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International Conference to be held
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Abstracts
Participants

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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

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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

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

where A_i are the coefficients of a globule's potential; Ω is the circular velocity around the Galaxy, κ is the epicyclic frequency. It has been worked out the equation

$$\pi G\rho\left(A_2 - \frac{a^2}{b^2}A_1\right) = \frac{1}{R}\frac{d\Phi}{dR} + \frac{2(\Phi_0 - \Phi)}{R^2},$$

from which it follows, that as a function of globule position the latter can have the form both the prolated (from the center of the Galaxy) or the oblate spheroid. On some critical distance these two kinds of the forms are divided by a sphere.

On the Problem of Angular Momentum Distribution in Axially Symmetric Galaxies

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1. The constructing axially symmetric models for gravitating equilibrium galaxies is frequently carried out through the distribution of the angular momentum $L[M(R)]$ as a function from mass inside a cylindrical surface with a value of L given on it. Such approach is physically more evident, than an *a priori* choice of a distribution law for an angular velocity. As the function $L(R)$ is an invariant at the abscence of turbulence and viscosity, then the study of observational distribution of the angular momentum in galaxies can clarify their origin.

2. In this paper the problem of internal distribution of the angular momentum in classical homogeneous Maclaurin's spheroids is considered. An exact expression of such distribution was found to be the following:

$$L(R) = L_t\left\{1 - \frac{5}{2}\left(1 - \frac{M(R)}{M_t}\right) + \frac{3}{2}\left(1 - \frac{M(R)}{M_t}\right)^{5/3}\right\}.$$

   Disappointing error in cosidering this problem in some reviews and monographs is revealed. Then the correct expression for the angular momentum is used for determining angular velocity distribution in galaxies with real density distribution.