the photographic region, and for BF Cygni in the infrared.

Those spectra have been extensively studied and one can summarize the results as follows:

(1) High-dispersion spectra of Z Andromedae (10 Å/mm). More than 850 emission lines were measured and tentatively identified. Numerous new multiplets and individual lines, principally of Fe II and Cr II, are observed. The profile of hydrogen emission lines shows that the star was surrounded by a slowly expanding atmosphere. The spectra of ionized oxygen and nitrogen give some evidence of a fluorescent excitation process. Very few "forbidden" lines appear.

(2) Near-infrared spectra of BF Cygni and other symbiotic stars. A systematic study of their spectra in the wavelength range 6000–9000 Å was carried out for the first time. It confirmed the general similarity between the symbiotic stars. New emission lines were observed; among them some stay as yet unidentified.

The best series of spectrograms was obtained for BF Cygni. Eight spectra taken in 1958 and 1959 enable us to follow the variation of the star, which is conspicuous in the infrared. The intensity ratios of several emission lines vary quite rapidly. The behavior of the two emissions of O I at 7772 and 8446 Å, is discussed, taking into account the possible excitation by Ly-β, and the de-excitation of the metastable level of the $^5S^0 - ^5P$ transition.

Galactic Spiral Arms as Hydrodynamical Instability. ALAN J. FALLER (introduced by Gart Westerhout), *University of Maryland*.—The hypothesis is advanced that galactic spiral arms are the result of hydrodynamical instability similar to that which occurs in the boundary-layer flow over a rotating disk. The assumption is made that the gaseous disk of the rotating galaxy is imbedded in a relatively stationary extragalactic (or halo) gas of much lower density. Under such circumstances the shearing stresses between the disk and the external gas would generate boundary-layer flow above and below the disk. The spiral band instability of this flow would deform the disk into similar spiral bands or arms.

Comparisons of galactic data with experimental results show that the Reynolds numbers, the band spacings, and other features are in remarkably good quantitative agreement.

Condensations in Stratified Atmospheres. GEORGE B. FIELD, *Princeton University Observatory*.—Condensation phenomena arising from thermal instability in the interstellar medium in the

absence of gravitational forces do not grow for wavelengths smaller than a critical one, owing to the damping introduced by thermal conduction (Parker, E. N., *Astrophys. J.* **117**, 431, 1953). If the zero-order state is an isothermal atmosphere in hydrostatic equilibrium in the presence of a gravitational field, however, it is found that the fundamental condensation mode, involving cooling of the dense lower part of the atmosphere, is unstable toward the formation of condensations even when the thermal conductivity is very high. This effect is due to the fact that the gravitational field can compensate the pressure gradients present in an isothermal perturbation in which the whole atmosphere "settles," creating a high-density layer at the bottom. This conclusion may be of interest in connection with the formation of cool clouds from a hot galactic halo. [Field, G. B. *The Distribution and Motion of Interstellar Matter in Galaxies*, edited by L. Woltjer (W. A. Benjamin, Inc., New York, 1962), p. 183.]

Night Sky X-Ray Emission. PHILIP C. FISHER, *Lockheed Missiles and Space Company*.—Measurements of x-ray sources in the night sky have been obtained by Fisher and Meyerott (*Astrophys. J.* to be published) from two rocket flights of 0.2 to 20 keV photon detectors. No single type of stellar object seems associated with the half-dozen or so poorly defined, high count rate regions observed. Although accurate identifications cannot be made, an approximate description of an emission region is that it might be identified with either a single or a small number of stellar objects of the order of 50 pc distant. If objects with similar x-ray luminosities exist at greater distances, then few color photometry investigations from satellites may be capable of yielding morphological information about systems within the local group. Satellite-based measurements of line spectra of some of the objects also seem warranted, although probably limited to sources within the Galaxy. The validity of the results for the sky common to the two flights are discussed. Then a more extensive map of emission regions, associated with 4 to 20 keV photons observed on only one flight, are presented and the degree of correlation between the high count rate regions and nearby bright stars described. This work has been supported by the National Aeronautics and Space Administration under contract NAS 5-1174 and by the Lockheed Independent Research Program.

An Observational Procedure for Establishing Systematic Errors in Trigonometric Parallaxes. JAMES GIBSON, *Wesleyan University*.—Any investi-