

WG I: New avenues in direct detection

- DD is a healthy & active community with clear ideas to go beyond G2 experiments. History of solving difficult background, energy threshold, and detector scaling problems; WIMP sensitivity improving 4 orders of magnitude in the past decade.
- Science targets: **1) WIMPs: developed over past 3 decades & 2) sub-GeV DM (new, compelling paradigm).**
- WIMP searches include ideas for going to or below the neutrino floor, for spin-dependent or spin-independent interactions.
- Sub-GeV searches include dark matter – electron scattering, dark matter-nucleon scattering, and/or dark matter absorption. Low DM particle masses \rightarrow very high DM number densities \rightarrow small, inexpensive detectors can reach new parameter space.
- Unique science capabilities of direct detection. Does not depend on whether the mediator decays visibly or invisibly. Ultralight mediator + small coupling is uniquely probed by direct detection. Probes many different scenarios.
- **Sixteen** experimental projects were presented. Several small projects < few \$million can probe orders of magnitude of new parameter space for WIMPs and sub-GeV DM to O(MeV) masses, with project start-dates of FY19. Two sub-GeV examples:

