

An abstract graphic on the left side of the slide. It features a dark blue background. A thick dark blue diagonal line runs from the top-left towards the center. A horizontal dark blue line intersects this diagonal line. The area above the horizontal line and to the left of the diagonal line is filled with orange. The area below the horizontal line and to the left of the diagonal line is filled with white. The right ends of these shapes are rounded.

Einstein Telescope in EMR update



Einstein Telescope in EMR update

Today:

- Science
- Technology
- Challenges
- Opportunities
- Chances
- Timeline

Rob van der Meer
Nikhef – LIOF

9 February 2026 – Mikrocentrum

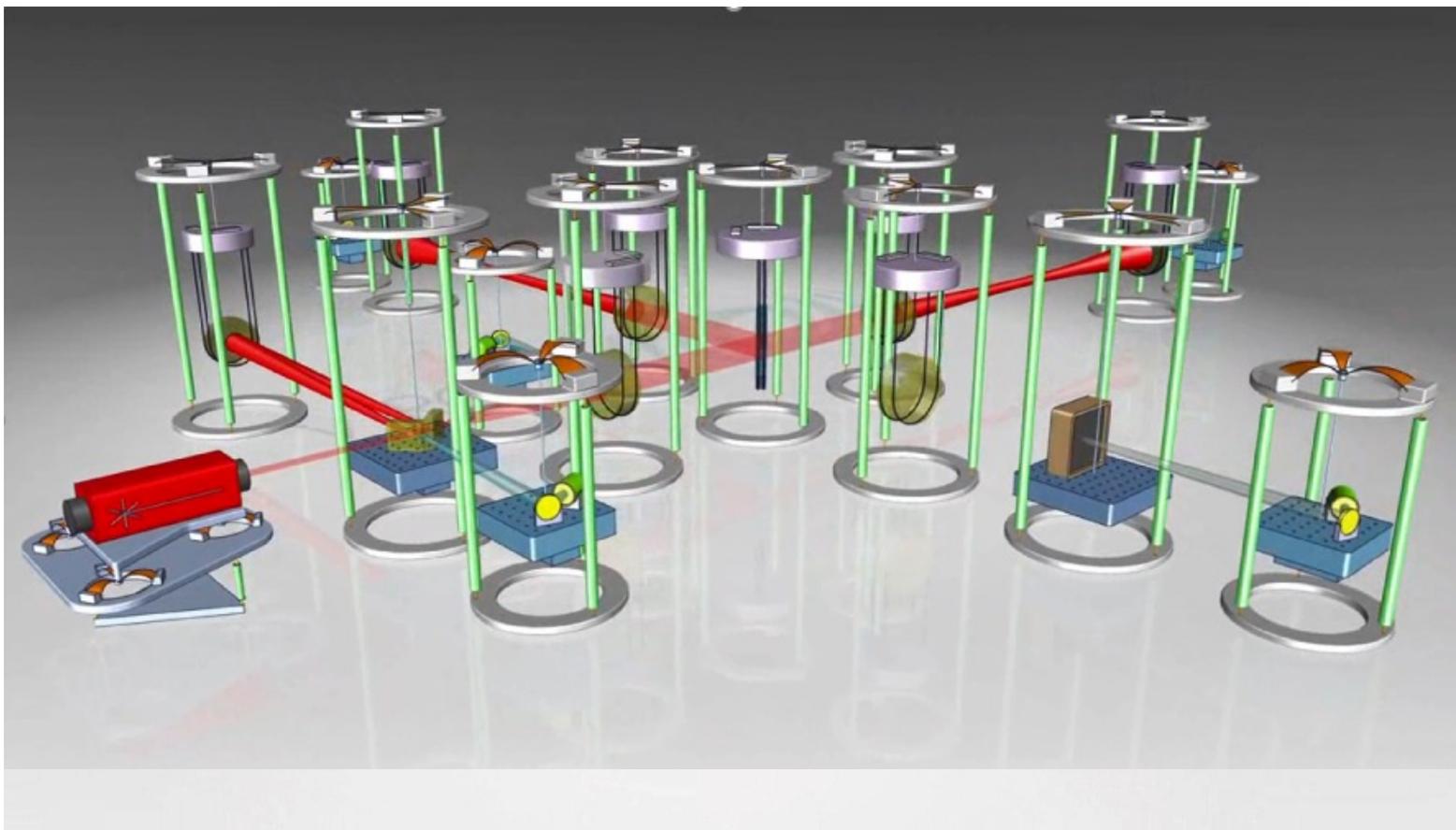
Einstein Telescope

- ◆ Gravitational Waves from the universe
- ◆ Extra window of information on astrophysics, especially on 'Dark' places
- ◆ First event in LIGO (USA) 2015
- ◆ Extremely small disturbances on Earth
- ◆ Extremely sensitive instrument needed
- ◆ Extreme noise suppression, or isolation needed
- ◆ Therefore extreme technical challenges in many fields
- ◆ Who is going to design and make our tools?
- ◆ Not just one-offs, but sometimes many items, so industrial collaboration needed
- ◆ Co-design, co-innovation, co-investment, etc.





The road to extreme sensitivity



I.

*Advanced
Virgo+*

2018-2024

Current observatories:

Developed since 1990
few km long arms
on Earth surface
Room temperature
In USA, Europa & Japan

~100) detections/year



Virgo
near Pisa
F-I-NL

in development since 2004

10 km long arms

underground

- 250 °C

European

>100,000 detections/year
From entire Universe!

Einstein Telescope:

10 km

Cost:

- ~ 200 M€ R&D/preparation
- ~ 1,700 M€ construction
- ~ 40 M€/year exploitation

(planning: ~50 year)

Valorisation in NGF project

- 6 projects in 5 areas
- Organised by LIOF
- einsteintelelescopeforbusiness.nl
- till June 2027
- plan to organise status meeting.



Zero-vibration Sorption Cryocooler for Einstein Telescope

LEES VERDER →



Manufacturing and Cleanliness of Beampipe for Einstein Telescope in High-vacuum

LEES VERDER →



SENVIDET | Sensor Engineering for Noise and Vibration Isolation and Damping in Einstein Telescope

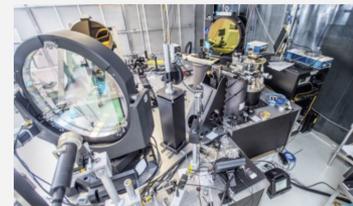
LEES VERDER →



ICVI | Improved Cold Vibration Isolation for science and industry



EINTEL/SPACE-ECHO | Optics Development for Einstein Telescope in the ET-LF cryogenic environment



ETMEROPE | MEasuring and Rectifying Optical Phase Errors



**Regionale
Ontwikkelings
Maatschappijen**

(New) programmes and (EU) projects

- ◆ ETpf – SSL
ETpathfinder Smart Skills Lab
Helps companies strengthen their technological skills
and innovation capability
ET → Industry



ETpathfinder Smart Skills Lab

<https://interregvlanded.eu/et-pathfinder-smart-skills-lab/>



- ◆ COMET
CoMaking the Einstein Telescope
Funding for SMEs in the German–Dutch border region

<https://www.comet-interreg.eu/>

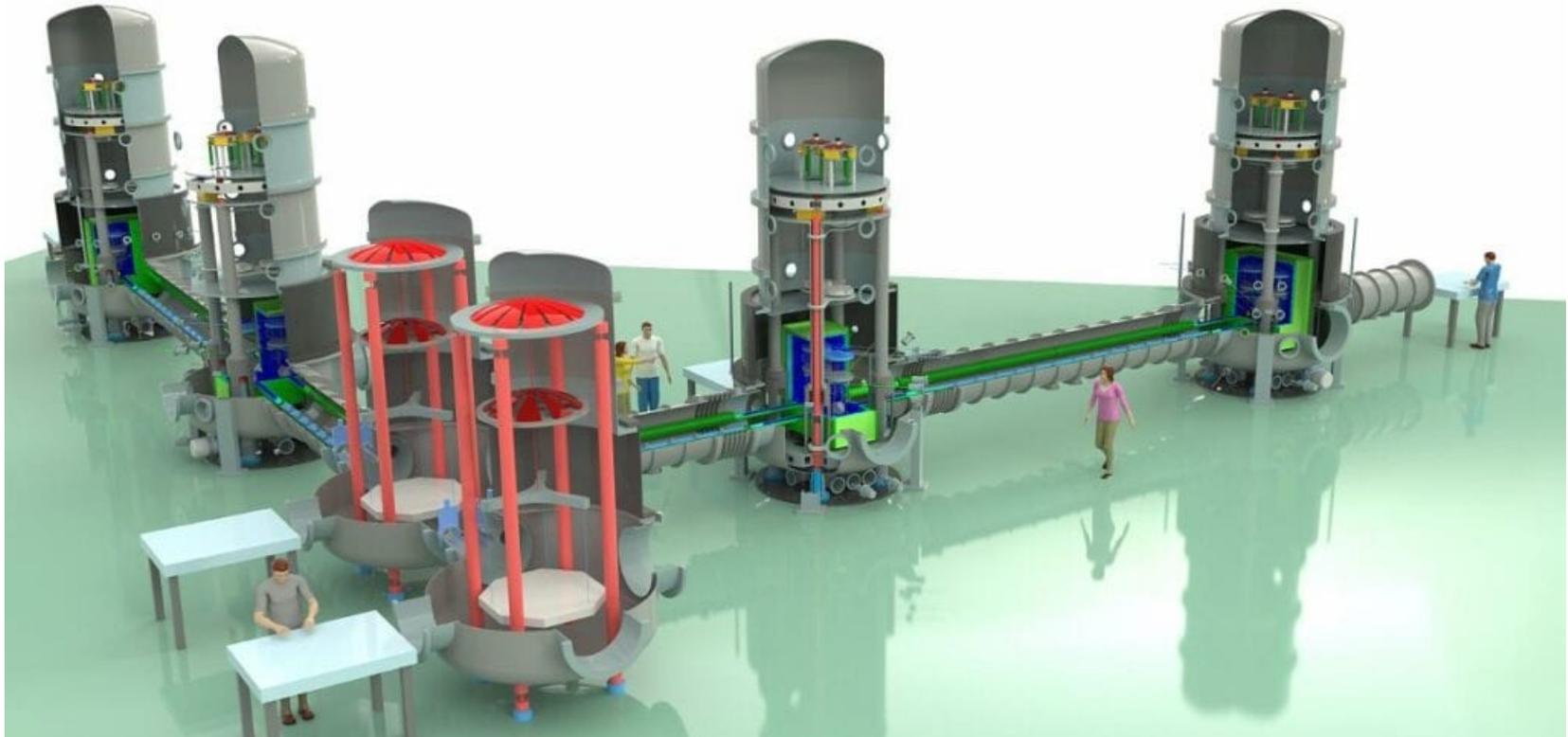
- ◆ ETpathfinder ++
Plan to make ETpathfinder into an expert center for
low frequency GW and temperature ET related R&D

<https://www.limburger.nl/regio/maastricht/plan-50-miljoen-euro-voor-expertisecentrum-met-torens-op-ware-grootte-van-einstein-telescoop/129229308.html>

- ◆ Einstein Academy
linkedin.com/company/einstein-academy-emr/

linkedin.com/company/einstein-academy-emr/

ETpathfinder, Maastricht



ALTMANN - 2 x 2 to



Summer 2022



2024



Upcoming events

- ◆ ET Vacuum Workshop
21-22 April 2026, CERN, Geneva, CH
<https://indico.cern.ch/event/1604489/>
Beampipes vacuum, instrument towers vacuum, Cryogenics
- ◆ ET Computing Workshop
14-15 April 2026, Nikhef, Amsterdam, NL
<https://indico.cern.ch/event/1605739/>
Computing challenges, hardware, infrastructure, AI-code,
- ◆ ET-NGF R&D symposium
2026, TBD, NL
Presenting results on ET-NGF R&D and future



Meer informatie

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[website](#)

Einsteintelelescopeforbusiness.nl