

OH absorption lines have been found in 26 galactic sources and in two extragalactic sources (W7 and Cyg A); W1 (NGC 7822), W12 (NGC 2024), W14 (IC 443), W22 (NGC 6357), W28 (M20), W29 (M8), W30, W31, W33, W35 (NGC 6604), W37 (M16), W38 (M17), W41, W42, W43, W44, W47, W66, W67, W69, W72, W73, W80 (NGC 7000), Tau A, Ori A, and Cas A. Cas A has previously been discussed by a number of authors. The absorption in W43 was announced by Williams (Williams, D. R. W., URSI-IEEE Meeting, April 1965). The Cyg A local velocity line is a confirmation of Menon's (Menon, private communication, 1966) result. Four of the above sources contain OH emission in the main lines in addition to the absorption: Ori A at 1667 and 1665, W33 at 1667 and 1665, W42 at 1667, and W43 at 1667 and 1665. The Ori A emission at 1665 has been announced by Weaver *et al.* (Weaver, H. F., Williams, D. R. W., Dieter, N. H., and Lum W. T., *Nature* **208**, 29 1965). The W42, W33, and Ori (1667) sources differ from the previously discovered emission sources in that the emission is at the high-velocity side of the absorption.

For the sources W12, W22, W28, W41, W43, W44, W51, Ori A, and Cas A all four lines of the multiplet have been detected. Most of these sources show normal intensity ratios in the main lines in 1667 and 1665. Except for W12 and W22 all of the sources show emission in the satellite lines 1612 and/or 1720. The emission in 1720 (0 velocity feature) of Cas A reported by Rogers and Barrett (Rogers, A. E. E., and Barrett, A. H., IAU/URSI Symposium on Radio Astronomy and the Galactic System, Noorwijk, Netherlands, August 1966) has been confirmed. Even for W12 and W22 the intensity ratios for the four lines are incompatible with a unique excitation temperature for the lambda doublet. It is suggested that the anomalous absorption is related to the anomalous emission.

The W12 result suggests that the rest frequency of 1720 should be 1720527 ± 3 kc/sec. This frequency is 6 kc/sec less than Radford's (Radford, H. E., *Phys. Rev. Letters* **13**, 534, 1964) value and removes the discrepancy in the frequency sum rule.

Two H II regions have been found in the direction of W43 in the 158α H recombination line. The velocities are +97 and +44 km/sec. The 158α H recombination line from the +97 km/sec H II region has been detected.

Gravitational Redshifts of the White Dwarfs.

JESSE L. GREENSTEIN AND VIRGINIA TRIMBLE, *Mount Wilson and Palomar Observatories*.—Low-dispersion radial velocities of 53 white dwarfs have been obtained on Palomar spectrograms. The measurements are difficult but have now been done on a systematic basis. A few members of wide binary

systems and six white dwarfs in the Hyades provide direct measurement of the Einstein gravitational redshift with a mean value of +51 km/sec. The hydrogen-line white dwarfs as a group show a mean expansion velocity of +66 km/sec. The temperature scale can be obtained from colors and combined with luminosities to give radii. If one assumes that the white dwarfs are composed of helium, and have a negligible hydrogen envelope, an approximate agreement is obtained between the theoretical mass-radius relation, and the radius derived from photometry and luminosities. The probable best value of the median mass is $0.87 M_{\odot}$. Since some of the white dwarfs are members of the high-velocity population, it appears that the presently derived mass suggests that currently evolving old stars have masses near that of the sun.

Current Loop Model for x-Ray and Quasi-Stellar Sources.

HOWARD D. GREYBER, *Martin Company, Denver*.—A theoretical model for the generation of gravitationally bound current loops in astrophysical objects is described. The equilibrium and stability of such an entity is analyzed and a proof is given for the stability of a gravitationally bound current loop under purely radial displacements. In addition, a proof of the stability of the exterior boundary against nonradial "flute" type instabilities is given. The application of the model to the explanation of time-varying quasi-stellar radio sources, such as the source at the nucleus of NGC 1275 (Kellerman, K. I., and Pauliny-Toth, I.), and x-ray sources is pointed out and the relationship of this model to the authors' unified theory for spiral and radio is sketched.

Observational Cosmology in a Real Universe.

JAMES E. GUNN, *Jet Propulsion Laboratory and California Institute of Technology*.—Some of the gravitational effects of local inhomogeneities in a statistically homogeneous and isotropic universe upon observable properties of distant sources are considered. It is shown that sizeable fluctuations in apparent luminosity and angular diameter can be expected, as well as some systematic effects if a significant fraction of the total mass is in compact and/or opaque bodies.

Apparent Underabundance of CN in Algol-Type Eclipsing Binaries.

DOUGLAS S. HALL, *Indiana University*.—Following a suggestion by Sahade, I used narrow-band photometry to search for a possible anomalous abundance of heavy elements in the subgiant component of Algol-type binaries by observing systems which undergo total eclipses. Adopting the CN band observations of Griffin and Redman (*Monthly Notices Roy. Astron. Soc.* **120**,