

DYNAMICAL EXPLORATIONS OF NUCLEAR STRUCTURES IN BARRED GALAXIES

J. ANOSOVA

ASE, University of Texas at Austin, Austin TX 78712, USA

AND

G.F. BENEDICT

Astronomy Department, University of Texas at Austin, Austin TX 78712, USA

NGC 4314 (Benedict et al. 1996) has a complex nuclear morphology with recent star formation confined to a nuclear ring. *HST* observations resolve the nuclear ring into multiple sites of new star formation and resolve the associated dust lanes into discrete clouds. We construct dynamical models of this galaxy in order to provide plausible identification of the dynamical processes that led to the formation of the observed structure. We assume that the center of this galaxy contains a very massive double black-hole, surrounded by relatively low-mass particles - the star clusters as well as gas and dust complexes. Our previous work (Anosova & Anandarao 1994, Anosova & Tanikawa 1995) showed that the dynamical evolution of such a model produces many structures similar to those observed in galaxies of diverse types: spiral and elliptical galaxies, interacting galaxies, and various types of flows and jets. In the present work, we consider a number of such models with different initial parameters. We study their dynamical evolution of the gravitational N-body problem, taking into account strong interactions of bodies. Comparison of the evolution of our models with the observed structure, distributions and motions of stars, gas, and dust complexes in NGC 4314 shows good agreement. The model predicts the velocity fields observed in this galaxy.

References

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