

Bar properties as seen in the *Spitzer* Survey of Stellar Structure in Galaxies

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Abstract. Bars serve a crucial signpost in galaxy evolution because they form quickly once a disk is sufficiently massive and dynamically cold. Although the bar fraction in the local Universe is well-established since the mid-60s, a variety of studies have concluded varying bar fractions due to different definitions of bars, use of low quality data or different sample selection. The *Spitzer* Survey of Stellar Structure in Galaxies (S⁴G) offers us the ideal data set for resolving this outstanding issue once and for all. S⁴G consists of over 2000 nearby galaxies chosen based on optical brightness, distance, galactic latitude and size in a 40 Mpc volume. With a 4 minute integration time per pixel over $>1.5 \times D_{25}$ diameter for each galaxy, the data provide the deepest, homogenous, mid-infrared (3.6 and 4.5 microns) data on the nearby Universe. The data are so deep that we are tracing stellar surface densities $\ll 1$ solar mass per square parsec. With these data we can confidently constrain the bar fraction and thus shed important light on the evolutionary state of galaxies as a function of mass, environment and other galaxy host properties.
