

220 B DRD activity lists

221 B.1 Task List for DRD1: Gaseous Detectors

No.	Name	Description
1.0	Coordination	Coordination tasks for DRD 1 in the UK and in the international collaboration.
1.1	Migdal	Observation and measurement of the Migdal effect. R&D: DRD1 WP8-D development of radio pure TPCs for precise track imaging and calorimetry with avalanche-based R/O. Deliverable: stable operation of low-pressure TPC with large dynamic range ranging from low energy electron recoils (few keV) to nuclear recoils. Beneficiaries: direct detection DM searches.
1.2	Thermal n imaging	Develop a fast neutron gas detector with sub-millimetre spatial resolution, evaluate operation with low GWP gases, identify optimum ASICs. R&D: (a) DRD1-WG3: operation of μ RWELLS with low GWP, high density (higher than CG_4) gases and (b) DRD1-WG5 evaluation of ASICs for MPGD detectors. Beneficiaries: thermal and epithermal n detectors.
1.3	EcoGas4gasDet	Identify novel low-GWP gas mixture for high-field ($E \gtrsim 5$ kV/mm) gaseous detectors. R&D: DRD1-WP1-T5 “Eco-friendly gases”. Deliverable: ideal novel gas mixture following criteria of: (a) low-GWP, (b) non-flammability, (c) ageing stability, (d) detector performance. Beneficiaries: large-scale future detectors at HL-LHC (ANUBIS), FCC, fixed target, ν detectors.
222 1.4	HiResLrgScale	Identify future materials for high-resolution, high rate, large scale RPC detectors. R&D: DRD1-WP1-T1 “New resistive RPC materials and production techniques for resistive layers” and WP5 “Development of high-granularity demonstrators”. Deliverable: materials and processes for next-generation RPCs following criteria of: (a) mechanical rigidity, (b) conductivity, (c) density/weight, (d) cost. Beneficiaries: large-scale future detectors like FCC-ee/hh, fixed target, ν detectors.
1.5	WarTPC	Further augment the capabilities of a High-Pressure gaseous TPC (HPgTPC) for measuring ν interactions. R&D: DRD1-WP4-T “Gas mixture”, DRD1-WP8-T1 “Enhanced operation of optical readout across gas densities”, DRD1-WP8-T2 “Enhanced operation of charge readout across gas densities”, DRD1-WP8-T4 “Ultra-low-energy reconstruction of highly ionizing tracks”. Deliverable: identify novel gas mixtures to further augment HPgTPCs, highly granular optical TPC readout, prototype calibration system, enhanced operation of charge readout across gas densities. Beneficiaries: ν detectors.
1.5	glass THGEMs	Develop and characterise novel glass THGEMs using optical gas TPC. R&D: DRD1-WP8-T1 “Enhanced operation of optical readout across gas densities”. Deliverable: development and characterisation of novel glass THGEMs using optical gas TPC, including radiopure THGEMs. Beneficiaries: DM detectors.

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