

Fermi National Accelerator Laboratory

LDRD Project Data Sheet – FY20

Project ID: FNAL-LDRD-2020-026

Project title: Accelerator-based Dark Matter Initiatives at Fermilab

Principal investigator: Matt Toups, Nahn Tran

Project description: (short description and explanation of cutting edge, high-risk, high-potential science or engineering)

This project aims to raise Fermilab’s profile in accelerator beam-based dark-matter searches by seeding research support in a number of promising experimental initiatives including: Stopped Pions @ PIP-II, SBN-DM, M3/LDMX and DarkQuest. The ultimate goal of this proposal is to deliver scientific papers which will strengthen the program of accelerator-based dark sector experiments at Fermilab in preparation for the upcoming Snowmass process.

Tie to Mission: (explain the project’s relevance or anticipated benefits to Fermilab’s and DOE’s missions)

The quest to identify and understand dark matter is one of the most compelling open particle physics missions and new initiatives in accelerator-based dark sector experiments are a rapidly growing effort. Fermilab, as the US’s premier particle physics laboratory, must play a role in this exciting opportunity.

Previous year’s accomplishments: (as applicable)

Work proposed for current fiscal year and anticipated / desired results:

Recruit and begin coordination of four postdoctoral researchers that will embed effort in the most promising beam-based dark matter experiment concepts under development now.

Project funding profile: (costs, budgets, projected budgets, and total)

Prior year(s) costs	FY20 ½	FY21	FY22	FY23 ½	Total
N/A	100,000	300,000	70,000		470,000

Project Start Date: 3/1/2020

Total Approved Project funds: \$470,000