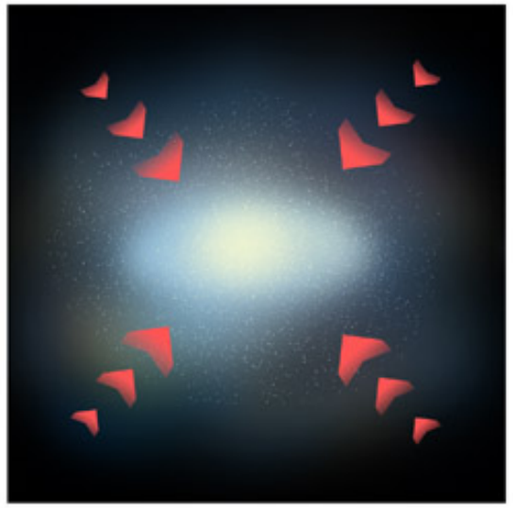

The formation of the inner Milky Way
Cosmic Duologue
ESO

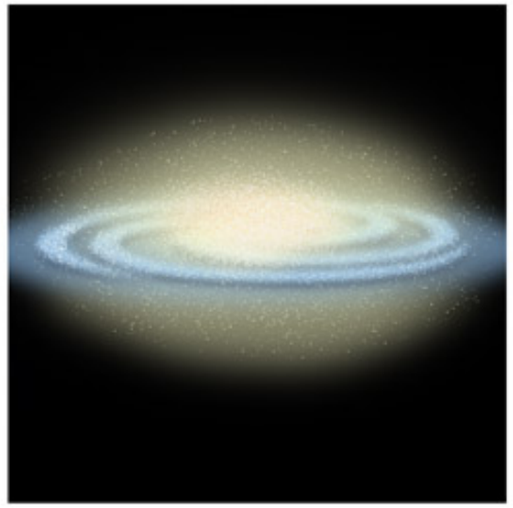
Rapid Collapse

Credit: NASA & ESA

1. Primordial hydrogen cloud.



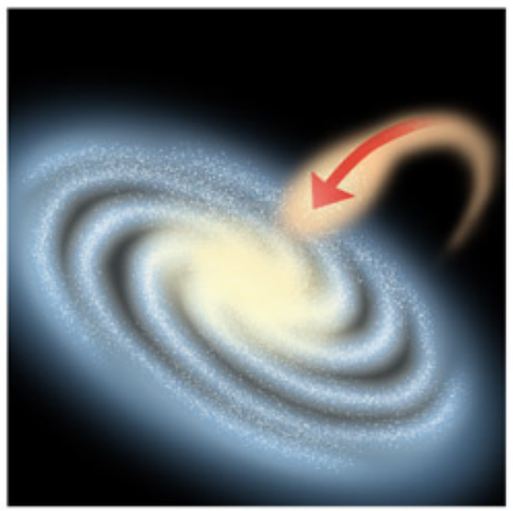
2. Cloud collapses under gravity.



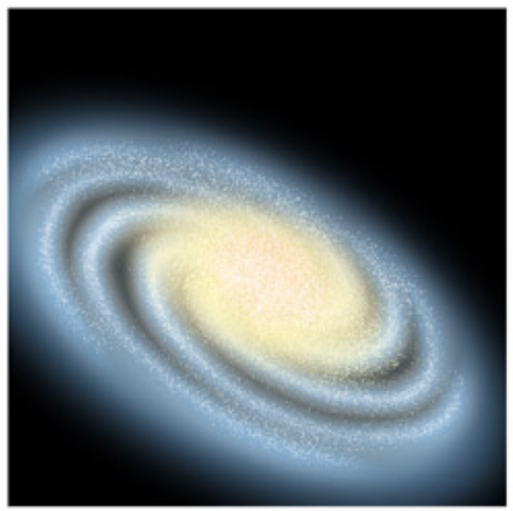
3. Large bulge of ancient stars dominates galaxy.

Environmental Effects

1. Disk galaxy and companion.

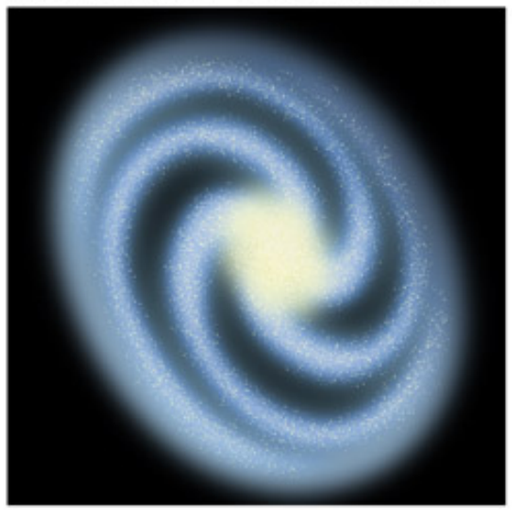


2. Smaller galaxy falls into disk galaxy.

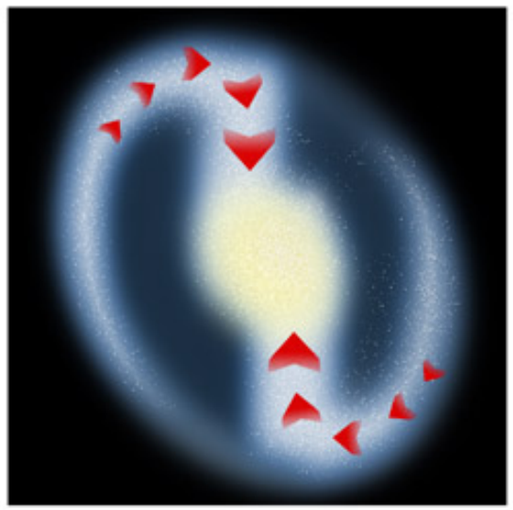


3. Bulge inflates with addition of young stars and gas.

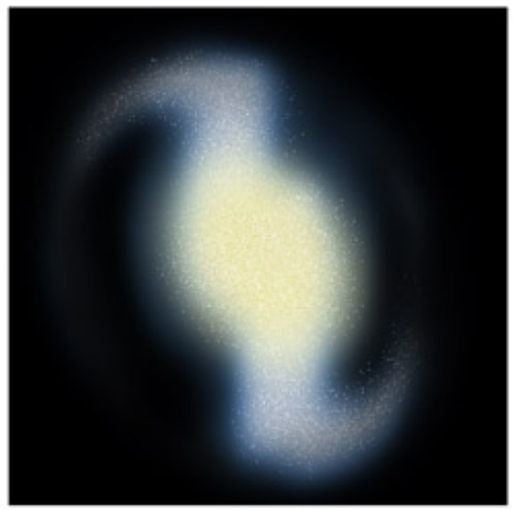
Internal Evolution



1. Disk galaxy forms around small bulge.



2. Disk perturbations form a bar-like structure which shovels fresh gas into the center.



3. As bulge grows with new stars the bar is disrupted and dissipates.

Förster Schreiber+2018

SFR [$M_\odot yr^{-1}$]

1000

100

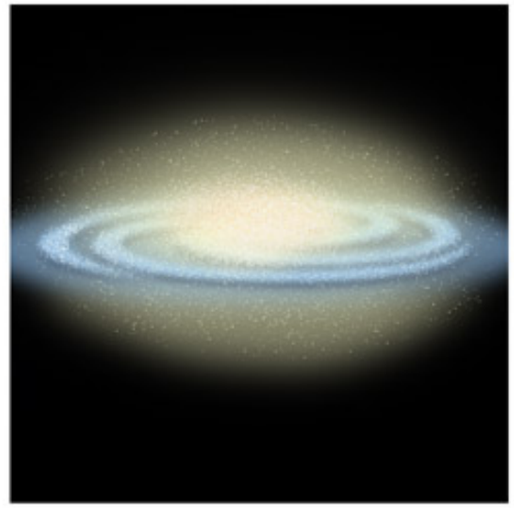
10

SINS/zC-SINF AO Survey

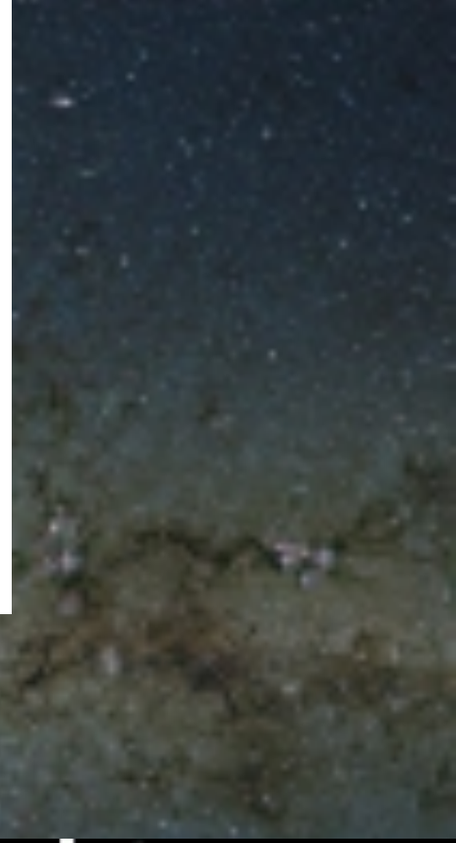
Hα line maps

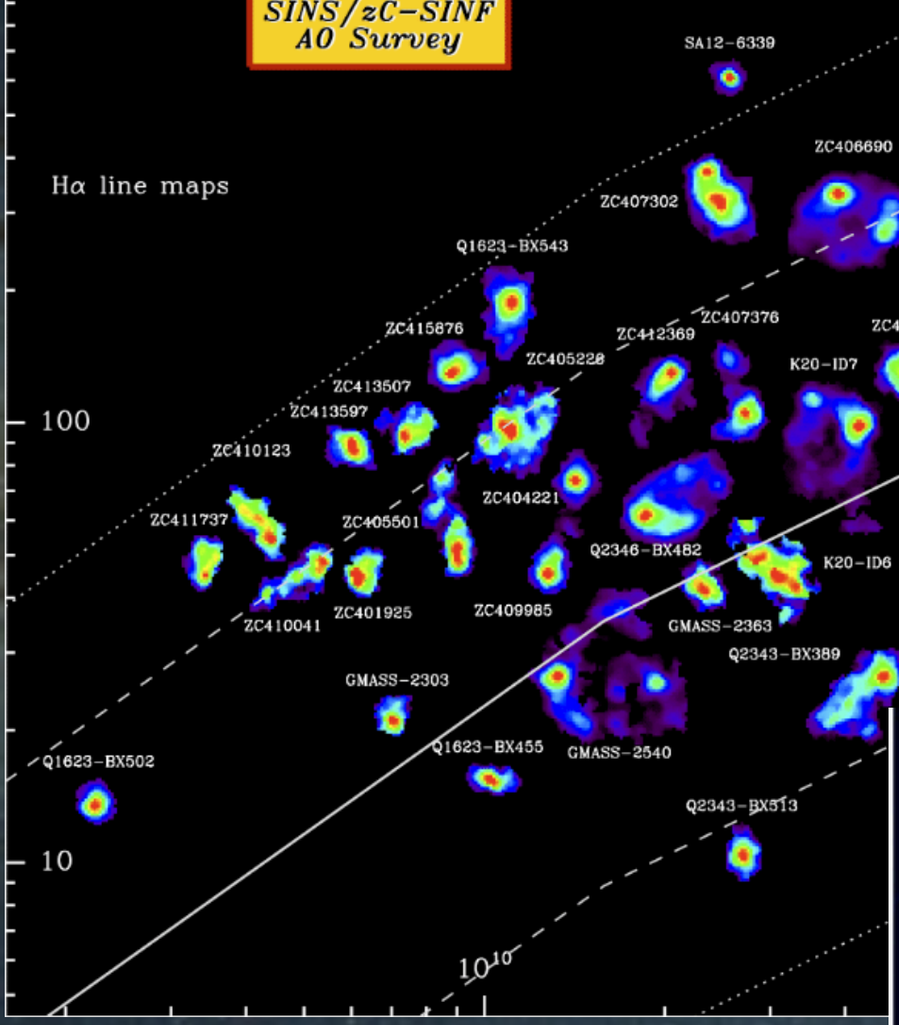
SA12-6339
ZC400528
D3a-6004
ZC406690
ZC407302
ZC400569
D3a-6397
MS
Q1623-BX543
ZC415876
ZC412369
ZC407376
ZC403741
ZC405228
K20-ID7
ZC413507
ZC413597
D3a-15504
ZC410123
×1/4
ZC404221
Q2343-BX610
ZC411737
ZC405501
Q2346-BX482
K20-ID6
Q1623-BX599
ZC410041
ZC401925
ZC409985
GMASS-2363
Q2343-BX389
GMASS-2303
×1/10
Q1623-BX455
GMASS-2540
Q1623-BX502
Q2343-BX513
1" (8kpc)
10^{10}
×10
×4

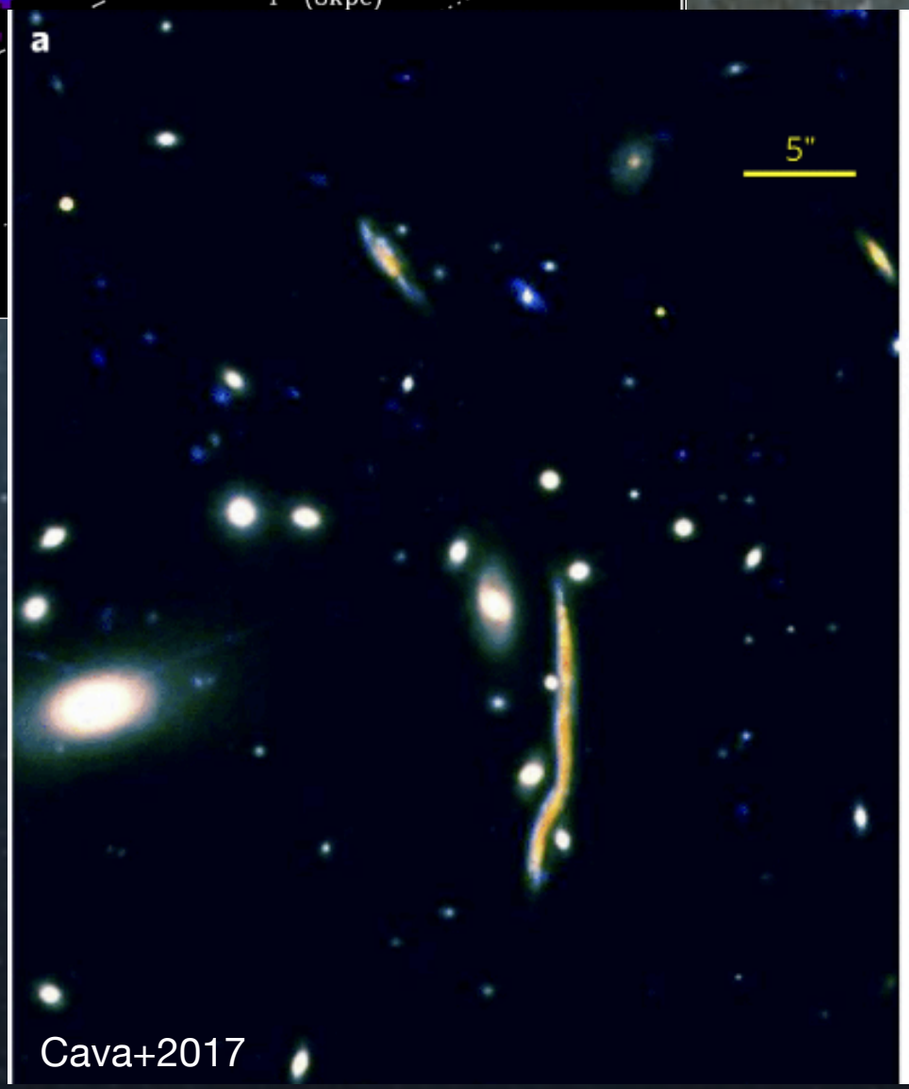
Credit: NASA & ESA



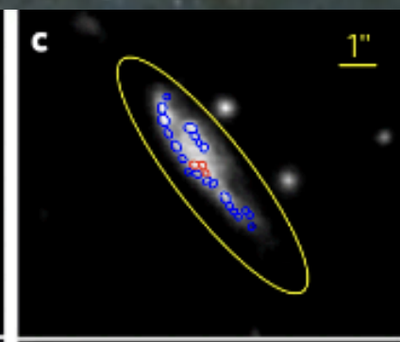
3. Large bulge of ancient stars

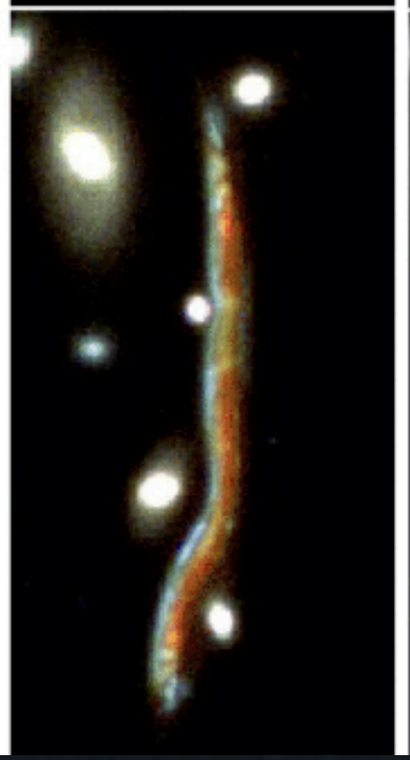


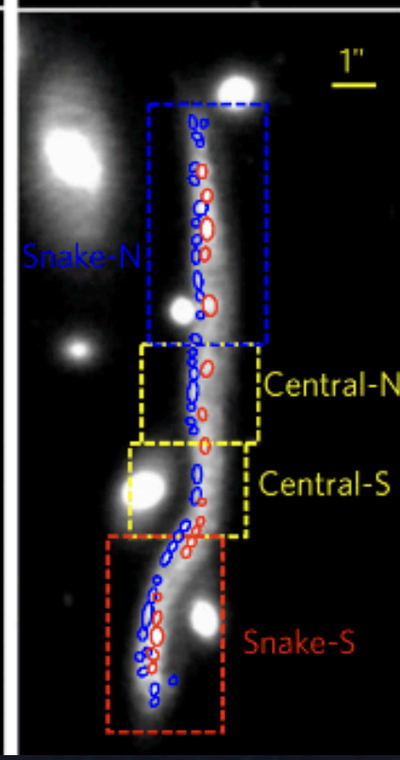




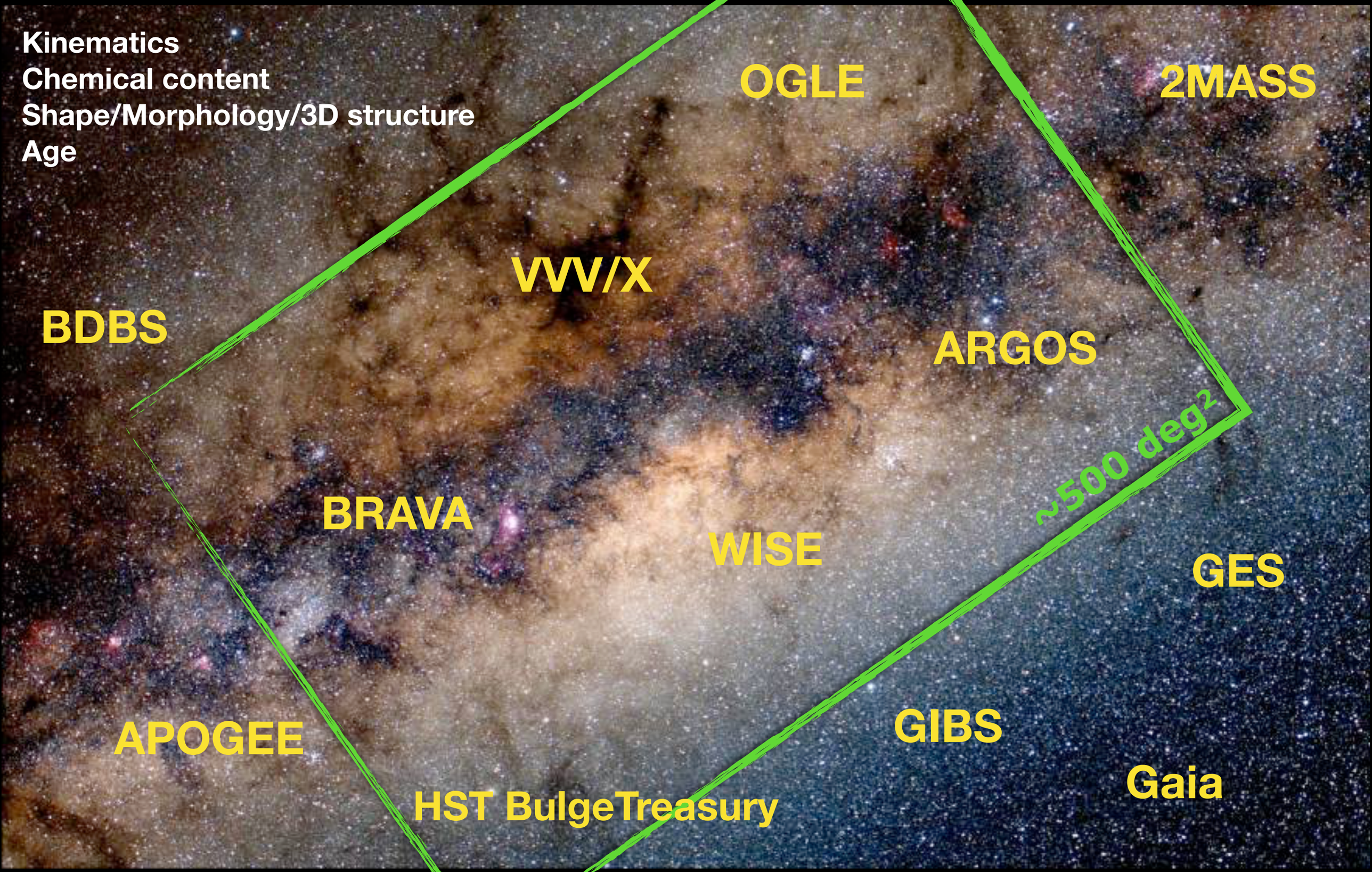
Cava+2017







The MW bulge is <u>the only bulge</u> where we can resolve individual stars in all evolutionary stages

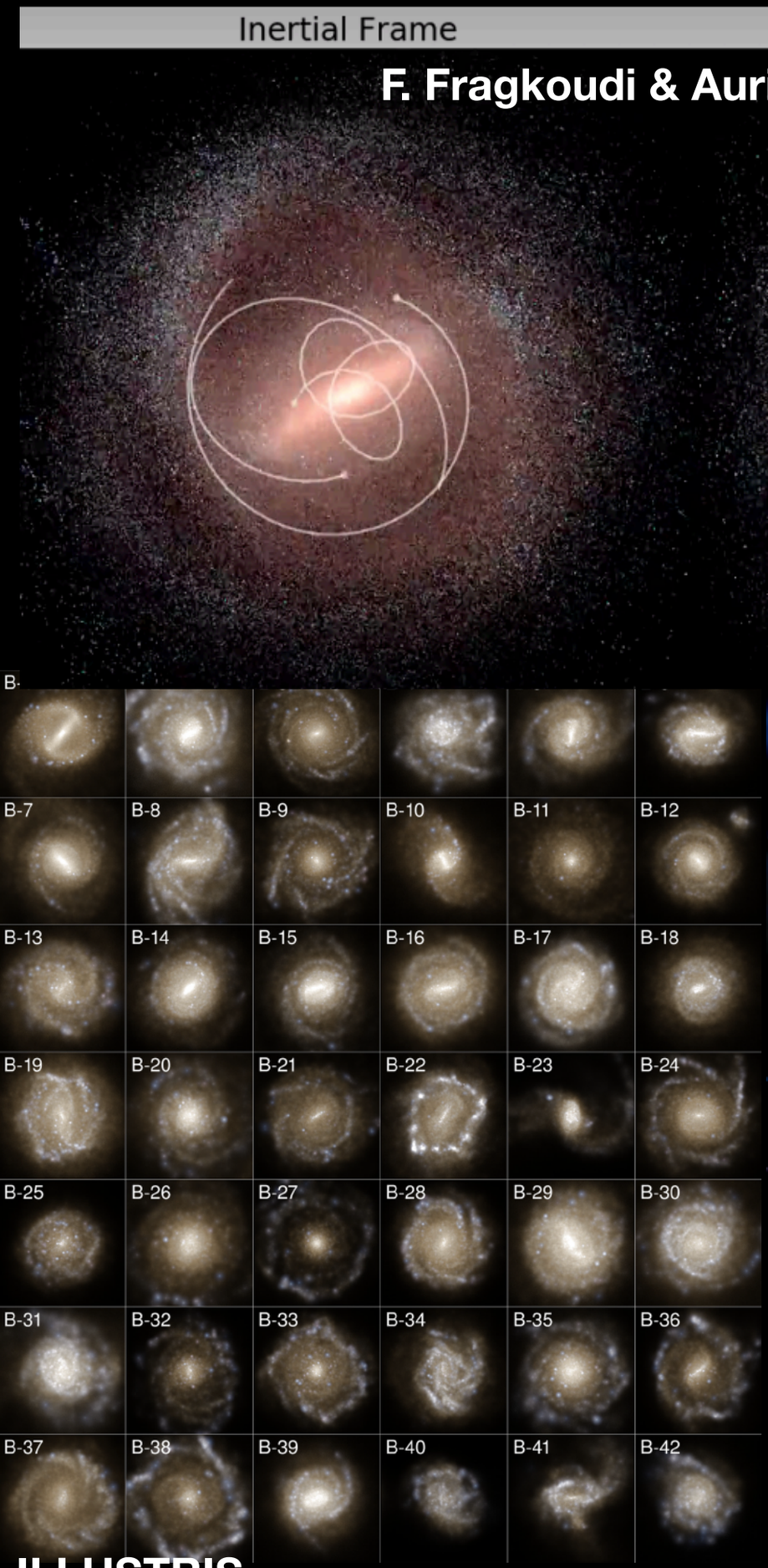


Inertial Frame

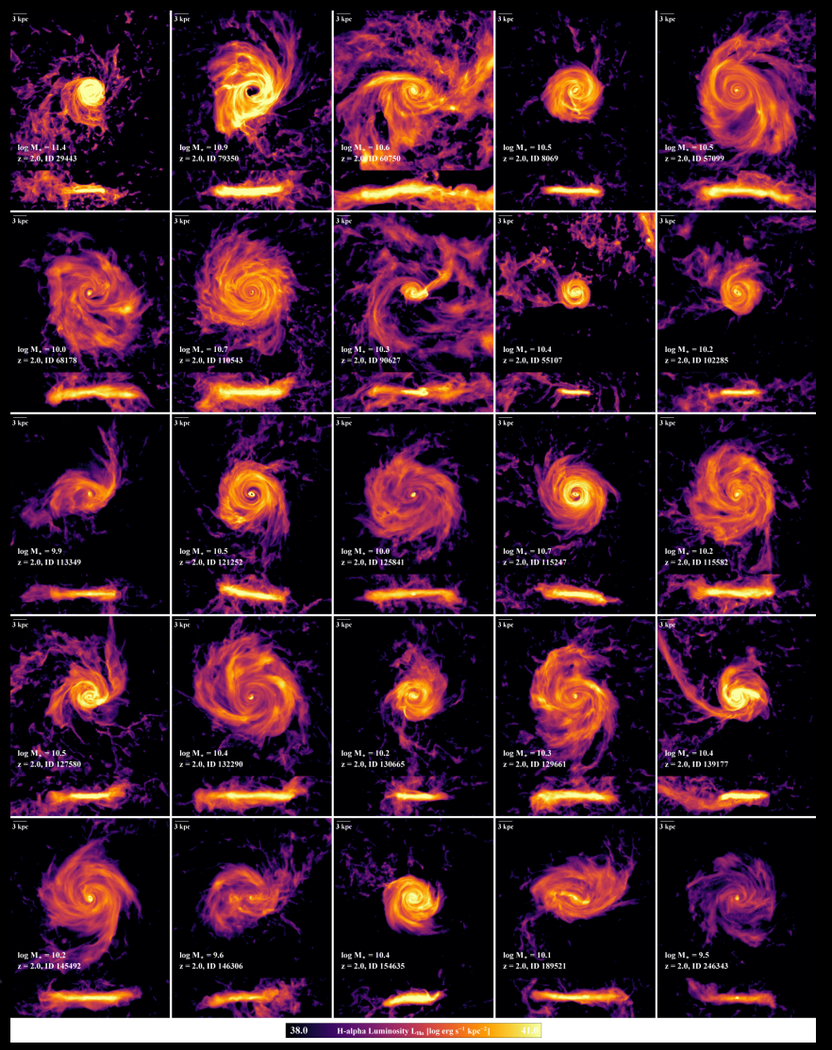
Rotating Frame

F. Fragkoudi & Auriga project

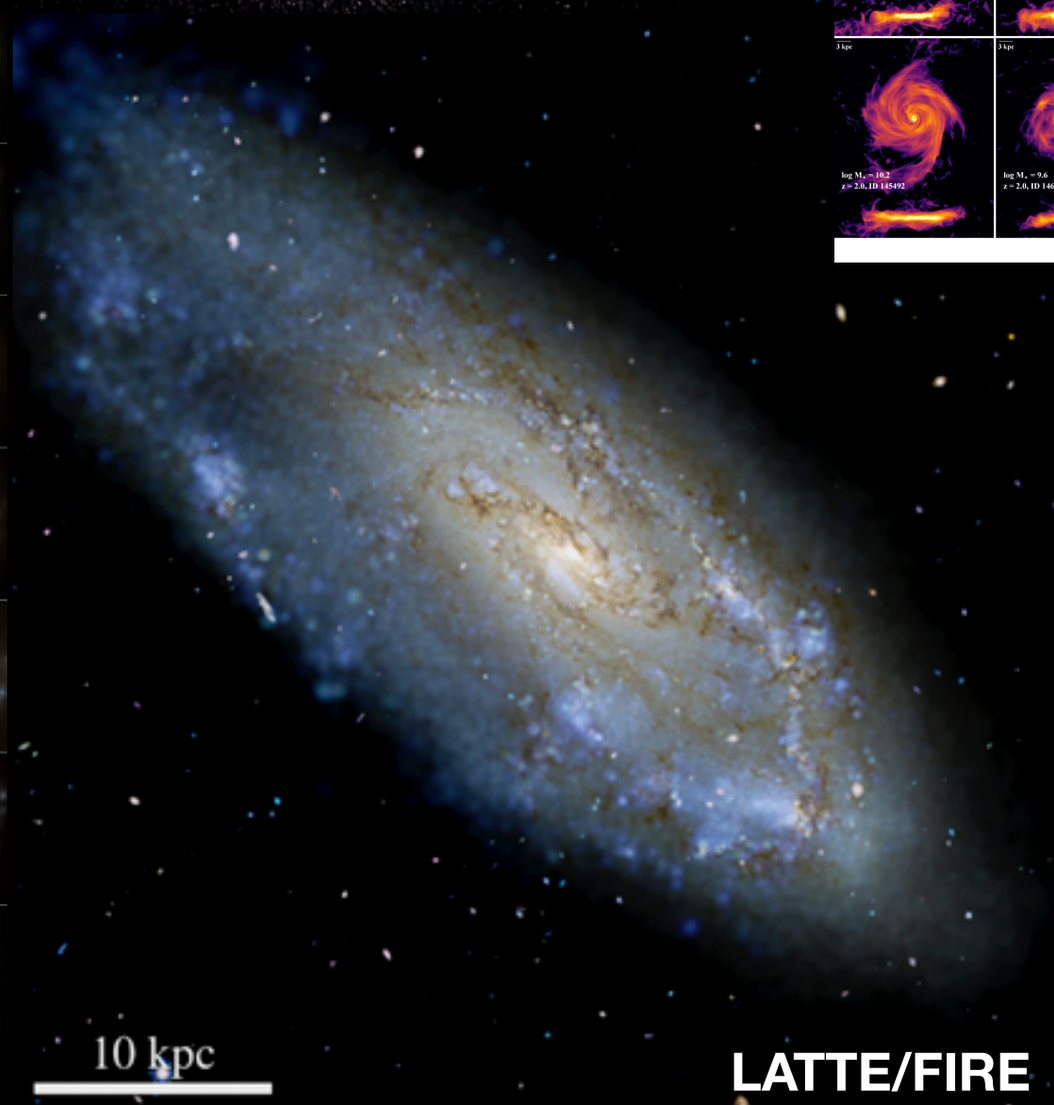
12.03 Gyr



ILLUSTRIS



TNG50



LATTE/FIRE