

Seminar Notice

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School of Physical Sciences

Title:	Origin of Low surface Brightness Galaxies: Role of the Dark Matter Halo
Speaker:	Arunima Banerjee, IISER, Tirupati
Date:	December 24, 2018 (Monday)
Time:	5:00 p.m.
Venue:	Physics Seminar Room - C406, 3rd Floor, Centenary Building, IACS
Abstract:	Low Surface Brightness Galaxies (LSBs), inspite of being gas rich, have low star formation rates and are, therefore, low surface brightness in nature. We calculate QRW, the 2-component disc stability parameter as proposed by Romeo & Wiegert (2011), as a function of galactocentric radius R for a sample of five LSBs, for which mass models, as obtained from HI 21cm radio-synthesis observations and R-band photometry, were available in the literature. We find that the median value of $Q_{min\ RW}$, the minimum of QRW over R, lies between 2.6 and 3.1 for our sample LSBs, which is higher than the median value of 1.8 ± 0.3 for $Q_{min\ RW}$ for a sample of high surface brightness galaxies (HSBs) as obtained in earlier studies. This clearly shows that LSBs have more stable discs than HSBs, which could explain their low star formation rates and, possibly, their low surface brightness nature. Interestingly, the calculated values of QRW decrease only slightly (median $Q_{min\ RW} \sim 2.3 - 3$) if the discs were taken to respond to the gravitational potential of the dark matter halo only, but reduce by $\sim$ a factor of 2-3 (median $Q_{min\ RW} \sim 0.7 - 1.5$) if they respond to their self-gravity alone. This implies that the dark matter halo is crucial in regulating disc stability in LSBs, which may have important implications for models of galaxy formation and evolution.

All are cordially invited to attend the seminar