



NEWSLETTER

RITTENHOUSE ASTRONOMICAL SOCIETY

Founded 1888 WWW.RITTENHOUSEASTRONOMICALSOCIETY.ORG

June 2010

OPEN TO PUBLIC AND STUDENTS
Upcoming Meeting on June 9th at
7:15 PM
The Franklin
20th Street and Benjamin Franklin Parkway

June's Meeting Members Help Wrap the Year!

With the possible closures of local school planetaria, we felt the best way to assist would be to focus on how they came to be, and what role they play in education today. Joyce Townes was a planetarium educator here at the Fels who now works with Spitz Inc., a local planetarium manufacturer. Joyce will be speaking to our membership this fall. We also felt it appropriate to ask other planetarium manufacturers in addressing their role in astronomy education.

June 9 will be our last meeting of the year. We are scheduled at this point in Musser Theater. Our tentative agenda:

- Lagrangian Points – Frank Bellomo
- Milky Way – Ted Williams
- Armand Spitz – Dr. Milt Friedman
- Sky Tonight – Alan Daroff
- Shuttle Update – Ken Kremer
- Tesla Coil Demonstration, Electricity Exhibit – Mike Mountjoy
- Observatory – Dave Walker, Carol Ludolph

Meeting Agenda

7:15 - Introduction
7:30 - Astronomy Lesson
President's Message
Sky This Month
Guest Speakers
Rooftop Observing - Weather Permitting



Joyce Towne

Joyce Towne of Spitz, Inc. will cover the history of Spitz planetariums - from the origination of the model A1 in 1946, to the wildly popular A3P planetarium of the 1960s. Other Spitz company innovations, such as a very early push-button student response system, and unidirectional seating under the dome will also be covered. Dome manufacture and technology, as well as modern, digital planetarium software (ie: Starry Night Dome) play big roles in today's teaching theaters. We are currently experiencing a renaissance in planetariums - the switch over to digital star projectors is causing a huge boost to planetarium business, which is reminiscent of a period in the 1960s when the Spitz company was receiving a planetarium order each week.

Visible Planets 06/09/2010

	Rises	Transit	Sets
Mercury	04:31 am	11:38 am	06:45 pm
Venus	08:08 am	03:36 pm	11:03 pm
Mars	11:19 am	06:03 pm	12:47 am
Jupiter	01:50 am	07:49 am	01:48 pm
Saturn	01:31 pm	07:43 pm	01:55 am

Health & Science: What will become of our society if we just learn what we need?

Dr. Milton Friedman

Columnist for Montgomery County Media

(Reprinted with permission)

When I heard that several schools in the suburbs were closing their planetariums, it brought to mind a thought that everyone has shared during the growing years: “Why do I have to learn a subject that I’ll never use?”

In our modern computer age, we feel we can survive without the need for proper grammar, knowing how to divide and multiply, the ability to tell time on a clock where the hands go around, or see the constellations on the dome of a planetarium.

Every generation wants to understand just what is needed to make a living and pay the bills. People would rather know every statistic of every ball player than where countries are located in Asia.

Today we have digital clocks, cell phones and computers that give us accurate time in digital form. People prefer to spend money on rental of their cell phones than to spend it on newspapers when cellular devices and the computer provide instant updates on everything current. They have no reason to know where foreign countries are located until a war, overthrow of a king or a natural disaster occurs. The news is important when an earthquake happens or a volcano erupts.

In the long run, we lose if we only study or care about what affects us directly. To protect our logic, we develop a list of reasons why many things we did should be left in the past. Cursive writing haunted every student in the last century. In those days, you looked at the blackboard and marveled at every perfect letter S and F as well as the other letters that were scripted by a handwriting expert. In writings of centuries ago, our ancestors wrote and signed documents in cursive. Today, cursive is still taught but its need is to sign a signature on checks, rental agreements and at health-care appointments.

Many students cannot look at a clock with its hour and minute hands and know the difference between a quarter-to-nine and eight forty-three. The top of the hour and the bottom of the hour are meaningless as are 12 noon and 12 midnight.

English grammar and sentence structure seem unimportant because cell phones and computers provide instant spell-checkers and sentence structure suggestions. The study of history is not just to be able to list the kings

and queens of a country or the names of all our presidents and when they were in office. History will reveal why a government was overthrown or why a war took place. Knowledge of history gives insight into why the problems of a country can involve the entire world. It gives a chronology of suicide rates and voting trends and even why we’re attracted to the stories of Camelot and Robin Hood.

Many studies have no immediate value but may become obvious in the future. Even medical students seem puzzled why they have to learn everything about diseases never seen in the United States. Who would have expected diseases to be carried from foreign countries that were incubating on airplane trips and now appear in this country?

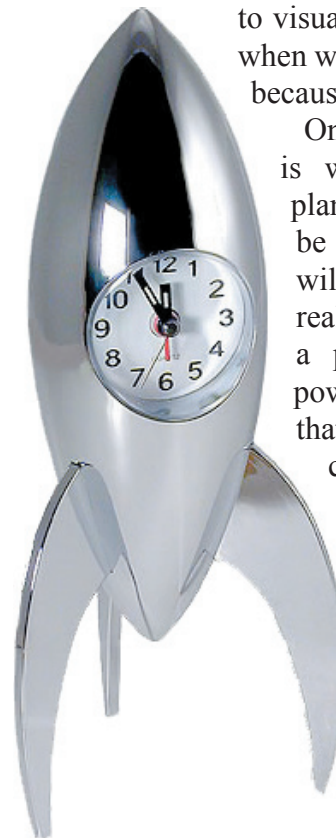
The study of mathematics goes beyond squaring and square root. It is necessary in physical sciences, computer sciences and biology. The field involving statistics and actuary work relies on mathematics. And it plays a major role in astronomy and the space industry.

Many countries besides the United States are in the planning stages of flights to Mars, asteroids, other planets and the moon. Money is allocated for the space industry and for the search for life beyond Earth. Over the years, the spin-offs from the space program have helped mankind with such things as pacemakers and telemetry in intensive care units in hospitals.

To understand our strange solar system and beyond requires teaching in the schools. As an example, it is difficult

to visualize giant stars that seem so tiny when we look at them from our backyard because of their distance from us.

One way to understand the universe is with the moments spent in a planetarium. Hopefully, money will be available, qualified teachers will be teaching and parents will realize the value of learning via a planetarium. There are hidden powers in the planetarium dome that seem to stimulate learning challenges. Indirectly, students will want to read an analog clock and realize the value of other types of knowledge. Using the brain instead of just the fingers will have endless benefits.



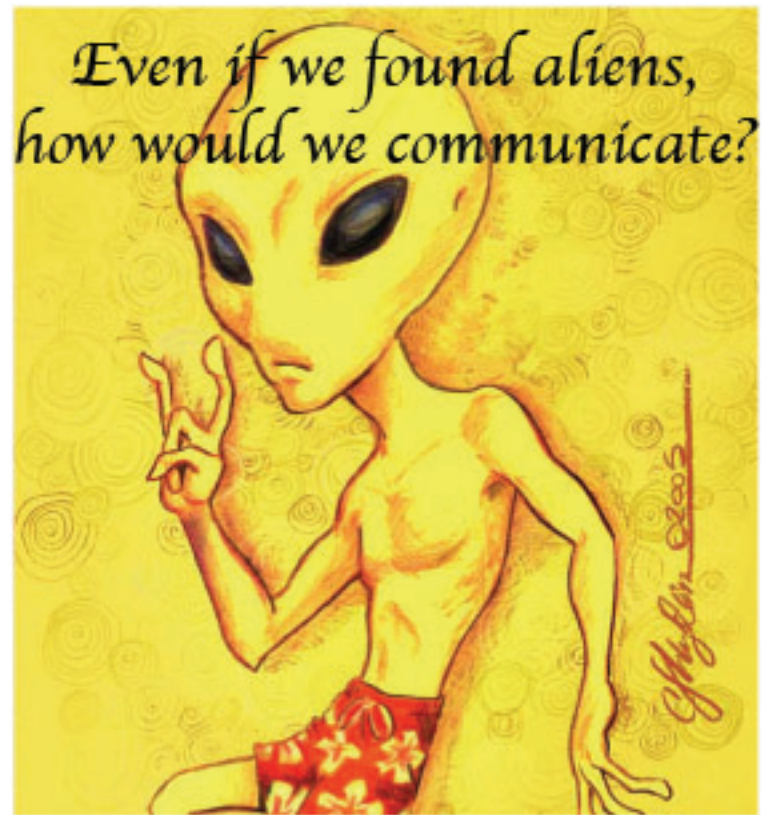
President's Message

Fifty years have passed since Frank Drake used a radio telescope in West Virginia in 1960 to search for alien signals coming from space. In 1974 Drake sent messages from Puerto Rico with the Arecibo telescope to two stars, Tau Ceti, eleven light years away and, when he found nothing, to Epsilon Eridani. This was the beginning of something new called SETI, the Search for Extraterrestrial Intelligence.



For 50 years astronomers have listened for signals from other life in the universe besides Earth but never received a message. Astronomers have spent the years hoping to find the right frequency that aliens would be broadcasting on. Drake had used 1,420 MHz, near hydrogen, the most common atom in the universe and because it was near the so called “water hole” frequencies that would be chosen since water is necessary for life. The water hole and 1,420 were quiet frequencies without much background noise. Despite the choice of frequencies and the improvement of radio telescopes that can listen to millions of frequencies at the same time, nothing has been detected coming from other life over the 50 years of listening.

Paul Davies has written an excellent book on the subject called, “The Eerie Silence.” The author explains that even if an alien civilization did send out signals, there’s no reason they would send it to Earth and, even if they did, they might have transmitted many years ago before we had invented radio telescopes. No one on Earth would have had the know-how and equipment to receive space transmissions more than 50 years ago. Likewise, Earth has



been using radio waves, radar and television for about 100 years, a short time to hope an alien civilization has been receiving them.

Since aliens might have newer ways to transmit besides radio waves, light waves and even laser pulses, our only hope of discovering alien life could involve other evidence discovered here on our planet other than electromagnetic waves. Davies suggests we examine our own planet to look for unusual signs that possibly a civilization beyond Earth has left its mark here. These might reveal explanations for such things as magnetic monopoles, string theory or quantum computers.

Within 70 light years of Earth are approximately 4,000 stars. The Kepler space probe and the Allen Telescope Array may locate stars that have possible life on their planets. Stay tuned.



May's Meeting

Our past meeting speaker Dr. Julia Plummer engaged me into thinking back my earliest memories when I was just becoming aware of the night sky. Attending Philadelphia schools afforded no real astronomy curriculum other than the planets of the solar system. I grew up never comprehending that those same planets were just above the nearby rooftops shining brightly. I suspect those teachers that shared the wonders of the solar system back in grade 3, did not know they could be seen overhead either.

It was not till grade 6 that my first telescope showed me the annoying moving moon. I could not quite figure how the tripod was drifting or shifting so that after I had carefully aligned the moon in the center of my field of view, it drifted quickly out of view. Memorizing that the "Earth spins on it's axis" never really helped me to understand what that would look like standing on the Earth looking at the sky. That night a light bulb went on for me, but not many I knew were looking through telescopes at that age.

Dr. Plummer's presentation showed us the many misconceptions we start out with at a young age. She shared her annoyance with the word misconception and alternately used interpretations as a way to explore what elementary students were thinking. Being an astronomy teacher I found her work quite familiar and on target with current interpretations of the night sky I see younger students develop and struggle with. Dr. Plummer's research supports that the challenges to understand basic motions of the night sky can more easily be overcome in the planetarium. This is an environment/instrument that allows students to better 'experience' celestial motions and view how they appear to us on Earth.

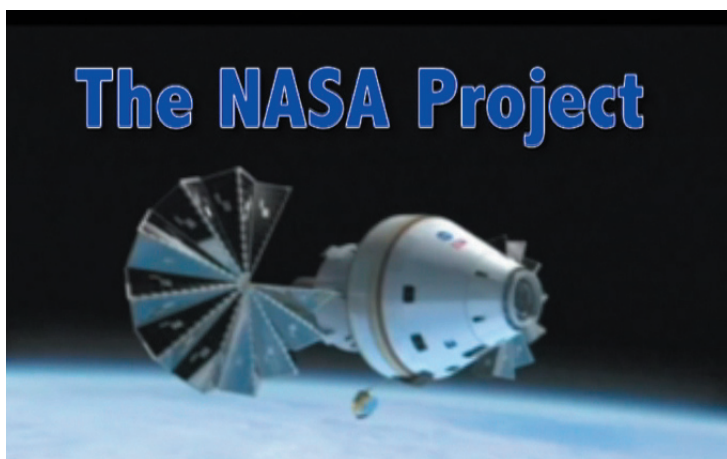
Laura James, a first grade educator at (blahblahblah school) shared a video she and her husband Marc James (technology educator) recorded and edited that demonstrated how her students became self motivated to invent and play



a game they called "Playing NASA." I think anyone in attendance could see themselves in those youngest mission controllers. I felt the video to be an inspirational reminder of why we continue to instill an interest in our children and our students in exploring the Universe. I feel that throughout my career I have seen that interest to be almost innate with young ones as they first interact with their world. Why not keep expanding that interest out to the Universe? Ms. James shows us that you can start that task quite early in life. We have discovered that it's a bigger universe than we ever expected in the past, consider starting our young ones earlier in life on that quest to understand it. The video was titled: The NASA Project International Year of Astronomy 2009

The NASA project was created by enthusiastic first graders who spontaneously combined astronomical facts with vivid imaginations. Through the wonderful world of play, students formed into an organized, well structured team able to launch rockets to far away lands. Soon "Playing NASA" took on a life of its own.

(This video is in honor of those students and their unique and powerful creation.)



Review of “The Earth Today”

David Teich

It's the 10th anniversary of the Rose Center and the 75th anniversary of the Hayden Planetarium. In “The Earth Today” program May 4, part of a year-long commemoration, the Hayden showed off its most recent technology, a data set that integrates images, about a day old, from the Landsat 7, AQUA and TERRA satellites, and projects them through the dome's “Digital Universe” 3-D software.

Dr. Carter Emmart, director of astrovisualization at the American Museum of Natural History, narrated the program to a musical score composed for the occasion by award-winning sound designer Jun Mizumachi.

A giant Earth filled the dome, turning slowly. The International Space Station--a projected 3-D image of a detailed model, hovered, fixed in place, between the Earth and the audience. The effect is startling: It's as if the audience is floating a few hundred meters above the space station at 17,500 miles an hour as the world turns serenely far beneath.

“I varied the altitude manually but the average was likely that of typical low-Earth orbit, which is a couple hundred miles off the surface,” Emmart says. “The ISS orbits at ~250 miles and we were up close to the ISS when I started. We have that in an accurate orbit, so when we fly in tandem with it, we see the astronauts' perspective faithfully recreated. Add in the daily images and we essentially recreate exactly what they see.”

We pulled away from the station and zoomed in. Africa lay below. “Here's Lake Victoria,” called out Emmart, who knows his geography. He points out Somalia, Ethiopia, the Red Sea, the Nile, Cairo and Alexandria. The cities were whitish smudges on a dry landscape. The Sinai, Israel, the Dead Sea, Turkey and Greece--its economic collapse seeming trivial from way up--rolled by.

“When the astronauts started out,” Emmart said, “they noted their home cities, regions and countries. But after a while, they simply saw Earth as the home of everybody.” We pulled away until the Earth was the size of a full Moon.

We went back in. A vast Asia came into view. The Caspian Sea, the Volga River and the Ural Sea glided by, followed by the steppes of the Cossacks, from where, Emmart observed, the Russians still launch their satellites.

He added Landsat imagery for a sharper view. All data were laid down in a patchwork of strips as various satellites made successive passes around the Earth. The resulting seams, mismatched clouds and occasional rectangles of missing data added to the journey's authenticity.

Tibet was now below. The eastern Himalayas were frosted with glaciers. At this height, Everest looked like an easy climb. We got closer, and the atmosphere thickened toward the horizon, a novel feature requiring extraordinary graphic skill.

The Brahmaputra River, Bhutan, Nepal, Malaysia, Sumatra, Java and Borneo, all came and went. Australia flattened out beneath us, red and dusty. We then crossed the Pacific. Mizumachi was obviously inspired by all natural sounds. His complex score, an engine-like pulsing overlaid with a sound like an eerie, ethereal wind, perfected our reverie.

Night fell. The dark Pacific gave way to the coast of California and the splotches of light pollution of the industrialized world. The American West glowed as the Sun swung around. Here, high above the atmosphere, it shone amid stars in a black sky.

Dust storms made white eddies in the New Mexico desert. We took a closer look at a gray spiral off the Mississippi Delta: the BP Petroleum drilling platform oil-spill disaster.

Mexico and Peru passed beneath. Before we reached Tierra del Fuego, we closed in on Rondonia, a large settlement amid many other deforested areas in the Amazon Rain Forest, whose dwindling untouched tracts remained lush.

As technology improves, Emmart believes, we can elevate ourselves with a view of our planet that only a few space travelers have ever seen. Maybe then we'll better “appreciate what it is we have left of this home of ours, and hopefully before it's too late for us.”

It's time to land, but not in New York City. We're off the east coast of South America. As we drop down, Emmart laid a zigzag line upon the Atlantic. It's the path of the schooner Anne, whose lone sailor, Reid Stowe, has spent more than 1,000 days on a three-year voyage analogous to an astronaut's journey to and from Mars. His girlfriend, Soanya Ahmed, got sick and left the boat on day 307. Turns out she was pregnant.

We left all real data-streaming behind as we landed on a mock-up of the Anne, tossing and pitching upon a mock ocean.

Right on time, the real Reid Stowe calls from mid-ocean and chats with Emmart as we listen in. He's returning to New York City in mid-June, is healthy on his diet of dried fish and bean sprouts, and would be happy to spend another year out there.

NGC4921 - A Ghostly Translucent Spiral Galaxy

Ivin Williams

Galaxies are enormous systems of stars, dust and gas held together by gravity. They are observed in every direction throughout the universe and exist in various shapes and sizes from elliptical shaped super giants that can be home base to trillions of stars to much smaller irregulars that have no distinguishable shape and contain many fewer stars. Every galaxy is a celestial city in its own right but it is those that are spiral in shape that often receive the most oohs and aahs. These carnival like rotating disks such as our own

Milky Way and its neighbor Andromeda are easily recognizable especially if they are observed face-on to our line of sight due to their having enormous glowing arms that slowly swirl around their cores. These spiral arms are the breeding grounds for star birth but what would a face-on spiral galaxy

look like to us if it did not have these glowing regions of star birth? A spiral galaxy with the prosaic name of NGC 4921 and one that has been dubbed “anemic” due to its low rate of star birth provides some answers.

NGC 4921 is a barred spiral located some 320 million light years away in the constellation Coma Berenices, the hair of Queen Berenice. It is one of the largest and brightest members of a cluster of over 1000 galaxies called the Coma Cluster also known as Abell 1656. This cluster is also held together by gravity and although it is some 20 million light years in diameter, that is not a whole lot of elbow room when that many galaxies are crammed into such a space. Ellipticals often arise as a result of galactic

train wrecks between various galaxies so it is unusual for such a massive spiral to actually reside within the Coma Cluster when so many of its neighbors are ellipticals.

In 2009, composite images of NGC 4921 taken by the Hubble Space Telescope were released and it soon became clear that there was something strange about this particular galaxy. It is a spiral galaxy alright but it seems to be missing the distinct glowing swirling arms that light up so many spirals and instead it has a very fine swirl of dust surrounding it along side some young blue stars. The outer regions of NGC 4921 are pale and very smooth which gives the whole galaxy the ghostly and translucent look of a deep sea creature that thrives without sunlight. This translucency



is directly related to its lack of heavy metal star birthing which is why it has been called anemic. The billions of stars that do reside in NGC 4921 are so spread out that the images also revealed many extremely remote galaxies directly behind it that surely were formed during the very early universe.

There are upwards of 100 billion galaxies in

the observable universe and just like stars and us humans, they all have life cycles with various stages of growing pains. Some galaxies grow as a result of galactic collisions and others tear apart. Stars that reside in the downtown regions of galaxy clusters compared to those that reside in much quieter neighborhoods will almost always show the wear and tear of living such a fast-paced lifestyle and NGC 4921 is no different. It has the tell-tale signs of a galaxy that has had various run-ins with its neighbors and because of it, we are able to witness one of the most beautiful galaxies in the whole distant universe even if it is anemic.

Atlantis Last Launch and Landing

Reporting Live from Kennedy Space Center

Dr. Ken Kremer

Space Shuttle Atlantis closed out a quarter century of service to the exploration of space with a majestic return from orbit and a spectacular landing this morning (May 26) at 8:48 AM EDT at the Kennedy Space Center (KSC) in Florida.

Atlantis and her six man crew descended through the atmosphere and were greeted by absolutely clear blue skies for what is likely to be her final touchdown on Earth.

Unless President Obama approves a final additional flight, Atlantis takes its place in the history books.

The orbiter approached from the south and was clearly visible to myself and other spectators from our bullseye perch nearby the Shuttle Landing Strip at KSC. She suddenly appeared as a faint speck, like a daytime star, that rapidly grew in size and form for some two minutes prior to landing at runway 33.

The forecasted threatening clouds fortunately stayed well off shore allowing Mission Control in Houston to easily approve a "GO" for Shuttle Commander Ken Ham to initiate the de-orbit burn at 7:41 AM while circling 220 miles above Indonesia.

The STS 132 mission lasted 11 days, 18 hours, 28 minutes from liftoff on May 14 to landing today during a journey of



Atlantis soars to Space on 14 May 2010 carrying the Russian 'Rassvet' research module and critical spare parts and is destined for the International Space Station. Credit: Ken Kremer



At the Operations and Checkout Building at the Kennedy Space Center, the STS 132 astronauts pose for a group portrait in their orange launch-and-entry suits in front of the Astrovan which will transport them to Launch Pad 39 A. From left are Mission Specialists Piers Sellers, Steve Bowen, Michael Good and Garrett Reisman; Pilot Tony Antonelli; and Commander Ken Ham. Credit: Ken Kremer

4.9 million miles and 186 orbits about the earth.

The primary goal of STS 132 was delivery of the Russian built Rassvet science module and other crucial spare parts to the International Space Station as a hedge against the looming date for the complete retirement NASA's three Orbiter shuttle fleet.

The ISS is now 94% complete by volume and 98% complete by mass.

Shuttle Atlantis completed 32 missions, lasting 294 days, while flying 120 million miles during 4648 orbits of the Earth since her first launch in 1985.

The fact is that only money, not safety, is causing the Space Shuttle Program to be prematurely grounded while the orbiters are now operated at the absolute peak of their performance and safety.

NASA has already purchased all the hardware needed to fly one more shuttle mission. But NASA requires money



and approval from the Obama Administration and the Congress to officially add the flight to the manifest which would be designated as STS 135.

This was the third of the final five planned flights until the space shuttle program is retired at the end of 2010. Only 2 shuttle flights remain on the manifest.

If you can, try and watch a magnificent shuttle flight in person before they are no more. There is nothing like seeing for yourself and being a witness to history.

The Space Shuttle is the most complex and capable machine built by humans. And there is nothing in the foreseeable future that will even come close to matching or replacing its awesome power and capabilities to explore the High Frontier.

Check out all my STS 132 Launch and Landing stories at the Planetary Society and NASA Watch:

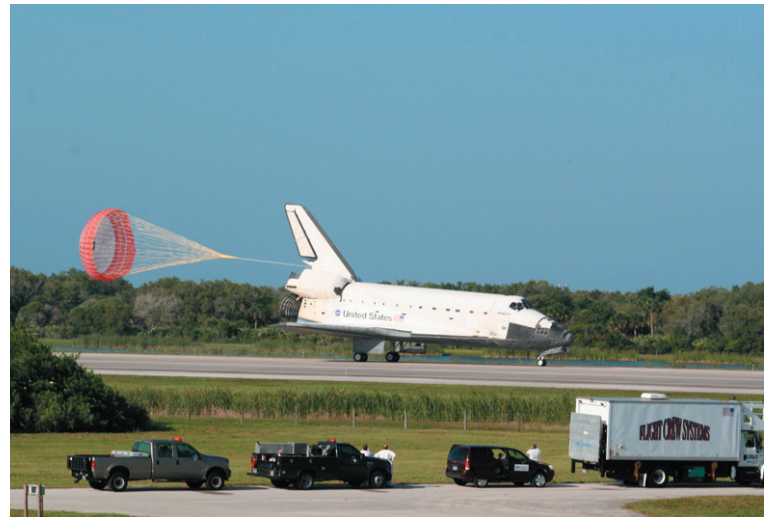
<http://www.planetary.org/blog/article/00002500/>

<http://www.spaceref.com/news/viewnews.html?id=1395>
(see links to more STS 132 stories)

Check out all my STS 131 stories at the Planetary Society and Universe Today websites:

<http://www.universetoday.com/author/ken-kremer/>

<http://www.planetary.org/blog/article/00002451/>



*Last Touchdown of Atlantis at Kennedy Space Center !
Credit: Ken Kremer*

Astronomy Outreach:

Dr. Ken Kremer

Please contact me for more info or science outreach presentations by email. My upcoming Astronomy talks include:

Café Scientifique: Philadelphia, PA, June 1, 6 PM, Belle Cena Restaurant. "6 Years of Mars Rovers and the Search for Life (in 3-D)" Website: <http://www.sciencecafephiladelphia.org/Home.html>

Rittenhouse Astronomical Society at Franklin Institute: Philadelphia, PA, June 9, 730 pm, "Brief Eyewitness Highlights from Last flight of Shuttle Atlantis". Website: <http://www.rittenhouseastronomicalsociety.org/>

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