zation (negative) varied as a function of porosity and albedo. It was found that the best fit to Crisium (Gehrels *et al.*) could be achieved with Haleakala volcanic ash with particle sizes between 37 and 88 μ , and furnace slag less than 37 μ ; Clavius could be fitted with the ash of sizes less than 37 μ , and the furnace slag less than 1 μ .

The polarimetric properties of the furnace slag, volcanic ash, and additional laboratory samples were investigated for wavelength dependence. It was found that the best color-polarimetric and best visual photometric match to Crisium were obtained with coarse chunks of the volcanic ash topped with less than 1 μ particles of itself.

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Observations of an Increase in the Flux from Tau A during Occultation by the Solar Corona. W. C. ERICKSON, *University of Maryland*.—During the June 1965 occultation by the solar corona, the radio source Tau A was observed at wavelengths of 74 and 128 cm with the NRAO 300-ft antenna. Little change in the flux at 74 cm was observed, but at 128 cm the flux increased by 30% during the occultation. Various explanations of these flux increase are considered, but none are found to be very satisfactory.

Early and Main Sequence Evolution of Low-Mass Stars. D. EZER AND A. G. W. CAMERON, *Goddard Institute for Space Studies*.—Evolutionary sequences of models have been constructed for stars of composition $X = 0.739$ and $Z = 0.021$, with masses 0.1, 0.2, 0.3 and $0.4M_{\odot}$. Our stellar structure program has been modified to include the effects of pressure ionization in the Saha equation (Rouse, *Astrophys. J.* 139, 339, 1964) and the electron screening factor in the thermonuclear reaction rates. The evolutionary study starts from the threshold of energy stability and the energy sources are assumed to be due to gravitational contraction and to the $H(p, \beta^+ \nu)^2D$, $^2D(p, \gamma)^3He$ and $^3He(^3He, 2p)^4He$ reactions. The general behavior of the evolutionary track in the H-R diagram is similar to the ones obtained for medium-mass stars which have been previously described. (Ezer and Cameron, *Astron. J.* 70, 139, 1965). The star of $0.4M_{\odot}$ reaches the main sequence in 4×10^8 yr with a radiative core covering about half of the mass. We confirm the previous conclusions of Hayashi and Nakano (*Progr. Theoret. Phys.* 30, 460, 1963) that the $0.3M_{\odot}$ star develops a radiative core before reaching the main sequence in 8.5×10^8 yr, but the $0.2M_{\odot}$ star reaches the main

sequence as a wholly convective star in 1.7×10^9 yr. But at the onset of thermonuclear reactions, the energy generation is strong enough to cause the central radiative region of the $0.3M_{\odot}$ star to become convective again. Therefore, the stars in the mass range 0.2 – $0.3M_{\odot}$ are the only stars which evolve with complete mixing of material. During the evolution of the $0.1M_{\odot}$ star the maximum central temperature attained is 4×10^8 °K, which is not sufficient to stabilize the star on the hydrogen-burning main sequence. Further contraction increases electron degeneracy; therefore, the central temperature decreases as contraction continues, and the star contracts towards the white dwarf configuration.

Line Identifications in the Infrared Spectra of Carbon Stars. THEODORE D. FAY, *Indiana University*, LAURENCE W. FREDRICK, *Leander McCormick Observatory*, AND HOLLIS R. JOHNSON, *Indiana University*.—Spectrograms of three carbon stars (W Ori, 19 Psc, and V460 Cyg) and one M star (μ Cep) with a reciprocal dispersion of 46 Å/mm in the wavelength range 9500–12 000 Å have been obtained with a mica-window image tube. These plates have been carefully measured, and line identifications have been made wherever possible. A new computer program (SEARCH) to aid in the identification of spectral features has been written and tested. For a given stellar wavelength, the program finds all coincidences within a selected wavelength interval from any or all of three wavelength tables (atomic, molecular, and terrestrial lines) stored in the machine. The atomic wavelength table includes all lines in this spectral region from the revised multiplet table, in addition to a few lines from other sources. Molecular wavelengths tabulated include the bandheads and all strong features in this spectral region due to CN, C_2 , HCN, and C_2H_2 molecules. Terrestrial lines were taken from the study of the sun in this same spectral region by Babcock and Moore. Coincidences found by the machine have been carefully analyzed according to such factors as multiplet number and ionization or excitation energy in order to eliminate extraneous identifications. Several results are discussed. Most of the lines suggested as atomic lines by Wyller (*Mem. Soc. R. Sc. Liege IX*, Fifth Series, 474, 1963) can be identified with lines of the CN molecule, which are very numerous in this region. Bands from the C_2 molecule due to all combinations of the isotopes ^{12}C and ^{13}C are present. Bands near 10 160 and 10 370 Å are tentatively identified with the 02100Σ–00000Σ and 00300Σ–00000Σ transitions of C_2H_2 . Broad features in the region of 10 390 Å in W Ori and V460 Cyg coincide with the 003Σ–000Σ band of HCN.