

第35回 RESCEU コロキウム



東京大学大学院理学系研究科 附属ビッグバン宇宙国際研究センター

日 時: 2019年3月7日(木) 13:30 ~ 14:30

場 所: 理学部4号館1階ピロティ RESCEU セミナー室

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Phase space complexity of star clusters: fresh observables for old and new questions

Our traditional paradigm of the internal dynamics of globular clusters has been recently revolutionised by a series of discoveries about their chemical, structural, and kinematic properties. The empirical evidence that their phase space structure is much more complex than usually expected encourages us to use them as refreshingly novel playgrounds for some long-forgotten aspects of collisional gravitational dynamics. Such a realisation, coupled with the discovery that the stars in clusters were not all born at once in a single population, makes them challenging 'chemodynamical' puzzles, with a suite of new questions to be addressed.

This renaissance is stimulated and enabled by significant advancements on the observational side. Precision astrometry now available from Gaia DR2 is complemented by decades-long HST campaigns and recent ESO spectroscopic surveys. The timeline of the forthcoming Gaia data releases is accompanied by the promise of future facilities (such as WEAVE, 4MOST, and MOONS), which will provide crucial spectroscopic follow-ups. And there is much hope that the opportunity to characterise the properties of 'proto-clusters' in the early universe will finally be within reach, thanks to JWST and E-ELT.

In this thriving context, I will discuss our current understanding of the internal dynamics of these collisional stellar systems and present some new theoretical insight emerging from a more realistic description of their phase space, with emphasis on the distinction between signatures resulting from the early formation stage ('primordial features') and from long-term dynamical processes ('evolutionary features'). Specific attention will be given to the interplay between internal rotation and tidal effects, with analogies to spin-orbit coupling in planetary dynamics. The final goal of this synergy between 'remastered' theory and fresh observables will be a deeper understanding of the role of 'small scales' in the assembly of cosmic structures in our universe.

興味をお持ちの方の聴講を歓迎致します。お茶とお菓子を用意しております。