Probing Minor-merger-driven Star Formation in Early-type Galaxies Using Spatially-resolved Spectro-photometric Studies

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Recent studies that leverage the rest-frame ultraviolet (UV) spectrum have revealed widespread recent star formation in early-type galaxies (ETGs), traditionally considered to be old, passively-evolving systems. This recent star formation builds 20% of the ETG stellar mass after $z = 1$, driven by repeated minor mergers between ETGs and small, gas-rich satellites. We demonstrate how spatially-resolved studies, using a combination of high-resolution UV-optical imaging and integral-field spectroscopy (IFS), is a powerful tool to quantify the assembly history of individual ETGs and elucidate the poorly-understood minor-merger process. Using a combination of WFC3 UV-optical (2500-8200 Å) imaging and IFS from the SAURON project of the ETG NGC 4150, we show that this galaxy experienced a merger with mass ratio 1:15 around 0.9 Gyr ago, which formed 3% of its stellar mass and a young kinematically-decoupled core. A UV-optical analysis of its globular cluster system shows that the bulk of the stars locked up in these clusters likely formed 6-7 Gyrs in the past. We introduce a new HST-WFC3 programme, approved in Cycle 19, which will leverage similar UV-optical imaging of a representative sample of nearby ETGs from SAURON to study the recent star formation and its drivers in unprecedented detail and put definitive constraints on minor-merger-driven star formation in massive galaxies at late epochs.