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## The Dark-PMT: A Novel Direction Light Dark Matter Detector Based on Vertically-Aligned Carbon Nanotubes

We present the latest results on the development of the Dark-PMT, a novel light Dark Matter (DM) detector. The detector is designed to be sensitive to DM particles with mass between 1 MeV and 1 GeV. The detection scheme is based on DM-electron scattering inside a target made of vertically-aligned carbon nanotubes. Vertically-aligned carbon nanotubes have vanishing density in the direction of the tube axes, therefore the scattered electrons can leave the target without being reabsorbed only if their momentum is parallel to the tubes, which is what happens when the tubes are parallel to the DM wind. This grants directional sensitivity to the detector, a unique feature in this DM mass range. We will report on the construction of the first Dark-PMT prototype, on the establishment of a state-of-the-art carbon nanotube growing facility in Rome, and on the characterizations of the nanotubes performed in Rome with XPS and angular-resolved UPS spectroscopy.

## **Collaboration / Activity**

Dark-PMT

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