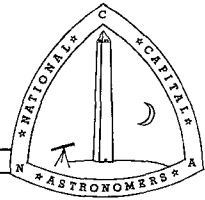


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Watters to Report Early Voyager-2 Uranus Results



DR. WATTERS

Dr. Thomas R. Watters, Research Geologist, Center for Earth and Planetary Studies, will deliver the March 1 National Capital Astronomers lecture. He will present preliminary results of the Voyager 2 Uranus flyby; most data have not been reduced.

Thomas R. Watters received his B.S. from West Chester University in 1977, his M.A. from Bryn Mawr College in 1979, and his Ph.D. from George Washington University in 1985. He is Principal Investigator for NASA's Planetary Geology and Geophysics Program. His past activities include investigations into the petrochemical-geochemical evolution of enstatite chondrite-achondrite meteorite association, geochemistry and irradiation history of olivines from carbonaceous chondrites related to the condensation sequence of the early solar nebula, tectonic evolution of the Tharsis region of Mars, modeling of the origin of basalt plains ridges on

Mars, the Columbia Plateau on Earth, and other terrestrial planets. His research specialties are meteorites, planetary and terrestrial remote sensing, and digital image processing.

MARCH CALENDAR -- *The public is welcome.*

Saturday, March 1, 6:00 pm -- Dinner with the speaker at the Ding How Restaurant, 1221 E Street, NW. Reservations unnecessary.

Saturday, March 1, 8:15 pm -- NCA monthly meeting at the U.S. Department of Commerce Auditorium, 14th Street and Constitution Avenue, NW. Dr. Watters will speak.

Tuesday, March 4, 11, 18, 25, 7:30 pm -- Telescope-making classes at Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.

Friday, March 7, 14, 21, 28, 7:30 pm -- Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Friday, March 7, 14, 28, 8:00 pm -- NCA 14-inch telescope open nights with Bob Bolster, 6007 Ridgeview Drive, south of Alexandria off Franconia Road between Telegraph Road and Rose Hill Drive. Call Bob at 960-9126.

Saturday, March 15, 3:30 pm -- ASTBBS Bulletin Board meeting: Improvements of the Astronomy Bulletin Board. For time and place See page 27.

Saturday, March 15, 7:30 pm -- Discussion group: Computation of comet orbits. New time and place. See page 27.

FEBRUARY LECTURES

Dr. John Graham, Department of Terrestrial Magnetism, Carnegie Institution, addressed the February 1 meeting of National Capital Astronomers. He discussed observations of stars now in process of formation.

Observing stars now forming yields data on the early stages of the Sun's formation. Stars are being formed largely in giant molecular clouds such as the Lagoon Nebula, which contain about 10^5 solar masses. A typical galaxy contains about a hundred such clouds concentrated in the spiral arms which are created by density waves.

The Orion region contains the nearest such clouds; these are now forming stars. There are two of these (Orion) clouds. One is around the Horsehead Nebula, the other is near M42.

It is theorized that local concentrations within these clouds become gravitationally compressed, the temperature is raised, and if there is sufficient mass, is increased enough to start thermonuclear fusion. Conversion of the lighter gases to heavier elements is begun; a new star is thus formed. Large clusters of stars may be formed in very extensive clouds.

The process is violent. Clouds condense from diameters of about a thousand astronomical units (au) to around one-thousandth au. Density increases by a factor of 10^{20} . As angular momentum is conserved, slow rotation becomes fast. Matter, and with it much angular momentum, is shed into a surrounding disk which generates a strong magnetic field. If it were not for this transfer of angular momentum the star would be disrupted.

There are strong stellar winds and magnetic fields. Formation of a large star results in shock waves which initiate the formation of more stars until the cloud is dissipated. M16 is typical. The Sun was probably formed in such an association which was torn apart later.

The strong stellar winds confuse observations. We need to find odd regions in which only one star is being formed in order to interpret the observations. Graham is thus very interested in a small cloud in the Southern Hemisphere, A210-GA in the Gum Nebula. The Gum Nebula is a fairly normal hydrogen-II region in which bursts of star formation are nearly over; Single stars still form.

Herbig-Haro objects, small, bright nebular concentrations of about one solar mass, are found near stars just being formed. They are being driven from the forming stars at a few hundred kilometers per second. The IRAS satellite found a point source resembling a star of one solar mass about 4200 light years away in the Valentine Nebula. A collimated line of objects was found in sulphur-II radiation; thus the stellar wind is probably collimated. The objects' spectra are blue-shifted about 147 km per sec. An energy of about 10^{37} ergs is required to accelerate five solar masses to such velocity! Objects in this state become T-Tauri-type (infant) stars. Herbig found a star, SU-Orionis, embedded in dense clouds, which has been seen to flare six times. Such eruptions may be typical for young stars.

Graham spoke of a Herbig-Haro object seen in 1983 which definitely was not there in 1957. This star, HH57, has been followed since 1983, and is observed to be cooling, as evidenced by strengthening molecular lines. It is fading a little, and its color is changing toward blue. Thus, it is blowing away its cocoon. It is expected to become a T-Tauri star. IRAS detected it (Probably actually its surrounding dust being heated by the star) in infrared. It is most variable at 48 μ , less so at 10-20 μ .

John B. Lohman

TERZIAN ADDRESSES NCA, CORNELL CLUB

Dr. Yervant Terzian, Chairman of the Astronomy Department, Cornell University, addressed the February 20 joint meeting of National Capital Astronomers and the Cornell Club.

He discussed the formation of the Universe according to the "Big-Bang" theory and described the morphology and evolution to the present state.

Terzian's brilliance, colorful wit, and pride in America's leadership in technology delighted an audience of nearly 400.

CAWELTI TO PRESENT NASM PLANETARIUM PROGRAM, SOLAR VIEWING

NCA President Stanley G. Cawelti, a Smithsonian Docent, will present the National Air and Space Museum's Monthly Sky Lecture in the Einstein National Planetarium at 9:30 am on March 1. He will relate some of the contributions made by amateur astronomers and organizations, and will follow with an update on the results of the Voyager-2 Uranus flyby. Using the planetarium, he will also demonstrate how to view Comet Halley.

Following the talk, weather permitting, safe telescopic solar viewing in hydrogen alpha will be offered on the east deck.

OCCULTATION EXPEDITIONS PLANNED

Dr. David Dunham is organizing observers for the following occultations. For further information call Dave at 585-0989.

Date	Time	Place	Vis Mag	Pent Sunlit	Cusp Angle	Min Aper
Grazing Lunar:						
03-30-86	07:03	La Paz, Baja Calif.	3.1	76	15S	5 cm
03-30-86	10:23	Klamath Falls, OR	1.2	75	2S	5 cm
Asteroidal:						
03 03-86	02:16	Georgia	7.5	5.0	(162) Laurencia	5 cm
03-12-86	07:54	North Carolina	9.2	5.0	(626) Notburga	5 cm

NCA WELCOMES NEW MEMBERS

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DISCUSSION GROUP ON ORBITS, ASTBBS BULLETIN BOARD MEETING

On Saturday, March 15, two meetings will be held at the home of Drs. David and Joan Dunham. All are invited to either or both but please call if you plan to attend: (301) 585-0989 (Silver Spring).

From 3:30 to 6:00 pm the Astronomy Bulletin Board will be discussed. Suggestions, future directions, and experience from a year of operation will be considered.

Following Pizza dinner at 6:00, the monthly discussion group will meet at 7:30, featuring determination of orbital elements from observations of comets, and computing local circumstances from orbital elements.

The Dunham's are at 9408 Ocala Street, Silver Spring, Maryland. Ocala Street intersects Franklin Avenue four blocks east of Colesville Road (U.S. 29) about a half-mile inside the Beltway. Turn left (north); 9408 is the fourth house on the left. From the Silver Spring Metro, take the #14 Ride-On bus to Franklin and Wire Avenue. Walk back one block to Ocala and turn right.

EXCERPTS FROM THE IAU CIRCULARS

1. January -- Stegelstein, Taylor, Rawley, and Stinebring, Princeton University, reported detection of the second-fastest millisecond pulsar at the Arecibo Observatory. In Ophiuchus, the pulsar has a period of 5.3621 ms.

2. January 10 -- Carolyn and Eugene Shoemaker discovered a comet of 12th magnitude in Leo with the 46-cm Palomar Schmidt telescope. The orbital elements by Marsden indicate that 1986a was at perihelion on December 19, and has a period of 16.34 years.

3. January 15 -- Barbieri, Iijima, and Sabbadin, Asiago Astrophysical Observatory, detected strong Na-I emission east of the nucleus of Comet Halley.

4. January 24 -- The Voyager Imaging Science Team reported the discovery of nine more satellites of Uranus, and another ring.

5. February 4 -- R. Evans, Mclean, N.S.W., discovered a supernova of 14th magnitude in NGC 3367. Robert N. Bolster

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