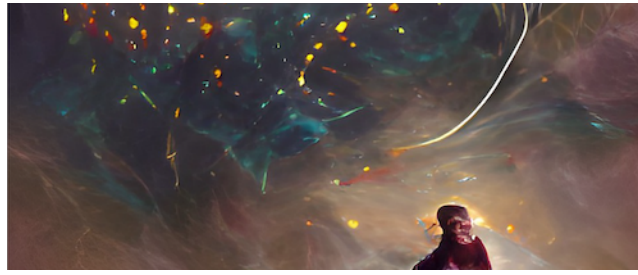


Cosmic Cartography 2022: Exploring the Cosmic Web and Large-Scale Structure



Contribution ID: 13

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The Cosmic Web and Galaxy Ecosystems Revealed by Slime Mold

Tuesday, 8 March 2022 10:40 (20 minutes)

Gas in the Cosmic Web, long associated with the IGM on large scales and CGM on small scales must fuel galaxy reservoirs and bear the imprint of galaxy feedback and structure formation. However, empirically connecting galaxies, their CGM, and the IGM within a Cosmic Web context has proven elusive. I will present our Cosmic Web reconstruction method Monte Carlo Physarum Machine (MCPM), inspired by the Physarum polycephalum slime mold, as well as new insights to galaxy ecosystems leveraging this methodology. At low and high redshift, I will demonstrate 1) the first conclusive association between the diffuse IGM and large-scale structure traced by galaxies and 2) that the physical conditions of the IGM and CGM depend critically on location within the Cosmic Web. Lastly, I will present our MCPM reconstruction data products covering $z=0.01-0.51$ that were recently released publicly with SDSS DR17.

Presenter: BURCHETT, Joseph (New Mexico State University)

Session Classification: Day 2 Morning