

University of Sheffield: SBND & DUNE

A single secondment, **currently ongoing** (~6 weeks in total ending mid-December).

Contribution to both SBND & DUNE with a priority on SBND.

1. Working with local, Fermilab, neutrino interaction experts on the development of **novel LArTPC nuclear cluster simulations** based on leading theoretical models of their production,
 - a. Initial implementation in SBND is being validated,
 - b. Currently carrying out impact studies for DUNE based on SBND measurements,
 - i. To what degree do nuclear clusters bias the (critical) DUNE energy reconstruction?
2. Developing **bespoke reconstruction pathway** to target these new topologies in LAr.
3. Training as an **SBND subsystem expert**.
 - a. Likely the photon detection system as light data will benefit the nuclear cluster measurement.
 - b. Already worked locally at Fermilab on the SBND data acquisition system.
4. Working with SBND experts on **nuclear cluster cross-section measurement** strategy.