

**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)

Significant theory activity, papers in progress. Postdoc hiring and test beam time delayed to Covid.

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

Onboard postdoctoral researchers that will embed effort in the most promising beam-based dark matter experiment concepts under development now. Execute test beam program if test-beam time is available in the on-going Covid era.

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

<b>Prior year(s) costs</b>	<b>FY20 ½</b>	<b>FY21</b>	<b>FY22</b>	<b>FY23 ½</b>	<b>Total</b>
N/A	67,290	202,858	150,000	32,710	452,858

Project Start Data: 3/1/2020

Total Approved Project funds: \$470,000