

## ***Nikhef & Einstein Telescope***

Rob van der Meer

ET-PP ICW'26

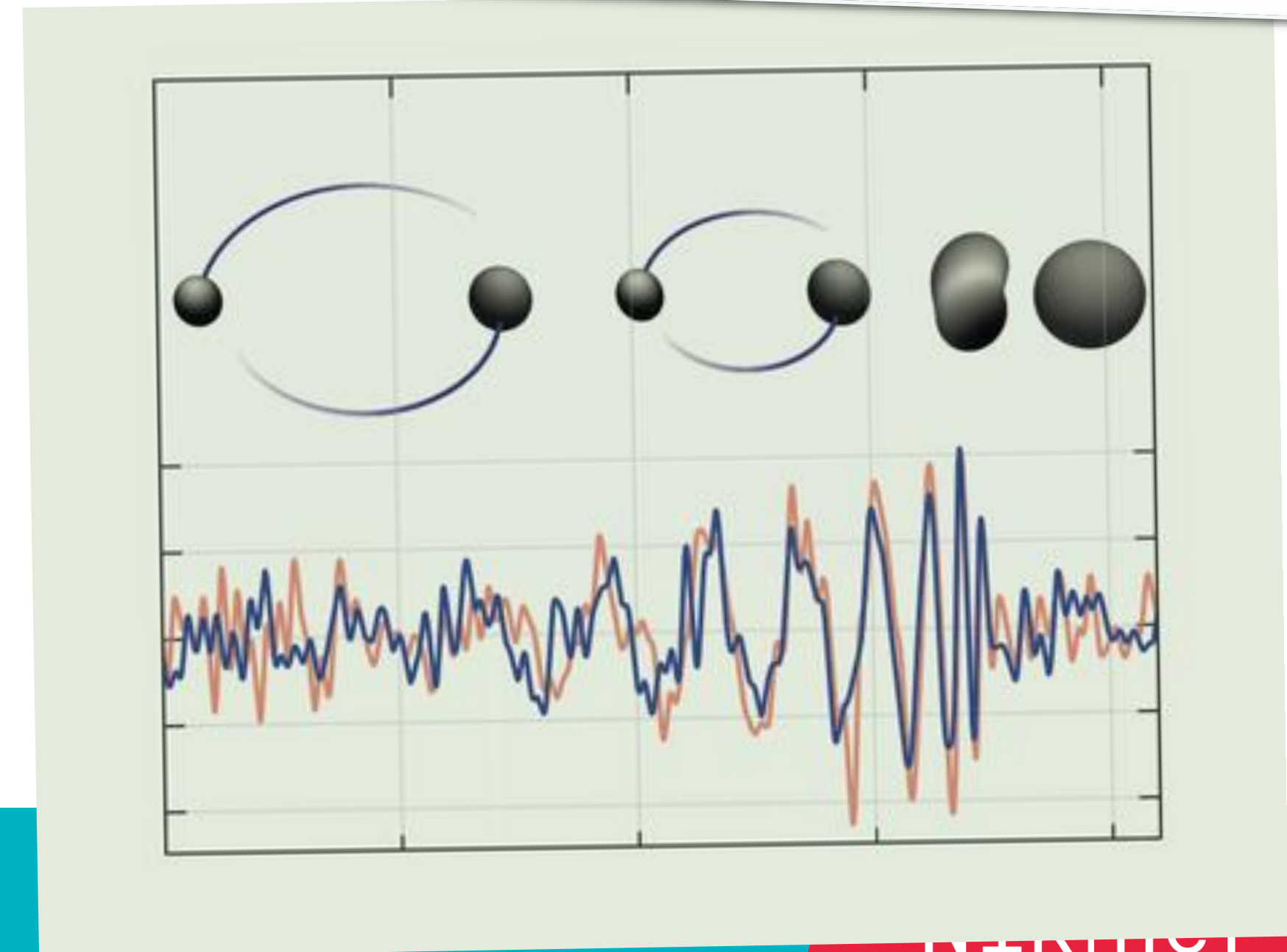
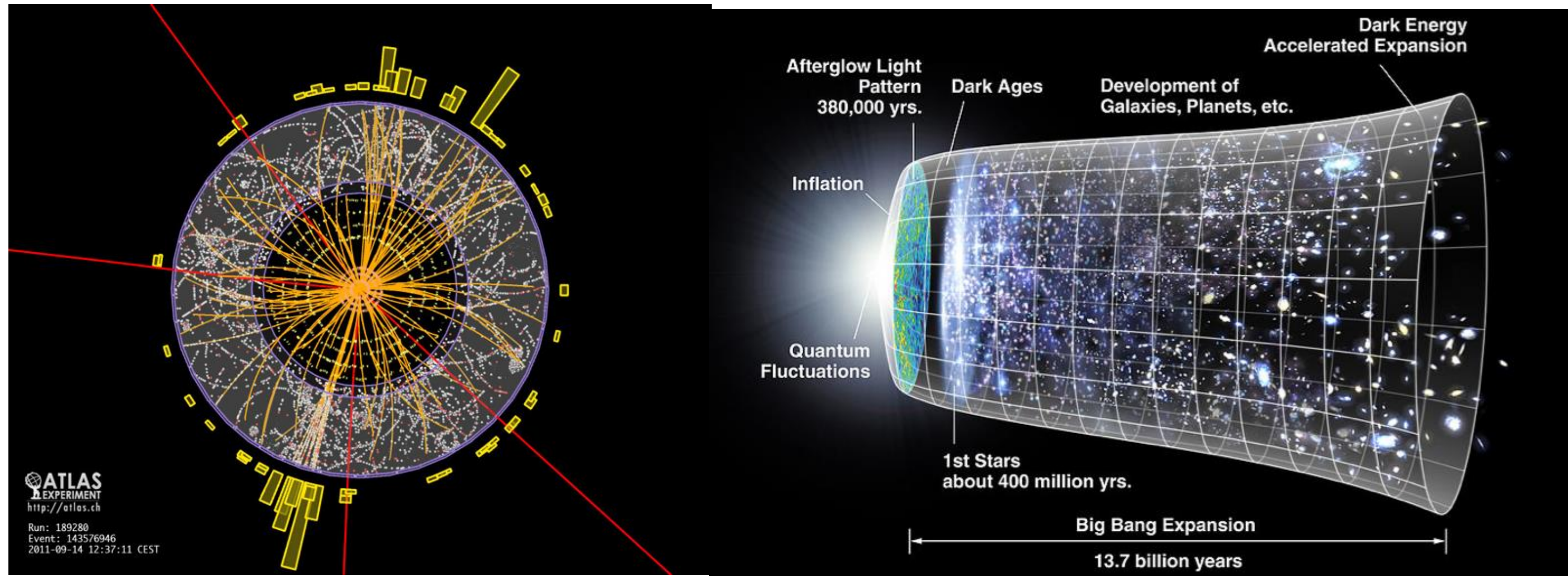
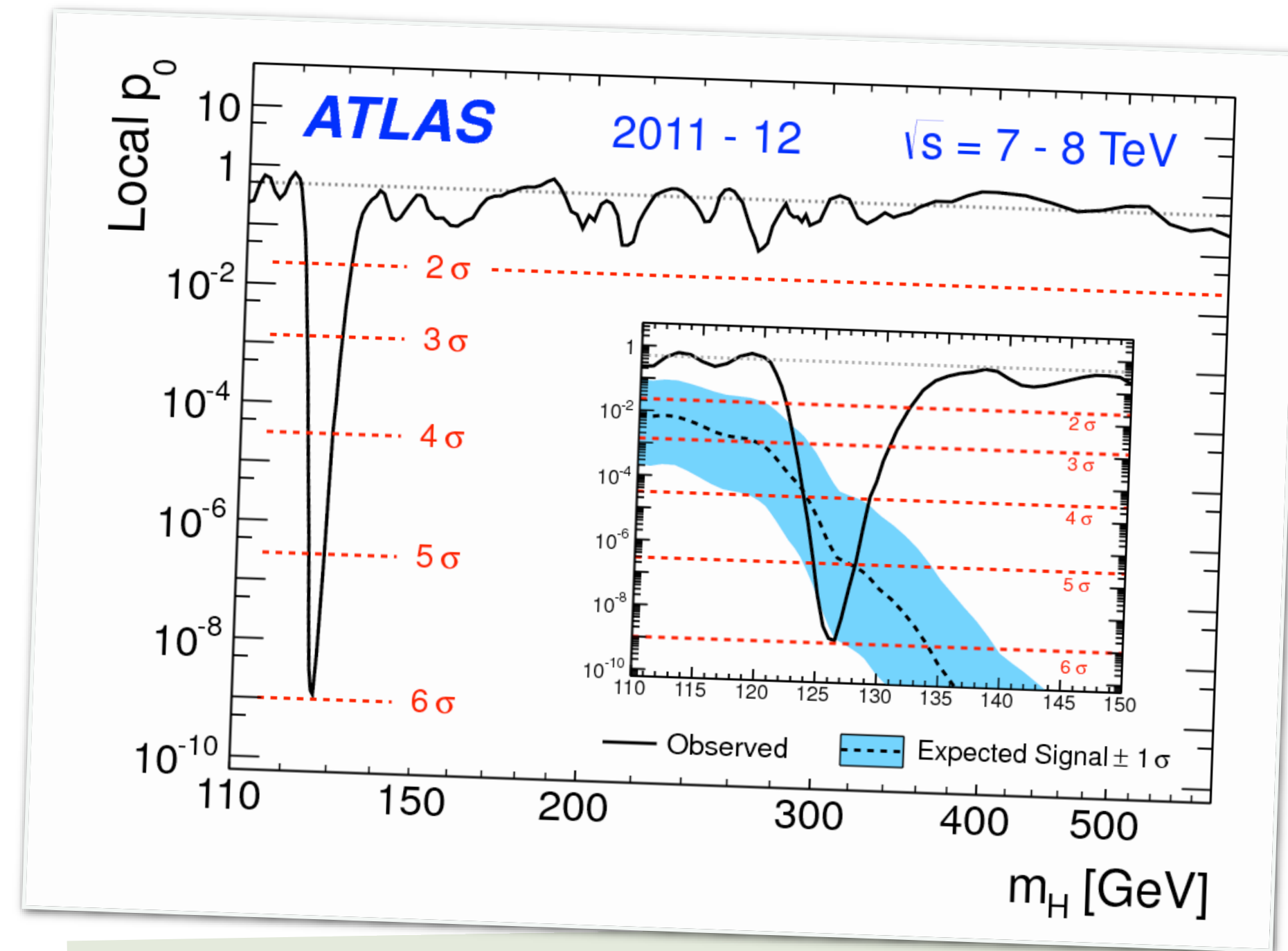
14 April 2026

# Nikhef's mission

Study the interaction and structure of all elementary particles and fields:

- Collider physics (i.e. CERN)
- Astroparticle physics

Knowledge and technology transfer



# The Nikhef Partnership

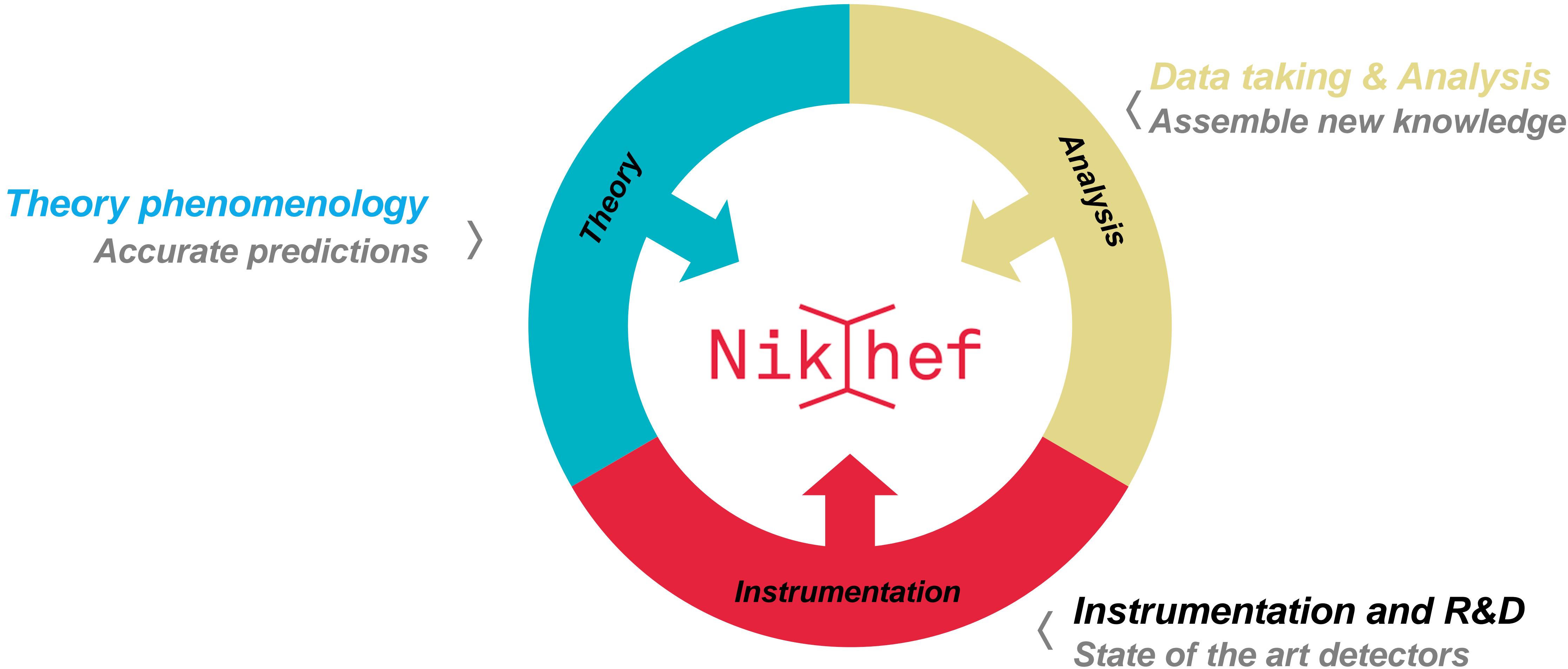
## A collaborative ecosystem

- university partners co-lead (most) research programmes
- aligned with a joint national strategy

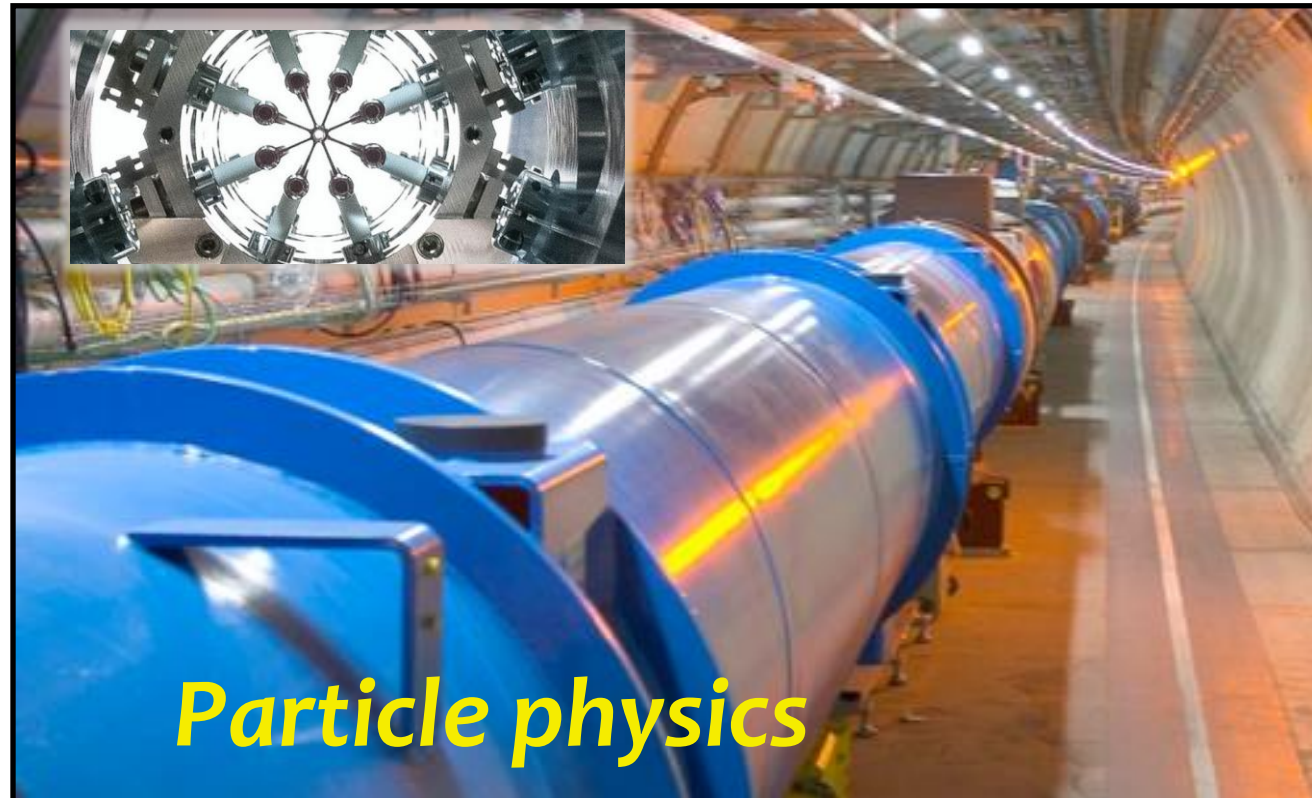
Permanent Staff	96
PhD candidates	125
Postdocs	43
Technical/engineer	88
Support	33



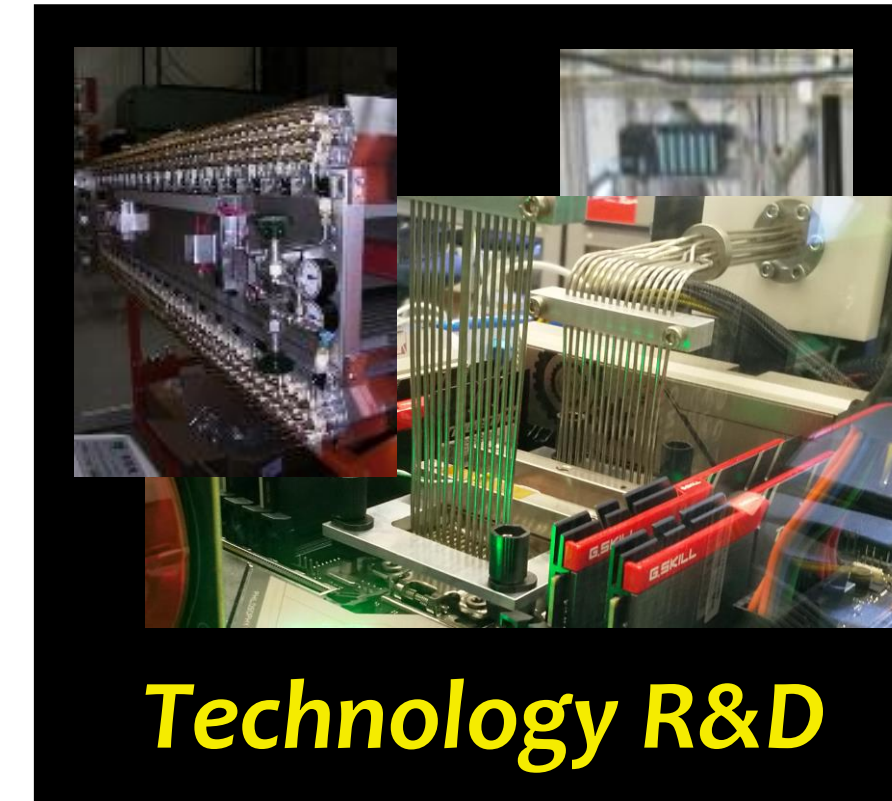
# The Nikhef ecosystem



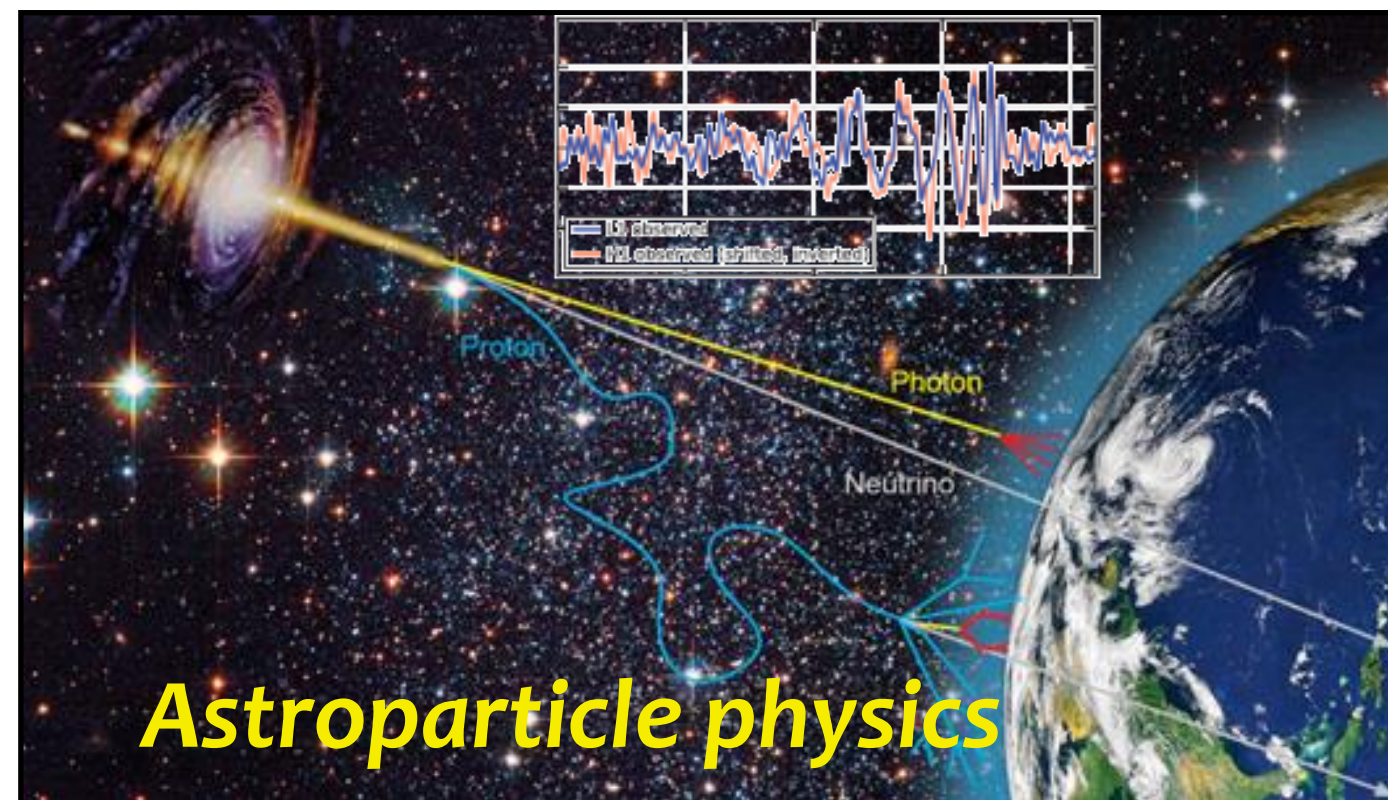
# Scientific programmes



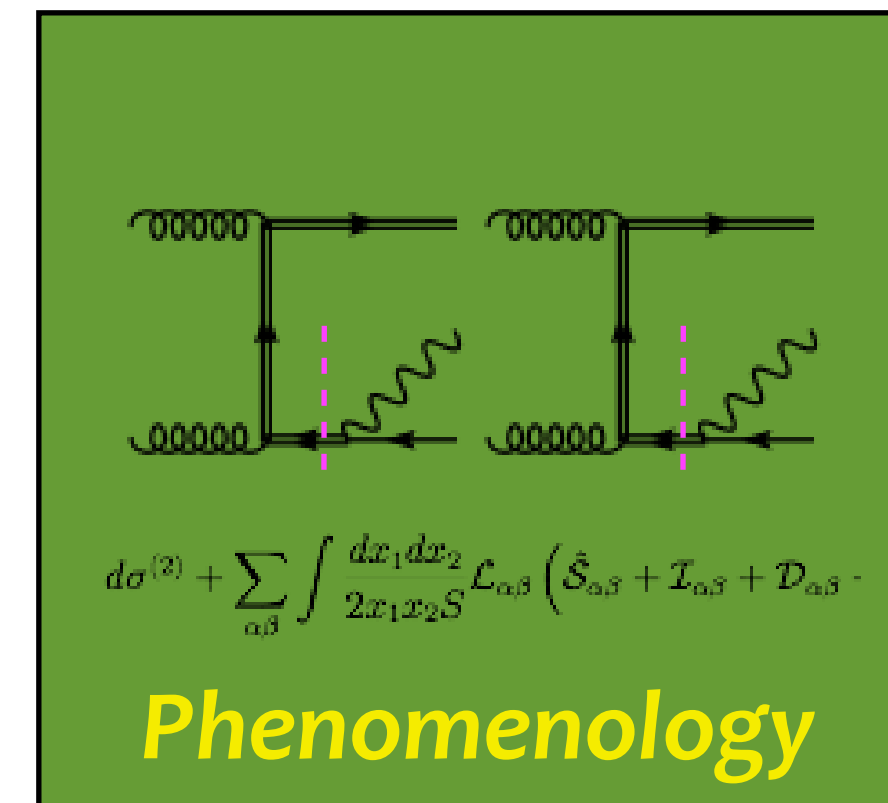
- Atlas
- LHCb
- Alice
- eEDM



- Detector R&D
- **Physics**
- **Data Processing**



- Neutrinos
- Gravitational waves
- Cosmic Rays
- Dark Matter



- Theoretical Physics

# Technical Engineering and technology transfer

*'The research at Nikhef relies on the development of innovative technologies. The knowledge and technology transfer to third parties, i.e., industry, civil society and general public, is an integral part of Nikhef's mission.'*



pictures from Nikhef's 'Dimensions' magazine and Computing Office *Hours*; <https://www.nikhef.nl/en/nikhef-mission/>

# Nikhef Computer Technology efforts

## *Supporting:*

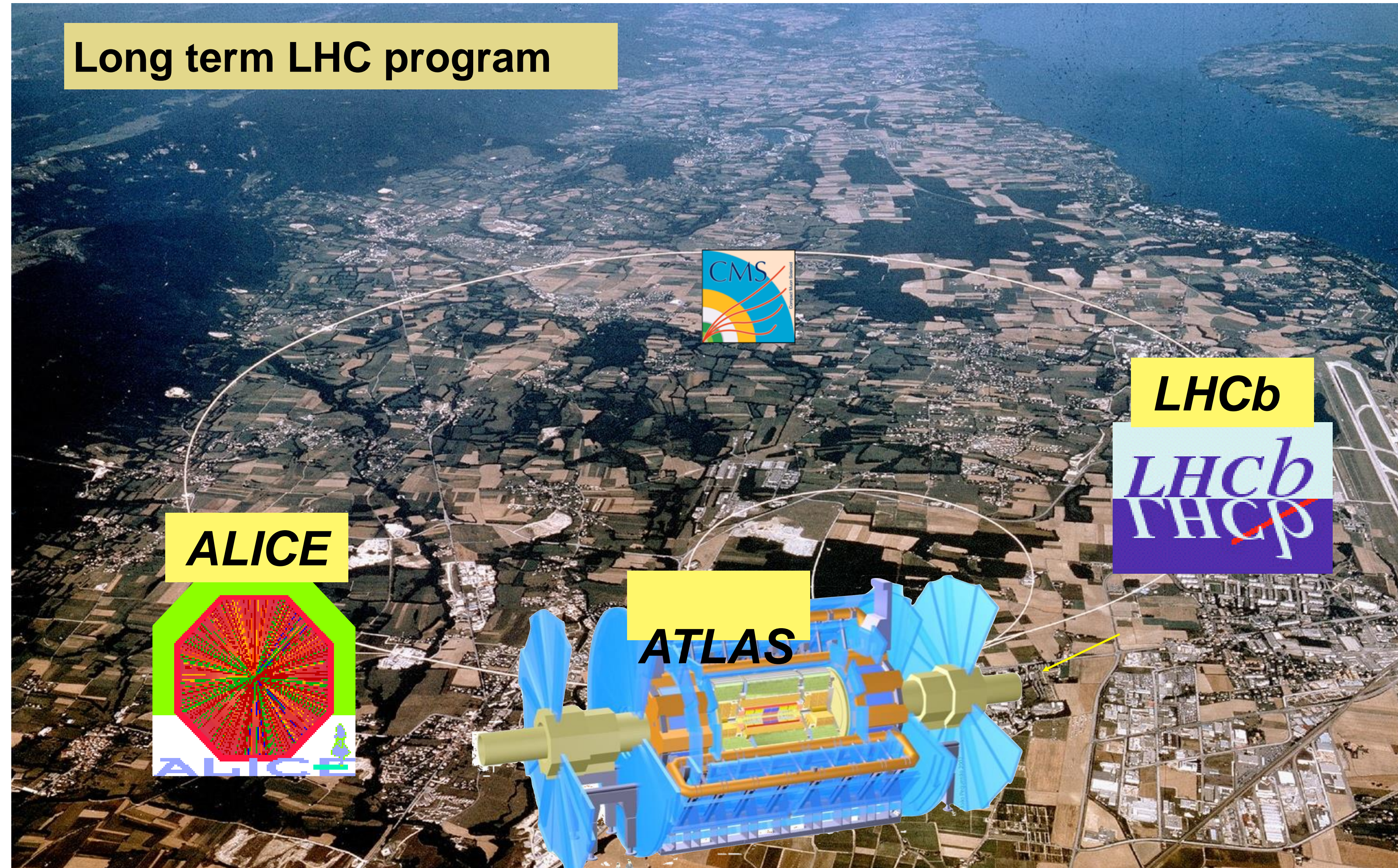
- *Software support for Data Analysis on large data sets*
- *Software support for Electronics Technology*
- *Nikhef Data processing and infrastructure*
- *World record data transfer speed to CERN 800 Gbit/s*
- *Co-location datacenter – connectivity*
- *Federation tools and secure collaboration*



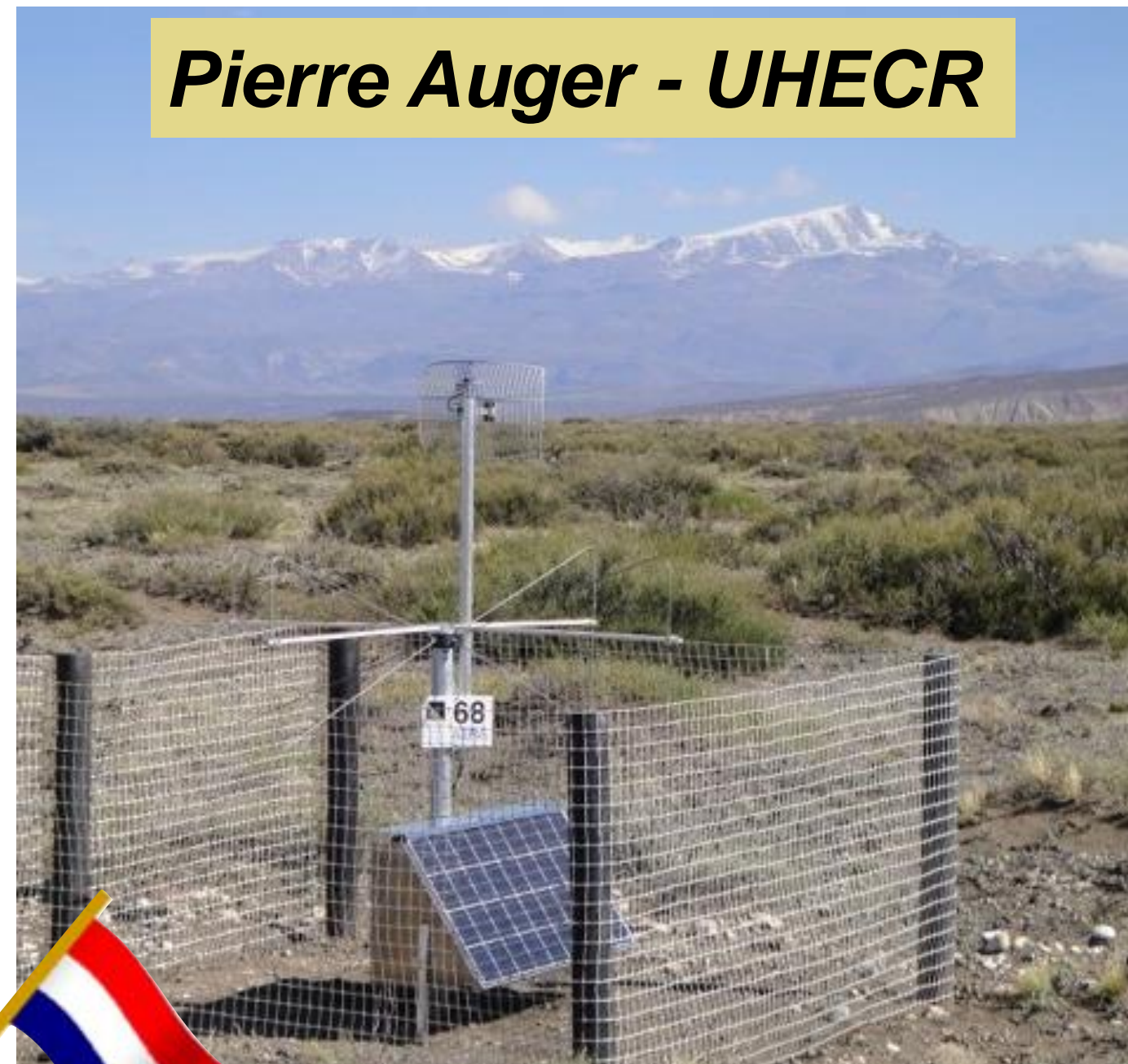
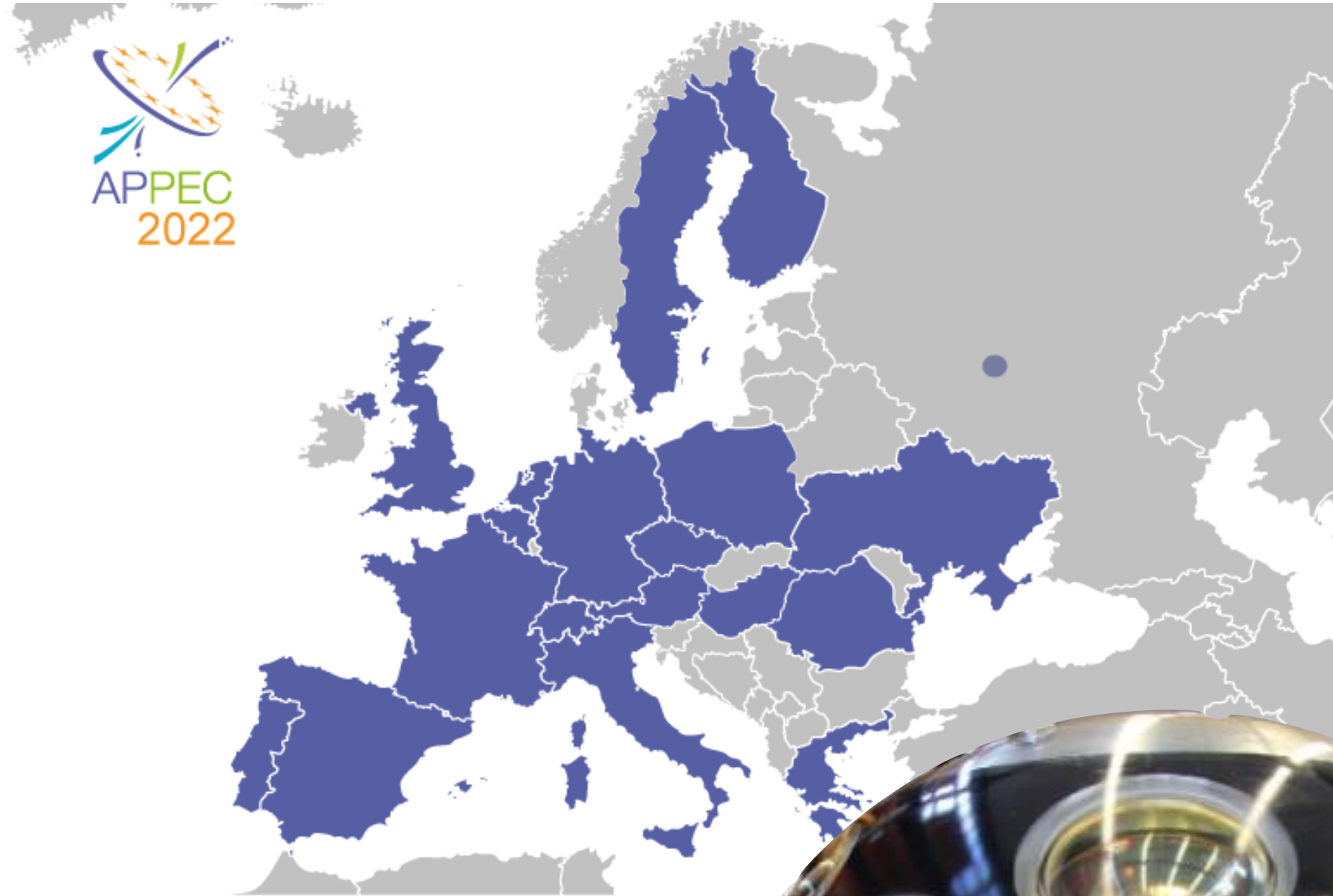
pictures from Nikhef's 'Dimensions' magazine and Computing Office *Hours*; <https://www.nikhef.nl/en/nikhef-mission/>

# LHC PROGRAMME - DUTCH INVOLVEMENT

- **ATLAS**
  - Higgs physics
  - New particles beyond the Standard Model
- **LHCb**
  - Rare decays
  - Matter-anti-matter differences
- **ALICE**
  - Plasm of quarks and gluons
  - Phase transitions



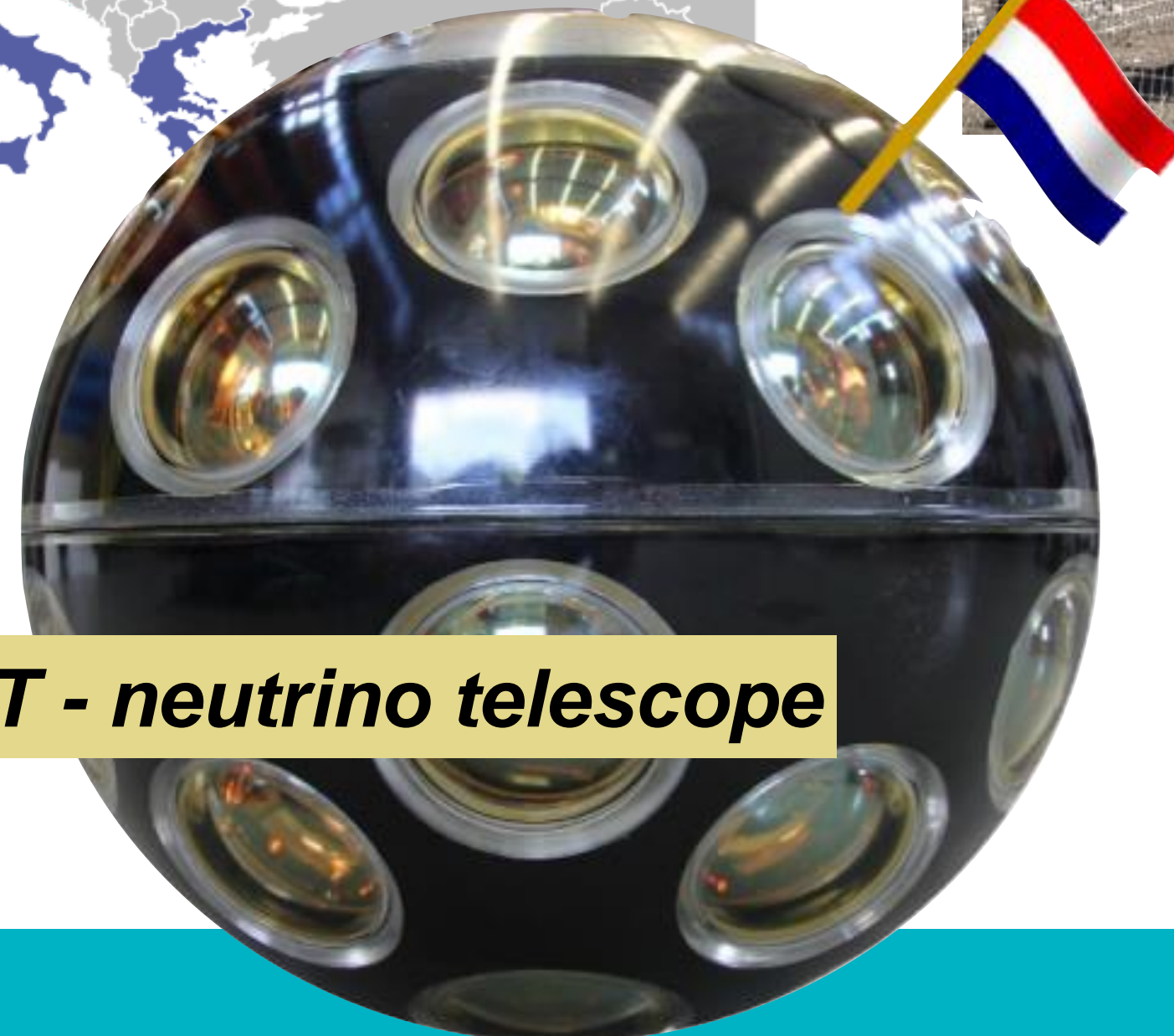
# ASTROPARTICLE PORTFOLIO @ NIKHEF



**Pierre Auger - UHECR**



**XENONnT - Dark Matter**



**KM3NeT - neutrino telescope**



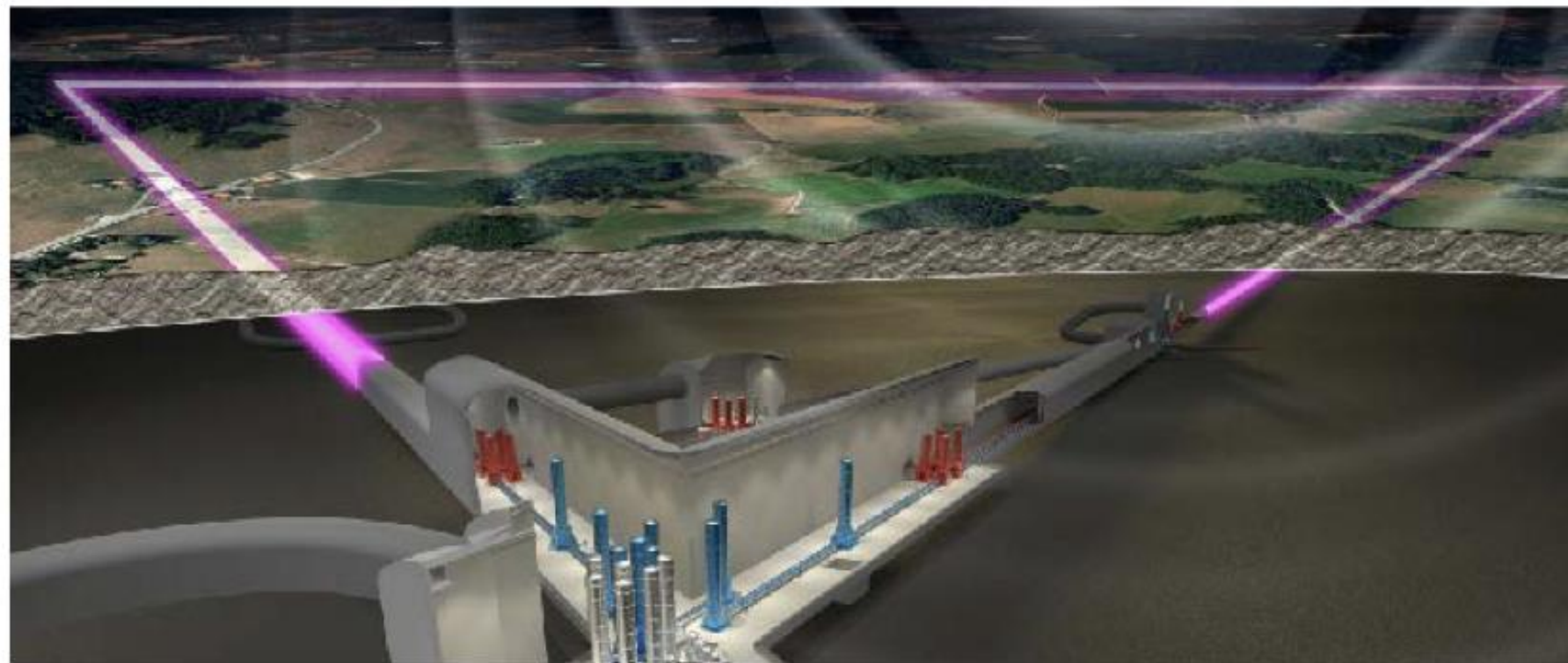
**Gravitational Waves**



# GRAVITATIONAL WAVES PROJECTS

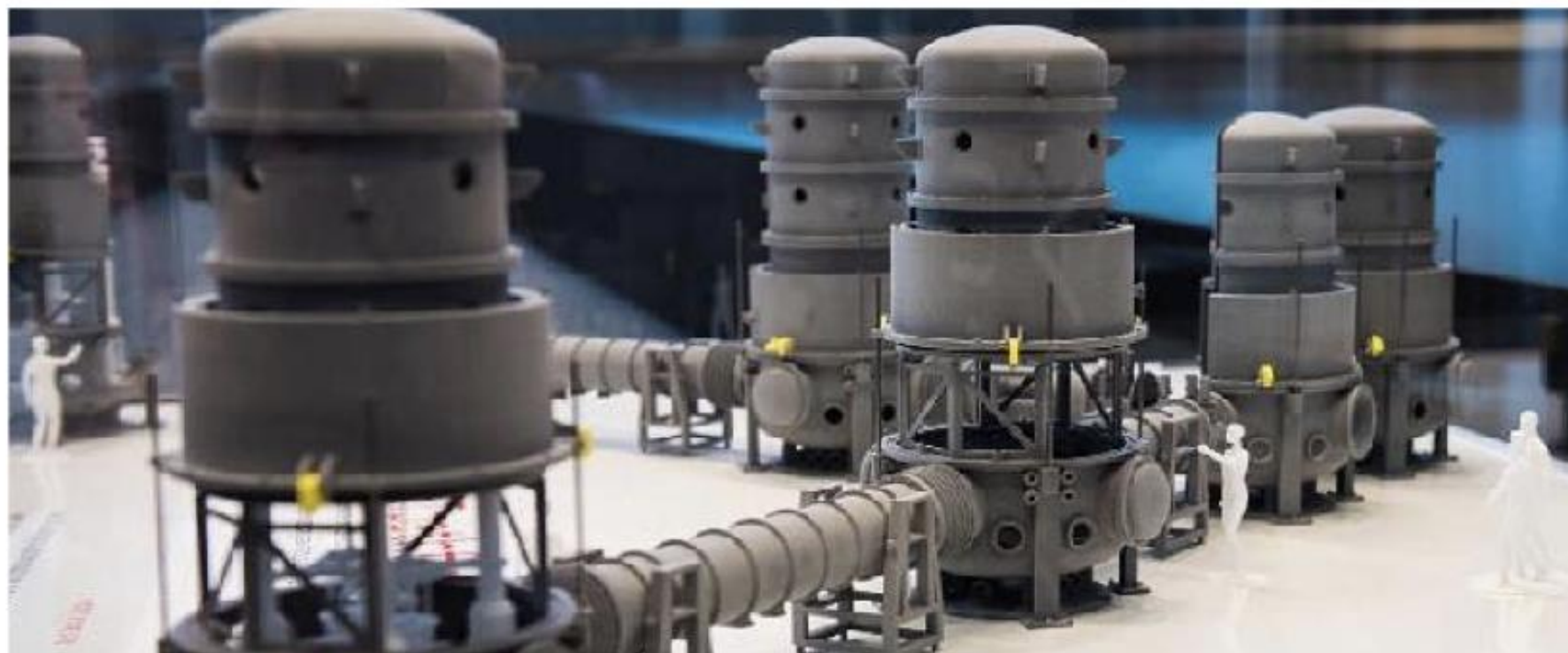
## Virgo:

- Active 2<sup>nd</sup> generation GW detector
- Nikhef installed many systems



## Einstein Telescope:

- Plan for future 3<sup>rd</sup> generation observatory in Europe
- Prepare for a bid in the EMR region



## ETpathfinder (U. Maastricht):

- 10m scale prototype interferometer
- Testbed for future GW technologies

## LISA (space mission, with SRON):

- Develop technologies in synergy for LISA & ET

# Environmental studies

