the central star HD 148937 (Harvard spectral class B0). The shape of the nebula is roughly that of a figure "8" with small knots in the nebulosity showing central symmetry. These details are confirmed on direct photographs obtained with the 48-inch Schmidt.

The apparent brightness ($6.89 m_{pg}$) of the central star is greater than that of any other planetary nucleus. Assuming the nucleus to be a main sequence B0 star, Cederblad derived a distance of 670 parsecs. If, as seems more likely, it is a subluminescent B or O star comparable to other planetary nuclei, its distance is reduced to about 150 parsecs.

The $370''$ angular diameter of the nebula is the fourth largest on record. At a distance of 670 parsecs this yields a linear diameter of 1.2 parsecs; while at 150 parsecs the derived linear diameter is 0.27 parsec.

This object is clearly a planetary nebula from a morphological viewpoint, but spectroscopic observations of the nebula and central star are required to determine whether or not it fits this description from an evolutionary point of view. Whatever the result, the object is of unusual interest and deserves further investigation.

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Hynek, J. A., Henize, Karl G. and Whipple, Fred L. Report on the precision optical tracking program for artificial earth-satellites.

The photographic tracking program for IGY artificial earth-satellites operated by the Smithsonian Astrophysical Observatory employs a network of 12 observing stations around the world which uses the 20-inch, $f/1$ Baker-Nunn Schmidt satellite tracking camera especially designed for satellite tracking purposes.

Since 5 July 1958, all 12 stations have been in operation and the optical performance of the Baker-Nunn cameras has fulfilled the original design specification which called for $20-25\mu$ diameter stellar images. Mechanical performance, which called for rapid cyclic operation at essentially satellite and stellar angular rates, and a photographic time presentation have likewise proved satisfactory.

Photography of all satellites aloft except the Vanguard 1958 β has been routine. 1958 α has, since 5 July 1958, been photographed at the rate of 2.05 transits per day, with multiple photographs obtained per transit. The $6''$ Vanguard

satellite has been successfully photographed at a distance of more than 900 miles.

The Army satellite, Explorer IV (1958 ϵ) has, after 27 July, been photographed at 0.81 transit per day. Rapid reduction of the Explorer photographs were made to provide minute-by-minute space positions for evaluation of the radiation counts made by the Geiger and scintillation counters carried by Explorer IV.

All satellite photographs are reduced roughly at the respective stations. Later, machine reduction is made at the tracking headquarters in Cambridge. Standard reduction techniques with both the Van Biesbroeck goniometer and the Mann two-screw measuring engine are used. These data will be published and will include: 1. α and δ and estimated p.e.; 2. position angle of satellite motion and estimated p.e.; 3. time (UT_2) and estimated p.e.

Using 117 measures of variable quality, the estimated probable errors are $5''.4$ in α and $4''.0$ in δ ; but using 13 images of best quality, the mean estimated probable errors of a single satellite position are $1''.1$ in α and $0''.5$ in δ .

The larger error in right ascension reflects the greater error in setting on satellite positions in the direction of satellite motion, which to date has been predominantly west to east.

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Koch, Robert H. The eclipsing binary, XY Leonis.

Photoelectric light curves were obtained in both yellow and blue light over a four month period in 1956. Additional observations place the variable on the (U, B, V) system and indicate it to be composed of similar late dwarfs.

The period of light variation is not constant and does not vary in a simple manner. To describe the outside-eclipse variations a term in $\cos 3\theta$ is necessary in both colors. Various methods of rectifying the observations are attempted, and it is shown that the final results do not depend greatly on the particular method chosen. The rectified eclipses are photometrically shallow but geometrically deep, and determinate solutions for the elements of the system have been derived. The discrepancies between the solutions are discussed, and a tentative model for the system is proposed.

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