

and Levitt three years ago; the second, that purchased from Princeton Observatory last year. The great card catalogue of eclipsing binaries also was transferred from Princeton at Dr. Wood's request, after the lamented death of Dr. Newton Pierce. Our department is now keeping this catalogue up-to-date and will continue indefinitely to do so. Dr. Wood is in personal charge of developing plans for our proposed new observatory which is to be situated on a 31-acre site, 13 miles west of Flower Observatory. This location was chosen by the writer two years ago after a large number had been investigated. We hope that work will begin this fall.

Vol. VII, Part 2, of our *Publications* is now in press. This will include comparison stars for 35 regions and several thousand observations of variable stars. One or more of our *Reprint* series by Barton, by Wilson and by Olivier have been issued. Articles by Wood, Nason, Moore and Blitzstein dealing with eclipsing variables have appeared or are now in press. Reprints of these have not yet been received. At present, photoelectric work is being carried out at Cook Observatory by Wood and Blitzstein. At Flower Observatory interferometer work on visual binaries is being done by R. H. Wilson and further work on approximately 100 variables, specially studied by our staff and particularly including EZ Aquilae, is being done by the writer. The routine work of directing the activities of the American Meteor Society proceeds as usual.

Charles P. Olivier, *Director*

Fuertes Observatory, Cornell University, Ithaca, N. Y.

Personnel: Mrs. Vera Cooper Rubin completed the work for the degree of Master of Arts and resigned as graduate assistant. Mr. Melville K. Short joined the staff as a graduate teaching assistant.

Instruction and publication: One hundred forty-eight students registered in the department during the year. Of this number twenty-one enrolled for upper-class or graduate study. Professor Stahr taught advanced courses in the Galaxy, External Galaxies, and Astrometry. Professor Shaw taught a year course in Introductory Astronomy and advanced courses in Celestial Navigation and Practical Astronomy.

The Observatory was open to the public on Friday evenings in October and again in May with attendance reaching several hundred per evening.

Professor Giorgio Abetti gave a Special Uni-

versity Lecture on the History and Problems of Solar Research. Professor A. Unsöld gave a General University Lecture on Galactic Radio-frequency Radiation.

Professor Stahr published a Bibliography of Extra-terrestrial Radio Noise as a part of the Report of Commission V to the IXth General Assembly of the International Scientific Radio Union. Her paper on "Radio Waves from the Sun" appeared in the book *Science Marches On* published by General Electric Company. She continued her search for radio stars and sky bursts in the Radio Astronomy Project carried on in collaboration with the School of Electrical Engineering.

Professor Shaw prepared material on spherical trigonometry in celestial navigation for the Committee on Navigation of the United States Power Squadrons. He delivered eight invited lectures on astronomy and related subjects in Ithaca and adjoining cities.

Instrumentation: The director devoted considerable time to the construction and installation of a 12-inch horizontal reflecting telescope and the accompanying electrically driven coelostat for the study of surface reflectivity of the moon. This program is carried on jointly by the University and the Office of Naval Research.

He also gave attention to the design and construction of the polar axis and fork of the 25-inch reflecting telescope which the Department has had under construction for some time.

R. William Shaw, *Director*

Goethe Link Observatory. Indiana University, Bloomington, Ind.

July 1, 1949 to June 30, 1951

This report covers the second and third years of operation following the gift of the Goethe Link Observatory to Indiana University, and is the second report issued from here under the name of this Observatory. Earlier reports from Indiana University were under the name of the Kirkwood Observatory, which now serves as the students' observatory on the campus.

PERSONNEL

Dr. Goethe Link, who continued as Honorary Director, was elected a patron of the American Astronomical Society. Dr. Frank K. Edmondson continued as director, and was promoted to the rank of professor at the beginning of this period. Dr. James Cuffey was promoted to the rank of associate professor at the same time. Dr. John

B. Irwin continued as associate professor. Dr. Marshal H. Wrubel joined the staff in September, 1950, with the rank of assistant professor.

Mrs. Beryl H. Potter continued as full-time research assistant. In 1949-50 the following students served as part-time assistants: Arthur N. Cox and Robert L. La Fara were research assistants, and William H. Potter was teaching assistant. James K. Gleim and Miss Mary Lois Connelley were undergraduate assistants. In 1950-51 the following students were part-time assistants: Arthur N. Cox, Kenneth L. Hallam, Thomas L. Swihart, and Kenneth G. Widing were research assistants, and Mary Lois Connelley was teaching assistant. Arnold R. Klemola was undergraduate assistant.

The following individuals served at various times as temporary assistants on the Office of Naval Research minor planet program: Don M. Bubeck, Robert C. Cameron, Felix Y. K. Chiang, Mary Lois Connelley, Daniel J. May, Lonnie Mead, Mrs. Ora Mae Mead, J. Paul Mutschlecner, Richard C. Nicholas, Mrs. Betty Ray Potter, Kenneth P. Potter, Sara Anne Potter, William H. Potter, Mrs. Nancy Smithson, and Thomas L. Swihart.

Marion Todd joined the staff on August 1, 1950, as instrument maker.

Professor U Aung Hla, head of the mathematics department at the University of Rangoon, spent the first two months of the 1950-51 fall semester here as a visiting professor under a grant from the State Department.

Dr. I. Epstein, of the Rutherford Observatory of Columbia University, arrived on June 12, 1951 to spend three months making photoelectric observations of the magnitudes and colors of bright stars.

Edmondson became Secretary of Section D (Astronomy) of the American Association for the Advancement of Science on January 1, 1950. In 1951 he began a three-year term as a member of the National Research Council Committee on Astronomy, advisory to the Office of Naval Research.

Irwin spent part of the summer of 1949 working at the United States Naval Ordnance Test Station at Inyokern.

RESEARCH

The 10-inch Cincinnati lens was used mostly for the minor planet program, which is supported by ONR and the Indiana University Graduate

School. During the interval covered by this report 779 plates were taken. About half of the critical-list objects searched for have been found, including a number of difficult cases with large values of $O - C$. Nearly 500 unidentified objects have been found, but most of these have only nuisance value. Magnitudes on a uniform system have been estimated by Edmondson.

The 10-inch has been equipped with plexiglas filters, and both the yellow and red foci give images of good quality. Some two-color photographic photometry was started by Mr. George S. Mumford III. Provision has also been made to use the photoelectric photometers on the 10-inch. Mr. Cox is using this instrument for the northern hemisphere observations to tie in with his measurements of Harvard Standard Regions made with the Victoria telescope at the Royal Observatory, Cape of Good Hope.

Photoelectric photometry has continued to be the major program with the 36-inch reflector. Mr. La Fara carried through "A Photoelectric Study of U Pegasi in Two Colors" as a thesis for the M.A. degree. Mr. Potter combined both photoelectric and photographic observations to obtain "The Color-Magnitude Relation for Galactic Star Cluster Messier 36 (NGC 1960)," also a thesis for the M.A. degree. The work on VV UMa, started by Mr. Donselman, has not yet been finished. A new elevator, built by Mr. Charles C. Cook, has greatly improved the efficiency of this telescope.

Cuffey's program now includes: M 37, M 38, M 53, NGC 1907, NGC 2169, NGC 2281, NGC 5053, NGC 6649, NGC 6694, NGC 6838, and NGC 6939. He has also made photoelectric observations of Vesta, Pallas, Ceres, Victoria, Ganymed, and the lunar eclipse of September 26, 1950.

Irwin, assisted by Cox, spent four months (June-September, 1950) in the Union of South Africa working on a number of photoelectric projects. This work was supported by ONR and the Indiana University Graduate School. The major part of their work was done with the 74-inch Radcliffe reflector at Pretoria, where they were able to use 240 hours out of a possible 360. They also did some work with the 27-inch Lamont-Hussey refractor at Bloemfontein, and with the 24-inch Victoria refractor at the Cape. Cox remained at the Cape for an additional four months after Irwin's return to Indiana. Grateful acknowledgement is made to the Directors and staffs of these observatories for their helpful

cooperation, without which the work of Irwin and Cox would not have been possible. Thanks are also due to Atkinson's Motor Garage in Bloemfontein for the loan of a storage battery.

Wrubel has been working on a number of problems in theoretical astrophysics, with emphasis on calculations of the decay time of magnetic fields in stars.

An advance of major importance was the installation of a machine shop in the basement of the Kirkwood Observatory during 1950, plus provision in the 1950-51 budget for the employment of an instrument maker. This at last makes it possible to keep our equipment in good repair, and to develop research programs on their scientific merits even though they involve new equipment or the modification of old equipment.

The order for a UV spectrograph which was placed with the Perkin-Elmer Corporation on August 11, 1946 was canceled on May 21, 1951. This step had to be taken when it was finally realized that the completed instrument was going to cost approximately four times the amount that was originally quoted to us, and for which a grant had been given by the Research Corporation. We are now exploring the possibility of building a more conventional type of spectrograph with the funds available.

Kirkwood Observatory. The office at the Kirkwood Observatory was remodelled to provide desk space for ten students. Remodelling of a classroom in Swain Hall has provided an additional faculty office, and a measuring and computing room. This is only a temporary solution to our space problem, and it is to be hoped that the University's building program will give us more space in the near future. A new tailpiece has been made for the 12-inch refractor in order to make it usable for photoelectric photometry and direct photography. Plans are being made to install an electric motor drive and electric slow motion.

McDonald Observatory. The cooperative arrangement which has been in effect since 1941 was continued. Spectra of faint A stars on Edmondson's radial velocity program were taken, and a few K stars were repeated in order to improve the luminosity classifications.

TEACHING

Enrollment in the elementary course continued at about 100. Most of the advanced courses listed in the catalogue were offered during this two-year period.

The following degrees were given at the 1950 Commencement: Robert L. La Fara and William H. Potter received the M.A., and James K. Gleim and Lonnie Mead received the A.B. Thomas L. Swihart received the A.B., with high distinction, at the 1951 Commencement.

A program leading to the Ph.D. was announced, starting at the beginning of the 1950 fall semester.

MISCELLANEOUS

The Indiana University Board of Trustees and the administrative officers of the University had dinner at the Link Observatory on September 16, 1949. This was the first time that the trustees had seen the observatory.

Astronomy clubs from several nearby colleges and high schools visited the Link Observatory at various times, and the Indiana Astronomical Society has held several meetings there. The Indiana University Chapter of Sigma Xi and the Butler University Sigma Xi Club have also held meetings at the Link Observatory.

Five public nights were conducted each year at the Link Observatory, with attendance ranging from 125 to 350. Lectures were given by: Potter, La Fara, Cox, Irwin, Mumford, Wrubel, and Dr. Harry E. Crull, Head of the Department of Mathematics and Astronomy at Butler University. "The Story of Palomar" was also shown.

The American Astronomical Society, with a registered attendance of 210, met in Bloomington on June 18-21, 1950, in commemoration of the 50th anniversary of the building of the Kirkwood Observatory.

The colloquium program brought the following outside speakers: (1949-50) Tombaugh, Hynek, Strand, Wrubel, Struve, Hiltner, and McLaughlin; (1950-51) Abetti, Kiepenheuer, Münch, Reber, Mrs. Gaposchkin, and van de Hulst. Other visitors included: Donn, Carpenter, Brouwer, Clemence, Herget, Mrs. Jaffe, J. G. Baker, Warwick, Mrs. Warwick, Kourganoff, Aller, Gamow, Sletteback, F. J. Weyl of ONR, Walter E. Thwaite, Jr. of the Research Corporation, and Professor Julian Huxley.

Frank K. Edmondson, *Director*

Leander McCormick Observatory. University of Virginia, Charlottesville, Va.

July 1, 1949 to June 30, 1951.

PERSONNEL

Dr. Mitchell has completed the revision of his book on "Eclipses of the Sun." The fifth edition