

ON PERIPHERAL DYNAMICS

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A review of the observed facts and the observed theories of distortions of the outer parts of galaxies.

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DISCUSSION FOLLOWING REVIEW V.2 GIVEN BY A. TOOMRE

ALLEN: Some years ago we used to think that such peculiar galaxies were only a small fraction of all galaxies in the sky. The new deep photographs seem to be changing this picture. Are there any galaxies left which remain simple and symmetric as one goes to even fainter isophotes?

TOOMRE: Perhaps not. And my life is made miserably difficult by these facts which seem to be getting better and better.

PFLIEDERER: I refer to the velocity distribution in the long whisp of NGC 3628. Do you have a simple explanation for the double peak in the outer part of the whisp?

TOOMRE: No, impossible. I would guess it might just be a remnant of there having been spiral structure in the galaxy, or may be it was lumpy like in arms already and somehow it got squashed.

WRIGHT: Could you remind us of the range of collision parameters which give strong tidal interactions and what fraction of encounters produce strong disturbances?

TOOMRE: The interacting systems should have roughly comparable mass, must be originally bound, and should pass at about an arm's distance.

GALLAGHER: The NGC 5128 situation may be even more complex than you have suggested. NGC 5102 is a member of the same group and is peculiar in that a high HI content and young stellar population appear super-

imposed on a normal SO. Van den Bergh has interpreted his photometry as evidence for a burst of star formation a few times  $10^8$  years ago. Thus whatever caused NGC 5128 may have been a group-wide phenomenon.

FREEMAN: I might add that the same group contains NGC 5253, an Irr II in which the supernovae rate is about three times higher than expected.

M.S. ROBERTS: The velocity field along the minor axis of NGC 2685 is, not surprisingly, peculiar; in addition to radiation at the systemic velocity, long velocity wings, both blue and red, are present. It is remarkable that almost exactly the same minor axis velocity field occurs in the presumably normal galaxy M31!

FREEMAN: People use the Rogstad ring procedure to estimate circular velocities for warped galaxies. This procedure is obviously not dynamically selfconsistent and the inferred circular velocities could easily be systematically wrong by 10 or 20 km/s; this is just the size error that could be a problem for calculating M/L in the outer parts of galaxies. What is your advice to people who measure rotation curves in warped galaxies?

TOOMRE: Just one word: wait!

M.S. ROBERTS: Could I comment on this? If one gives a rotation curve it should be clearly stated as to how this was obtained. The safest thing is that you don't even correct for the inclination. If you have a modest bend the effects on the rotation curve are not very great. Only when you have a great bend in a peculiar position you can grossly distort your data so that your rotation curve can fool you.