23.03 Very Dusty Galaxies. M. Jura, UCLA. — I consider the possibility that there exists a significant population of dust-shrouded galaxies which do not emit much optical light but instead are primarily infrared sources. If very dusty galaxies have a luminosity function similar to that of normal galaxies, current observations seem to show that there are not more dusty galaxies than normal objects. However, until more extensive infrared observations are obtained, it seems at least possible, though perhaps unlikely, that there are in fact a significant number of very dusty galaxies. This work has been partly supported by NASA and the Alfred P. Sloan Foundation.

23.04 Observations of Ammonia in External Galaxies. P. T. P. Ho, U. C. Berkeley, R. N. Martin and K. Rup, MPFR. Using the MPFR 100m radio telescope we have made further observations of the ammonia emission from IC342. We observe the (J, K)=(1, 1) and (2, 2) transitions to be of similar intensity with ΔA=0.025K and obtain upper limits to the (3,3) transition. We deduce that the gas responsible for the emission has a kinetic temperature of 30-60K, and a sizescale of at least 30pc. Densities and masses can be derived as a function of sizescale, and appear to be consistent with line formation in a region of active star formation. In a search for ammonia in other galaxies, we obtain upper limits in 10 regions. PTPR acknowledges support from the Miller Institute, and NSF Grant AST 78-21037.

23.05 Giant Stellar Bars in Early-Type Disk Galaxies. J. S. Gallagher, U. of Ill. Although bars are usually considered to be minor albeit important perturbations on the structure of disk galaxies, there are interesting and potentially significant counter examples. Photometry of NGC-3585 ("theta") galaxies based on observations obtained at CTIO reveals that the axial symmetry of these systems is broken by bars on virtually all scales. Typically theta galaxies divide into 3 zones: a nuclear oval, the dominant main bar, and an elliptical outer ring, each rotated with respect to its neighbor by ~90 degrees. Thus many of the stars lie in bars, a conclusion that is supported by 1/2 law fits to the main bar minor axis which show the spherical bulge contributes at most 1/2 of the optical light. We therefore suggest the theta galaxies are disk-dominated, despite their optical appearance which seems to suggest a large stellar bulge, and hypothesize that early-type (SO) galaxies with large disks have in general been overlooked because they formed bars as a result of the well known instability of stellar disks against bar formation. This research has been supported in part by the National Science Foundation through grant AST 79-09977.

23.06 NGC 1097: The Structure of the Central 3 kpc at 10µ. C. M. Telesco, Inst. for Astronomy, Univ. of Hawaii, and I. Gatley, UKIRT. -- We have used the Infrared Telescope Facility at Mauna Kea to determine the distribution of 10µ emission in the central 3º of the galaxy NGC 1097. A strong correlation is seen between the optical and infrared surface brightnesses; 10µ flux densities of 50-100 mJy (beam diameter = 6') are detected from the nucleus and from a prominent ring-like spiral feature ~2 kpc in diameter. The extended emission appears to originate in dust heated by young stars. For the central 3º of NGC 1097, we infer a bolometric luminosity of ~10^11 L☉, most of which originates outside the central 1 kpc-diameter region. The spatial extent and luminosities are comparable to those for the Seyfert galaxy NGC 1068. These observations strongly support suggestions that the infrared emission detected from many extragalactic sources is associated with bursts of star formation. This research was supported by NASA contract NASW 3159 and by the Royal Observatory, Edinburgh.

23.07 Intense 10 Micron Emission from the Inner Disk of NGC 1068, C. M. Telesco, E. E. Becklin, and C. C. Wyman-Williams, Inst. for Astronomy, Univ. of Hawaii. -- We have followed up our discovery of extended 20µm emission from NGC 1068 (Telesco, Becklin, and Wyman-Williams, Ap. J. Letters, in press) by mapping the central 30º of this galaxy at 10µ with the IRTF on Mauna Kea. We detected emission from essentially all of the 20º x 30º visually bright inner disk; the surface brightness of this region as averaged over a 6º diaphragm is about 1% of that of the nucleus. The bolometric luminosity of this 2 kpc diameter source is of order 10^11 L☉ exclusive of the emission from the 1º diameter nucleus itself. Some idea of the vast amount of energetic activity in the disk can be gained by comparing it to M82; the extended disk in NGC 1068 has about 20% of the surface brightness of M82, but has a 10µ luminosity nearly an order of magnitude larger. We discuss whether or not this emission can be explained in terms of bursts of star formation. This work was supported by NASA contract NASW 3159.

23.08 On the Differences Between Globular Clusters and Spheroidal Populations in Three Elliptical Galaxies. S. E. Strom, KPNO, J. C. Forfe, Obs. Astrar., Univ. Nac. la Plata, Argon., and K. M. Strom, KPNO. -- The mean colors of globular clusters surrounding the three Virgo cluster E galaxies have been compared with the colors of the smooth spheroidal component. Over a comparable range of galactocentric distances, the clusters are bluer by an average of 0.31m in (U - R), 0.30 in (U - B), and 0.11 in (B - R). If interpreted as a difference in metal abundance, these color differences imply that the clusters are more metal-poor than the halo stars by ~0.6 dex. If so, then the chemical enrichment history of the cluster and spheroidal populations must be significantly different. Furthermore, the radial falloff in the globular cluster surface density is less steep than that deduced from surface photometry of the spheroid. Hence the dynamical history of the cluster system may also differ from that of the spheroidal component. We speculate that globular clusters represent a population component intermediate, in an evolutionary sense, between the spheroidal component and the unseen "Population III" material.