

WORKING GROUPS

E. SEGRETO

SEPTEMBER 12

PROPOSED WG STRUCTURE

- The **proposed** working group structure has been **built on the basis of our list of deliverables**, with the idea that each WG is responsible for a sub-set of deliverable – *ab initio*
- Proposed structure:
 - 1) Light collector
 - 2) Photosensors
 - 3) Electronics
 - 4) Simulation and physics
 - 5) Integration

LIGHT COLLECTOR

- Deliverables (very very general):
Conceptual Design
 - ✓ Engineering Design
 - ✓ Materials Selection
 - ✓ Prototyping
 - ✓ Fabrication
 - ✓ Test Stand Development
 - ✓ Testing
- Conveners: **Flavio Cavanna** (FNAL),
Denver Whittington (Syracuse),
Ana Machado (UFABC)

PHOTOSENSORS

- Deliverables
 - ✓ Evaluation, Qualification, and Selection
 - ✓ Development of Packaging
 - ✓ Development of Array & Ganging Configuration
 - Cold Board Design
 - SiPM Procurement
 - Cold Board Assembly
 - Test Stand Development
 - Testing
- Conveners: TBD – **Contacts started,**
Nominations are welcome !!!

ELECTRONICS

- Deliverables
 - ✓ Read-out
 - ✓ Firmware programming
 - ✓ Warm Low-Voltage Cables
 - ✓ Warm Bias-Voltage Cables
 - ✓ Low-Voltage Power Supply
 - ✓ Bias-Voltage Supplies
 - ✓ Cold signal cables
 - ✓ Cold bias voltage cables
 - ✓ PDS Calibration System
- Conveners: **Contacts started, waiting for responses.**
Giovanni Franchi (UNICAMP and Age scientific) accepted to be one of them.

Nomiations are welcome!

SIMULATION AND PHYSICS (PART 1)

- Deliverables

- ✓ Physics Deliverables

- Further development of PDS subsystem requirements

- Validation of PDS Requirements with respect to Physics Performance

- PDS Performance Validation via ProtoDUNE Data Analysis

- Demonstrate PDS radiological/cosmogenic background rejection capabilities

- Develop strategies for using PDS information to trigger on interesting events

- Develop strategies for online reduction of PDS data volume.

- Study potential light-enhancement strategies involving reflective cathode planes

SIMULATION AND PHYSICS (PART 2)

- Deliverables
 - ✓ Software Deliverables
 - Simulation Code
 - Reconstruction Code
 - Calibration Run Control Software
 - Analysis Software
 - Calibration Database
 - Hardware Database
 - Data Collection
 - Data Monitoring Code

Conveners: **A. Szelc** (Manchester University).

Waiting responses from other people.

Nominations are welcome

INTEGRATION

- Deliverables
 - ✓ System Engineering
 - ✓ Development of QA Plan (specification of tests/facilities)
 - ✓ Development of QC Plans (for all components)
 - ✓ PDS Integration Test Facility
 - ✓ Detector Integration Test Facility
 - ✓ Collaboration with HV System consortium on potential light-enhancement strategies involving reflective cathode planes
 - ✓ PDS Electronics Infrastructure
 - ✓ Signal Flanges
- Conveners: **N. Buchanan** (Colorado), **E. Kemp** (Unicamp)

WHERE TO START FROM?

- **I would like to stress the importance** - at this point - of the **Simulation and Physics group**.
- **In 1-2 months** we should have an **idea** of what we need to built
 - ✓ **How efficient needs to be** our system to meet Physics goals?
 - ✓ **How much light do we need to collect** for a supernova neutrino event?
 - ✓ **How do we plan to use the signal** (T0, trigger, calorimetry , ...)?
 - ✓ **What is the efficiency required to the basic element of the PD System (0.1% - 1%, more)?** Taking into account that the constraints on the APA will not be easily removed (can't increase coverage)

Answer to these questions will give a significant contribution to single out the technology we will use for the light collector

WHERE TO START FROM?

- ✓ **Do we need to install reflective foils** coated with wavelength shifter on the cathode to increase the LY and the uniformity?
- ✓ How do we want to use the signals? Do we need to have a digitized waveform? Time sample? Is Pulse Shape Discrimination relevant for our experiment? Is it enough to know the total amount of light detected?

Answers to these questions will drive the development of the electronics

WHERE TO START FROM?

- We should use as much as possible all the things we have learned up to now from Task Force, DUNE PD working group, tests of the different systems done in the past to answer these questions and fill the gaps with new studies
- **All the people** which can give a (even small) contribution **is invited to participate to this WG**, at least in this very initial phase – due to its importance