



Contribution ID: 29

Type: **Contributed talk**

Discovering the most important temperatures of helium burning reactions in pair-instability supernova nucleosynthesis

Wednesday, January 29, 2025 4:15 PM (25 minutes)

Pair-instability supernovae (PISNe) are the final fates of massive stars with an initial mass ranging from 140-260 M_{\odot} . Due to the efficient ^{56}Ni nucleosynthesis, PISNe can be very luminous phenomena. According to some previous works, not only the PISN progenitor evolution but also the PISN nucleosynthesis is affected from $^{12}\text{C}(\alpha, \gamma)^{16}\text{O}$ reaction rate strongly. However, these works are based on the reaction rate tables changed high or low in all temperature despite the strong dependence of nuclear reactions on temperature. In this work, we considered the most important temperatures of helium burning reactions for ^{56}Ni nucleosynthesis in PISN using Monte Carlo methods, specifically, we simulated the stellar evolution with randomized helium burning reaction rates, and we obtained the strong correlated temperature for these reactions. In this presentation, we will report the details of the results.

Primary author: KAWASHIMO, Hiroki (The University of Tokyo, Komaba)

Co-authors: Dr KIMURA, Masaaki (RIKEN RNC); Dr NISHIMURA, Nobuya (The University of Tokyo); Dr SUWA, Yudai (The University of Tokyo)

Presenter: KAWASHIMO, Hiroki (The University of Tokyo, Komaba)

Session Classification: Oral Presentation