



Odyssey

Pushing the Edges

November
2005

Official Newsletter of OASIS: the Los Angeles Chapter of the National Space Society

OASIS LECTURE SERIES

Space Researcher Explains "Orbital Mechanics for Real People"

By Steve Bartlett

Mixing humor, wry asides, and rocket science, Dr. Seth Potter described the whys and wherefores of objects in space in his lecture, "Orbital Mechanics for Real People," on October 15. Potter briefed an audience of students, lay people, and space enthusiasts at the Long Beach Public Library as part of the OASIS lecture series on space science and development.

Dr. Potter, an advanced programs scientist for the Boeing Company in Huntington Beach and Seal Beach, informed the audience by starting with the basics: what orbits were, their shapes, and why objects followed them. He gave definitions for the parameters that define where an object is located with respect to the sun or the Earth and what paths the object could follow.

The paths depend on the orbiting object's velocity at a given point and on the mass of the object being orbited. These paths result from a balancing act between the force of gravity and the kinetic energy from the object's motion.

The orbits Potter identified were elliptical, circular, parabolic, and hyperbolic. Elliptical orbits may be thought of as "squashed circles" and are the most common for objects in space. Early astronomers plotted the paths of planets through the sky; Johannes Kepler used these data to determine the "rules of the road" for orbiting objects. When the force of gravity is equal to the centripetal acceleration (sometimes called the centrifugal force), an object will follow an elliptical orbit. Circular orbits are a special case of elliptical orbits and are common to

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But first, some physics fundamentals!
Photo by Steve Bartlett

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Joy Crisp, Spirit and Opportunity
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LosCon Follows Turkey Day! November 25-27, 2005

By Craig E. Ward

The International Space Development Conference (ISDC) is coming to Los Angeles next year, May 4-7. It will be co-hosted by the National Space Society and the Planetary Society. The ISDC is many things: the annual meeting of the National Space Society, a technical conference, a career networking opportunity, and a general celebration of space exploration.

Planning for the ISDC is moving into high gear. Volunteers from all over the world are assembling to make it happen. Teleconferences are happening and the next local face-to-face meeting is scheduled for

December 4, 2005. You can contact me by email if you want to be added to the list to be notified of planning meetings and general information about the ISDC.

The main theme of the conference will be "Exploring Together." A website is up at isdc.nss.org/isdc2006/ with initial information about tracks, tours, registration, and hotel information.

Because most OASIS members are located in the Los Angeles area, there will be many opportunities to get involved. Some roles that will require a lot of time and effort are still available as of this writing. (For example, Exhibitors' Hall manager,

Program Manager, Track Managers, and Press Relations.) Many roles will take less effort up front, but need time during the conference, such as room monitor, tour guides, speaker A/V support, registration, and general gopher. (I have performed many of these roles at past conferences and I can attest that the feelings of satisfaction at a successful conference are hard to beat.)

The ISDC will need many volunteers to make it a success. I hope many of you will step forward and offer your time and energy at whatever level you can. Together we can make this ISDC one to remember.

Orbital Mechanics for Real People

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many Earth-orbiting artificial satellites. The amount of an orbit's deviation from being circular is referred to as its eccentricity.

Parabolic orbits are the paths that objects follow when their kinetic energy is not enough to balance the force of gravity. A baseball thrown into the air, a ball shot from a cannon, or a ballistic missile will follow a parabolic orbit.

In layman's terms, hyperbolic orbits occur when an object is moving too fast to travel in an elliptical orbit. Some comets follow hyperbolic orbits. They fall into the inner solar system from deep space at high speed, swing past the sun, and go back into deep space, perhaps never to return.

When a company launches a communications satellite or when NASA sends a probe to

explore Mars, the Moon, or some other object, they use the balance of gravity and kinetic energy to send the spacecraft on its way and ensure that it arrives intact.

Dr. Potter described some particularly useful orbits around the Earth, including:

- Geostationary orbits above the equator, where a satellite circles the Earth at the same rate that

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LECTURE REVIEW

Spirit and Opportunity's Excellent Adventure in Mars Geology

By Grant Hovey

The exploration of Mars gained a whole new dimension November 2, 2005, when Jet Propulsion Laboratory scientist Joy A. Crisp reviewed the accomplishments of the intrepid robots, Spirit and Opportunity, before an enthusiastic audience at a packed Beckman auditorium, on the Caltech campus.

Although the rovers had a life expectancy of 90 days, Dr. Crisp announced that Spirit now has been operating for 652 days. Here at last, after nearly two years of brief and occasional television clips, Internet visits, and newspaper articles, the audience, vicarious Martian explorers all, had a focal point. And they broke into spontaneous applause.

Nearly one-half of the copious number of slides were in 3-D. To facilitate viewing, a pair of the familiar blue/red glasses were enclosed in each program. Not only did the appreciative audience get to cheer the longevity of the rovers, they got to salute the fascinating images as well.

The Spirit rover traverses freely on Mars. Upon arrival, its stereoscopic cameras fixed on a feature on the distant horizon, Columbia Hill. With only 90 days of life, such a journey was nearly impossible.

Despite the poor odds, the unstoppable Spirit headed for the hills, but never missed a chance to burr into the innards of an interesting looking rock, or peer into and crawl inside an inviting crater.

Eventually, Spirit reached the base of Columbia Hill, which consists of several peaks. One, Husband Hill, looked the most climbable. So up it went, and like any tourist, took pictures as it neared the summit. At last, Spirit reached the top of Husband Hill and looked down on the other side to see a large unexplored area, Tennessee Valley. The plain below revealed a white, roughly pentagonal shape soon given a folksy nickname: home plate.

From this vantage point, Spirit beheld something never before seen on any other planet: movement. Dust devils whisked their way in unison across an open plain. But Martian winds did more than create and move these funnel-shaped clouds of dust. The rover's months-old solar panels had been blown clean, and were eagerly converting the dim sunlight into electricity.

Opportunity, Spirit's twin, took full advantage of the circumstances. Fortuitously, this rover bounced upon landing into the middle of a crater. JPL scientists and engineers were

as excited as a duffer scoring a hole-in-one. Eagle Crater exposed an outcropping of bedrock. Spirit pounced on this feature like Champollion deciphering the Rosetta Stone.

After leaving Eagle Crater, Opportunity encountered the last thing wanted on a geological expedition: the rover became stuck. The otherwise cool JPL team had a few scary moments before extracting the rover, and with a nod to our religious past nicknamed the area Purgatory.

Spirit and Opportunity discovered indications of past liquid water and the possibility of past or present life forms nearly everywhere they went. Dr. Crisp carefully explained that bodies of water formed hematite, peppercorn-sized sphericals, and rock layers. This water could have been the medium for simple, but self-replicating, cells.

The Herculean effort on the part of many scientists worldwide to find life on Mars has many implications, some not so obvious. The great argument that began with Darwin in the 19th Century between religion and science rages on. If life arose on remote Mars, then it may well could have come into being on Earth by itself.

Moving Day by Anonymous

"I don't like movers."

That thought kept me going while I hauled papers and personal belongings to my new office. By moving everything myself, the 20-plus boxes were just where I needed them to start work on my new job. All the while, sweat trickled down my temples - a reminder of just how much paper weighs.

It's a good office - large and centrally located. Many people I know and like are nearby. My new job places me among some of my employer's best engineers. Moves like that should make me happy. But I wasn't happy. It had nothing to do with my new job. Rather, it was what happened to my old job.

We were told it must "stand down".

At first, I didn't know what that meant. Neither did my co-workers. The spacecraft we'd spent three years designing and building was almost fully assembled. We were beginning the most complex phase of testing to support our launch date next year. Everyone was working at full steam, confronting and overcoming tech-

Star Trek's Scotty would be proud of. Surely, no one was telling us to back off?

But that's exactly what we were told. Our customer, thousands of miles away, felt unsure about going forward. Those building the spacecraft should finish their work and step away. Those about to support operations testing and practice flying the spacecraft should file away everything they'd been doing. Except for a small, core team, everyone on the project would need to find another job - perhaps where they were currently working, perhaps elsewhere.

The small, core team, working amid newly vacant offices, would need to assemble all the material required to provide a detailed status report to our customer. Then, months from now, we'll learn our project's future. Perhaps we'll be asked to slip launch for a year. Perhaps our postponement will be indefinite.

I'll have little to do to support that decision. My job was one that was set aside.

You may wonder what project this is. Who is our customer? Is there some inside informa-

tion I'll share? If so, I'm sorry to disappoint you. These are uncertain times and an ill-chosen word may have undesired consequences. The story is best told when the full story is over.

The particulars are unimportant. In any given year, my story will be repeated in dozens of places by thousands of engineers throughout the aerospace industry.

All this is new to me. While many projects I've worked on had been threatened with cancellation, none had gone so far as to let people go. I was lucky. My Group Supervisor found me a new position within a few days. It's on a project I'd wanted to join for some time. Moving offices was the only real, albeit minor, inconvenience. Meanwhile, good people are still looking for work several weeks after their projects let them go.

There's no way for an engineer to prepare for the letdown of having a project stood-down or cancelled. Putting men and machines into space demands our full energies. It's an emotional rush to be part of it.

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Editor: Lisa Kaspin
310-598-4564

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odyssey_editor@yahoo.com

Contributions may also be mailed as .doc or .txt files on PC-formatted CDs, or as hard copy to:

OASIS, PO Box 1231
Redondo Beach, CA 90278



COMES TO

Loscon 32

***Want to get people excited about space
and have fun at the same time?***

Come join us for LosCon:
the Los Angeles regional science fiction convention!

When: Thanksgiving Weekend (Nov. 25-27)

Where: LAX Marriott
5855 W. Century Blvd
Los Angeles, CA 90045

We will have a booth, where we will be passing out information about OASIS. We will also host a party that Friday evening (Nov. 25) with fun raffle prizes and other events.

We may even get another impromptu concert from our Artist-in-Residence, didgeridoo player Mitch Walker!

If you are interested in volunteering, send an e-mail to: oasis@oasis-nss.org.

Please note that if you wish to volunteer for this event, you **MUST** be a current OASIS member in good standing and have a paid membership to the convention itself.

For more information about LosCon, including prices for either one-day or full-weekend memberships, please visit: <http://www.loscon.org/32/index.html>.

the Earth turns on its axis, making the satellite appear to sit in a fixed position relative to an observer on the ground. This feature is particularly useful for communications satellites.

- Polar orbits, which allow a satellite to view the entire surface of the Earth.

- Sun synchronous orbits, which allow an imaging satellite to view locations on the surface at the same time of day relative to the sun.

- Molniya orbits, which are high

inclination orbits used by Russian satellites to allow communication among people in far-northern latitudes, which would have a poor view of a satellite over the Earth's equator.

Potter commented that his personal focus was to educate our future space explorers and settlers. "The Real People are the ones who're going to go into space and those are mostly young people," he said. As if

to emphasize this point, Potter gave the lecture twice, once for the main audience, and an abbreviated version for a group of high school students who arrived near the end of the talk.

Besides being a space researcher with several published papers to his credit, Seth Potter is the former president of OASIS and former head of the New York chapter of the National Space Society.

Moving Day

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Often the pace is grueling -- all the way from the first scribble on a cocktail napkin to the awards ceremony when the mission is over. We complain about the pace, and then we jump to new projects that demand no less. The energy feels like driving a racecar in a tight formation at the Indianapolis 500. A stand-down or cancellation feels like the aftermath of a tree suddenly falling across the raceway.

More than that, redirection means breaking up a team. In space, as in sports, teams make things happen. Many hours go into creating working relations that get the job done even when the other person is getting on your nerves.

I've seen teambuilding produce strong bonds and create lasting friendships. The importance of teams is evident in the offices of many of my coworkers. They decorate their desks with family pictures and decorate their walls with group photos of project teams they've belonged to. Their wardrobe reflects team identity as well. They adorn the neck lacing holding their badges with mission pins - an engineer's campaign ribbons.

My move brings these feelings into sharp focus. I packed quickly and didn't take time for housecleaning. Most boxes contain documents and memos from past projects.

I may reread them someday, but probably not. It's time to throw them out. That's especially true of papers from my last project -- everything I'd want is stored in my computer and can be reprinted (computer screens give me eyestrain). Only a superstitious person would imagine that throwing them all away could jinx my old project and its chances of restart.

Will it launch someday? I hope so. That's why I'll keep a few key documents in hardcopy for easy reference if the need arises.

Superstition has nothing to do with it.

December 3-4. JPL Educator Conference: "Comets, Asteroids, and Much More - Small Bodies, The Solar System's New Zoo." Jet Propulsion Laboratory, 4800 Oak Grove Dr, Pasadena. The conference is open to all educators including museum staff. High school students and above may attend. Anyone under sixteen years of age must be accompanied by an adult (parent or teacher). Registration: \$35. 818/354-0112 or <http://education.jpl.nasa.gov/events/comets10-11-05.html>.

December 8-9. Jet Propulsion Laboratory. "The Spitzer Space Telescope: Exploring the Infrared Universe", a FREE lecture by Michael Werne -- JPL, Spitzer Space Telescope Project Scientist. 7 pm, von Kármán Auditorium, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA

Call (818) 354-0112 or visit <http://www.jpl.nasa.gov/events/lectures/may05.cfm>.

December 10. Los Angeles Sidewalk Astronomers Star Party

Sunset until 10 pm. Autry Museum of Western Heritage, 4700 Western Heritage Way, Los Angeles, CA 90027-1462. Call (323) 664-1191 or see

<http://www.sidewalkastronomers.com/chapters/laevents.html>

December 10. OASIS Board Meeting and Holiday Party.

Board Meeting @ 3:00 pm. Party @ 6 pm.

Home of Bob Gounley and Paula Delfosse, 1738 La Paz Road, Altadena, CA 91001



Organization for the Advancement of Space Industrialization and Settlement
A chapter of the National Space Society

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*Family rates include the children's edition. Please specify names of children.

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November 30.. California Space Authority / California Space Education & Workforce Institute Annual Membership Meeting.
6:00 pm - 6:30 pm Networking/Reception: 6:30 pm - 7:30 pm Membership Meeting; 7:30 pm - 8:00 pm Networking.

Sheraton Gateway Hotel 6101 West Century Boulevard, Los Angeles, CA

RSVP Required: Please contact Patti Ruiz,patti.ruiz@californiaspaceauthority.org 805/349-2633

December 1-2. Conference: "Transforming Space: Innovation, Infrastructure, and Intellectual Capital." Guests include Brian Binnie (SpaceShipOne X2), Buzz Aldrin, and other astronauts.

Sheraton Gateway Hotel, 6101 W Century Blvd, Los Angeles. Sponsored by California Space Authority (CSA) and California Space Education and Workforce Institute (CSEWI). Registration: \$495 CSA members; \$595 non-members; \$245 student/government.

805/349-2633 or http://www.californiaspaceauthority.org/html/spotbeam_conf_2005/index.html.

December 3. Science of the Dark Side of the Universe. Reuben H. Fleet Science Center.

Lecture admission free with Exhibit Gallery or IMAX theater ticket, but a separate (complimentary) ticket is required for lecture admission. These may be obtained at our Ticket Counter. Seating is limited and available on a first-come, first-served basis; one ticket per person please.

1:00 - 2:00 pm Lecture Hall, Reuben H. Fleet Space Center, 1875 El Prado, Balboa Park, San Diego, CA 92101

Information: Call 619/238-1233 for the daily schedule or (TDD)

619/685-5744 or visit our website at www.rhfleet.org.

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P.O. Box 1231

Redondo Beach, CA 90278

310-364-2290