Where stars form: inside-out growth and coherent star formation in galaxies at z~1

Imaging surveys with HST have demonstrated that many galaxies attained their current forms at z~1. Key to understanding this process is a direct measurement of the distribution of star formation within galaxies at this crucial epoch. This is now possible with the WFC3 grism capability on HST, as it provides Hα maps of all galaxies at 0.7< z <1.5 in its field of view. Using Hα maps for ~2000 galaxies, we show where star formation is distributed in galaxies across the star formation - mass plane (the “main sequence”). We find that the disk scale length of Hα is larger than that of the stellar continuum emission, consistent with inside-out assembly of galactic disks. Across the main sequence, we find evidence for ‘coherent star formation’: in galaxies with higher than average star formation rates, Hα is enhanced throughout the disk; similarly, in galaxies with low star formation rates Hα is depressed throughout the disk. In this talk Dr. Nelson will discuss these results in the context of several proposed mechanisms for enhancing and quenching star formation. She will also show first results of the spatial distribution of star formation at z~2-3.