

FOR JANUARY 1, 2016

The History of Ceres Is as Weird as the Dwarf Planet Itself

Why There Were Ceres Truthers During the 19th Century

The Strange Story Behind the Discovery of Ceres 215 Years Ago

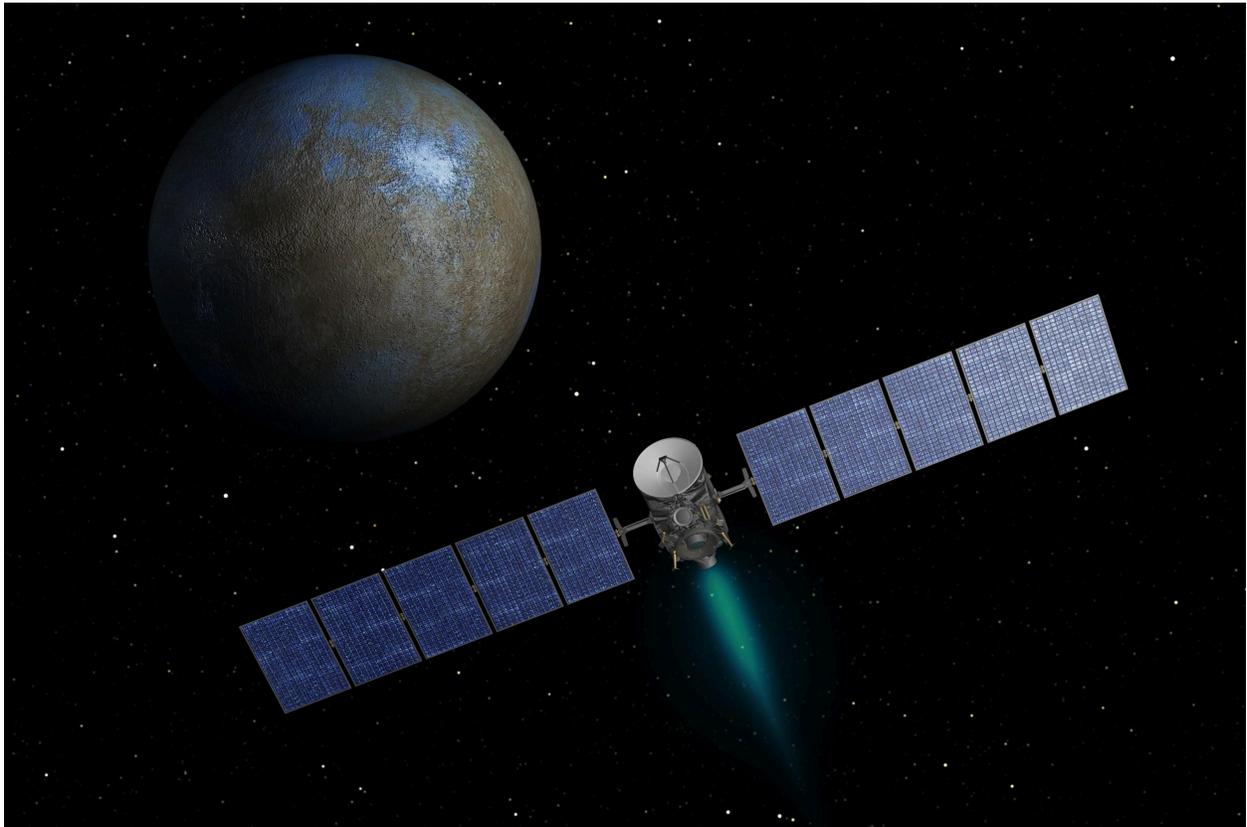
The Tale of Ceres's Discovery Includes Planet Truthers and 'Celestial Police'

How an Italian Astronomer Discovered, Then Lost, the Dwarf Planet Ceres

Piazzini, Gauss, Herschel, and the Discovery of the 'Missing' Planet Ceres

// Even before we knew about its weird bright spots, Ceres had a fascinating backstory.

// The discovery of Ceres is a New Year's story like no other.



Concept art of Dawn visiting Ceres. Image: [NASA/JPL-Caltech](#)

On January 1, 1801, while revellers rang in the dawn of the 19th century with drinks, dance, and song, astronomer Giuseppe Piazzi settled into an evening of star-watching from his world-class observatory in Palermo, Sicily.

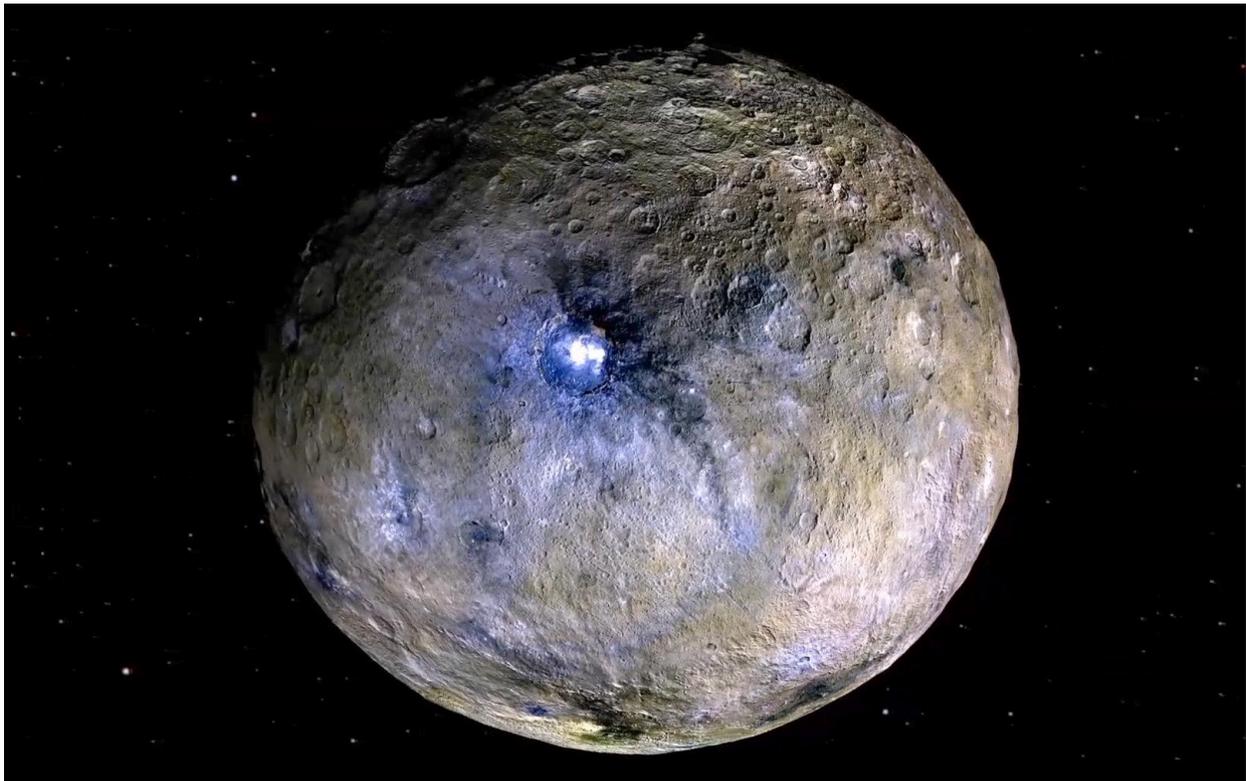
Piazzi was [intent on building](#) the most accurate star catalog in the world, and had already invested well over a decade in pursuit of that goal. The night was shaping up to be one more notch toward this magnum opus when, at around 8PM, Piazzi noted a faint point in the skies he had never seen before.

At first, he thought it might have been an undiscovered star, but when he and his assistant Niccolò Cacciadore tracked its orbit again on successive nights, they realized with delight that it was following a planetary orbit. On January 24, [after several weeks](#) of hawk-eyed nocturnal observation, Piazzzi finally reached out to some of his fellow astronomers about the discovery.

“I dare to write you, impatient as I am to give you [news],” he said [in a letter](#) to his close friend and colleague Barnaba Oriani. “On the 1st of January, I have observed in the shoulder of Taurus a star of the eighth magnitude [...] I have announced this star as a comet, but since it shows no nebulosity, and moreover, since it had a slow and rather uniform motion, I surmise that it could be something better than a comet.”

It was, in fact, “better than a comet.” As it turned out, Piazzzi had discovered the dwarf planet Ceres, the largest object in the asteroid belt between Mars and Jupiter.

That name might ring a bell, because Ceres has been hogging headlines after NASA’s Dawn spacecraft trekked [3.1 billion miles](#) to study it, finally arriving in Ceresian orbit in March 2015. The mission has yielded hundreds of gorgeous, high-resolution shots of Ceres, from its bright salt patches to its hazy daytime weather.



Ceres in false color. Image: [NASA/Dawn](#)

In addition to sending back these sensational postcards from the asteroid belt, the Dawn orbiter has also raised all kinds of questions about its new home. Is Ceres [older than](#) Earth? Is there a

[liquid water ocean](#) under its crust? Could lifeforms [be lurking](#) within those depths? Was life on Earth [seeded by](#) life on Ceres?

This cascade of inquiries perfectly mirrors the huge interest in Ceres in the wake of Piazzi's 1801 discovery. Both then and now, the dwarf planet not only riveted scientists, it prompted them to completely rethink the mechanics of the Solar System.

But where modern researchers are probing Ceres's geology and habitability, the astronomers of Piazzi's era were preoccupied with fielding basic questions about the tiny speck in the night sky. Was it a star, a comet, a planet, a hoax, or something else entirely?

To that point, while Piazzi's initial observation was a happy accident, scientists had actively been looking for an object between Mars and Jupiter ever since the influential astrophysicist Johannes Kepler noted that region was gravitationally wonky in 1596.

In 1800, a group of 24 astronomers joined forces to finally track down this holdout world, giving themselves [the delightful name](#) of "Himmels Polizei," or the Celestial Police. Each member was assigned a 15 degree region of the zodiac to scan for the missing planet.

Piazzi hadn't been invited to join these space cops, but his New Year's Day discovery certainly caught their attention. In fact, Celestial Police member Johann Elert Bode, who was based in Berlin, had the nerve to publicly announce the discovery without Piazzi's permission, and even went ahead and named the new planetoid Hera, after the Greek goddess of marriage and childbirth.

Piazzi was understandably peeved at this presumptuous attitude, especially since he had already named the object after Ceres, the patron goddess of his adopted home of Sicily.

"If the Germans think they have the right to name somebody else's discoveries they can call my new star the way they like," he wrote [in a letter to Oriani](#), dated August 25, 1801. "As for me I will always keep it the name of Ceres and I will be very obliged if you and your colleagues will do the same."



Piazzi's publication on the discovery of Ceres. Image: [Giuseppe Piazzi](#)

But the drama over Ceres did not stop there, and in fact, matured into full-fledged conspiracy theories about whether the planet really existed at all. Yes, there were once Ceres truthers, including the respected French astronomer Jérôme Lalande.

You can hardly blame Lalande and his fellow critics for their skepticism considering that by the time news of the discovery had circulated, Ceres was no longer visible in the skies. Its orbit had brought it into the glare of the Sun, making observation impossible. That, coupled with Piazzi's paranoid secrecy about his data, only stoked rumors that the whole thing was a hoax.

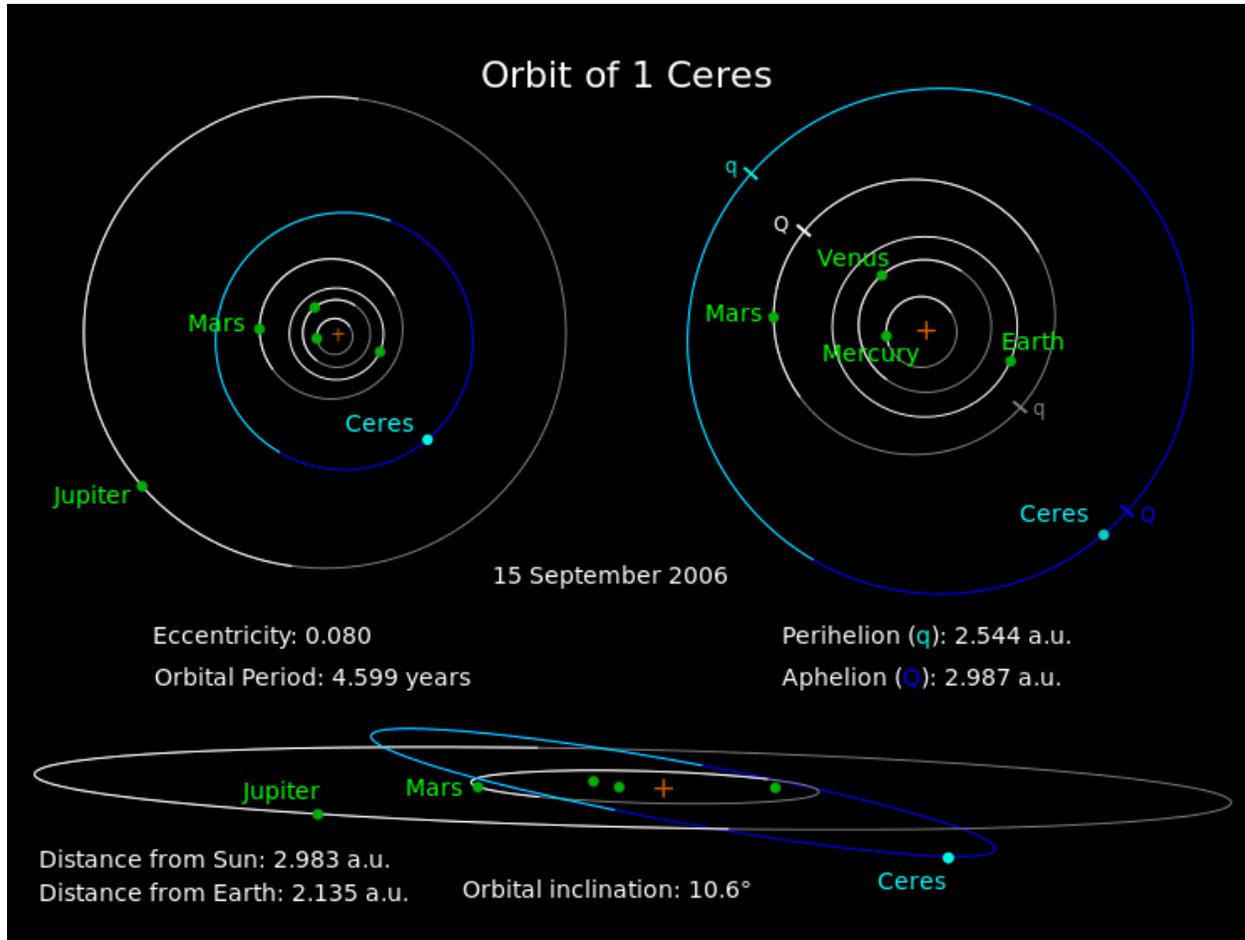
"What is going on with the Ceres?" Baron Franz Xaver von Zach, the founder of the Celestial Police, [wrote to Oriani in a letter](#) dated December 7, 1801. "Nothing has been found as yet either in France or in Germany. Peoples are starting to doubt. Already sceptics are making jokes about it. What is Devil Piazzi doing? Lalande wrote me that [Piazzi] has changed again his observations and that he has made a new Edition of them! What does that mean? Lalande in his letter adds: *This is why I do not believe in the planet.*"

There are a few reasons why Piazzi had been stalling for time when it came to publishing his final observations. One was that he had a rough year healthwise, and had fallen ill for several weeks in the spring of 1801. But the main holdup was that Piazzi wanted to be the first to calculate Ceres's orbit so that he could predict exactly where it would reappear when its orbit drew it out of the Sun's glare.

Alas, Piazzi would not be the one who ultimately found a way to crunch those orbital numbers. In one of history's trademark plot twists, the famous polymath Carl Friedrich Gauss, who was then only 24 years old, stepped up to the plate to figure out where Ceres was headed next. Gauss was really jazzed about cracking this particular nut too, as evidenced [by this passage](#) from his treatise *Theoria motus*.

"Could I ever have found a more seasonable opportunity to test the practical value of my conceptions, than now in employing them for the determination of the orbit of the planet Ceres?" Gauss wrote.

"Nowhere in the annals of astronomy do we meet with so great an opportunity, and a greater one could hardly be imagined, for showing most strikingly the value of this problem, than in this crisis and urgent necessity, when all hope of discovering in the heavens this planetary atom, among innumerable small stars after the lapse of nearly a year, rested solely upon a sufficient approximate knowledge of its orbit to be based upon these very few observations."



Ceres's orbit. Image: [NASA/Orionist](#)

Armed with star maps and math, Gauss did what he was best at—compute the crap out of a problem. Over the course of three months, he plotted out Ceres's orbital trajectory so accurately that von Zach was able to definitively locate it again on December 31, 1801. The dwarf planet found on New Year's Day, then lost in the summer glare, had been rediscovered again on New Year's Eve. History is often messy and unsatisfying, but you have to admit that it doles out a perfect story arc now and then.

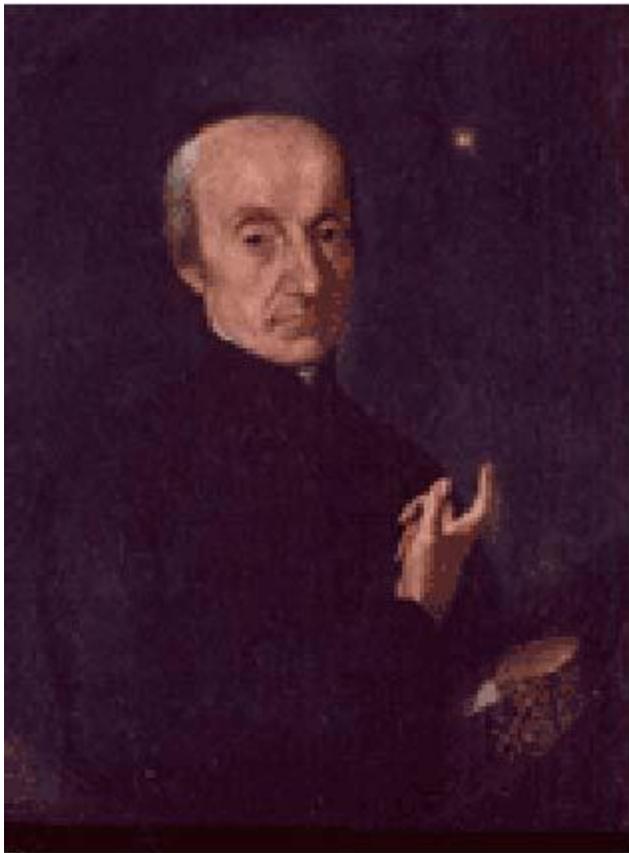
Indeed, Gauss wouldn't even be the last intellectual giant of that period to weigh in on the larger questions raised by the discovery of Ceres. On May 22, 1802, William Herschel, the most celebrated astronomer in the world at the time—and arguably of *all* time—wrote to Piazzi to present his theories about Ceres, as well as the asteroid Pallas, which had been discovered in March 1802.

Herschel was the first to call these objects "asteroids," [noting that they were](#) "a new species of celestial bodies, with which hitherto we have not been acquainted."

“Neither the appellation of planets, nor that of comets, can with any propriety of language be given to these two stars,” Herschel wrote [in his paper](#) on the new worlds. “They resemble small stars so much as hardly to be distinguished from them.”

Sure enough, more bodies in the asteroid belt began to be discovered and named over the course of the 19th century. Instead of rooting out the speculative missing planet between Mars and Jupiter, astronomers were astonished to find multitudes of tiny worlds, the likes of which had never been seen. Much like today, Ceres was a catalyst for redefining what we know about our solar neighborhood and its planetary denizens.

Today, exactly 215 years after Piazzi made that fateful first discovery, we have visited the asteroid belt with our space-faring emissaries with about a dozen flybys. Most importantly, Ceres has its own dedicated orbiter, which has yielded a new level of intimacy with the dwarf planet that caused so much controversy and confusion to the turn of the 19th century, challenging scientific legends like Gauss and Herschel to explain its motion and nature.



Portrait of Piazzi with Ceres in the background. Image: [NASA/JPL](#)

215 years is not a long stretch of time at all, historically speaking. As Louis CK [might put it](#), that's about three 70-year-old ladies living and dying back to back. Yet in that time we have not only characterized the asteroid belt's bizarre worlds, we have gotten right up in their faces to

take awe-inspiring pictures, and to study their history and behavior. New Year's Day is a holiday known for its focus on the future, so it's easy to imagine that Piazzzi wondered if humans would ever visit the farflung worlds he discovered that night. The question for our time is, what will the next 215 years bring?