

Colloquium

SFB 956

Conditions and Impact of Star Formation

16.06.2017 | supplementary colloquium

Friday 11:00 am

Max-Planck-Institut für Radioastronomie

Auditorium 0.02

Auf dem Hügel 69 | 53121 Bonn

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Are galaxies self-centered or social beings ?

Local galaxies exhibit a bimodal distribution. Red-dead galaxies are more clustered than blue-star forming galaxies suggesting that galaxies are social beings whose life depends on their environment. In apparent contradiction, evidence has been accumulated for a universality of the star-formation history of galaxies independently of their environment. The so-called main sequence of star forming galaxies indeed suggests that it their mass that controls the history of galaxies; in situ mechanisms being more important than ex situ ones.

I will review recent results obtained with the combination of Herschel and ALMA and discuss this apparent contradiction between the respective roles of in situ and ex situ mechanisms in the history of galaxies.

I will present a population of distant massive star-forming galaxies that were missed by the standard Lyman-break technique and discuss their role on the origin of compact early-type galaxies seen at $z \sim 2$, whose progenitors have been missing until now. The most extreme of these, missed even in the deepest HST NIR images, now jump to the eye with ALMA. I will show that these massive distant galaxies follow the universal star-forming main sequence up to $z=4$. Their closer siblings studied at $z=2.5$ trace the most distant massive galaxy cluster caught at the very epoch of its formation.

I will then discuss possible physical mechanisms at play in these galaxies. Do giant kpc-clumps of star formation play an important role in the mass growth of a galaxy? What is the role of galaxy mergers vs violent dynamical instabilities? Is there a negative or positive effect of active nuclei in the stellar mass growth of galaxies ?

