

The link between supermassive black hole activity and star formation

The physical processes underlying the evolution of galaxies, which shape the diversity of present-day galaxies, has yet to be understood. One of the most important unresolved questions is, what role do central supermassive black holes (SMBH) play in galaxy evolution? The link between the SMBH and the host galaxy properties is now well documented, showing a tight correlation between the mass of an extinct SMBH and the properties of its host galaxy, whose star formation is quenched. Does all the activity (star formation and SMBH) cease when the galaxy uses up its cold gas, or are energetic outflows from the SMBH responsible for re-heating the gas, and thus shutting off the star formation? Observations of the SMBH and its host galaxy during the active phase, using a combination of optical imaging and spectroscopy and X-ray imaging can address these questions, to determine the physical state of the galaxy during this quenching phase. This proposal aims at starting a collaboration between experts from Princeton and UNIGE focused on the scientific analysis of data recently obtained as part of two ambitious projects supported by both universities: ESA's XMM-Newton "XXL" observing program, using the most powerful X-ray satellite, and the Princeton/Japan-led "HSC" wide-field survey at the 8.2-meters Subaru telescope. Both projects started a few years ago and will continue for another 3 (XXL) and 4 (HSC) years. This project aims at building a long-standing collaboration between the two groups from UNIGE and Princeton. In 2020, the ESA-led Euclid mission will launch, giving yet more powerful data to be analyzed to address these questions. The primary goal of this proposal is to allow PhD students from both universities to visit UNIGE or Princeton, and attend the XXL and HSC collaboration meetings. This project involves 1 student from each institution.

Participants :

Dr Stéphane Paltani
University of Geneva - Department of Astronomy
[Website](#)

Dr Jean Coupon
University of Geneva - Department of Astronomy
[Website](#)

Prof Michael Strauss
Princeton University - Department of Astrophysical Sciences
[Website](#)

Prof Jenny Greene
Princeton University - Department of Astrophysical Sciences
[Website](#)