



Milky-Way-like Populations in IllustrisTNG and Implications for Galactic Habitability

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Parameters on which galactic habitability depends:

- total stellar mass
- ongoing star formation rate
- total metal mass

SCIENTIFIC QUESTION

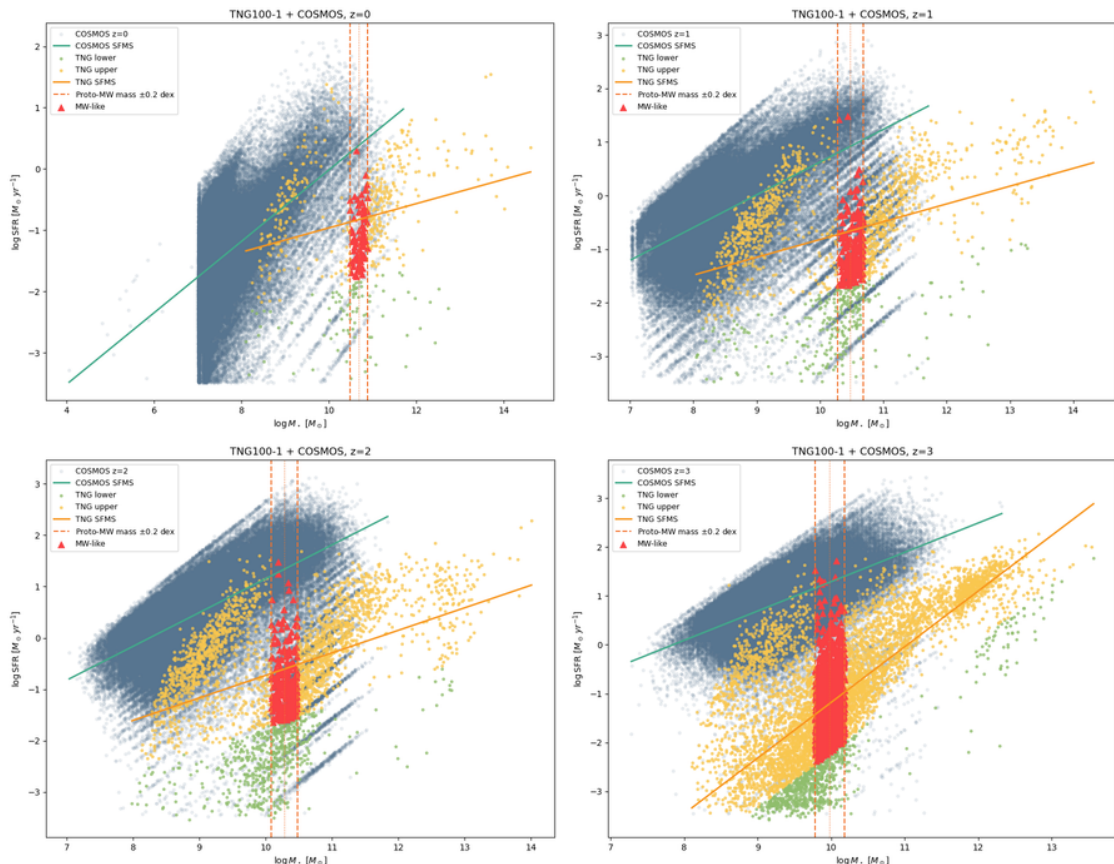
How the changes in these parameters of galaxies similar to the Milky Way, in terms of mass and SFR, affect the possibility of the existence of habitable planets in these galaxies?

THE NUMBER OF HABITABLE TERRESTRIAL PLANETS

$$N_t \propto \frac{M_*^2 Z_g^\alpha}{\psi}$$

Dayal et al. 2015.

MILKY WAY - LIKE GALAXIES

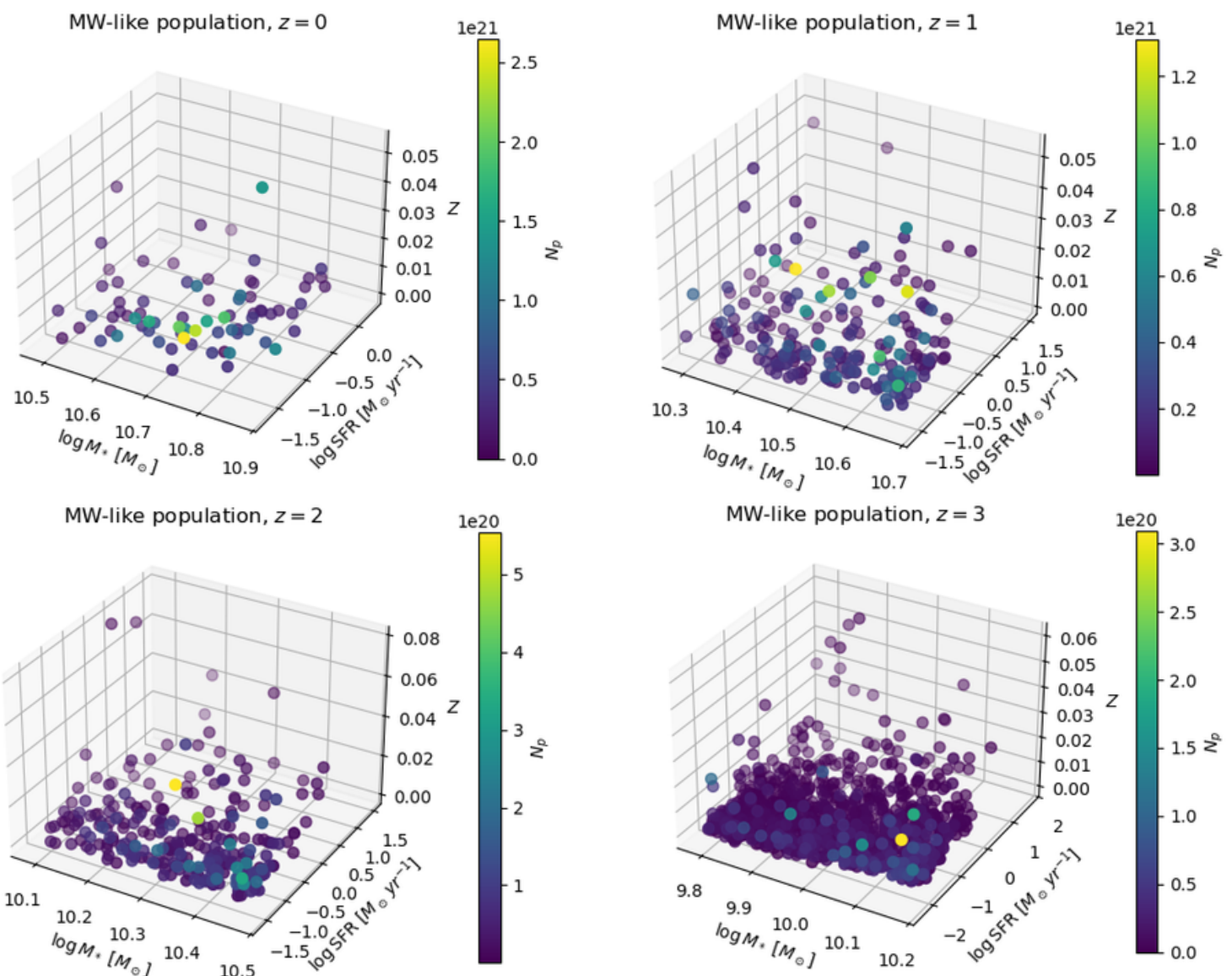


Star-Forming Main Sequence (SFMS) is the observed correlation between a galaxy's stellar mass and star-formation rate, describing the population of actively star-forming galaxies.

Milky Way - like galaxies are those galaxies that meet the following requirements:

- $\Delta \log \text{SFR} = \log \text{SFR} - \log \text{SFR}_{\text{SFMS}} > -1.0$ dex
- and
- $|\log M_* - \log M_{*, \text{MW}}| \leq 0.2$ dex

RESULTS



The distribution of Milky Way - like galaxies in the logM, logSFR, Z space follows a trend, with galaxies having the highest N_t values showing the largest deviations from it.