



## SOLAR-SYSTEM ANOMALIES, ELECTION ON MAY 6



DR. VAN FLANDERN

Following the election of NCA officers for fiscal 1979, Dr. Thomas Van Flandern, Chief of the Celestial Mechanics Branch of the U. S. Naval Observatory's Nautical Almanac Office, will offer some of his recent findings regarding anomalies in solar-system dynamics.

The slate of candidates offered by the nominating committee is given on page 35. Only the election will precede the lecture.

In Dr. Van Flandern's continuing investigation of solar-system dynamics, he frequently encounters seeming irregularities for which he seeks explanations. His searches sometimes evolve evidence which is persuasive but difficult to reconcile with present understanding. In his talk, "The New Solar System," Dr. Van Flandern will discuss the evidence of some of the apparent changes that not only make today's solar system

different from that which was formed several billion years ago, but also pose some serious questions as to our present knowledge. He will offer possible explanations of the apparent disruption of Neptune's satellite system (the retrograde motion of Triton, the 0.76 eccentricity of Nereid), the origin and nature of the rings of Uranus, which seem both invisible and impossibly unstable, and the origin of the satellites of Mars, possibly captured planet fragments.

Dr. Van Flandern's paper on his fragmented-planet hypothesis has been accepted by *Icarus* for publication in the fall.

Thomas C. Van Flandern was born in Cleveland, Ohio, received his B.S. from Xavier University in Cincinnati, and his Ph.D. in Astronomy from Yale University in 1969. Dr. Van Flandern has been a research astronomer in the Nautical Almanac Office of the U. S. Naval Observatory since 1963, and is now Chief of the Celestial Mechanics Branch. He is a member of the International Astronomical Union, American Astronomical Society, American Geophysical Union, American Association for the Advancement of Science, Sigma Xi, and National Capital Astronomers.

**MAY CALENDAR** — *The public is welcome.*

Monday, May 1, 8, 15, 22, 29, 7:30 PM — Telescope-making classes at the Chevy Chase Community Center, Connecticut Avenue and McKinley Street, NW. Information: Jerry Schnall, 362-8872.

Friday, May 5, 12, 19, 26, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Saturday, May 6, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. Reservations unnecessary.

Saturday, May 6, 8:15 PM — Annual NCA business meeting and election, and monthly lecture at the Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Thomas Van Flandern will speak.

Saturday, May 13, 9:00 PM — *Exploring the Sky*, presented jointly by NCA and the National Park Service. Glover Road south of Military Road, NW, near Rock Creek Nature Center. Planetarium program if cloudy. Information: Bob McCracken, 229-8321.

## APRIL LECTURE

At the April 1 meeting of National Capital Astronomers Dr. William Herbst, Carnegie Fellow at the Carnegie Institute of Washington, discussed a possible mechanism whereby supernovas may trigger the formation of some stars, particularly the early types (O, B), which are hot and massive.

The recent discovery in the Allende Meteorite of the presence of  $^{26}\text{Al}$  and an excess of one of its decay products,  $^{26}\text{Mg}$ , allows radioactive dating of carbonaceous chondrites from the formation of the solar system about  $5 \times 10^9$  years ago. Thus, an abundance of the nuclide  $^{26}\text{Al}$  must have been formed at that time. Of the ways in which  $^{26}\text{Al}$  might have been formed, energy considerations suggest the radiation of a nearby supernova. During its outburst — a few weeks or months — a supernova typically radiates about  $10^{51}$  ergs. At its present rate (about  $10^{33}$  ergs per second) the Sun would require 32 billion years to reach that total.

A supernova, then, may have triggered the formation of the Sun. According to this theory, first outlined by Ernst Öpik in 1953, the pre-supernova star of perhaps 4-5 solar masses is surrounded by diffuse clouds of dust and gas. About  $2 \times 10^5$  years after its explosion the expanding shock front compresses a parcel of surrounding matter, initiating a gravitational instability and ultimate collapse to a star with nuclear fusion at its center. The collapse requires another  $10^5$  years; by then the supernova remnant has long ago faded into the background.

Canis Major R1 is an association of young, massive stars with an illuminated nebulosity shell. Observations in the 21-cm line of neutral hydrogen show that the central part of the shell is approaching us relative to the motion of the association at 30 km per second; optical Fabry-Perot spectrometry of the ionized hydrogen component show the same radial velocity as the association. This indicates that the shell is expanding, with hot, young stars at its edge, consistent with the star-triggering hypothesis.

Stars moving at inordinate velocities, known as runaways, are believed to have been members of binary associations which have been gravitationally released from orbit when their companion stars became supernovas. One star in the R1 association is a runaway; it is moving relative to the Sun at 42 km per second. The others are moving at 3 to 16 km per second.

The young star association, Cygnus OB3, is a similar example.

The arms of spiral galaxies contain many new, short-lived ( $10^7$  year) blue stars. Numerical models have created spiral-galaxy constructs with density-wave arms and supernova-cascade processes. wrw

## OCCULTATION EXPEDITIONS PLANNED

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

May	UT	Place	Vis Mag	Pent Sunlit	Cusp Angle	Min Aper
08	15:15	Billings, MT	1.1	04	6S	Eye
09	15:25	South Dakota	5.1	08	3S	1"
10	15:10	Duluth, MN	5.7	14	1N	2"
10	17:18	New Haven, CT	5.7	14	0N	2"
12	17:16	Brandywine, MD	8.4	29	3N	5"
14	17:42	Westfield, NJ	8.0	48	3N	4"
14	17:43	Harlingen, NJ	7.7	48	3N	3"

## NCA ELECTION IN MAY

Fiscal 1979 NCA officers will be elected at the annual business meeting on May 6. Candidates offered by the Nominating Committee are:

President: James H. Trexler (Incumbent), Head, Space Systems Division, Naval Research Laboratory.

Vice President: Daniel G. Lewis (Incumbent), Electrical Engineer, Federal Power Commission.

Secretary: William R. Winkler (Incumbent), Meteorologist, National Oceanic and Atmospheric Administration.

Treasurer: Robert M. Lynn (Incumbent), Veterinarian, Owner, Lynn Animal Hospital.

Trustee: Richard J. Byrd, Attorney at Law.

Sergeant at Arms: Walter I. Nissen, Computer Sciences Corporation.

Additional nominations may be made by written petition of ten full members in good standing, submitted to the trustees prior to the May 6 election.

NCA thanks the Nominating Committee, G. Robert Wright, Chairman, Mary Ellen Simon, and John B. Lohman for their services.

## EXCERPTS FROM THE IAU CIRCULARS

1. March 10 — Bernacca and Bianchini, Asiago Astrophysical Observatory, observed four attenuation features of 10 to 30 seconds and 0.06 to 0.2 magnitude in the ultraviolet brightness of X Persei during two nights, confirming earlier observations of similar events.

2. March 16 — Greenstein and Zimmerman, Hale Observatories, independently observed the brightening of VV Puppis, and found the spectrum to have a blue continuum with strong, broad, H, He I, and He II emission lines. They used the SIT digital spectrograph at the 5-m reflector.

3. April 7 — M. Honda, Kurashiki, Japan, discovered a nova of 10th magnitude in Sagittarius at 18h30.3m -20°07'.

4. April 11 — The SAS Team, M.I.T., reported that the X-ray burster MXB1730-335 became active in mid-March. Numerous bursts were detected until activity declined during the first week of April and apparently ceased on April 8. rnb

## NCA TO HOST MERAL CONVENTION

National Capital Astronomers will host the convention of the Middle East Region of the Astronomical League here on August 19, 1978. Details will be announced at the May NCA meeting.

## LEHIGH VALLEY GROUP PLANS GATHERING

The Lehigh Valley Amateur Astronomical Society is planning a camp-out on Memorial Day weekend, May 27, 28, and 29, at Pulpit Rock, near Lenhartsville, Pennsylvania. Plans include a tour, planetarium, and picnic.

Reservations will be necessary. Further information may be obtained from Bob Wright.

## FOR SALE

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