As *NO* has the lowest ionization potential of all the neutrals, NO^+ will accumulate, and act as a clustering nucleus at low altitudes and temperatures. C^+ will be dominant at high altitude and will charge-balance the electron concentration in the ionosphere.

16.09-P

Lick Observatory Observations of the Occultation of Tr148 by Triton

E. W. Dunham (NASA Ames), J. S. McDonald (SETI Inst.), D. K. Gilmore, J. Holbrook, D. M. Rank, R. P. S. Stone (UCO Lick Obs.), L. A. Young (NRC/NASA Ames), J. L. Elliot, C. B. Olkin (MIT and Lowell Obs)

We observed the occultation of the star Tr148 by Triton on 14 August, 1995 (UT) using two telescopes at Lick Observatory. Observations were carried out with one second time resolution using an unfiltered CCD camera on the 0.9 meter Crossley reflector and at four second time resolution in the K band with the Lick NICMOS2 camera on the 1-meter Nickel telescope. It is evident in the occultation lightcurve that Tr148 is a close double. Tr148A has a companion Tr148B with an open-CCD magnitude difference of ~1.5. Preliminary times for the observed Lick chords are 7:36:42-7:37:57 for Tr148A and 7:31:08-7:32:44 for Tr148B. The chord lengths and time difference indicates a star separation of about 0.4 arcsec. Results concerning Triton's atmospheric structure will be presented at the meeting. This work was supported, in part, by NASA Grant NAGW-1494 at MIT and by the NASA Planetary Astronomy Program at NASA Ames.

16.10-P

Occultation Candidates for Triton, Chiron, and Pluto-Charon

S. W. McDonald, M. J. Person, S. J. Bus (MIT), J. L. Elliot (MIT and Lowell Observatory)

We are continuing our program of searching for potential stellar occultations by Triton, Chiron, and Pluto-Charon that can be observed from Earth. Stellar occultations by Triton (Olkin *et al.*, Elliot *et al.* this conference) and Pluto (Elliot & Young 1992, *AJ* **103**, 991) have already provided information about the atmospheric structures of these cold bodies. Further occultation observations are necessary to study long-term changes in their atmospheres, particularly since Triton's atmosphere has been predicted to undergo large changes (Spencer & Moore 1992, *Icarus* **99**, 261; Hansen & Paige 1992, *Icarus* **99**, 273). The haze or sharp thermal-gradient issue for the structure of Pluto's lower atmosphere could be resolved with simultaneous visible and IR occultation observations. Two occultations by Chiron have revealed jets, possibly driven by CO (Bus *et al.* 1995, *Icarus*, submitted; Elliot *et al.* 1995, *Nature* **373**, 46).

Our searches for stars that might be occulted in the future provide lists of candidates for planning occultation observations. Previous searches have allowed us to observe several occultations: Tr60 by Triton and Ch02, Ch08 by Chiron. Preparation for a specific event requires refinement of the star position and the occulting body's ephemeris for accurate prediction of the visibility zone for the event. Our current work extends previous deep searches for the bodies in our program. We have new candidate lists for Triton, Pluto-Charon, and Chiron for the second half of this decade. The Triton search used CCD strip-scan images covering the predicted Triton ephemeris from 1995 through 1999 (McDonald & Elliot 1995, *AJ* **109**, 1352). The Pluto-Charon search also used CCD strip-scan frames, and covers the period from 1996 through 1999. The Chiron search used photographic material and extends from 1996 through 2001. All three searches reach a visual magnitude of 17.5, which is necessary to cover candidates that might be bright in the infrared, or whose occultation paths might include a large telescope. Future work will extend the search for potential occultations into the next century. This work is supported, in part, by NASA Grant NAGW-1494.

16.11-P

Near-Infrared Observations of Pluto and Charon Using Adaptive Optics Imaging

D. J. O'Connor, J. Anuskiewicz (University of Hawaii, Institute for Astronomy (UH IfA)), A. Brahic (Université de Paris VII, Observatoire de Meudon), C. Dumas, J. E. Graves, M. Northcott, T. Owen, C. Roddier, F. Roddier (UH IfA)

We present preliminary imaging data taken on the Canada-France-Hawaii 3.6 m telescope on Mauna Kea of the Pluto-Charon system in *J*, *H*, and *K* bands. The University of Hawaii's curvature-based adaptive optics system was installed at f/35 Cassegrain focus and performed real-time atmospheric wavefront correction. On two separate observations in June and August 1995, we corrected mean seeing conditions of 1.0 and 0.5 arcseconds to achieve compensated image resolutions of 0.3 and 0.1 arcseconds, respectively. The Pluto-Charon system elongation (0.7 and 0.8 arcsec) was easily resolved in both observations. Individual color ratios are compared with previous observations and strategies for future observations are discussed.

16.12-P

WIRO Observation of Stellar Occultation by Triton on 14 August 1995

H.J. Reitsema (Ball Aero.), W.B. Hubbard, R. Hill, R. Marcialis (U. of Arizona), R. Howell (U. Wyoming)

We successfully observed the occultation of the star Tr148 by Triton (event predicted by McDonald and Elliot, Astron. J. 109, 1352) at Wyoming Infrared Observatory. The University of Arizona portable occultation CCD system (PCCD) was installed at the optical port of the 2.3m telescope, and was operated in direct-imaging mode without filter, recording 90 by 50 pixel arrays (3.25 arcsec/pixel) every 400 msec. These frames included Tr148, Triton, and Neptune. Because of the brightness of Tr148 (about 1 mag brighter than Triton), we expected a signal/noise of about 100 for this experiment. However, clouds were present throughout the data recording interval. Although the clouds can be successfully removed by using Neptune as a monitor, their effect is to reduce the signal/noise to about 10 on average. The observed occultation lasts approximately 50 seconds between half-flux points (immersion was at approximately 7:36:13 UTC), corresponding to a chord length of about 1235 km. The stellar flux shows the gradual decline and recovery characteristic of a loosely-bound atmosphere.

We will present a comparison of our data with a model based upon extrapolation of the Voyager 2 radio occultation profile (Tyler *et al.*, Science 246, 1466) to higher altitudes.

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16.13-P

On the Vertical Thermal Structure of Pluto's Atmosphere

D. F. Strobel, X. Zhu (Johns Hopkins Univ.), M. E. Summers, M. H. Stevens (NRL)

A radiative-thermal conduction model for the vertical thermal structure of Pluto's atmosphere is developed with a non-LTE treatment of solar heating in the CH_4 3.3 μm and 2.3 μm bands, non-LTE radiative exchange and cooling in the CH_4 7.6 μm band, and LTE cooling by CO rotational line emission. The model includes the effects of opacity and vibrational energy transfer in the CH_4 molecule. Partial thermalization of absorbed solar radiation in the CH_4 3.3 μm and 2.3 μm bands by rapid vibrational energy transfer from the stretch modes to the bending modes generates high altitude heating to produce a warm, $\geq$ 100 K atmosphere at microbar pressures. Heating in the 2.3 μm bands exceeds heating in 3.3 μm bands by approximately a factor of 6 and occurs predominantly at microbar pressures to generate steep temperature gradients ~ 10-20 K km^{-1} for p > 2 μbar when the surface pressure is ~ 3 μbar with constant CH_4 mixing ratio = 3%. This calculated structure may account for the "knee" in the stellar occultation lightcurve. The vertical temperature structure in the first 100 km above the surface is similar for atmospheres with Ar, CO, and N_2 as the major constituent. Based on the calculated ratio of temperature to mean molecular