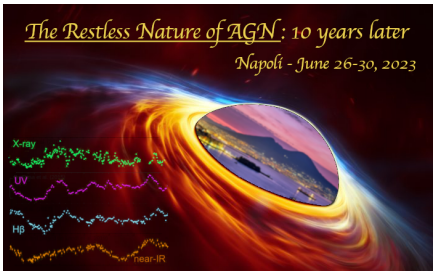

Contribution ID : **54** Type : **Contributed talk**

Exploring the jet-BLR connection: flare-induced variability in the optical emission lines

martedì 27 giugno 2023 11:00 (15)

PKS 2004-447 is a narrow-line Seyfert 1 (NLS1) galaxy harboring relativistic jets capable of producing gamma-ray emission. On 2019-10-25, the Fermi Satellite detected a gamma-ray flare from this source for the first time. Thanks to coordinated spectral observations, we had a unique opportunity to study the behavior of the broad-line region (BLR) during a jet flare and searching for optical variability. Despite the obvious importance of understanding whether the jet can interact with the BLR, this aspect has not been thoroughly investigated. In my talk, I will introduce the peculiar nature of PKS 2004-447, which has remained poorly understood since its identification more than twenty years ago. I will also report on the results of our FORS2 and X-Shooter observations carried out before, during, and after the flare. During the high-energy event, a flux excess redshifted by 250 km/s is clearly seen in the Balmer, Paschen, and He I permitted lines. Such behavior has never been observed before, and interestingly this new emission feature is no longer visible 1.5 years after the flare, indicating a possible causal connection with the gamma-ray flare. The emission lines coming from the same atomic transition series show a similar velocity offset for this “red excess”, but the offset changes for different line series. This discovery suggests that the relativistic jet can affect the physics of the BLR in this peculiar AGN, and that flaring activity can lead to the formation of additional and localized broad emission components. Our results highlight the importance of optical spectroscopy for flaring jetted AGN, and that our understanding of the jet-BLR connection is still very limited. These results will be used as a starting point for future dedicated studies of this kind.

Primary author(s) : Dr. BERTON, Marco (European Southern Observatory (ESO))

Co-author(s) : Dr. SANI, Eleonora (European Southern Observatory (ESO)); Mr. HON, Wei-Jeat (University of Melbourne)

Presenter(s) : Dr. BERTON, Marco (European Southern Observatory (ESO))

Session Classification : Emission Line variability