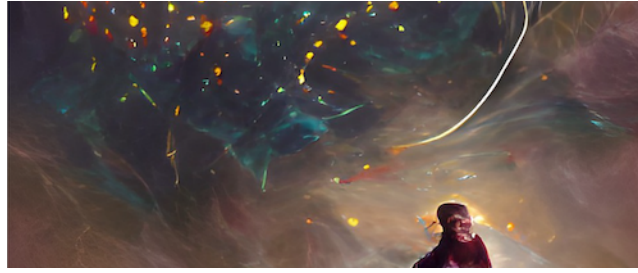


Cosmic Cartography 2022: Exploring the Cosmic Web and Large-Scale Structure



Contribution ID: 31

Type: not specified

Accelerated growth of galaxies and super-massive black holes within the cosmic web gas filaments at $z=3$

Wednesday, 9 March 2022 09:40 (20 minutes)

A generic prediction in a cold dark matter universe is the presence of a network of filaments, at the intersection of which galaxies form and evolve. Now the advent of IFU instruments enables us to directly trace the gas filaments and uncover galaxy formation and evolution within the filaments. In this regard, one of the best target is the SSA22 proto-cluster at $z=3.1$. Our MUSE observations map the gas in filamentary structures on a Mpc-scale. Intense star formation and supermassive black-hole activity is also found to occur within the galaxies embedded in this structure, suggesting that the growth of galaxies and black holes in massive proto-clusters is fed by the gas filaments of the cosmic web. The SSA22 proto-cluster will further provide an invaluable target for PFS to investigate the nature of the cosmic web and the role in galaxy formation, together with the ongoing deep Lyman-alpha mapping with Subaru/HSC.

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Session Classification: Day 3 Morning