

Systems Engineering when the Stakes are High and Time is Short: Lessons from the Lunar Reconnaissance Orbiter



Presented by:
David Everett,
NASA GSFC

Wednesday, 16

June 2010 (6:00 – 8:00 pm)

**Applied Physics Laboratory, Johns Hopkins University
11100 Johns Hopkins Rd Laurel MD 20723 (Main Entrance – Lobby 1)**

Presentation: Schedule pressure is common in the commercial world, where late delivery of a product means delayed income and loss of profit. Research spacecraft developed by the government, on the other hand, tend to be driven by the high cost of launch vehicles and the public scrutiny of failure--the primary driver is ensuring proper operation in space for a system that cannot be retrieved for repair. The Lunar Reconnaissance Orbiter (LRO) development faced both schedule pressure and high visibility. Originally conceived as one of many small, annual robotic missions to explore the moon in advance of the next human campaign, LRO became the only NASA mission to the moon for the next few years, but NASA was already committed to launch this 7-payload spacecraft within 2-1/2 years of confirmation. The team had to balance the strong push to meet a 2008 launch against the need to ensure that this first mission for Exploration succeeded. In the end, national launch priorities delayed LRO and reinforced the emphasis on mission success, an outcome ensured by the team's diligence along the way. This presentation will provide an overview of the mission from concept through commissioning and explore some of the challenges the systems engineering team faced taking a mission from preliminary design review to pre-ship review in 3 years.

Speaker: David Everett has led the design, build, and launch of three spacecraft (FAST, WIRE, and LRO), and he was a key player during the launch of three others (SAMPEX, SWAS, and TRACE). His eighteen years at NASA has included substantial experience in the assembly and testing of spacecraft. Between 1999 and 2005, Mr. Everett focused on early mission planning, including the formulation of Global Precipitation Measurement. Starting in September 2005, Mr. Everett led the technical effort for the Lunar Reconnaissance Orbiter (LRO) as the Mission Systems Engineer. Mr. Everett is currently the chief systems engineer for the Heliophysics and Explorers Program Office at Goddard. Mr. Everett has actively supported NASA outreach activities through over 50 speaking engagements. He has received 28 individual awards and 19 group awards for his efforts at NASA, and he has published 15 papers. He earned a BSEE summa cum laude, at Virginia Tech in 1986 and a MSEE at the University of Maryland in 1989. Before he joined NASA in 1991, Mr. Everett worked at Westinghouse Electric Corporation where he was awarded two patents for his designs of RF circuits.

Note: Dinner will be held in the Howard County Room #3 (Enter the Main Laboratory Entrance, Lobby 1, and take a right at the guard station into the main cafeteria. We're down at the end of the hallway in the very last dining room.) Topic discussion will follow dinner.

Delicious friendly networking buffet dinner: Taco nite -- Soft flour tortillas and corn tortillas; Seasoned ground beef; Sour cream guacamole assorted salsas; Tomatoes, lettuce, etc...; and Black Beans and Rice with garden salad dressing, rolls and butter, dessert, coffee and iced tea.

Dinner Reservations: To register for dinner, contact Don York at donald.york@tasc.com

Dinner Cost: Guests: **\$20**; INCOSE members: **\$15** if payment is received by June 11th, 2010, **\$20** afterwards. To pay by credit card or PayPal, visit our website: <http://www.incose.org/chesapek>; or to pay by USPS, mail checks (payable to INCOSE-CC) to:

INCOSE-CC, PO Box 142, Linthicum, MD 21090-0142.

Dinner Cancellation Policy: If you make a dinner reservation and then find that you will be unable to attend, please notify Dave Griffith by Monday, June 14th, 2010. There will be no refunds after Monday, June 14th, 2010.

Presentation ONLY: FREE (no reservations necessary)

Corporate Sponsor: We wish to thank the Applied Physics Laboratory for supporting the systems engineering profession through use of their facilities.

Our Evening's Agenda

5:45 – 6:00 pm	Arrival and Socializing
6:00 – 6:45 pm	Dinner
6:45 – 6:50 pm	Member Introductions
6:50 – 6:55 pm	Chapter Business Items
7:00 – 8:00 pm	Presentation

Directions: **JHU APL**, 11100 Johns Hopkins Road, Laurel, Maryland 20723, Phone (443) 778-5000
See APL's Visitor Guide for more: <http://www.jhuapl.edu/newscenter/visitor/default.asp>

From Washington DC and Capital Beltway (I-495):

Take I-95 North toward Baltimore, 10 miles to Columbia exit (MD Route 32 West),
Go 2.5 miles to the Washington DC exit (US Route 29 South).
Go 1.5 miles south and take Johns Hopkins Road exit (bear right at the top of the hill).

Or from the Capital Beltway (I-495):

Take US Route 29 North (Colesville Road) 10 miles and follow signs for the turn onto Johns Hopkins Road.

From Baltimore and Baltimore Beltway (I-695):

Take I-95 South toward Washington DC.
Go 13 miles and take Columbia exit (MD Route 32 West).
Go 2.5 miles and take Washington DC exit (US Route 29 South).
Go 1.5 miles south and take Johns Hopkins Road exit (bear right at the top of the hill).

Once you're on Johns Hopkins Road:

APL is a half-mile west of US Route 29 on your right side. Go past the first entrance, continuing past the pond and take the next right turn onto a tree-lined lane. Park in the visitor's lot on your left side. Enter at the main entrance marked **Building 1** (flagpoles and traffic circle in front).

Dinner is held in the Howard County Room #3 located at the end of the cafeteria hallway to the right of the entryway just before the Guard's desk.

