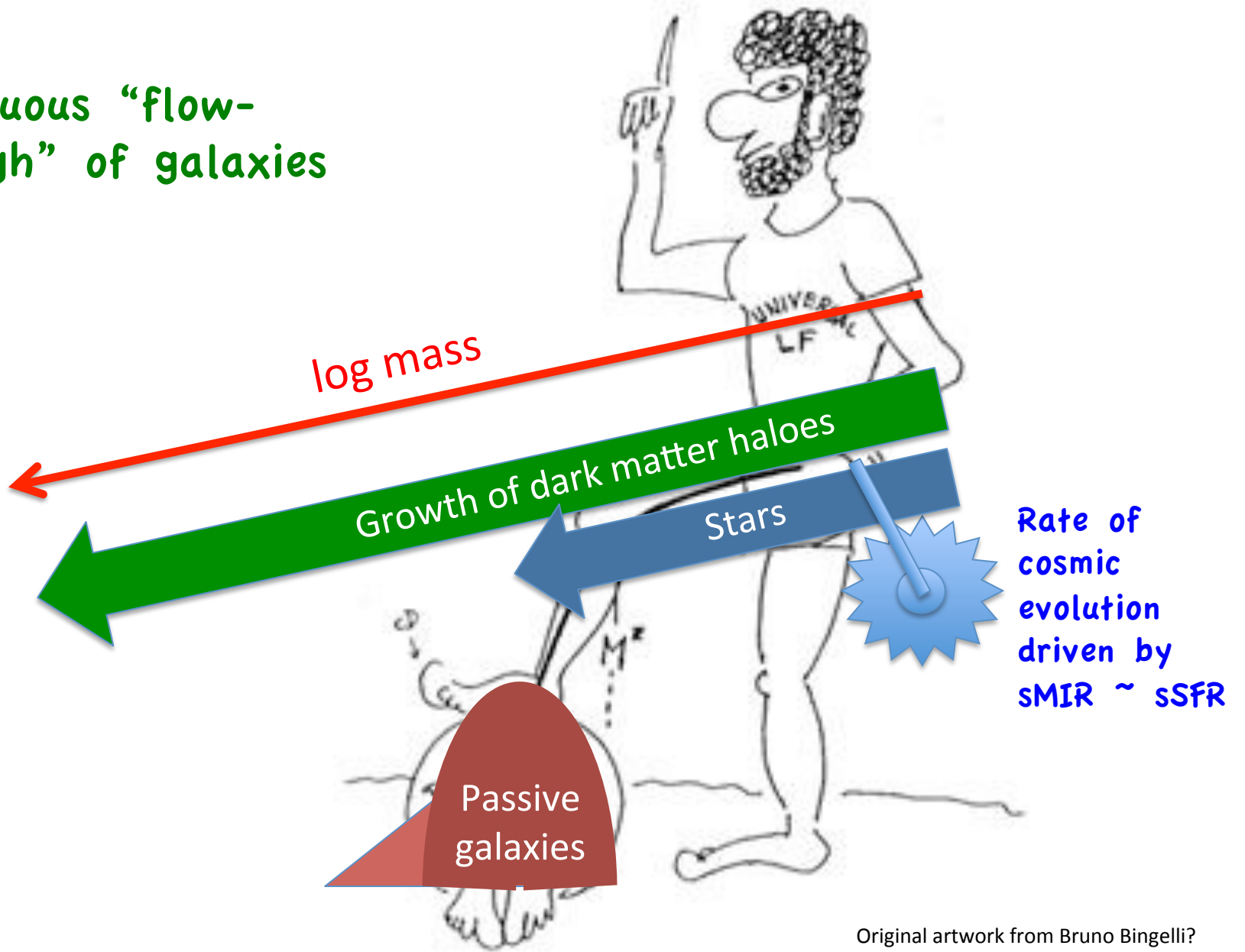


Continuous “flow-through” of galaxies



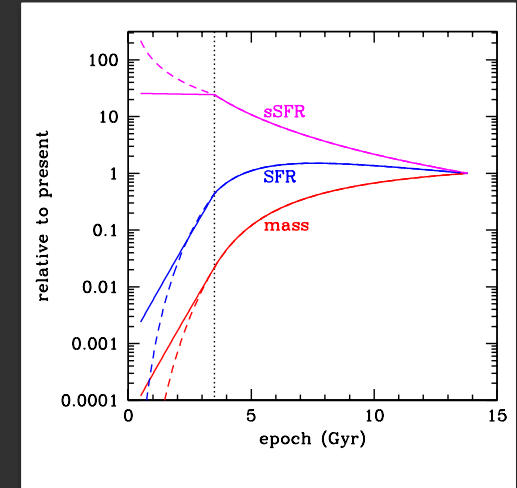
Original artwork from Bruno Bingelli?

“Downsizing”



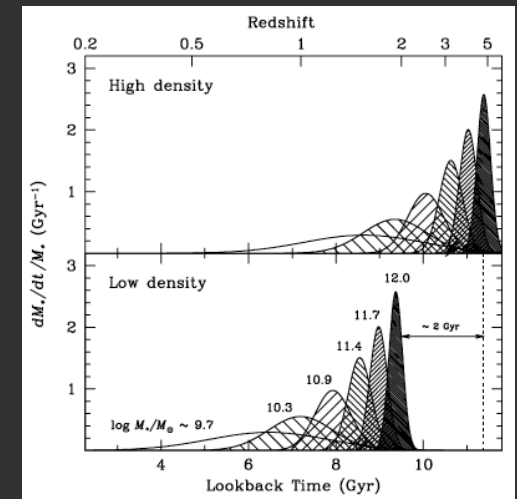
Lower mass galaxies e.g. $\log m_{\text{star}} \leq 10.8$

- Stellar population formed over the Hubble time with roughly constant SFR



Massive galaxies e.g. $\log m_{\text{star}} \geq 10.8$

- Stellar population formed over short period of time in early Universe
- Age and τ^{-1} both increase with mass



Thomas et al 2005

Two comments on “downsizing”

Galaxies which are today quenched (generally with high mass) probably did so at high z , because quenching rate proportional to SFR ($\times 20$ at $z = 2$). Galaxies which are today not quenched (generally with lower masses), did not quench!

- At high z , ALL galaxies have higher sSFR and shorter mass-doubling times. The fact that the MS $\beta < 0$ actually implies that at all redshifts it is the LOWER mass galaxies that are evolving fastest, i.e. with highest sSFR and shortest mass-doubling times! But galaxies that quench early don't experience the lower sSFR at later times
- Fact that new passives are being created with constant M^* (same M^* as SF population but $\alpha_p = \alpha_{sf} + 1$) with some subsequent mass increase due to merging means that the most massive passives today will have been the ones that quenched earliest (when cosmic with sSFR was highest) so as to maximise the time for subsequent growth via merging

i.e. $\text{age}(m)$ and $\alpha\text{-enrichment}(m)$ are not “anti-hierarchical”, but exactly hierarchical!