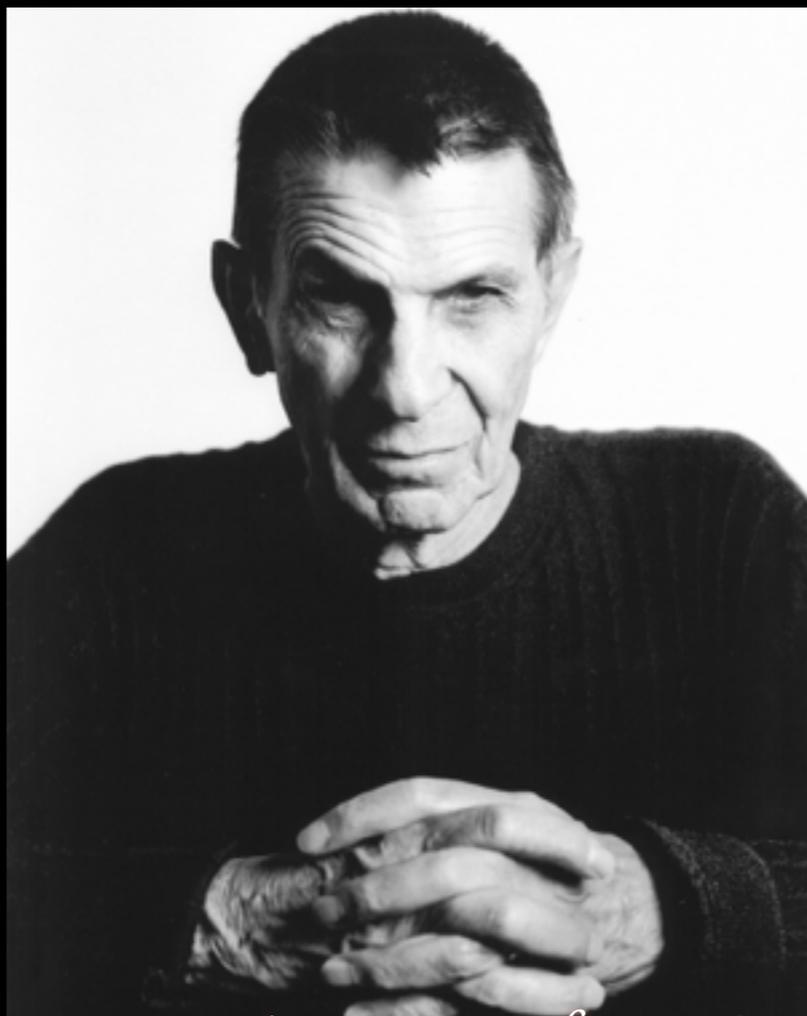


In Search Of:

Planet X



in memory of

Leonard Nimoy: 1931-2015

presented by Stuart Robbins
Southwest Research Institute
@DrAstroStu

A Bit About Me



- Involved in the scientific skepticism movement since 2008.
- Try to bring science to the general public, focusing on misconceptions and pseudoscience related to astronomy and similar fields.
- Run podcast and blog, “Exposing PseudoAstronomy.”
- Ph.D. in geophysics.

Why Planet X?

- Planet X is big!
- *New Horizons* encounters Pluto in July ... the “original” Planet X.
- Planet X is used to generate fear:
 - Remember 2012?
 - Pole Shifts?
 - Doomsday?
 - Solar Flares?

The Concept

*there is an as-yet undiscovered planet ...
“out there” in our solar system*



Possible?

Pluto: The Original Planet X

- Since the ancients, there were 6 planets.
- Early 1600s: Johannes Kepler and the Laws of Planetary Motion.
- 1772: Johann Bode helped formulate the Titius-Bode Law, suggesting another planet was between Mars and Jupiter.
- 1781: William Herschel discovered Uranus.
- 1801: Giuseppe Piazzi discovered Ceres.
- 1843, '45: Mathematicians calculate Uranus was not where it should be.
- 1846: Johann Galle discovered Neptune. Orbit weirdness remained.

Possible?

Pluto: The Original Planet X

- Orbital oddities were unexplained for decades.
- 1900s: Percival Lowell founded Lowell Observatory, searched for Planet X.
- 1929: Lowell Observatory's director assigned search to Clyde Tombaugh.
- 1930: Clyde Tombaugh discovered Pluto.
- 1989: *Voyager 2*'s encounter with Neptune revised its mass, removing all orbital oddities.

Possible?

Pluto: The Original Planet X

POOR
PLUTO



Could it Be ...

Planet on a 3600-Year Orbit?

IDEA

- Popularized by the late Zecharia Sitchin.
- Populated by the Anunnaki who created humans to mine gold.

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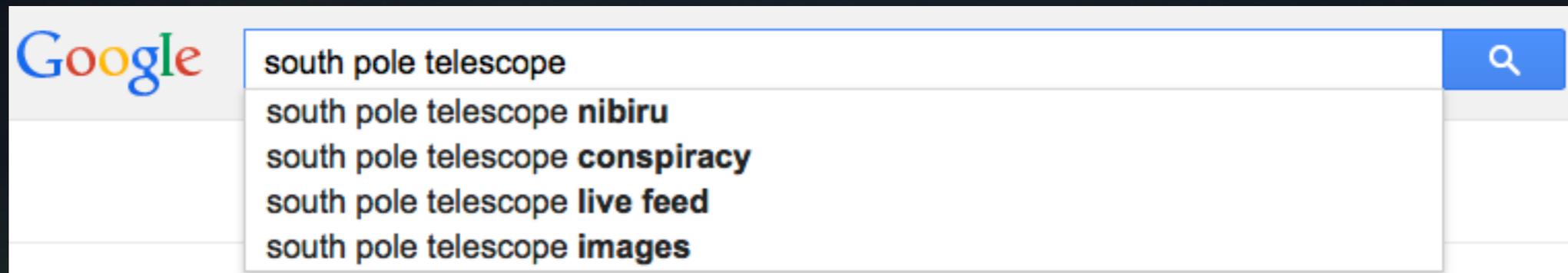
SCIENCE

- To come near Earth, planet must go $>6x$ from the sun than Pluto.
- Asteroid belt is stable ... not possible with a planet coming through *2.5 million* times in the solar system's lifetime.
- No (real) Earth records of a planet?

Could it Be ... Approaching from the South Pole?

IDEA

- Scientists have secret telescopes at the South Pole.
- Because that's the only place we can see Planet X approaching.



Could it Be ...

Approaching from the South Pole?

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SCIENCE

- From the North Pole, you can see 1/2 the sky, rotating around you.
- From the South Pole, you can see 1/2 the sky, rotating around you.
- From the equator, you can see 100% the sky, rotating above you.

Could it Be ... Behind the Sun?

IDEA

- Planet X is approaching from behind the Sun (or is hiding there now).

Could it Be ... Behind the Sun?

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- Planet X is approaching from behind the Sun (or is hiding there now).

SCIENCE

- All evidence for this is based on photos of well-known optical phenomena: Lens flares, atmosphere refraction, sun dogs, etc.
- We have sun-watching satellites that view the entire sun.
- Earth moves. How could Planet X always be behind the sun?

Ideas & Trends

Continued

Could it Be ... Discovered in 1983?

IDEA

- InfraRed Astronomical Satellite (IRAS) discovered Planet X in late 1983.

Mystery heavenly body found close to Earth

Washington Post

WASHINGTON — A heavenly body possibly as large as the giant planet Jupiter and possibly so close to Earth that it would be part of this solar system has been found by an orbiting telescope called the Infrared Astronomical Observatory (IRAS).

So mysterious is the object that astronomers do not know if it is a planet, a nearby "protostar" that never got hot enough to become a star, a distant galaxy so young that it is still in the process of forming its first stars or a galaxy so shrouded in dust that none of the light cast by its stars ever gets through.

never been seen by optical telescopes on Earth or in space, is that it is a giant gaseous planet as large as Jupiter and as close to Earth as 80 trillion km.

While that may seem like a great distance in earthbound terms, it is a stone's throw in cosmological terms, so close in fact that it would be the nearest heavenly body to Earth beyond the outermost planet Pluto.

Whatever it is, said Dr. James Houck, a member of the IRAS science team, the mystery body is so cold its temperature is no more than 40 degrees above "absolute" zero, which is 456 degrees Fahrenheit below zero.

"I believe it's one of these

Search for Planet X

or whatever it is out there. The Infrared Astronomical Satellite was boosted into orbit Tuesday night from Vandenberg. It represents an \$80-million bet. Britain and the Netherlands, over the next few months, the telescope is exchanging survey of nearly all the light of ordinary light but of infrared light invisible to the human eye and largely undetected — stars, interstellar dust. If, by any luck, the object that pulls

its search of the skies was made in 1930 of Pluto, the ninth planet. More than a century before that, Uranus in 1781 by the English astronomer William Herschel. Until then, the

planetary system seemed to end with Saturn.

As astronomers observed Uranus, noting irregularities in its orbital path, many speculated that they were witnessing the gravitational pull of an unknown planet. So began the first planetary search based on astronomers' predictions, which ended in the 1840's with the discovery of Neptune almost simultaneously by English, French and German astronomers.

But Neptune was not massive enough to account entirely for the orbital behavior of Uranus. Indeed, Neptune itself seemed to be affected by a still more remote planet. In the late 19th century, two American astronomers, William H. Pickering and Percival Lowell, predicted the size and approximate location of the trans-Neptunian body, which Lowell called Planet X.

Years later, Pluto was detected by Clyde W. Tombaugh working at Lowell Observatory in Arizona. Several astronomers, however, suspected it might not be the Planet X of prediction. Subsequent observations proved

U.S. and Dutch technicians preparing the Infrared Astronomical Satellite before its launch last week.

United Press International, Jet Propulsion Laboratory

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Ideas & Trends
Continued

Could it Be ... Discovered in 1983?

IDEA

- InfraRed Astronomical Satellite (IRAS) discovered Planet X in late 1983.
- It was promptly covered up.



U.S. and Dutch technicians preparing the Infrared Astronomical Satellite before its launch last week.

United Press International, Jet Propulsion Laboratory

Clues Get Warm in SCIENCE Search for Planet X

- There were anomalous objects found by IRAS.
- Every single one was followed-up with ground-based telescopes.
- They were very, very distant galaxies.

SOMETHING out there beyond the farthest reaches of the known solar system seems to be pulling at Uranus and Neptune. Some gravitationally irregularities in their orbits. The force suggests a presence far away and unseen, a large object that may be the long-sought Planet X.

Evidence assembled in recent years has led several groups of astronomers to begin the search for the 10th planet. The search is being conducted with observations with the 200-inch telescope at Mount Palomar in California. They are tracking two Pioneer spacecraft, now approaching the orbit of distant Pluto, to see if variations in their trajectories provide clues to the source of the mysterious force. And they are hoping that a satellite-borne telescope launched last week will detect heat "sig-

... a 560-mile-high polar orbit Tuesday night from Vandenberg Air Force Base, Calif. It represents an \$80-million venture by the United States, Britain and the Netherlands. In the next six or seven months, the telescope is expected to detect objects in the sky, including stars, but also infrared radiation, which is invisible to the human eye and largely absorbed by the atmosphere. Scientists thus hope that the new telescope will chart thousands of infrared-emitting objects that have gone undetected — stars, interstellar dust, and other objects that pull on the planets at Uranus and Neptune.

The last time a serious search of the skies was made it led to the discovery in 1930 of Pluto, the ninth planet. But the story begins more than a century before that, after the discovery of Uranus in 1781 by the English astronomer and musician William Herschel. Until then, the

planetary system seemed to end with Saturn. As astronomers observed Uranus, noting irregularities in its orbital path, many speculated that they were witnessing the gravitational pull of an unknown planet. So began the first planetary search based on astronomers' predictions, which ended in the 1840's with the discovery of Neptune. The search for Planet X was abandoned.

But Neptune was not massive enough to account entirely for the orbital behavior of Uranus. Indeed, Neptune itself seemed to be affected by a still more remote planet. In the late 19th century, two American astronomers, William H. Pickering and Percival Lowell, predicted the size and approximate location of the trans-Neptunian body, which Lowell called Planet X.

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SCIENCE

- Sure, why not?
- But we have limits from WISE and science in general:
 - WISE: No Saturn-sized object to 10,000 AU (Earth-Sun distances).
 - WISE: No Jupiter-sized object to 26,000 AU (0.4 light-years).
 - Science: Should actually follow laws of physics.

Conclusion

There could still be a large “planet” in our solar system ...

but the conspiracy, hype, & fear-mongering is not based in reality.

In Search Of:

Planet X

Questions?

Stuart Robbins || @DrAstroStu
<http://podcast.sjrdesign.net>