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RUMO A UMA COMPREENSÃO GLOBAL DE COMO ANÃS BRANCAS ACRETANTES SE FORMAM E EVOLUEM

Relatório de Pós-doutorado realizado na Universidade Estadual Paulista (UNESP), Faculdade de Engenharia e Ciências, Guaratinguetá.

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1 Abstract of Young Investigator Grant Project

The main objective of this project is to investigate the formation and evolution of accreting white dwarfs using numerical simulations. The study of accreting white dwarfs bears relevance for several fields of research due to their wide variety of phenomena, over virtually all wavelengths and on a broad range of timescales, which makes them natural laboratories to investigate, for instance, binary formation and evolution, accretion processes, transient events, jets and outflows, type Ia supernova progenitors, low-frequency gravitational waves, strong magnetic fields under extreme conditions. Despite their general importance for astrophysics and recent progress in the field, we still do not fully understand how these fascinating objects form and evolve as the classical picture faces serious problems when confronted with observations. All current problems are most likely related to the characteristics of the evolution of these systems and their progenitors, which are currently neither well-understood nor well-constrained. Therefore, to progress further with the understanding of accreting white dwarfs, it is crucial to properly characterize such mechanisms. Here we propose to investigate in detail the pathways leading to the formation of accreting white dwarfs and the main mechanisms driving their evolution. We will use a combination of a rapid population synthesis code with a detailed evolutionary code to investigate accreting white dwarfs, which will allow us to properly calculate the response of the binary and its components during the formation and evolution of these systems as well as to predict the overall characteristics of the intrinsic populations. We expect to solve major problems connected with accreting white dwarf formation and evolution, gain valuable insights into the mechanisms driving their evolution, and take a step closer towards a global understanding of their formation and evolution.