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The Star-Formation Rate and Stellar Mass Relation of Distant Galaxies BRETT SALMON, Texas A&M University, CANDELS COLLABORATION — Distant star-forming galaxies show a correlation between their star-formation rates (SFR) and stellar masses, and this has deep implications for galaxy formation. In this talk, I present a study on the evolution of the slope and scatter of the SFR-stellar mass relation for galaxies at high redshift, z $>$ 3.5, using multi-wavelength photometry from the Cosmic Assembly Near-infrared Deep Extragalactic Legacy Survey (CANDELS). We find that distant star-forming galaxies follow a nearly unevolving correlation between stellar mass and SFR that follows SFR $\sim$ $M_\star^\alpha$ with $\alpha \approx 0.6$. This evolution requires a star-formation history that increases with decreasing redshift (on average, the SFRs of individual galaxies rise with time). The measured scatter in the SFR-stellar mass relation is tight for galaxies with log $M_\star/M_\odot > 9$ dex. This implies that the true intrinsic scatter in the SFR at fixed stellar mass is even smaller, σ(log SFR)$<$ 0.2 - 0.3 dex. Assuming that the SFR is tied to the net gas inflow rate of galaxies (SFR$\sim$ d(M_{gas})/dt), then this result implies a low scatter in the gas inflow rate, favoring the theory of smooth gas accretion for star-forming galaxies at high redshift.

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