Colloquium

SFB 956

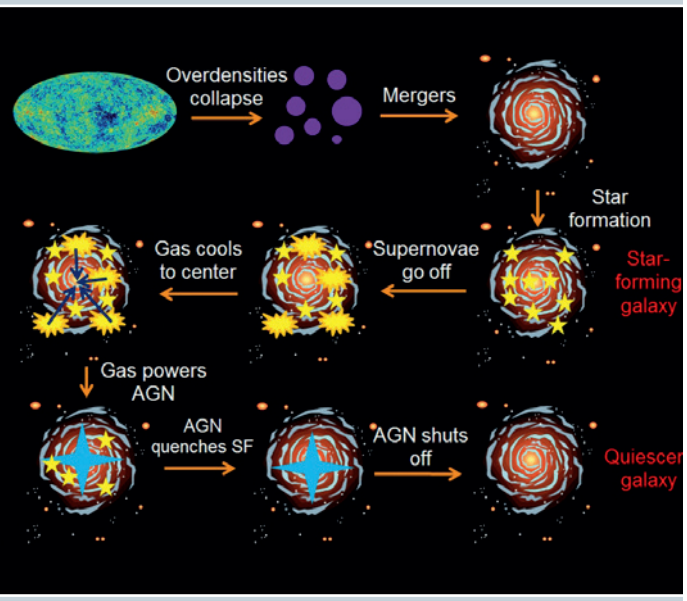
Conditions and Impact of Star Formation

18.06.2015 | supplementary colloquium

Thursday 11:00 am

AIfA, Bonn

Argelander-Institut für Astronomie
Auf dem Hügel 71 | 53121 Bonn
Lecture Hall 0.012



Charles Steinhardt

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Are All Galaxies the Same? A Synchronized, Uniform Framework for Galaxy and Black Hole Evolution

Initial results from SPLASH, an ultra-deep multi-wavelength survey, allow a study of star formation out to z~6. Combining these results with dozens of star formation and supermassive black hole accretion studies, there is a consistent picture of galactic evolution at $0 < z < 6$. These results also create tension with hierarchical merging at high redshift. We can define a „synchronization timescale" for galaxies as a measure of the uniformity of an ensemble of galaxies at various cosmic epochs. If galaxy evolution is dominated by stochastic processes, then galactic events occurring at high redshift should happen at nearly the same time across an ensemble of galaxies, while events occurring at low redshift should be much less synchronous. Surprisingly, this synchronization timescale is both mass- and time-independent, a constant 1.4 Gyr for all combinations of mass and time. As a result, we are prompted to consider a framework for galactic evolution along a main sequence so that star formation, supermassive black hole accretion, and feedback between the two are dominated by deterministic rather than stochastic processes.