Contribution ID: **4** Type: **Regular**

Low-mass galaxy interactions trigger AGN activity

Tuesday 8 October 2024 11:35 (15 minutes)

Recent discoveries of supermassive black holes existing less than 500 million years after the Big Bang represent a major puzzle. How did these black holes grow so much in such a short time? In this talk, I will discuss how the early Universe environmental conditions could have led to an accelerated black hole growth. The prevailing wisdom suggests that the early Universe is dominated by dwarf galaxies that are undergoing concurrent and consecutive interactions with other dwarfs. I constructed the largest sample of low-z dwarf-dwarf pairs and groups using the 3D-HST survey, which can be used as local analogs of high-z interacting dwarfs. Then, I used Chandra deep sky surveys to discover 6 AGN in these systems, increasing the number of known dwarf-dwarf merger-related AGN from 1 to 7. I constructed a sample of isolated dwarfs, with the same redshift-stellar mass distribution as interacting dwarfs, and found that interacting dwarfs are 6-10 times more likely to host AGN. This discovery demonstrates that low-mass galaxy interactions are very efficient in triggering black hole activity and opens new avenues in studying the growth mechanisms of the first supermassive black holes.

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Session Classification: Physics of AGN