

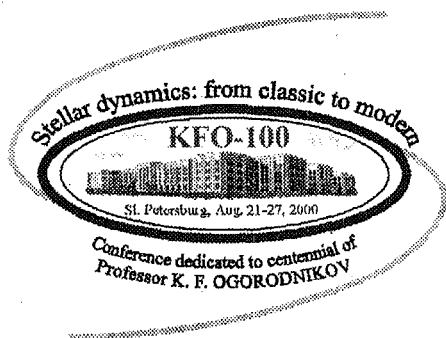
SAINT PETERSBURG STATE UNIVERSITY
Sobolev Astronomical Institute

STELLAR DYNAMICS:
FROM CLASSIC TO MODERN

Proceedings of the International Conference
held in Saint Petersburg, August 21–27, 2000,
in honour of the 100th birthday of Professor
K. F. Ogorodnikov (1900–1985)

Edited by

L. P. Ossipkov and I. I. Nikiforov
Saint Petersburg State University, Russia



Saint Petersburg
2001

The volume contains the proceedings of the International Conference "Stellar Dynamics: from Classic to Modern" held in Saint Petersburg, August 21–27, 2000, in honour of the centennial of Professor Kyrill Fedorovich Ogorodnikov's birth.

Publication is supported by the State Program for Leading Scientific Schools of Russia (grant number 00-15-96775).

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ISBN 5-7997-0290-5

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Some Principal Questions of the Theory of Equilibrium Figures

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The goal of this work 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.

- At first we discuss the stability problem for Jacobi ellipsoids. We start with a demonstration that the bifurcation point for the pear-shaped equilibrium figures on the Jacobi sequence must coincide with the corresponding neutral point. Our method is original and independent on Cartan's one.
- Then we prove an impossibility of the quasiprecession 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.
- 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 W_t is the total gravitational potential energy, W_i is the "internal" potential energy of the figure, and $\eta = W_t/(2\pi G\rho I_3)$ is the normalized total gravitational potential energy.

The full text of the paper is published (in English) in *Kinematika i Fizika Nebesnykh Tel, Prilozhenie* [Kinematics and Physics of Celestial Bodies, Supplement], 1999, no.2, 16–21.