Astronomy Seminar

Haoning He

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Searching for Sources of Ultrahigh-energy cosmic rays

Time: 10:00-11:00, 25 December (Wednesday), Shanghai time

Venue： N600（TDLI)

Host: Hao Zhou (周浩)

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Abstract:

Ultrahigh-energy cosmic rays (UHECRs) are the highest energy messenger from space, with energies exceeding 1 EeV. Although UHECRs were discovered over 60 years ago, their origin still remains a mystery. Pinpointing sources of UHECRs is crucial for understanding the extreme astrophysical processes that accelerate particles to such extraordinary energies. We searched for UHECR multiplets via analyzing 17 years of data with energies greater than 40 EeV from the Pierre Auger Observatory. A spatial association is found between a multiplet of 26 cosmic rays and the Sombrero galaxy with a local (global) significance of 4.5 sigma (3.3 sigma). The Sombrero galaxy hosts a supermassive central black hole with a mass of ~ 1e9 Solar Mass, and exhibits large-scale radio lobes and jets. Our finding provides critical evidence on active supermassive black holes as the source of the highest-energy cosmic rays.

Biography:

Dr. Haoning He received her B.S. and Ph.D. degrees from Nanjing University in 2007 and 2012, respectively. Then she started her postdoctoral research at Purple Mountain Observatory, UCLA and RIKEN from 2012 to 2020. She's now an associate researcher at Purple Mountain Observatory. Dr He's current research focuses on searching for sources of high-energy cosmic rays and high-energy neutrinos via a multi-messenger approach.

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