
**Galaxy Formation and Evolution in 3D**

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Tracing matter and chemical elements in the Universe is critical for understanding the formation of the first galaxies, the formation and growth of supermassive black holes, and ultimately the evolution of galaxies like our Milky Way. Throughout the history of the universe, large-scale gas flows have moulded the arms of spiral galaxies, formed the bulges of the most massive galaxies in the universe, fed supermassive black holes in the centers of galaxies, fueled generation upon generation of new stars, and enriched the intergalactic medium with metals. The physics and impact of these processes can now be traced through new efficient, wide-field 3D integral field spectrographs. We use multi-object integral field spectroscopy to build the largest local sample of galaxies with wide 3-dimensional imaging spectroscopy. We combine our local results with insights into the early universe probed through gravitational lensing and adaptive optics. I will present the latest results from our large local and high-z 3D surveys to understand the relationship between gas inflows, galactic-scale outflows, star-formation, chemical enrichment, and active galactic nuclei in galaxies. I will finish by discussing how this field will be transformed in the JWST and ELT era.