



MARTIAN BIO?CHEMISTRY, ELECTION IN MAY



DR. LEVIN

The annual business meeting of National Capital Astronomers, at which the election of fiscal 1978 officers will be held, will hear Dr. Gilbert V. Levin, President of Biospherics, Incorporated, and NASA Experimenter on the 1971 Mars Orbiter and the 1976 Mars Viking Labeled Release life detection experiment.

Candidates offered by the Nominating Committee are listed on page 35.

Within safety constraints, sites most propitious for organisms were selected for the Mars Viking Landers. Although neither the Orbiter nor the Lander cameras detected any evidence of living systems, all of the three instruments designed to detect biological activity responded significantly.

In control experiments in which the samples were first heat sterilized, the same instruments yielded negative results, as would be expected if the responses were to biological activity.

Independent chemical analysis of the same soil samples failed to find any organic compounds. While it is possible that the level of organic detritus on Mars is below the sensitivity threshold of the instrument, it is also possible that the high incident ultraviolet flux on Mars may activate surface material to produce an inorganic, temperature-labile reaction mimicking the responses produced by microorganisms.

The Viking experiments are being modified and continued, and extensive efforts are underway in laboratories on Earth to duplicate the Mars chemistry.

Gilbert V. Levin received his B. E., M. S., and Ph. D. in Environmental Engineering from Johns Hopkins University. He served as Public Health Engineer in the State Health Departments of Maryland, California, and the District of Columbia, as Research Assistant and Clinical Assistant Professor of Preventive Medicine at George Washington University Schools of Medicine and Dentistry, Vice President of the Washington Laboratory of Resources Research, Incorporated, Director of the Life Systems Division of Hazelton Laboratories, and since 1967, as President of Biospherics, Incorporated.

Dr. Levin is a member of several leading professional societies, and is a Fellow of the American Public Health Association.

MAY CALENDAR — *The public is welcome.*

Monday, May 2, 9, 16, 23, 30, 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 6, 13, 20, 27, 8:00 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall.

Saturday, May 7, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. Reservations unnecessary.

Saturday, May 7, 8:15 PM — Annual NCA business meeting, election, and

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CALENDAR — continued

lecture, Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Gilbert Levin will speak.

Saturday, May 14, 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 if cloudy. Information: Bob McCracken, 229-8321.

Saturday, May 21, 4:00 PM — Byrds host NCA. Details on page 35.

APRIL LECTURE

Dr. Thomas A. Clark, of Goddard Space Flight Center's Infrared and Radio Astronomy Branch, addressed the April meeting of National Capital Astronomers on Very Long Baseline Interferometry (VLBI) and its bilateral application to both astronomical and geodetic problems.

Dr. Clark described the observing and data-processing techniques used by his team in VLBI with several of the world's great radiotelescopes, and followed with a description of VLBI observations of Quasars, and the use of the data in a wide variety of measurements.

Atomic clocks at each observatory provide a precise time base which is recorded with the simultaneous observations from widely separated sites. The tapes can then be mailed and processed together, where their correlation develops the interference fringes from which the data are derived. The previously required interconnection is eliminated; even satellites can be used.

The enigmatic quasars are at once astrophysical puzzles and useful benchmarks for extremely precise geodesy by the powerful techniques of VLBI. Their redshift, energy, and fine-structure behavior frustrate satisfactory modelling. Their distance, compactness, and energetic radiation make possible geodetic measurements of unprecedented accuracy by VLBI with aperture-synthesis techniques.

VLBI observational parameters to be processed include the amplitudes of the interference fringes among the various stations, their relative phases, group and phase delay, time-rate of change of differential delay with the diurnal rotation of the Earth, etc. In the plane normal to the source direction, the projection of the diurnal motion of each station is an ellipse; the projections of the several interstation baselines into this plane rotate among the ellipses and vary in length with diurnal motion.

Many simultaneous observations by a sufficient number of stations allows resolution and precise measurement of many of the involved parameters that are imperfectly known, e. g., baseline vectors, source coordinates, clock performance, atmospheric effects, tectonic plate motion, diurnal polar motion, Earth tides, ocean loading on plates, and others.

Millisecond-arc resolution of the fine structure of quasars has revealed puzzling changes at apparent velocities substantially exceeding that of light. While the changes seem real, the velocities may be an illusion involving phase velocity in some way. No fully satisfactory model is known; the physical processes are not understood. A week of observations from Space Shuttle in conjunction with Earth-based observations would provide needed data.

Experimental measurements are impressive. The distance between the Haystack and Westford sites near Boston, about 1.4 km, has been surveyed to within about 2 cm; VLBI measurements agree consistently to within 5 mm. Day-length measurements by VLBI agree within 2 ms with lunar laser ranging. VLBI measurements of the positions of radio sources agree within 0.03 arcsec with the highest accuracy measurements by other means. The distance between sites in Massachusetts and California was measured to 8 cm. Such precision approaches that necessary to measure continental drift — a few cm per year.

VLBI has also been demonstrated to be an excellent method for synchro-

NCA ELECTION IN MAY

Fiscal 1978 NCA officers will be elected at the annual business meeting on May 7. Candidates offered by the Nominating Committee are:

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

Vice President: Daniel G. Lewis, Electrical Engineer, Federal Power Commission, in charge of the FPC Data Base.

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

Treasurer: Robert M. Lynn (Incumbent), Veterinarian, owner and operator of Lynn Animal Hospital, College Park, Maryland.

Trustee: Benson Jay Simon (Retiring President), Senior Budget Analyst, United States House of Representatives Budget Committee.

Sergeant at Arms: Richard J. Byrd (Incumbent), Attorney at Law.

Additional nominations may be made by written petition of ten full members in good standing, submitted to the Trustees prior to the May 7 election.

NCA thanks the Nominating Committee, Robert H. McCracken, Chairman, Mabel Sterns, and Mr. and Mrs. Richard J. Byrd, for their services.

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	Pcnt Sunlit	Cusp Angle	Min Aper
14*	10:00	Winnipeg, Man.	-4.2	12	2S	*
23	01:40	Abingdon, MD	8.5	21	3N	6"
23	02:01	Near previous	9.0	21	2N	8"
27	00:55	Hanover, VA	5.7	60	6N	2"
June 5	09:43	Doswell, VA	3.2	83	3N	2"

*Venus. Occultation visible with binoculars.

NCA PICNIC TO BE HOSTED BY BYRDS; PREVIOUS TRY RAINED OUT

Dick and Nancy Byrd will host NCA at their lake and cabin on Saturday, May 21, from 4:00 PM. Bring food for cooking (Dick has grills) and telescopes, etc. A-c power is not available. To reach Byrdland:

From Virginia, I-95 south 34 mi from Beltway to U.S. 17; south on 17, cross U.S. 1 at light onto 664; right at light onto 218; left at light onto U.S. 3; about 19 mi farther, just after King George, left onto 205; cross U.S. 301 at light. *Continue 4.4 mi, then right onto 620 immediately after Ninde Post Office. At 0.85 mi turn left onto unmarked private dirt road. Proceed about 700 feet to fork, bear right between chainposts. About 1200 feet farther is a gravel parking area on left. A drivable grass road leads from here to cabin.

From Southern Maryland, U.S. 301 about 10 mi south of Potomac River Bridge, turn left onto 205 and continue as from * above.

NCA thanks Dick and Nancy for their gracious hospitality.

nizing clocks. Synchronization between Haystack and Westford within 3 ns was achieved — better than by transporting clocks. A recent experiment was conducted between Haystack and Greenbank, with the Naval Observatory flying clocks to both ends of the baseline, but results are not yet available.

In a recent issue of the Astronomical Journal, Dr. Clark published high-accuracy positions of 19 radio sources to within hundredths of an arcsec.

Dr. Clark thanks NASA, NSF, the Air Force, and others for funding the

EXCERPTS FROM THE IAU CIRCULARS

1. March 27 — Y. Kuwano, Hita, Oita, Japan, discovered a nova of 9th magnitude in Sagittarius.

2. April 16 — Eleanor Helin, California Institute of Technology, discovered a 15th-magnitude comet (1977e) in Virgo with the 46-cm Palomar Schmidt.

3. April 17 — E. Helin and B. Bus, CIT, discovered a fast-moving asteroidal object of 15th magnitude in Canes Venatici. It appears to be an Apollo-type object with a period of 1.99 years.

4. April 19 — An analysis of 25 Uranian ring occultation observations by Bryan Marsden indicates that four of the rings are circular, with radii of 44,950, 45,890, 47,840, and 48,510 km. The fifth appeared asymmetric, extending 51,790 km west and 51,120 km east. Other possible rings were observed 42,550 and 42,810 km to the west and 53,720 km to the east. The radius of Uranus was determined to be 26,450 km.

5. April 24 — C. T. Kowal, Hale Observatories, discovered a 16th-magnitude comet (1977f) in Virgo.

This listing courtesy R. N. Bolster.

AAVSO TO CONVENE IN WASHINGTON

The 1977 convention of the American Association of Variable Star Observers will be held Friday and Saturday, May 13 and 14, at the Capital Hilton Hotel.

Highlights will be a social hour and talk by James Elliot on the newly-discovered rings of Uranus, a tour of the U. S. Naval Observatory, paper session, banquet, and tour of Washington. A talk by Vera Rubin on supernovae will follow the banquet. Further information and schedule can be obtained from Daniel Costanzo. 841-0051.

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★ S T A R D U S T



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