model derived by Pierce and Waddell (*Mem. Roy. Astron. Soc.* **68**, 89, 1961) from continuum observations, and in the Minnaert model as used by Lefevre and Pecker (*Ann. d'Astrophys.* **24**, 238, 1961). Calculations for a *Ti I* line observed by the latter authors and in this work suggest the need for an improved theoretical and observational investigation of the reality of the "fishbone effect," particularly with regard to the assumed properties of the atmosphere above continuum optical depths $\tau_{5000} \approx 0.005$.

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Atlas for Objective Prism Spectra and Information Obtainable from Low-Dispersion Spectrograms of Nova Herculis 1963. WALTRAUT SEITTER, *Sternwarte der Universität Bonn*.—The 340/500/1375 mm Schmidt telescope of Bonn Observatory is equipped with three objective prisms of dispersions 240, 645, and 1280 Å/mm at H_γ . Several investigations have shown all dispersions to be useful for work in stellar statistics and on selected objects. To facilitate future investigations with dispersions in that range work was started a year ago on a spectral atlas using the Johnson–Morgan standards as reference stars. Special attention has been given to ultraviolet and infrared criteria. One of the objectives of the atlas is to show the change of criteria with changing dispersions. Examples are given of the appearance of the spectra which are enlarged 18 to 40 fold for the atlas prints.

The bright Nova Herculis 1963 may serve as an example of applying the above-mentioned dispersions to an individual object. Thirty-one spectrograms taken between February and October 1963 allowed following the spectral development of the nova. Continuum intensities were determined from microphotometer tracings and the radiation was found to correspond to that of a nebula with $T_e = 20\,000^\circ\text{K}$ and $N_e = 5 \times 10^4 \text{ cm}^{-3}$. Emission line intensities were traced until the disappearance of the features. During the early stages *H*, *O I*, and *N I* emissions were quite pronounced. By May the neutral *O* and *N* lines, except for *O I* 8446, had disappeared. Permitted and forbidden lines of *O II*, *O III*, *N II*, and *N III* were strong from March to July. [*Ne III*] and [*Ne V*] emissions were observed in May and later. In the second half of July, *H α* , [*O III*] 4363 and [*O III*] 5007 dominated the spectrum. By October, 5007 had increased markedly with respect to 4363. The varying strength of absorption lines could be observed until the end of March. Radial velocity measurements yielded average values of 1000, 1400, and 1700 km/sec for different hydrogen absorptions.

Numerical Investigation of the Dynamics of Small Stellar Systems. NEVIN W. SHERMAN AND DEWAYNE KINMAN, *University of California—Lawrence Radiation Laboratory*.—A computer program for numerical integration of the classical *N*-body problem is in operation. It was designed to yield 4 or 5 significant figures after 10^5 integration steps. Integral checks, such as total energy and angular momentum, appear to confirm a sufficiently slow error buildup to achieve this ideal. One exception is caused by extremely close encounters. A technique for handling these cases has been detailed, but the programming complexities involved prevent its inclusion in the present program. The computer time required per integration step is short enough to make feasible the study of small stellar systems (≤ 500 stars).

Plots of the projected star positions at successive times are photographed, producing motion pictures of the dynamical evolution of the cluster. Periodically the integrated coordinates and velocities are sampled to produce certain meaningful frequency functions (histograms), and the ten general integrals. These integrals monitor the accuracy of the integration. Simultaneous ancillary calculations are made to facilitate our examining the pertinence and validity of the concepts of equipartition of energy and relaxation time. The potential of the stellar distribution, and its acceleration upon a unit mass, are determined as functions of distance from the cluster center.

We are calculating a cluster containing 380 stars, the stars being of several mass classes. The initial mean density is about 10 times that of the solar neighborhood. The initial positions are pseudo-random throughout a sphere of radius *R*. The initial velocity directions also are pseudo-random; their magnitudes are a simple function of radius. These initial conditions can be readily changed.

A complete integration step for a 380-member star cluster requires 23 sec of LARC computer time. For our density distribution, such a step averages 2000 to 4000 yr. Thus, the calculation of 20 to 40 million years of cluster history consumes about 70 h.

Expulsion Planetary Theory. ANATOL J. SHNEIDEROV, *Delegate for the U.S.A. of the Centre Européen pour les Recherches sur la Gravitation*.—According to the radional field theory previously published by the author ("The Exponential Law of Gravitation . . .," *Trans. Am. Geophys. Union* 1943, pp. 61–88, "On the Internal Temperature of the Earth," *Boll. Geofis. Teor. Appl.*, No. 10, 1961; "An Outline of the Radional Field Theory," *Astronautica*, No. 4, 1962, Rome, Italy; and others) the rest mass *M* of a protostar can be expressed by the quantity of matter *Q* it contains,