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(*Acting Director, J.Hers*)

STAFF

In January Mr P.N.J.Wisse and Mrs M.Wisse joined the staff as Research Officer and Assistant Research Officer, respectively. Dr J.Straka was employed as Senior Research Officer from June to September. Resignations were accepted from the following: Messrs E.L.Berry and G.H.Smith in January; C.D. de Villiers in May; J.L.Newburg and J.M.Jannetta, and Mrs E.J.Lake in September.

ASTRONOMICAL RESEARCH

Visual double stars

With the 26½-inch refractor 238 measures of double stars were obtained, the observers being Newburg (168 measures on 31 nights), van den Bos (39 measures) and Klerk (35 measures). The telescope was used on 11 nights to test the correlation between double-star seeing and seeing as determined by the Danjon diffraction ring method, using an 8-inch reflector.

Minor planets and comets

With the Franklin-Adams telescope at Hartbeespoort, Bruwer and Klerk obtained 196 plates on 27 nights; from which 239 minor planet positions were derived, as well as 7 positions of comet Bennett (1969i) and one of comet Suzuki-Sato-Seki (1970m).

Photometric double stars

The 20-inch reflector was used by Knipe on 58 nights for photometric measures of eclipsing binaries and visual double stars. Eclipsing binaries observed included CV Vel, W Cru, HD 90707, TU Mus, U Oph, ST Aqr, γ² Vel and HD 161783. The light curve of HD 161783 was completed and orbital elements obtained. When combined with the spectrographic results of Sahade and Dassy all parameters of the system were obtained in terms of kilometres and of the Sun's mass. Results for RS Sgr and QS Aql were prepared for publication.

Photoelectric measurements of the magnitudes and colours of double stars were continued. Nova Serpentis was observed on several nights in April.

Variable stars

The 20-inch reflector was used on 142 nights by P. and Mrs M.Wisse for the photoelectric observation of long period variable stars of different types (Irregular, SR, Mira, RV Tauri). In this programme the aim is to cover the whole range of light variation, and to observe possible irregularities in the light curves. The following stars were observed during the year: θ Aps, V450 Aql, S Car, RR Car, IW Car, T Cen, Y Cen, V369 Cen, V412 Cen, V418 Cen, o¹ Cen, RT Cnc, T Cet, U Del, EU Del, Z Eri, RR Eri, π¹ Gru, U Hya, AK Hya, T Ind, δ Lep, RX Lep, U Mon, X Mon, RY Mon, V523 Mon, V551 Oph, CK Ori, R Sct, τ⁴ Ser, SU Sgr, UX Sgr, X TrA, RW Vir and SW Vir.

Observations of the P-Cygni type stars HR Car and AG Car, the anomalous cepheid V553 Cen and the R Coronae Borealis star RY Sgr have also been obtained.

A data transfer unit with IBM typewriter was acquired for recording the output from the photometer.

Planetary photography

Observations as part of the International Planetary Patrol Program were continued by Roberts and Jannetta on 179 nights between January and September. With the 26½-inch refractor, 29,910 exposures were obtained of Jupiter, while a further 2115 exposures of Jupiter and 10815 exposures of Venus were obtained by means of the 20-inch reflector. The exposed films have been forwarded to the Planetary Research Center of the Lowell Observatory for processing, while copies of the 1969 series of photographs have been received back.

Occultations

Eighteen total occultations were observed visually by various members of the staff. Nine occultations were observed photoelectrically with the 20-inch reflector, using a solid state amplifier and chart recorder running at 125 mm/sec.

With the help of a team of local amateurs under the direction of Mr M.D.Overbeek, 26 observations were obtained of the grazing occultation of ZC 2988 at Heilbron on 1970 November 5.

NEW OBSERVATORY SITE

Observations on the farm Kookfontein in the Richmond district of the Cape Province were continued during January and February.

The percentage of clear nights was found to be substantially higher than had been initially supposed, and not very different from that observed at De Aar, 120 km to the north.

As it had been found during the preceding year that the measurement and reduction of the double-beam photographs was very time-consuming, making it difficult to obtain a rapid and accurate assessment of seeing conditions, more attention was given to the Danjon diffraction ring tests. Assistance was again received from members of the staff of the Royal Observatory in Cape Town, who made similar measures at the Sutherland site during January.

TIME SERVICE

In June a VHF link with the STADAN station at Hartebeeshoek was installed, which proved to be of value not only to the tracking station itself but also to the Observatory, since this made it possible to reset the time service immediately after the occurrence of an interruption. Exceptionally severe lightning storms made such interruptions regrettably frequent, but in every case it was found possible to reset the time signals to within a microsecond.

Time comparisons with travelling clocks from the U.S. Naval Observatory were made on April 14 and September 9-21, and with a clock from NASA on May 21.

PUBLICATIONS

Republic Observatory Circulars No. 129 (Third Catalogue of Orbits of Visual Binary Stars, by W.S.Finsen and C.E.Worley) and No. 130 were issued during the year. The following paper appeared elsewhere:

Wisse,P.N.J. & Wisse, M., 1970. Some observations of the anomalous cepheid V553 Centauri, ***Mon. Notes astr. Soc. Sth Afr.***, **29**, 151.