



Contribution ID: 27

Type: **Submitted oral (In person)**

“Nuclear thermometers” reveal the origin of the universal r-process nucleosynthesis

Friday 29 November 2024 12:15 (12 minutes)

The validity of the Brink-Axel hypothesis is inferred from the resembling behaviour of giant dipole resonances built on ground and excited states, which present similar energy systematics. Together with previous work, this assigns giant dipole resonances as spectroscopic probes or “nuclear thermometers” to explore the cooling of the extremely hot ejecta gas produced in neutron-star mergers, down to the production of elements through the rapid-neutron capture or r-process. Such “thermometers” of nuclear matter show a slight increase in the energy of the giant dipole resonance at the typical temperatures where seed and r-process nuclei are produced, which lowers the nuclear binding energy through the symmetry energy. New data at $T=0.5$ MeV will be shown, which can provide a solution to the long-sought universality of elemental abundances by narrowing down the reaction network for element production in stellar explosions. Further data for heavy, neutron-rich nuclei are crucial.

Author: ORCE GONZALEZ, Jose Nicolas (University of the Western Cape (ZA))

Presenter: ORCE GONZALEZ, Jose Nicolas (University of the Western Cape (ZA))

Session Classification: Recent Experimental Results III