

AAS NEWSLETTER

June 2014

Important announcement

Presidential Message

Ayraastro is moving to new premises for the start of the 2015 - 15 season.

Starting from our first meeting on Monday the 29th September we will now meet at Loudoun Hall in Ayr.

The hall is situated almost directly across the road from Ayr Academy but is accessed more easily from The Sandgate.

Meetings will be 7:00pm to 9:30pm as usual.

There is no car parking at the Hall itself but there is free parking on The Sandgate and Fort Street.

PLEASE DO NOT PARK IN THE ACADEMY GROUNDS.

Following meetings will be on Monday the 27th October and Monday the 24th November.

As usual there will be no meeting in December but we will be arranging a Christmas meal.

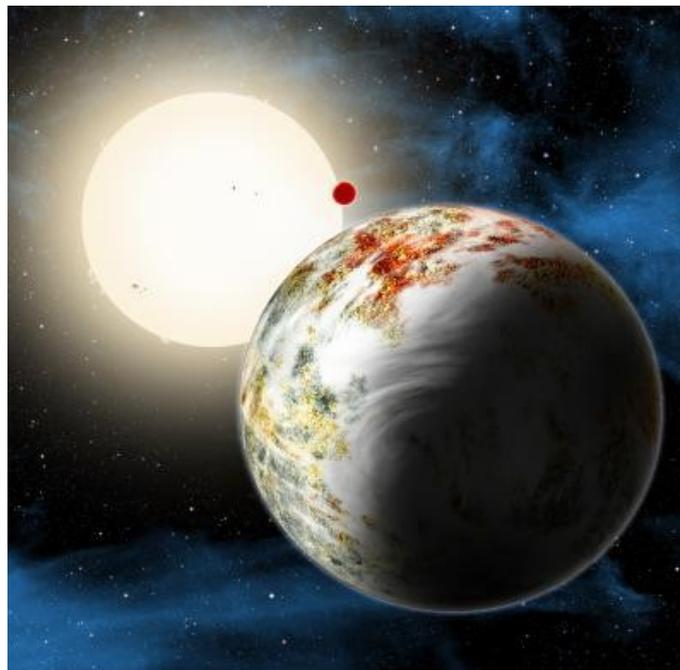
We have applied for bookings at Loudoun Hall for the rest of the session in 2015 and are awaiting a response from the Council.

We are planning a "Beginners Night" for the first meeting so bring along your scopes/etc and questions and be prepared to help out our new and less experienced Members as it will be short talks and "hands on".

Graham

Astronomers Find "Mega-Earth," Most Massive

Rocky world could be the first of an entirely new class of planet.



Keplar 10 system
And its
Mega-Earth
(Artists impression)

Astronomers have discovered the heaviest planet yet that's predominantly rocky, a hefty body 17 times more massive than Earth.

Called Kepler-10c, the planet orbits a star that is similar to the sun, though nearly twice as old, and located about 560 light-years away in the constellation Draco.

The exoplanet, which has been dubbed a "mega-Earth," could be the first of a new class of massive rocky planets found at more distant orbits from their stars, said the astronomers who announced their discovery this week at the American Astronomical Society meeting in Boston.

Kepler-10c weighs as much as Neptune. But while Neptune has a radius about 3.9 times wider than Earth's, Kepler-10c has a radius only 2.3 times bigger. For a planet to be so compact and heavy, it must be primarily made of rock, the scientists reason.

Astronomers assume that rocky planets are necessary for habitability, since any life would likely need to have evolved near a solid surface.

The discovery of a massive rocky planet like Kepler-10c "increases the number of planets out there which could be potentially habitable," explained one member of the research team, Dimitar Sasselov of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts.

Almost All Rock

Finding a rocky planet of such a massive size was not the biggest surprise, though, said Xavier Dumusque of Harvard-Smithsonian, who led the research. "The surprise is that there is no gas around it.

"Planets are born from the disk of gas and dust that surrounds an embryonic star. A body as massive as Kepler-10c has so much gravity that it should have collected enough hydrogen and helium to turn into a giant gas planet like Jupiter. It's very difficult to put together a large solid planet like this without accreting even a small amount of hydrogen and helium, which is there in the disk,"

Sasselov explained. The Kepler Space Telescope detected the planet in 2011, along with its companion, Kepler-10b, which was the first confirmed rocky planet found outside the solar system.

Astronomers could use data from Kepler to measure the planets' radii, but they could only get a rough estimate of the planets' masses. To better determine how heavy the planets are, Dumusque, Sasselov, and their colleagues used the Galileo National Telescope in the Canary Islands to measure how fast the planets were orbiting their star. From the speeds, the researchers deduced what the masses were and that the planets must be made of rock. The Diversity of Planets Kepler-10c is certainly interesting and appears to be an outlier for now, but it may not be that bizarre.

"Something on the order of the mass of Neptune and [that] is rocky with metallic material and perhaps a thin veneer of a hydrogen and helium atmosphere—that doesn't seem outside the realm of reasonable possibility," said Gregory Laughlin of the University of California, Santa Cruz, who was not involved in the finding. There are a number of conceivable ways to create a planet like Kepler-10c, said Jack Lissauer of the NASA Ames Research Center in Moffett Field, California, who also wasn't a part of the team. The planet could have resulted from the collision of two smaller bodies that didn't have much gas to begin with. Or all of the gas in the embryonic star's disk may have somehow dissipated quickly, before the planet had time to accumulate any.

But calling Kepler-10c "rocky"—or even a "mega-Earth"—is a little misleading, since it's nothing like Earth, Lissauer noted. "I would call it a rock-rich world," he said. Although the planet is made nearly entirely of rock, there may be enough surrounding gas to create extreme pressures at the planet's surface, he explained. "This is an important discovery," Lissauer said, because it "shows how diverse planets can be."

(Ref National geographic 06/06/14).

THE SKY NEXT MONTH : Things to watch out for.

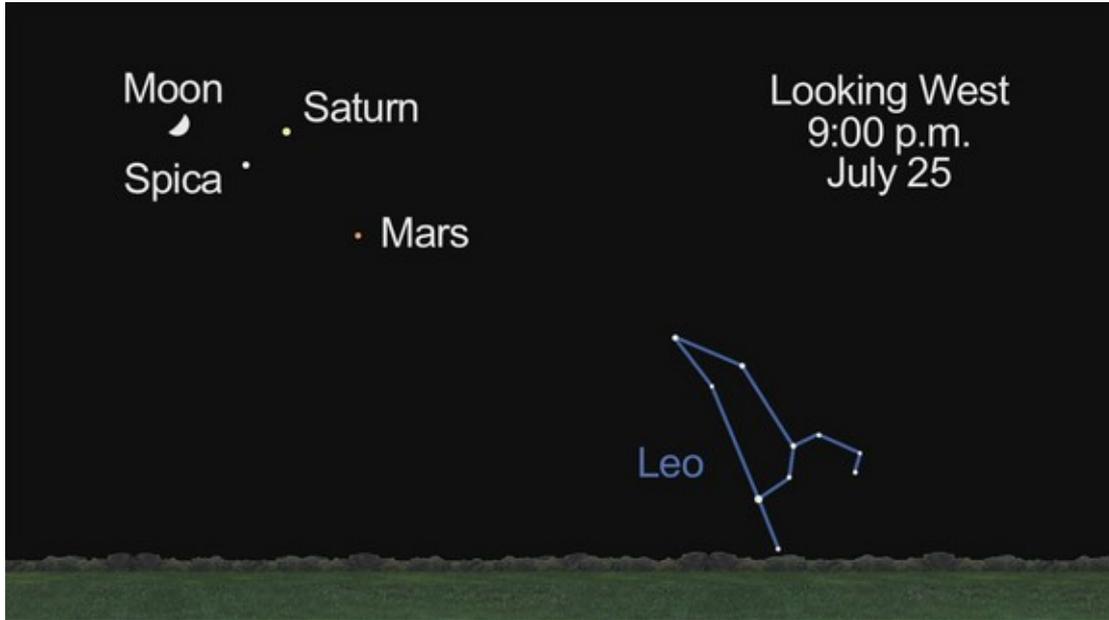


The Summer triangle : Search high in the Eastern sky. (Photo credit : Stellarium)

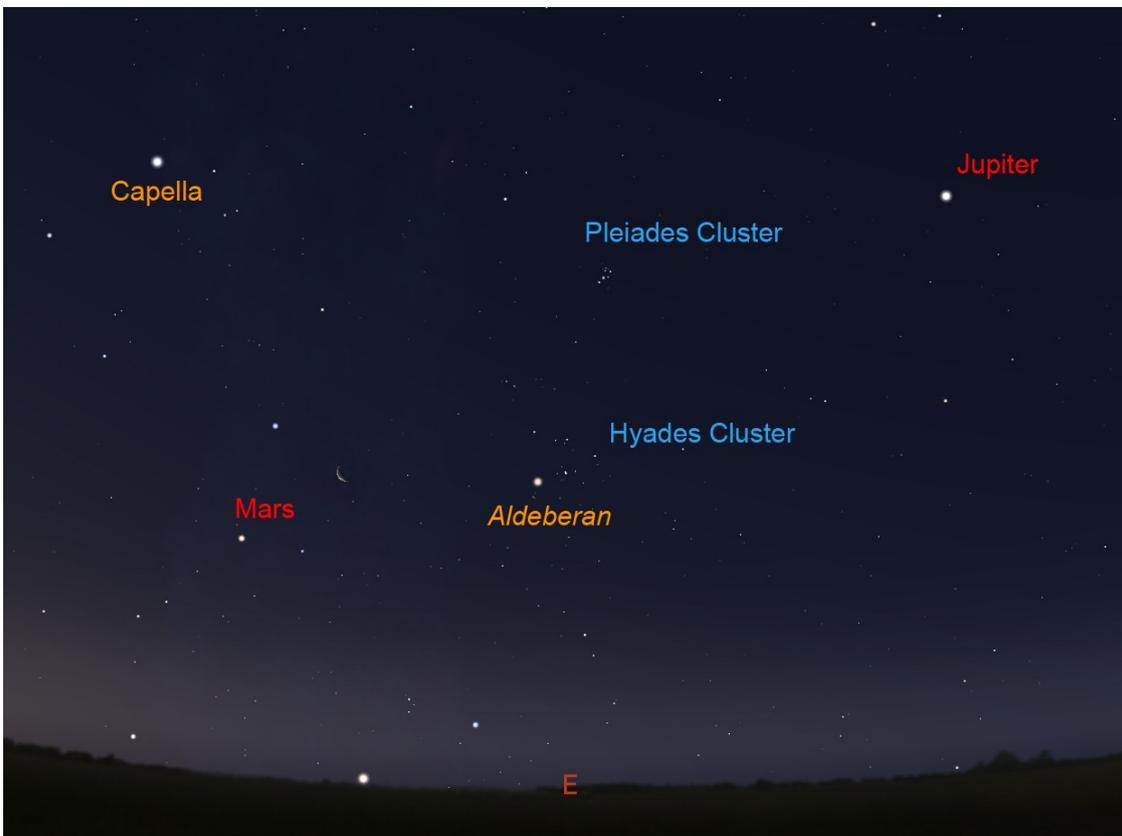


July 21st Dusk, Venus and Regulus. (Photo credit : Stellarium)

THE SKY NEXT MONTH : Things to watch out for.



Looking West , Moon , Saturn, Mars, and Spica. (Photo credit : Stellarium)



Pleiades and Hyades Clusters. (Photo credit : Stellarium)

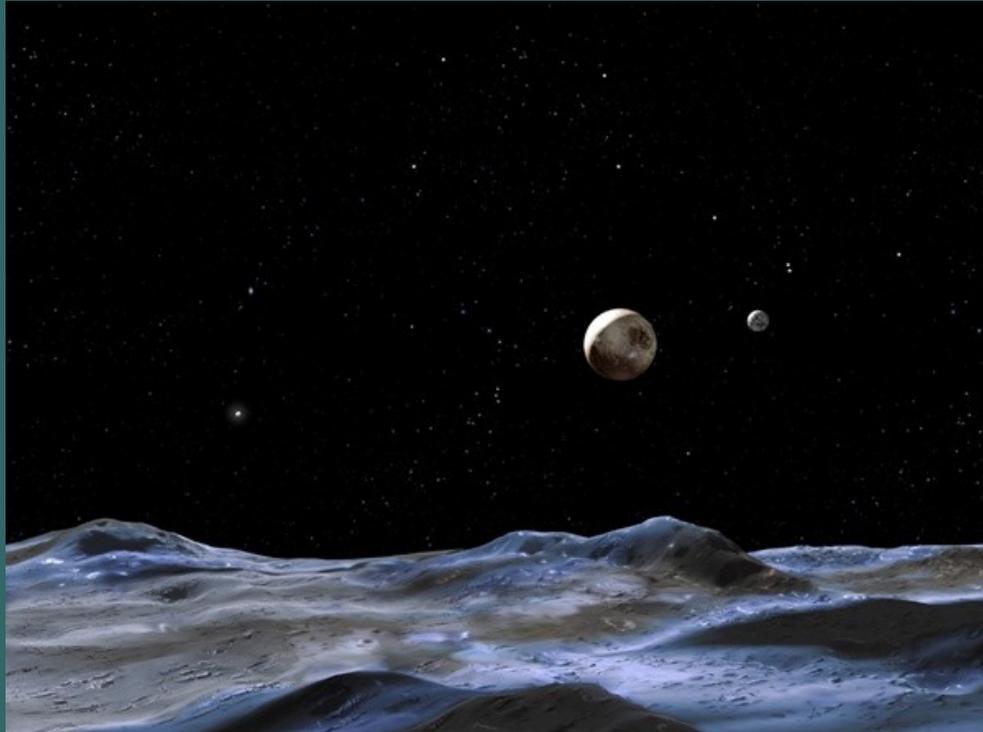
THE SKY NEXT MONTH : Things to watch out for.



And last but not least. One for the Moon
watchers out there

Why not have a look at Plato

Cracks in Pluto's moon could indicate it once had an underground ocean



This artist concept shows Pluto and some of its moons, as viewed from the surface of one of the moons. Pluto is the large disk at centre. Charon is the smaller disk to the right.

The New Horizons spacecraft will be the first to visit Pluto and Charon and will provide the most detailed observations to date.

If the icy surface of Pluto's giant moon Charon is cracked, analysis of the fractures could reveal its interior was warm, perhaps warm enough to have maintained a subterranean ocean of liquid water, according to a new NASA-funded study.

Pluto is an extremely distant world, orbiting the Sun more than 29 times farther than Earth. With a surface temperature estimated to be about -380° Fahrenheit (around -229° Celsius), the environment at Pluto is far too cold to allow liquid water on its surface. Pluto's moons are in the same frigid environment.

Pluto's remoteness and small size make it difficult to observe, but in July of 2015, NASA's New Horizons spacecraft will be the first to visit Pluto and Charon and will provide the most detailed observations to date.

"Our model predicts different fracture patterns on the surface of Charon depending on the thickness of its surface ice, the structure of the moon's interior and how easily it deforms, and how its orbit evolved," said Alyssa Rhoden of NASA's Goddard Space Flight Centre in Greenbelt, Maryland.

"By comparing the actual New Horizons observations of Charon to the various predictions, we can see what fits best and discover if Charon could have had a subsurface ocean in its past, driven by high eccentricity."

Some moons around the gas giant planets in the outer solar system have cracked surfaces with evidence for ocean interiors – Jupiter's moon Europa and Saturn's moon Enceladus are two examples.

As Europa and Enceladus move in their orbits, a gravitational tug-of-war between their respective parent planets and neighbouring moons keeps their orbits from becoming circular. Instead, these moons have eccentric — slightly oval-shaped — orbits which raise daily tides that flex the interior and stress the surface. It is thought that tidal heating has extended the lifetimes of subsurface oceans on Europa and Enceladus by keeping their interiors warm.