05.06.07 Interstellar HCO+. H. A. WOOTTEN and R. SNELL, The University of Texas at Austin. - We have observed the J=1-0 line of HCO+ and $^{12}CO$ and the 2mm line of $H_2CO$ in a number of millimeter molecular line sources. These observations have then been fit with a spherical large velocity gradient radiative transfer model of a molecular cloud. The temperature, density, and velocity gradient parameters for these models have been fixed through the use of the CO observations to estimate the kinetic temperature, the $H_2CO$ observations to estimate the density, and linewidths of HCO+ and $H_2CO$ to estimate the velocity gradient. The abundance of HCO+ relative to $H_2$ is then obtained by requiring the model to reproduce the observed HCO+ intensities. $n(HCO+)/n(H_2)$ appears to drop by more than an order of magnitude between molecular clouds associated with giant HII regions and dark clouds. This behavior may reflect a more severe attenuation of ionizing radiation in giant molecular clouds as compared to dark clouds. This work has been supported in part by the National Science Foundation under grant AST 75 - 22903.

05.07.07 Detection of a Complex New Interstellar Molecule with a Molecular Weight of 99. H.W. KROTO, C. KIRBY, AND D.R.M. WALTON, University of Sussex, Brighton, England, and L.W. AVERY, N.W. BROTEN, J.M. MACLEOD, AND T. OKA, Herzberg Institute of Astrophysics, National Research Council of Canada, Ottawa, Canada. - The $J = 9 \rightarrow 8$ rotational transition of the complex linear molecule cyanohexatriyne, $H(C\equiv C)_3CN$, has been detected at two positions in Heiles' Cloud 2, a dark dust cloud in Taurus. This molecule, which contains 8 heavy atoms, is not found naturally on the earth. It was first synthesized in the laboratory of the School of Molecular Sciences of the University of Sussex in March 1977. It was subsequently detected in emission at 10.2 GHz in Cloud 2 with the Algonquin Radio Observatory's 46 meter radio telescope. The antenna temperature of the line was $T_A \simeq 0.08$ K at a radial velocity $V_{LSR} = +6$ km/s. The two positions at which the line was detected are separated by two beamwidths, so the cloud of $H(C\equiv C)_3CN$ is extended. Based on the present observations and our observations of $H(C\equiv C)_2CN$ in the same cloud, the abundance of $H(C\equiv C)_3CN$ is only down by a factor of $\sim$1.5 to 3.0 from that of $H(C\equiv C)_2CN$. Thus it appears that the formation of these linear molecules containing long carbon chains proceeds in a relatively efficient manner in this cloud. Since the lifetime of the cloud against free-fall gravitational collapse is only $\sim 7 \times 10^5$ years, the existence of these molecules suggests that the ion-molecule formation mechanism, proposed to account for lighter molecules, will have to be supplemented by additional formation theories.

05.08.07 OH Masers in the Orion Nebula. S. S. HANSEN NRAO and Univ. of Mass., J. M. MORAN and M. J. REID CFA, K. J. JOHNSTON and J. H. SPENCER NRL, R. C. WALKER MIT.- We observed the ground state OH masers in the Orion Nebula at 1665 MHz using very long baseline interferometers having fringe spacings between 0".33 and 0".009. The position of the 8.6, 7.1 and 3.9 km/sec features was found to be R.A. = $5^h32^m46^s.72 \pm 0^s.025$, DEC = $-5°24'32" \pm 2".4$ (1950). This OH emission is approximately 14" south of the Becklin-Neugebauer object and is in the vicinity of the southern $H_2O$ masers and the $CH_3OH$ masers. The three features lie within a projected distance of $7 \times 10^{15}$ centimeters (1") of one another. Their sizes are about $5 \times 10^{14}$ centimeters (0".06). All the other features are larger than $2 \times 10^{15}$ centimeters. The 8.6 km/sec feature is 100% left circularly polarized and the 7.1 km/sec feature is 100% right circularly polarized.

05.09.07 Water Maser Variability in W3(OH). N.L. COHEN, Brandeis - We report recent observations of the water maser features in W3(OH). Several new features with intensity variations were detected, extending the velocity range of this source from -20 to -70 km-s$^{-1}$. Although all of the features varied significantly, no obvious correlation was found between them. Theories on maser variability in HII regions are reviewed and it is suggested that recurrent shocks may be responsible. The tendency for some features to disappear and later reappear can be ascribed to density fluctuations caused by the shocks. Features may share the same pump source without exhibiting a variability correlation.

## MONDAY, 13 JUNE

### Session 6: Room 700, General Classroom Building 0945-1200

06.01.06 GD 428, An Unusual Dwarf Cepheid. R.A.BERG, U.Roch., - During a recent series of observations of white dwarfs, we discovered a 56.3-minute periodicity in GD 428. The combined set of data available to us, which includes apparent magnitude, proper motion, five-color photometry, spectra, and the light and color curves, suggests this star is a dwarf cepheid. If so, it is the shortest period star of this class, has the lowest intrinsic luminosity of all known dwarf cepheids and occupies a unique position on the HR diagram.

06.02.06 THE REMARKABLE VARIABLE VV PUPPIS. N. Woolf, E. K. Hege*, J.R.P. Angel, J. Liebert, H. Stockman, University of Arizona; (*Hege, also Hollins College)