

Do Bars Trigger Activity in Galactic Nuclei?

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We investigate the connection between the presence of bars and active galactic nucleus (AGN) activity, using a volume-limited sample of ~ 9000 late-type galaxies with axis ratio $b/a > 0.6$ and $M_r < -19.5 + 5\log h$ at low redshift ($0.02 \leq z \leq 0.05489$), selected from the Sloan Digital Sky Survey Data Release 7. We find that the bar fraction in AGN-host galaxies (42.6%) is ~ 2.5 times higher than in non-AGN galaxies (15.6%), and that AGN fraction is a factor of two higher in strong-barred galaxies (34.5%) than in non-barred galaxies (15.0%). However, these trends are simply caused by the fact that AGN-host galaxies are on average more massive and redder than non-AGN galaxies because the fraction of strong-barred galaxies (f_{SB}) increases with $u - r$ color and stellar velocity dispersion. When $u - r$ color and velocity dispersion (or stellar mass) are fixed, both the excess of f_{SB} in AGN-host galaxies and the enhanced AGN fraction in strong-barred galaxies disappears. Among AGN-host galaxies we find no strong difference of the Eddington ratio distributions between barred and non-barred systems. These results indicate that AGN activity is not dominated by the presence of bars, and that AGN power is not enhanced by bars. In conclusion, we do not find clear evidence that bars trigger AGN activity.