

Hi there everyone!

In this issue of Astro Newsletter, we have some fresh space news to share with you. Did you know that Mercury is actually getting smaller? or that the Cassini mission is coming to an end? What about the huge underground ice deposit on Mars? Check out our Space News in a Flash section for the headlines.

Most of the schools participating in our programs have completed their Mission Patches and started focusing on creating new space toys or modifying the existing toys so that they work in microgravity. We plan to share the photos of these space toys in our next issue.

## SPACE NEWS IN A FLASH

- Mercury is getting even smaller
- World looks up to gaze at extra bright 'Supermoon'
- Concept space suit for Mars explorers
- Best weather satellite ever built rockets into space
- Cassini Begins Saturn Ring Dives, Kicks Off Mission Finale
- Huge Underground Ice Deposit on Mars
- The rocky 'Proxima b' may be habitable
- Pure Metal Asteroid has mysterious water deposits

*The sky is the limit only for  
those who aren't afraid to fly!*  
- Bob Bello

### Mercury is getting even smaller

Poor little Mercury is getting even smaller. Astronomers have discovered a large valley on Mercury that provides further evidence for the planet's shrinkage — an odd phenomenon that has been the topic of debate for decades. This newfound feature is larger than Arizona's famous Grand Canyon and deeper than the Great Rift Valley in East Africa, scientists said.

Mercury is 3,032 miles (4,880 km) wide, and the vast majority of the planet's volume is taken up by its metallic core, which is estimated to be about 2,500 (4,000 km) wide. That core has been cooling slowly since Mercury (and the other planets) formed nearly 4.6 billion years ago, and the little world has been shrinking as a result.

(<http://www.livescience.com>)

### World looks up to gaze at extra bright 'Supermoon'

On November 13th and 14th, the world was treated to the brightest supermoon in 68 years. The term supermoon refers to a full moon that coincides with the lunar orb's closest approach to Earth, or perigee. And the last time it was this close to the Earth was in 1948.

Supermoons tend to look larger and brighter in the sky, offering a rare treat for sky gazers. The variability is caused by the fact that the moon's orbit around the Earth is egg-shaped and slightly irregular, making for times when it is closer or farther away from us.

(<http://news.nationalgeographic.com>)



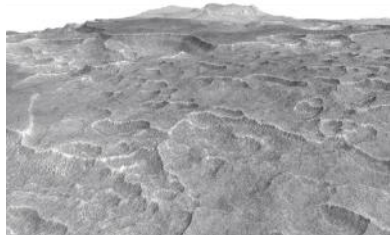
## Concept space suit for Mars explorers

Dutch company Mars One, which aims to send people to the Red Planet within a decade, recently unveiled its first concept for a space suit to protect humans "under the most difficult conditions."

The pressurised suit will include an impact resistant helmet with a see-through bubble. Made from material similar to that used for NASA's astronauts when exploring the Moon, the suit's design also takes into account "new challenges" presented by Mars' surface. This included dealing with omnipresent red dust, which the company admitted still "needed more work."

Consisting of interchangeable parts, the suit will have to ward off life-threatening radiation and be able to fit many different sizes of would-be Martian explorers.

(<http://www.phys.org/>)



## Huge Underground Ice Deposit on Mars

A giant deposit of buried ice on Mars contains about as much water as Lake Superior does here on Earth, a new study reports.

The ice layer, which spans a greater area than the state of New Mexico, lies in Mars' mid-northern latitudes and is covered by just 3 feet to 33 feet (1 to 10 meters) of soil. It therefore represents a vast possible resource for future astronauts exploring the Red Planet, study team members said.

"This deposit is probably more accessible than most water ice on Mars, because it is at a relatively low latitude and it lies in a flat, smooth area where landing a spacecraft would be easier than at some of the other areas with buried ice," co-author Jack Holt, of the University of Texas, Austin, said in a statement.

(<http://www.space.com>)

## Best weather satellite ever built rockets into space

A powerful new satellite that will give forecasters their best-ever looks at storms and other severe weather has taken to the skies. The GOES-R weather satellite lifted off from Florida's Cape Canaveral Air Force Station, riding a United Launch Alliance Atlas 5 rocket to orbit.

GOES-R is the first of four new advanced weather satellites that are, somewhat confusingly, collectively known as GOES-R. The U.S. National Oceanic and Atmospheric Administration (NOAA), which manages the GOES-R program, is expecting big things from all four of these spacecrafts.

"If we can give people another 10, 15 or 20 minutes, we're talking about lives being saved," famed NBC Today Show weather man Al Roker said.

(<http://spacenews.com>)



## Cassini Begins Saturn Ring Dives, Kicks Off Mission Finale

Cassini will begin a phase of the mission that the science team calls "Cassini's Ring-Grazing Orbits," as the spacecraft will start skimming past the outer edge of the rings, coming within – at times — 4,850 miles (7,800 kilometers) of the rings.

Between November 30, 2016 and April 22, 2017 Cassini will circle high over and under the poles of Saturn, diving every seven days for a total of 20 times through the unexplored region at the outer edge of the main rings.

(<http://www.universetoday.com>)

## The rocky 'Proxima b' may be habitable

The planet orbiting the nearest star to Earth may be habitable, according to NASA. The rocky Proxima b, which orbits Proxima Centauri, appears to be in the so-called Goldilocks zone, meaning the planet could have liquid water on its surface.

A team of researchers from the Marseille Astrophysics Laboratory goes even further, saying the planet could be an "ocean planet with an ocean covering its entire surface." The dimensions and properties of the planet "favor its habitability."

For example, the planet's core is likely similar to Mercury with a metal core accounting for two-thirds of its mass. Researchers think Proxima b has an overall mass similar to Earth.

(<http://www.voanews.com>)



## Pure Metal Asteroid has mysterious water deposits

Water has been showing up in all sorts of unexpected places in our Solar System, such as the Moon, Mercury and Jupiter's moon Ganymede. Add one more place to the list: Asteroid 16 Psyche. This metal-rich asteroid may have traces of water molecules on its surface that shouldn't be there, researchers say.



Psyche is thought to be the largest metallic asteroid in the Solar System, at 300 km (186 miles) across and likely consists of almost pure nickel-iron metal. Scientists had thought Psyche was made up of the leftover core of a protoplanet that was mostly destroyed by impacts billions of years ago, but they may now be rethinking that. For now, the source of the water on Psyche remains a mystery.

(<http://www.universetoday.com>)

# SCHOOLS IN ACTION



**Çekmeköy Final School, Istanbul**

Here is a photo taken during our second Mission Patch videoconference. Students have already started working on their toy designs.



**Ekin College, Izmir**

Great teamwork again from the students of Ekin College. It was nice to know they had lots of fun during the process. Next time we will use a photo from the boys :)



**FMV İlk School, Istanbul**

One of the best patches we saw this year came from these students. Great ideas and lots of talent in execution. GREAT job again!



**Ismail Kaymak School, Çanakkale**

A photo of the lovely crowd at Ismail Kaymak School. The interest and focus of each student here is amazing. The Future Explorers are coming strong!



**ITK BTK, Izmir**  
**Aylward Academy, London**

Our PSSP partners from last year are once again together with new students and teachers! Raise your hand if you're having fun.



**SEV College, Izmir**  
**Archer Academy, London**

We had a short but sweet Meet&Greet session with these two partner schools. Students from both schools were very excited to be in the program :)

## Astronomy Picture of the Day



W5: The Soul of Star Formation

**Explanation:** Where do stars form? Many times, stars form in energetic regions where gas and dark dust are pushed around in chaotic mayhem. Pictured, bright massive stars near the center of W5, the Soul Nebula, are exploding and emitting ionizing light and energetic winds. The outward-moving light and gas push away and evaporate much surrounding gas and dust, but leave pillars of gas behind dense protective knots. Inside these knots, though, stars also form. The featured image highlights the inner sanctum of W5, an arena spanning about 1,000 light years that is rich in star forming pillars. The Soul Nebula, also cataloged as IC 1848, lies about 6,500 light years away toward the constellation of the Queen of Aethopia (Cassiopeia). Likely, in few hundred million years, only a cluster of the resulting stars will remain. Then, these stars will drift apart.