energy available for beta decay increases, halting the tendency
toward lighter nuclei. The subsequent increase in proton number
enables the nuclei to reabsorb neutrons and thus the matter seems
to follow an r-process-like path toward the region of superheavy
elements.

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WEDNESDAY, 10 DECEMBER

Session 26: Lecture Hall, 1000-1200

26.01.07 Molecular Equations of State for Dense Dust
Clouds,* B. AMES, Los Alamos Sci. Lab. - Self-consistent
gas phase abundances are calculated for dense dust clouds
taking into account condensation of species onto dust
grains during the early stages of star formation.
*Work performed under the auspices of the U.S.EDA.

26.02.07 Detection of Interstellar OH at 3078Å.
R. M. CRITCHER and W. D. WATSON, U. LII. - The inter-
stellar OH line near 3078Å has been observed with the Mt.
Wilson 100-inch telescope coudé scanner. This is the
first interstellar molecular line detected using ground-
based optical techniques since before 1940. The measured
equivalent widths are 3.5 ± 1.1 mÅ for o Per and 1.1 ±
0.7 mÅ for ζ Oph; quoted errors are standard or mean
errors. The frequency distributions of the more than 500
measurements for each star are very good approximations
to the normal error curve, and no significant systematic
errors are expected. Hence, the probabilities that the
measured lines are not real are 1 in 1400 for o Per and
1 in 17 for ζ Oph. The OH column densities are log N(OH)
= 14.0 toward o Per and 13.5 toward ζ Oph. Based on the
known oscillator strength of OH λ3078 and Snow's (1975)
preprint) probable detection of OH λ1222.07 toward o Per
the oscillator strength of the latter transition is
0.005, an order of magnitude less than a previous es-
timate. Detailed analysis indicates that the abundance
of OH in these clouds is consistent with the proposed
ion-molecule formation processes initiated by the rapid
H+ + 0 → H + H charge transfer.

26.03.07 Interstellar Material in the Direction of
ζ Oph. P.C. FRISCH, U. CALIF., Berkeley - The optical
interstellar spectrum in the direction of ζ Oph has been
studied. This spectrum features a high ratio of neutral
constituents to color excess. Measurements are presented
of the equivalent widths and velocities of CaI, FeI, CaII,
CH and OH lines. Most of the interstellar material
is concentrated in two clouds separated in velocity by
1.3 km/sec. The more negative velocity cloud contains
all of the FeI and CH and some OH and CaII. It may be
dominantly H2. The other cloud contains some CHII and
some CaII and is probably mostly HI. A model of the two
clouds based on the ionization equilibrium of calcium,
sodium and iron is developed and used to evaluate
possible CH and OH formation mechanisms.

26.04.07 Detection of Interstellar Deuteron Lyman Alpha.
W. McCULLOUGH, R. C. HENRY, H. W. MOOS, Johns Hopkins Univ., and
J. L. LINSKY, JILA, and Univ. of Colorado
and NBS. - The high resolution (λ0.05 Å)
spectrometer aboard the Copernicus satellite
has been used to obtain two observations of
chromospheric hydrogen Lyα emission from the
K2 V star η Eri, and one observation of
chromospheric hydrogen Lyα emission from the
K5 V star η Ind. All three observations show
evidence for a weak interstellar absorption
line which may be identified with Lyman
absorption by deuterium. Boggs and York
(Ap. J. lett., 186, L95, 1973) have observed
interstellar deuterium Lyβ to Lyα, and have
pointed out the potential importance for
the cosmology of such observations. Use of their
value for the interstellar deuterium abun-
dance, with the present observations, permits
a better separation of the effects of inter-
stellar absorption from the intrinsic profile
of chromospheric hydrogen Lyα in these stars.

26.05.07 The Rocket Ultraviolet Spectrum of NCG 1976,
the Orion Nebula. R. C. BOHLIN AND Y. P. STECHER, NASA/ GSFC. - The same instrumentation used to obtain the UV
spectrum of the planetary nebulae NGC 7027 and NGC 7662
was flown on an Aerobee 300 rocket from WSMR to photog-
graph the spectrum of the Orion Nebula from 1200 to
2900Å. A slit, 22" by 17", was placed at the entrance
aperture, producing a spectrum with 22Å resolution.
The spectrum was detected by a micro-channel-plate
image-converter and recorded on 14a-0 film. Considerable
effort has been expended to obtain a reliable absolute
calibration of the flight instrument. A laboratory
calibration was completed before flight using standards
directly traceable to NBS. In addition, the stars,
including 8 Orl, observed in flight will provide a

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