

Sachdev-Ye-Kitaev model: from quantum chaos to quantum gravity

【摘要】

I first provide a brief overview of the Sachdev-Ye-Kitaev (SYK) model, N fermions in zero spatial dimensions with infinite range interactions in Fock space and its relation to black hole and wormhole physics. Afterwards, I review some of my recent research on this topic focused on the non-hermitian SYK as a toy model for dissipative quantum chaos or quantum measurement, Euclidean wormholes and many-body topology. I conclude with recent results on the sparse SYK model that broadens the scope of theories with a gravity dual and also provides a novel platform for efficient quantum many-body fermionic simulations on GPU.

【报告人简介】



Antonio received his PhD by the State University of New York at Stony Brook. He held postdoctoral appointments in the Université Paris-Sud, now Paris-Saclay, and Princeton University. Later, he was a junior faculty in the Cavendish Laboratory of Cambridge University. In 2017, he joined Shanghai Jiao Tong University where he is now a Full Professor. He has over one hundred publications. Highlights of his previous research include a theory of finite size effects in blackbodies and nano-superconductors and its experimental confirmation, the development of a novel theory of defect formation in dynamical phase transitions and a semiclassical analytical description of the Anderson metal-insulator. The main themes of his current research are many-body quantum chaos, low dimensional quantum gravity and quantum information brought together by the study of the Sachdev-Ye-Kitaev model.

【报告人】

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