ArgonCube
a novel, fully-modular approach for the realization of large-mass liquid argon TPC neutrino detectors

The present Collaboration

D. Yilmaz
Department of Physics Engineering, Faculty of Engineering, Ankara University, Ankara, Turkey

C. Azevedo A. L. Silva J. Veloso
I3N, Physics Department, University of Aveiro,3810-193 Aveiro, Portugal

C. Amsler, M. Auger, A. Ereditato[a], D. Göldi, R. Hänni, I. Kreslo, M. Lüthi, P. Lutz,
Ch. Rudolph Von Rohr, Th. Strauss, M. Weber
Albert Einstein Center for Fundamental Physics (AEC) - Laboratory for High Energy Physics (LHEP), University of Bern, Bern, Switzerland

M. Bishai, H. Chen, G. De Geronimo, F. Lanni, D. Lissauer, V. Radeka, B. Yu
Brookhaven National Laboratory (BNL), Upton, NY 11973-5000, USA

J. Bremer, U. Kose, D. Mladenov, M. Nessi, F. Noto, D. Smargianaki
European Organization for Particle Physics (CERN), Geneva, Switzerland

Y. Arbelo, F. Barbato, D. Bleiner, A. Borgschulte, F. La Mattina
Swiss Federal Laboratories for Materials and Technology (EMPA), CH-8600 Dübendorf, Switzerland

A. Marchionni, O. Palamara, J. L. Raaf, G. P. Zeller
Fermi National Accelerator Laboratory (FNAL), Batavia, IL 60510 USA

M. Zeyrek
Middle East Technical University (METU), TR-06800, Ankara, Turkey

T. Gamble, N. McConkey, N. J. C. Spooner, M. Thiesse
University of Sheffield, Sheffield, UK

J. Asaadi, M. Soderberg
Syracuse University University, Syracuse, NY 13244 USA

F. Bay[b], E. Cavus
TUBITAK Space Technologies Research Institute (TUBITAK UZAY), METU Campus, TR-06800, Ankara, Turkey

B. Fleming
Yale University, New Haven, CT 06520 USA

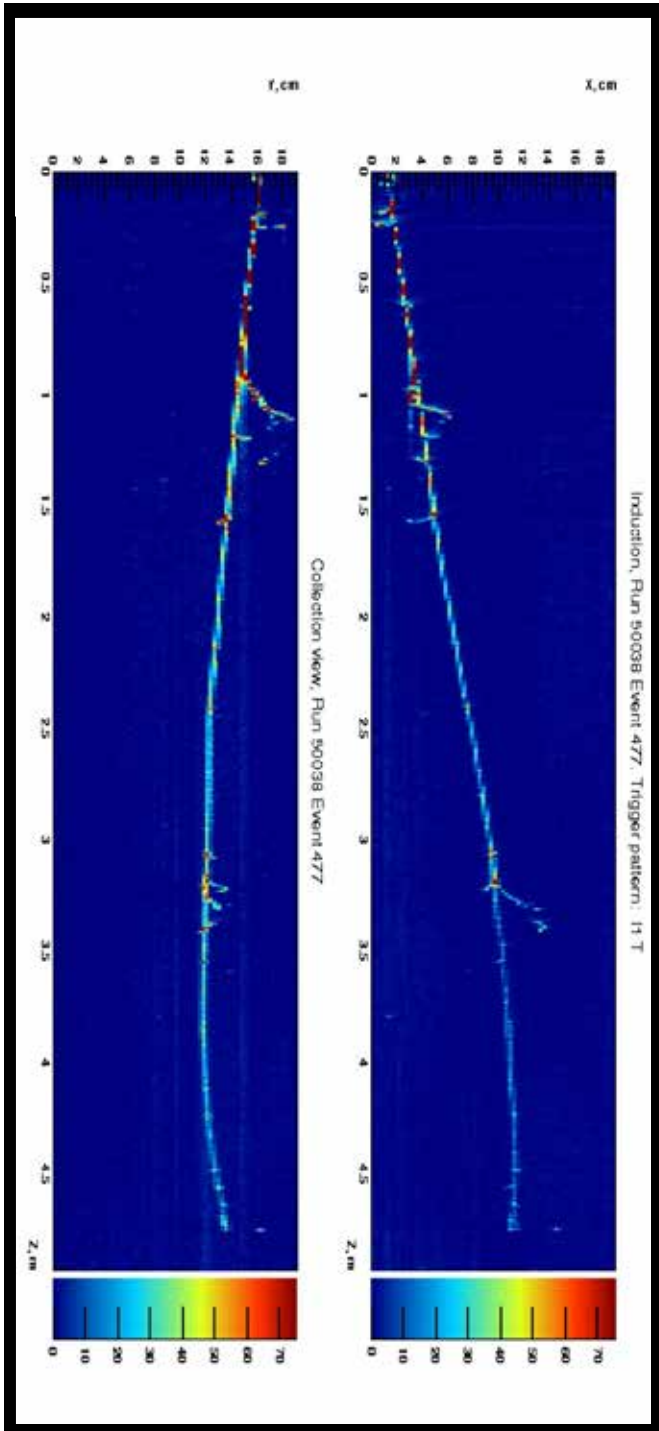
LoI submitted to the SPSC

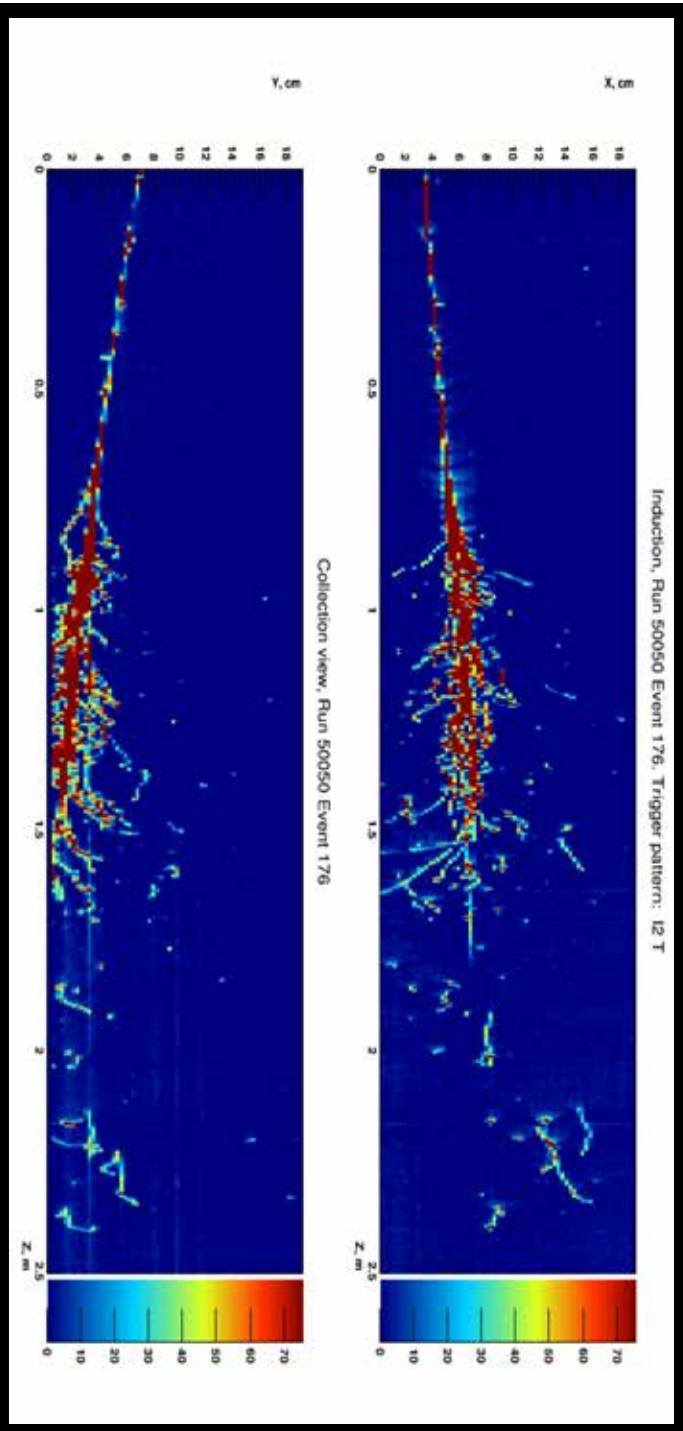
14 April 2015

CERN SPSC LoI 243, 2015

*The Committee **received with interest** the Letter of Intent SPSC-I-243 describing the proposed R&D to assess the feasibility of fully modular liquid argon TPCs (ArgonCube).*

*The SPSC **encourages** the ArgonCube collaboration to conduct the first stage of the proposed project at the University of Bern. The Committee **expects** the first stage to investigate open questions such as LAr purity, detector mechanics, charge readout options, data compression and event reconstruction which should be answered before the collaboration considers submitting a proposal for future steps.*





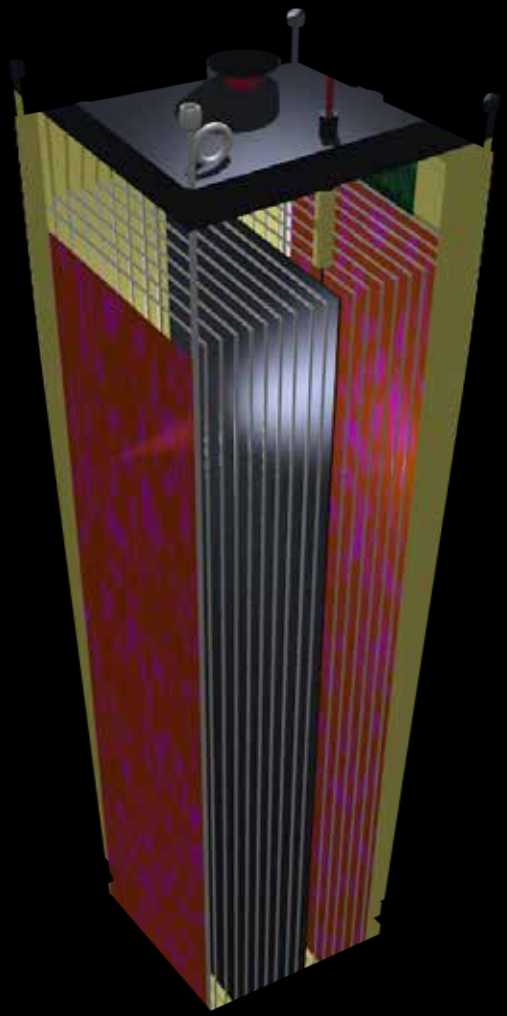
ARGONTUBE
Cosmic ray events

Free electron life time >2ms

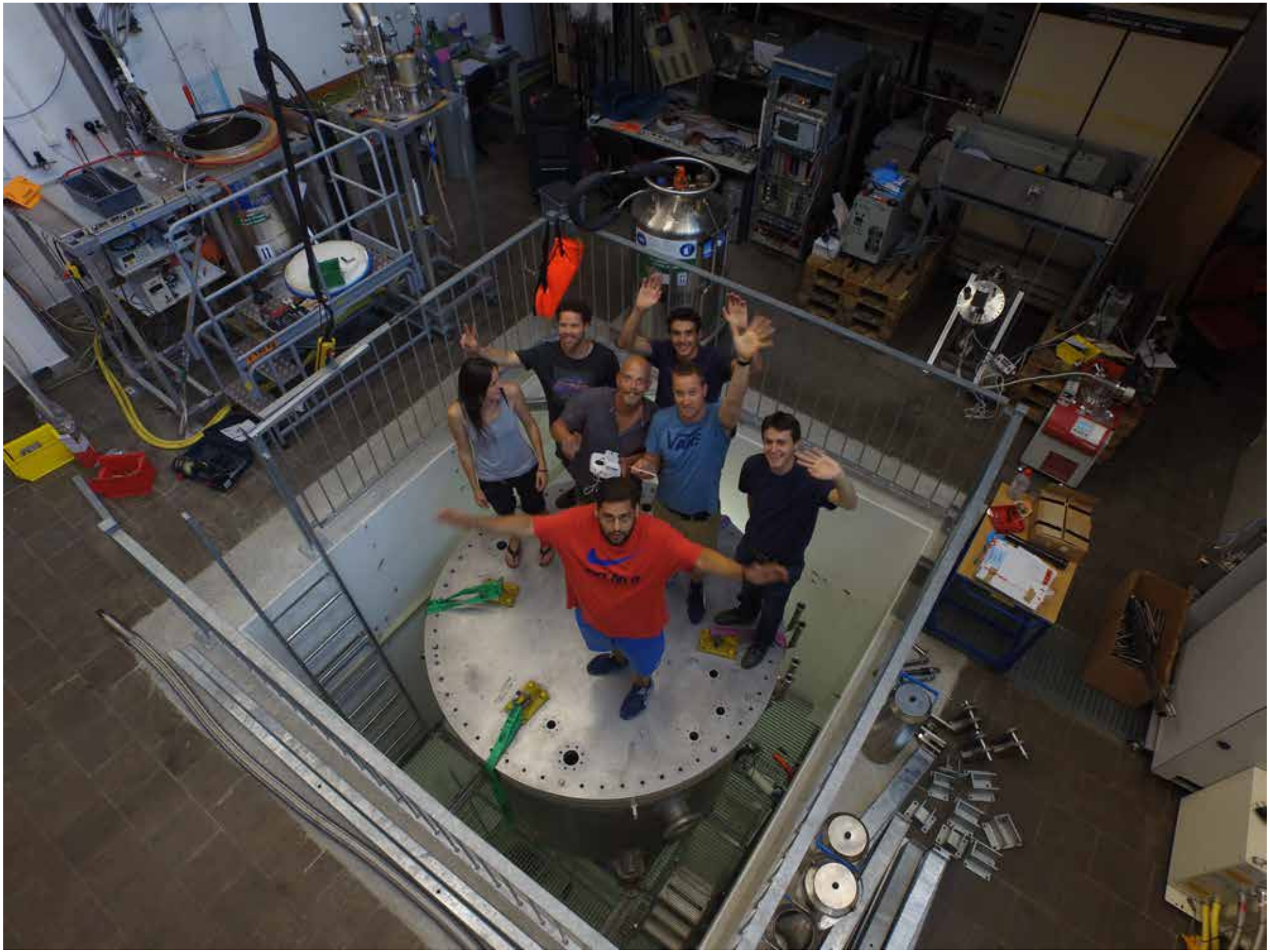
S/N ratio MIP near R/O ~30

Drift time ~4 ms
@ ~400 V/cm

ArgonCube modularity

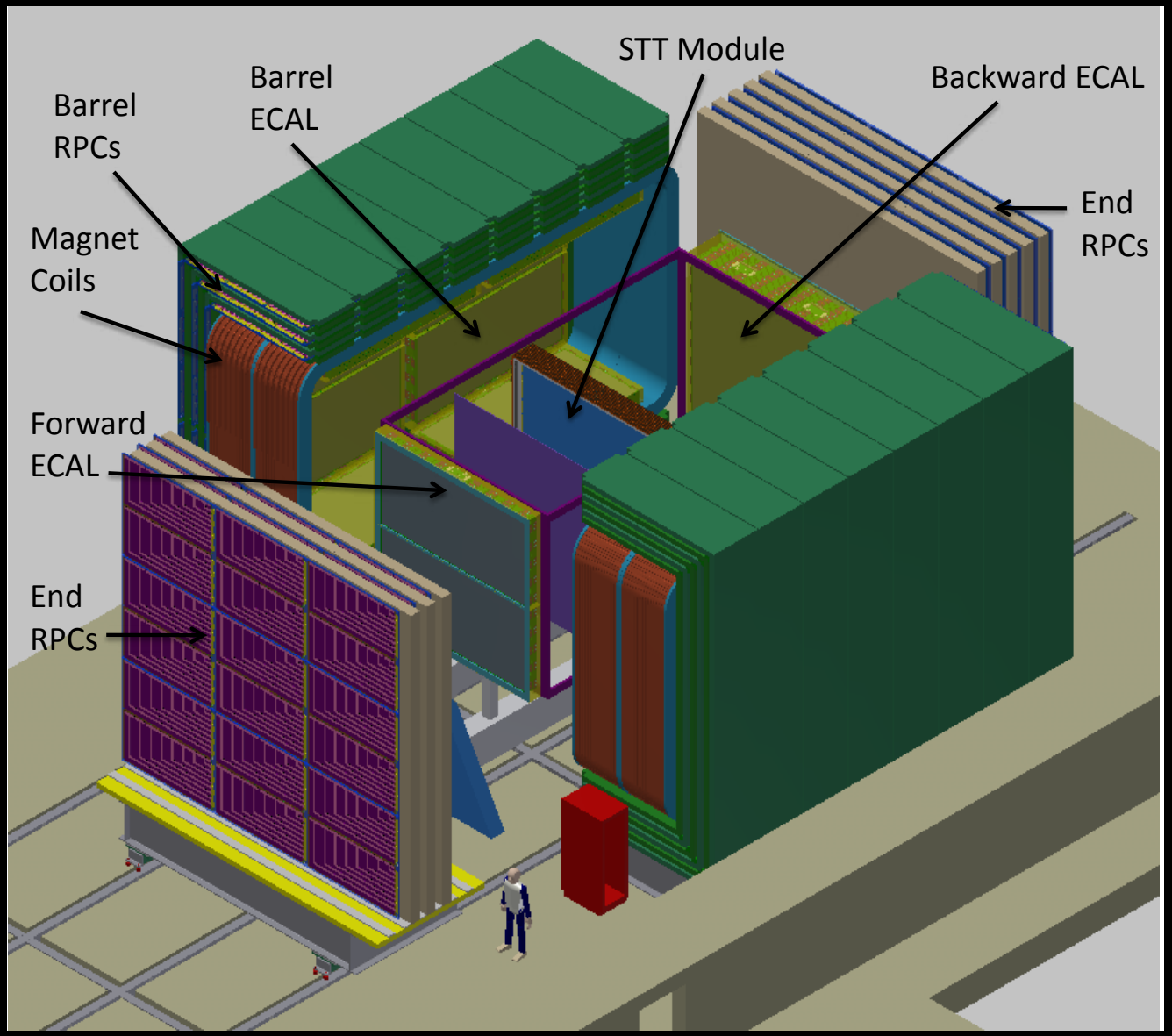


- Shared construction
- Replaceable units
- Incremental & upgrade
- Easier requirements



- Following the SPSC recommendations, execute a full R&D program in Bern
- Define general common features of modules to be tested in Bern (4-6 modules)
- Realize the modules with possibly different technological solutions
- Think of groups or group clusters responsible for individual modules: Bern, USA, EU@CERN, …
- Develop ancillary technologies on specific points: readout, materials, mechanics, etc.
- Joint installation, operation and data analysis
- Aim at a prompt answer to the SPSC questions and move to Phase 2

DUNE near detector



A possible strategy

- Set up a Collaboration WG with the mandate to perform a conceptual design for the DUNE ND
- Contact the DUNE management to define timeline
- Tentative dead line: conceptual design/LoI by early 2016

Another aim of this meeting

- Define a tentative organizational scheme
- Define schedules and milestones