Contribution ID: **8** Type: **Invited Talk**

Ab initio prediction of α(d,γ)6Li at Big Bang nucleosynthesis energies

Wednesday, 2 August 2023 11:15 (35 minutes)

The radiative capture α(d,γ)6Li is the dominant process in the Big Bang Nucleosynthesis (BBN) of 6Li. It therefore strongly influences the abundance ratio of 6Li/7Li, for which observational data are three orders of magnitude higher than BBN predictions. Because of the low cross section and the large experimental uncertainties, it is crucial to have accurate predictions. In this talk, I will present an ab initio calculation of α(d,γ)6Li, where all nucleons are active and interacting through chiral-EFT nucleon- and three-nucleon forces. After reviewing the ab initio no-core shell model with continuum method, I will show our results [1] which are in excellent agreement with the recent LUNA data [2]. I will also discuss the importance of each electromagnetic transitions on α(d,γ)6Li at BBN energies.

[1] C. Hebborn, G. Hupin, K. Kravvaris, S. Quaglioni, P. Navrátil and P. Gysbers, Phys. Rev. Lett. 129, 042503 (2022).

[2] Anders et al. Phys. Rev. Lett. 113, 042501 (2014).

*This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics, under the FRIB Theory Alliance Award No. DE-SC0013617 and by LLNL under Contract No. DE-AC52-07NA27344.

Primary author: HEBBORN, Chloë (Facility for Rare Isotope Beam (MSU) and Lawrence Livermore National Lab)

Co-authors: Dr HUPIN, Guillaume (IJClab); Dr KRAVVARIS, Kostas (Lawrence Livermore National Laboratory); Mr GYSBERS, Peter (TRIUMF); Dr NAVRATIL, Petr (TRIUMF); Dr QUAGLIONI, Sofia (Lawrence Livermore National Laboratory)

Presenter: HEBBORN, Chloë (Facility for Rare Isotope Beam (MSU) and Lawrence Livermore National Lab)

Session Classification: Wednesday Plenary Session (AudiMax)