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# Astronomy

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# AN OBSERVER'S GUIDE STAR



OLGA POPOVA/DREAMSTIME

**MANY READERS OF** *Astronomy* can point back to televised science fiction as their first introduction to the universe. For some — like me — it was *The Outer Limits*, which had a brief run starting

in 1963. Others may have been influenced by *The Twilight Zone* (1959), *Lost in Space* (1965), or *The Invaders* (1967).

By far, however, the TV show that gave the most astronomy buffs their start exploring space was *Star Trek*, which began a three-season run at 8:30 P.M. EDT on Thursday, Sept. 8, 1966. This groundbreaking television



The *Enterprise* has visited many star systems on its voyages. Here's how to see some of them for yourself.

BY MICHAEL E. BAKICH

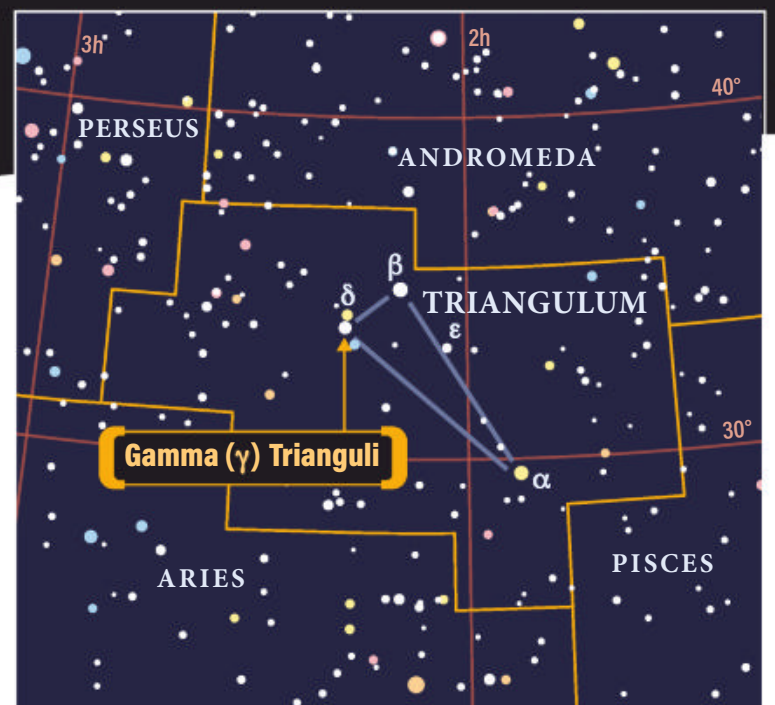
# TO TREK

show was followed by *Star Trek: The Next Generation* (1987), *Star Trek: Deep Space Nine* (1993), *Star Trek: Voyager* (1995), *Star Trek: Enterprise* (2001), *Star Trek: Discovery* (2017), and *Star Trek: Picard* (2020), along with various movies, animated series, and lots of books and comics.

During the five and a half decades that followed the first show, now often referred to as *The Original Series*, the *Enterprise* has visited hundreds of planets. Of

course, each one originated in some writer's imagination. But I wondered how many of those destinations were placed in a star system visible in our sky. A lot, it turns out. I stopped counting at 50.

What follows is a list that combines some of the brightest stars in our sky with several not-so-bright ones, all of them important in the *Star Trek* universe. The next time you look at one of these stars, let your mind drift back to 1966, when people — through their television sets — voyaged to distant worlds. Indeed,



TOP: Starting with the NCC-1701, the *Enterprise* carried crews to far-flung worlds throughout the galaxy. Many of these star systems are observable right from your backyard. MARY EVANS/AF ARCHIVE/CINETEXT BILDARCHIV/EVERETT COLLECTION

ABOVE: The *Enterprise* once visited the faintest of the three stars outlining the constellation Triangulum, Gamma Trianguli, discovering a world ruled by the supercomputer Vaal. ASTRONOMY: ROEN KELLY

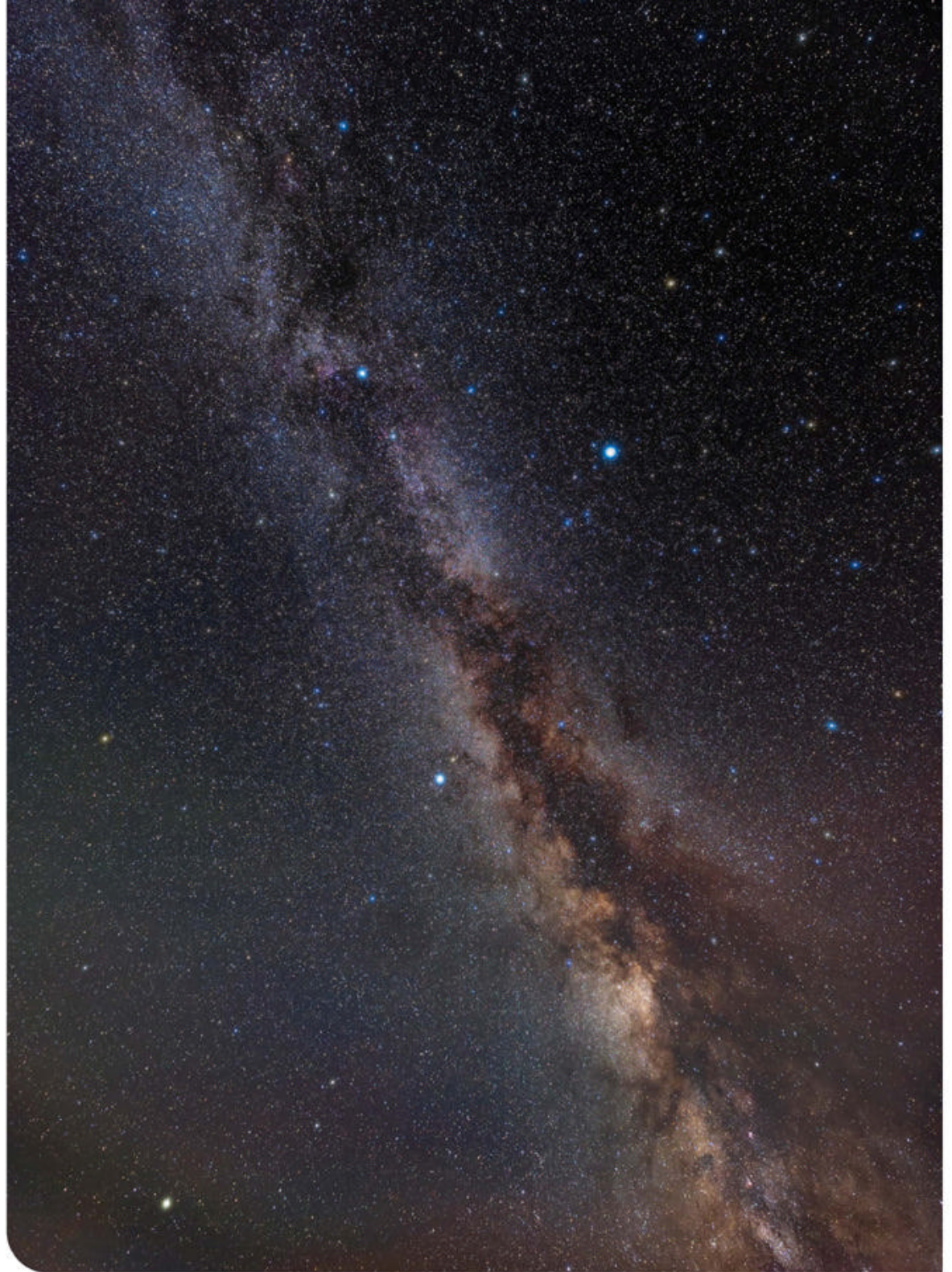
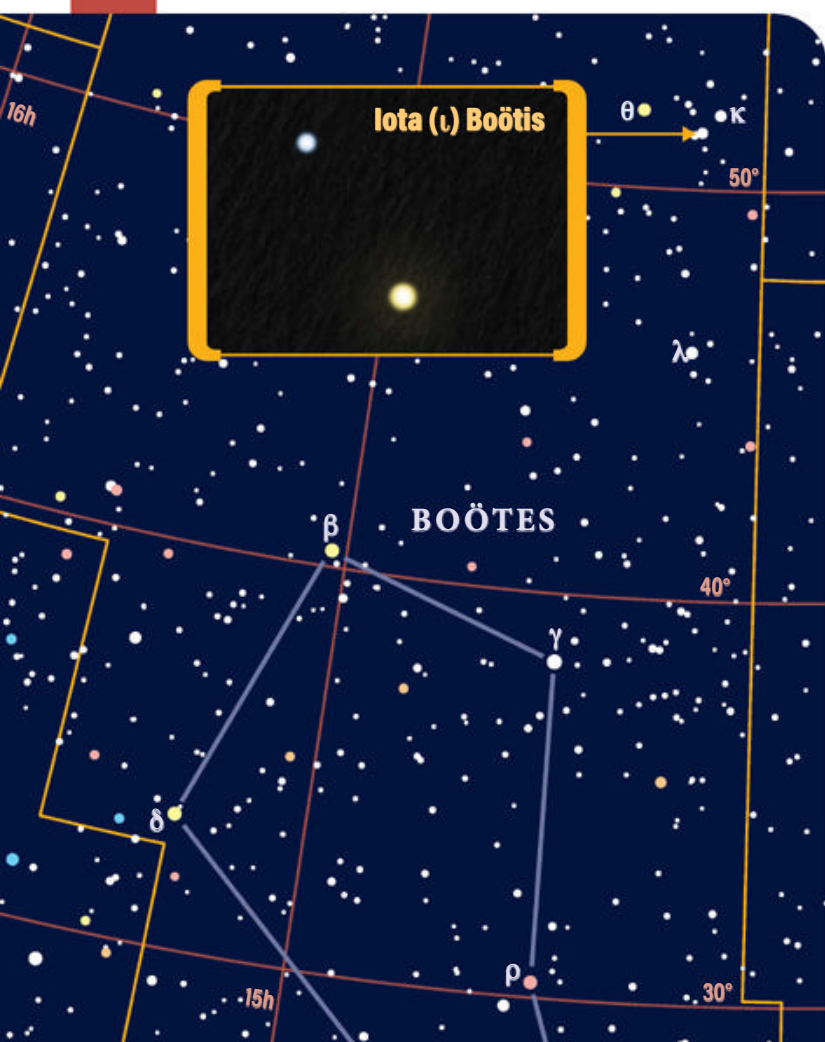
with all the recent exoplanet discoveries, it's not hard to imagine that an alien civilization might exist where no one has gone before, on a planet revolving around one of the stars of *Star Trek*.

### Strange new worlds

Besides Earth, probably the most important planet in *Star Trek* is Vulcan, homeworld of Mr. Spock. Early on, some official reference books listed magnitude 3.7 Epsilon ( $\epsilon$ ) Eridani as the star around which it orbited. During an episode of *Enterprise*, however, Chief Engineer Tucker states that Vulcan is 16 light-years from Earth. And Epsilon Eri is only 10.5 light-years away.

Current *Trek* star maps place Vulcan in the **Omicron<sup>2</sup> ( $\omicron^2$ ) Eridani** system. This triple star, also known as Keid and 40 Eri, is some 16.3 light-years from Earth. Its primary glows at magnitude 4.4. To find it, look 15° west of Rigel.

The brightest star visited by any *Star Trek* crew on television or film is **Canopus** (Alpha [ $\alpha$ ] Carinae), which observers can spot from the southernmost states. Shining at magnitude  $-0.7$ , it's the second-brightest star in our night sky. It featured in *The Original Series* episode "The Ultimate Computer." In



**ABOVE:** The Summer Triangle is a familiar warm-weather asterism comprising the bright stars Vega, Deneb, and Altair. Fictional worlds circling each of these three stars are featured throughout *Star Trek*. ALAN DYER

**FAR LEFT:** The star Iota Boötis is known in *Star Trek* as Denobula Triaxa. As its name might indicate, this was once believed to be a trinary system; astronomers now suspect the third star is not associated with the binary. ASTRONOMY: ROEN KELLY. INSET: JEREMY PEREZ

**LEFT:** The *Enterprise's* transporter allows crew to quickly move from the ship to the worlds of any star system they're visiting. EMILY743/DREAMSTIME

the episode, which takes place in 2268, the scientist Richard Daystrom installs a tactical computer aboard the *Enterprise*. The device can control the ship with some 5 percent of its normal crew. Its first task is to survey the inhabited planet Alpha Carinae II.

Note that the brightest nighttime star, Sirius (Alpha Canis Majoris), also has a planetary system whose members served as settings for stories, but only in *Star Trek* books or video games.

The third-brightest star in our sky, **Alpha Centauri**, is a triple system that's famous as the nearest star system

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279		89	6589	6547	6587	3465	867	2347	5762	4588	05
8967248	7	9798	8969	476	9047	8476	9748	8992	8969	0247	89
3478	8	867	346	34	48	49	8	89	897	38	
898990	8	200	285	923	9	387	238	578	1975	87	9
947589	7	569	68	678	893	56	584	678	475	458	4

3465	0646	9798	969	29
867	2347	5762	4588	05
9748	8992	8969	0247	89
8	89	897	38	
238	578	1975	87	9
584	678	475	458	4

to our own. It's also famous in the *Star Trek* universe, hosting no less than 22 planets. Thirteen of them circle Rigil Kentaurus (Alpha Cen A), five orbit Alpha Cen B, and four more travel around Proxima Centauri (Alpha Cen C).

What's more, three of these planets are populated. Including outposts and space stations, this system supports some 21 billion inhabitants. When you spot Alpha Centauri (only visible from latitudes south of 30° north), imagine how cool it would be if, in reality, any planets around those stars contained the simplest form of life, let alone intelligent life.

Our next entry is one that requires some searching to see. In the *Star Trek* universe, more than 150 planetary civilizations belong to a democratic society known as the United Federation of Planets. Such a body often needs neutral ground for negotiations: a planet named Babel, which orbits the star **Wolf 424**.

This star, also known as FL Virginis, is a system of two red dwarfs a bit more than 14 light-years away that together glow just brighter than a meager 13th magnitude. You'll need an 8-inch or larger scope, a dark site, an excellent star chart (or software), and lots of patience to track it down. But for a true fan of *Star Trek*, that's a small price to pay to spot a star whose planet has two episodes — "Journey to Babel" and "Babel One" — named for it.

The stellar moniker Menkar may not be familiar to *Star Trek* fans. But call this star **Ceti Alpha**, and it will immediately conjure up the image of Khan Noonien Singh. This character first appeared in *The Original Series* episode "Space Seed," and then in the movies *Star Trek II: The Wrath of Khan* and *Star Trek Into Darkness*.

Though referred to in *Star Trek* as Ceti Alpha, a luminary that has at least six planets in orbit, it's more correct to call this star Alpha Ceti. However, *Star Trek's* writers aren't the only ones to break convention regarding the star's designation. The alpha star is usually the brightest star in a constellation. Not in Cetus the Whale, though. That honor goes to Diphda (Beta [β] Ceti), which, at magnitude 2.0, is 58 percent brighter than magnitude 2.5 Alpha. Both stars are easy



**ABOVE and LEFT:** Small, furry, and fast-multiplying, Tribbles hail from Iota Geminorum. TRIBBLES: PARAMOUNT/COURTESY EVERETT COLLECTION. CHART: ASTRONOMY: ROEN KELLY

**BELOW:** A stamp shows the *Enterprise* en route to new worlds and new stars. OLGA POPOVA/DREAMSTIME



to spot in the Northern Hemisphere's autumn sky.

### Three to beam up

A triad of stars well known to amateur astronomers is the Summer Triangle: **Vega** (Alpha Lyrae), **Altair** (Alpha Aquilae), and **Deneb** (Alpha Cygni). In *Star Trek*, Vega hosts at least nine planets, the main one being Vega IV with a mostly human colony of nearly 5.8 billion inhabitants. This system is referenced in *The Original Series* episode "Mirror, Mirror." Captain James T. Kirk learns that one of the first actions his mirror

counterpart took after assuming command of the *Enterprise* (via assassination) was to execute 5,000 colonists on Vega IX.

Now, on to Altair. The most famous planet in the Altair system is Altair VI. In *The Original Series* episode "Amok Time," the *Enterprise* is headed to this planet to attend the inauguration of its new president when it has to divert to Vulcan for Spock's mating ritual.

In *Star Trek*, the name Deneb is used to refer to the "true" Deneb (Alpha Cygni) and also as shorthand for Deneb Kaitos, which is another name for the star Diphda in Cetus. The latter has no



ABOVE: On a galaxy-class starship, navigation to new star systems takes place at the conn. JOSE TERRERO/DREAMSTIME

LEFT: Magnitude 5.3 61 Uma is famous in *Trek* lore for hosting the planet Archer IV — the first Earth-like, or M-class, planet discovered by humans. You can find it with the naked eye from a dark site. ASTRONOMY: ROEN KELLY

less than six planets, while the former hosts nine planets, the most important of which are Deneb II and Deneb IV. This second world is the site of Farpoint Station, where the crew in the very first *The Next Generation* episode, “Encounter at Farpoint,” meets the ultra-powerful being known as Q.

### Tribbles, the Borg, and Denobulans, oh my!

Midway on the sky between the Andromeda Galaxy (M31) and the Pleiades (M45), you’ll find the tiny constellation Triangulum. Of its three brightest luminaries, the least apparent is 4th-magnitude **Gamma (γ) Trianguli**. In *The Original Series*, the *Enterprise* visited the planet Gamma

Trianguli IV during the episode “The Apple,” finding a civilization controlled by a supercomputer named Vaal.

Every *Star Trek* fan — and probably



most non-fans — have heard of Tribbles, which debuted in “The Trouble With Tribbles” in the second season of *The Original Series*. Brought aboard the *Enterprise* by merchant Cyrano Jones, they nearly overwhelmed the ship’s operations. The homeworld of the furry creatures is Iota Geminorum IV, whose central star, **Iota (ι) Geminorum**, glows at magnitude 3.8 about 4.5° from both Castor and Pollux.

On the other end of the brightness spectrum from most of the stars I’ve mentioned, **Wolf 359** is incredibly faint. Although it lies less than 8 light-years away, this red dwarf glows meekly at magnitude 13.5. Wolf 359 lies in southern Leo, almost directly on the ecliptic. In *The Next Generation* two-part episode “The Best of Both Worlds,” a disastrous battle takes place in this star system between the Federation and the Borg. The real kicker is that the Borg ship is under the

TOP: Khan Noonien Singh is one of the most infamous adversaries in *Star Trek*. After attempting to take control of the *Enterprise*, he was exiled to — and eventually escaped from — a planet circling Menkar, known in *Star Trek* as Ceti Alpha. PARAMOUNT/COURTESY EVERETT COLLECTION

LEFT: Cetus the Whale, located in the lower portion of this shot, contains two famous *Star Trek* stars. Diphda (Deneb Kaitos) is the bright luminary at right and Menkar (Ceti Alpha in *Star Trek*) is in the lower left of the frame. ALAN DYER

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757	898990	8	200	285	923	9
484	947589	7	569	68	678	893



**TOP RIGHT:** Sirius (at top) reigns as the brightest star in the sky. Coming in second is Canopus, visible just above the horizon in this photo shot in Arizona. Both host planetary systems in *Star Trek*. ALAN DYER

**BOTTOM RIGHT:** Older *Star Trek* texts claimed the planet Vulcan orbited Epsilon Eridani. But current maps place the famous world around 4th-magnitude 40 Eri A, the brightest member in the Keid (Omicron<sup>2</sup> Eridani) system. ASTRONOMY: ROEN KELLY. INSET: GIUSEPPE DONATIELLO

guidance of Locutus — formerly the *Enterprise*'s Captain Jean-Luc Picard, who was captured and assimilated into the Borg collective, losing his individuality and prior allegiance in the process.

Only an observer familiar with the series *Enterprise* will know the planet Archer IV, named for the captain of the NX-01. It's an important one, however: the first M-class (meaning Earth-like and habitable) planet discovered by humans. To see the luminary around which this fictional world revolves, look toward the southernmost part of the constellation Ursa Major. There, you'll find the Sun-like star **61 Ursae Majoris**, glowing at magnitude 5.3 — just bright enough to spot without binoculars from a dark site.

*Enterprise* also gave us the wonderfully named Denobula Triaxa, the star we know as **Iota Boötis**. In fantasy, this is a triple star, but reality shows it is binary. Its components glow at magnitudes 4.8 and 8.3. You can spot them easily through any size telescope because their separation is a worthy 39". They also show a nice color contrast, with a yellow primary and the secondary a blue-white. In *Enterprise*, this system is notable as the homeworld of Chief Medical Officer Dr. Phlox.

## Resistance is futile

As you can see, a lot of stars in our sky — some familiar, some not — have found their way into the lore of *Star Trek*. The next time you encounter one, let your mind wander a bit and consider that the prospect of life in the universe is a lot more possible now than it seemed in 1966. Live long and prosper! 🖖

**Michael E. Bakich** is a contributing editor of *Astronomy* who enjoys early *Star Trek* reruns from his home in Tucson, Arizona.

