LARGEST QSO REDSHIFT

Carswell and Strittmatter (C & S) have reported the discovery of a quasistellar object (QSO) with the redshift 3.4 (*cf. Nature*, **242**, 394, 1973). This value is not only a record as far as high redshifts are concerned, but it comfortably exceeds the previous record value of 2.877 held by the QSO associated with the radio source 4C 05.34.

The new record holder is a QSO identified with the radio source OH 471. The data on position and identification is based on accurate positional work at the Royal Radar Establishment at Malvern, and was communicated to C & S by Dr. Cyril Hazard. (It was Hazard's data on the accurate position of 3C 273 that led to the discovery of the first QSO.) C & S examined the optical object (a neutral, stellar object with estimated $m_B \sim 18$—18.5 mag) spectroscopically with the Cassegrain image tube spectrograph at the Steward Observatory 90 inch telescope. There are strong emission features at 4548 Å and 5351 Å, with a wavelength ratio 1 : 1.177. This agrees well with the rest wavelength ratio 1 : 1 . 176 of O VI 1033.8 and Lyman α. The corresponding identification of the lines leads to the redshift 3.4.

Apart from its observational interest, this high redshift presents fresh food for thought to theoreticians, especially to those who believed that redshifts beyond 2.2 would be hard to find for cosmological reasons. If many more objects with high redshifts ~ 3 or more are found, they will throw light on the present countroversies about the nature of QSO redshifts and about the origin of the universe.

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Note added in press by the Editor: The accurate radio and optical coordinates of OH471, as given by Crowther (*Nature*, **243**, 25, 1973), are

Radio : $\alpha\,(1950) = 06\text{ h }42\text{ min }53.3\text{ s} \pm 0.2\text{s}$
$\delta\,(1950) = 44^\circ\,54'\,33'' \pm 1''$

Optical : $\alpha\,(1950) = 06\text{ h }42\text{ min }53.1\text{ s} \pm 0.1\text{s}$
$\delta\,(1950) = 44^\circ\,54'\,31'' \pm 1''$

A second QSO with a redshift greater than 3 has been reported by Wampler, Robinson, Baldwin and Burbidge (*Nature*, **243**, 336, 1973). The radio coordinates of the OQ 172 with redshift of 3.53 are

$\alpha(1950) = 14\text{ h }42\text{ min }50.48\text{ s}$
$\delta\,(1950) = 10^\circ\,11'\,12.4''$.

The V magnitude of the continuum is about 17.9.

DEUTERIUM IN INTERSTELLAR SPACE

Similar to 21 cm line of hydrogen, Deuterium also has a hyperfine structure transition at a wavelength of 91.6 cm. The detection and the amount present of Deuterium in interstellar space is very important as it is directly related to the origin of elements and also to the origin of the universe itself. Recently this line seems to have been detected in absorption by Cesarsky, Moffet and Pasachoff (*Ap. J.* (*Letters*), **180**, L 1, 1973) from the galactic centre, in observations covering about 100 hours. The ratio of n_D/n_H ranges from 5×10^{-4} to 3×10^{-5}. In addition, lines from deuterated hydrocyanic acid (DCN) in the microwave region has also been detected by Jefferts, Penzian and Wilson (*Ap. J.* (*Letters*), **179**, L 57, 1973), and Wilson, Penzian, Jefferts and Solomon (*Ap. J.* (*Letters*) **179**, L 107, 1973) from the Orion nebula. By comparing with the observations of HCN, they obtain $n_D/n_H \simeq 6\times10^{-3}$, which is larger than the terrestrial value by about a factory of 40. The enrichment of the deuterated molecule has been attributed to chemical fractionation (Solomon and Woolf, *Ap. J.*, **180**, L 89, 1973).

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GAMMA RAY ASTRONOMY IN THE FOREFRONT AGAIN?

Way back in 1958, Astrophysicists had predicted a bright future for the then newly emerging field of Gamma Ray Astronomy. Amongst the various celestial objects, the Sun was nominated to be the most likely candidate to serve as a gamma ray source. Ever since this prediction was made, several experimenters have been involved in the futile search for this radiation.

The X-ray astronomers stole the limelight when the first X-ray source was discovered in 1962 and several new celestial sources began to appear in the sky. By now fairly detailed studies of X-ray sources are being carried out and serveral mechanisms for the production of X-rays are being proposed almost overshadowing the work on the more energetic photons viz. Gamma Rays.

Some recent observations, however, have given a fresh shot-in-the-arm to the gamma ray astronomers and it is hoped that they will clear up the attic and bring to light new information promised by this branch of astronomy.

The first break-through has been provided by the fairly recent measurements made by the University of