



NEWSLETTER

RITTENHOUSE ASTRONOMICAL SOCIETY

Founded 1888 WWW.RITTENHOUSEASTRONOMICALSOCIETY.ORG

May 2009

OPEN TO PUBLIC AND STUDENTS
Upcoming Meeting on May 13th at
7:30 PM
The Franklin
20th Street and Benjamin Franklin Parkway

May's Meeting:

A Multi-Cultural Interpretation of the Night Sky

Steven Berr

I would like to have a different kind of star show. One that looks at various parts of the night sky and explains how different cultures throughout the world see them. These could be African, Hawaiian, Mayan, Japanese, Chinese, or Jewish. I will investigate how these cultures developed calendars, creation stories, and used the stars for navigation. We will explore how they saw themselves in their universe. Come join us as Steve explores the multi-cultural view of the skies.

Brief Biography

Stephen Berr was graduated from Brooklyn College with a BS, major in Geology, minor in Physics. He received an M.Ed. from Temple University, with a major in Science Education. He has attended NSF institutes at Knox College, University of Washington, University of Pennsylvania, Michigan Technological University and Michigan State University.

Mr. Berr began his teaching career as an Earth Science Teacher in New York City. The majority of his working career was spent as a Planetarium Director for the Colonial School District in Montgomery County, PA., where he also taught Earth Science, Physics, Astronomy, and Gifted and Talented classes in Science.

Upon retiring in 1993, he began representing Learning



Technologies Incorporated in the Mid-Atlantic states demonstrating and selling the Starlab Portable Planetarium systems, both the opto-mechanical and digital versions. He also trained teachers and museum personnel giving workshops on how to use these products effectively. He stopped representing Learning Technologies in 2007.

During his career Mr. Berr organized and led a student group to the Yucatan to see Halley's Comet in 1986, organized and led an adult tour to Hawaii to see the solar eclipse of 1991, and was a guest lecturer aboard the SS Veendam during its Caribbean Eclipse Cruise in 1996.

Mr. Berr was contributing writer for Project STAR and project SPICA Astronomy Activity books produced at the Harvard Smithsonian Center for Astrophysics.

Meeting Agenda

7:20 - Prelude
7:30 - Astronomy Lesson
President's Message
Sky This Month
Guest Speaker
Rooftop Observing - Weather Permitting

Visible Planets 05/13/2009

	Rises	Transit	Sets
Mercury	06:09 am	01:25 pm	08:40 pm
Venus	03:56 am	10:11 am	04:25 pm
Mars	04:15 am	10:36 am	04:56 pm
Jupiter	02:11 am	07:26 am	12:41 pm
Saturn	02:11 pm	08:40 pm	03:09 am

One of Mr. Berr's major interests has been non-western sky mythology; how other cultures viewed the heavens. This interest centers on creation mythologies, and how they used the celestial phenomena to develop calendars and determine their activities through the year. Toward that end he has studied Native American, Japanese, Mayan, Chinese and African star stories.

April's Meeting

This Art of Arts



Our past meeting included a presentation by our guest speaker Robert Hicks. Robert did an outstanding job guiding us across the Atlantic as we followed a voyage from England to Virginia. We were introduced to many of the early celestial tools that were employed by sailors to find their way around the globe. A sextant, cross-staff, back staff, and astrolabe were some of the basic instruments on display for members to inspect. Robert utilized them during his talk to illustrate some of the navigational methods that were used to determine longitude and latitude. Rare early books on celestial navigation were described and available for members to page through. At the end of the evening, Robert treated members and guests with some "gifts" which included some early star charts, posters navigation charts and sundial kits. Also up for grabs were some vintage astronomical magazines.

Our student lesson included a search for some of the navigational stars that early sailors might have used, which are the same stars that modern day go-to type telescopes use to determine their position (although most recent models also include some type of GPS device to assist in their set-up.)

Members were also quite surprised when we fired up the planetarium and were treated to the new projection system installed in the Fels. Star color and resolution of double stars and star clusters became immediately evident as we

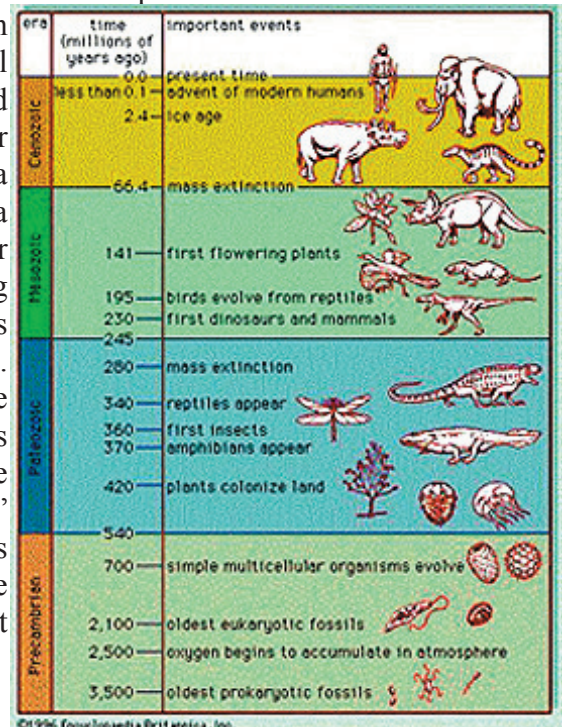
pointed out the sites of the current night sky. The projection system helped the Fels return closer to the original sky that the Zeiss (an optical mechanical sky projector) provided when the Fels originally opened. While many who work in the planetarium field realize that a video projected sky cannot match (at this point in time, those original skies of the optical mechanical machines), this newest system definitely improved the clarity (resolution) and color as compared to recent installations. If you missed the meeting, come on out and see what you think of the newly upgraded night sky. It is an obvious if not startling improvement!

President's Message

Dr. Milton Friedman

All of us look ahead to the future and hope to expand our knowledge. We anxiously await results of Kepler's search for Earth-sized planets over its three year exploration of the cosmos. We hope Hubble will be repaired to continue its fantastic views of our universe. As we look ahead, we tend to forget to look back. The most successful life forms on our planet are the unicellular organisms known as bacteria and archaea. Within a few million years after Earth was created, these organisms were thriving here. As we look back, we should ask where did the first living forms come from? According to some estimates, their number make up 10 to the 30th power, far more than all the multicellular life on Earth, such as worms, animals and us, added together. The answer to their origin is still uncertain. They either formed here on Earth deep in cracks at the bottom of the oceans known as hydrothermal vents or arrived here after "hitching" a ride deep in a meteorite or comet carrying them across the universe.

We await the answer. As soon as the "backwards" scientists decide, the RAS will let you know.



A Meeting of the Minds

*Dr. Sandra Faber and her Colleagues
Visit The Franklin Institute
~ Ivin Williams*



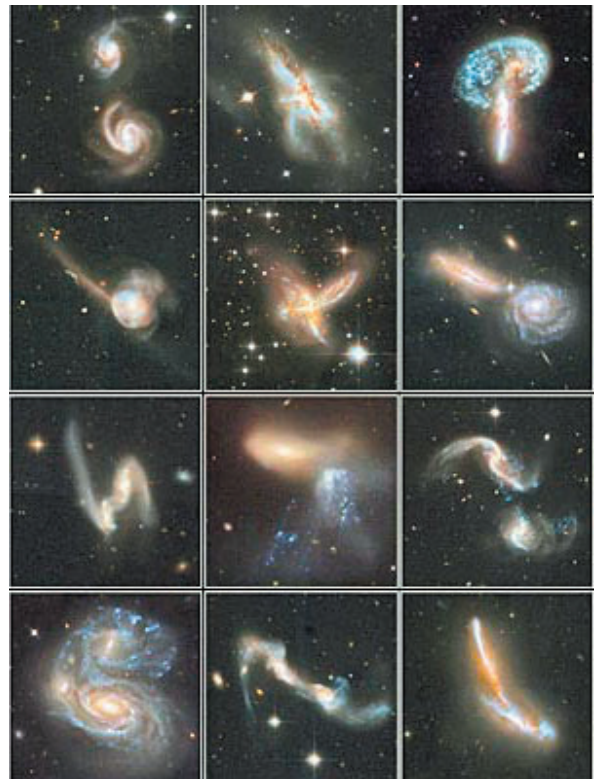
A real meeting of the minds took place at the Franklin Institute on Tuesday, April 21, 2009 when when it hosted a panel discussion titled “The Cosmic Origin of the Human Species” featuring Dr. Sandra Faber and four of her PhD colleagues: Dr. Michael Fall from John Hopkins University, Dr. Jeremiah Ostriker from Princeton University, Dr. Scott Tremaine from the Institute for Advanced Study and Dr. David Weinberg from Ohio State University. The event was moderated by Derrick Pitts, chief astronomer at the Franklin Institute. A professor of astronomy and astrophysics at the Lick Observatory, University of California, Santa Cruz, Dr. Faber is well respected for her work in astrophysics including heading the team known as the “Samurai Seven” who discovered “The Great Attractor” which is an enormous gravitational force that is tugging on certain galaxy clusters including our own Local Group. The Franklin Institute awarded Dr. Faber with the 2009 Bower Award and Prize for Achievement in Science.

Dr. Faber began by letting the audience know that the discussion would focus specifically on the settings for life and not the origins of life. She mentioned that the presentation is formally divided into four chapters but that only chapters 2 and 3 would be discussed. Chapter 2 began with a short film that simulated the scale of the universe beginning with the Orion Nebula and ending with the the giant elliptical galaxy M87 in the Virgo cluster some 60 million light years away. Dr. Faber then showed another short film that differentiated the shapes of spiral galaxies from those that are elliptical. Dr. Faber talked some about her collaboration with astronomer Robert Earl Jackson that led to the Faber-Jackson relation which among other things shows the correlation between the size of a galaxy and it’s orbital speed. Dr. Faber discussed a little bit about that trillionth of a second period of time known as inflation that shortly followed the Big Bang. Dr. Faber also pointed out that the universe is composed of 6/7 dark matter and 1/7

regular matter (periodic table). Chapter 2 ended with Dr. Faber mentioning that the farther one looks out into the cosmos, the less galaxies one actually sees.

Chapter 3 focused on star formation and specifically nucleosynthesis and the role that supernovas play in the creation of elements heavier than iron that can be found in each and every one of us. Dr. Faber also pointed out that when supernovas explode, they leave behind enormous amounts of interstellar gas which in turn become the birth place of stars resulting in a perpetual cycle that never ends. A short discussion followed about extra solar system planets and the exact conditions that must be met for them to exist. Dr. Faber concluded the presentation by mentioning the Anthropic Principle which suggests that the physical and chemical conditions that exist in the universe are just the right ones to allow for life as we know it. After the presentation, Dr. Faber’s colleagues joined the discussion and answered questions from the audience.

The discussion panel was a real treat for those of us who love astrophysics and cosmology. It was very fascinating to hear Dr. Faber and her esteemed colleagues discuss back and forth the various topics that were brought up but many of these topics were ones that could have easily been discussed for a couple of hours entirely on their own if time allowed. Hopefully at some point in the not too distant future, another such event will take place so that some of these topics will be discussed in much greater length and detail.



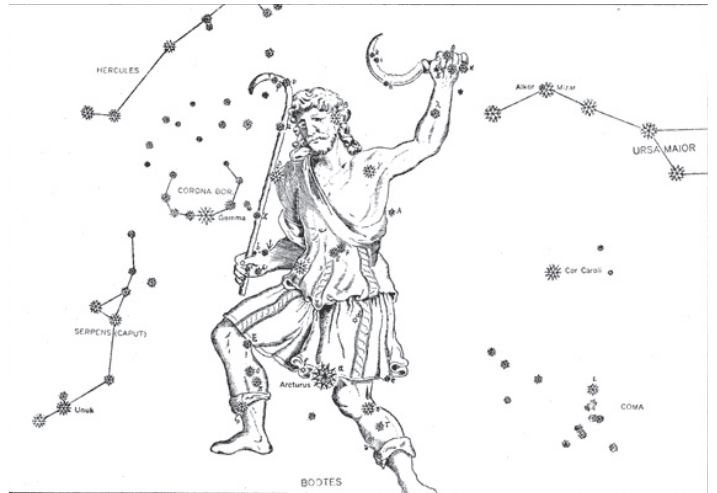
The Boötes Void

Where are all the galaxies?

~ Ivin Williams

Spring has arrived here in the northern hemisphere and weather permitting, one can look up in the night sky and see what resembles a flying kite. This is the constellation Boötes (pronounced boo-OH-tees) and it was known as the Herdsman to the ancient Greeks. The ancients observed the Boötes region with only their eyes but if they had been equipped with modern technology, they would have discovered an empty region of space so vast that it surely would have challenged them to find the correct god to name it after. This enormous empty region of nothingness is known as the Boötes Void and is named after the constellation that it resides in. The Boötes Void is extremely interesting primarily because it is relatively empty of galaxies. Spring is the time of the year when many things bloom that often stay hidden or buried during the other seasons, so where are all the galaxies in the Boötes Void that one would expect to find in a region of space so vast?

The Boötes Void was discovered in 1981 by Robert Kirshner and his team while conducting a survey of galactic redshifts which measures the light speeds of receding celestial bodies. This roughly spherical void stretches some 250 million light years across (75 megaparsecs) which translates to a distance of about 2% of the diameter of the visible universe. The center of the Boötes Void lies some 700 million light years away from us and it would take a search light a good 250 million years just to cross it. This enormous size led the astronomer Greg Aldering to once comment “if the Milky Way had been in the center of

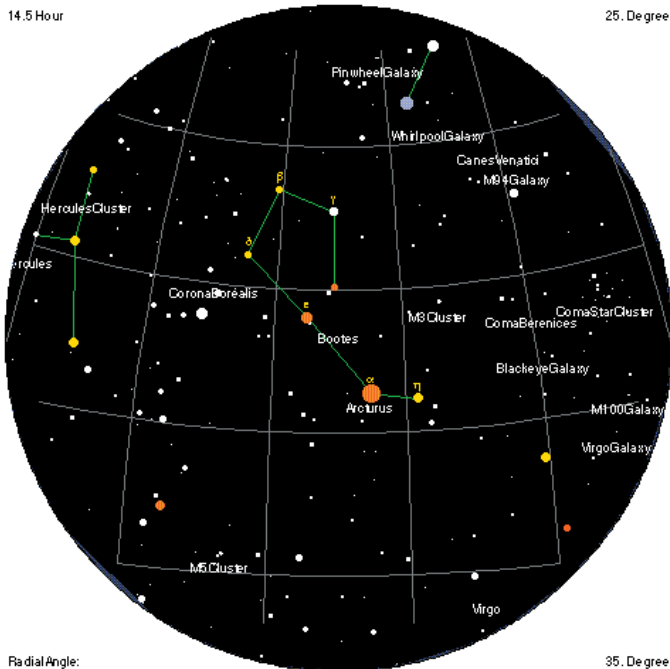


the Boötes Void, we wouldn't have known there were other galaxies until the 1960's”

Cosmic voids are actually not all that rare and in fact may make up 98% of the universe. These enormous voids arise as a result of gravitational clumping that leave vast regions of mostly empty space which are then surrounded by strings of galaxies known as filaments. The use of the word void suggests that the Boötes Void is 100% totally empty of all matter but this is definitely not true and in fact, some 53 galaxies have been found to reside there within tube-shaped regions. These so called void galaxies are also most interesting because they have been found to shine some 25% brighter than the average galaxy in the universe.

Astrophysicists and cosmologists often get frustrated when confronted with empty spaces and especially vast ones like the Boötes Void so they do what comes natural to them, they try to fill it up with whatever might be lying around such as a galaxy here or perhaps some dark matter there just as one has to fill up a jar with marbles or whatever else because they just can't handle looking at it empty. The average particle density in the universe has been calculated to be about one particle (atom) for every cubic feet of space but the space within the Boötes Void appears to have even less particles per cubic feet than that. This means that these astrophysicists and cosmologists can try filling up the Boötes Void all they want but they are going to need more than a life time to do so.

The Boötes Void is only one such vast empty like region in the universe but it's soap bubble like anatomy does suggest that some extremely interesting events took place during those few trillionths of a second after the big bang. Perhaps dark matter has been a long time tenant in the Boötes Void which might explain why there are not too many vacancies available for many other galaxies to also make it their home.



NASA Ambassador Update

~ Dr. Ken Kremer

Photos from RAS March 09 Meeting: “Pluto and the “People’s Telescope”: Hubble observations of the Solar System, and the Space Shuttle Servicing Mission saga” by Max Mutchler from the Space Telescope Science Institute (STSCi)



Hubble Space Telescope Astronomer Max Mutchler presented a thrilling talk to a large and enthusiastic crowd at the March 09 monthly meeting in the Fels planetarium, which also attracted many new faces to our club. Max described how he discovered Pluto’s newest moons Nix and Hydra, took the best ever images of Ceres and Vesta, his first hand account of work to prepare astronomy science equipment for installation by space walking astronauts on the upcoming Space Shuttle servicing mission to Hubble and much more.



About 20 students from the Gloucester County College (NJ) Astronomy Club attended Max Mutchler’s presentation, pictured here with Max and host Ken Kremer. GCC student Dan McCormick (RAS student webmaster)

and the entire RAS Board of Directors made a super effort to help organize a great turnout. Thank You RAS !!



NEWS ALERT: Launch of Space Shuttle Mission STS-125 to service and upgrade the Hubble Space telescope during 5 space walks has been moved up to May 11. If successful, Hubble will be at the apex of its Astronomy Science capability !

Astronomy Outreach

~ Dr. Ken Kremer

Exploration of the Solar System by NASA and ESA was the topic of my outreach talks in March and April in NY, PA and NJ.



Well over 100 college students and community members attended my talk on “Mars, Saturn, Asteroids and Beyond in 3 D” at Rockland Community College (NY) on March 6 co-sponsored by the Rockland Astronomy Club.



Upper Moreland Middle School in Hatboro, PA. On March 25, a giant crowd of well over 450 from the local community attended "A 3-D Mars Experience: Mars Day Celebration" presented by Ken Kremer.



Another 250 middle school students attended 5 more presentations of "Exploring for Life in the Solar System in 3 D" by Ken during an all day Astronomy Event at Upper Moreland Middle School

Your Officers and Members-At-Large

- President.....Milt Friedman
- Vice-President.....Alan Daroff
- Secretary/WebMaster.....Ted Williams
- Treasury/Newsletter.....Ruth M List
- NASA Liason.....Dr. Ken Kremer
- Instructional Technology Advisor.....Mike Mountjoy
- Fels Planetarium Liason.....Dave Walker
- Observatory Liason.....Carol Ludolph
- Student Liason.....Daniel McCormick
- Science Journalist.....Eric Van Osten
- Amateur Cosmologist.....Ivin Williams



Hundreds of middle school students in Hatboro, PA took a journey with Ken Kremer to be "On Mars in 3 D" for an up-close Out of this World experience.

See photo report from my DAWN Asteroid mission talk at Gloucester County College on April 15 and other talks elsewhere next month, including my latest published Phoenix Mars mosaics.

http://www.gccnj.edu/news_and_alerts/rotating_ads/ken_kremer.cfm

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

Plantation Astronomy Club: Leesburg, FL, May 18, 7 PM. "Mars, Saturn, Asteroids and Hubble Servicing Mission"

Villages Astronomy Club: The Villages, FL, May 19, 7 PM. "5 Years of Mars Rovers and Hubble Servicing Mission"

Dr. Ken Kremer Email: kremerken@yahoo.com

NASA JPL Solar System Ambassador

Website: <http://www.rittenhouseastronomicalsociety.org>

Our **NEW** Mailing Address:

Rittenhouse Astronomical Society
 P.O. box 283
 Feasterville, PA 19053-0283