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Dipartimento di Fisica e Astronomia Galileo Galilei

COLLOQUIUM DFA

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Probing the low frequency gravitational wave universe with a galactic-scale detector

Abstract: On June 2023 several collaborations around the world published evidence for nano-Hz frequency gravitational waves (GWs) in pulsar timing data. I will describe the technique of pulsar timing and how it can be used to detect low frequency GWs, the detected signal and its possible interpretations. The primary candidate is the cosmic population of massive black hole binaries (MBHBs) but a cosmological origin is not ruled out by observations. I will discuss the importance of this detection and the way ahead to pin down the nature of the signal.

Alberto Sesana is a Full Professor of Astrophysics at the University of Milano-Bicocca. He obtained his PhD in Physics and Astrophysics in 2007 and has held research positions in Germany, the UK, and the United States, including at the Albert Einstein Institute and the University of Birmingham. His research focuses on gravitational-wave astrophysics, massive black hole binaries, pulsar timing arrays, and space-based detectors such as LISA. He is a leading contributor to the LISA science case and holds major grants, including two ERC grants (Consolidator and Advanced). He has supervised numerous PhD students and postdoctoral researchers and plays a prominent role in international scientific collaborations (specifically LISA and the European Pulsar Timing Array -- EPTA) and ESA advisory bodies.

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