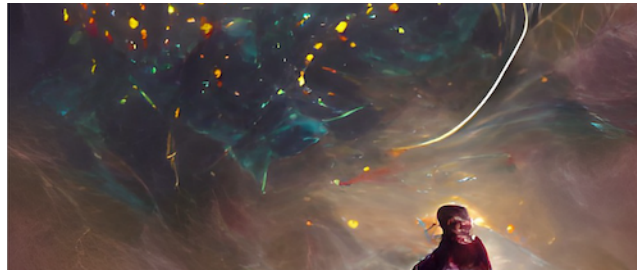


Cosmic Cartography 2022: Exploring the Cosmic Web and Large-Scale Structure



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Spinning filaments: the largest rotation in the universe

Tuesday, 8 March 2022 16:05 (20 minutes)

How rotation is generated in a cosmological context is one of the key unsolved problems of cosmology. In the standard model of structure formation there is no primordial rotation and rotation must be generated as structures form. The cosmic web in general, and filaments in particular, are intimately connected with galaxy formation and have a strong effect on galaxy spin, regulating how they rotate. By focusing on filaments, we hope to identify how spin arose in the Universe. To do so, the motion of hundreds of thousands of galaxies was mapped and examined to see if these long tendrils spin on the scale of hundreds of millions of light years. A rotation on such enormous scale has never been seen before. By approximating filaments as cylinders the mean redshift difference (the Doppler shift) between galaxies on the receding (red) and approaching (blue) side of the filament tube was measured. A rotation signal was identified, opening a new door in understanding why everything in the universe spins.

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Session Classification: Day 2 Afternoon