

Neutrino group@Nikhef



Dorothea Samtleben on behalf of the Neutrino Group

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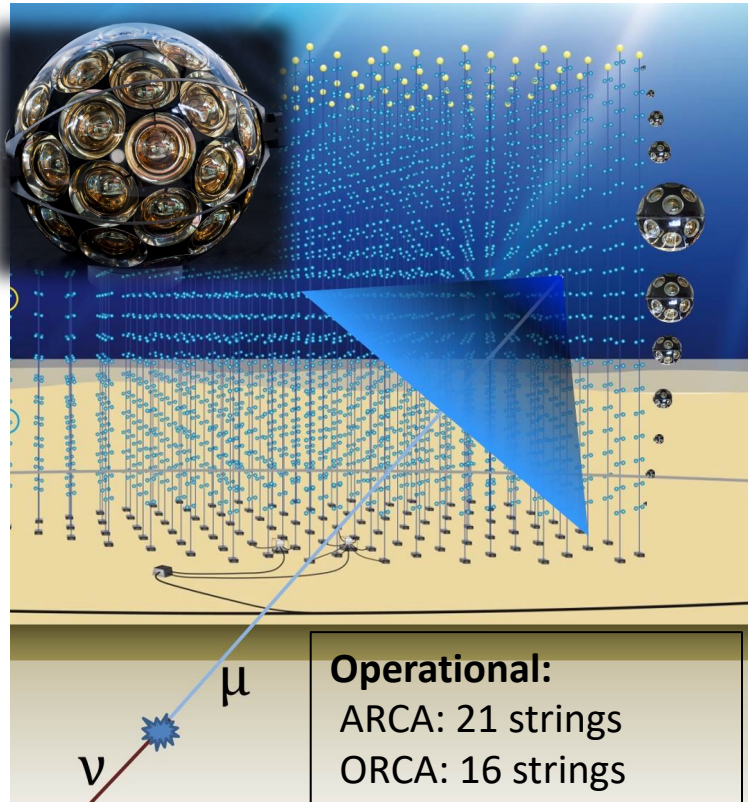
KM3NeT:

km³ neutrino telescope in the Mediterranean Sea

KM3NeT-ARCA -> Cosmic neutrinos

KM3NeT-ORCA -> Neutrino oscillations

further: cosmic rays, dark matter

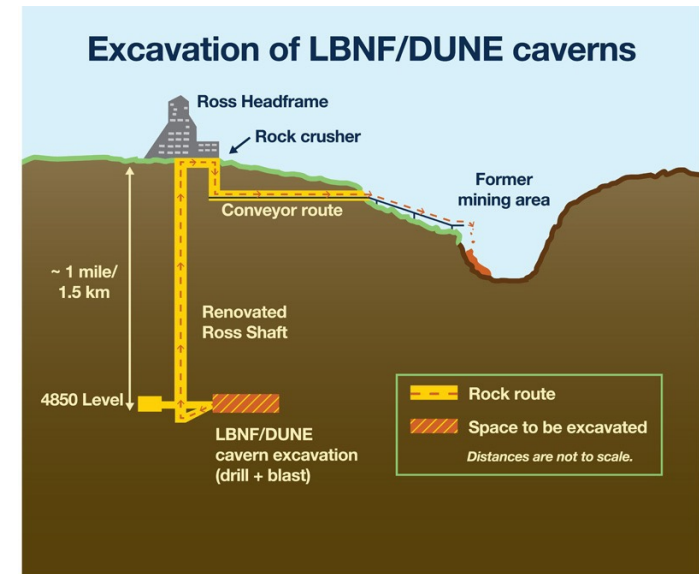


DUNE:

Sanford Underground Research Facility,
South Dakota, USA

Neutrino beam from **Fermilab** (1300km)

-> Neutrino oscillations, CP-phase



KM3NeT

Joined: **Francisco (Paco) Vazquez de Sola** (postdoc)
Vincent Kueviakoe (PhD candidate) to join in September

Master students: **Liselotte Dijkema**, **Charles Estourgie**, **Isis Hobus**, **Wessel Krah**, **Jelmer Mulder**,
Evi Nikoloudaki, **Lara Skrabal**, **Bas Slotema**, **Kevin van Oers**, **Dylano van Oijen**

Bachelor students: **Joshua Aartsen**, **Lieke Gijsen**, **Raf Jooren**, **Jelle Koorn**, **Niels Odijk**,
Rosje van Praag, **Björn van Loon**, **Emanuel van Campenhout**, **Mike Wang**

Left: **Suzan Basegmez**, **Alba Domi**, **Valentin Pestel** (postdocs), (**Rasa Muller** PhD defends 11th July)

DUNE

Joined: **Marjolein van Nuland** (PhD candidate)

Funding

NWO Roadmap Grootschalige Wetenschappelijke Infrastructuur

NWO Physics Programme “The Hidden Universe of Weakly Interacting Particles”

VICI **Aart Heijboer**

Netherlands eScience Center grant **M. Bouwhuis** (2023)

A database-integrated KM3NeT solution for automated processing

ESCAPE, InfraDev2, FUSE





Detector construction in the Pimu hall

Since last year:

At Nikhef: Construction (repair) of
60 DOMs
5 (2) strings

Deployments:

ORCA: +10 => 16 strings operational

ARCA : +11 => 21 strings operational



-> see also

[MADE@NIKHEF](https://www.nikhef.nl/en/made@nikhef)





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**Giorgos
Androulakis
award for
engineers in the
project**

Special thanks to **Jorgen, Willem, Ivan, Oscar and Robin**
who make this happen in the PiMu hall.

In addition, thanks to **Edward, Jan-Willem, Antonio and Ruud** for support!

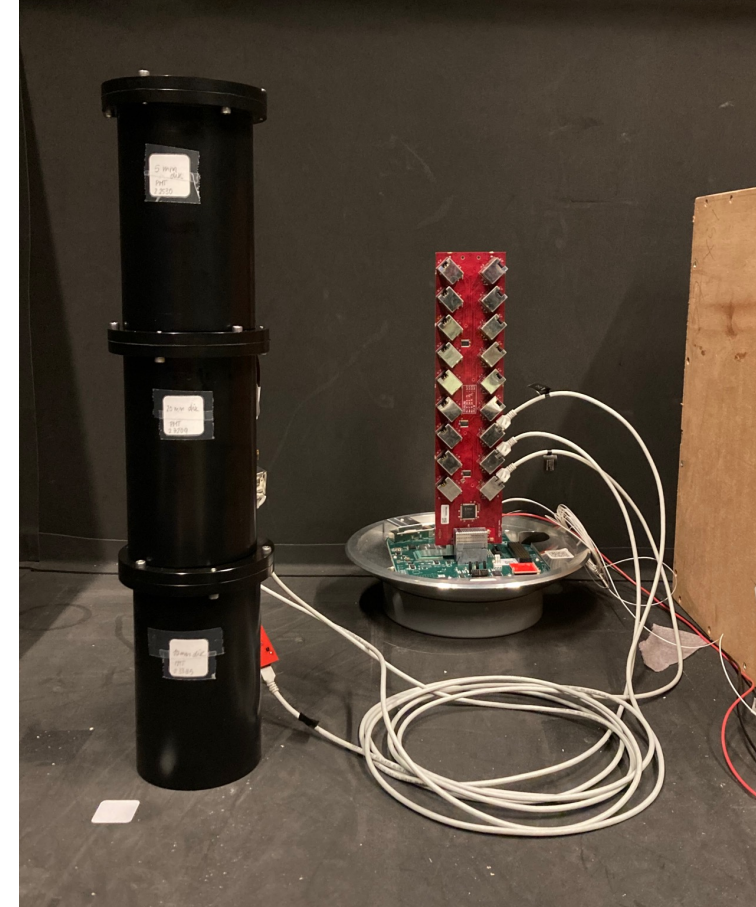
Paul Timmer: Retiring -> We will miss you!
Invaluable contributions in the KM3NeT electronics!



Also student projects in the Dark room:

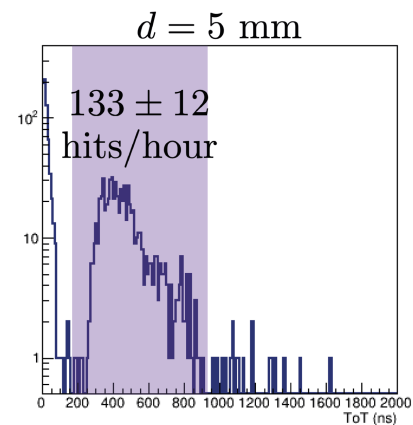
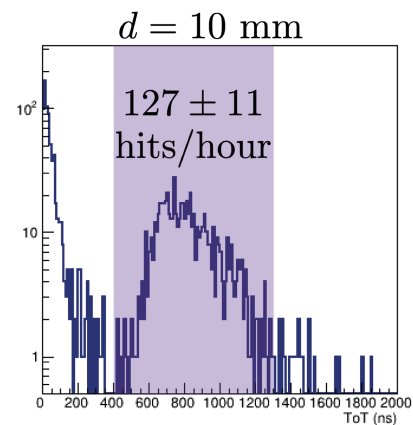
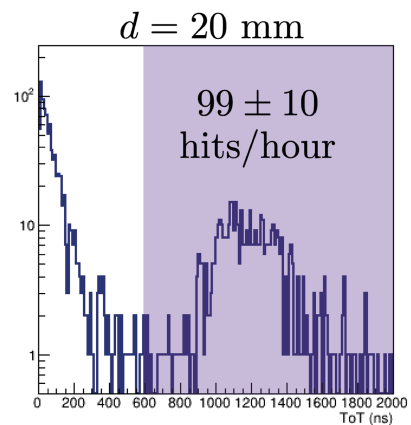
Development of a stand-alone muon detector in the DOM

-> enable precision cosmic ray studies



Signal rate for different scintillator thicknesses

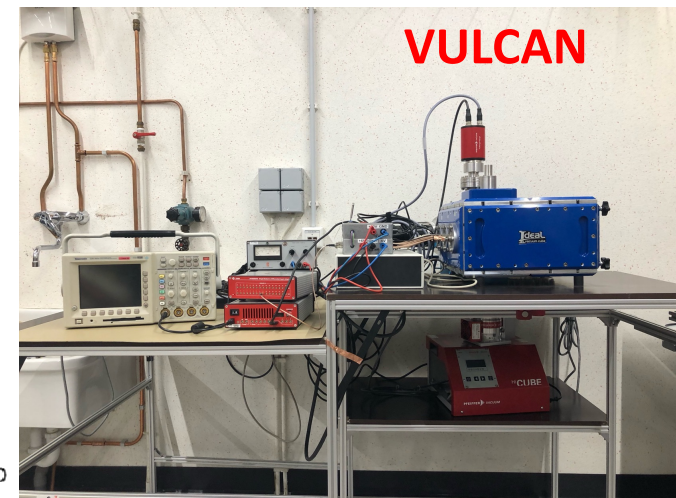
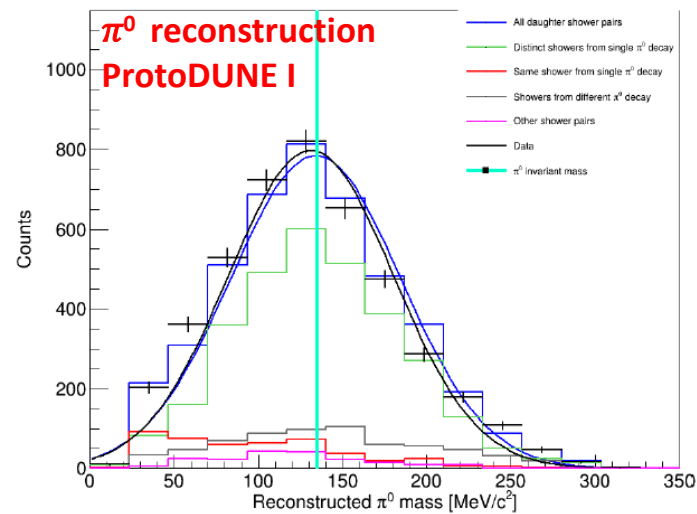
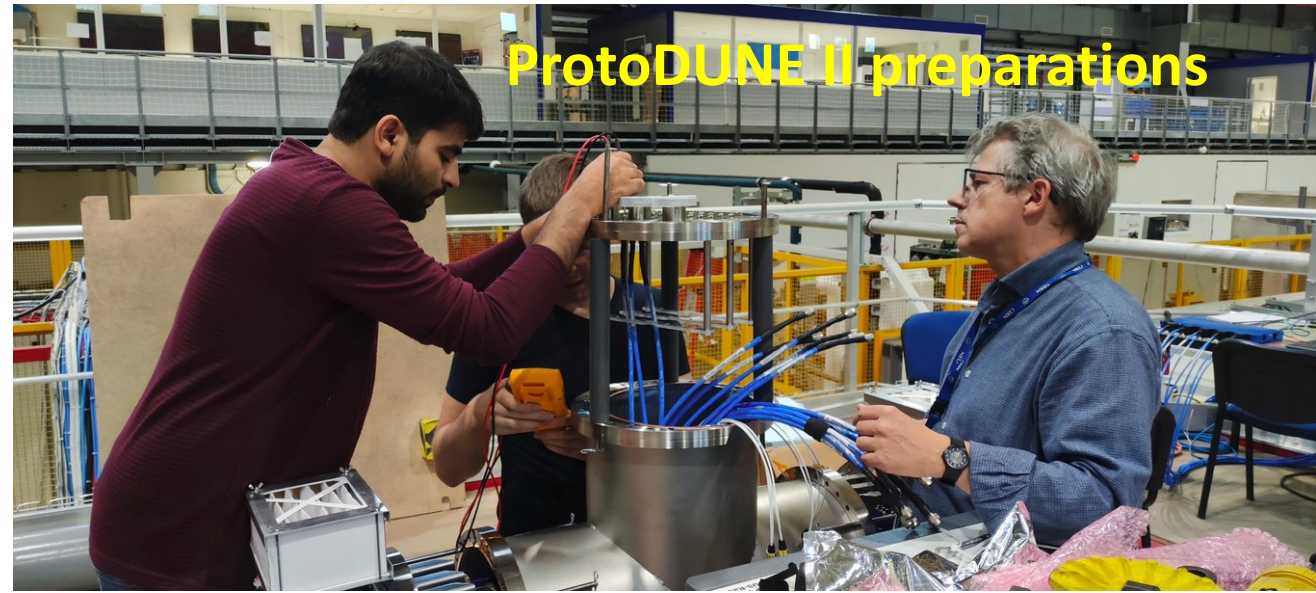
Isis Hobus



simulations: $\sim 105 \mu/\text{hour}$

Nikhef activities in DUNE

- **Data analysis** of ProtoDUNE I (SP), emphasis on π^0 reconstruction and π^0 -e separation.
- **Shower reconstruction** (e, γ) in LAr.
- **Preparations for ProtoDUNE II** at CERN; photon detector elements. Run in 2023 or 2024.
- **Tier-1 computing**: 10% of DUNE needs
- **VULCAN: Vacuum Ultraviolet Light Characterization**
At Nikhef: characterize response of materials to LAr scintillation light



To be continued here:

Jhulik Majumdar: *Cosmic Neutrinos with KM3NeT*

Bouke Jung: *Physics with KM3NeT-ORCA*



Neutrino group outing at Wijk aan Zee

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Jhulik Majumdar: *Cosmic Neutrinos with KM3NeT*

Bouke Jung: *Physics with KM3NeT-ORCA*



Collage by Aart Heijboer