NEWSLETTER

RITTENHOUSE ASTRONOMICAL SOCIETY

Founded 1888 *WWW.RITTENHOUSEASTRONOMICALSOCIETY.ORG* **December 2009**

OPEN TO PUBLIC AND STUDENTS

Upcoming Meeting on December 2nd at
7:30 PM
The Franklin
20th Street and Benjamin Franklin Parkway

December's Meeting:

Special Event

NASA Astronaut and USN Captain Christopher Ferguson will address the Rittenhouse Astronomical Society at the Franklin Institute, Philadelphia on Wednesday evening, December 2, 2009 at 7:45 PM. The title of his talk is The International Space Station and the Future of Human Space Flight after the Shuttle. This free lecture will focus on Ferguson's experiences to the International Space Station and the future of human space flight. The presentation is open to the public, students are encouraged to attend.

Meeting Agenda

7:15 - Seating

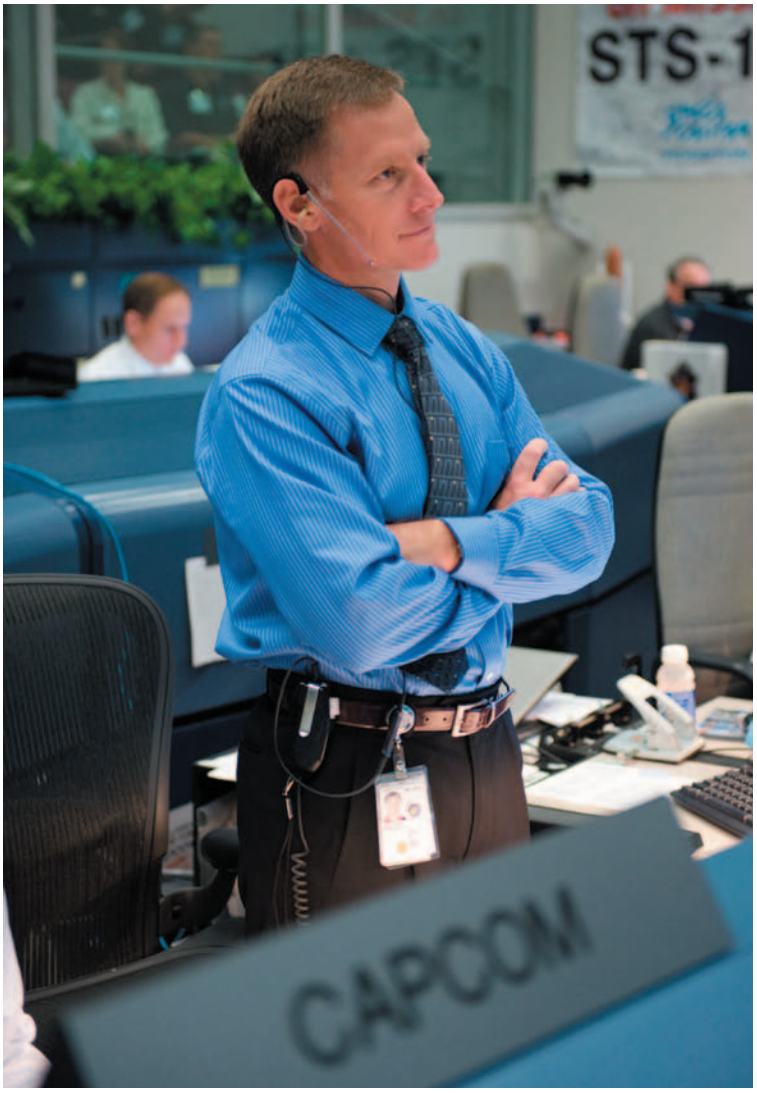
Meeting Commences

President's Message - Dr. Milton Friedman

President and CEO - Dennis M. Wint, PH.D.

Guest Speaker - Christopher Ferguson

Rooftop Observing - Weather Permitting



SC2009-E-240933 (16 Nov. 2009) --- Astronaut Chris Ferguson, STS-129 spacecraft communicator (CAPCOM), watches the big screens from his console in the space shuttle flight control room in the Mission Control Center at NASA's Johnson Space Center during launch count-down activities a few hundred miles away in Florida, site of Space Shuttle Atlantis' STS-129 launch. Liftoff was on time at 2:28 p.m. (EST) on Nov. 16, 2009 from launch pad 39A at NASA's Kennedy Space Center.

Atlantis Rockets to Orbit on ISS Resupply Flight

Dr. Ken Kremer

I was thrilled and fortunate to attend the recent launch of Space Shuttle Atlantis on flight STS 129 at the Kennedy Space Center with a press pass and was reporting in person on behalf of The Planetary Society, Universe Today and Spaceflight magazine. I also toured the next two space station modules known as Tranquility and Cupola, up close. They are set for launch in February 2010 on the next shuttle flight, STS 130.

All my reports and pictures are kindly collected on the Rittenhouse Astronomical Society homepage as well as my personal webpage below, to peruse at your leisure. You can also see my first two television interviews with the Indian TV channel NDTV from New Delhi:
http://www.rittenhouseastronomicalsociety.org/
http://www.rittenhouseastronomicalsociety.org/Dr.Kremer/K.htm

Our December speaker, Space Shuttle Commander Chris Ferguson was the primary CAPCOM or Capsule Communicator, for the STS 129 flight.

Read my launch account below. Two more articles and four of my new Mars mosaics are publishing in the Jan. 2010 issue of Spaceflight magazine.

Space Shuttle Atlantis and her crew of six rocketed into orbit on Monday, November 16 precisely as planned at 2:28 PM EST from the Kennedy Space Center (KSC) in Florida. Atlantis ascended off the pad on 7 million pounds of liftoff thrust from the combined might of the twin solid rocket boosters and three space shuttle main engines. She quickly rotated about, leaving behind a wake of blazing exhaust flames, smoke and rumbling thunder which seemed to nearly engulf the shuttle in mid air moments after liftoff.

Atlantis arose swiftly and was visible to onlookers from the KSC press center for roughly three minutes as she accelerated in a northeasterly path up the east coast of the United States for her trek to the International Space Station (ISS). After a two day pursuit she rendezvoused and docked with the six person crew on board the station.

Atlantis punched into space through the remaining wispy clouds to the delight of onlookers at the KSC press site including me. For the first time ever, NASA invited over 100 tweeters into the press site in a social networking experiment to bring the thrill of space exploration and a shuttle launch to a broader range of the public. I was quite impressed with the high-tech setup inside the tweeters tent located adjacent to the iconic Vehicle Assembly Building (VAB).

STS 129 carried almost 30,000 pounds of spare parts and back-up equipment known as Orbital Replacement Units, or ORU's. The 11 day flight included three spacewalks (or EVA's) to install the ORU's onto the exterior structure of the ISS ahead of the looming retirement date of the shuttle planned for September 2010 or soon thereafter. The Space Shuttle is the only vehicle which can carry these types of bulky equipment to the ISS. This unique capability will be lost for decades to come after the 5 remaining shuttle flights are completed.

The STS-129 crew members are Commander Charles O. Hobaugh; Pilot Barry E. Wilmore; and Mission Specialists Leland Melvin, Randy Bresnik, Mike Foreman and Robert L. Satcher Jr. Station resident Nicole Stott was on board when Atlantis returned on November 27, increasing the crew size to seven. Stott spent over three months conducting scientific research on the ISS.

Moments after 2:28 PM EST blast off of Space Shuttle Atlantis and six person crew on 16 November 2009 from pad 39 A at the Kennedy Space Center, Florida.
Credit: Ken Kremer

The six person crew of Space Shuttle Atlantis walk out from crew quarters at 10:38 AM to greet the cheering crowd of media and NASA officials and then head out to pad 39 A to strap in for space launch with hours.
Credit: Ken Kremer

Astronomy Outreach:

Dr. Ken Kremer

Riverside Elementary School, Family Astronomy Night: Princeton, NJ, Dec 9, 6 PM. "Phoenix and the Twin Mars Rovers (in 3-D)"
Gloucester County College Astronomy Club: Sewell, NJ, Jan, 2010 TBD, 7 PM. "Fixing Hubble: Eyewitness to Shuttle Atlantis Launch to save The People's Telescope"
Website: http://www.gccnj.edu/news_and_alerts/rotating_ads/ken_kremer.cfm
Café Scientifique: Philadelphia, PA, April 6, 2010 6 PM, Belle Cena Restaurant. "6 Years of Mars Rovers and the Search for Life (in 3-D)"
Website: http://www.sciencecafephila.org/Home.html

Please contact me by email for more info or presentations.

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January's Meeting

Terry Underkoffler

Astronomical Web Resources

Our January meeting will be filled with astronomical resources and some amazing ways to pull those resources together while working on the Internet. Our guest presenter, Terry Underkoffer, has been a long time technology specialist and has worked with area school districts as they further their technology endeavors. A teacher trainer and technology integrator, Terry has specialized in assisting classroom teachers to explore new technologies to expand their educational horizons. Terry will share with us new ways to harness astronomical resources available on the internet.

Close up of Space Shuttle Atlantis and crew walk out arm and platform at 195 ft level of pad 39 A. Close out crew assists crew into their seats. Thereafter the orbiter hatch is closed for the 11 day mission to the ISS. The arm swings away a few minutes prior to launch. Credit: Ken Kremer

The Christmas Tree Cluster Celestial Ornaments

Ivin Williams

The Holiday Season is upon and soon festive expressions of every color, shape and size will dot the landscape from single candles elegantly placed in windows to soaring Christmas trees adorned with jaw dropping brilliancy. The variety of lights and other decorations that are available is truly amazing and choosing which ones to decorate with can often be such a daunting task that perhaps the only thing more holiday challenging would be decorating a tree that not only is many lights years in height but would require decorations many times the size of our sun. The Christmas Tree Cluster located in the Monoceros constellation is such an object and not only does it resemble the shape of a fir tree when viewed in visible light, it is also very well lit due to the active star-forming regions that are located there. What is responsible for the Christmas Tree Cluster's distinct shape? Is the cosmos joining us in celebrating the holiday season?

The Christmas Tree Cluster also called NGC 2264 due to it's designation in the New General Catalogue of deeps space objects is an open star cluster of about 40 stars. It is located some 2500 light years away in the faint constellation Monoceros, the Unicorn. Monoceros is located on the celestial equator which is an imaginary projection of the earth's equator on to an imaginary sphere known as the celestial sphere that completely surrounds earth. NGC 2264 is actually four objects that also include the Cone Nebula, the Fox Fur Nebula and the Snowflake Cluster.

Open star clusters are groups of stars that average anywhere from a few dozen to several hundred and are loosely held together by gravity. This means that over time they will disperse. Open star clusters are differentiated from globular clusters where gravity is so strong that they are packed together very tightly. The stars in open clusters were created from the same molecular cloud, the birthplace of stars and planets. They also have similar ages, composition and are located at a similar distance away from us.

It helps for one to know a little bit about what a nebula (plural nebulae) is in order to understand what in the universe is going on with NGC 2264 and why such shapes as cones, fir trees and snowflakes are visible to us. Nebulae are clouds of gas and dust that can form in the interstellar medium, those extremely vast but almost empty regions of matter between stars. The ratio of this interstellar medium where there actually is matter is about 99% interstellar gas (hydrogen) and 1% interstellar dust. Historically, the term nebulae described almost any kind of blurry or fuzzy patch in the night sky including some that were later determined to be actual galaxies. Nebulae can also be referred to as being diffused because they often lack any defined boundaries.

Nebulae for the purposes of this topic are subdivided into emission nebulae, reflection nebulae and dark (absorption) nebulae. Emission nebulae are associated with interstellar gas while reflection nebulae and dark nebulae are associated with interstellar dust. Emission nebulae are self-luminous which means that when clouds of cold molecular hydrogen become gravitationally unstable, they proceed to collapse and star birth can result. Ultraviolet radiation released from these extremely hot and newly formed stars ionizes the surrounding gas to the point that it becomes plasma and begins to glow. Stunning red nebulae are created this way. The famous Eagle Nebula

is an example of an emission nebula. A reflection nebulae on the other hand is not luminous on it's own but instead reflects through clouds of dust the light from a star that is either behind or near it. The Witch Head nebula is an excellent example of a reflection nebula because it reflects light from the star Rigel. Clouds of dust can also become so thick that they absorb light resulting in dark nebula that often stand out as dark areas or patches. The Horsehead Nebula is a familiar example of a dark nebula.

There is an enormous amount of emitting, reflecting and absorbing of gas and dust taking place in and around NGC 2264 that is responsible for it's holiday like shapes. NGC 2264 is not visible to the naked eye but when binoculars and telescopes are pointed towards it, one sees a large area that has a distinct triangle like shape that comes from a reflection nebula surrounding many bright stars. This is the fir tree part of NGC 2264. At the apex of the tree, the shape of a cone is superimposed on a background emission nebula. This is the dark Cone Nebula and although it takes up only a small portion of NGC 2264, it is a good 7 light years in length. In addition to all of this holiday like activity taking place, there are several very active star-forming regions composed of extremely hot blue stars that illuminate the surrounding areas. It is this star birthing that makes NGC 2264 look like a fully lit and decorated Christmas tree. The bright blue-white massive variable star system known as 15 Monocerotis is only some of this tree's enormously huge ornaments.

The Christmas Tree Cluster is like many Christmas trees in that it often takes some time to fully observe and really appreciate everything about it. Embedded in and surrounded by gas and dust this celestial Christmas tree does not reveal everything about itself all at once. Surely, in a perfect universe, the Christmas Tree Cluster would appear in the northern hemisphere night sky just in time for us to enjoy it during the holiday season. Perhaps it is somewhat ironic that it is our neighbors along the equator who are fortunate to have such a stunning celestial object floating directly above them given that the equatorial regions of our planet are usually not the first areas that come to mind when one thinks of Christmas. No matter it's location in the sky, the Christmas Tree Cluster is truly one of the most beautiful and spectacular of all celestial objects even if is not actually joining us in celebrating the holiday season.

Visible Planets 12/02/2009

	Rises	Transit	Sets
Mercury	08:24 am	12:54 pm	05:23 pm
Venus	06:15 am	11:09 am	04:03 pm
Mars	09:30 pm	04:35 am	11:41 am
Jupiter	11:39 am	04:48 pm	09:57 pm
Saturn	01:21 am	07:25 am	01:30 pm

Messages from our Secretary

Ted Williams

Year-end updating of our Membership Database

Each year-end it has become our practice to update our membership database. It is at this time that we retire members that have not yet renewed from the previous academic year. We have included a membership renewal form if you would like to keep your membership active through the New Year. One of your membership benefits is the Abrams Sky Map which has also expired. If you would like to renew your membership, we will again continue to subscribe on your behalf to this award winning sky guide.

We realize that the economy may affect the organizations that you decide to support this year with your continued membership, or possibly you have found another astronomy organization that meets your astronomical needs. We have many astronomy organizations in our immediate area and understand that we all bring a different focus on astronomy. We have their with contact information on our website. We thank you for your support this past year, and if you choose not to renew your membership with us, you are still most welcome to attend any future meeting or event we conduct regardless of your membership status.

Membership Cards

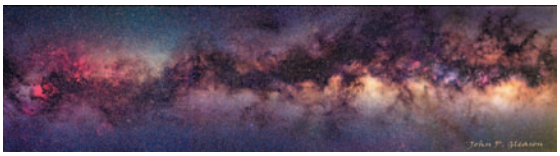
You can have an active part in our organization by giving away your membership card! We have plenty of replacements. Why give them away? If you find an interesting speaker, educator or presenter in your travels that you feel our membership would enjoy hearing from at one of our meetings, hand them your Rittenhouse membership card. Get some contact information from the prospective guest presenter (ideally their business card.) Contact one of the RAS executive officers listed on the back of your card, or on our website, to inform us who you have contacted, and we will follow up by contacting them to discuss a prospective presentation.

All of our members are representatives of our society; with your input we can better provide speakers that interest our fellow members.

Membership Certificates

A benefit of your membership dues is a membership certificate suitable for framing. Please remember you need to ask for this benefit since we do not automatically print certificates for all who join. This certificate is ideal to hang on your office bulletin board, classroom kiosk, or home office. The certificate indicates that you are active in an organization that expands your astronomical interests. Simply putting it on display in your office area may spur on astronomical interests in others. Teachers, please consider this a way to show your support of an organization that furthers astronomy education.

Project to Move Forward



At the beginning of the International Year of Astronomy we floated three project ideas that we felt would help RAS members pull together and share their astronomy interests with the visiting public at our meetings and on our website. They included a guest log book to track attending members and guests during the year, the Galileo sketch form to encourage observers to sketch the sights that Galileo observed, and the "Drive Me to the Milky Way" project encouraging members to share where they have traveled from Philadelphia to see the Milky Way. Of the three projects, the Milky Way project seems to have attracted the most interest. This idea has spurred a R.A.S. web page with member's descriptions. It is a project we would like to expand and carry on to the New Year. It is based on the questions that come from many visiting our meetings that concern finding a good view of the stars of our galaxy.

We would like to expand the project on our website to include a map of areas surrounding Philadelphia that members have viewed our galaxy from. Ideally the map would be interactive with rollover buttons that prompt descriptions of that viewing site. It sounds like an ideal project for any instructional design students to tackle that might be in the ranks of our membership. If the Instructional Design program was still offered at Philadelphia University, we would have a project to propose. Sadly, that program recently lost the support of the University and no longer provides a masters degree in instructional design. Contact us if you are interested in getting involved with the continuation of this project.

President's Message

Dr. Milton Friedman

By the time we see it, it might be too late. On March 2, 2009, at 8:40 a.m., a space object estimated to be 115 feet in length classified as a Near Earth Asteroid (NEA) passed above Earth, missing us by 44,740 miles. The NEA whizzed by twice as high as our geostationary satellites which are in place 22, 000 miles up.

Comets and asteroids that might some day strike Earth are known as NEOs (Near Earth Objects) and NASA has been hoping to locate 90 percent of those that have diameters more than 1 Km. (six-tenths of a mile) by the end of 2009. According to predictions, there are 1,000 of them up there.

PHOs are Potentially Hazardous Objects that might hit Earth. By definition, they are asteroids or comets that are larger than 500 feet and can come closer than 4.6 million miles. Of these, 1,085 PHAs or Potentially Hazardous Asteroids have been discovered.

By an apparent coincidence, autumn is the season when they approach and scare us.

This happened on Oct. 7, 2008 over the Sudan, Oct. 8, 2009 over Indonesia and on November 6 of this year at 4:30 p.m., a 22 foot object missed us by 9,800 miles. So far this year, 799 have been discovered that are 1 km. (0.6 mile) or larger.

Although a large strike is rare, it has happened in the past. It is believed that the dinosaurs were wiped out 65 million years ago when an asteroid hit. A crater near Winslow, Arizona resulted from a 164 foot asteroid hitting 50,000 years ago, creating a three-quarter mile wide crater 608 feet deep. Fortunately it struck before the area was inhabited. A probable asteroid exploded over Siberia in 1908 that was 100 to 150 feet across and leveled trees for hundreds of miles.

Nothing is coming over the horizon for us to worry about today but sometimes asteroids and comets appear before any preventive steps could be taken. At present, if we were on a collision course, modern science hasn't figured out what could be done. Stay tuned.

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