# NUSTAR Seminar


## Ryo Taniuchi

### University of York, UK


### Wednesday, June 02 2021 at 04.00 pm

### Zoom Link

https://gsi-fair.zoom.us/j/98115842039

Meeting-ID: 981 1584 2039
Kenncode: 822460

### Gamma-ray spectroscopy in the vicinity of double-magic $^{78}$Ni


$^{78}$Ni is one of the iconic doubly-magic nuclei located far from the stability line and therefore has been a primary focus of many experimental and theoretical investigations. Though it was expected to have a doubly-magic character for both proton (Z=28) and neutron (N=50) shells, several works around this region have suggested that both shell gaps may be reduced in further neutron-rich isotopes and isotones.

In this talk, I will discuss the results of the experimental works measuring gamma-rays from the excited states of $^{78}$Ni in-beam at a relativistic energy produced by the high-intense beam at the RIBF facility. The first spectroscopy has been achieved using a NaI(Tl) scintillator array, DALI2, and a thick liquid hydrogen target with vertex reconstruction system, MINOS. Two gamma-ray transitions were assigned as ones decaying into the ground state from individual $2^+$ states. With the support of several theoretical investigations, they are interpreted as a sign of the emergence of the possible shape coexisting feature associated with shell-quenching in both proton and neutron gaps at and beyond this anchor-point nucleus.

To further investigate with an improved energy resolution, we have conducted an experiment using HPGe detectors this April. I would like to present some of the online spectra from this experiment and discuss the potential of high-resolution gamma-ray spectroscopy of nuclei apart from stability at fast beam facilities.


Convener: T. Dickel
Secretary: R. Krause / D. Press
https://indico.gsi.de/event/12706/