★ STAR DUST

Volume XXXX October 1983 Number 2

WILSON EXPLORES ACTIVE GALAXIES, RADIO JETS

DR. WILSON
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Dr. Andrew S. Wilson, Associate Professor of Astronomy at the University of Maryland, will speak at the October meeting of National Capital Astronomers. He will discuss active galaxies having explosive nuclei and radio jets.

A small fraction of galaxies, one or two percent, show explosive phenomena in their nuclei and radiate large amounts of energy — 10^{12} or more solar radiancies — from a very small region, in some cases no larger than the solar system. These active galaxies include Seyfert galaxies, radio galaxies, BL Lacertae objects, and quasars. Dr. Wilson will review current knowledge of some aspects of these objects, with particular emphasis on the radio jets seen in some of them. These jets, mapped with large radiotelescopes, are collimated energetic outflows from the active nuclei. They are seen on all scales from light years to millions of light years. Their origin and formation near the massive black hole presumed to power the activity presents one of the most difficult and perplexing problems of modern astronomy.

Born in Doncaster, Yorkshire, England, Dr. Wilson received his Ph. D. in 1973 from the University of Cambridge under Martin Ryle. Before joining the Maryland faculty he was a postdoctoral Research Fellow at Sterrewacht, Leiden, and at the University of Sussex. He has made major discoveries, either individually or jointly: The largest-known radio galaxy, 3C236; Seyfert galaxies and BL Lac objects through identification of cosmic X-ray sources; that Seyferts can eject radio clouds and jets as do elliptical radio galaxies and quasars.

Dr. Wilson is a Fellow of the Royal Astronomical Society, a member of the International Astronomical Union, and the American Astronomical Society.

OCTOBER CALENDAR — *The public is welcome.*

Saturday, October 1, 6:15 pm — Dinner with the speaker at the Thai Room II, 527 13th Street, NW. Reservations unnecessary.

Saturday, October 1, 8:15 pm — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Wilson will speak.

Tuesday, October 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, October 7, 14, 21, 28, 7:30 pm — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall.

Saturday, October 8, 7:30 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: Dr. John Lohman, 820-4194.

Friday, October 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, October 15, 8:00 pm — Discussion group at the Department of Commerce on image processing. Information: Mark Trueblood, (301) 986-9442.

SEPTEMBER LECTURE

Dr. David DeVorkin, Associate Curator of the History of Astronomy at the National Air and Space Museum, addressed the September meeting of National Capital Astronomers. He recounted the beginnings of rocket astronomy in the United States and the use of captured German V2 rockets.

The Earth's atmosphere creates well-known problems for the astronomer. Image degradation caused by air turbulence (called *seeing* by the astronomer) imposes a limit on attainable resolution. Most wavelengths do not penetrate the atmosphere; all are partly absorbed. The atmosphere also interposes its own dark (absorption) lines on celestial spectra.

Balloons were the first means attempted to reduce the bad effects of the atmosphere. The earliest objective was the measurement of the *solar constant*, the amount of solar radiation reaching the Earth's upper atmosphere. It was also hoped that wavelengths absorbed by the atmosphere could be observed, thus to determine the radiation characteristic of the Sun. (Ed. note: An absolutely absorptive (black) body, when heated, radiates a wide band of wavelengths with maximum radiation at a wavelength determined by its temperature. The band shape characteristic is known as *black-body* radiation.) As it turned out, balloons were not much help here; too much absorbing atmosphere remains above them.

From the beginning, the atmosphere along with astronomy was a subject of study. The Earth's ozone layer was soon found to extend to higher altitude than thought; ozone is a principal absorber of ultraviolet. By World War II, manned balloons had risen to an altitude of 13 miles; unmanned balloons reached 22 miles. The nature of the ionosphere was beginning to be glimpsed.

Rocket astronomy began at Peenemünde under von Braun. It was halted by allied bombardment of the sites.. Krause set up a rocketsonde section at the U. S. Naval Research Laboratory in 1945. The U.S. Army wisely supported this work. They needed data on ballistic missiles, and also realized that the basic physics would surely be useful to them.

Tousey at NRL designed and built a suitable ultraviolet spectrograph to be carried on rockets. The rocket's spin was ingeniously and effectively overcome by the use of a tiny bead of lithium fluoride as a secondary source of the Sun's radiation. Lithium fluoride transmits far into the ultraviolet; the bead served as a point source which moved with the rocket in spin. The spectrograph used the common and excellent Rowland design. With this system the ultraviolet was observed out to 2000 Å. In 1953 the Lyman Alpha region, of great theoretical importance, was observed at 1215 Å with improved grazing-incidence optics.

Early work used the captured German V2 missiles at White Sands, New Mexico. As these were obtained as parts only, they were reconstructed, and some duplicates were built in the United States. A great advantage of the V2 was its huge (for that time) size; there was plenty of room to carry comparatively large equipment. Even so, ballast was usually carried!

The Aerobee era followed, reaching still farther into the ultraviolet. The Sun was found *not* to radiate as a black body. (Ed note: Nothing does! and it does make a difference in physics.) Its actual complex nature as a radiator was — and is — studied. Ozone distribution was found to be at several layers around 15 and 25 km (V2 work contributed here). Cosmic-ray physics was extensively studied along with astronomy.

A primary, largely unappreciated result of the rocket-astronomy era was the creation of a coterie of space scientists who became a major part of the satellite era work force. Van Allen is a well-known example of these men (there are many others. It can be conjectured that if rockets had gone modestly higher the Van Allen belts would have been discovered and understood at least a decade earlier.

John B. Lohman

OCCULTATION EXPEDITIONS PLANNED

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

UT Date	UT Time	Place	Vis Mag	Pcnt Sunlit	Cusp Angle	Min Aper
10-01-83	07:02	Myersville, MD	6.4	33	13N	5 cm
10-27-83	06:55	N. Charleston, SC	3.2	70	12N	3 cm
10-28-83	06:21	Midway, NC	3.7	59	12N	3 cm
10-28-83	06:23	Powells Point, NC	3.7	59	11N	3 cm
10-30-83	10:32	Layhill, MD	8.2	35	2N	10 cm
ASTEROIDAL APPULSES:		Star mag	Miss dist	Name of Asteroid		
10-03-83	01:34	11.2	0".9S	(451) Patientia		20 cm
10-10-83	07:40	8.9	2".7N	(247) Eukrate		5 cm

NCA WELCOMES NEW MEMBERS

Dr. Sylvan M. Berman
5320 Carvel Road
Bethesda, MD 20816

Ron G. Scheible
45 Maryland Avenue
Annapolis, MD 21401

Francis J. Snyder, #10
2000 Calvert Street
Arlington, VA 22201

Charles H. Stange, #400
1669 Parkcrest Circle
Reston, VA 22090

Carl G. Wiggington
6009 Roxbury Avenue
Springfield, VA 22152

NCA MEMBERS INVITED TO SPECIAL EXHIBITION

The Columbia Historical Society, the National Academy of Sciences, the Naval Medical Command, and the U.S. Naval Observatory invite you to attend a special exhibit and lecture on Wednesday, October 5, at the National Academy of Sciences, 2101 Constitution Avenue, NW, at 7:30 pm.

The exhibit, *Lighthouse of the Sky*, features the U.S. Naval Observatory from 1844 to 1893, at the old site recently toured by NCA. The lecture, *Wise Men from the East: The U.S. Naval Observatory and the Solar Eclipse of 1878*, will be given by Jan K. Herman, Historian, Naval Medical Command. Mr. Herman addressed the March 1983 meeting of NCA, and conducted an NCA tour of the old Naval Observatory in April.

NEIGHBORHOOD ASTRONOMERS MEETING SCHEDULED

The fifth Washington Area Neighborhood Astronomers Meeting will be held at the U. S. Naval Research Laboratory on Thursday, 13 October 1983 from 8:30 am to 5:30 pm, followed by a reception at 6:00.

Registration is $3.00. Foreign nationals are welcome, but must register in advance. Call (301) 454-3005 as soon as possible for information.

SMITHSONIAN OFFERS COURSES

Two astronomy courses will be offered this autumn by the Smithsonian Resident Associate Program: *Astrophysics and the Universe*, by Carl Fichtel and Jacob Trombka, and *Astronomy at the Observatory*, by Theodore Rafferty. Smithsonian Resident Associate members $55, nonmembers $81 each course.

For further information call 357-3030.

EXCERPTS FROM THE IAU CIRCULARS

1. August 10 — L. E. Gonzales, University of Chile, found a novalike object of 9th magnitude in Libra. Previous plates of the area show the object at magnitude 18.5.

2. August 11 — M. Hanner, Jet Propulsion Laboratory, detected a spectral absorption feature at 2.9 - 3.0 micrometers in Comet Cernis (1983 l) using the Infrared Telescope Facility at Mauna Kea.

3. August 11 — Barbieri, Cristiani, and Romano, Asiago Astrophysical Observatory, found quasar 3C446 at B magnitude 15.1, the brightest it has ever been seen, on plates taken with the 67-cm Schmidt telescope. R. N. Bolster

FOR SALE

Telescope — Celestron C-5 with tripod and wedge, 1.25-inch diagonal and visual back, 6 x 30 right-angle finder, $600 or best offer. Cristin Birch, 532-5248 evenings. (Arlington)

DISCOUNTS ON BOOKS THROUGH NCA

National Capital Astronomers is an agent for Sky Publishing Company, Inc. Members can purchase *Sky* products at a discount. Call Ruth Freitag, NCA Treasurer, at 521-7831 for details. (Arlington)

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WASHINGTON, D. C.

Published eleven times yearly by NATIONAL CAPITAL ASTRONOMERS, INC., a non-profit, public-service corporation promoting astronomy and related sciences through lectures, expeditions, discussion groups, tours, classes, public programs, and publications. President and Editor, Robert H. McCracken. Deadline 15th of preceding month. Information: (301) 320-3621. Material for publication: *STAR DUST:* 5120 Newport Avenue, Bethesda, MD 20816.

FIRST CLASS