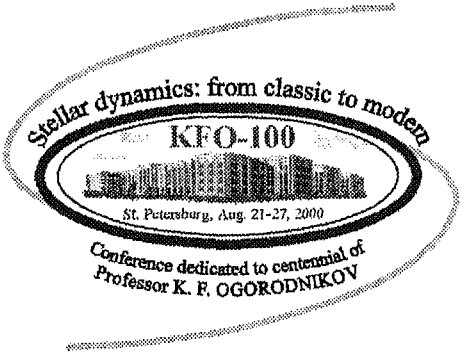
SAINT PETERSBURG STATE UNIVERSITY
Sobolev Astronomical Institute

STELLAR DYNAMICS: FROM CLASSIC TO MODERN

International Conference to be held
in Saint Petersburg, August 21–27, 2000

Abstracts
Participants



Saint Petersburg
2000

Edited by L. P. Ossipkov, I. I. Nikiforov

The issue contains the abstracts and list of participants of the International Conference "Stellar Dynamics: from Classic to Modern" to be held in Saint Petersburg, August 21–27, 2000 in honour of the 100th birthday of Professor Kyrill Fedorovich Ogorodnikov (1900–1985). The work of editors was mainly technical. Only the authors of abstracts are responsible for scientific contents of their texts.

Publication is supported by the Russian Foundation for Basic Research (grant number 00-02-26102)

ISBN 5-7997-0221-2

ЛР № 040815 от 22.05.97.

Подписано к печати 19.07.2000 г. Формат бумаги 60X90 1/16. Бумага офсетная. Печать ризографическая. Объем 4,5 п.л. Тираж 200 экз. Заказ 1475.
Отпечатано в отделе оперативной полиграфии НИИХ СПбГУ
с оригинал-макета заказчика.
198904, Санкт-Петербург, Старый Петергоф, Университетский пр. 2.

is necessary well to know well methods and opportunities of the theory of equilibrium figures.

1. Classical "line": homogeneous fluid mass:
   - 1a) The figures of relative equilibrium;
   - 1b) The Dirichlet's problem: a motion of a fluid ellipsoid with the linear velocity field;
   - 1c) The equilibrium figures with the nonlinear velocity field.
2. The theory of equilibrium figures of a heterogeneous fluid mass:
   - 2a) The Emden's and Plummer's spheres (can rotate);
   - 2b) From the Clairaut's and Liapounov's problems to Chandrasekhar.
3. The system of several isolated liquid masses:
   - 3a) The Roche's and Darwin's ellipsoids;
   - 3b) The figures with internal currents;
   - 3c) Binary galaxies.
4. Dynamics of elliptic galaxies:
   - 4a) Two types of E-galaxies;
   - 4b) The stellar-hydrodynamic models;
   - 4c) The collisionless phase-space models.

Some Principal Questions of the Theory of Equilibrium Figures

B. P. Kondratyev
(Physics Faculty, Udmurtia State University,
Universitetskaya ul. 1, Izhevsk, 426034, Russia)

The goal of this paper is to describe several problems unifying objective of which is to obtain an improved understanding of the theory of equilibrium figures. We will consider three basic questions.

1. The first section includes remarks on the stability problem of Jacobi ellipsoids. Ones begin with a demonstration that the bifurcation point for the pear-shaped equilibrium figures on the Jacobi sequence must coincides with the corresponding neutral point. Our method is original and independent on Cartan's one.

2. In the second section we have proved an impossibility of the quasiprecesson for the large class of equilibrium figures with (or without) internal flows. This analysis significantly extends known results, obtained early by H. Poincaré, P. Appell and V. A. Antonov.

3. At last, the new formula for the angular velocity $\Omega/\sqrt{\pi G\rho}$ of rotating, self-gravitating homogeneous equilibrium figures has been derived:

$$\Omega^2 = 1 + \eta - \sqrt{(1+\eta)^2 - \frac{6W_i - W_t}{\pi G\rho I_3}}.$$

Here η is the normalized total gravitational potential energy and W_i is the "internal" potential energy of the figure.

Equilibrium Figures of Gas-Dust Clouds in the Galaxy

B. P. Kondratyev
(Physics Faculty, Udmurtia State University,
Universitetskaya ul. 1, Izhevsk, 426034, Russia)

According to observations, in our Galaxy there exist a numerous class of rather dense, compact gas-dust nebulae, which Bok has called by globules. The physical conditions in these dense nebulae are such, that young stars can be formed there. Many of these nebulae have a smoothed, sometimes round, form. Hence, they are in equilibrium state under influence of external and internal forces. The problem on the equilibrium form of these globules is considered. The methods of the theory equilibrium figures are applied for solving the problem. Modelling the globule by a homogeneous triaxial ellipsoid and setting the potential Φ in a plane of symmetry of the Galaxy, the equilibrium equations for it were obtained

$$A_1 a^2 = b^2 \left(A_2 - \frac{2\Omega^2}{\pi G\rho} + \frac{\kappa^2}{2\pi G\rho} \right) = A_3 c^2,$$