

# OBSERVER



The Needle Galaxy, NGC 4565, in Coma Berenices — featured this month in “June Skies.” Image © Jon Martin

## JUNE SKIES

*From the editor: Dennis Cochran has decided to stand down from writing this column—I’m pinch-hitting for now, knowing well that I have big shoes to fill. Wish me luck and hold on tight; here we go...*

The planets put on a great show for us this month, starting with Venus at twilight on June 1st. That evening, the planet lies 5° southward of Pollux in Gemini—making a very noticeable lineup with Pollux’s “twin,” Castor. On the 12th and 13th, Venus swings very close to M44, the Beehive Cluster; both planet and cluster will fit easily into a binocular field, or that of a rich-field telescope. (You’ll want a clear western horizon, though, because they’ll both be very low as astronomical twilight ends.)

At Jupiter, **Europa “occults” Ganymede, at 9:47 p.m., local time, on the 14th.** Though the occultation is more of a slight grazing encounter than a full-on cover-up, we will see the two moons “touch” for several minutes after the time above. Try watching at least 10 minutes earlier, though, to see Europa approach Ganymede—at that point, the two moons are still about 4 arcseconds apart.

On the evening of June 30th, **Venus and Jupiter appear very close together—within 1/3° of each other**—tight enough to fit both planets into a good 80-120X view, depending on your eyepiece’s angular field. Start looking for the pair low in the west soon after sunset—both planets are bright enough to be visible long before it’s truly dark, and by 9:30, they’ll already be just 15° above the horizon and getting lower by the minute.

Meanwhile, Saturn is visible at nightfall in the south-southeast as June begins, and due south toward the end of the month. Earth is far “above” Saturn’s equatorial plane this year, offering great views of the planet’s ring system and north pole. At the same time, Saturn is also somewhat low in our skies—that, together with our usual atmospheric choppiness here in Denver, will make getting a sharp image more difficult. To see Saturn at its best, try to do your observing or imaging when the planet is highest in the sky—that is, within about an hour on either side of the planet being due south. By the end of June, twilight and moonlight will interfere somewhat, but in trade, the moon passes within 2° of Saturn on the 28th, for a beautiful view.

As for the stars and deep-sky objects, at the beginning of the month, you can still find Leo the Lion—which makes its initial annual appearance during the winter—shining in the western sky. The great galaxies of the Virgo Cluster still command attention between Leo and Virgo. And in the east, there’s the promise of the tremendous splendor of our own galaxy’s nebulae and clusters, as the summer Milky Way approaches. Much of the latter is already well up by midnight, and if you just can’t wait, the center of our galaxy, in Sagittarius, will be at its highest in the sky by 2 a.m. or so.

So what we see, from the zenith southward as darkness falls this month, is the rough border between the exiting winter view and the coming summer one. While we look away from the plane of our own galaxy (as we did last month to see the Virgo Cluster), we can see

### Sky Calendar

- 2 Full Moon
- 9 Last-Quarter Moon
- 14 Europa Occults Ganymede (See Story in “June Skies”)
- 16 New Moon
- 24 First-Quarter Moon
- 30 Venus and Jupiter 1/3° apart (See Story in “June Skies”)

### In the Observer

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# PRESIDENT'S MESSAGE *by Ron Hranac*

We live in an exciting time of space exploration and discovery. Ongoing and upcoming missions will add to science, and no doubt challenge some of what we thought we knew.

Think about those two sentences for a moment.

I still have my first astronomy book, *The ABC's of Astronomy: An Illustrated Dictionary*, by Roy A. Gallant. A bit tattered now, the book was published by Doubleday & Company, Inc., in 1962. It had been a long time since I perused *The ABC's of Astronomy*, so I recently took it down from the bookshelf and thumbed through its pages. Most of the fundamentals of astronomy haven't changed in the more than 50 years since the book's publication, but we certainly know a lot more today than we did back then. I chuckled at a map of the surface of Mars, which shows canals and other features we now know don't exist. Also included is an illustration of an example of an early artificial satellite, Vanguard I.

To be fair, Gallant penned his book at a time that could be accurately described by this column's two introductory sentences. The space race was underway, and it would be but a few short years before the first humans stepped foot on the Moon. We did indeed live in an exciting time of space exploration and discovery, and ev-

ery mission since then—manned and unmanned—answered a lot of questions and posed many more. (NASA has a nice overview at [https://www.nasa.gov/50th/50th\\_magazine/historyLetter.html](https://www.nasa.gov/50th/50th_magazine/historyLetter.html).)

It would be easy to believe that the great era of space exploration is in the past, but those introductory sentences apply to the present, too. The New Horizons spacecraft will fly by Pluto in July,



Rosetta photographed the Imhotep region on Comet 67P/Churyumov-Gerasimenko from a distance of 19.9 km from the comet's center on March 28, 2015. The field of view is 1.7 x 3.1 km, roughly 1 x 2 miles. Image © ESA - European Space Agency

giving us our first close-up glimpse at what used to be called the solar system's ninth planet. Messenger just wrapped up a four-year mission at our innermost planet, Mercury. Dawn is now orbiting the largest body in the asteroid belt, Ceres, after spending about a year in orbit around the asteroid (4) Vesta. Rosetta rendezvoused with Comet 67P/Churyumov-Gerasimenko. Even more amazing, a probe carried by Rosetta landed on that comet's

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## DAS SCHEDULE

### JUNE

- 5 General Meeting at DU's Olin Hall, 7:30 p.m., with Justin McHeffey—See p. 3 for details
- 10 -14 Rocky Mountain Star Stare
- 13-15 Dark Sky Weekend—EGK Dark Site & Brooks Observatory
- 19 E-Board Meeting—At DU's Historic Chamberlin Observatory, 7:30 p.m.
- 27 Open House - DU's Historic Chamberlin Observatory—Starts at 8:30 p.m.

During Open House, volunteer members of the DAS bring their telescopes to the Chamberlin Observatory's front (south) lawn, so the public can enjoy views of the stars and planets, try out different telescope designs, and get advice from DAS members. The Observatory is open too (costs listed below), and its historic 20-inch telescope is open for observing with no reservations necessary.

Open House costs (non-members): If the skies are clear, \$2/person (\$5/family), \$1/person in inclement weather. DU students with ID, and DAS members free.

Public Nights feature a presentation on astronomical subjects and a small-group observing session on the historic 20-inch telescope (weather permitting), at Chamberlin Observatory on Tuesday and Thursday evenings (except holidays), beginning at the following times:

March 10 - September 30 at 8:30 P.M.

October 1 - March 9 at 7:30 P.M.

Public Night costs (non-members): \$4/adult, \$3/child and students with ID. DAS members and DU students with ID: free.

Members of the public (non-DAS/DU, as above), please make reservations via our website ([www.denverastro.org](http://www.denverastro.org)) or call (303) 871-5172.

## Society Directory

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*The Executive Board conducts the business of the DAS at 7:30 p.m., at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome. <http://www.denverastro.org>*



# DAS NEWS

## Volunteer Opportunities

**June 9, 8:30pm: Lincoln Hills in Gilpin.** This is a request by TEENS Inc., which is facilitating a youth employment program call Team-Works. They are starting out their program with a camping outing to serve as the orientation for the program and would like to have some DAS members bring out scopes for about 20 teens.

**June 13, 7:30pm-9:30pm: The Broadmoor Hotel in Colorado Springs.** We have a request for DAS member(s) to come set up scopes in The Broadmoor Hotel's Mountain Club House for an event with approximately 40 guests. DAS has

been offered a substantial donation if we participate, so I hope to hear from at least a couple of you!

**June 19, 8:30pm: Astronomy at the Grange at the Meadows in Castle Rock.** *DAS member Cliff Simpson is taking the lead in recruitment for this event.* He is looking for 2 more people to bring out scopes. There will be about 50-75 people in attendance. (If you are interested in participating, please contact Cliff at [cliffsimpson@q.com](mailto:cliffsimpson@q.com).)

To volunteer, please contact Lindsey Shaw at [external@denverastro.org](mailto:external@denverastro.org) —and thanks!

## DAS Member David Shouldice Honored

David Shouldice was this year's DAS Spring Banquet recipient of the Bill Ormsby Memorial Volunteer Award. The Shouldices were out of town during the banquet, so the award was presented to David after their return.

David volunteers at Public Nights and Open Houses, and has been a lead telescope operator at nearly every Tuesday Public Night for more than a decade, clocking hundreds of hours of volunteer service. He established a tradition of providing building tours for visitors, including an in-depth explanation of the meridian scope, the observatory's clocks, and a journey to the basement to see the telescope pier. David has done historic research and documentation of Dr. Howe's diaries after they came to light in the late '90s. Several times he visited and talked extensively with Howe's grandson,

Julian, during trips to the west coast, gaining even more historic background about DU's historic Chamberlin Observatory. In many respects, David is a walking Chamberlin history book.

He also trains apprentice operators, giving them hands-on experience using the 20-inch Clark's navigation features and in finding objects by themselves—ensuring that operators are ready for check rides.

At Open Houses, David not only operates a home-built Newtonian telescope (which was featured in *Sky & Telescope* magazine), but actively seeks out and assists those who may be having difficulty with their own scopes. He served for several years on the E-Board, and has helped with repairs on the 20-inch Clark.

Congratulations again to David Shouldice, this year's recipient of the Bill Ormsby Memorial Volunteer Award.

## DAS General Meeting

**Friday, June 5th, 7:30pm:** Colorado Native Justin McHefey is the meteorologist and reporter viewers see on the air and reporting live from the CBS4 Mobile Weather Lab in the mountains, on the plains, and in Denver.

Prior to CBS4, Justin spent two years at KMOT-TV in Minot, North Dakota forecasting softball-sized hail, tornadoes, blizzards, and flooding on the northern plains. His broadcasting career began in Missoula at the University of Montana, as a morning news anchor for College Radio 89.9 FM. After receiving a bachelor's degree in anthropology from Montana, he went on to receive a master's degree in mass communication from Arizona State University.

In 2013, Justin graduated from Mississippi State University with a certificate in Broadcast Meteorology, a rigorous three-year atmospheric science curriculum focusing on all aspects of meteorology and television presentation. He also holds the Seal of Approval from the National Weather Association (NWA), a professional recognition of the quality of his weather broadcasts. Among radio and television meteorologists, the NWA designation is sought as a symbol of distinction.

Justin's interest in meteorology dates back to childhood. Often heckled by friends for obsessing over national and local weather coverage, he could name most (if not all) on-air weather personalities before his 11th birthday. He is devoted to understanding the atmosphere and loves the feeling of delivering an accurate forecast. (*Bio Courtesy CBS4*)

The meeting will be held at **DU's Olin Hall, Room 105**, and all present will be invited to a reception following the meeting at DU's Historic Chamberlin Observatory. Coffee and light refreshments will be served.

## Writers Wanted

The Denver Astronomical Society is looking for good, volunteer writers to contribute articles for *The Observer's* "This Month's Skies."

Are you brimming with ideas about how to describe celestial events? If you are, please contact the editor, Zachary Singer, at [editor@denverastro.org](mailto:editor@denverastro.org)

# ABOUT THE DAS

Membership in the Denver Astronomical Society is open to anyone wishing to join. The DAS provides trained volunteers who host educational and public outreach events at the University of Denver's Historic Chamberlin Observatory, which the DAS helped place on the National Register of Historic Places. First light at Chamberlin in 1894 was a public night of viewing, a tradition the DAS has helped maintain since its founding in 1952.

The DAS is a long-time member in good standing of the Astronomical League and the International Dark Sky Association. The

DAS's mission is to provide its members a forum for increasing and sharing their knowledge of astronomy, to promote astronomical education to the public, and to preserve Historic Chamberlin Observatory and its telescope in cooperation with the University of Denver.

The DAS is a 501 (c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the DAS General Fund, and the Edmund G. Kline Dark Site Fund.

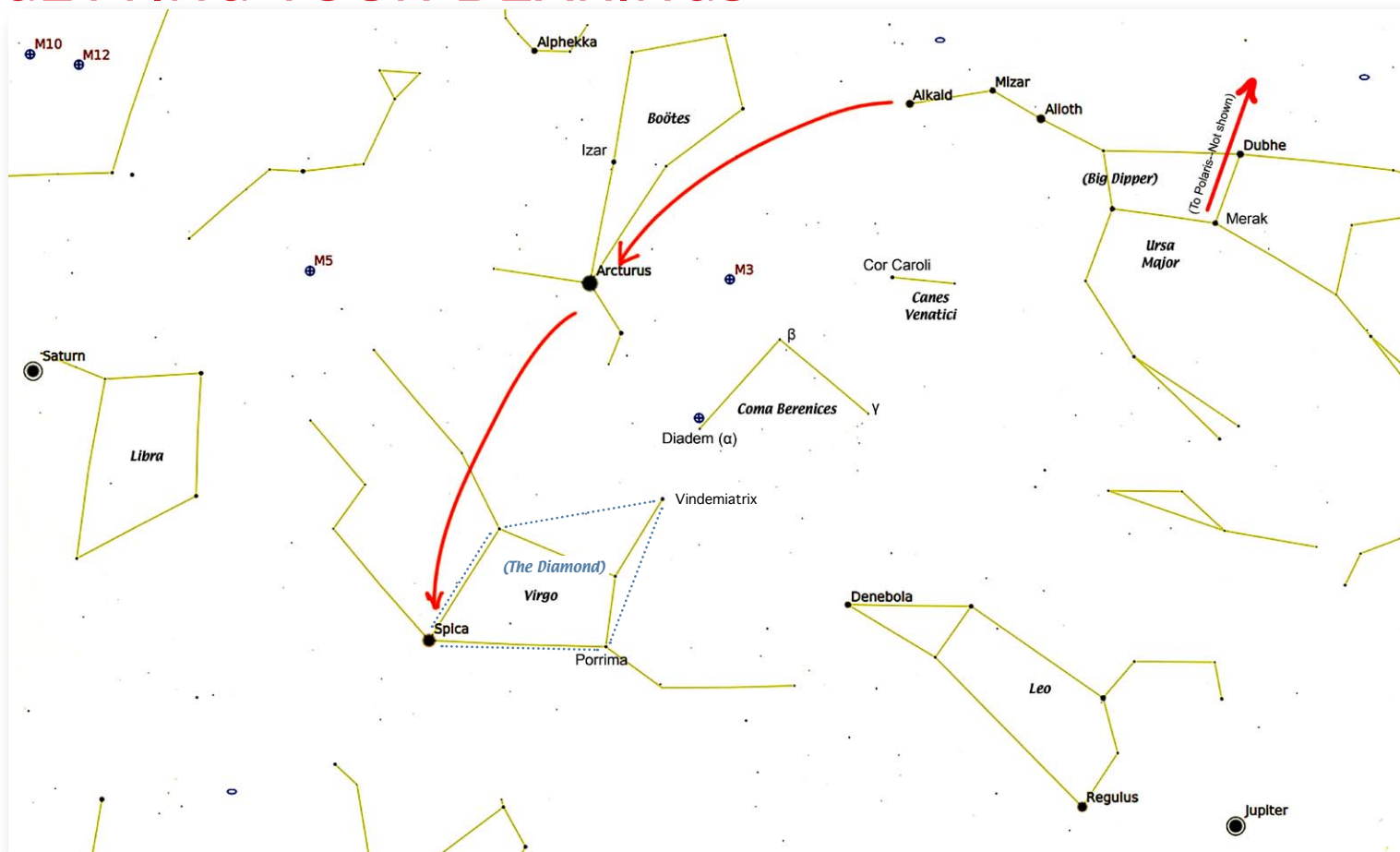
More information about DAS activities and

membership benefits is available on the DAS website at [www.denverastro.org](http://www.denverastro.org).



## GETTING YOUR BEARINGS

... from the editor



Use the “pointer stars” of the Big Dipper as shown by the arrows to find Arcturus, Spica, and Polaris (not shown).

Chart produced with Stellarium software under GNU license and then enhanced in Photoshop.

Given the snowy and rainy weather these past few months, and the cold of winter before that, there’s a good chance that some of our newer members may just be getting started with stargazing—whether you’ve got a computerized telescope or one aimed manually, knowing some of the brighter stars and constellations will be a big help. If you’re in the computerized camp, you’ll still need to find some of the bright stars to align your telescope (or for that matter, to realign it on longer observing sessions). If, on the other hand, you’re pointing your telescope to your targets yourself, then having a stash of familiar landmarks to get you oriented easily will save you a lot of time—comparing star charts with the sky in front of you to find challenging objects is easier when you start in the right constellation!

Happily, the June skies offer a very convenient set of tools for getting started—the Big Dipper (for the purists, it’s a part of the constellation Ursa Major, the Great Bear). It’s an easy star-pattern to find, and its stars will point the way to other stars and constellations that are close to it in the sky. As twilight ends this month, look for the Dipper high in the northwest, “pointing downward” as if to scoop up the north horizon.

The first “Dipper” trick is fairly well-known, though still worth a mention—Merak and Dubhe, the two stars along the side of the Dipper’s “spoon” farthest from the “handle,” can be used to point to Polaris, the North Star. As our diagram shows, when the Dipper’s handle is on your left (you might need to tilt your head), then Merak and Dubhe point “upward” toward Polaris. As a guide, the distance from Dubhe (the top of the bowl) to Polaris is roughly the same as from Dubhe to Alkaid (the star at the far end of the handle).

The same diagram shows how to use the Dipper’s handle as a pointer to other stars. Follow the handle’s curve outward (away from the bowl) for about the same distance as the Dipper’s width, and you’ll come to Arcturus,

the brightest star in the constellation Boötes. Arcturus isn’t just a shortcut to Boötes, though; it’s the brightest star in Denver’s sky at this time of year (it’s second to Sirius, which sets with the sun in June). That makes it a great jumping-off point—we’ll use it this month to find some objects of interest, and you can bet it’s on the list of alignment stars for a computerized scope (since it starts with “A,” it’ll be high on the list, too!).

It’s worth remembering that Arcturus is also high enough in declination (the sky’s version of latitude) to be visible a good part of the year in Colorado. It’s 20° above the eastern horizon at midnight every February, appearing earlier and farther to the west each night, until it settles into the western horizon at sunset in October. Learn to find it now, and it will be a beacon for you for several months this year—and for a good, long run thereafter.

Following the Dipper-Arcturus curve about the same distance farther south, you’ll find another bright star—Spica, the brightest star in the constellation Virgo. The Arcturus-Spica distance is a handy reference for comparing relative distances on star charts, allowing star-hopping astronomers to get a “feel” for how far across the sky other objects will be found. (This month, for example, you’ll find Saturn roughly east of Spica, just a little farther from Spica than the Spica-Arcturus span.)

Spica also forms an easy-to-spot diamond-shaped asterism with three other bright Virgo stars. Some of the “diamond” stars, like Porrima, are interesting in their own right (see “June Skies”), but all of them, separately and together provide useful landmarks for making navigation in this part of the sky simpler. Because of its location, Spica is also commonly “passed by” by the planets, providing quick reference for finding them, too. This December, for example, the star will be joined by Mars and Venus; Spica is a beautiful companion to the moon sometimes, as well.

*President's Message*    *Continued from Page 2*

**The Sombrero Galaxy / M 104: The Hubble Heritage Team of astronomers created a 6-image mosaic using the Hubble Space Telescope's Advanced Camera for Surveys, resulting in a very high resolution final image. Photo by NASA / STScI.**

surface, and the Rosetta craft itself will remain in orbit around the comet, continuing to observe it as the comet swings past the sun this August.

Several relatively recent Mars missions—Spirit and Opportunity, Curiosity, MAVEN, and others—have revolutionized what we know about the red planet, and pretty much confirmed that water once existed on its surface. Arguably one of the most captivating ongoing space missions is the Hubble Space Telescope, which continues to dazzle with amazing images. *Astronomy*, *Sky & Telescope*, and even *National Geographic* recently featured articles about Hubble's 25<sup>th</sup> anniversary. Can you believe Hubble has been contributing to science for a quarter century?

Like many members of Denver Astronomical Society, I grew up with the space race. That experience influenced my interest in things scientific and technical, especially astronomy. I think having lived through the space race made many of us feel like we were part of it, even if we were just observers. That bond continues today, and in some ways, more directly: Keeping an eye open for visible passes of the International Space Station and “Iridium flashes” (sunlight reflecting off Iridium satellites’ solar panels) is a lot of fun.

If you have an interest in current and recent space missions, here are some useful links. The following list is by no means comprehensive, so don't be bashful about digging around some of the web sites or doing a Google search for your favorites.

Cassini (Saturn): [http://www.nasa.gov/mission\\_pages/cassini/main/index.html](http://www.nasa.gov/mission_pages/cassini/main/index.html)

Curiosity (Mars): [http://www.nasa.gov/mission\\_pages/msl/index.html](http://www.nasa.gov/mission_pages/msl/index.html)

Dawn (4 Vesta and Ceres): [http://www.nasa.gov/mission\\_pages/dawn/main/index.html](http://www.nasa.gov/mission_pages/dawn/main/index.html)

Hubble Space Telescope: [http://www.nasa.gov/mission\\_pages/hubble/main/index.html](http://www.nasa.gov/mission_pages/hubble/main/index.html)

International Space Station: [https://www.nasa.gov/mission\\_pages/station/main/index.html](https://www.nasa.gov/mission_pages/station/main/index.html)

International Space Station and other satellite visible passes: <http://www.heavens-above.com/>

MAVEN (Mars): [http://www.nasa.gov/mission\\_pages/maven/main/index.html](http://www.nasa.gov/mission_pages/maven/main/index.html)

Messenger (Mercury): [http://www.nasa.gov/mission\\_pages/messenger/main/index.html](http://www.nasa.gov/mission_pages/messenger/main/index.html)

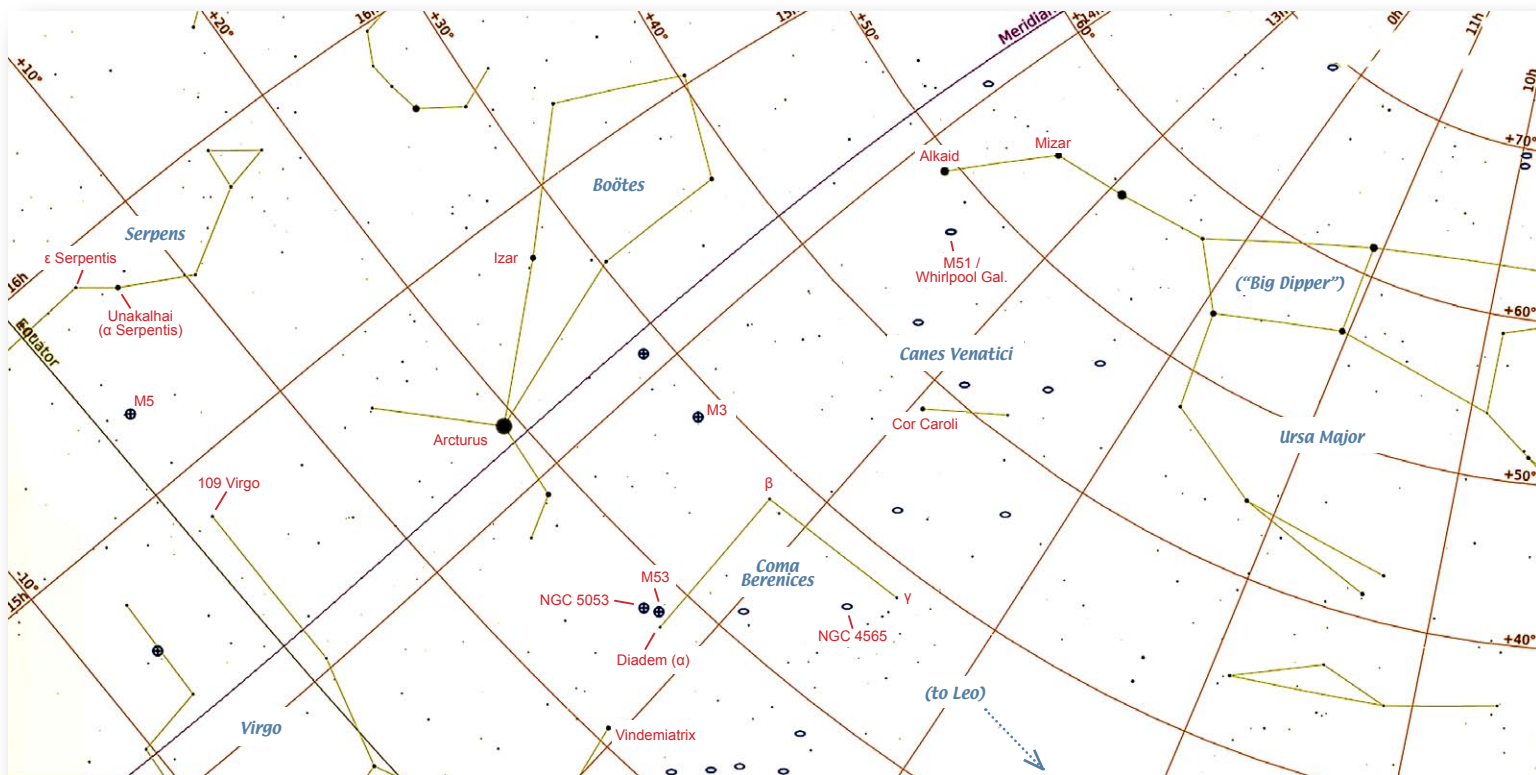
New Horizons (Pluto flyby; the closest approach is scheduled for July 15, 2015): [http://www.nasa.gov/mission\\_pages/newhorizons/main/index.html](http://www.nasa.gov/mission_pages/newhorizons/main/index.html)

Rosetta (Comet 67P/Churyumov-Gerasimenko): [http://www.esa.int/Our\\_Activities/Space\\_Science/Rosetta](http://www.esa.int/Our_Activities/Space_Science/Rosetta)

Spirit and Opportunity rovers (Mars): [http://www.nasa.gov/mission\\_pages/mer/index.html](http://www.nasa.gov/mission_pages/mer/index.html)

If you're interested in the missions that study our Sun, a handy overview with useful links is available at <http://www.planetary.org/explore/space-topics/space-missions/missions-to-study-the-sun.html>.



JUNE SKIES *Continued from Page 1*

Map of the southern sky, mid-June at 10:30 p.m., viewing roughly southwest and 65° up. (Note Meridian line, near Arcturus, showing true South in sky.) This map contains all of the objects mentioned in “June Skies,” except Porrima, (γ) Gamma Virginis, which would be off the map, roughly below and left of Vindemiatrix. (Porrima is plotted in the chart for “Getting Your Bearings,” on p. 4.)

Chart produced with Stellarium software under GNU license, and then enhanced in Photoshop and InDesign.

the deep, galaxy-filled space beyond it. As we look eastward, towards our own Milky Way, the view contains more and more of its clusters, star clouds and nebulae—and especially towards our galaxy’s center, globular clusters. (By the time we get to the Scorpius-Sagittarius region next month, there’ll be so many objects, it will often be hard to tell one from another for all the crowding, and the view outward to other galaxies will become obscured.)

This month, then, we’ll look at a few beautiful galaxies while they’re still easy to see, check out some “early” globulars that show up in our sky before the multitudes (and which might get missed in the rush to see those nearer the galaxy’s center), and stop for a look at some beautiful binary stars.

We’ll do the binaries first, since some of them, like Cor Caroli, will be useful in finding the other objects we’re looking for. This star, also known as (α) Alpha Canum Venaticorum, is a beautiful blue-and-white pair, easily split in a 6-inch scope—even on lousy nights of poor seeing in Denver! The brightest star in Canes Venatici, Cor Caroli shines at mag. 2.8, with 19 seconds of arc between the two components. At an estimated distance of 110-120 light years, depending on whom you ask, the physical separation between the pair is in the range of 700 astronomical units (AU)—compare that to Pluto’s 40 AU average distance from the sun!

Cor Caroli can be found by making a rough right angle off the end of the Big Dipper’s handle (the Dipper is high in the northwest sky at nightfall now) and heading south towards the constellation Leo. It’s the first bright star you’ll find in that direction, at about the same distance from Alkaid (the star at the end of the handle) as the handle is wide.

The next binary of note is Porrima, also known as (γ) Gamma Vir-

ginis. Porrima is easy to find when using the star Spica to get you started—if you’re not familiar with this part of the sky, see “Getting Your Bearings,” in this issue. Porrima is worth a look because of its two stars’ highly elliptical orbit—having passed their closest approach a few years ago, they’re still a rather tight pair, but will keep drawing apart over the next several years. If you look now, you’ll have a baseline for comparison in the future, and a chance to *experience* stars orbiting each other over time.

The last binary on our tour is Izar, (ε) Epsilon Boötes. You’ll find it about 10° northeast of Arcturus (which, if you’re lost, is also in “Getting Your Bearings,” and very easy to find). In a telescope, Izar is a wonderful turquoise-and-orange pair, with a catch—you’ll need some experience and well-collimated optics to split the two. Their separation of 2.6 arcseconds makes it tough, but so does the difference in magnitudes—the blue star is easily lost in the bright orange star’s glare. It will take a steady night and a fair amount of patience to split them, but when you do, ahhh...

Moving into the deep sky, M3, at 13h 40m, +28°, is a blazing beauty of a globular cluster! It’s among the brightest in Denver’s sky, and rivals M13, the famous Hercules Cluster, for sheer impact. Visible during winter in the wee hours, the time (and outside temperatures) for viewing are much nicer now—you’ll find it high in the south, where it’s at its best, around 10:30 at the beginning of June.

If your scope has a computer or setting circles, M3 is an easy object—if not, you’ve got a fighting chance to find it by using a telrad to rough out the location, and then pulling it in with a finderscope. To do this, point the telrad halfway between Cor Caroli and Arcturus, and then nudge it *slightly* towards the latter—M3 should be in your

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finderscope (see accompanying map). The good news is that both Cor Caroli and Arcturus are very bright and easy to use for estimating the line between them; the bad news is it's still a big jump to make—be an artist and feel your way forward, and good luck!

If there's a cluster that can top M3, though, it's M5, located at 15h 19m, +2°, between Virgo and Serpens. Easily visible in a 6-inch scope, and stunning in a 10- or 12-inch, M5 is definitely worth a look. Unfortunately, it may be difficult for inexperienced star-hoppers to find—if you have a plain dobsonian scope, without a computer, the guiding stars for locating M5 with a telrad are dimmer and less obvious in the sky than M3's. On the other hand, at least they're 1/3 closer together than Cor Caroli and Arcturus are.

If you want to try, M5 is centered between 109 Virginis (the westernmost star in Virgo's top leg) and (ε) Epsilon Serpentis, and just below the line drawn between those two stars. (Look for Epsilon just below (α) Alpha Serpentis, the mag-2.6 orange star also known as "Unukalhai.") A detailed star chart will be a big help here.

If your scope has an equatorial mount, but no computer, try centering Zubeneschamali, aka (β) Beta Librae, and moving a little over 11° northward in declination—M5 should be in your finderscope. (α) Alpha and (β) Beta Librae are both bright stars making up part of a fairly obvious triangle east of Spica, so β Librae shouldn't be too hard to find.

Unlike M3 and M5, M53 (13h 14m, +18°) isn't a huge showboat, but it does have a beauty of its own, and an interesting dimmer companion globular, NGC 5053, about 1° away. M53 is also relatively easy to find with a telrad and/or finderscope, since it's just a degree northeast of a 4th-magnitude star—(α) Alpha Comae Berenices, also known as Diadem. Centering Diadem in your finderscope will include M53 in the finder's field of view; for the telrad folks, **at 10:30 p.m. in the beginning of June**, putting Diadem at the "5 o'clock" position on your telrad's middle (2°) ring (with the ground towards 6 o'clock) should place M53 inside an average telescope's low-power field. By month's end, you'll need to shift Diadem over to the 6 o'clock position, but the trick will still work. (More generally, you can find M53 anytime by noting that it's a 45° angle off the line between (α) Alpha and (β) Beta Comae Berenices—*there's more on finding these stars below.*)

Finally this month, two spectacular galaxies—one you've heard of, and one you may not have: M51 and NGC 4565. The first, M51, or the Whirlpool, is a face-on spiral with a smaller companion; you might see the spiral structure with an 8-inch scope on a good night (perhaps even a 6-inch), and it's a very rewarding visual target in a 10-inch or larger instrument! If you've not visited M51 before, it's just a telrad-circle away from Alkaid.

To find M51, start at Mizar, the famous bend in the Big Dipper's handle, head to Alkaid at the end of the handle, and make a right-angle turn *southward* from Alkaid to the Whirlpool—that is, roughly towards Cor Caroli. Since there's about 3½° of sky between Alkaid and M51, if you position the outer (4°) telrad circle on Alkaid with the line to M51 down its center, the galaxy should fall within the circle, and inside your finderscope. For better accuracy, try aiming the telrad's innermost circle along that same southward right-angle line, but place it about half the distance from Alkaid as Alkaid is from Mizar—whichever trick

gets you to M51 most easily is the "right" one.

NGC 4565, the Needle Galaxy, is our last official destination this month; it's a large and bright *edge-on* spiral galaxy that makes a wonderful complement to M51's face-on view. The Needle is at 12h 37m, +26° in Coma Berenices, just 3° from the gamma (γ) star, along the line back to (α) Alpha Comae Berenices, aka Diadem (directions to the



M51, The Whirlpool Galaxy, and its companion, NGC 5195. Image © Sorin

constellation momentarily). If you're familiar with the constellation, consider its "right-triangle" shape, imagining the alpha (α) and gamma (γ) stars as its base—then move the middle of the telrad along that base until Gamma is on the outer telrad circle, on the side opposite Alpha. (To roughly center the galaxy, slide the telrad an extra degree toward Alpha—the distance between the outer and middle telrad circles. If you have it right, Gamma will now lie *outside* the telrad circle, farther from Alpha by about the same distance as the gap between inner and middle rings. Again, whichever approach is easiest for you is best.)

To find Coma Berenices itself, head to Arcturus, then look westward for three 4th-magnitude stars, (α) Alpha, (β) Beta, and (γ) Gamma, that form a right triangle. You'll see (α) Alpha—Diadem—a little less than halfway between Arcturus and Denebola (the westernmost star in Leo the Lion's haunches); (β) Beta and (γ) Gamma lie a similar distance south of Cor Caroli. Keep in mind that at 4th magnitude, Coma's main stars are usually wiped out by city lights... Out in the country, though, the pattern is easily identifiable once you know where to look—and there are *lots* of galaxies in its neighborhood!

— See you next month.





The globular cluster Messier 5, in the constellation Serpens. The finished picture was created from images taken with Hubble's Advanced Camera for Surveys through a blue filter (F435W, coloured blue), a red filter (F625W, coloured green) and a near-infrared filter (F814W, coloured red). The total exposure times per filter were 750 s, 400 s and 567 s, respectively. The field of view is about 2.6 arcminutes across.

*Image Credit: ESA/Hubble & NASA*

