

ENGINEERS CLUB OF THE WEST VALLEY

OCTOBER 2009 NEWSLETTER

www.engineersaz.com

The Engineers Club is a social organization which meets regularly for lunch with a speaker on a technical topic. Spouses are invited and many attend regularly. Short field trips are occasionally scheduled. Membership is open to anyone who has worked in or had close ties to the engineering or scientific fields. Meetings are held at 11:30am on the first Friday of each month, October through June, at Briarwood Country Club, 135th and Meeker in Sun City West, Arizona.

Visitors are always welcome -- Reservations are required -- Just call (623)544-0942 to let us know you are coming.

OCTOBER 2 PROGRAM

GeoEye-1 Satellite
Bruce Boyce and
Tadd Spicer
General Dynamics



Bruce Boyce



Tadd Spicer

The GeoEye-1 satellite is the highest capacity, highest resolution capability and most accurate imaging satellite yet approved for commercial use by the United States government. The presentation will include descriptions of the key satellite subsystems and components and a description of the primary attributes of the ITT camera or Optical Sensor Assembly (OSA). Further information and a Gallery of images is available at the GeoEye, Inc web site – www.geoeye.com. Bruce Boyce will address the sensor and Tadd Spicer will cover the other satellite subsystems.

Bruce Boyce attended Stevens Institute of Technology, earning a B.S. in Physics in 1963. Upon graduation, he moved to Connecticut and joined Perkin-Elmer to work on optical technology and optical systems. He continued working for the successor owners (Hughes Aircraft, Raytheon and Goodrich), from 1963 to 2004 on a wide range of imaging and spectrometric system concepts for civil and military space applications, starting with stray light analyses for the 3 meter large Space telescope, which later became the scaled down 2.4 meter Hubble Space telescope. In 2004 Bruce joined Spectrum Astro, a small independent satellite builder in Gilbert Arizona, as the in-house lead optical systems engineer. Bruce spent the next 4 years working and overseeing development of the camera destined for the Geoeye-1 earth imaging satellite which was launched on September 6, 2008.

Tadd Spicer has a BA degree from Northwestern University and earned an MSEE degree from the US Naval Postgraduate School in Monterey, CA. He began his Space Systems Engineering career in 1975 during a US Navy tour of duty as Lt. Commander with the Navy Space Program Office. In 1979, Tadd began his civilian space center career with Martin Marietta Astronautics Group in Denver. In 1991, Tadd joined Motorola Inc. in Chandler, AZ and spent the next 12 years with the IRIDIUM program. During his final five years he was assigned as the systems engineer with the IRIDIUM Launch Team and during that time, 95 IRIDIUM satellites were successfully launched. In 2003 Tadd joined GD-AIS (then Spectrum Astro Space Systems) as a senior system engineer. Tadd was involved with the GeoEye program from its beginning, and subsequently became the Lead Systems Engineer (and defacto deputy program manager) for the execution phase. Following the launch of the GeoEye-1 satellite in September, 2008 Tadd has been a primary contributor to the On-Orbit Checkout and Calibration plan for that project.

NOTES FROM ...

President Fred Scheske

Hoover Dam A 20th Century Engineering Feat



The largest federal project of the century, Hoover Dam was built in the depths of the Great Depression in the 1930s. More than 200 engineers and 20,000 men worked to build the dam in hot, dirty and dangerous conditions. There were many injuries and some deaths during construction. The dam was built to provide flood control and water for thirsty farms in California and the Southwest. Its hydroelectric energy was, and still is, needed to satisfy the requirements of millions of people in nearby states. A by-product of the dam is the gigantic water reservoir, Lake Mead. This beautiful water recreation area of over 200 square miles provides fishing, boating, sailing and camping amenities for millions of visitors each year. Originally named Boulder Dam, the name was officially changed to Hoover Dam to recognize the efforts of then Secretary of Commerce, Herbert Hoover, who later became President Hoover.

Using lights at night, construction continued 24 hours a day. Men scaled the canyon walls first to remove loose rock to smooth walls for concrete adherence. Colorado River water was then diverted through four tunnels to permit work. The arduous task of pouring concrete in interlocking blocks using 4 and 8 cubic yard loads began. Four and a half million cubic yards of concrete were poured into the structure, enough to make a two lane highway from Seattle to Miami!

The dam is 726 feet tall and 1244 feet long, its base 660 feet thick. Depression Era cost was \$49 million. Six companies were scheduled for the work beginning in 1931 with a 1938 completion date. The dam was completed in five years, two years ahead of schedule. Public Works projects were designed in classic art deco style, including stone, metalwork, statues and ornate plaques all of which can still be seen on the structures.

Seventy-three years later it still stands as an engineering marvel high above the Colorado River.

WELCOME BACK

NOVEMBER 6 PROGRAM

Large Synoptic Survey Telescope

By Phil Pinto

2009 OFFICERS

President	Fred Scheske	556-2892
Vice President	Larry Pensiero	546-1703
Secretary	Jodie Lawrosky	238-5256
Treasurer	Don Block	546-0557

COMMITTEE CHAIRPERSONS

Programs	Larry Pensiero	546-1703
Membership	Bob Latvalla	546-7801
Membership	Bill Lee	977-1818
Reservations	Dave Whitehouse	544-0942
Luncheons	Hal Clemett	546-4941
Scholarship	Geraldine Montag	546-7963
Scholarship	Fred Berkenkamp	214-7757
Scholarship	Rutheloise Borchardt	933-2307
Reception	Bob Kessler	872-1994
Newsletter	Bill Harrison	546-4943
Web Site	Jim & Pat Ardis	362-1013
Publicity	Keith Morrow	546-3080
Field Trips	TBA	xxx-xxxx
Past President	Keith Morrow	546-3080

TREASURER'S REPORT 8-31-2009

General Fund Balance: \$4,278.46
Scholarship Fund Balance: \$925.45

LUNCHEON MENUS

October 2: Grilled Pub Steak w//Bourbon Peppercorn Sauce, Smashed Red Potatoes w/ Bacon Bits, Green Beans and Vanilla Ice Cream. (Entrée Option: Fruit Plate)

November 6: Turkey Medallions w/Cranberry Cream Sauce, Apple Walnut Stuffing, Green Beans Almandine and Pumpkin Pie. (Entrée Option: Fruit Plate)

RESERVATION POLICY

The cost of the monthly luncheon is \$16.50 per person.
The reservation deadline is 6PM Monday before the meeting.
Late reservations cannot be guaranteed the regular meal.
Call Dave Whitehouse if you cannot keep your reservation.

A fee of \$10 will be charged for "no-shows."

Please have cash or make out your check in advance.

RESERVATIONS Dave Whitehouse (623)544-0942



Brian Katz from Orbital Sciences receives a certificate of appreciation from Larry Pensiero for his presentation on Small Space Rocket Systems in June 2009.

WHAT'S THE MATTER?

By Kess Alley, PhD

Many perplexing problems in physics and astronomy have been partially or even fully resolved in the last century. The Big Bang, the age and dimensions of the Universe, Black Holes, Quasars, Pulsars, Neutron Stars, Novas, and the nuclear reactions in the stars are now fairly well understood by modern scientists and cosmologists.

One of the current remaining esoteric topics in cosmology is Dark Matter and Dark Energy.

What are these mysterious phenomena and why are they important to our understanding of the Universe?

By mathematical analyses of the masses and motions of stars, solar systems and galaxies, and the Universe, we can construct a model based on known physics. All mass influences all other mass, by well-known formulas developed by Newton in the seventeenth century and expanded by Einstein in the twentieth century.

Using available knowledge and concepts, when we calculate the expected motions of the Universe, there are anomalies which we cannot readily explain. The stars on the outer edges of galaxies are moving much faster than predicted by the well-known gravity equations. There must be more mass out there than we can see or even detect by conventional means. It neither emits nor reflects light.

Scientists have labeled this unknown influence as "Dark Matter." A whole list of possibilities has been developed to account for the extra mass, but there is no consensus on its makeup. That question constitutes a whole new field of study. Solving it would bring us closer to a fundamental understanding of the Universe itself.

The mystery deepens when we examine the so-called "Dark Energy." This is an ever present force pushing the Universe apart at an accelerating rate. At present, cosmologists now conclude that the observable mass of stars and gas represent only about 5% of the known Universe, with dark matter at 25% and dark energy at 70%. A bewildering conclusion.

This complex subject is being pursued with deepening interest by many scientists. One of the not so far out possibilities is that the dark matter is in another dimension or in a mirror world. If such is the case, our shining stars would look like dark matter to observers in the mirror world.

Who says science is not exciting?

