

SJAA EPHEMERIS

November General Meeting

Ben Shelef to talk on Space Elevators

November 12, 2005 at 8 p.m.

Dave Smith

Spacecraft have contributed significant advances to our astronomical knowledge. The Hubble, Compton, Spitzer, and Chandra observatories among others in Earth orbit have expanded our spectral and resolution horizons. From Mariner 2, through

the Voyagers, to Cassini and the Mars rovers, Interplanetary spacecraft have revolutionized knowledge of the solar system. But these, and other applications of space flight remain rare and expensive, to a large degree because of launch costs. It costs around \$10,000

to put a kilogram of payload into orbit with current rockets.

Yet, the amount of energy required to orbit that kilogram is surprisingly small: 9 kilowatt-hours. That is, half a kilowatt-hour worth of gravitational energy to reach an altitude of 200 km, and another 8.5 kwh in kinetic energy to reach a speed of 17,500 mph. That is about 90 cents worth of electricity.

Our Nov, 12 speaker will be Ben Shelef, founder of the Spaceward Foundation. Ben will describe research on space elevators, a method to achieve cheap access to space using electricity instead of rockets. Space elevators (or "beanstalks") have long been considered outlandish science fiction. But advances in materials science are pushing them into the realm of the plausible. Space elevators are the cover story of the August IEEE Spectrum, published by the no-nonsense Institute of Electrical and Electronics Engineers.

This year, Mr. Shelef's foundation has won a grant from NASA to administer as prize money for developments needed to enable elevator construction.

The Spaceward Foundation will sponsor the first Space Elevator Games on October 21, 2005. Ben is helping to raise the curtain on the new Age of Space Exploration.

SJAA Activities Calendar

Jim Van Nuland

November

- 5** Dark sky weekend. Sunset 5:06 p.m., 19% moon sets 7:53 p.m.
- 11** Houge Park star party. Sunset 5:00 p.m., 83% moon sets 3:01 a.m. Star party hours: 7:00 to 10:00.
- 12** **General meeting** at Houge Park. Ben Shelef of the Spaceward Foundation, will speak on using space elevators to geosynchronous orbit.
- 13** Fall swap. Noon until 3-4 p.m.
- 17** ATM class at Houge Park. 7:30 p.m.
- 25** Houge Park star party. Sunset 4:52 p.m., 27% moon rise 1:53 a.m. Star party hours: 7:00 to 10:00
- 25** Astronomy Class at Houge Park. 7:30 p.m.
- 26** Dark sky weekend. Sunset 4:52 p.m., 19% moon rises 2:53 a.m

December

- 3** Dark sky weekend. Sunset 4:50 p.m., 9% moon sets 6:49 p.m.
- 9** Houge Park star party. Sunset 4:50 p.m., 69% moon sets 2:00 a.m. Star party hours: 7:00 p.m. to 10:00 p.m.
- 10** ATM Class at Houge Park. 7:30 p.m.
- 17** **General meeting** at Houge Park. 8 p.m.
- 22** ATM Class at Houge Park. 7:30 p.m.
- 23** Houge Park star party. Sunset 4:55 p.m., 45% moon rises 0:38 a.m. Star party hours: 7:00 p.m. to 10:00 p.m.
- 24** Dark sky weekend. Sunset 4:56 p.m., 35% moon rises 1:39 a.m.
- 31** Dark sky weekend. Sunset 5:00 p.m., 2% moon sets 5:41 p.m

The Board of Directors meets at 6:00 p.m. preceding each general meeting. All are welcome.

24 hour news and information hotline: (408) 559-1221

<http://www.sjaa.net>

Fall Swap – November 13, 2005

Mike Koop

The SJAA Fall Astronomical swap meet will be conducted at Houge Park in San Jose Sunday, November 13, 2005, starting at noon.

Telescopes, binoculars, eyepieces, mountings, mirrors, lenses, clock drives, books, camera equipment, star charts, finders, tubes, diagonals, photographs, space art - everything you need to make your hobby more enjoyable. You name it, it's likely to be there! Check your garage and closets for anything astronomical you would like to sell. Anyone can buy and sell, it's fun and easy!

This is the fifth year for the swap, which is a follow on to the spring auction that has been run for twenty-five years. There is no auction, just the swap sale. Get your holiday shopping done early this year!

Doors open at 12:00 p.m. to set up tables and bring in the material for sale. Selling will begin at 1 p.m., and will run as long as needed (probably 3 p.m.). Each buyer pays the seller. Sellers are to keep track of their sales and pay 10% commission for items (new or used) with a cap of \$50 for any one item, \$500 maximum per seller. The commission is fully tax deductible. There are no table fees. Please bring items that would interest the astronomical audience such as astronomical, science, or tech items. The SJAA reserves the right to turn away inappropriate items for the swap. Joe Sunseri of Earth and Sky Adventure Products will be there with many fine new and used items such as eyepieces and telescope accessories.

Do you have a large item to sell such as a telescope? Please email swap@sjaa.net with a description and a photo of the item or a link to your own website for some pre-swap publicity. We will post

the information to the swap web page to allow people to do some research before they get to the swap. Have only one item to sell, such as a book or eyepiece? A consignment table for people to drop off up to 3 items will be available so that they can shop at the swap and not be hindered by selling an item.

Part of running a successful swap is to make sure that there are people who are new to astronomy in attendance. We can use your help to make this so! Go to the swap website linked off the main page, download, and print a swap poster to display. Post them at the bulletin boards at work, at church, at your local library, or where you think people might be interested. Hand it out to a friend who has expressed interest in getting a telescope. You get the idea! Thanks for your assistance!

For more information and directions, visit our web site at <http://www.sjaa.net>.



Approximately 94 people not only attended CalStar this year but they assembled into a crowd and all faced the same direction. Photo courtesy of Rob Hawley.

All Mars, All the Time

Akkana Peck

This month the show is all Mars, all the time.

The red planet reaches opposition on the evening of the 7th, right around midnight. The planet is already past its closest approach, which happened on October 29th, but it will remain large, bright, and high in the sky all month and into next month.

Mars' southern pole is tipped toward us. But it's not a radical tilt like the last few oppositions, merely ten degrees; you'll probably be able to see most of the northern features fairly well, as well as the southern ones. You may even be able to see both polar caps at once.

That is, you might be able to see some of the dry-ice haze of carbon dioxide vapor making up the North Polar Hood, plus the very small south polar cap. It's late summer there, so the cap is as small as it gets. It's also considerably offset from the pole; depending on how Mars is rotated, the cap may be invisible, or it might be fairly easy. It should be fun to watch it over a period of a couple of weeks (or over the course of a single long evening) as it appears to wax and wane.

Why one evening versus a couple of weeks?

Mars' day is slightly longer than Earth's. That means that if you go out to observe Mars at 10pm tonight, tomorrow night at 10pm you'll be looking at a point slightly earlier in the Martian day from the view you saw tonight. It takes a bit over a month for the cycle to complete and bring you back to the place where you started. If you don't like the side of Mars you're seeing right now, wait two weeks and you'll be looking at the opposite side of the planet.

Of course, if you're in a hurry to see a

different side of the planet, you don't have to wait a month. Just keep watching over a period of hours, and you'll see new features rotate into view.

As November opens, evening viewers will see dark Syrtis Major, centered on the planet, extending northward from the bright circular impact basin Hellas. These are the two Martian features which are easiest to spot, so if you haven't looked yet, it's the perfect time to grab a telescope and get started.

Over the next week, Mars rotates so that the three linear dark areas Maria Tyrrhenum, Cimmerium, and Sirenum will be visible. The latter two join together to make a long diagonal slash across the southern hemisphere, separated from Tyrrhenum by a much lighter area. They're a little more subtle than Syrtis Major and Hellas, but it's also a great area to see and sketch lots of interesting detail.

By mid-November, Tyrrhenum and Cimmerium will be mostly gone, but Sirenum will dominate the south. The north appears initially as a featureless expanse of orange: this is a region known as Amazonis, and to its east (rotating in a later in the week) are Olympus Mons, the highest volcano in the solar system, and the Tharsis Plateau, home to three other huge volcanoes. You can't see the volcanoes directly. But look for lighter areas which change from day to day — orographic clouds over the volcanoes.

By the 22nd, Lacus Solis comes into view. It's a fairly small dark spot by itself, but from the right angle, the dark areas nearby frame it to become the pupil of a human eye — the "eye of Mars".

To the north, Vallis Marineris is more or less centered — a very tough target for advanced observers. Most of the time

you won't see anything, but several SJAA members have suspected they saw parts of the enormous canyon as a thin line when the atmosphere on our end was rock steady. On the northeast limb, look for the edge of dark Acidalia.

Finally, by the end of the month, dark Margaritifer (aren't Mars names great?) is showing well, with all the interesting splotchy bays at its north end. South of it is lighter Mare Erythraeum, and even farther south, not quite to the pole, bright Argyre is another impact basin like Hellas but smaller.

On the eastern limb, you can see the grasping finger of Sinus Meridiani peeking over the limb. Over the first week in December you can watch that rotate in, followed by Syrtis Major, which starts the cycle all over again in December.

It's a good thing there's so much to look at on Mars, because there's not much other planet action in the sky.

Venus continues the stunning display it's been showing us since late September. Since it's quite far south, it rides fairly low in the western sky at sundown, but you still get another couple of hours to view it before it sets, and by month's end it shows a slight crescent.

Uranus and Neptune are still in the evening sky, but they're getting lower. Catch them early in the evening if you want a good look. Saturn rises before midnight, but doesn't get high in the sky until the wee hours of the morning. Jupiter rises just before dawn. Mercury is too close to the sun to be easily observed from San Jose, though observers in the southern hemisphere are getting a good look.

Mike Koop Receives AANC Amateur Astronomer Award

Kenneth Frank

Mike Koop was presented the 2005 Astronomical Association of Northern California Amateur Astronomer Award at the Slide and Equipment night. He has been Vice President of AANC for 2 years & on the Board for longer than that and a fixture at the San Jose Astronomical Association for over 10 years. Mike has a way of staying under the radar.

He has been President of the San Jose Astronomical Association for at least 3 years and is selfless and tireless with whatever project he promotes. Mike's big thing is the loaner program he

manages. SJAA has over 33 working telescopes on loan (more than any club I know of). He single-handedly made a CD rom compendium of all the

making workshop atm classes. He's currently working on a club 10" mirror...

("how long have you been working on that mirror Mike?"), and does the "what's up in the sky tonight" portion of our star parties. He has been active working on insurance issues with all clubs through the AANC for over a year now.

To quote Dave North, former SJAA President, Mike is: "An amazing engine of action for

the astronomy community."

Congratulations Mike. Well done.



Mike Koop (left) is presented with an award from AANC. The presenter is Kenneth Frank. This presentation was made at Slide and Equipment Night, September 17, 2005. Photo courtesy of Sam Sweiss.

Ephemeris newsletters. Now that's a labor of love! Mike heads up the mirror



This picture shows some of the attendees at Slide and Equipment Night, Sept. 17, 2005. Names withheld by direction of the Department of Homeland Security. Photo courtesy of Sam Sweiss.

Where No Spacecraft Has Gone Before

Dr. Tony Phillips

In 1977, Voyager 1 left our planet. Its mission: to visit Jupiter and Saturn and to study their moons. The flybys were an enormous success. Voyager 1 discovered active volcanoes on Io, found evidence for submerged oceans on Europa, and photographed dark rings around Jupiter itself. Later, the spacecraft buzzed Saturn's moon Titan—alerting astronomers that it was a very strange place indeed!—and flew behind Saturn's rings, seeing what was hidden from Earth.

Beyond Saturn, Neptune and Uranus beckoned, but Voyager 1's planet-tour ended there. Saturn's gravity seized Voyager 1 and slingshot it into deep space. Voyager 1 was heading for the stars—just as NASA had planned.

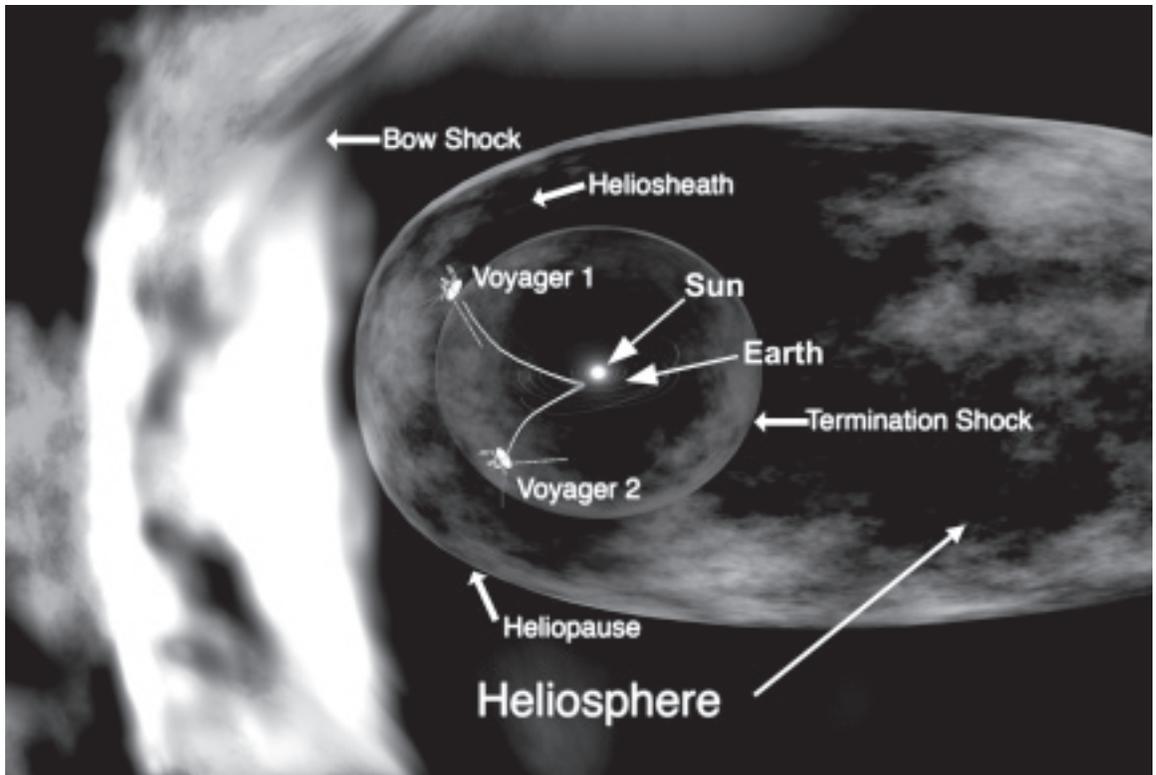
Now, in 2005, the spacecraft is nine billion miles (96 astronomical units) from the Sun, and it has entered a strange region of space no ship has ever visited before.

"We call this region 'the heliosheath.' It's where the solar wind piles up against the interstellar medium at the outer edge of our solar system," says Ed Stone, project scientist for the Voyager mission at the Jet Propulsion Laboratory.

Out in the Milky Way, where Voyager 1 is trying to go, the "empty space" between stars is not really empty. It's filled with clouds of gas and dust. The wind from the Sun blows a gigantic bubble in this cloudy "interstellar medium." All nine planets from Mercury to Pluto fit comfortably inside. The heliosheath is, essentially, the bubble's skin.

"The heliosheath is different from any other place we've been," says Stone. Near the Sun, the solar wind moves at a million miles per hour. At the heliosheath, the solar wind slows eventually to a dead stop. The slowing wind becomes denser, more turbulent, and its magnetic field—a remnant of the sun's own magnetism—grows stronger.

So far from Earth, this turbulent magnetic gas is curiously important to human life. "The heliosheath is a shield against



galactic cosmic rays," explains Stone. Subatomic particles blasted in our direction by distant supernovas and black holes are deflected by the heliosheath, protecting the inner solar system from much deadly radiation.

Voyager 1 is exploring this shield for the first time. "We'll remain inside the heliosheath for 8 to 10 years," predicts Stone, "then we'll break through, finally reaching interstellar space."

What's out there? Stay tuned...

Chris McKay to talk on November 9, 2005 at 7 p.m.

Andrew Fraknoi

Astronomer Chris McKay of NASA's Ames Research Center will give a non-technical, illustrated talk on: *REVEALING TITAN: What the Cassini Mission Has Discovered about Saturn's Giant Moon*. The talk will be in the Smithwick Theater, Foothill College, El Monte Road and Freeway 280, in Los Altos Hills, California. Free and open to the public. Parking on campus costs \$2. Call the series hot-line at 650-949-7888 for more information and driving directions.

Saturn's huge moon Titan is the only satellite in the solar system with a substantial atmosphere. The joint

NASA/European Space Agency mission called Cassini has been exploring this fascinating, but haze-shrouded, moon in detail, even dropping a probe onto its surface.

Dr. McKay, a co-investigator for this experiment to reveal Titan's surface for the first time, will fill us in on what the probe and the orbiter are finding out about this cold and alien world, which nevertheless has features that remind us of Earth.

Christopher McKay is a planetary scientist at NASA's Ames Research Center, specializing in the exploration of

Mars and Titan, in the evolution of the solar system, and the search for life. He is actively involved in planning future Mars missions, and has traveled to cold, dry parts of our own planet to search for Mars-like environments. In 1989, Dr. McKay received the prestigious Urey Prize of the Division for Planetary Science, given to a young investigator who has already made important contributions to science early in his career. He is a popular speaker, giving lectures on the planets all over the country, in a uniquely humorous and accessible style.

Solar System Stats for November 2005

Adapted from the Observer's Handbook published by The Royal Astronomical Society of Canada which in turn gets this data from the U.S. Naval Observatory's Nautical Almanac Office and Her Majesty's Nautical Almanac Office and contributions by David Lane, St. Mary's University, Halifax NS.

		Mercury	Venus	Mars	Jupiter	Saturn	Uranus	Neptune	Sun
RA	1	15 ^h 56 ^m	17 ^h 40 ^m	3 ^h 00 ^m	13 ^h 58 ^m	8 ^h 54 ^m	22 ^h 36 ^m	21 ^h 09 ^m	14 ^h 25 ^m
	11	16 ^h 32 ^m	18 ^h 24 ^m	2 ^h 45 ^m	14 ^h 06 ^m	8 ^h 55 ^m	22 ^h 35 ^m	21 ^h 09 ^m	15 ^h 05 ^m
	21	16 ^h 21 ^m	19 ^h 04 ^m	2 ^h 33 ^m	14 ^h 14 ^m	8 ^h 55 ^m	22 ^h 35 ^m	21 ^h 10 ^m	15 ^h 46 ^m
Dec.	1	-23°12'	-26°55'	+16°10'	-10°55'	+17°59'	-9°44'	-16°33'	-14°22'
	11	-24°31'	-27°00'	+15°42'	-11°39'	+17°55'	-9°45'	-16°32'	-17°22'
	21	-21°56'	-26°09'	+15°17'	-12°22'	+17°55'	-9°45'	-16°30'	-19°52'
Dist (AU)	1	1.07	0.69	0.46	6.43	9.08	19.58	29.94	0.993
	11	0.87	0.61	0.48	6.39	8.92	19.74	30.11	0.990
	21	0.69	0.54	0.51	6.34	8.76	19.91	30.28	0.988
Mag	1	-0.2	-4.3	-2.3	-1.7	0.3	5.8	7.9	
	11	0.0	-4.3	-2.2	-1.7	0.3	5.8	7.9	
	21	3.1	-4.4	-2.0	-1.7	0.2	5.8	7.9	
Size	1	6.3"	24.2"	20.2"	30.6"	18.2"	3.6"	2.2"	32'14"
	11	7.8"	27.2"	19.6"	30.8"	18.6"	3.5"	2.2"	32'19"
	21	9.7"	31.1"	18.5"	31.1"	18.9"	3.5"	2.2"	32'23"

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Submit

Submit articles for publication in the
 SJAA Ephemeris. Send articles to
 the editors via e-mail to
 ephemeris@sjaa.net. **Deadline,**
10th of previous month.

SJAA loaner scope status

All scopes are available to any SJAA member; contact Mike Koop by email
 (koopm@best.com) or by phone at work (408) 473-6315 or home (408) 446-0310
 (Please leave message, phone screened).

Available scopes

These are scopes that are available for immediate loan, stored at other SJAA members
 homes. If you are interested in borrowing one of these scopes, please contact Mike Koop for a
 scope pick up at any of the listed SJAA events.

# Scope	Description	Stored by
1	4.5" Newt/ P Mount	Annette Reyes
3	4" Quantum S/C	Hsin I. Huang
6	8" Celestron S/C	Karthik Ramamurthy
7	12.5" Dobson	Tom Fredrickson
10	Star Spectroscope	Jim Albers
13	Orion XT6 Dob	Ravinder Pal Singh
14	8" f/8.5 Dob	Colm McGinley
15	8" f/9 Dobson	Mike Koop
19	6" Newt/P Mount	Daryn Baker
23	6" Newt/P Mount	Wei Cheng
24	60mm Refractor	Al Kestler
26	11" Dobson	Vivek Kumar
27	13" Dobson	Steve Houlihan
28	13" Dobson	Anupam Dalal
29	C8, Astrophotography	Mark Ziebarth
32	6" f/7 Dobson	Sandy Mohan
34	Dynamax 8" S/C	Yuan-Tung Chin
35	Meade 8" Equatorial	Ethan Romander
38	Meade 4.5" Digital Newt	Tej Kohli
42	11x80 Binoculars	Ritesh Vishwakarma

Scope loans

These are scopes that have been recently loaned out. If you are interested in borrowing
 one of these scopes, you will be placed on the waiting list until the scope becomes available
 after the due date.

# Scope	Description	Borrower	Due Date
36	Celestron 8" f/6 Skyhopper	Shinji Wakamatsu	11/12/05
39	17" Dobson	Steve Nelson	10/2/05
40	Super C8+	Sander Pool	12/23/05
41	18" Sky Designs Dob	Martin J. Smallen	12/14/05

Extended scope loans

These are scopes that have had their loan period extended. If you are interested in
 borrowing one of these scopes, we will contact the current borrower and try to work out a
 reasonable transfer time for both parties.

# Scope	Description	Borrower	Due Date
2	6" f/9 Dob	John Paul De Silva	?
8	14" Dobson	Colm McGinley	11/01/05
9	C-11 Compustar	Bill Maney	Indefinite
11	Orion XT6 Dob	Ravi Shankar Erram	12/10/05
12	Orion XT8 Dob	Kevin Roberts	10/16/05
16	Solar Scope	Bob Havner	11/12/05
21	10" Dobson	Michael Dajewski	Repair
33	10" Deep Space Explorer	Jack Zeiders	11/23/05
37	4" Fluorite Refractor	Bob Leitch	11/1/05

Waiting list:

16	Solar Scope	Ken Frank
37	4" Fluorite Refractor	Carl Ching

San Jose Astronomical Association Membership Form

You can join or renew with the SJAA online at <http://www.sjaa.net/SJAAMembership.html>

New **Renewal** (Name only, plus corrections below)

Membership Type:

- Regular — \$20
- Regular with Sky & Telescope — \$53
- Junior (under 18) — \$10
- Junior with Sky & Telescope — \$43

Subscribing to Sky & Telescope magazine through the SJAA saves you \$10 off the regular rate. (S&T will not accept multi-year subscriptions through the club program. Allow 2 months lead time.)

Bring this form to any SJAA Meeting or send (with your check) to

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Make your check payable to "SJAA"
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