

The Ursa Minor Report



Newsletter of the Kutztown University
Planetarium & Observatory

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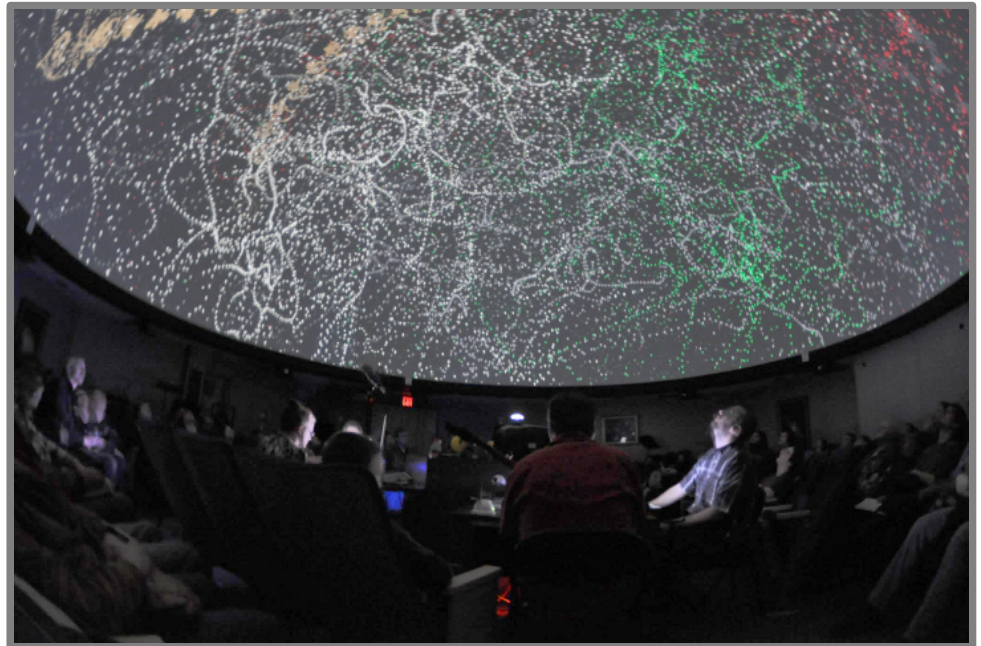
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Computer Music & Visualization Conference

The Kutztown University Computer Music & Visualization Conference (KUCMVC) took place at the KU Planetarium on June 13 & 14, 2015. More than 30 performances were presented over the course of two full days, with presenters visiting us from all around the country.

Dr. Dale Parson (KU – Dept. of Comp. Sci. & I.T.) organized the event and presented his own computer music & visualizations. Parson was accompanied by current and former KU students. Dr. Phill Reed (KU – Dept. of Phys. Sci.) contributed to the conference by displaying astronomical visuals for some of the spacey tunes.



Perhaps one of the highlights of the event was the final presentation called “Zero Input Mixer” at midnight on Sunday night. During this presentation, the performers used custom-built audio mixers to drive sounds originating from their own feedback alone. The live interaction between the audio and the computer-generated graphics was impressive!

More information and reviews of the event can be found here:

- <http://faculty.kutztown.edu/parson/music/>
- <https://www.facebook.com/events/362932373878073>
- <http://electro-music.com/forum/viewtopic.php?p=411464>
- <https://vimeo.com/channels/kucmvc2015/>

Fall 2015 Schedule of Public Planetarium Shows & Events

DATE	TIME	EVENT	COST
Thursday, September 10	7:00 pm	"Exploding Universe"	FREE
Wednesday, September 23	7:00 pm	<i>The Golden Age of Exoplanet Discovery</i> a Public Lecture by Dr. Joshua Pepper in MSU183 (NOT in planetarium)	FREE (with snacks provided)
Wednesday, September 30	7:00 pm	Naming Exoworlds & "Extreme Planets"	FREE
Thursday, October 15	7:00 pm	"Legends of the Night Sky: Perseus & Andromeda"	FREE
October 26 - 30	7:00 pm 8:00 pm	<i>Laser Light Shows</i> (Pink Floyd & Halloween) (See website for schedule)	\$5 \$4 w/ KU ID
Wednesday, November 4	7:00 pm	Pluto Update & "Birth of the Solar System"	FREE
Sunday, November 8	2:30 pm	Sesquicentennial Show: "150 years of the sky over Kutztown University"* sponsored by the Kutztown Foundation and Alumni Relations office (* To request free tickets for this show, please call 610-683-4110)	FREE*
Thursday, December 3	7:00 pm	"Exploding Universe"	FREE

More To Be Announced ...
www.kutztown.edu/planetarium



"Exploding Universe" Planetarium Show

Out of devastating events in the cosmos comes new creation. Explosive phenomena are responsible for the way we see the universe today, and not all of them happen on a grand scale.

When giant stars explode as "supernovas," they seed the galaxies with heavy elements that make planets and life possible. Some collisions we're only just now starting to understand. For example, when black holes collide, they can throw off some of the most energetic particles known, ripping and warping space as they go. But other "explosions" have profound effects as well, such as the beauty and power of supervolcanoes which have contributed to the transformation of our world into the life bearing oasis we now enjoy. The smallest of explosions, such as the forced impact of high energy particles, can echo the foundational events of the early universe.

As the universe has transformed into the structure we live in now, even the most elementary particles have endured. This show follows the path of one of these "particles," a proton, as it participates in nature's astounding events of rebirth and renewal. Admission is FREE.

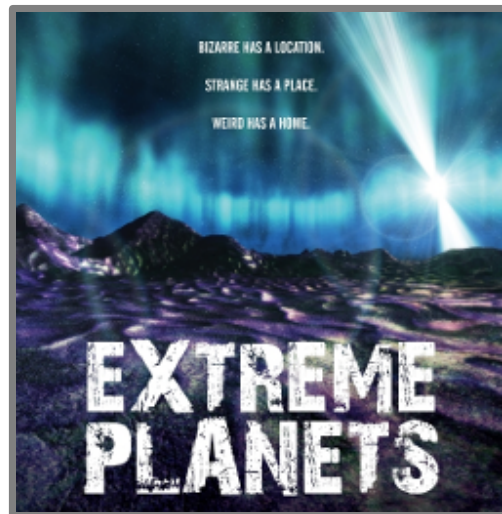
"Extreme Planets" Planetarium Show

Exoplanets are planets orbiting stars other than our Sun. The Extreme Planets planetarium shows investigates the likely conditions on several exoplanets that have recently been discovered.

Astronomers using advanced observatories such as NASA's Kepler Mission to study light from distant stars in search of exoplanets have discovered hundreds of alien worlds. Can you imagine visiting a planet made entirely of carbon? How about one where half the planet is always in daytime while the other half is always dark? What do you think it might be like if our Sun were a neutron star?

Narrated by Rene Auberjonois, Extreme Planets explains the discovery and analysis of exoplanets and helps guide your imagination toward an understanding of what these worlds might actually look like.

This show will begin with information about how you can participate in the official naming of new exoplanets and their host stars – “naming of exoworlds”. Admission is FREE.



"Legends of the Night Sky: Perseus & Andromeda" Planetarium LASER Show



There are stories in the stars. Most of the constellations that map out the current night sky have roots in legends from long ago. Narrated by an animated mouse named Socrates, this planetarium LASER show teaches the audience about the ancient legends of Perseus and Andromeda.

Covering characters from King Cepheus and Queen Cassiopeia to the mythical god Poseidon and the sea monster Cetus, this LASER adventure tells the story of Perseus & Andromeda like never before.

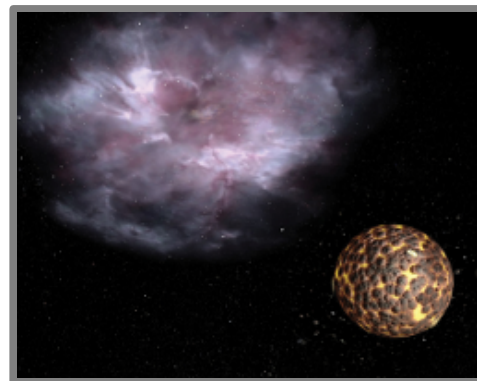
This LASER show is preceded by a short, live planetarium presentation about some interesting stars and galaxies located within these constellations. Admission is FREE.

"Birth of the Solar System" Planetarium Show

Our Solar System, as we know it, contains one star, eight planets, dozens of moons, and countless comets & asteroids. When and how did it come to into being and why does it look the way it does?

Birth of the Solar System will take you back several billion years and show you how a process scientists call "accretion" is responsible for the construction and current appearance of our Solar System.

This show will begin with an update about the latest discoveries made by the New Horizons mission to Pluto and the Dawn mission to Ceres. Admission is FREE.



Sesquicentennial Planetarium Show: "150 years of the sky over Kutztown University"



How has the study of astronomy changed over the 150 years since the founding of Kutztown University? What has stayed the same? And what has happened in the sky over Kutztown during the University's first century and a half?

These questions will be answered in this one-time-only live planetarium presentation. Rare photographs will be shared and interesting stories (legends?) will be told.

This show is sponsored by the Kutztown Foundation & Alumni Relations office and requires tickets. To request FREE tickets, please call 610-683-4110.

LASER LIGHT SHOWS

(October 26 - 30 at 7pm & 8pm)

These are professional laser light productions designed specifically for the KU planetarium dome! The small admission fee of \$5.00 (\$4 for KU students, faculty, & staff) helps to support some of the free educational events presented at the KU Planetarium & Observatory. A portion of the proceeds also supports the KU Society of Physics Students (Physics Club). This semester features *Pink Floyd* and a special *Halloween music show*.

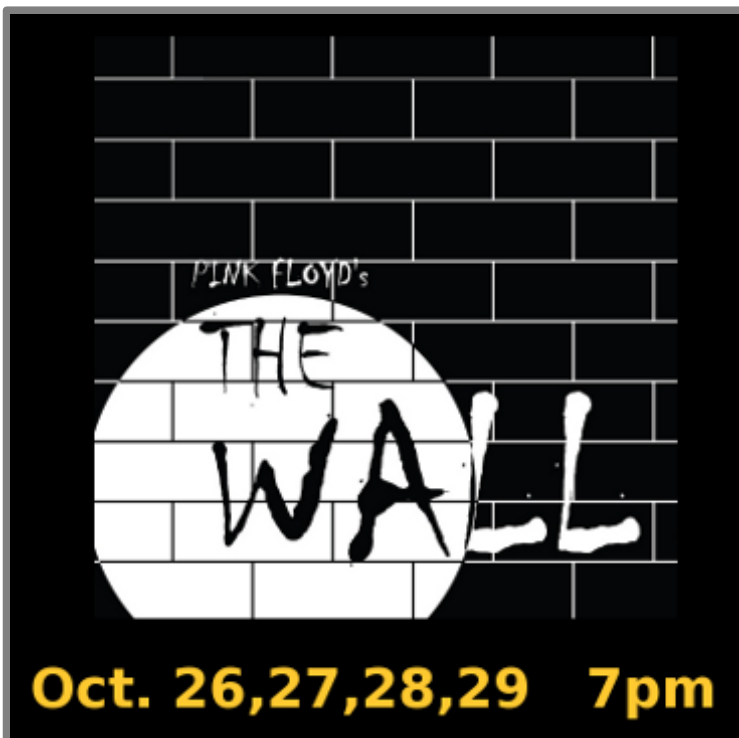
Tickets go on sale October 5th and are available at the SUB information desk and on-line. If they are still available, tickets will be sold at the door on the day of the show.



Pink Floyd's Dark Side of the Moon

October 26,27,28,29 8pm

A poster for a laser light show. The background is a dark, starry space. A white beam of light enters from the left and passes through a transparent triangular prism. The light is dispersed into a vibrant rainbow spectrum that extends across the width of the image. The text 'Pink Floyd's Dark Side of the Moon' is written in a white, hand-drawn font at the top. At the bottom, the dates 'October 26,27,28,29' and the time '8pm' are displayed in a bold, yellow font.



PINK FLOYD'S THE WALL

Oct. 26,27,28,29 7pm

A poster for a laser light show. The background is black with a white grid pattern representing a brick wall. A large white circle is positioned on the left side, containing the words 'THE WALL' in a bold, black, hand-drawn font. Above the circle, the words 'PINK FLOYD'S' are written in a smaller, white, hand-drawn font. At the bottom, the dates 'Oct. 26,27,28,29' and the time '7pm' are displayed in a bold, yellow font.

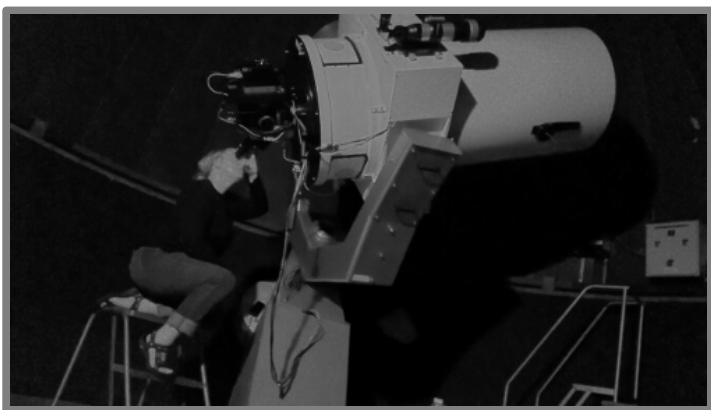


FRIGHT LIGHT

Oct. 30 7pm & 8pm

A poster for a laser light show. The background is black. The title 'FRIGHT LIGHT' is written in a bright green, jagged, hand-drawn font at the top. Below the title, there are several colorful, neon-like drawings of various figures and objects, including a man with a gun, a spider, a person with a large mouth, a skeleton, and a person with a red hat. At the bottom, the date 'Oct. 30' and the times '7pm & 8pm' are displayed in a bold, yellow font.

Open House at the Observatory



ABOVE: A visitor looks through the eyepiece of the 24" research telescope – the KU Observatory's main instrument.

The KU Observatory (located on the roof of the Grim Science Building) is open to the community during public observing events. Since these events require a clear sky and are heavily dependent on the weather, they are announced as the opportunities arise. Oftentimes, a public observing event will be announced on the morning of the same day. A sure way to get all of the announcements is to follow the KU Planetarium & Observatory on Facebook:

<https://www.facebook.com/KUPlanetarium>

Guests at the KU Observatory have been treated to live views of planets, star clusters, galaxies, and more!



ABOVE: These are typical views through the 24" telescope's eyepiece of some common targets for visual observing. From left to right: a very small portion of the moon's surface, the planet Saturn, the "Orion Nebula" (M42) – a star forming region, the planet Jupiter, and the "Hercules" globular star cluster (M13) – a collection of 300,000 stars in the Galactic halo.

Research at the Observatory

The KU observatory continues to operate as a professional research facility, giving KU students the opportunity to participate in meaningful research projects. KU faculty and students conduct their own research and they also collaborate with other colleagues around the world. Recent international collaborations have led to the discovery of new exoplanets (planets orbiting stars other than the Sun) and to new insights on the nature of pulsating stars.

KU student Stephanie Klein (senior – B.S. Physics/Astronomy) and professor Phill Reed represented Kutztown at the General Assembly of the International Astronomical Union (IAU) in Honolulu in August 2015. Klein & Reed (pictured below) presented results of research they performed using the on-campus observatory at KU.

One of the projects they presented at IAU is a study of RW Tauri, an "interacting" binary star. To the right (upper panel) is an illustration of the cool, red sub-giant star transferring mass to the hotter blue companion star. The bottom panel shows two spectra. The black line is the observed spectrum and the red line is the theoretical model for the stars. The

blue line is the difference between them and reveals the emission of light by hydrogen atoms. Klein & Reed tracked the variations in the hydrogen emission to study the variable nature of the transfer of mass between the stars. This research sheds light on the role played by magnetic fields in the evolution of binary stars and progenitors of type Ia supernovae. The published abstracts of their IAU presentations can be found here:

- <http://adsabs.harvard.edu/abs/2015IAUGA..2258215R>
- <http://adsabs.harvard.edu/abs/2015IAUGA..2257313J>

