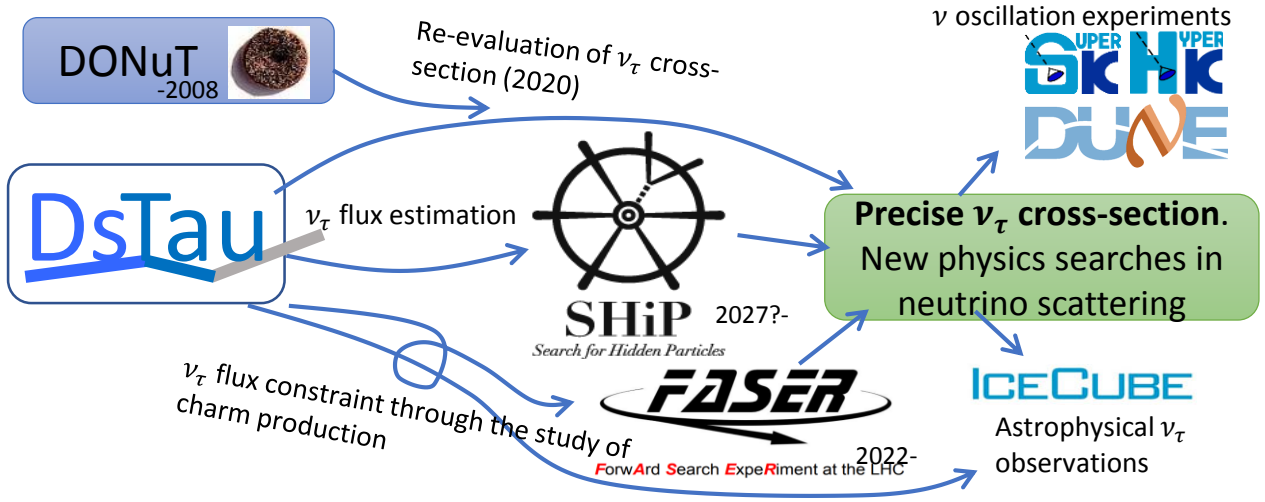
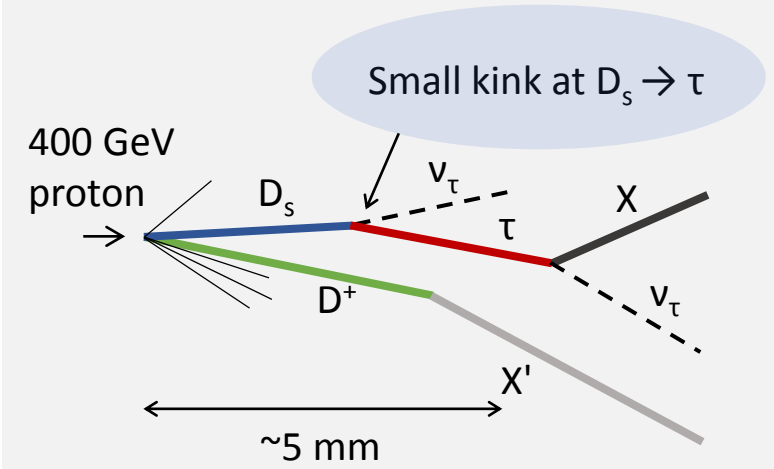
NA65/DsTau

Akitaka Ariga

The NA65/DsTau experiment at the CERN SPS

- Study of ν_τ production for future tau neutrino experiments.
  - Measurement of **D_s double differential production cross section**
  - Reduce uncertainty of ν_τ flux from >50% to 10% → Fundamental input for future ν_τ experiment: SHiP, and indirectly FASER
- Forward charm physics, charm/gluon PDF





- Principle of the experiment
  - Detection of "**double-kink + charm decay**" topology within 10 mm.
  - 4.6×10^9 protons, $\mathbf{2.3 \times 10^8}$ proton interactions in target, 10^5 charm pairs, $1000\ D_s \rightarrow \tau \rightarrow X$ detected events.

Beam requirement

- Beam: 400 GeV proton
- Beam size/shape: 2 cm x 2 cm. larger is better
  - Gaussian-like shape is better than square-like profile.
  - A sigma of distribution ~10 mm (not RMS)

- Beam intensity: a few x 10^5/spill
- Spill structure: flatter is better

Requirements for infrastructure

1. Storage of our target mover (1m x 2 m + some carton boxes)
2. Vacuum pipe to transport proton beam
3. Beam profile monitor
4. Movable table (DESY table might be not big enough?)