from infrared photometry. The discrepancy may be due to errors in observational data or it may be due to molecular opacity sources such as H_2^- not included in the calculation. The evolutionary tracks for completely convective contraction are nearly vertical in the theoretical H–R diagram. The times required to reach the main sequence are 1.5×10^8 and 3.5×10^8 yr, for masses 0.4 and 0.1, respectively.

Departures from LTE in the Atmosphere of an A0 Star. MYRON LECAR, *Yale University Observatory and Institute for Space Studies.*—Two model atmospheres have been constructed for an A0 star in radiative equilibrium, which maintain constancy of the flux to a part in 10^4 for $\tau<1$ and to a few parts in 10^3 for larger τ. The composition was pure hydrogen; the effective temperature was 10^4°K and the gravitational accelerations were 10^3 and 10^4. These models were based on the assumption of LTE.

The resultant radiation fields and densities were then used to calculate the steady state atomic populations. The steady state populations differed from the LTE populations by as much as a factor of 2 at the optical depths where the lines were still transparent, but were essentially in LTE (to a fraction of a percent) at the depth where the continuous flux was formed. Thus the emergent continuous flux showed no departures from LTE. The emergent flux in the center of the resonance lines, however, was depressed by 30–40% as a result of departures from LTE. This effect was progressively less pronounced for the weaker lines.

Neutral Hydrogen in the Region of IC443. J. L. LOCKE, J. A. GALT, AND C. H. COSTAIN, *Dominion Radio Astrophysical Observatory.*—A study has been made of the neutral hydrogen in the region $\alpha=05^h55^m$ to 06^h35^m, $\delta=+20°$ to $+26°$ at radial velocities $V=-3.0$, -7.2, and -11.4 km/sec. The observations show the presence of a cloud centered on the IC443 nebulosity. This cloud has a mean velocity of -2 km/sec, a velocity dispersion of 5 km/sec, and a density of the order of 10 atom/cm^3. Such a cloud in the vicinity of IC443 has been postulated by Minkowski (Minkowski, R., Paris Symposium on Radio Astronomy 1959, p. 315) to explain the apparent retardation of the expanding supernova shell.

Flux of Cas A and Cyg A at 320 Mc/sec. D. A. MACRAE AND E. R. SEAQUIST, *University of Toronto.*—The radio flux at 320 Mc/sec from each of the two strongest sources has been measured at the David Dunlap Observatory of the University of Toronto. Two identical pyramidal horn antennas were used, the gain of each being known from the geometry. A flux measurement consisted of determining the amplitude of an interferometer trace. The radiometer was calibrated with thermal noise sources. The principal uncertainty remaining in the measures lies in our knowledge of the effective apertures of the two horns, and amounts to about 5%. The mean value of the flux from Cas A is 7.83×10^{-23} W m^{-2} cps^{-1}, and the ratio of the flux of Cyg A to that of Cas A is 0.750.

Characteristics of Identified Extragalactic Radio Sources. THOMAS A. MATTHEWS, *California Insititute of Technology.*—A considerable amount of information is available on the distance of the galaxies identified with radio sources, and thus about the absolute radio characteristics of some 57 identified sources. The flux L radiated by the source and the projected radio size D have been calculated for these sources. The flux has been integrated over a bandwidth of approximately 10^7 to 5×10^{10} cps, where the limits used take into account any curvature in the radio spectrum. A plot of $\log L$ against D illustrates that radio sources vary in L over a factor of 10^7, while D varies by $\sim10^3$. Selection effects have prevented us from seeing or studying sources which have a large angular diameter, but which have low apparent flux. Such sources probably exist since all sources of large diameter will eventually run out of energy and enter this unobserved region. At least 75%, and perhaps 90%, of extragalactic radio sources are radio doubles. Those that have a small size are found nearest the nucleus of a galaxy; those that are largest are found well separated from the parent galaxy. This suggests an evolution where the source is born in the nucleus of a galaxy and the energy is supplied from that region. The components move away from the galaxy and also expand in size. However, the translation occurs at a higher velocity than the expansion, which indicates a channeling of the energy into specific directions. We do not know how the radiated flux changes as a function of time, but almost invariably the radio centroid is very close to the apparent galaxy even when the brightness distribution is very asymmetrical. All these observed characteristics must be explained by whatever mechanism is proposed for the production and evolution of extragalactic radio sources.

A Survey of the Cygnus X Region. G. C. MCVITTIE, *University of Illinois Observatory.*—K. S. Yang and G. W. Swenson, Jr., have used the radio telescope at the Vermilion River Observatory