

Search for Light Dark Matter with the DarkMESA Experiment

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**DARK
MESA**

 **MPA**
MAINZ PHYSICS
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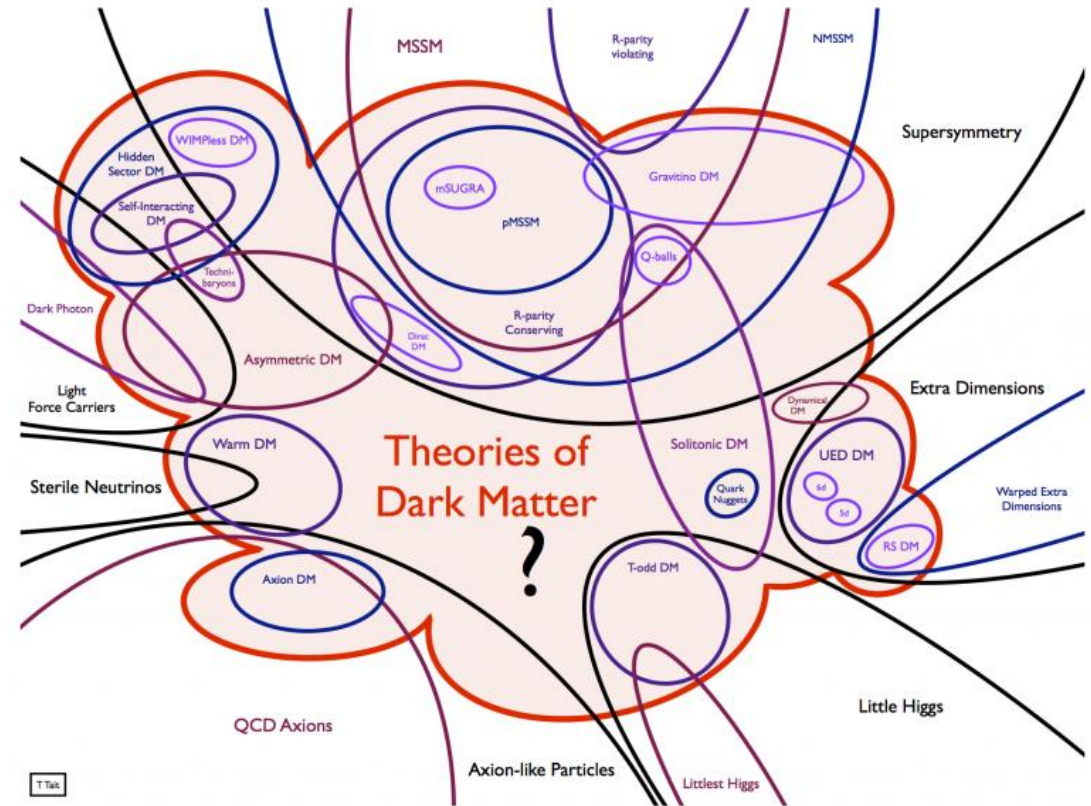
 **PRISMA+**

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Dark Matter Searches

- Dark Matter searches needed to extend the Standard Model
 - Especially interesting: Models with possible SM interactions
- Search for Dark Matter relies on large data sets due to rare processes
 - High intensity accelerator experiments needed!

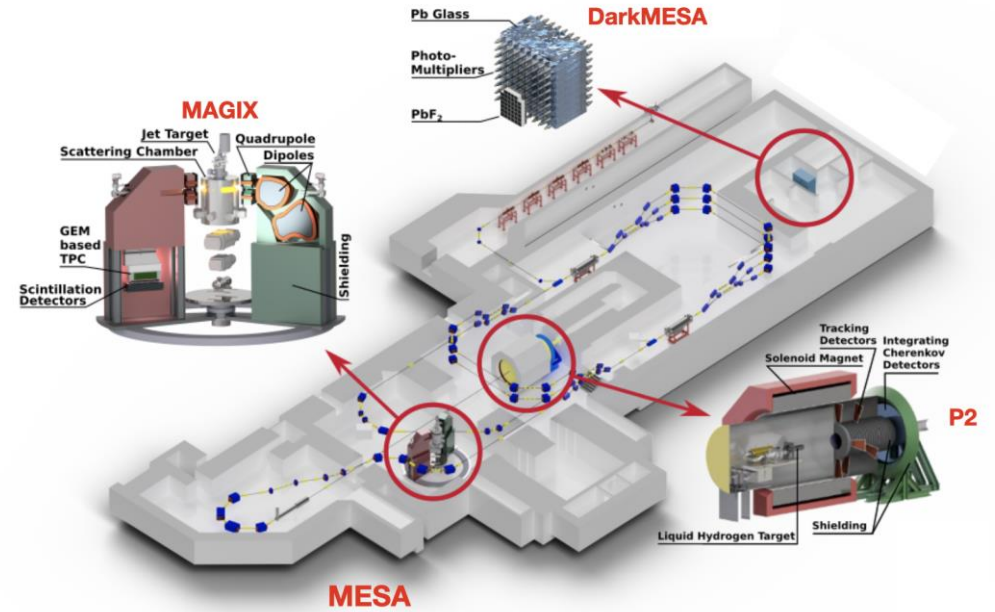


Tim Tait, <https://physics.aps.org/articles/v11/48>

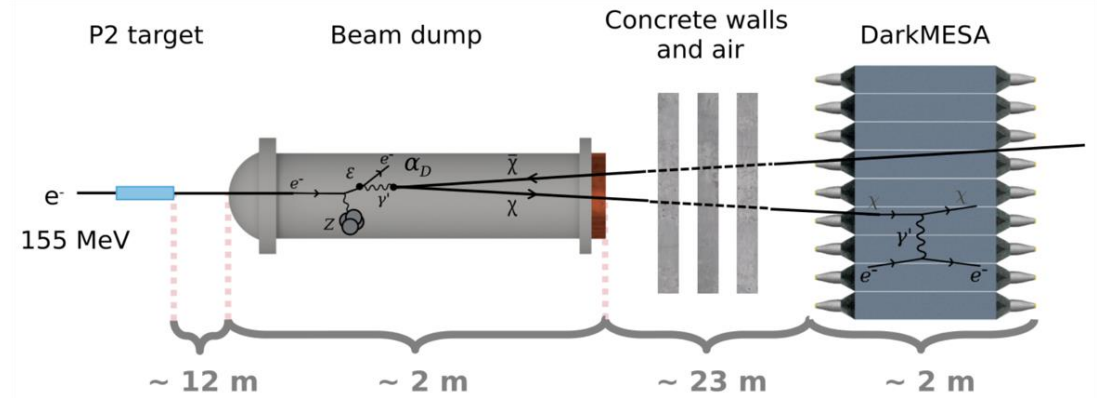
The DarkMESA Experiment

- Located at the upcoming MESA accelerator
 - Electron accelerator
 - Energy recovery mode: 105 MeV @ 1 mA for MAGIX
 - Extracted beam mode: 150 MeV @ 0.15 mA for P2 and DarkMESA

- DarkMESA
 - Parasitic beam dump experiment behind P2
 - Research objective: direct detection of Dark Matter



<https://magix.uni-mainz.de/mesa.php>



<https://magix.uni-mainz.de/physics.php>

Simulations of the Experimental Reach

- Evaluation of experimental range necessary before start
 - Modeling of the accessible parameter space
 - Comparison for data analyses in the future
 - Creation of a research programme
- Expand simulation to other Dark Matter models
 - Axions in the MeV range are well motivated
 - Utilise Primakoff processes for Axion production

