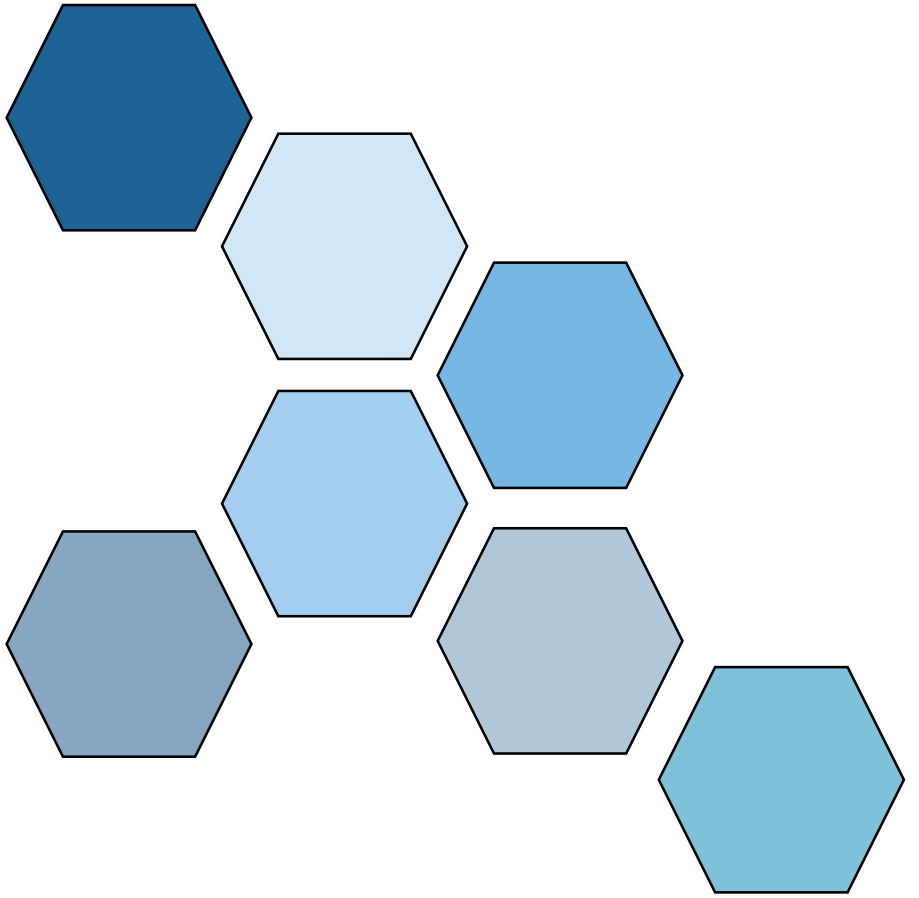
P-ONE Virtual Meeting

P-DOR ideas and **TRBnet** introduction



M. Böhmer, C. Fink, C. Fruck, R. Gernhäuser, A. Gärtner, C. Haack, F. Henningsen, K. Holzapfel, Na. Khera, Ni. Khera, K. Leismüller, L. Papp, I.C. Rea, E. Resconi, C. Spannfellner, M. Traxler, J. Michel, L. Winter, L. Ruohan, C. Bellenghi, D. Vivolo

TUM – Experimental Physics with Cosmic Particles

P-DOR ideas and TRBnet introduction

1. P-DOR (P-ONE Digital Optical Receiver) ideas
    1. PMT selection/calibration
    2. Mechanics - early concept
2. TRBnet introduction (M. Böhmer)

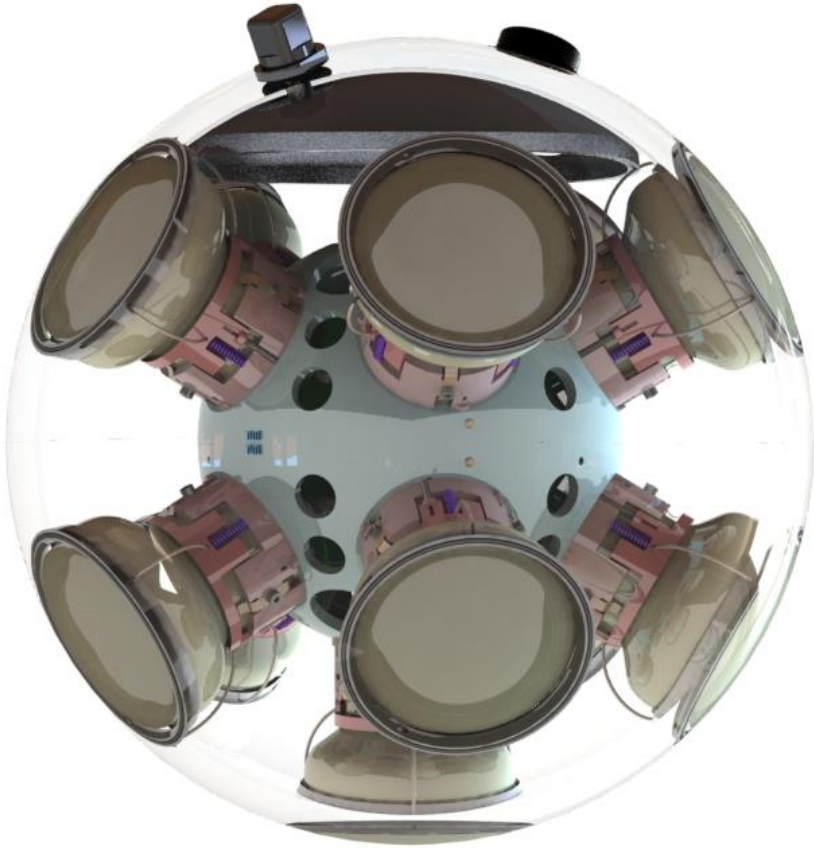
P-DOR early concept | L. Papp, C. Spannfellner

P-DOR ideas - PMT selection/calibration

- multi-PMT approach
  - 4π field-of-view
  - Multiplicity for background filtering
  - Number of PMTs tbd

- Calibration stage (under construction)
  - Selection of PMTs according to following criteria:
    - **Gain:** >10^6
    - **Transit time spread:** <2-3ns, max 5ns
    - **Quantum efficiency:** min 20% (at 450nm)
    - **Hemispherical cathode** (lower TTS)
    - **Compact**
  - Scalable approach

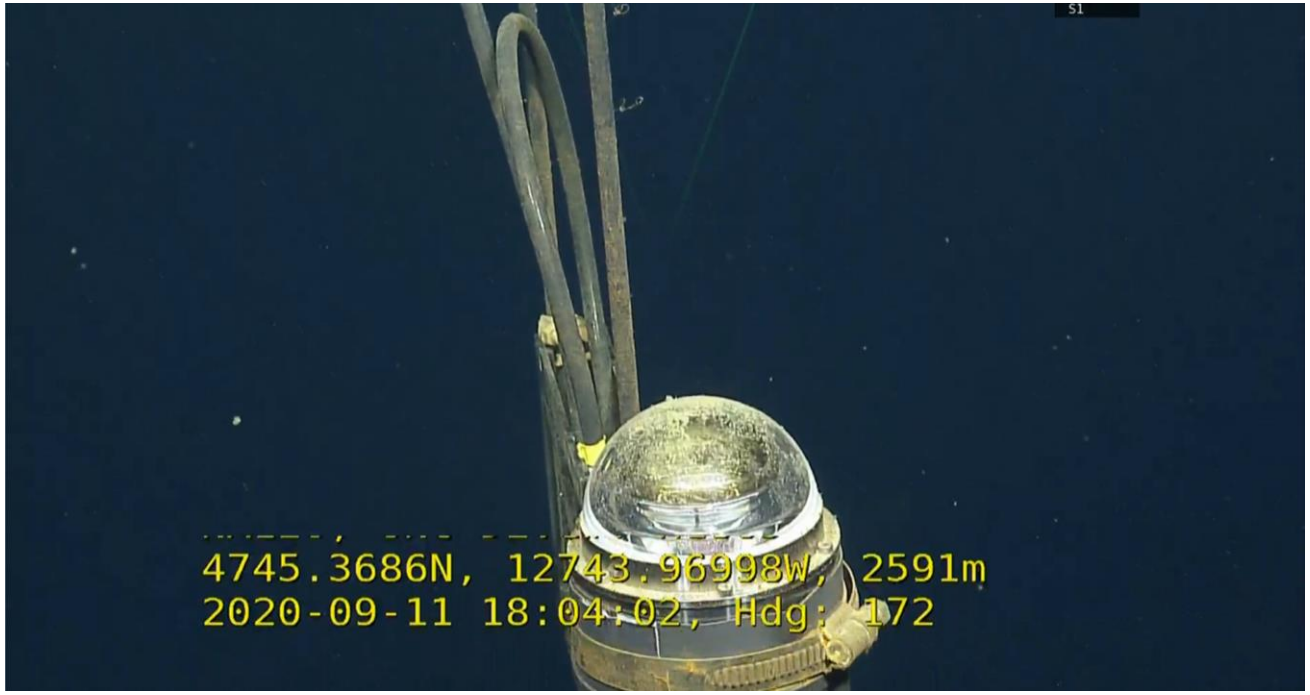
- GEANT4 simulations



P-DOR early concept | L. Papp, C. Spannfellner

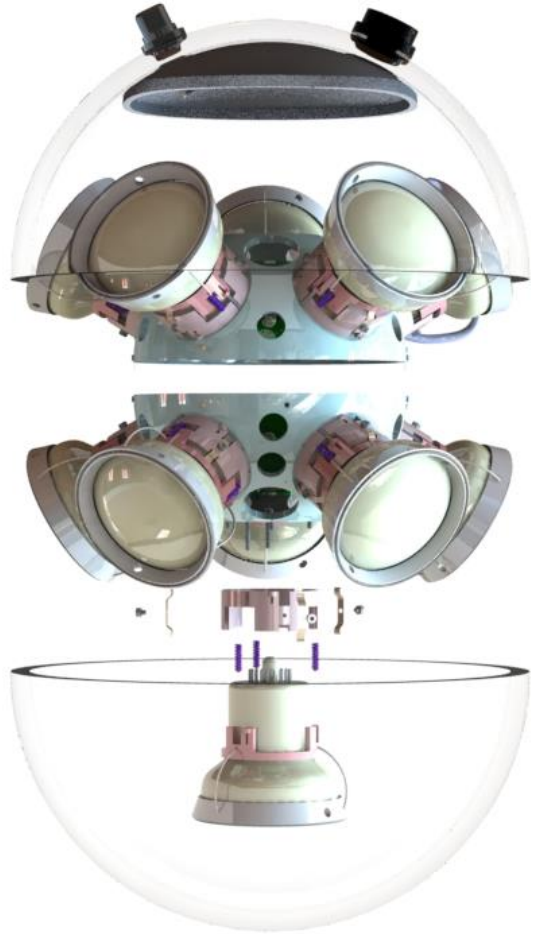
P-DOR ideas - mechanics & early concept

- Problems
  - Marine growth as seen from STRAW inspection
  - Internal cooling
  - Optical coupling of PMTs to glas
  - Space constraints
  - Modularity – make it „easy“ to build
- Early concept uses 13“ sphere (similar to STRAW-b)



P-DOR ideas - mechanics & early concept

- 1st early concept
  - Receptacle and vacuum port on top – mitigate marine growth
  - Heat bowl (on top) for internal cooling – similar to STRAW-b
  - Modular and multi-PMT approach
  - Optical coupling with gel (and springs)
- Early concept uses 13“ sphere (similar to STRAW-b)
- **NOTE:** Mounting, #PMTs, etc. depends highly on selected PMTs



P-DOR early concept | L. Papp, C. Spannfellner

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P-ONE

Baseline: P-DOR is in a very early concept phase. PMT selection and other related work is ready to start beginning of 2021. Design depends heavily on chosen PMTs.

Up next: TRBnet introduction (Michael Böhmer)

Thank you for the attention!