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Finding EMRI Gravitational Wave Signals in Simulated LISA Data

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In preparation for the upcoming Laser Interferometer Space Antenna (LISA) mission, the LISA Data Challenges pose a series of open questions on how to extract gravitational wave (GW) signals from simulated LISA data. Solving these challenges is essential to demonstrating effective analysis methods for the mission in the mid-2030s. As the LISA mission will detect GW signals in a new frequency range, a variety of previously undetected GW source types will be present in the LISA data. One such source type is the extreme mass-ratio inspiral (EMRI), an inspiraling binary system where a stellar mass object orbits a supermassive black hole. This project seeks to use Markov Chain Monte Carlo (MCMC) algorithms to develop reliable methods for identifying EMRI signals and extracting their source parameters.

Presenter: MULLER, August (Haverford College)

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