

# The eleventh annual AST poster session

## Thursday, November 16, noon, AS 1623

Number in front of presenters' names represent their booth number

### 1. Eric Williams and Ty Edwards Formation of Stars

The formation of a star. A deeper look into the life cycle of the bright dots emitting light above the earth's atmosphere, as well as the process of a star's birth within the many constellations rotating in the night. What causes this emission of light? From its beginning as a swirling cloud of gas to its first act of nuclear fusion the stars are the dominant power source for the universe.

### 2. Hunter Houvener, North Seattle Community College STELLAR NURSERIES

Stellar nurseries are accepted as the beginning for many stars in galaxies throughout our universe. It is simply an area where a newborn star is soon developed into a full grown star. The stellar nurseries are surrounded and intertwined with hot dust, glowing plasma, and magnetic fields. One of the most impressive stellar nurseries is the Eagle Nebula, which was photographed in 1995 by the Hubble Space Telescope. This picture of the Eagle Nebula was dubbed as "The Pillars of Creation," and soon claimed fame and little more attention to stellar nurseries. The stars in a stellar nursery bud up out of the core of the nebula like the apples of a tree. The dust collects, gases collapse, and stars are born from these nurseries. So "nurseries" really does mean that the nebula is nursing these stars into development.

### 3. Devin Kochanasz, North Seattle Community College **Globular Clusters & the Oldest Stars in the Universe**

The size of our galaxy is commonly estimated by astronomers by a variety of methods. However, the discovery and understanding of globular clusters can tell us the true size and extent of our galaxy. For example, in the constellation Sagittarius of the Milky Way Galaxy is our galactic nucleus that is approximately 30,000 light years from earth. It is surrounded by a spherical distribution of ancient stars called the central bulge. This bulge of stars outlines the halo of the Milky Way and is a showing example of the extent of our galaxy's reach. A typical globular cluster contains up to 1 million stars in volume. Astronomers can figure out the age of the stars by gauging the temperature in Kelvin: The higher the temperature of the star, the younger the star; the lower the temperature, the older the star. The cluster's existence can best be compared to a burning candle, as the flame dies out over time.

**4. Erika Rivera and Keith Lindahl, North Seattle Community College**  
**HYPERNOVAS: THE BIGGEST BANGS**

A Hypernovae is referred to an exceptionally large star that collapses at the end of its lifespan. It is related to a Supernovae, but more powerful. Until a star explodes, Hypernovas, and their affiliation with gamma ray bursts help astronomers detect light from the first generation of stars. Although Hypernovae explosions haven't been definitely observed, a very energetic Hypernova was possibly identified on March 29, 2003.

**5. Abraham Habteselassie and Thomas Abraha, North Seattle Community College**  
**THE STORY OF CYGNUS X-1**

Cygnus X-1 is an x-ray binary that is in the constellation called Cygnus. It was one of the first x-ray sources and was discovered in 1962. Its name Cygnus X-1 is that because it was the first x-ray source that was discovered in the constellation of Cygnus. HDE226868 is the visible object that is a 9th magnitude blue super star giant. Its orbital period is about a week. Cygnus X-1 has a strong X-ray emitter. The optical and X-ray emission has a variation on a very short time scale. The short time scales indicate that the companion could be a black hole.

**6. Phillip L Collins and Tony Tran, NSCC, Furutani Tracy, AST100**  
**SPACETIME, THE THEORETICAL AND THE PHYSICAL**

Discovering and defining how space and time function has captured the interest of many famous theorists. Einstein used his theory of relativity and concepts from Newtonian Gravity to come up with his idea space-time. The concept of Space-time combines space (3 dimensions) and time (the 4<sup>th</sup> dimension) into one concept, as they are dependant on each other. The fabric of space-time can be easily displayed using Euclidian Geometry. The fabric of space-time is like a cloth and objects (such as stars and planets) dent this fabric with their mass. The important conclusion of this model is that a planet's orbit, such as Earth's, occurs inside a dent in the fabric. These big dents are made by high mass objects, such as the Sun, which other lower mass objects revolve around. This theory is a great visual aid and model but is believed relevant enough for NASA (in collaboration with Stanford) to launch a probe into space to detect the curvature of space around earth.

**7. Kris Gill and Mark Perry, North Seattle Community College**  
**VOYAGER - WHERE NO ONE HAS GONE BEFORE.**

The Voyager Project was launched in 1977. The Voyager probes were meant to survive just four years. Their mission was originally to explore our Solar System and perform detailed surveys. Now nearly thirty years later, both Voyager probes have exceeded all expectations and have crossed over into the 'heliosheath', the outermost boundary of the Sun's effects. The Voyager probes will be the first human-made objects to pass out of the Solar System, and enter the rest of the Milky Way Galaxy.

**8. Trista Wenrich and Chris Novak, North Seattle Community College**  
**EXTRASOLAR PLANETS**

An extrasolar planet is a planet that is beyond our Solar System . The use of high-resolution spectroscopy led to the detection of many new extrasolar planets. These advances allowed astronomers to detect new extrasolar planets indirectly by measuring their gravitational influence on the motion of their parent stars. Extrasolar planets are also detected by observing the variation in a stars apparent luminosity as a planet passed in front of it. NASA has scheduled to launch in 2008 the Kepler mission, which is a spaceborne telescope designed to survey distant stars to determine the number of Earth-like planets. Kepler will detect planets indirectly, using the transit method. There are more than 200 extrasolar planets have been discovered and more are being discovered constantly.

**9. Jacquie Coulter and Alisa Andersen, North Seattle Community College**  
**JAMES WEBB SPACE TELESCOPE**

The James Webb Space Telescope is planned to launch into space in 2013. Astronomers are hoping to discover new information regarding the beginnings of our universe, galaxies and life through the data the James Webb Space Telescope will collect. In comparison with the Hubble telescope, scheduled for retirement in 2010, the JWST costs nearly the same, has about half the mass, will have a much larger orbit (one year compared to 100 minutes), and advanced optical technology with 6 times the collecting area in its primary mirror. New instruments on the James Webb Space Telescope include: a near-infrared (IR) camera, a near-IR multi-object spectrograph, a mid-IR instrument, and a tunable filter imager.

**10. Ian Donahoe and Blaine Holien, North Seattle Community College**  
**HUBBLE DEEP FIELD**

The Hubble Deep Field is a project that uses the Hubble Space Telescope to image an the area that the human eye has never seen until 1995. In the deep field are galaxies that have been hiding from the earth for a very long time. From an astronomer's viewpoint, these pictures give an explanation of what heated the universe thousands of years ago. As the big bang theory suggests, our solar system was extremely hot and dense, and needed to expand. This deep field represent at least 1500 galaxies at their various stages of evolution.

**11. David Dunning, North Seattle Community College**  
**SETI@Home: The search for Extraterrestrial Intelligence**

5.2 million participants worldwide are using their own computers in a combined effort to find the real E.T. The program SETI@Home which began in May, 1999 is the world's largest computation as acknowledged

by The Guinness Book of World Records. Users from around the globe download the necessary BOINC software and donate time and work to help sift through millions of years worth of data from the Arecibo Radio Telescope in Puerto Rico. Searching for spikes in the form of non-naturally occurring narrow bandwidth radio signals, it is the dream of every participant to hit the proverbial jackpot and make contact with an alien. No evidence has been found of E.T. phoning home yet; however a significant candidate signal announced on September 1, 2004 named Radio Source SHGb02+14a has been found and will be further researched. Some speculation has been made that we will have conclusive evidence of other life between years 2020 and 2025.

12. B. Colby Batts, North Seattle Community College  
**S.E.T.I.@HOME: THE SEARCH FOR EXTRATERRESTRIAL INTELLIGENCE  
CONTINUES ON YOUR COMPUTER**

One thought that has been on humans minds since we first started looking to sky was if we are alone in the universe. Instead of just sitting and waiting for a visitor to come to our planet to answer the question, U.C. Berkeley started recording radio transmissions from space on November 20, 1998 from the Arecibo Radio Telescope. Because the distance between stars with the possibly of inhabited planets would be so great, one of the most probable strategies to detect a message from extraterrestrial intelligence is to search for radio signals traveling at the speed of light. On May 17, 1999 S.E.T.I.@HOME was launched as a distributive computing project and soon millions of volunteers were using their computers unused time to process work units of the data. After a work unit is processed, it is sent back to U.C. Berkeley and promising work units are then flagged for further study. Although there is no conclusive evidence yet of a radio transmission from extraterrestrial intelligence, the S.E.T.I.@HOME project continues collecting and processing data today on minimal funding from The Planetary Society and private donations.

13. Jeramey Reamer and Erin Wilson, North Seattle Community College  
**ALIEN SPECIES**

Learning the species of aliens to allow one to differentiate between and identify them when looking at photographs, drawings, or reading descriptions of the beings is helpful in the realms of astronomy, alien life, and popular culture. Although not scientifically documented, through stories, abduction accounts, and homemade video, one can assume that the five most common species include: Greys, Nordics/Nords/Human Type/Blondes, Reptilians, Chupacabras, and Hybrids. Greys are overwhelmingly the most common

species. With their upside-down egg-shaped heads and skinny bodies, the Greys have been attributed to much alien abduction, crop circle phenomena, and have adorned the pages of science fiction books, comics, magazines, and blockbuster movies.

14. Amanda Heneghan, North Seattle Community College

#### WHAT WE CAN INFER THE AZTECS KNEW OF ASTRONOMY AND HOW IT SHAPED THEIR WORLD

The Aztecs made incredible advances in science and astronomy from what we can tell from archeological finds and records their culture left behind. One surviving piece of evidence that the Aztecs had developed complex science and astronomy systems is the Cuauhxicalli [Eagle Bowl] commonly known as the Aztec Sun Stone. It portrays the two different calendars the Aztecs used, with a triangular piece towards the top indicating Doomsday. When a cycle of the two calendars had been completed, fifty-two years would have passed, after which the Aztecs celebrated the “New Fire Ceremony” that occurred when the Pleiades rose above the mountain Col-huacan. The cosmology of the universe, as they saw it, shaped their religion beliefs, ceremonies, and festivals, and predictions of future happenings, like Montezuma seeing a comet and believing it was the portent of an impending crisis right before the arrival of the Spaniards.

15. Alicia Neilson, North Seattle Community College

#### STARS IN NAVIGATION

There are many methods to find your position on earth using tools other than a map or GPS system. The facts and knowledge we have today concerning the movement of stars in the sky, allow us to use tools such as a sextant to find the true altitude, mathematics, logical thinking and nautical or other almanacs (to know the positions of the heavenly bodies). Therefore, it is possible to be very accurate about our position and direction. On the other hand, there are times when these tools are not available. This is where primitive and easy to find materials are useful. Simple objects such as sticks, a magnet, and a sewing needle are all materials that can be used. Combined with knowledge and logical thinking a person can accomplish the same purpose but with less certainty or accuracy.