:**

- May 20...Discovery Center star party, upper parking lot, starts at dusk
- May 25... NO virtual lecture: conflict with RTMC
- May 26 and 27... RTMC at Camp Oakes/Lake Williams
- June 2... Urban Assault in the Village, NE corner of Village Drive/Pine Knot
- June 16... Discovery center star party, upper parking lot, starts at dusk, need presenter
- June 22... Virtual Lecture on Spin Casting of mirrors
- June 24...Star party... location TBD
- July 14... Discovery center star party, upper parking lot, starts at dusk, need presenter
- August 11... Discovery center star party, upper parking lot, starts at dusk, need presenter

✓

✓ **Reference to past Virtual Lectures... congratulations and a million thanks to Claude and Teresa for arranging the speakers over the last several years... what a very cool program.**

- Tom McMahon on the LBT: <https://youtu.be/bJ-MMtUM-ug>
- Steve Howell on Kepler and K2: <https://youtu.be/W69S3761u98>
- Paul Butler on alien worlds and the history of science: https://youtu.be/j2oJ8_wjhpA
- Mark Giampapa on Solar Stellar connection: <https://youtu.be/L7ymAzjdFTA>
- Sarah Marcotte on Mars 2020: <https://youtu.be/4PD7zrzjzBg>
- Jay Pasachoff on solar eclipse: <https://youtu.be/FoNUDaWMq4>
- Eric Young on SOFIA: <https://youtu.be/juCl1cYrYQI>
- Bill Welsh on KOI-54: <https://youtu.be/Ymezzyc-N7Q>
- Grace Chase on Infrared mysteries of star birth: <https://youtu.be/0pOy0wcvELQ>
- Don McCarthy on Pluto occultation: <https://youtu.be/TwbOyHfcZDw>
- Dan Durda on New Horizons: <https://youtu.be/f0qNY-Y1V7c>
- Joe Tenn on astronomer Frank Schlesinger: not available
- Pedro Sada on Exoplanets: <https://youtu.be/9PNu97XXRrQ>
- John Varsik on solar flares: https://youtu.be/p3fi_K7RUQg
- Dale Gary on radio astronomy: <https://youtu.be/dyAF-vvX1RU>
- Jeff Morgenthaler on Io torus: <https://youtu.be/fDSL8jBtwXs>
- Astronomy without borders: <https://youtu.be/nKRnxq4ssVk>
- International Dark Sky association: <https://youtu.be/r3qG0nj-pcc>
- Connie Walker on Intl Year of Light: <https://youtu.be/i1-orX6HFho>
- Don Jennings on Saturn in the IR: <https://youtu.be/EWdFvVoTAeA>
- John Varsik on BSO history: <https://youtu.be/7BEDqD3PBD8>

The Evening Sky Map

FREE* EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

WWW.SKYPAPERS.COM

NORTHERN HEMISPHERE
MAY 2017

Sky Calendar – May 2017

Get Sky Calendar on Twitter
<http://twitter.com/skymaps>

- 2 Moon near Beehive cluster (evening sky) at 18h UT.
- 3 First Quarter Moon at 2:47 UT.
- 4 Moon near Regulus (evening sky) at 10h UT. Occultation visible from Australia and New Zealand.
- 5 Mars 6.2° N of Aldebaran (24° from Sun, evening sky) at 22h UT. Mags. 1.6 and 0.8.
- 6 Eta Aquarid meteor shower peaks at 2h UT. Most active for 7 days around this date. Associated with Comet Halley. Very fast, bright meteors, up to 30 per hour. Favors skywatchers in the tropics and southern hemisphere observing a few hours before dawn.
- 7 Moon near Jupiter (evening sky) at 23h UT. Mag. -2.4.
- 8 Moon near Spica (evening sky) at 17h UT.
- 10 Full Moon at 21:43 UT.
- 12 Moon near Antares (morning sky) at 13h UT.
- 12 Moon at apogee (farthest from Earth) at 20h UT (distance 406,210 km; angular size 29.4').
- 13 Moon near Saturn (morning sky) at 23h UT. Mag. 0.2.
- 17 Mercury at greatest elongation west (26° from Sun, morning sky) at 23h UT. Mag. 0.6.
- 19 Last Quarter Moon at 0:34 UT.
- 20 Moon near Neptune (75° from Sun, morning sky) at 6h UT. Occultation visible from the South Atlantic Ocean. Mag. 7.9.
- 22 Moon near Venus (morning sky) at 14h UT. Mag. -4.4.
- 24 Moon near Mercury (25° from Sun, morning sky) at 2h UT. Mag. 0.2.
- 25 New Moon at 19:45 UT. Start of lunation 1168.
- 26 Moon at perigee (closest to Earth) at 1:20 UT (357,207 km; angular size 33.5').
- 27 Moon near Mars (18° from Sun, evening sky) at 3h UT. Mag. 1.7.
- 30 Moon near Beehive cluster (evening sky) at 1h UT.
- 31 Moon near Regulus (evening sky) at 17h UT. Occultation visible from central Africa and Madagascar.

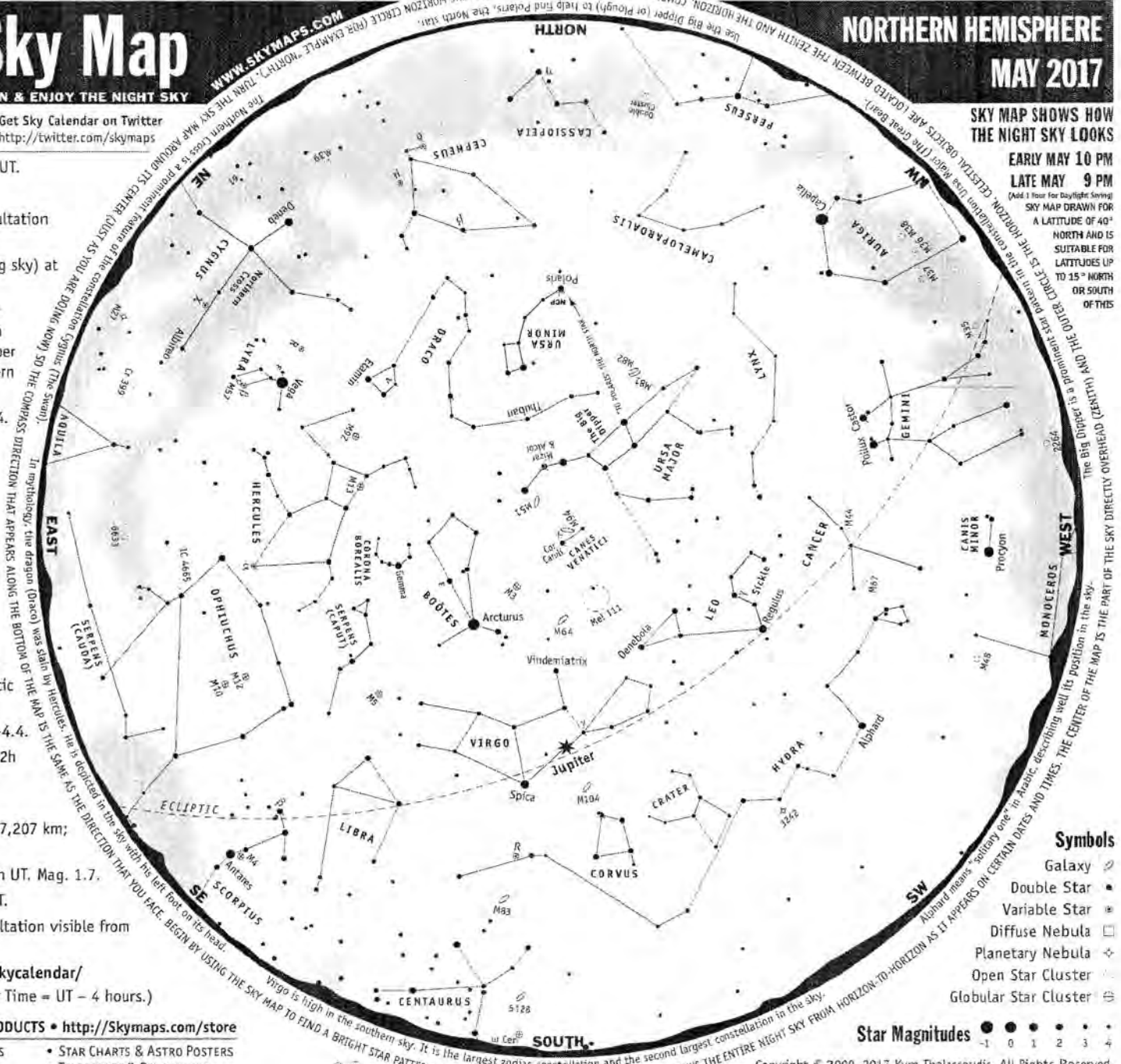
More sky events and links at <http://Skymaps.com/skycalendar/>

All times in Universal Time (UT). (USA Eastern Summer Time = UT - 4 hours.)



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 - STAR CHARTS & ASTRO POSTERS
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 - TELESCOPES & BINOCULARS
- All sales support the production and free distribution of The Evening Sky Map.



SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

EARLY MAY 10 PM
LATE MAY 9 PM

(Add 1 Hour for Daylight Saving)
SKY MAP DRAWN FOR A LATITUDE OF 40° NORTH AND IS SUITABLE FOR LATITUDES UP TO 15° NORTH OR SOUTH OF THIS

Symbols

- Galaxy
- Double Star
- Variable Star
- Diffuse Nebula
- Planetary Nebula
- Open Star Cluster
- Globular Star Cluster

Star Magnitudes -1 0 1 2 3 4

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Virgo is high in the southern sky. It is the largest zodiac constellation and the second largest constellation in the sky. INSTRUCTIONS: THE SKY MAP SHOWS THE ENTIRE NIGHT SKY FROM HORIZON-TO-HORIZON AS IT APPEARS ON CERTAIN DATES AND TIMES. THE CENTER OF THE MAP IS THE PART OF THE SKY DIRECTLY OVERHEAD (ZENITH) AND THE OUTER CIRCLE IS THE PART OF THE SKY ON THE HORIZON. COMPASS DIRECTIONS ARE INDICATED ALONG THE HORIZON. (FOR EXAMPLE: NORTH). THE NORTHERN CROSS IS A PROMINENT FEATURE OF THE CONSTITUTION OF THE GREAT BEAR. USE THE BIG DIPPER (OR PLOUGH) TO HELP FIND POLARIS, THE NORTH STAR.

About the Celestial Objects

Listed on this page are several of the brighter, more interesting celestial objects visible in the evening sky this month (refer to the monthly sky map). The objects are grouped into three categories. Those that can be easily seen with the naked eye (that is, without optical aid), those easily seen with binoculars, and those requiring a telescope to be appreciated. Note, all of the objects (except single stars) will appear more impressive when viewed through a telescope or very large binoculars. They are grouped in this way to highlight objects that can be seen using the optical equipment that may be available to the star gazer.

Tips for Observing the Night Sky

When observing the night sky, and in particular deep-sky objects such as star clusters, nebulae, and galaxies, it's always best to observe from a dark location. Avoid direct light from street lights and other sources. If possible observe from a dark location away from the light pollution that surrounds many of today's large cities.

You will see more stars after your eyes adapt to the darkness—usually about 10 to 20 minutes after you go outside. Also, if you need to use a torch to view the sky map, cover the light bulb with red cellophane. This will preserve your dark vision.

Finally, even though the Moon is one of the most stunning objects to view through a telescope, its light is so bright that it brightens the sky and makes many of the fainter objects very difficult to see. So try to observe the evening sky on moonless nights around either New Moon or Last Quarter.

Astronomical Glossary

Conjunction – An alignment of two celestial bodies such that they present the least angular separation as viewed from Earth.

Constellation – A defined area of the sky containing a star pattern.

Diffuse Nebula – A cloud of gas illuminated by nearby stars.

Double Star – Two stars that appear close to each other in the sky; either linked by gravity so that they orbit each other (binary star) or lying at different distances from Earth (optical double). Apparent separation of stars is given in seconds of arc (").

Ecliptic – The path of the Sun's center on the celestial sphere as seen from Earth.

Elongation – The angular separation of two celestial bodies. For Mercury and Venus the greatest elongation occurs when they are at their most angular distance from the Sun as viewed from Earth.

Galaxy – A mass of up to several billion stars held together by gravity.

Globular Star Cluster – A ball-shaped group of several thousand old stars.

Light Year (ly) – The distance a beam of light travels at 300,000 km/sec in one year.

Magnitude – The brightness of a celestial object as it appears in the sky.

Open Star Cluster – A group of tens or hundreds of relatively young stars.

Opposition – When a celestial body is opposite the Sun in the sky.

Planetary Nebula – The remnants of a shell of gas blown off by a star.

Universal Time (UT) – A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.

Variable Star – A star that changes brightness over a period of time.

CELESTIAL OBJECTS

NORTHERN HEMISPHERE
MAY 2017

Sky maps .com

Easily Seen with the Naked Eye

Capella	Aur	• The 6th brightest star. Appears yellowish in color. Spectroscopic binary. Dist=42 ly.
Arcturus	Boo	• Orange, giant K star. Name means "bear watcher". Dist=36.7 ly.
Procyon	CMi	• Greek name meaning "before the dog" - rises before Sirius (northern latitudes). Dist=11.4 ly.
δ Cephei	Cep	• Cepheid prototype. Mag varies between 3.5 & 4.4 over 5,368 days. Mag 6 companion.
Deneb	Cyg	• Brightest star in Cygnus. One of the greatest known supergiants. Dist=1,400±200 ly.
Castor	Gem	• Multiple star system with 6 components. 3 stars visible in telescope. Dist=52 ly.
Pollux	Gem	• With Castor, the twin sons of Leda in classical mythology. Dist=34 ly.
α Herculis	Her	• Semi-regular variable. Magnitude varies between 3.1 & 3.9 over 90 days. Mag 5.4 companion.
Regulus	Leo	• Brightest star in Leo. A blue-white star with at least 1 companion. Dist=77 ly.
Vega	Lyr	• The 5th brightest star in the sky. A blue-white star. Dist=25.0 ly.
Antares	Sco	• Red, supergiant star. Name means "rival of Mars". Dist=135.9 ly.
Polaris	UMi	• The North Pole Star. A telescope reveals an unrelated mag 8 companion star. Dist=433 ly.
Spica	Vir	• Latin name means "ear of wheat" and shown held in Virgo's left hand. Dist=250 ly.

Easily Seen with Binoculars

M44	Onc	• Praesepe or Beehive Cluster. Visible to the naked eye. Dist=590±20 ly.
M3	OH	• Easy to find in binoculars. Mght. be glimpsed with the naked eye.
μ Cephei	Cep	• Herschel's Garnet Star. One of the reddest stars. Mag 3.4 to 5.1 over 730 days.
Mel 111	Com	• Coma Berenices. 80 mag 5-6 stars in 5 deg. Dist=283 ly. Age=400 million years.
χ Cygni	Cyg	• Long period pulsating red giant. Magnitude varies between 3.3 & 14.2 over 407 days.
M39	Cyg	• May be visible to the naked eye under good conditions. Dist=900 ly.
ν Draconis	Dra	• Wide pair of white stars. One of the finest binocular pairs in the sky. Dist=100 ly.
M13	Her	• Best globular in northern skies. Discovered by Halley in 1714. Dist=23,000 ly.
M82	Her	• Fainter and smaller than M13. Use a telescope to resolve its stars.
R Hydrae	Hya	• Long period variable. Mag varies between 3.0 & 11.0 over 390 days. Brilliant red.
ε Lyrae	Lyr	• Famous Double Double. Binoculars show a double star. High power reveals each a double.
R Lyrae	Lyr	• Semi-regular variable. Magnitude varies between 3.9 & 5.0 over 46.0 days.
M12	Oph	• Close to the brighter M10. Dist=18,000 ly.
M10	Oph	• 3 degrees from the fainter M12. Both may be glimpsed in binoculars. Dist=14,000 ly.
IC4685	Oph	• Large, scattered open cluster. Visible with binoculars.
6633	Oph	• Scattered open cluster. Visible with binoculars.
M4	Sco	• A close globular. May just be visible without optical aid. Dist=7,000 ly.
M5	Ser	• Fine globular star cluster. Telescope will reveal individual stars. Dist=25,000 ly.
Mizar & Alcor	UMa	• Good eyesight or binoculars reveals 2 stars. Not a binary. Mizar has a mag 4 companion.
Cr 399	Vul	• Coathanger asterism or "Brooch's Cluster". Not a true star cluster. Dist=218 to 1,140 ly.

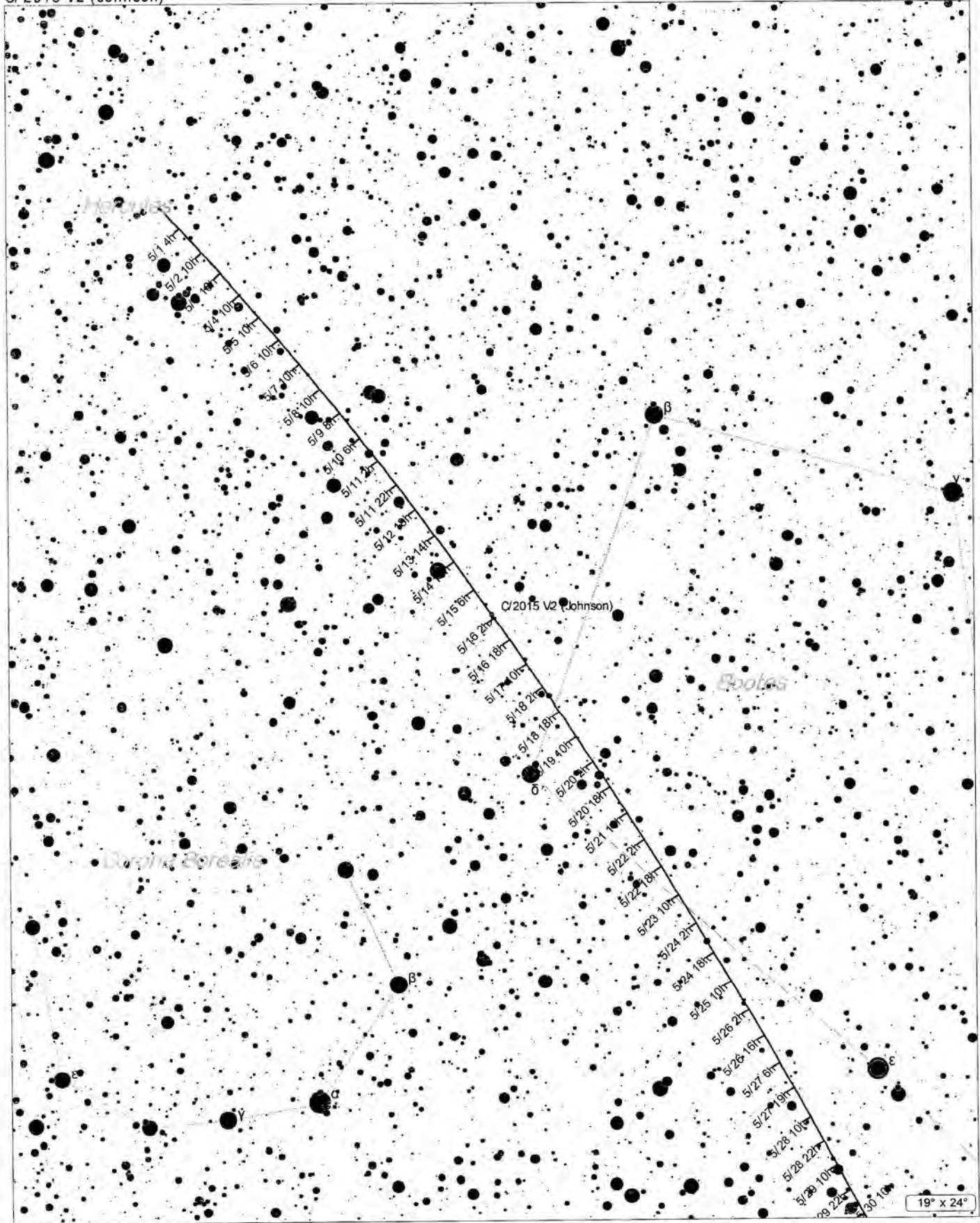
Telescopic Objects

ε Bootis	Boo	• Red giant star (mag 2.5) with a blue-green mag 4.9 companion. Sep=2.8". Difficult to split.
M67	Onc	• Contains 500+ stars mag 10 & fainter. One of the oldest clusters. Dist=2,350 ly.
M84	OH	• Compact nearly face-on spiral galaxy. Dist=15 million ly.
η Cassiopeiae	Cas	• Yellow star mag 3.4 & orange star mag 7.5. Dist=19 ly. Orbit=480 years. Sep=12".
5126	Can	• Bisected by a wide obscuring lane. Strong radio source. Dist=14 million ly.
M51	OH	• Whirlpool Galaxy. First recognised to have spiral structure. Dist=25 million ly.
M64	Com	• Black-Eye Galaxy. Discovered by J.E. Bode in 1775 - "a small, nebulous star".
Albireo	Cyg	• Beautiful double star. Contrasting colours of orange and blue-green. Sep=34.4".
61 Cygni	Cyg	• Attractive double star. Mags 5.2 & 6.1 orange dwarfs. Dist=11.4 ly. Sep=28.4".
3242	Hya	• Ghost of Jupiter. Bright blue disk. Mag 11 central star. Dist=2,600 ly.
M83	Hya	• Classic face-on spiral. Discovered in 1752 by Lacaille. In attractive star field.
γ Leonis	Leo	• Superb pair of golden-yellow giant stars. Mags 2.2 & 3.5. Orbit=600 years. Sep=4.4".
β Lyrae	Lyr	• Eclipsing binary. Mag varies between 3.3 & 4.3 over 12,940 days. Fainter mag 7.2 blue star.
M57	Lyr	• Ring Nebula. Magnificent object. Smoke-ring shape. Dist=4,100 ly.
M16	Ser	• Eagle Nebula. Requires a telescope of large aperture. Dist=8,150 ly.
M81	UMa	• Beautiful spiral galaxy visible with binoculars. Easy to see in a telescope.
M82	UMa	• Close to M81 but much fainter and smaller.
M104	Vir	• Sombrero Galaxy. Almost edge-on spiral galaxy. Protruding central core.
ν Virginis	Vir	• Superb pair of mag 3.5 yellow-white stars. Orbit=169 years. At their closest in 2005.
M27	Vul	• Dumbbell Nebula. Large, twin-lobed shape. Most spectacular planetary. Dist=975 ly.

COMET JOHNSON

C/2015 V2 (Johnson)

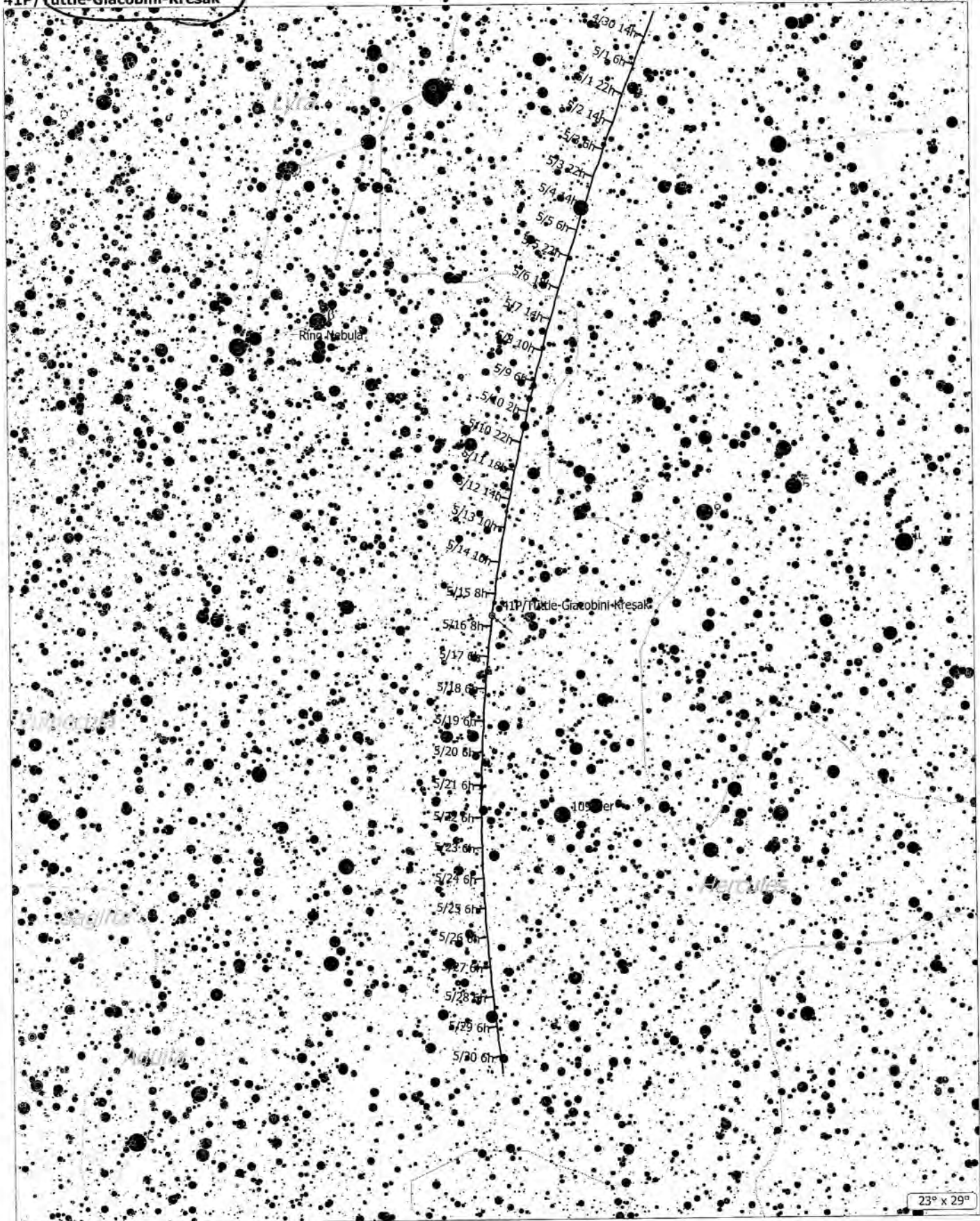
SkyTools 3 / Skyhound.com



C/2015 V2 (Johnson) (Comet)
 Magnitude: 8.67 Coma Diameter: 4.8' SBR: 20.7 Mag/arcsec² Earth

Distance: 0.9 AU

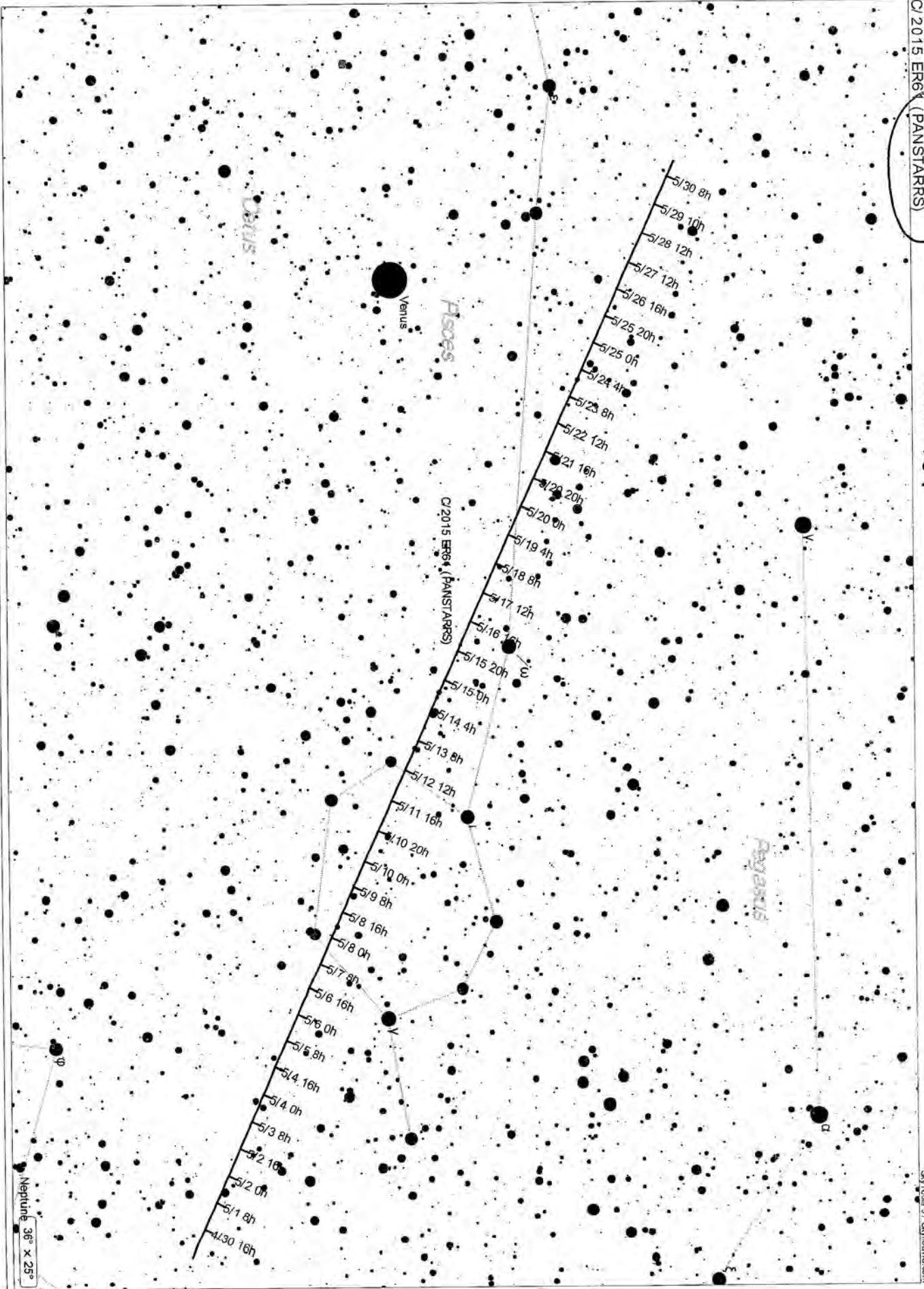




41P/Tuttle-Giacobini-Kresak (Comet)
 Magnitude: 9.18 Coma Diameter: 9.4' SBR: 22.7 Mag/arcsec² Earth

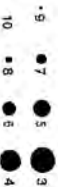
Distance: 0.2 AU





C/2015 ER61 (PANSTARRS) (Comet)
Magnitude: 7.51 Coma Diameter: 4.7' Sp: 19.5 Mag/arcsec² Earth

Distance: 1.3 AU



Neptune 36° x 25°