☆ STAR DUST

Volume XXIX October 1972 Number 2

BLACK HOLES AND EINSTEIN: RECENT WORK

DR. RONALD ADLER

Dr. Ronald J. Adler will speak to the National Capital Astronomers on October 7, 1972 of some results of recent work on the black holes produced upon gravitational collapse of rotating stars.

Dr. Adler's publications on general relativity include the frequently used textbook, *Introduction to General Relativity*, co-authored with Drs. Maurice Bazin and Menahem Schiffer, and an encyclopedia article on unified field theories. He also works in nuclear and elementary-particle physics.

Dr. Adler will begin with the appearance of events in space-time and the manner in which gravitational forces are replaced by a curvature in this space-time arena. Dr. Adler is gifted in his presentation of this stimulating material.

Dr. Adler is a popular lecturer at the American University, where he conducts courses in modern astronomy for freshmen, and modern physics and cosmology for graduate students, as well as continuing his research. Among his hobbies are climbing tall mountains, running long distances, and solving difficult equations.

OCTOBER CALENDAR

Monday, October 2, 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.

Wednesday, October 4 — "The Planets," Carl Sagan, Cornell University.*

Friday, October 6, 13, 20, 27, 7:30 PM — Telescope-making classes at American University, McKinley Hall basement. Information: Jerry Schnall, 362-8872.

Saturday, October 7, 6:15 PM — Dinner with the speaker at Bassin's Restaurant, 14th Street and Pennsylvania Avenue, NW. No reservations needed.

Saturday, October 7, 8:15 PM — NCA monthly meeting at the Department of Commerce Auditorium, 14th and E Streets, NW. Dr. Ronald Adler will elucidate black holes and relativity.

Thursday, October 12 — "Planetary Atmospheres," I. Rasool, Goddard Institute for Space Studies, New York.*

Saturday, October 14, 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. Information: Bob McCracken, 229-8321.

Wednesday, October 18 — "The Moon," John Wood, Smithsonian Astrophysical Observatory.*

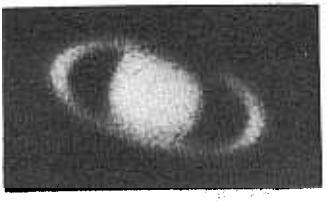
Wednesday, October 25 — "The Outer Planets," John Lewis, M.I.T.*

Wednesday, November 1 — "The Comets," Bryan Marsden, Smithsonian Astrophysical Observatory.*

*National Air and Space Museum-Smithsonian Astrophysical Observatory lecture, Museum of History and Technology Auditorium, 12th — 14th Streets on Constitution Avenue, NW, 7:30 PM.

MEMBERSHIP NOTES

At Knoxville, Maryland, Jerry Hudson is well advanced on his home observatory, the core of which is a large metal tool shed. The roll-off roof building is on a concrete slab and footing with wooden roofing and extensions. When it's finished, Jerry will mount his 10-inch Wright-Schmidt camera there.



A number of "Exploring the Sky" programs in Rock Creek Park this year have attracted as many as 150 people. The largest telescope used in the September 16 program was the 12-inch open-tube Cassegrain built by Ed Jones, who used it to make the accompanying unfiltered photo of Saturn.

Rene Lamadrid, who conducted the "Neighborhood Astronomy" series at the Chevy Chase Community Center last season, has been sharing his telescope with all comers during Jerry Schnall's Monday night telescope-making classes at the Center.

Jerry reports that eight mirrors are being ground in his Monday night class, while one mirror and several mounts are being made at his Friday night class.

New member Gene O'Bryan, a Virginia Tech student, reports a new astronomy club on campus. Supported by the Physics Department, the club owns an 8-inch Celestron, has a 12-inch on order, and plans an optics lab.

TELESCOPE FOR SALE

RV-6 Dynascope (6-inch) with several added features: clock drive with switch, declination slow-motion control, camera mount, tube bracers, moon filter. $200.00. Call Mark Emlet at 532-7651.

FINANCIAL STATEMENT — July 15, 1971 to September 3, 1972

INCOME

Dues	$1793.10	
Obsvrs Hdbk	63.80	
Graphc T Tbl	.50	
Telescope class	27.00	
Heyden dnr surpls	10.61	
Total	1895.01	

Reconciliation of Checking Account and Current Funds

Sept. 3, 1972		
Chk Ac't	$1152.12	
Petty Cash	15.76	
Total		$1167.88
July 15, 1971		
Chk Ac't	920.44	
Petty Cash	15.37	
Total		$935.81
Increase		$232.07
Ledger Balance July 15, '71		$415.64
Increase, 1971-72		232.07
New Ledger Balance		$647.71

SUMMARY

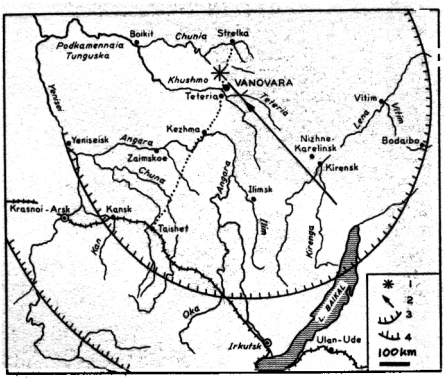
Income	$1895.01
Expenses	1662.94
Excess Income	$232.07

EXPENSES

Sky Pub Corp		$913.94
Star Dust		
Publ	$196.24	
Post	207.01	
Total		403.25
Directory		
Publ	$38.04	
Post	16.00	
Total		54.04
Obsvrs Hdbk		96.00
Graph T Tbl		22.50
Spkrs dinners		37.38
Wash Acad Sci		15.00
Astro League		
1971-72	$41.25	
1972-73	41.00	
Total		82.25
Treasurer		
Misc	$ 8.82	
Post	18.64	
Reprod	7.80	
Total		36.06
Science Fair		1.52
D.C. Rec. of Deeds		1.00
Total		$1662.94

(Signed) Charles P. Shephard, Treasurer

AN ANTIMATTER HYPOTHESIS FOR THE 1908 SIBERIAN METEOR



Dr. Clyde L. Cowan, Catholic University physicist, spoke to NCA on the Tunguska, Siberia meteor of 1908 at the September 9 meeting. This object was seen to explode at high altitude after following a northward trajectory. The first men to study the meteor were part of a very carefully planned Soviet expedition to Tunguska in 1923. They found no meteorite and no crater: only a devastated swamp forest.

The trees had all fallen radially outward from the swamp that remained. From considerations of the mechanical force this required, the meteor fall produced the equivalent of the explosion of 30 megatons of TNT. Analysis of burn marks on the trees yielded an equal thermal energy — an amount much larger than the thermal output of such a TNT explosion. Thus, a nuclear or antimatter explosion is indicated.

The Soviets gathered all available visual reports of the Tunguska meteor fall. These are of uncertain reliability, but significantly, no reports of a visual streak or cloud trail following the fall were received, casting doubt upon the hypothesis of a small, low-angle comet as the origin.

Theory indicates that a fist-sized rock of antimatter can cause a 30-megaton explosion. An experimental test is whether or not the amount of (radioactive) carbon 14 in the global atmosphere was doubled at the time. This would result from antimatter neutrons being captured by the earth's atmosphere of 78 percent nitrogen to form C^{14} plus proton.

Meticulous analysis of Arizona tree-ring samples by Dr. Cowan and his staff indeed showed that 1909 had the highest C^{14} values yet detected in the atmosphere, a result confirmed by both pine and oak tree rings.

Dr. Cowan indicated that future research on the antimatter hypothesis for the 1908 Siberian meteor would include C^{14} analysis of both Northern and Southern Hemisphere tree rings. He pointed out the great need for more C^{14} dating laboratories.

The figure above, derived from the report of the 1923 Soviet expedition to Tunguska, gives pertinent physical data on the 1908 meteor: 1 — explosion, 2 — probable trajectory, 3 — limit of visual reports, 4 — limit of aural reports.

PICTURE OF THE MONTH

On page 8, the northern hemisphere of Mars — from the polar cap to a few degrees south of the equator — is seen in this mosaic of three photos taken by Mariner 9 on August 7, 1972. The north polar ice cap is shrinking during the late Martian spring and the area shows complex sedimentary systems. Fractured terrains partially flooded by volcanic extrusions are visible in the center of the disk. In the bottom photo are the huge Martian volcanoes and the west end of the great equatorial canyon (lower left). The volcanic mountain Nix Olympica (left center) is 500km across at the base and stands higher than any feature on Earth. When Mariner 9 went into Mars orbit last November, only Nix Olympica and the three aligned volcanoes at lower left protruded above a planet-wide dust storm. Compare with the Mariner 9 photos on page 20 (with legend on page 19) of *Star Dust*, January 1972. When the dust settled, clouds of water or dry ice crystals continued to obscure the area north of the 50th parallel until recent months. The northern hemisphere now appears free of atmospheric obscuration. The three photos of the mosaic were taken 84 seconds apart from an average range of 13, 700km. NASA photo courtesy Dick Horwitz.

Mars from Mariner 9 — *NASA photo*

* Star Dust *

WASHINGTON D.C.

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