

# **Intensity Frontier Fellowship on MINOS+, MicroBooNE and LBNE**

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I have collaborated on the Intensity Frontier programme at Fermilab for more than a decade and am proud to take up an Intensity Frontier Fellowship for the academic year 2014-15. During my fellowship, I will carry out research on the MINOS+, MicroBooNE and LBNE experiments.

I am a long-standing member of the MINOS long-baseline experiment, and have collaborated on both the operation the MINOS detectors and the publication of its neutrino oscillation physics results, which are also major results for the Fermilab Intensity Frontier programme. I am currently serving as analysis coordinator for MINOS+, which is the next phase of MINOS. MINOS+ has an exciting programme of physics, ranging from precision measurements of neutrino oscillations to searches for new phenomena such as light sterile neutrinos, non-standard interactions and other exotic scenarios.

I am also an active member of the Liquid Argon programme at Fermilab and have collaborated on MicroBooNE since 2013 and on LBNE since 2010. The main focus of my research on these experiments is the development of automated algorithms for neutrino event reconstruction, exploiting the superb spatial and calorimetric resolution of Liquid Argon TPC detectors. As a member of the PandoraPFA development team at Cambridge, I have demonstrated fully automated chains of pattern recognition algorithms for Liquid Argon TPC detectors using particle flow techniques.

The coming year will be important period for all three of my Fermilab experiments, and the Intensity Frontier Fellowship will provide a unique opportunity to spend time onsite. As well as performing my roles on MINOS+, I aim to support the commissioning of MicroBooNE by providing fast reconstruction and visualisation of cosmic-ray muons and neutrino interactions. I also plan to work on event reconstruction topics for LBNE, important for optimising the Far Detector design, calculating realistic physics capabilities, and analysing data from the 35t prototype detector.