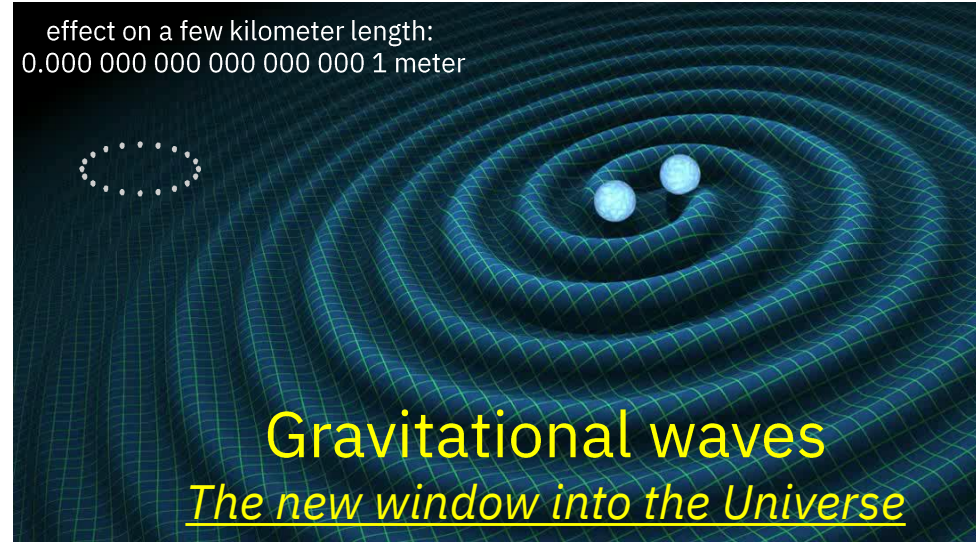




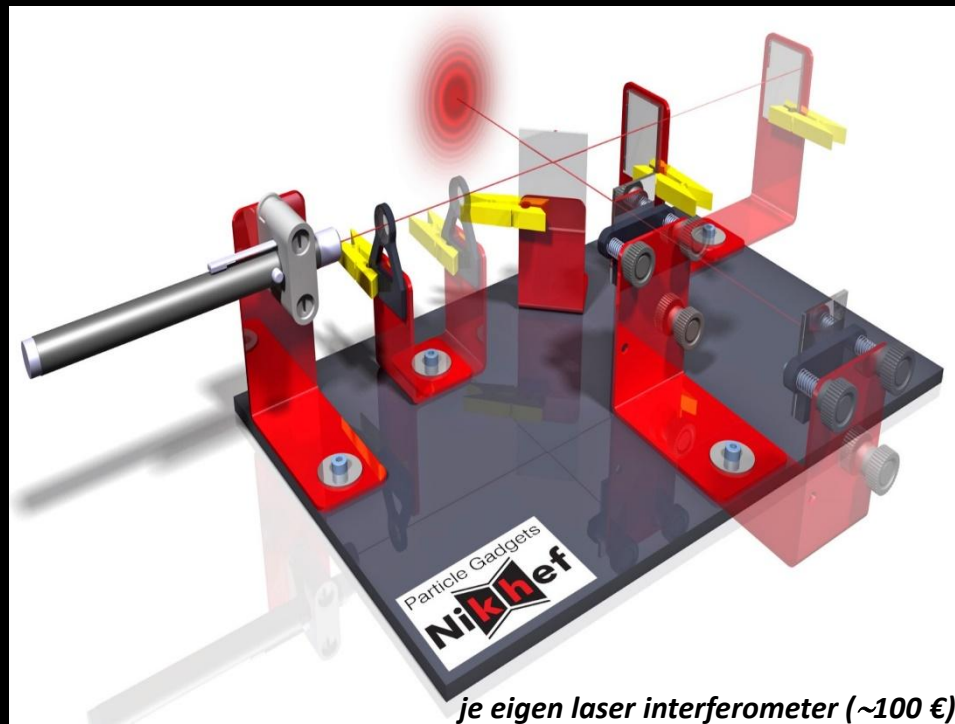
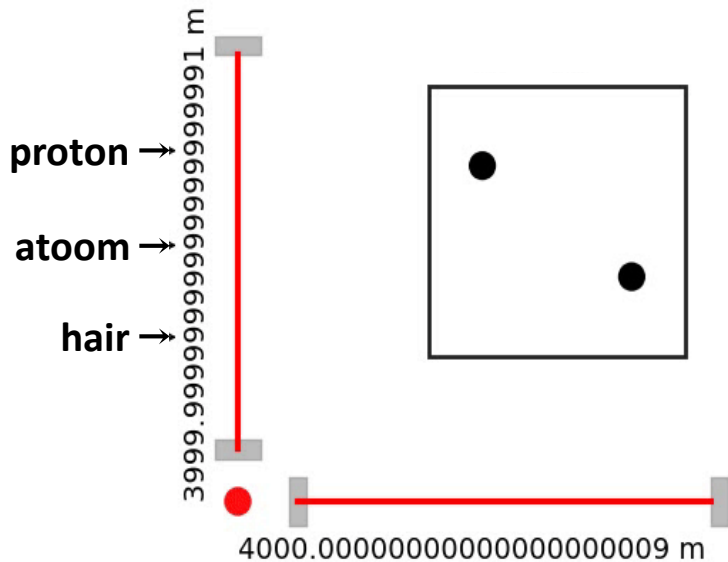
Einstein Telescope in EMR update

Einstein Telescope

- ◆ Gravitational Waves from the universe
- ◆ Extra window of information on astrophysics, especially on 'Dark' places
- ◆ This week 10 years since first event in LIGO
- ◆ 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.

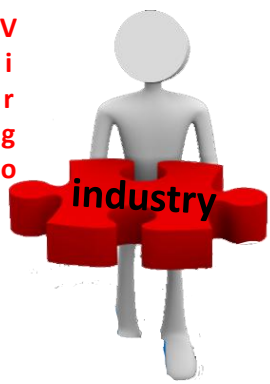


Detection principal: *laser-interferometer*

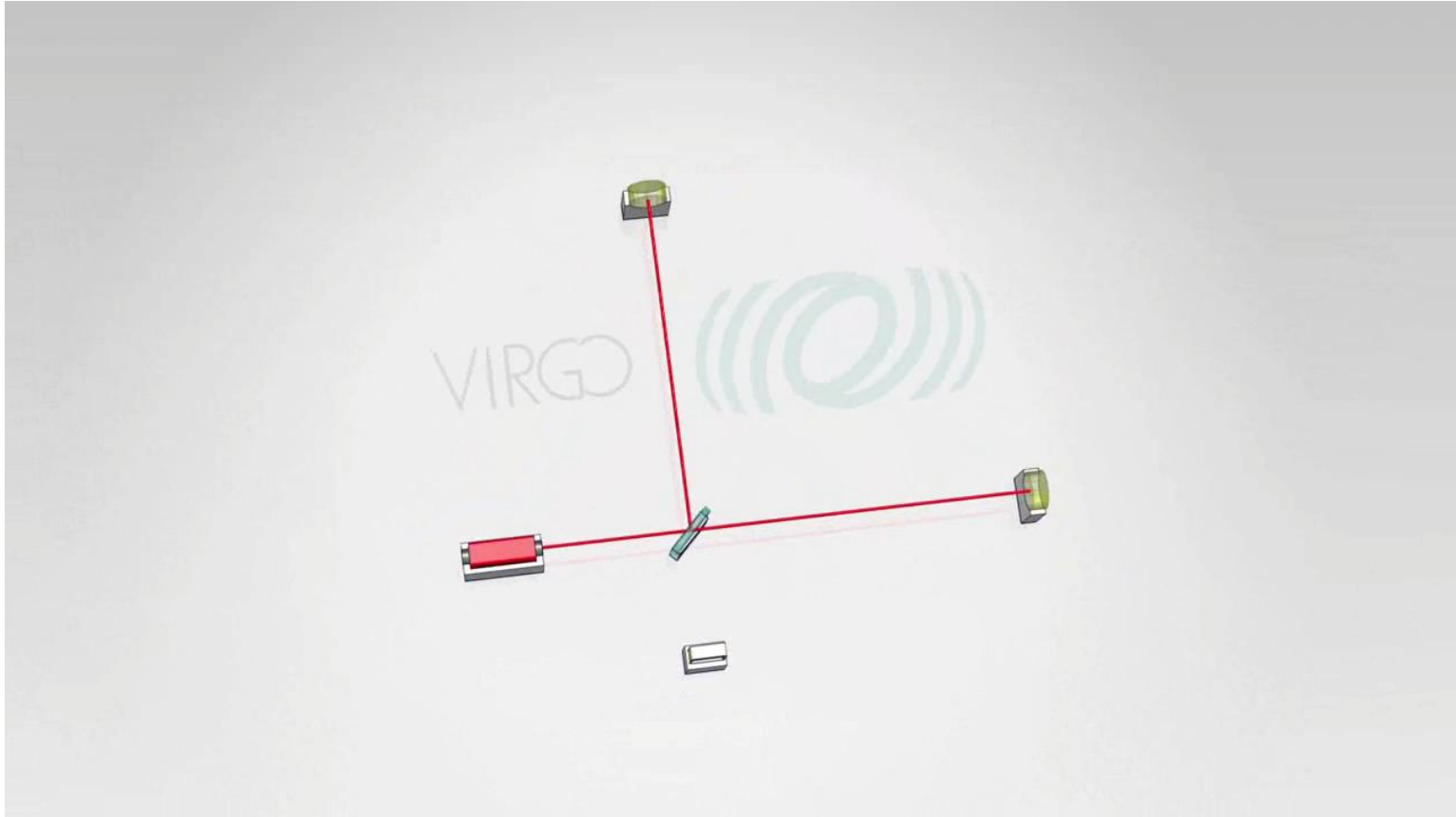


Reality: permanent fight against noise:

Laser (in)stability, imperfect mirrors, (seismic, thermal, ...) vibrations, stray light, imperfect vacuum, imperfect alining, quantum noise, etc. 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

Einstein Telescope:

in development since 2004

10 km long arms

underground

- 250 °C

European

>100,000 detections/year
From entire Universe!

10 km

Cost:

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

(planning: ~50 year)

ETpathfinder, Maastricht



ALTMANN - 2 x 2 to

Summer 2022





2024



Valorisation in NGF project

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



Regionale
Ontwikkelings
Maatschappijen



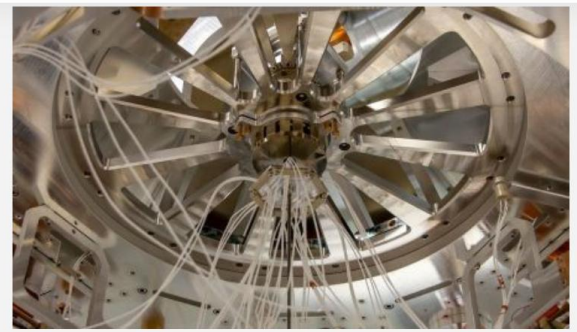
Zero-vibration Sorption Cryocooler for Einstein Telescope

LEES VERDER →



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

LEES VERDER →

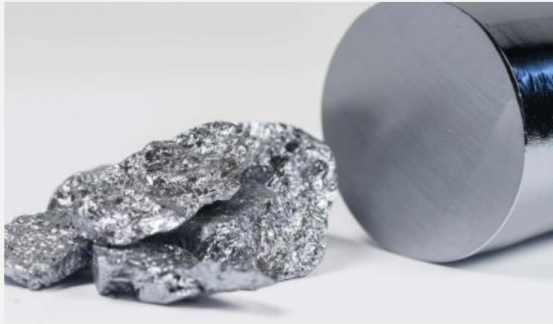


SENVIDET | Sensor Engineering for Noise and Vibration Isolation and Damping in Einstein Telescope

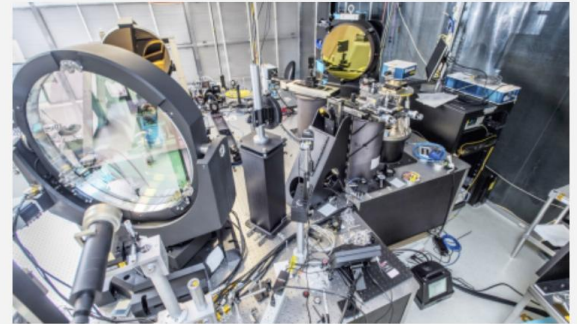
LEES VERDER →



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

Upcoming events

- ◆ <https://indico.cern.ch/event/1514758/>
24-26 November 2025, Maastricht, NL
- ◆ ET Vacuum Workshop
March/April 2026, CERN, Geneva, CH
- ◆ ET Computing Workshop
March/April 2026, TBD, EU
- ◆ ET-NGF R&D symposium
spring 2026, TBD, NL



APPEC Tech Forum Vacuum & Cryogenics
Industry meets Academia



Meer informatie

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website

Einsteintelelescopeforbusiness.nl

Rondleiding

- ◆ Rondleiding bij Demcon in de hal tijdens borrel
- ◆ UTwente
 - ◆ Vandaag helaas slechts 15 mensen
 - ◆ Alternatief:
 1. European Cryo days 28-30 Oktober, op do 30/10
 2. Besloten EMS symposium do 27/11