Canadian Association of Physicists
Association canadienne des physiciens et physiciennes

Contribution ID: **4221** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) An Exploration of La, Ba, Eu Ratios from r-process candidate sites

Monday 27 May 2024 14:45 (15 minutes)

Neutron star mergers are an ideal environment for rapid (r-process) neutron captures to take place that lead to the production of neutron-rich nuclei far from the valley of stability. This is one encouraging site to investigate for where abundances of the heaviest elements in our Solar System and beyond are thought to have come from. We explored the r-process regime in mergers through the testing of various mass models, fission yields, and astrophysical conditions; covering three distinct hydrodynamic simulations, some of which make use of more than 1000 tracer particles. We considered elemental abundance ratios involving the key indicators Barium, Lanthanum, and Europium, ultimately aiming to investigate the spread in these ratios that the r-process can accommodate, with current conclusions discussed here. Further, we compared to stellar data, drawn from literature results compiled by JINAbase, for metal-poor stars. This work has allowed us to gain a better understanding about the production of elemental abundances in the universe and to further test the expected bounds of known nucleosynthesis process regimes.

Keyword-1

nuclear astrophysics

Keyword-2

nucleosynthesis

Keyword-3

stellar abundances

Primary author: CICCONE, Stephanie (University of Guelph)

Co-authors: DILLMANN, Iris; Dr CABALLERO SUAREZ, Liliana; VASSH, Nicole (TRIUMF)

Presenter: CICCONE, Stephanie (University of Guelph)

Session Classification: (DNP) M2-4 Nuclear Astrophysics | Astrophysique nucléaire (DPN)

Track Classification: Technical Sessions / Sessions techniques: Nuclear Physics / Physique nucléaire (DNP-DPN)