



# Katabuchi Laboratory

## Study on nuclear reactions using neutron beam and its application

### Laboratory for Advanced Nuclear Energy

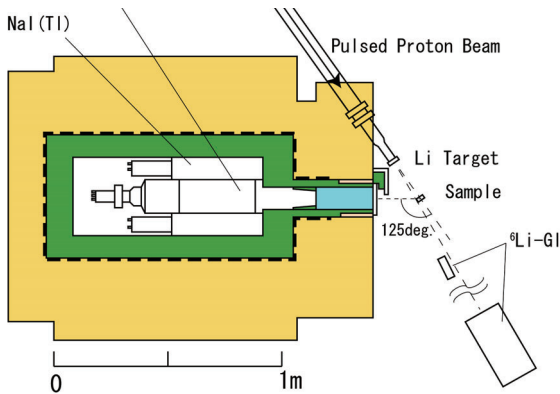
<http://www.lane.iir.titech.ac.jp/~buchi/>

- Study on neutron nuclear reactions for nuclear engineering
- Development of online dose imaging system for boron neutron capture therapy
- Study on neutron nuclear reactions for nucleosynthesis

Neutron-induced nuclear reactions are important for nuclear engineering. We study nuclear reactions using neutron beams produced with particle accelerators.

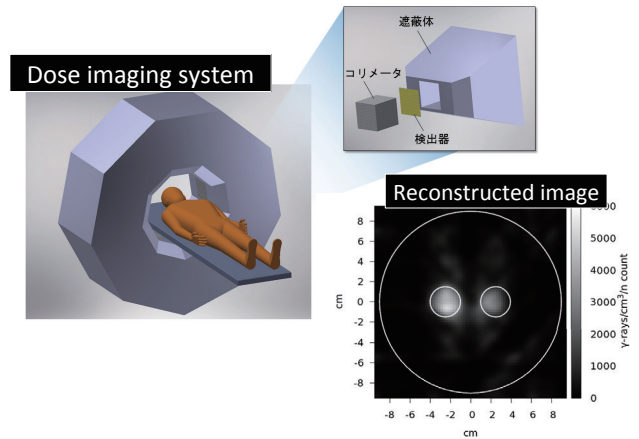
In experiments, we detect neutrons and  $\gamma$ -rays with radiation detectors. Thus, we work on development of radiation detection technology. Experiments are made using both a Tokyo Tech accelerator and J-PARC in Tokai, Ibaraki.

Nuclear reaction data of long-lived nuclides important for study on nuclear transmutation, were measured. Development of online dose imaging system for boron neutron capture therapy (BNCT) is also ongoing.



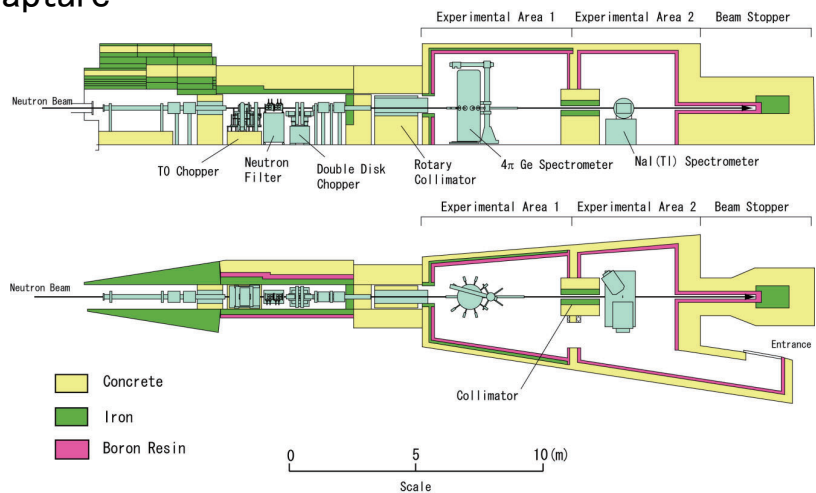
#### Tokyo Tech neutron beam experimental setup

- Neutrons produced using a Pelletron accelerator
- Neutron time-of-flight using a pulsed neutron beam
- Accurate neutron cross section measurement achieved with a large NaI(Tl) detector



#### Online dose imaging system for BNCT

- Patient dose evaluation during irradiation
- Test experiments carried out with a neutron beam
- Reconstructed image obtained in test (right-bottom)



#### ANNRI – Accurate Neutron Nucleus Reaction Measurement Instrument

- Neutron beam line for nuclear data measurement in J-PARC
- Intense pulsed-neutron beam allowing measurement that was difficult before
- Tokyo Tech group participated the ANNRI project from the beginning of construction.