

# Down Under from North Florida

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*Challenge yourself and look for deep southern celestial objects.  
One of them, Omega Centauri, is a true jewel of the heavens*

**S**ome star gazers say **Southern Skies bedazzle, its magnificence shining with celestial jewels not visible from northern regions of our planet.** Unfortunately, these skies remain invisible to many of Earth's peoples. For example, residents of Earth's north polar regions see only about half the celestial firmament. Here stars appear to circle slowly about the zenith of the heavens where the sky's pole of rotation resides. But few people live here.



**Fig. 1. Canopus.** The sky's second brightest star is difficult to observe from north of Florida latitudes. However, the star is easily seen with careful planning. Here *Canopus* hovers low, only 6 degrees high, between trees over the southern horizon. Photograph taken from southwest of Gainesville, Florida on an early evening in late March 25, 2012.

Of course, more of the sky becomes visible as one travels south with most of the sky observable from Earth's equatorial tropics. Nevertheless, most of our planet's land masses reside in the northern hemisphere where nearly 90 percent of Earth's humans live. Moreover, about 50 percent of all people live north of 27 degrees latitude, the approximate distance of South Florida from the equator (Cartographer, Bill Rankin 2008).

Consequently, many southern sky splendors remain hidden to the world's populations. However, people living in extreme southern mainland USA latitudes have a distinct advantage over their more northern neighbors. Although celestial objects as the "Big Dipper" swing low over the north horizon in northern subtropical latitudes, the brilliant southern sky with its spectacular summer Milky Way more than compensates. These southern skies provide an easy view of many beautiful galactic star clouds and clusters.

Actually, with some effort, southern objects inaccessible to more northern latitudes can be viewed even from North Florida

including Gainesville, 29.6 degrees from Earth's equator. (The only other region of the mainland USA with this advantage is southernmost Texas including Houston and San Antonio.)

No, one cannot see the *Magellanic Clouds* from Florida including the enormous *Tarantula Nebula* or the magnificent *47 Tucanae* globular cluster. Yet with careful planning, several interesting and beautiful southern sky objects can be found in far southern skies.

For example, the sky's second brightest appearing star, **Canopus** (*Alpha Carinae*), remains invisible from most of USA locations. Residents as far south as Atlanta, Georgia would have difficulty spotting this star. Here *Canopus* only reaches a maximum altitude of about 3-1/2 degrees over this southern city's south horizon. Even many Floridian star gazers have never seen this "mysterious star" that rises but 23 degrees east of south and reaches a peak altitude of only 7.4 degrees just three hours later over North Florida. However, astute Gainesville area residents can easily spot this bright star low over the southern winter horizon with careful planning. **See Figure 1.**

**Note:** Atmospheric extinction may dim *Canopus* (mag. -0.62) by one or two magnitudes, which therefore unfortunately belies its actual brilliance. Still, *Canopus* is only one of four nighttime stars with negative apparent magnitudes — the others being brighter *Sirius* (-1.44), and less bright *Arcturus* (-0.05) and *Rigel Kentaurus* (-0.01), also known as *Alpha Centauri*. (Magnitudes from *Observer's Handbook* 2015.)

In addition, one of the heavens most spectacular deep sky objects, especially in moderate sized scopes, is **Omega Centauri** (NGC 5139). This gorgeous globular cluster in the constellation of *Centaurus* is usually thought to be out of reach from the mainland USA due to its large southern declination of 44.7 degrees). In fact, one typically hears this cluster is only visible to southern observers. (The cluster's name, reminiscent of a star name, results from this object being misidentified as a star in ancient times.)

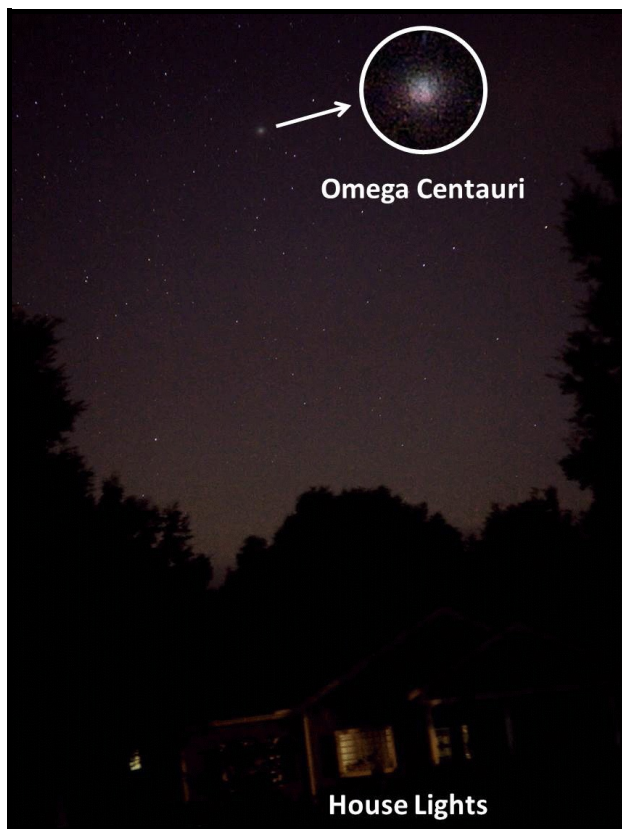
Not so. This brightest of all observable globular clusters can be seen even from North Florida by knowledgeable sky watchers. Indeed, I mentioned this fact at several recent Alachua Astronomy Club meetings, though some may have been skeptical. Sure enough, at the 2015 May 16 club star party at Newberry Star Park, many people were treated to its glorious appearance in several telescopes.

To demonstrate this point further, I tried to photograph this cluster one week later from my home, although my house lies only six miles southwest of the University of Florida Cultural Plaza. Unfortunately, from my back yard both my house and trees block the deep southern horizon, which, nevertheless, is moderately dark since Kanapaha Prairie lies to the south. However, from my driveway I found a convenient dip in the tree line through which I found the cluster would pass in late evening.

Skies, however, remained partly cloudy with considerable haze and a murky horizon a week after the Newberry Star Party. Anyway, I was determined to try it.

Using a three-inch, 480 mm focal length refractor telescope, I managed to find and image the cluster although visibility was low and southern stars soon became hidden by the misty

sky. I tried again the next night but used only my camera with a lens set 115 mm focal length to picture the cluster in the surrounding sky. Although sky transparency was again poor, I was moderately successful.



**Fig. 2. Omega Centauri Swings Low.** This southern hemisphere globular cluster appears only 13 degrees high against the faint stars of *Centaurus* in this picture. This beautiful cluster is not difficult to find with a clear sky and an unobstructed south horizon even from North Florida locations. Although skies were very murky when this photograph taken, the cluster was still readily visible on this late evening, 2015 May 23. The inset shows an enlargement of the cluster made from this photo taken with a DSLR camera and a lens set at 115 mm focal length. (Image trimmed from original.) Also see next figure made with a small refractor telescope.

These images (**Figures 2 and 3**) show this magnificent cluster is easily viewed from North Florida despite its large southern declination of south 48 degrees.

This is good time of year to spot this most beautiful cluster from North Florida. (See chart in **Figure 4**.) In June, for instance, *Omega Centauri* reaches its maximum altitude (approximately  $13^\circ$ ) in early evening when it transits the meridian. (The faint constellation of *Centaurus* lies about 40 degrees west of the body of *Scorpius*.) A medium-size telescope (say 10 to 18 inches aperture) should show this globular cluster brimming with its uncountable gem-like stars.

Now, want a really severe challenge?

Look for some stars in the small but distinctive constellation of *Crux* ("The Southern Cross"), which lies near the southwestern boundary of *Centaurus*. Yes, I said the "Southern Cross" normally only associated with Earth's southern hemisphere! The northernmost bright stars of *Crux* are potentially visible from the Gainesville area. **Gamma Crucis**, at magnitude +1.6, transits the celestial meridian at an altitude of only 3.2 degrees.

Difficult? Yes, but perhaps possible with a *very clear*, unobstructed south horizon. Yet be warned that extinction by Earth's atmosphere may dim the star by several magnitudes.

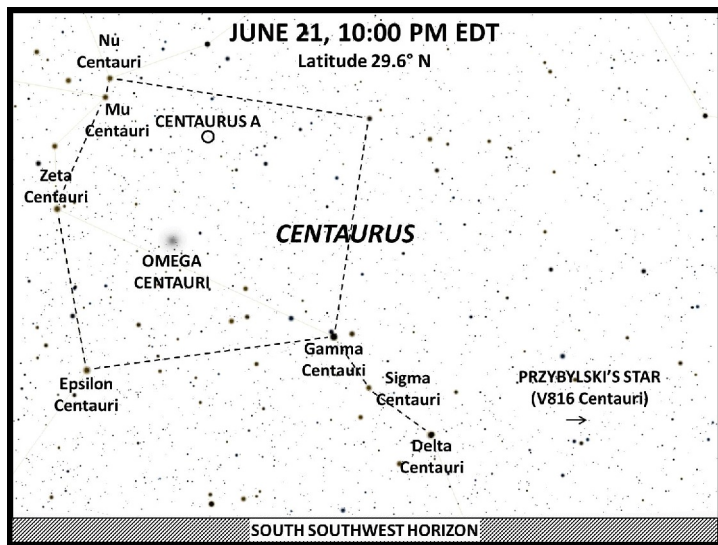
**Beta Crucis**, is slightly brighter at magnitude +1.2 and is really one our first magnitude stars. However, many are unfamiliar with this star since its peak altitude is a mere 0.7 degrees for residents of North Florida! However, if one likes doing the impossible, try it remembering our atmosphere will again severely dim the star. If one can spot this star from North Florida, this will be truly one for the books! (However, the constellation's brightest star, **Alpha Crucis**, at magnitude +0.8, never rises above the North Florida horizon.)





**Fig. 3. Omega Centauri.** Although this photograph was made with only a three-inch telescope under very murky skies, the image resolves the brighter stars in this exquisite and brightest of all globular clusters. Photograph taken 2015 May 22 in late evening. (Images trimmed from original.)

thus also called **Centaurus A**. Photographs show an apparent elliptical galaxy but the galaxy is bisected by strange dark band. Being the fifth brightest in the sky, NGC 5218 looks like an amorphous glob in small scopes but large instruments should show the dark lane. Look for this unusual galaxy about four degrees north of the *Omega Centauri* globular cluster in clear skies (**Figure 4**).



**Fig. 4. Finding Chart.** Chart shows part of the constellation of *Centaurus* with the *Omega Centauri* globular cluster. The positions of the peculiar radio galaxy *Centaurus A* and *Przybylski's Star*, a magnitude +8.0 star with perhaps the most unusual known stellar spectrum. (See text.) Chart was specifically made for a North Florida mid-June evening but should be useful for other locations and times.

a confounding name, **Przybylski's Star** or **HD 101065** (also designated **V816 Cen** due to its variable brightness). This star transits the meridian at nearly the same altitude as *Omega Centauri* but this star is about 18 degrees west of the cluster (**Figure 4**).

And what about the famous but enigmatic **Eta Carina** and its nebula? Sorry, this massive, extremely luminous star system and its curious nebula are out of reach from North Florida. Here it just barely touches the south horizon and is *circumpolar* at latitude 30° south. Likewise the stunning "**Jewel Box Open Cluster**" (NGC 4755), with its precious colored stars in *Centaurus*, unfortunately lies at a similar, unreachable southern declination of 60 degrees south.

However, *Centaurus* contains several other intriguing objects that are reachable from North Florida latitudes. **NGC 5218**, one of the most interesting and peculiar galaxies, is a strong source of radio radiation and

If *Centaurus A* is too challenging, try finding **M83** ("The Southern Pinwheel Galaxy"), one of the closest and brightest barred spirals. Within *Hydra* above the *Centaurus* constellation, M83 crosses North Florida's southern horizon about 30 degrees high so is easily reachable from many USA locations.

Finally, some celestial objects are not striking for their breathtaking appearance but notable for their history, uniqueness, strangeness, mysterious nature or baffling features.

So after observing *Omega Centauri*, turn your attention to a nearby perplexing object, an apparently nondescript 8th magnitude star with

Discovered in 1961 and named for its discoverer, the Polish-Australian astronomer Antoni Przybylski (1913–1984), some say this star *has the most unusual of all stellar spectra!*

Spectral lines originally suggested HD 101065 had features of a solar spectrum but also had very strong lines of *ionized lanthanides*. However, the apparent absence of spectral lines of iron, common in cooler stars like the Sun, was a puzzle.

**Note:** *Lanthanides* are metallic elements with atomic numbers 57 through 71. (Atomic number is the number of protons in the nucleus.) They are included in a set of elements known as “rare earths,” elements not necessarily rare but generally not highly concentrated in minerals. *Ionization* refers to the atom having lost one or more electrons.

Later work suggested this star was a much hotter, peculiar type star (designated spectral type **Ap**) but such hot, peculiar stars typically have noticeable lines of iron. The conundrum deepens because the star’s color suggests a solar temperature inconsistent with the supposed spectrum of a hotter star. Research on the peculiar nature of this star’s spectrum remains active.

Find Przybylski’s Star, show it to your friends and have fun trying to pronounce its name!

**Hint:** Pronounce *Przybylski* as “jebilskée”, with the “je” as if it were in French. The initial “P” gets minimal sound according to the astronomer, Mike Bessell.

Although many southern bedazzling celestial objects are out of reach for most mainland USA locations, rejoice knowing that some southern objects as the stunning *Omega Centauri* cluster are partial compensation for not seeing other southern celestial jewels.

Good hunting.

☐

## Appendix

Larger jpg images of all figures are available through these links:

<b>Fig. 1.</b> Canopus	<a href="http://goo.gl/kWa7Z1">http://goo.gl/kWa7Z1</a>
<b>Fig. 2.</b> Omega Centauri Swings Low	<a href="http://goo.gl/wc92Vg">http://goo.gl/wc92Vg</a>
<b>Fig. 3.</b> Omega Centauri	<a href="http://goo.gl/EQnbax">http://goo.gl/EQnbax</a>
<b>Fig. 4.</b> Finding Chart	<a href="http://goo.gl/BHb2in">http://goo.gl/BHb2in</a>

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