

LZ: probing heavy dark matter in liquid xenon

The Hertel Group

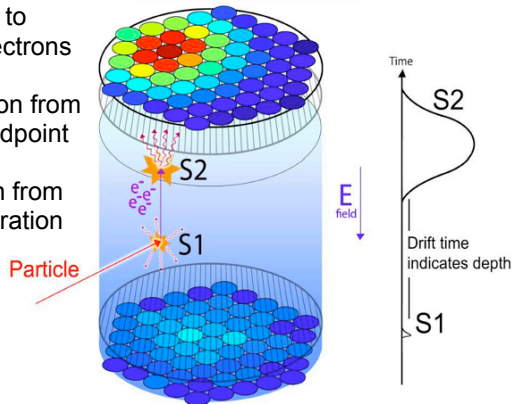
dark matter
mass: $\sim 100 \text{ GeV}/c^2$

^{131}Xe
KE: $\sim 10 \text{ keV}$
scintillation
and ionization

Sensitive to
single electrons

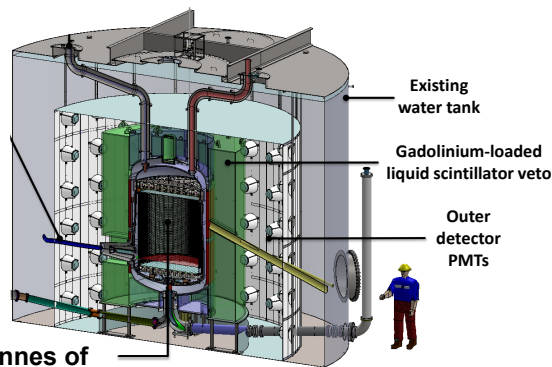
XY position from
 e^- drift endpoint

Z position from
 e^- drift duration

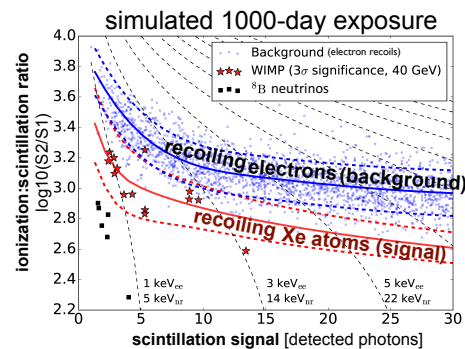


Davis Cavern before lab construction

LZ will be shielded from
cosmic rays by nearly a
mile of earth, deep in the
Homestake Mine in South
Dakota.

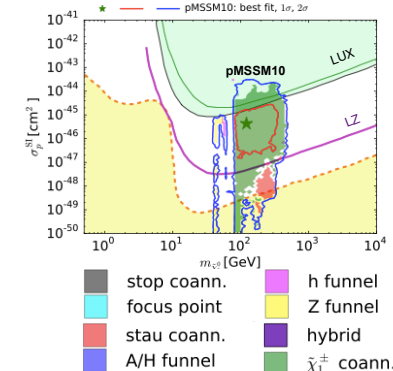
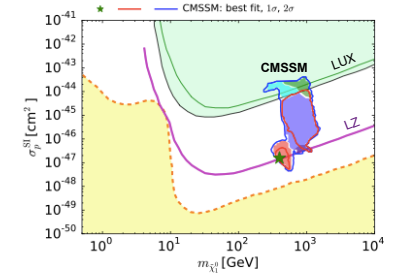
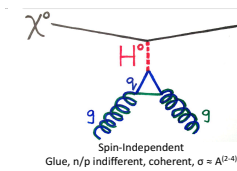


10 tonnes of
liquid xenon
(5.6 tonnes in
central region)

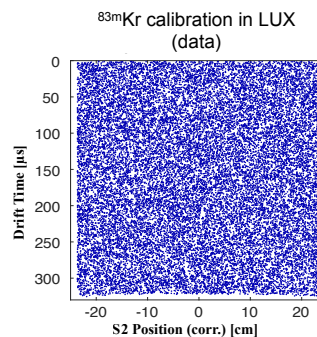
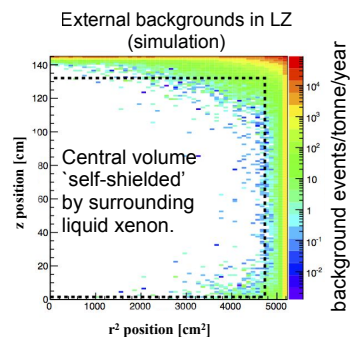


Project Timeline

- 2017** Underground lab renovations begin
- 2019** Underground experiment installation
- 2020** First results, newly probing interesting supersymmetric models (below)



Bagnaschi et al, Aug2015 Supersymmetric Dark Matter after LHC Run1



The UMass Contribution:

Calibrations
employing isotopes
which mix into the
LXe itself, a necessity
given LXe's natural
self-shielding.