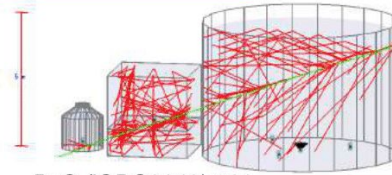


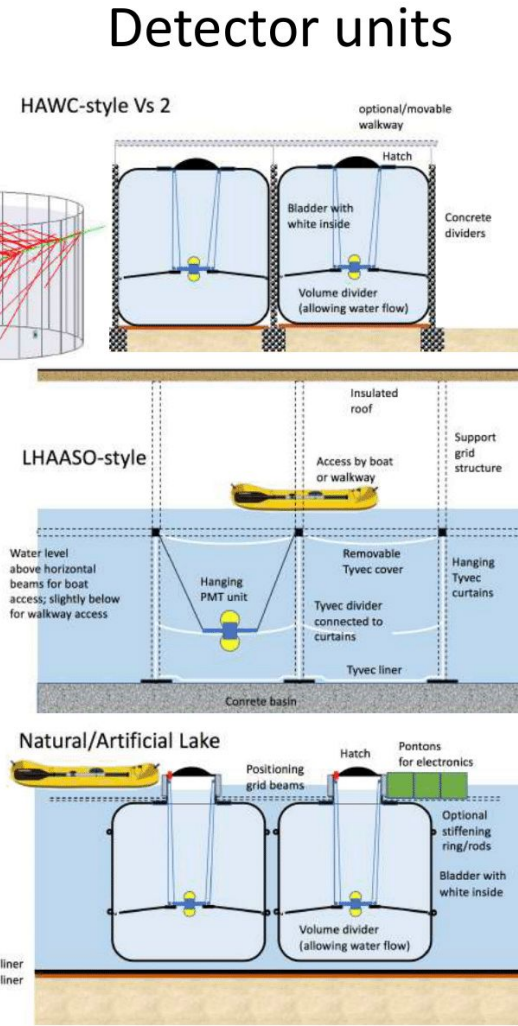
# The SWGO Concept

## Multiple detector options to be investigated

- Core unit is a water-Cherenkov Detector
  - Options being investigated based on tanks (HAWC-like), ponds (Milagro-like) and lake-base
- Simulations currently ongoing to constrain all aspects of the detectors
- Design strongly dependent on site choice
  - Water access, construction costs, infrastructure feasibility, compatibility with scientific driven main design goals...
- Strong muon detection capability
  - Large potential for gamma/hadron separation above 1 TeV and consequently background-free conditions driving high sensitivity at the highest 100+ TeV range,
- Muon-tagging in all units?
  - Double layer WCD unities
  - Time-intensity tagging of single through-going particles



PoS (ICRC2019) 720



## The SWGO Concept

HAWC-style Vs 2

optional/movable walkway



Concrete dividers

	IACT Arrays	Ground-particle Arrays
Field of view	3°–10°	90°
Duty cycle	10%–30%	>95%
Energy range	30 GeV – >100 TeV	~500 GeV – >100 TeV
Angular resolution	0.05°–0.02°	0.4°–0.1°
Energy resolution	~7%	60%–20%
Background rejection	>95%	90%–99.8%

Support grid structure

Hanging Tyvec curtains

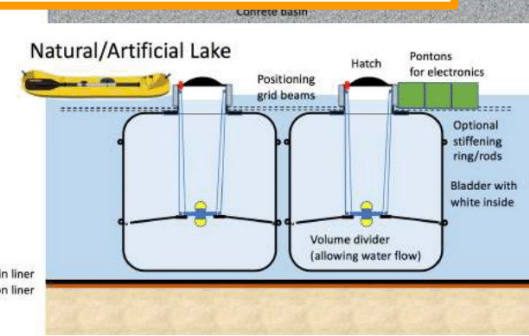
Science Case White Paper arXiv:1902.08429

frequently background-

free conditions driving high sensitivity at the highest 100+ TeV range,

### Muon-tagging in all units?

- Double layer WCD unities
- Time-intensity tagging of single through-going particles



# The Core Science Case

---

- ⊙ Detection of short-timescale phenomena
  - ⊙ Low-energy threshold for detection of short-timescale ( $< 1\text{ hr}$ ) transient events down to 100 GeV
- ⊙ Search for PeVatrons
  - ⊙ Improved sensitivity up to a few 100s TeV to search for PeV Galactic particle accelerators.
- ⊙ PWNe and Gamma-ray Halos
  - ⊙ Unique potential for accessing the high-energy end of the Galactic Population.
- ⊙ Dark Matter and Diffuse Emission
  - ⊙ Unique access to the Galactic Center and Halo at the high-energy end of the spectrum.
- ⊙ Cosmic-rays
  - ⊙ Unique complement to LHAASO for anisotropy studies, with capability to reach low-angular scale.
  - ⊙ Good muon tagging implies good mass resolution for composition studies up to the knee.