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Observational Puzzles and Prospectives: Growing Supermassive Black Holes at $z > 6$

Monday, 8 July 2024 17:00 (30 minutes)

JWST's discoveries of black holes with masses $\sim 108 M_{\odot}$ when the Universe was less than 5% of its current age challenge our understanding of star and black hole formation. The leading hypothesis to explain these observations is the inflowing of a large amount of gas directly onto the SMBH from galaxy-wide scales while maintaining gas stability against star formation. However, alternatives in which the initial seeds are already massive either because they formed from dark-matter powered stars or as direct collapse black holes can successfully explain a wide range of observations. In this talk, I will discuss multiwavelength and multi-messenger observations from current and planned missions (e.g., JWST, Nancy Grace Roman, and the Square Kilometer Array) and their potential to distinguish between the various theories about the origins of supermassive black holes at $z > 6$.

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