QUICK SEARCH
GO

HEADLINES
ARCHIVE
ENVIRONMENT
REAL X-FILES
SCIENCE

ABOUT US
CONTACT US
CONTRIBUTORS
EARTHFILES SHOP
SEARCH IN DEPTH
SUBSCRIPTION

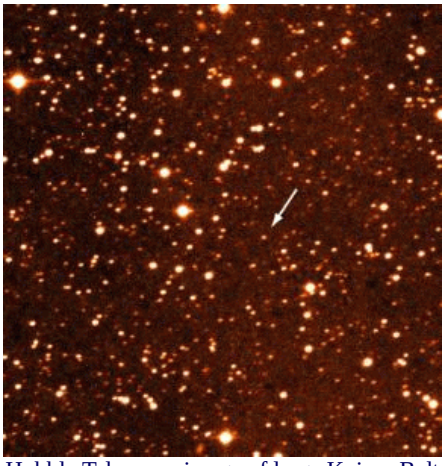
LOGIN
LOGOUT

HELP

Printer Friendly Page

Earthfiles, news category.

Large Kuiper Belt Planetoid Found Beyond Pluto



Hubble Telescope image of large Kuiper Belt planetoid (800 miles diameter) called "Quoaor" or "2002 LM60," more than 1.5 billion kilometers beyond Pluto. Image courtesy Hubble STScI.

"We have found the largest object in the solar system since the discovery of Pluto in 1930. ...What is clear to me is that the more we look (in the Kuiper Belt), the more we find and the more we look, the larger the objects we find. The fact that we have only looked for eight months through a small fraction of the sky and found this object really says to me there is a pretty good chance there will be larger and larger objects out there."

- Mike Brown, Astronomer, Cal Tech, Oct. 7, 2002 -

October 7, 2002 Birmingham, Alabama - The discovery of the largest object in the solar system since the discovery of Pluto in 1930 was officially announced today, even though the object has been known since June 2002 and photographed by the Hubble Telescope. Astronomers Mike Brown and Chadwick Trujillo, from the California Institute of Technology, Pasadena, made a formal report in the October 7, 2002, Harvard Smithsonian Minor Planet Electronic Circular, the *Astronomical Journal* and before the 34th Annual Meeting of the Division of Planetary Sciences of the American Astronomical Society which began this week at the Sheraton Conference Center in Birmingham, Alabama.

The new planetoid is currently being called the native American name, Quaoar, pending a name vote by the International Astronomical Union. Quaoar's location is in the Kuiper Belt of icy bodies left over from the solar system's creation, one and a half billion kilometers (900 million miles) beyond Pluto. Its diameter is 800 miles, about half the size of Pluto. If all the 50,000 numbered asteroids known in the asteroid belt were combined, their mass would still not be as big as Quaoar.

Image courtesy CalTech.

Today I talked with Dr. Brown about the significance of the large Kuiper Belt Object discovery and the ongoing debate about whether Pluto is really a Kuiper Belt Object, too, and not a real planet.

Interview:

Mike Brown, Ph.D., Assoc. Prof. of Planetary Astronomy, California Institute of Technology, Pasadena, California: "The most significant aspect is that we have found the largest object in the solar system since the discovery of Pluto in 1930. What is clear to me is that the more we look (in the Kuiper Belt), the more we find and the more we look, the larger the objects we find. The fact that we have only looked for eight months through a small fraction of the sky and found this object really says to me there is a pretty good chance there will be larger and larger objects out there. As Pluto was a very exciting discovery in 1930 showing that the solar system extended further than originally thought, Quaoar(KWAW-waur) in June 2002 is showing the same thing, that the solar system continues on further than people realized.

THERE CONTINUES TO BE THIS DEBATE ABOUT WHETHER PLUTO IS EVEN A PLANET OR COULD BE A LARGE KUIPER BELT OBJECT. NOW, THIS OBJECT IS ABOUT HALF THE SIZE?

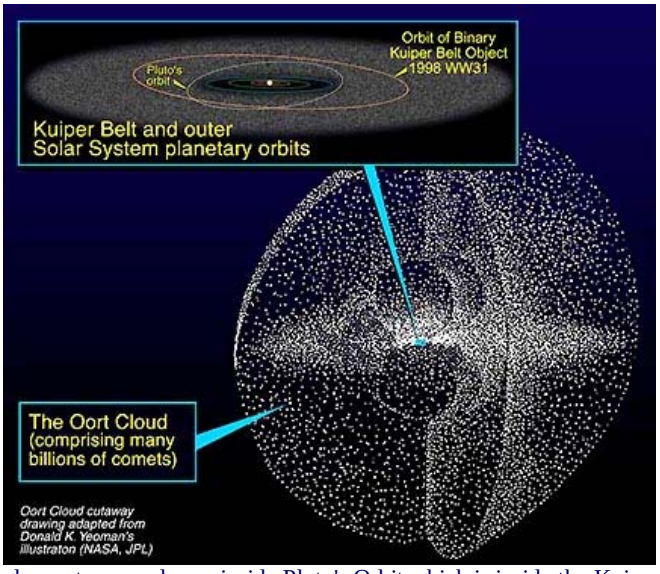
It's about half the size of Pluto, right.

IF IT IS, WHY AREN'T THEY BOTH PUT IN THE CATEGORY OF KUIPER PLANETOIDS?

I tell you what I would do. If I had a vote on how you would classify both of these objects, I would say that a planet if you want to be a planet, you should be significantly bigger than anything else in your vicinity. Right now, Pluto is not significantly bigger than anything in its vicinity because now we know about Quaoar and we know that Pluto is not significantly bigger. So, I would classify both of those objects as particularly large, but just as Kuiper Belt Objects, we now know about 600 other Kuiper Belt Objects in orbits beyond Neptune and these (Pluto and Quaoar) are just currently the two biggest members.

WHAT EXACTLY ARE THE KUIPER BELT OBJECTS?

Kuiper Belt Objects are thought to be the remnant from the earliest time in the solar system, about 4.5 billion years ago. Then the solar system was a large gaseous nebula shaped like a pancake, a flattened pancake, and planets were beginning to form. Large planets formed close inside. Jupiter was the largest planet that was formed inside. As we moved further out, Saturn, Uranus, Neptune get progressively smaller. By the time you get out past Neptune, there is not enough material to form large planets like those four small planets, so smaller objects form. Smaller icy form and those objects would have formed about the same time or a bit later than the giant gaseous planets and have been sitting out there basically in deep freeze for the past 4.5 billion years.



Sun and solar system are drawn inside Pluto's Orbit which is inside the Kuiper Belt that begins
around the orbit of Neptune and extends outward more than a billion miles toward the Oort Cloud
made up of billions of icy comets. One of astronomy's great mysteries is why there is a defined
boundary for the Kuiper Belt, a clear separation from the more distant Oort Cloud.
Illustration courtesy NASA and JPL.

HOW FAR IS THIS NEW QUAOAR?

Quaoar is about 4 billion miles from the sun.

THAT PLACES IT HOW FAR BEYOND PLUTO?

About a billion miles beyond Pluto. So it's quite a ways out there.

IS IT AN AUSTRALIAN WORD?

No, the word is from the Tongva tribe indigenous to the Los Angeles basin and it's the name of their creation force.

LIKE WHAT THEY WOULD SAY IS THE FORCE IN EVERYTHING?

Right. Quaoar is a formless, genderless, force that sang and dance the entire universe into existence.

WHAT BROUGHT YOU ASTRONOMERS TO USE THAT NAME?

There is a name from the International Astronomical Union who controls naming of all objects in the sky, that objects in the Kuiper Belt like this one, have to be named after a creation deity in some mythology. Some of the objects were named after your generic Greek and Roman mythology. We thought it would be much more interesting and appropriate to name it after the tribe that was indigenous to the Los Angeles basin (near Pasadena and Cal Tech where Mike Brown and his colleague, Chadwick Trujillo, work to find Kuiper Belt Objects and discovered Quaoar.)

DO YOU THINK THERE ARE MORE KUIPER BELT OBJECTS AS LARGE, OR EVEN LARGER, THAN THIS ONE?

I would be willing to bet that in the next year or two, we will be finding objects at least this large and I even expect we will be finding objects larger than Quaoar and probably even larger than Pluto.

DOES THIS HAVE ANY CONNECTION TO ALL OF THE STORIES IN THE PAST FEW YEARS ABOUT A PLANET X ORBITING PERHAPS FURTHER OUT IN THE OORT CLOUD. THERE IS A HYPOTHESIS THERE IS A BROWN DWARF OUT THERE LEFT OVER FROM THE EARLY DAYS OF

OUR SOLAR SYSTEM WHEN IT STARTED OUT TO BE A BINARY STAR SYSTEM?

No connection. That hypothesis which is still open to a lot of debate and is generally not accepted by most astronomers that there is a large brown dwarf-like object quite a bit further away. If there really is this brown dwarf, it's much more massive than Quaoar. It's even more massive than Saturn, Uranus or Neptune, probably. Maybe even Jupiter, probably even Jupiter. So, if this object exists and I would say the jury is still out if this object exists, it is much more massive and would not feel any effects from Quaoar. It's also sufficiently far away that Quaoar would not feel any effects from it.

This discovery does not really speak much to that one, except this discovery of Quaoar is concrete. We see the object, we know it's there, rather than just hypothesizing it from some fairly subtle evidence.

WHICH HAS TO DO WITH THE IMPACT ON COMET ORBITS.

That's right.

NO INFLUENCE ON COMET PATHS?

No, it's probably too small unless a comet happened to come very close by, the same way that Pluto is too small. We currently don't know of any definite effects of Pluto on comet bodies or other bodies coming by into the solar system.

WHY ARE YOU READY TO BET MONEY THAT THERE IS AN OBJECT IN THE KUIPER BELT THAT IS AS LARGE, OR LARGER, THAN QUAOAR?

The reason is that we only started this survey of the outer solar system eight months ago. And eight months since we started the survey, we've covered maybe 5-10% of the sky. In that time, we found Quaoar, we found in January an object not quite as big as Quaoar, but about half the mass of Quaoar. There is a pretty good chance there will be larger and larger objects out there.

The Mystery of the Kuiper Belt's Abrupt Boundary

ANY OTHER MYSTERY THAT YOU ARE ESPECIALLY INTRIGUED ABOUT AND DISCUSSING WITH YOUR COLLEAGUES IN THIS PLANETARY MEETING DOWN IN ALABAMA?

Yes, there is one big one and that is this. We know the Kuiper Belt starts somewhere just outside the orbit of Neptune, but we also know it ends fairly abruptly a little bit outside the orbit of Quaoar. There is really no good reason why that should be the case. All the original hypotheses about the existence of the Kuiper Belt would have suggested that it extends much further into space, and yet there seems to be a 'cliff' right there. We don't know why that is. We are trying many different ways to see if there are other objects further out there. One of the hypothesis might be that there are some particularly large objects now I'm talking about planets, not Kuiper Belt Objects large objects, maybe the size of Earth or Mars that are much further out that are causing something that looks like this edge to the known solar system. But for now, we don't know that. All we know is that there is edge and we really would like to know why that edge is there.

THE EDGE IS BETWEEN THE KUIPER BELT AND THE OORT CLOUD?

Right. The Oort cloud is much further out and it's composed of objects that didn't form out there. They formed probably between Jupiter and Saturn and then were flung much further out there.

WHAT YOU ARE SUGGESTING IS THAT THERE MIGHT BE A LARGE PLANET-SIZED BODY STILL ROTATING OUR SOLAR SYSTEM THAT WE HAVE YET TO DISCOVER THAT COULD BE AT THAT DISTANCE MARK BETWEEN THE KUIPER BELT AND THE OORT CLOUD?

It's speculation, but it's speculation that I think is worth considering. It's the type of thing with the survey we are carrying out over the next few years, we should be able to detect. I'm talking about something maybe the mass of Mars or Earth.

GREAT COSMIC MYSTERIES, EVEN AT THE EDGES OF OUR OWN SOLAR SYSTEM.

Yes, it's really quite fun!"

Website:

http://www.gps.caltech.edu/~chad/quaoar/

http://www.ifa.hawaii.edu/faculty/jewitt/kb.html

Credits