

# The MIGDAL Experiment

*Monday 12 December 2022 15:00 (20 minutes)*

Direct dark matter experiments exploit the Migdal effect to extend their sensitivity to low-mass WIMPs, yet the Migdal effect itself has not yet been observed to occur in nuclear scattering. The MIGDAL experiment aims to directly observe this effect in a low-pressure optical time projection chamber exposed to an intense beam of fast neutrons from DD and DT generators. The experiment uses an optical time-projection chamber filled with pure CF<sub>4</sub> at 50 Torr - for its high scintillation yield and emission spectrum in the visible light. A fast CMOS ORCA-Fusion camera records high resolution track images generated by a stack of two Gas Electron Multipliers. Charge is collected at an Indium Tin Oxide (ITO) anode plane spanning 10 cm x 10 cm and segmented into 120 readout strips to obtain depth information about the track. These two readouts will be used for 3D reconstruction of the characteristic Migdal event topology containing two tracks - one belonging to a nuclear recoil and another belonging to a low energy Migdal electron. This talk details the efforts and commissioning phase of the MIGDAL experiment at the NILE facility, Rutherford Appleton Laboratory and will show preliminary results of calibration data.

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**Session Classification:** Session 3