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Machine Learning for AGN selection and classification in the era of time domain surveys

Monday, 22 July 2024 11:45 (25 minutes)

In this talk, I will present a review of the different machine learning (ML) techniques used to select and classify active galactic nuclei (AGNs) in large photometric surveys, such as the Zwicky Transient Facility (ZTF), Pan-STARRS, La Silla QUEST survey (LSQ), and the upcoming Rubin Observatory Legacy Survey of Space and Time (LSST). I will first introduce the most popular ML selection techniques currently used, followed by a discussion on the use of AGN variability and ML to identify different sub-classes of AGNs that the more traditional selection techniques could miss. I will examine the advantages and disadvantages of using optical alert streams to identify new AGN candidates, in contrast with other data products from the same surveys, taking as an example the experience of the ALeRCE broker. ALeRCE has been using ML techniques to separate transients and persistently variable objects, including three classes of AGNs, taking advantage of their distinct variable behaviour with respect to other classes of objects. I will focus on the currently available ZTF alert stream and their data releases and will discuss what we should expect from the LSST.

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