

Title: Dark-Matter live

Description: This project will contribute to Dark-Matter-Live, an open, community-driven platform that unifies and visualises experimental constraints on dark matter models across collider, direct-detection, indirect-detection, and cosmological searches. The project will extend or refine the implementation of a well-defined dark matter model within the framework, validate selected experimental limits against published results, and improve interactive visualisations that enable transparent, side-by-side comparison of constraints in a consistent parameter space. In addition, the project will explore technical integration of Dark-Matter-Live with the HEPData portal, assessing how curated experimental results can be ingested, cross-referenced, and kept synchronised to enhance reproducibility.

References:

- Dark-Matter-Live software and data release (Zenodo: <https://zenodo.org/records/18135859>);
- Dark-Matter-Live project website (<https://darkmatter.web.cern.ch/pages/about/about.html>);
- HEPData portal (<https://www.hepdata.net>).

Possible start date: 8 June 2026

Timeline:

Weeks	Planned work	Deliverables
1-2	Learn the current backend workflow and understand how HEPData and arXiv can provide useful dark-matter publication data.	Short summary of source APIs, required metadata, and project scope.
3-4	Build a simple HEPData interface to fetch recent records and identify new dark-matter-related entries.	Working script/module that retrieves and lists relevant HEPData records.
5-6	Download table files from selected HEPData records and convert them into the internal data format used by the project.	Prototype normalization pipeline for selected HEPData tables.
7-8	Build an arXiv interface to collect recent paper metadata and connect papers to matching HEPData records where possible.	Working arXiv metadata fetcher and basic record-matching results.
9-10	Use the collected data to generate draft DarkMatterLive plot inputs and prepare reviewable update packages.	Draft CSV/JSON outputs and example review package for new data.
11-12	Test the full workflow on a few recent papers, fix issues, and write clear documentation for future use.	Final tested prototype, short documentation, and end-of-project report/demo.