



Siddhant Mishra-Sharma (MIT/AI FI) Summer School



170

5

2

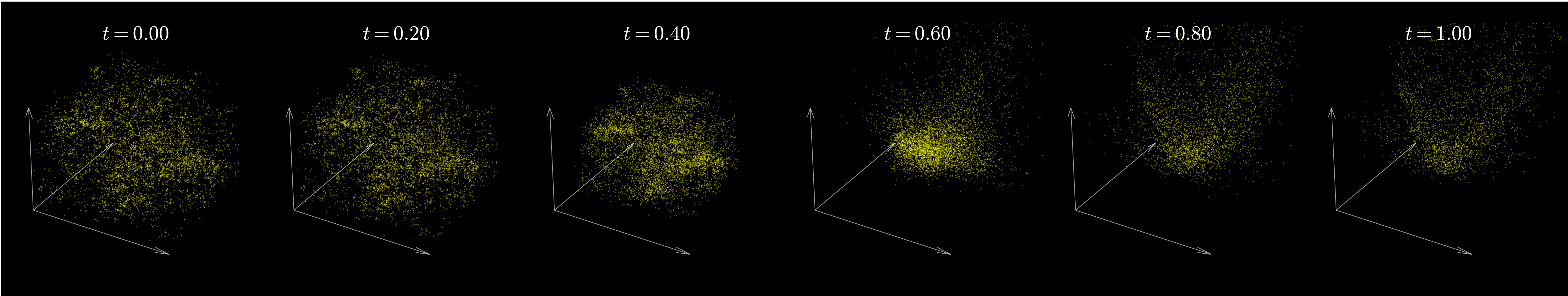


*Graph neural network-guided diffusion on galaxy*

Samples from *Quijote* [Villacusa-Navarro et al, 2021].



Forward process (*adding noise*)



Reverse process (*denoising*)



Cosmology parameters  $\{\Omega_m, \sigma_8, \dots\}$   
+ Galaxy-halo parameters



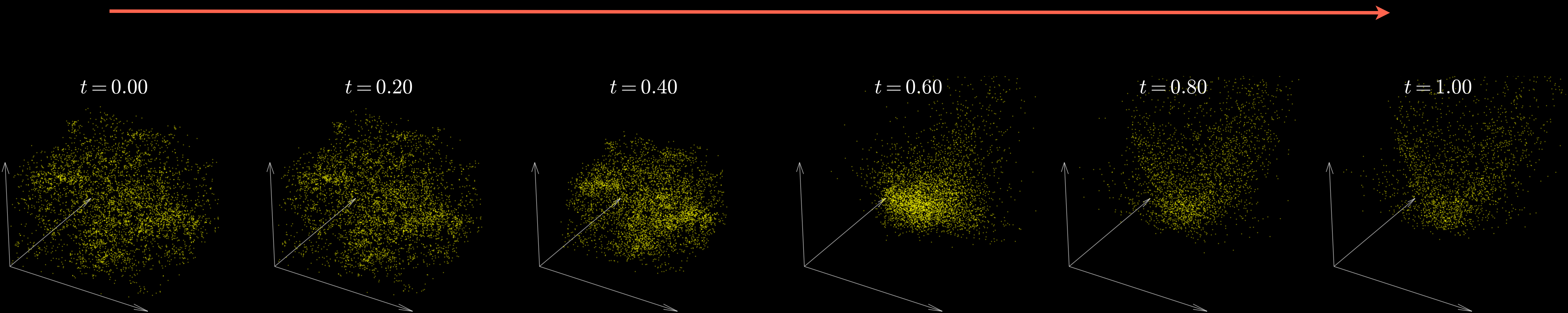
SN, Cuesta-Lazaro [ICMML4Astro]

# Graph neural network-guided diffusion on galaxies

SM, Cuesta-Lazaro [ICML ML4Astro]

Samples from *Quijote* [Villaescusa-Navarro et al, 2021].

Forward process (*adding noise*)



Reverse process (*denoising*)

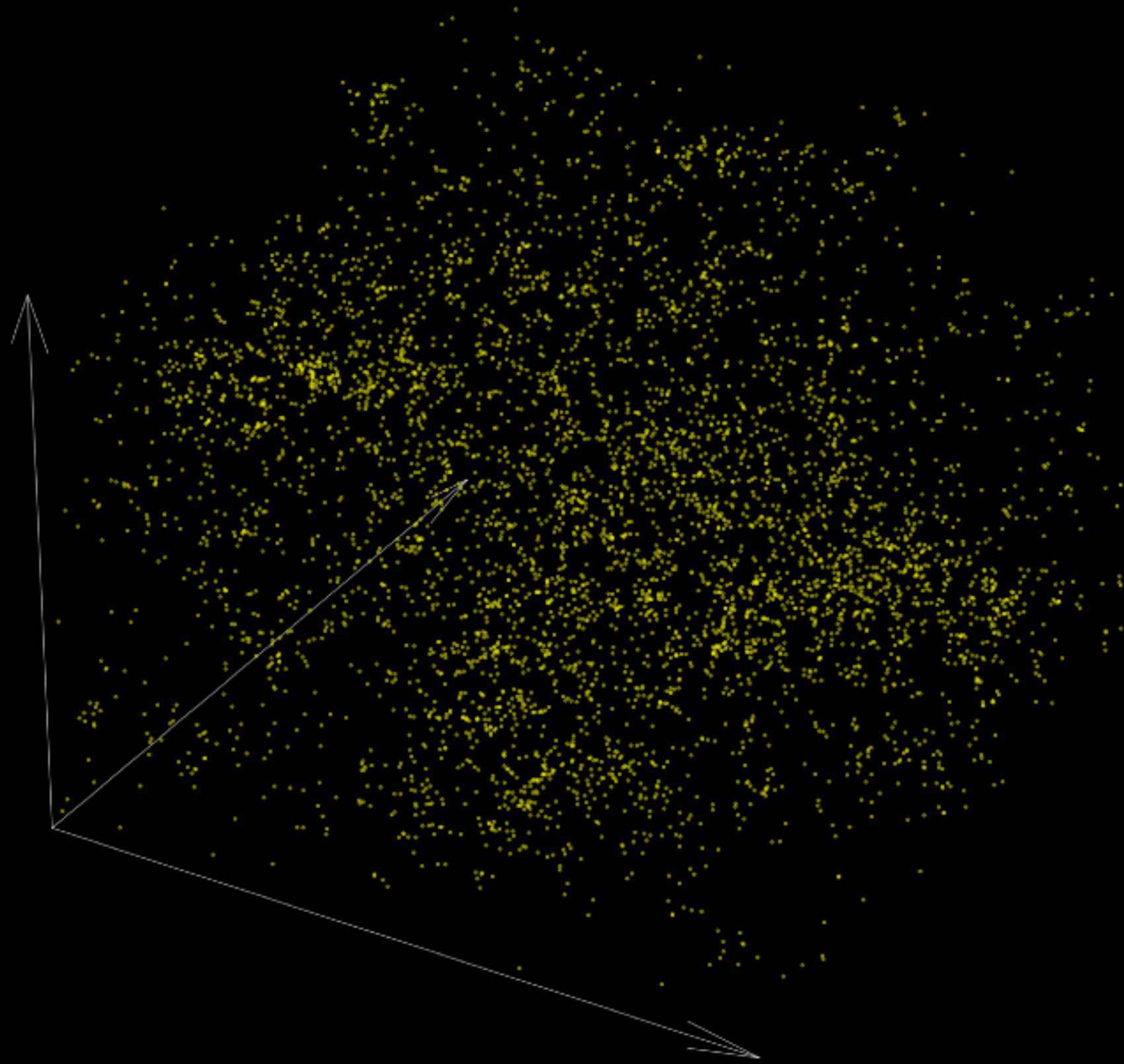
Cosmology parameters  $\{\Omega_m, \sigma_8, \dots\}$   
+ Galaxy-halo parameters

# Diffusion on galaxies

SM, Cuesta-Lazaro [ICML ML4Astro]

Diffusion process

$t = 0.00$



Conditional generation  $x \sim p(x \mid \Omega_m, \sigma_8)$

$\Omega_m = 0.10, \sigma_8 = 0.60$

