

Hello Dear Readers,

With our E-Pal Week right around the corner, we are extremely excited for the videoconferences and presentations we will get to experience. Along with our Special Events Night, Science Fair, and the Barbeque Party, it is safe to say that history is about to be written here at Space Camp Turkey.

During the E-pal Week, which will be held on July 2-8, we will have videoconference sessions with **ESA Astronaut Jean-Francois Clervoy** and **NASA Flight Director Robert 'Bob' Dempsey**. They will share their experiences and answer various questions asked by our campers. Also, **Major Michael Coyne** will do a presentation about "Space Weather" and inform our campers about the conditions on the Sun. You can find more information about our Special Guests on the following pages.

Have a GREAT Summer Everyone!

SPACE NEWS IN A FLASH

- Student-Made Rocket Tops 9,000 Meters
- NASA's Newest Astronaut Recruits
- Planet 10? Another Earth-Size World May Be Out There
- A Company Wants to Help Astronauts Bake in Space
- KELT-9b is the Hottest Exoplanet Ever Found
- Magnetic Space Tug Could Target Dead Satellites
- The Kepler Space Telescope Finds New Exoplanets
- Elon Musk's Vision of a Self-Sustaining City on Mars

There are no passengers on spaceship earth. We are all crew.

- Marshall McLuhan

Student-Made Rocket Tops 9,000 Meters

A student team from the University of Michigan, Ann Arbor, took top honors last weekend at the 2017 Spaceport America Cup in New Mexico.

The Michigan competitors were chosen as the team that most impressed judges overall after also winning first prize in a category that saw them send a rocket to more than 9,000 meters above ground level.

Summer interns at ULA achieved another milestone — the largest sport rocket ever launched — when they sent aloft a 16-m-tall rocket. The 612 kilograms rocket launched "thousands of feet" above ground level to inspire education in science, technology, engineering and math (STEM).

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

NASA's Newest Astronaut Recruits

After receiving a record-breaking number of applications to join an exciting future of space exploration, NASA has selected its largest astronaut class since 2000. Rising to the top of more than 18,300 applicants, NASA chose 12 women and men as the agency's new astronaut candidates.



The astronaut candidates will begin two years of training in August. They could be assigned to any of a variety of missions, including: performing research on the ISS, launching from American soil on spacecraft built by commercial companies, and departing for deep space missions on NASA's new Orion spacecraft and Space Launch System rocket.

(<https://www.nasa.gov>)

Planet 10? Another Earth-Size World May Be Out There

Though the number of planets in our solar system has fluctuated in the last 11 years, it never exceeded single digits—until now. Two planetary scientists at the University of Arizona in Tucson believe they've found a 10th planet (assuming the unconfirmed ninth planet discovered last year exists), orbiting beyond Neptune, *New Scientist* reports.

The Mars-sized object is thought to exist in the Kuiper belt region at a distance that spans 30 and 55 AU (the distance between our Earth and sun). Still, many experts doubt that a planet of that size at that distance (the proposed ninth planet is 700 AU) would have gone unseen for so long.

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

Magnetic Space Tug Could Target Dead Satellites

Derelict satellites could in future be grappled and removed from key orbits around Earth with a space tug using magnetic forces.

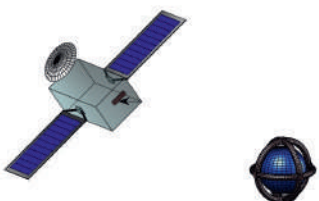
This same magnetic attraction or repulsion is also being considered as a safe method for multiple satellites to maintain close formations in space.

Such satellite swarms are being considered for future astronomy or Earth-observing missions – if their relative positions can stay stable they could act as a single giant telescope.

To combat space debris, interest is growing in plucking entire satellites from space. The biggest challenge is to grapple and secure such uncontrolled, rapidly tumbling objects, typically of several tonnes.

Multiple techniques are being investigated, including robotic arms, nets and harpoons.

(<https://phys.org>)



A Company Wants to Help Astronauts Bake in Space

A team of engineers and scientists may have just found a way for astronauts to enjoy fresh bread in space.



Currently, astronauts on the ISS rely on tortillas as their "bread" because they have a long "shelf life" and don't produce crumbs. But now, a team of engineers and scientists in Germany is developing an oven that works in microgravity, as well as space-grade dough that's suitable for baking bread in orbit, so that astronauts may one day be able to bake and enjoy fresh bread on the job.

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

The Kepler Space Telescope Finds New Exoplanets

NASA has unveiled the complete set of data from the first four years of the agency's Kepler Space Telescope mission, which stared at a single patch of the sky in the search for alien planets. The result: Kepler has discovered 219 new candidates since NASA's last data unveiling, including 10 near-Earth-size planet candidates in the so-called habitable zone around their stars where the conditions are just right for liquid water to exist on a planet's surface — a key feature in the search for habitable worlds.

The new discoveries boost Kepler's total to **4,034** candidate planets during its mission, 2,335 of which were later confirmed by follow-up observations, NASA officials said in a statement. The 10 newfound potentially Earth-size worlds bring Kepler's total up to 50 of that type of exoplanet, with more than 30 of those being confirmed, NASA officials said during a briefing on June 19th.

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

KELT-9b is the Hottest Exoplanet Ever Found

Scientists have discovered a planet that is hotter than many stars. In May 2016, astronomers were observing the sky and noticed that a star named KELT-9 would dim slightly every 1.5 days.

Further investigation led to the discovery of KELT-9b: an exoplanet that completes a circuit of KELT-9 every 1.5 days. It stood out from previous discoveries.

The temperature on KELT-9b is 4600 Kelvin. To put this in perspective, it is only 1200 K cooler than the surface of our Sun, and three times as hot as volcano lava. The heat is due to extreme radiation that is projected onto the planet from its very bright host star KELT-9.

(<http://cosmosmagazine.com>)

Elon Musk's Vision of a Self-Sustaining City on Mars

The Commentary entitled "Making Humans a Multi-Planetary Species" presents the vision of Elon Musk, CEO of SpaceX, for future manned trips to other planets and specifically what will be needed to create a self-sustaining city on Mars.



In the paper, Mr. Musk explores the planetary options for expanding to a space-bearing civilization and describes the advantages Mars offers. He provides a comprehensive review of a system architecture required for a rocket and spaceship capable of transporting people and supplies to Mars, comparing possible vehicle designs and performance features.

A major challenge facing engineers and scientists at present and discussed in the article is the need to improve the cost per ton of transporting materials to Mars by 5 million percent.

(<https://www.marsdaily.com>)

SPECIAL GUESTS OF E-PAL WEEK 2017



Jean-Francois Clervoy

Astronaut of the European Space Agency

Jean-Francois Clervoy was selected for the second group of French astronauts in 1985. From 1987 to 1992 he directed the parabolic flight programme at the Flight Test Center in Brétigny-sur-Orge, France, and provided technical support to the European human space program. In 1992, he joined the ESA astronaut corps at the European Astronaut Centre in Cologne, Germany. In August 1992 Jean-François was detached to the NASA Johnson Space Center in Houston, USA, qualifying as a Space Shuttle mission specialist.



Robert Charles Dempsey

Flight Director of NASA

As a flight director, Bob Dempsey has worked over 400 real-time execution shifts in missions control where he was responsible for all activities of day-to-day life on the International Space Station (ISS) including mission planning, handling major system failures and recoveries as well as vehicle dockings and undockings and a number of complex space walks (both US and Russian). He has served as lead for the 15th 6-month crewed expedition to the ISS working closely with his Russian partners. He led the five-month Automated Transfer Vehicle (ATV) 2 project in 2011 and the STS-130/20A ISS mission to deliver, attach and activate the Node 3 module in 2010.

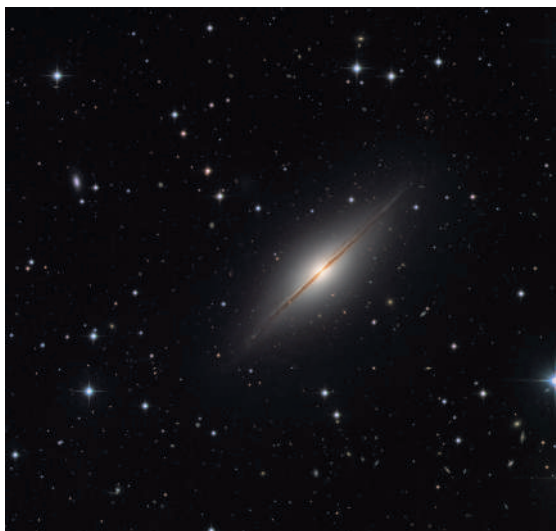


Major Dan-Michael P. Coyne

Meteorological and Oceanographic Officer for NATO

Maj. Dan-Michael Coyne serves as the meteorological and oceanographic officer for NATO's Land Command, Izmir, Turkey. He provides environmental expertise for long term planning across the land domain in order to ensure the long-term security of the alliance. He commissioned into the United States Air Force on 6 May 2007 from Air Force Reserve Officers' Training Corps Detachment 157, with a Bachelor of Science in Meteorology from Embry-Riddle Aeronautical University, Fla.

Astronomy Picture of the Day



NGC 7814: The Little Sombrero in Pegasus

Explanation: Point your telescope toward the high flying constellation Pegasus and you can find this expanse of Milky Way stars and distant galaxies. Dominated by NGC 7814, the pretty field of view would almost be covered by a full moon. NGC 7814 is sometimes called the Little Sombrero for its resemblance to the brighter more famous M104, the Sombrero Galaxy. Both Sombrero and Little Sombrero are spiral galaxies seen edge-on, and both have extensive halos and central bulges cut by a thin disk with thinner dust lanes in silhouette. In fact, NGC 7814 is some 40 million light-years away and an estimated 60,000 light-years across. That actually makes the Little Sombrero about the same physical size as its better known namesake, appearing smaller and fainter only because it is farther away. Very faint dwarf galaxies, potentially a satellites of NGC 7814, have been discovered in deep exposures of Little Sombrero.