

# **The different modes of star formation in the distant Universe**

Fadia Salmi

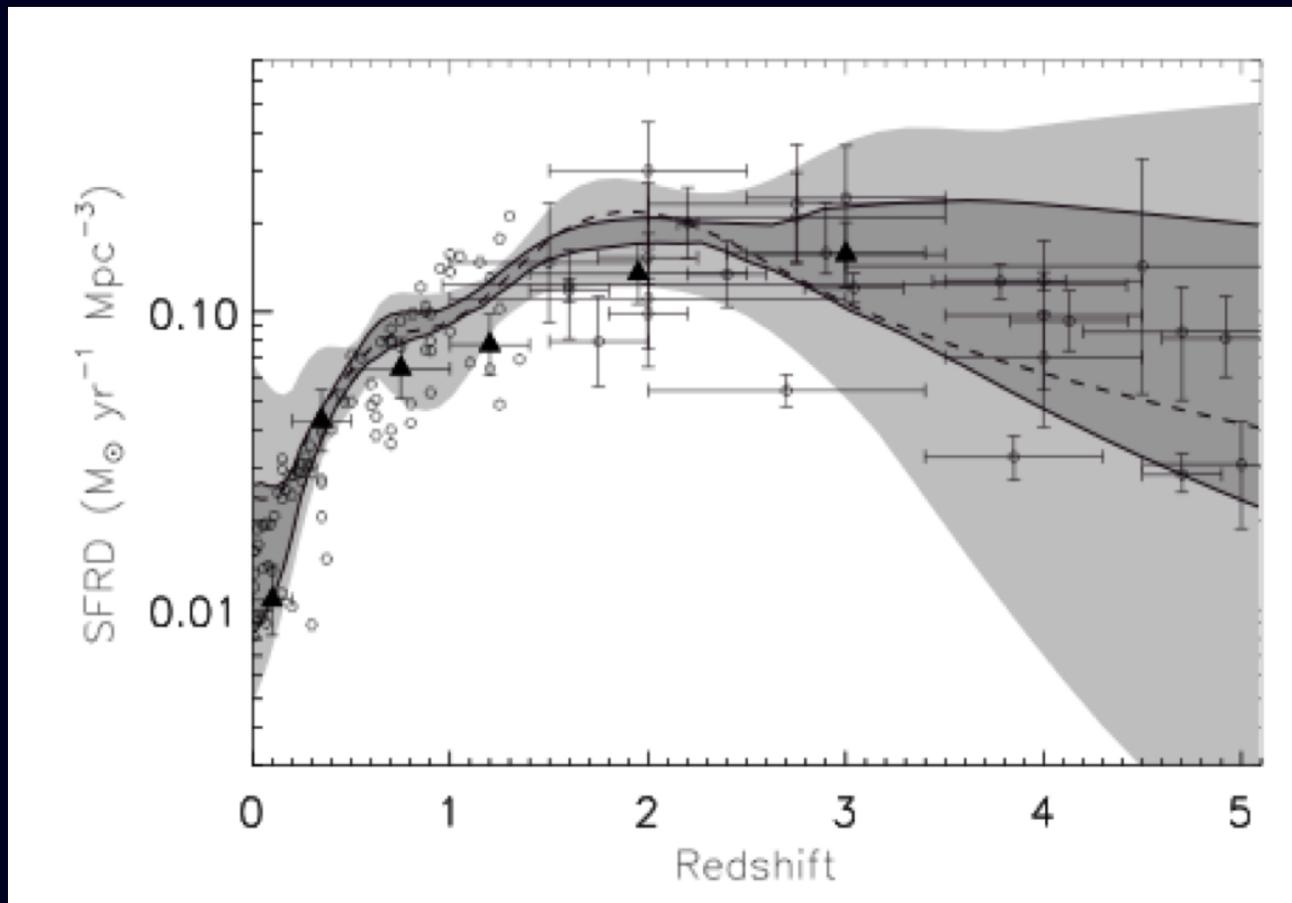
with

Emanuele Daddi and David Elbaz

(Salmi et al. 2012)

# Cosmic SFRD

Cosmic star formation history, evolving with redshift



Le Borgne et al. 2009

SFR=Star Formation Rate



# Mode of star formation

Merging? Interactions? (Burst mode : triggering of the star formation)

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More important gas? (Secular mode : continuous star formation, gas reservoir  
fed with cold gas accretion)

*As an example Clumpy galaxy : structure with granular aspect*





# Mode of star formation

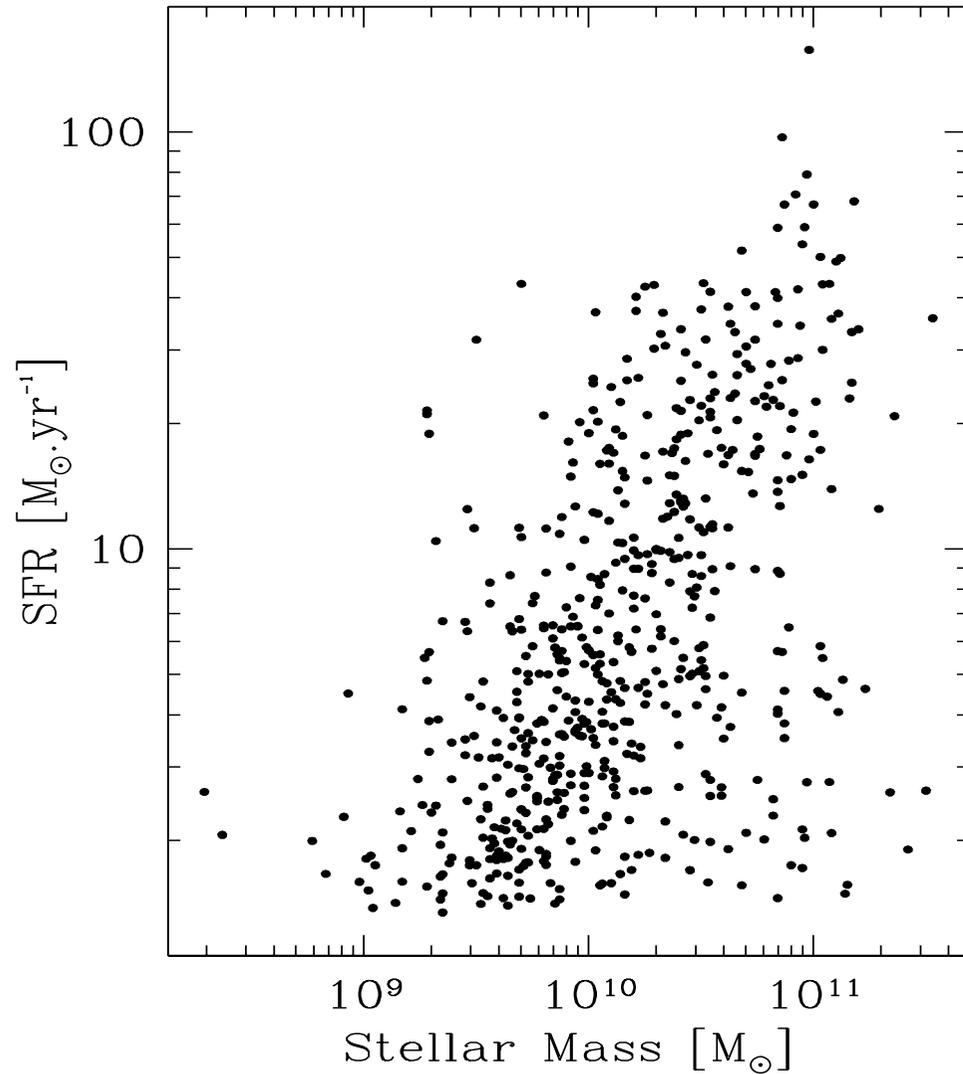
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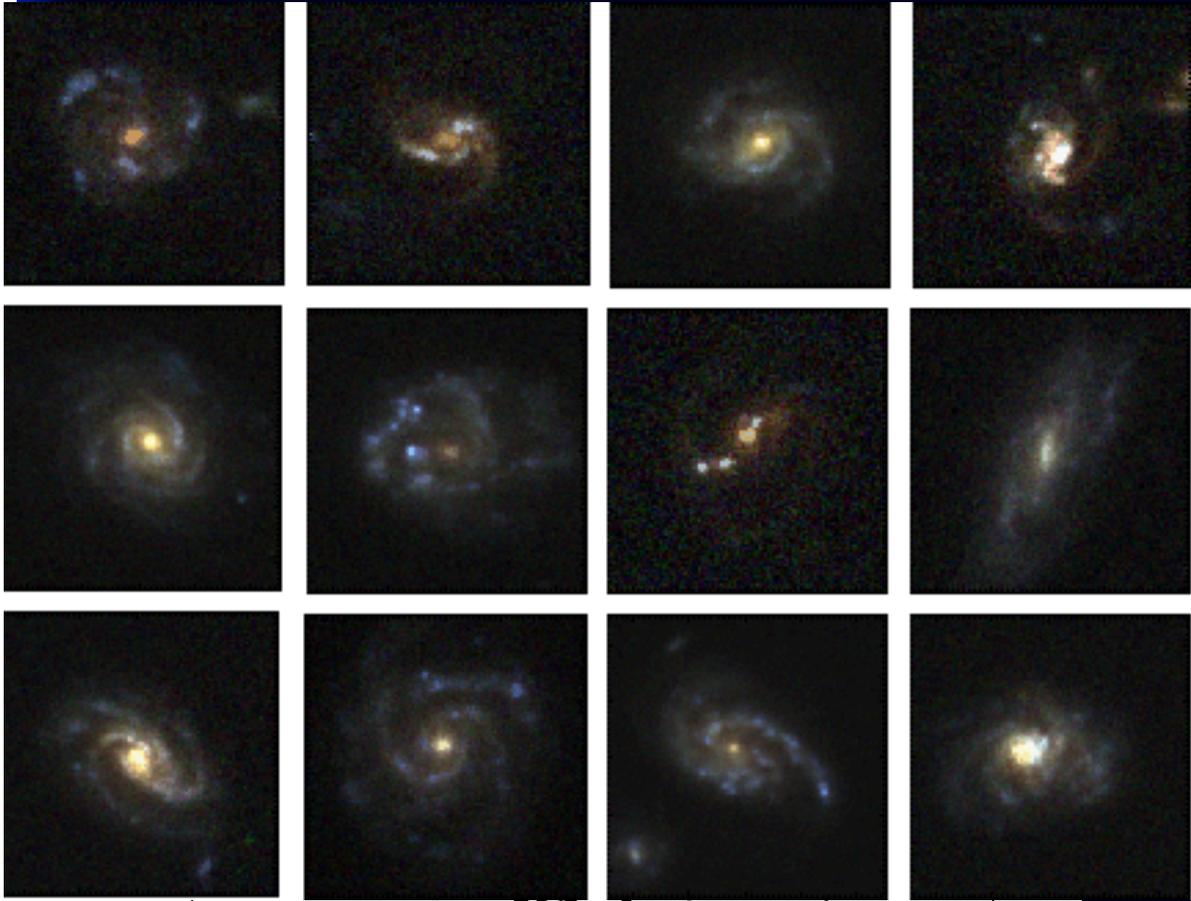
**Dominant mode of star formation in galaxies?**

General scaling law which permits to constrain the  
underlying physical phenomena :  $\text{SFR} \propto M^*$

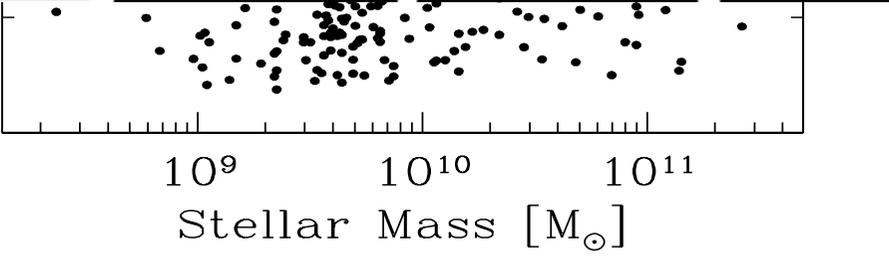


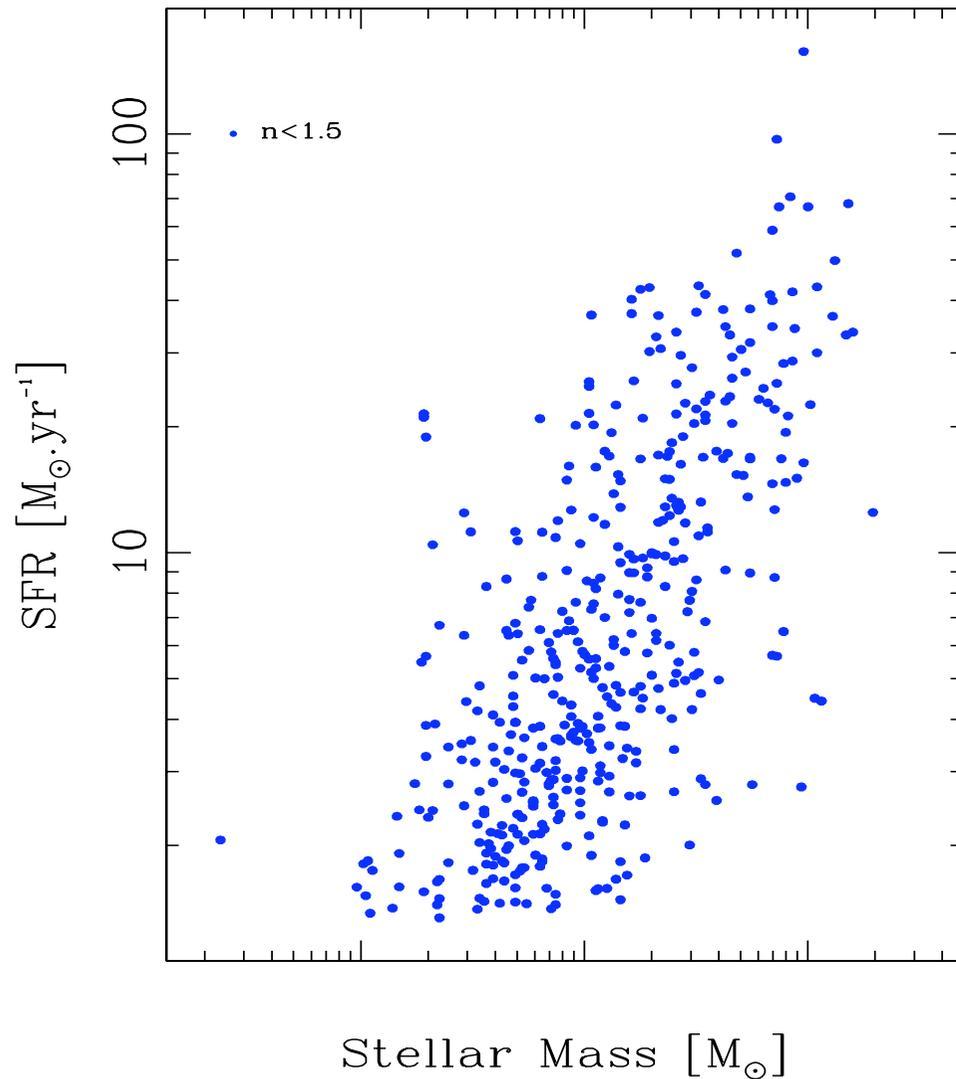
✧ Sequence but *outliers*  
➔ cloud

# SFR-M\*



✧ Sequence but *outliers*  
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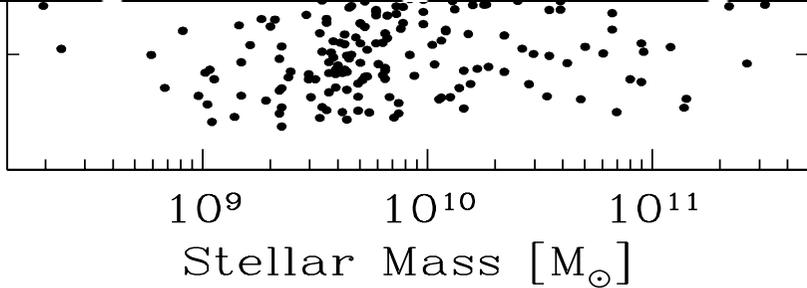
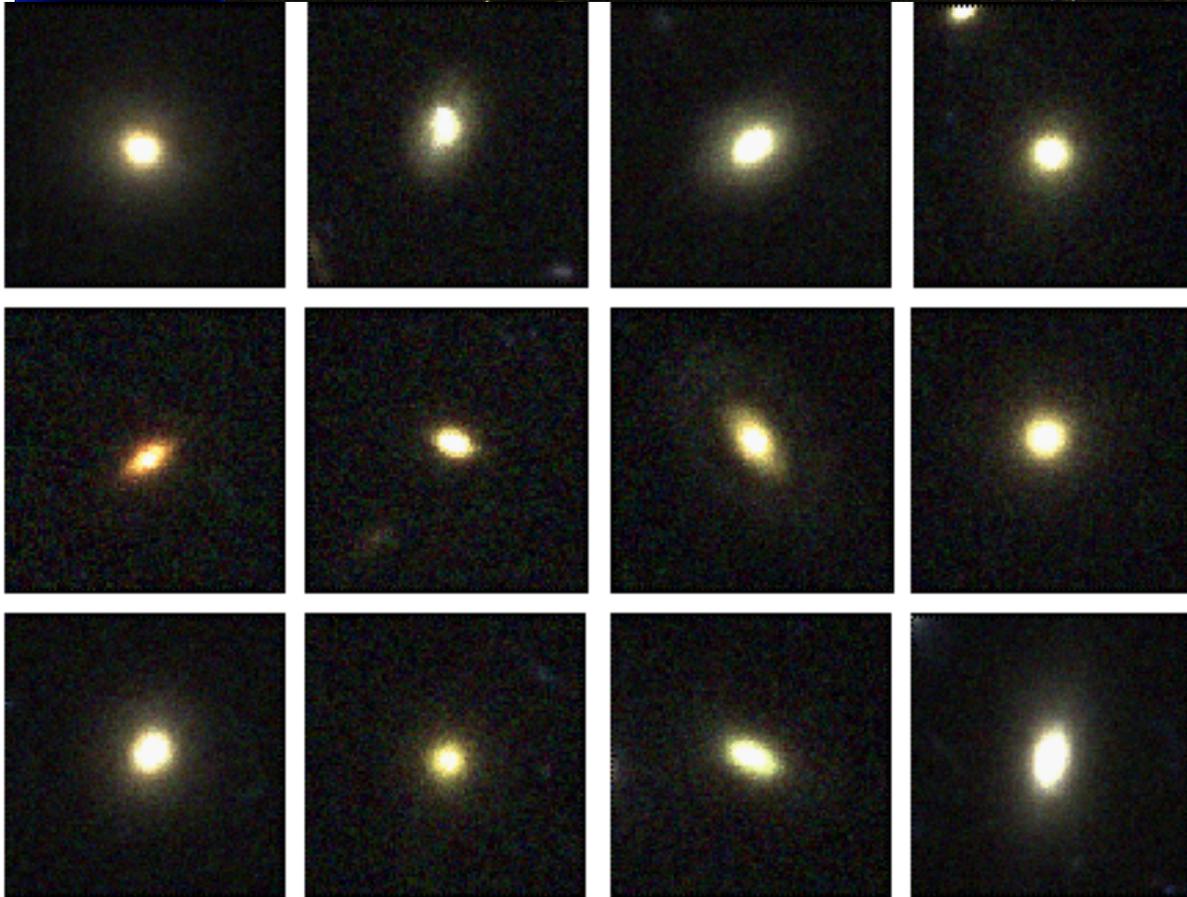


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Morphology discriminant factor

✧ Main Sequence  
(93% disks, 7% spheroidals)

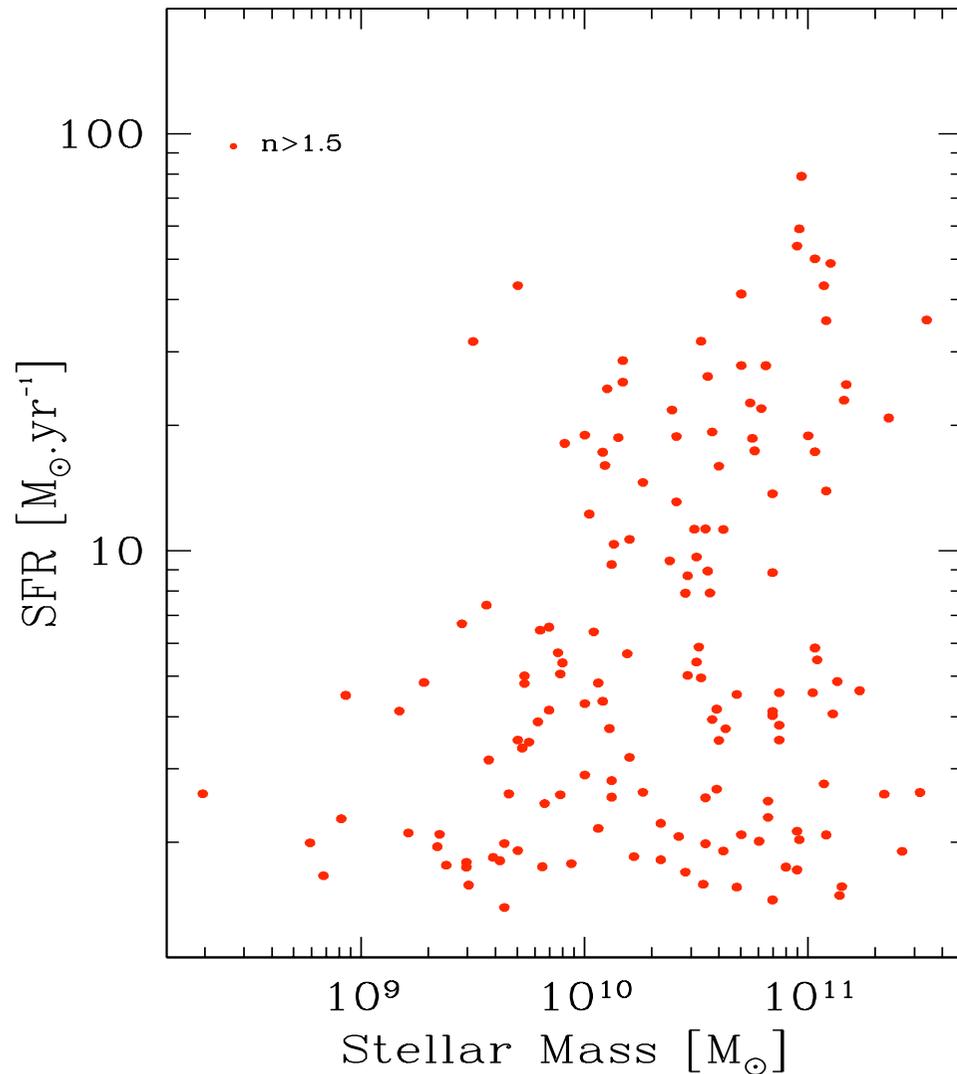
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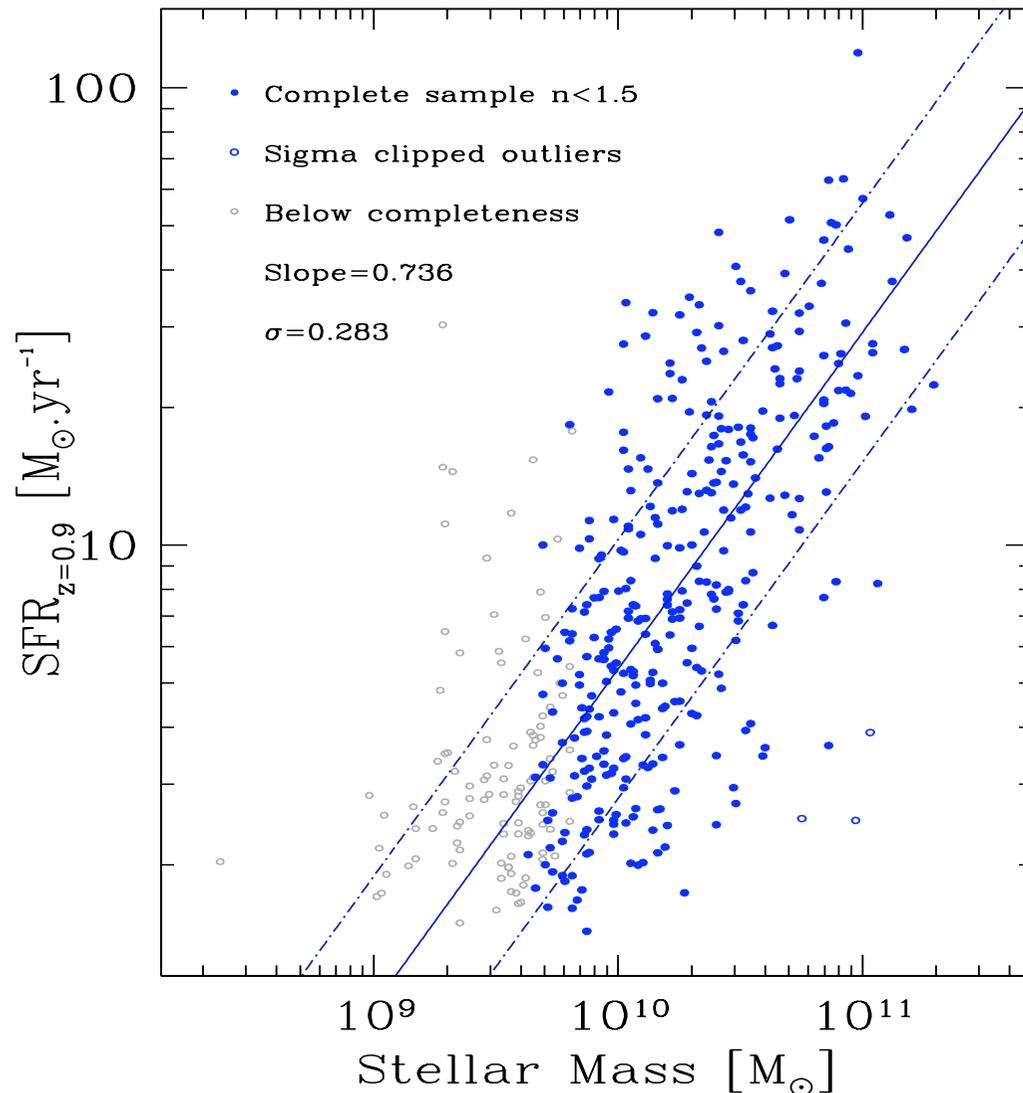


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# Characteristics of SFR-M\*



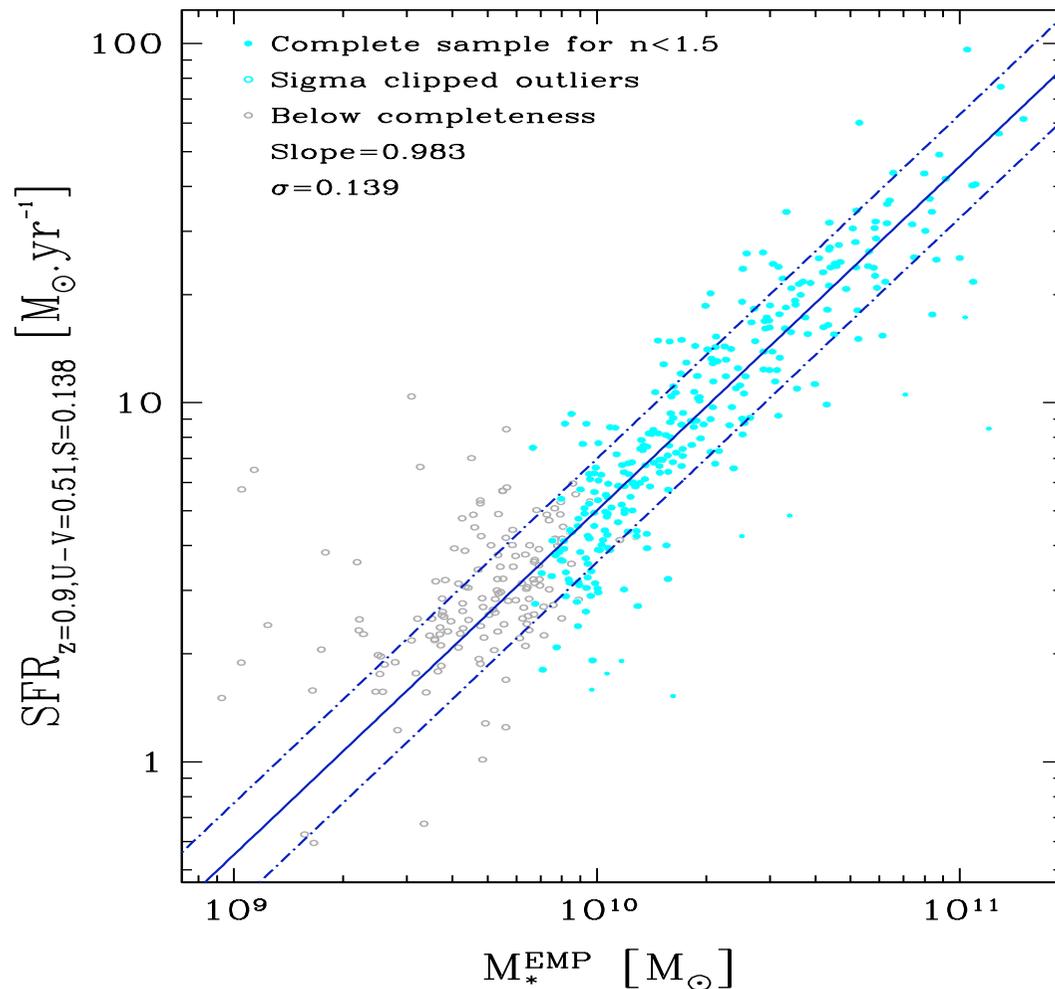
Initial measurements

Slope = 0.736

Scatter = 0.283 dex

# Scatter : the total

✧ Empirical mass + U-V + *clumpiness*



Slope : 0.736  $\rightarrow$  0.983  $\approx$  1

Scatter : 0.283  $\rightarrow$  0.139 dex

Contribution in the scatter  
 $\approx$  0.25 dex

Accurate estimation of SFR  
with 0.1 dex accuracy



# SFR-M\*

different redshifts

