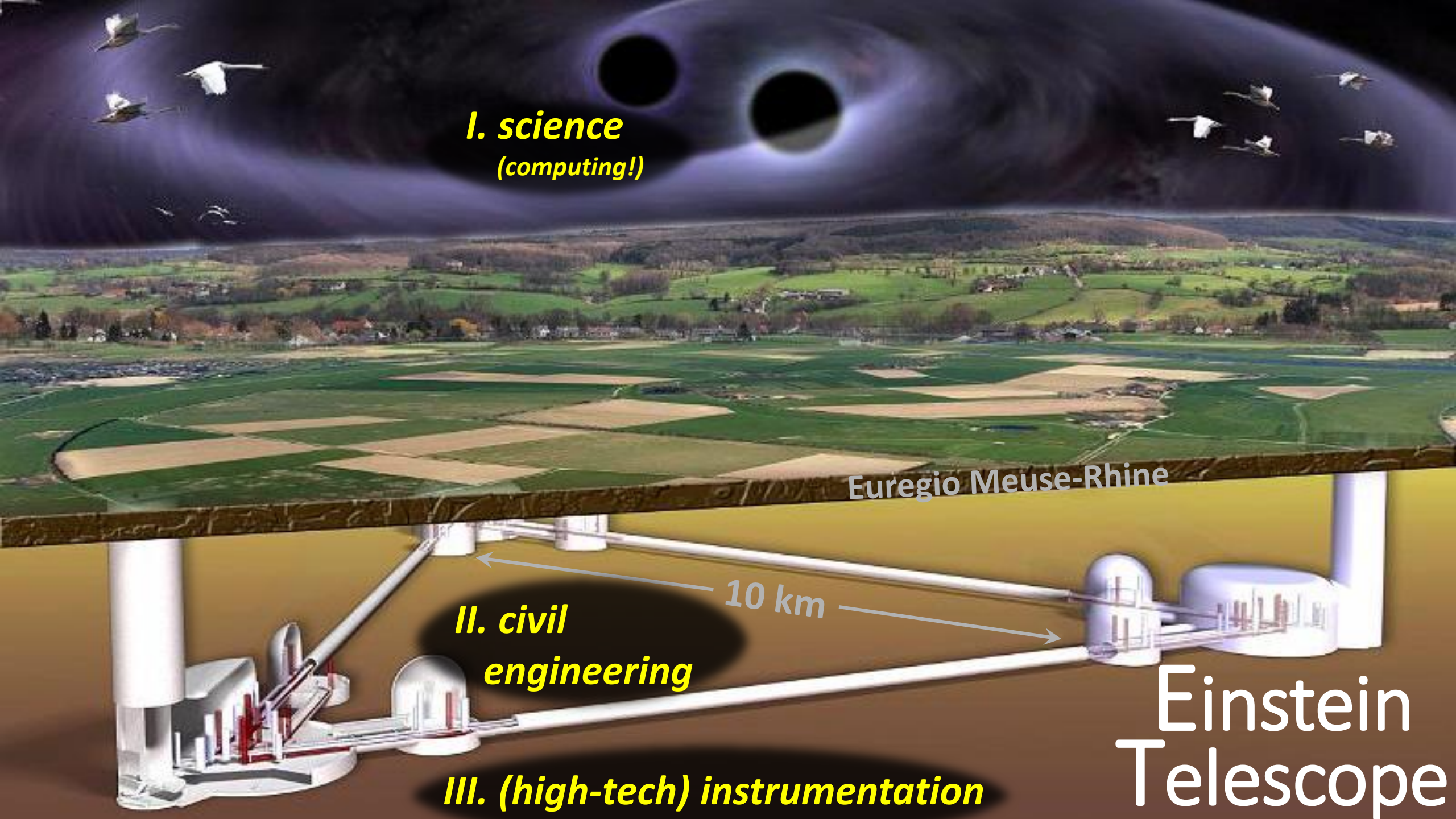
Einstein Telescope

Technical challenges of the Einstein Telescope

The European physics and astronomy community wants to build a next generation gravitational wave detector: the Einstein Telescope. This detector will enable scientists to study parts of the universe that have never been observed before. It also comes with unique technical challenges that push the current state-of the art. In the coming three years we will invest more than 20 M€ on industry orders in the research facilities ETpathfinder and E-TEST to develop and test necessary new techniques. We are looking for industry partners who would like to join us in this challenge. That's why we would like to invite you to two webinars and online discussions to explore the possibilities.

https://www.einsteintelescope.nl/en/?set_lang=en

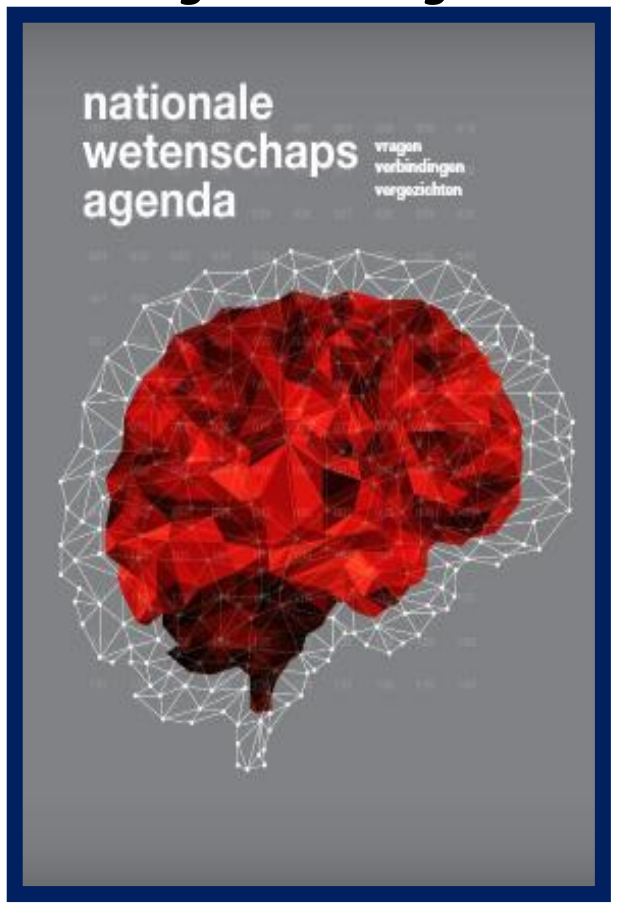

I. science
(computing!)
Euregio Meuse-Rhine
10 km
II. civil
engineering
III. (high-tech) instrumentation
Einstein
Telescope

ET in the NL landscape *(pre-COVID-19)*

ET 1 out of 33

ET 1 out of 13

ET 'game changer'



Ministry of Education, Culture & Science

"I" = 

Action: in preparation for the possible construction of the Einstein Telescope, I will invest € 2 million in the ETpathfinder. Moreover, I will intensify cooperation with Germany and Belgium for the preparation of a possible bid.

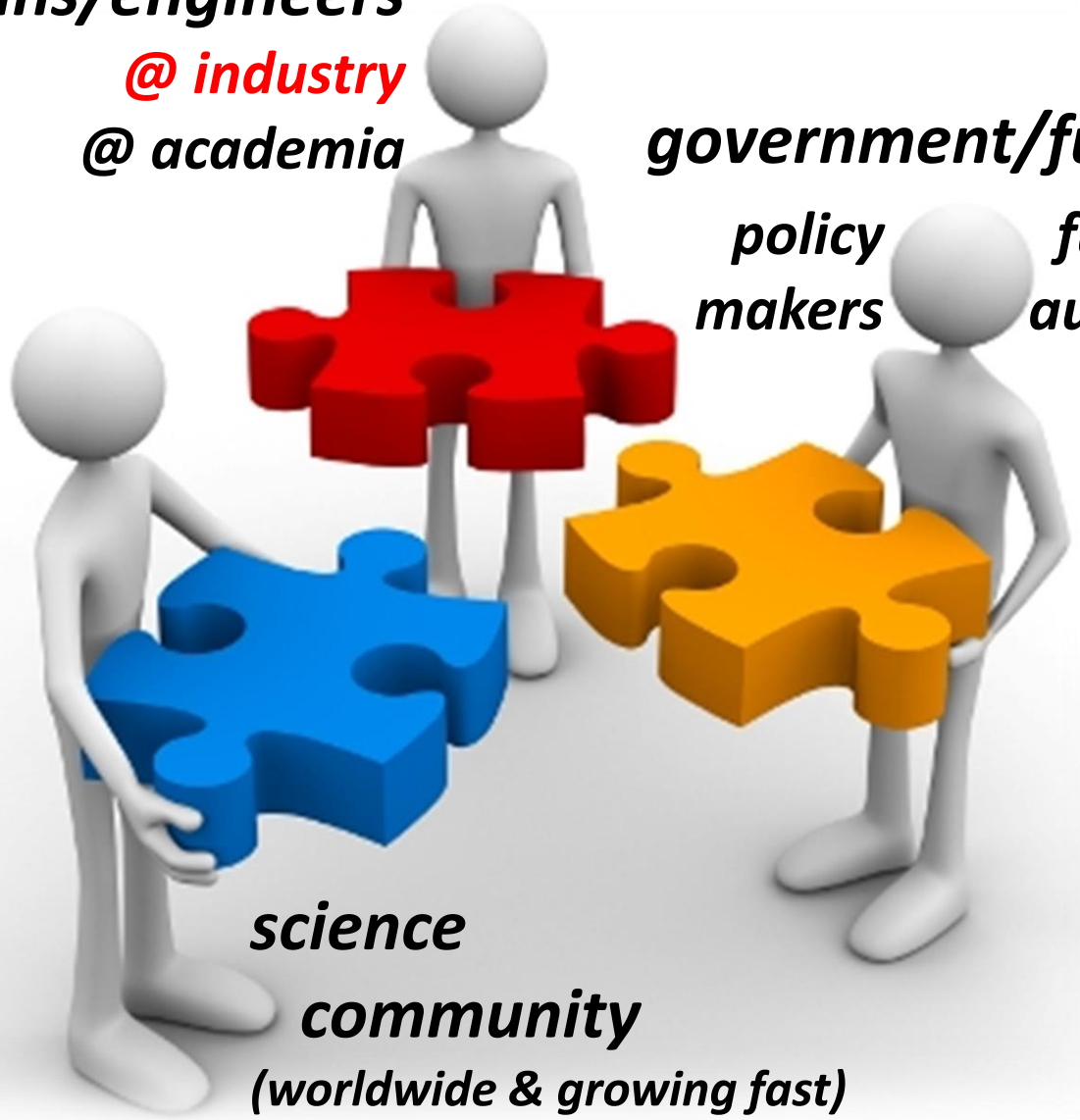
Einstein Telescope hinges on collaboration

industry ↔ academia

• • • • chance to get orders depends on R&D phase involvement!

specifications & design

expertise ↑
costs ↓



ETpathfinder

RESEARCH INDUSTRY PARTNERS MEDIA CONTACT

Interreg EUROPESE UNIE Vlaanderen-Nederland Europees Fonds voor Regionale Ontwikkeling

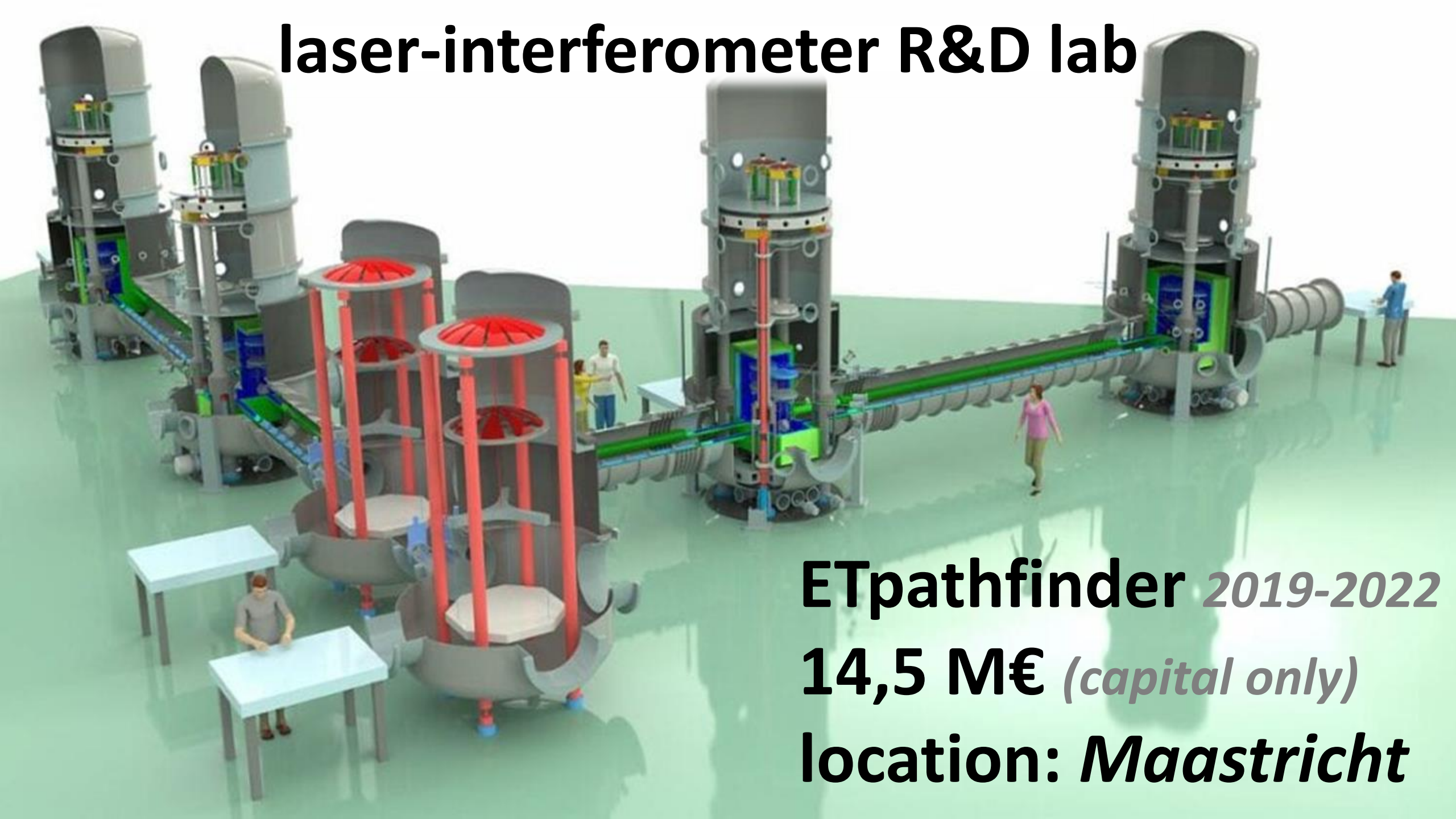
https://www.etpathfinder.eu/

ETpathfinder

ETpathfinder is a R&D infrastructure for testing and prototyping innovative concepts and enabling technologies for the Einstein Telescope, the first of a new class of future gravitational wave observatories.

READ MORE

laser-interferometer R&D lab



ETpathfinder *2019-2022*

14,5 M€ *(capital only)*

location: ***Maastricht***

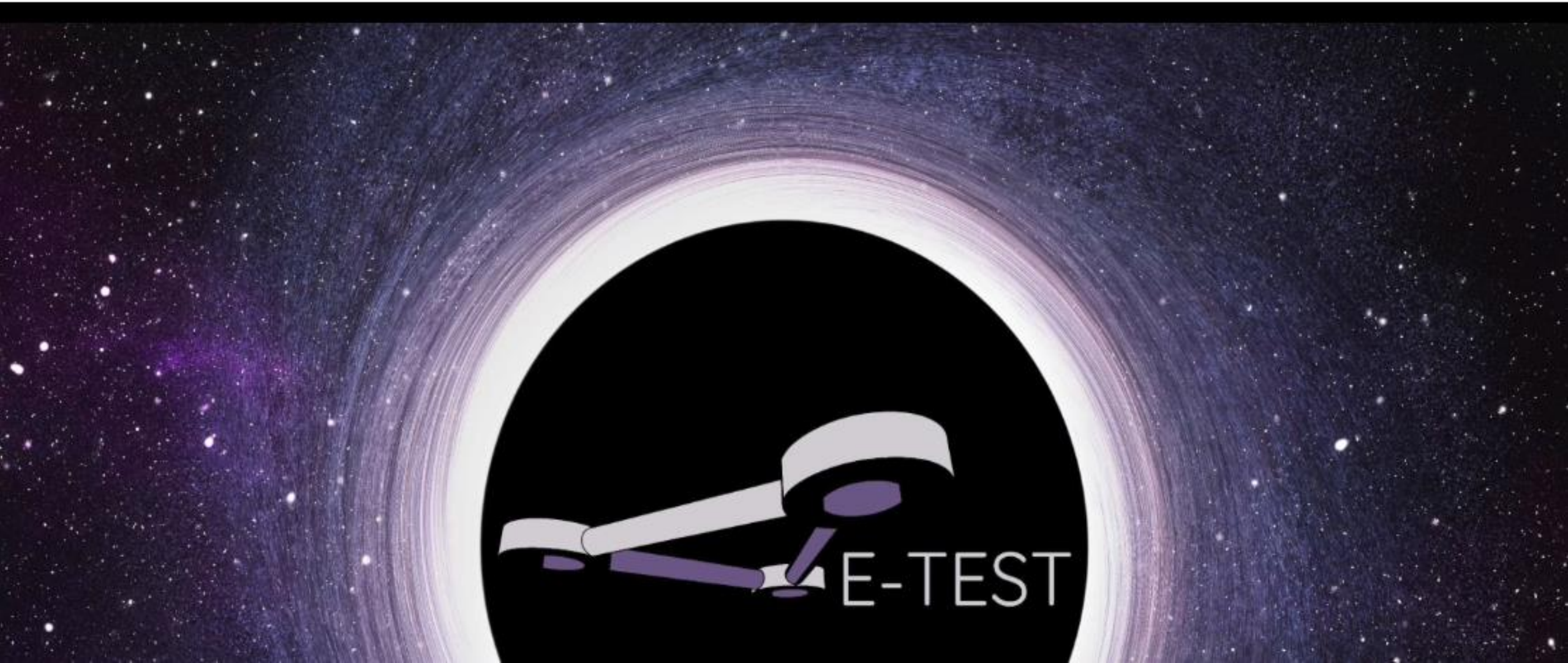
E-TEST Einstein Telescope EMR Site & Technology

ACTIVITIES INDUSTRIES MEDIA COOPERATIONS PARTNERS & FINANCIERS

Interreg Euregio Meuse-Rhine European Regional Development Fund

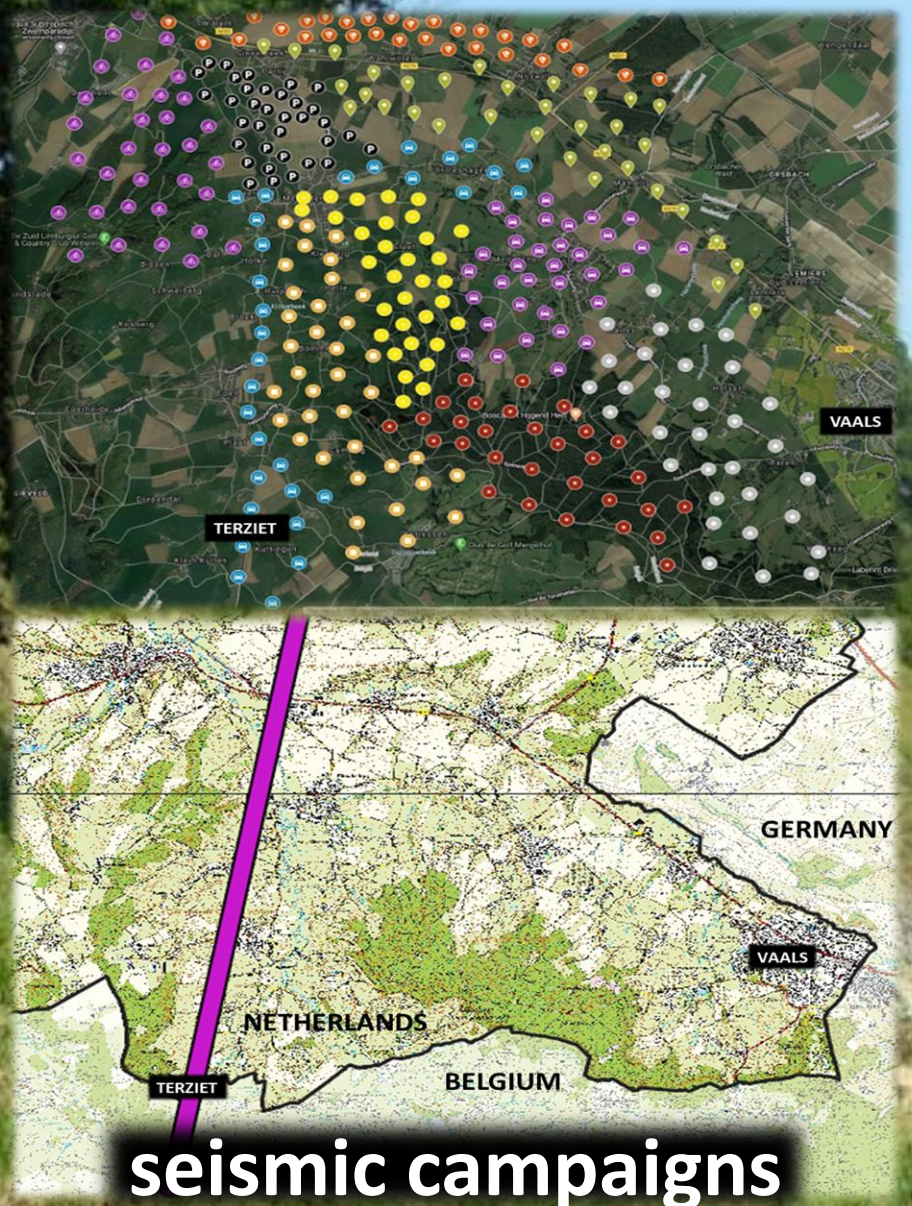
EUROPEAN UNION

https://www.etest-emr.eu/



geology in the Euregio

boreholes



seismic campaigns

ET tunnel track . . .

upcoming funding opportunities *(industry focus)*

ambition: 2 M€ voucher fund to stimulate collaboration between research institutes and (cross-border) industrial parties (>1)

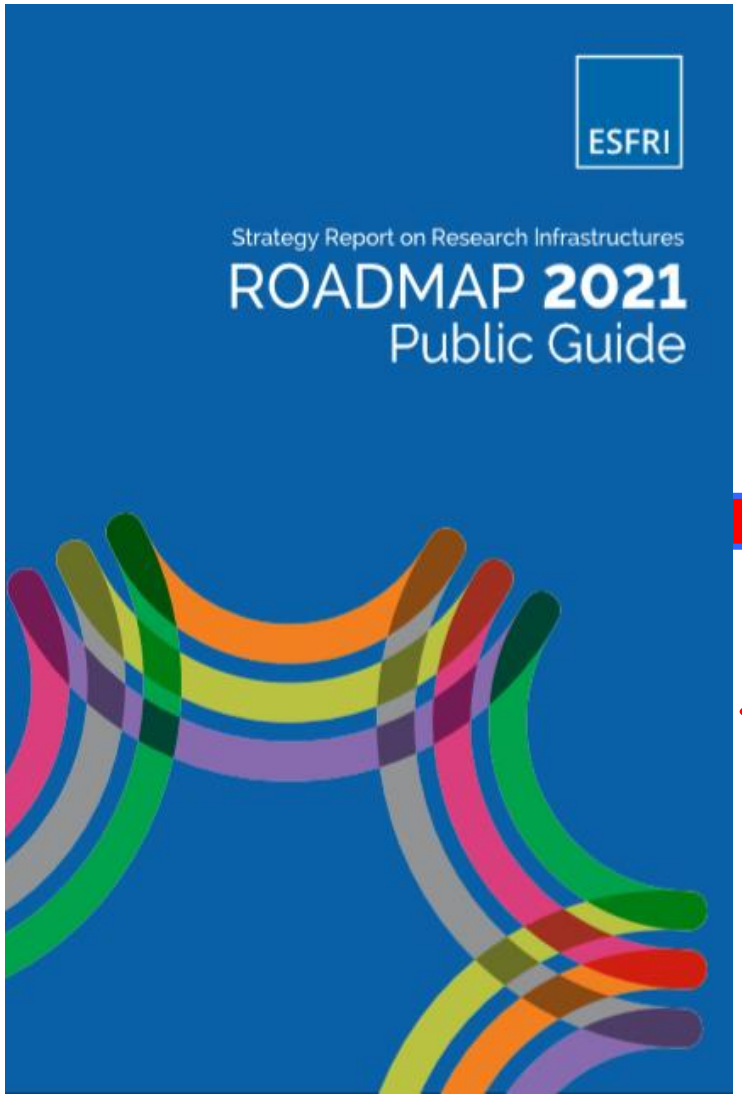
2021

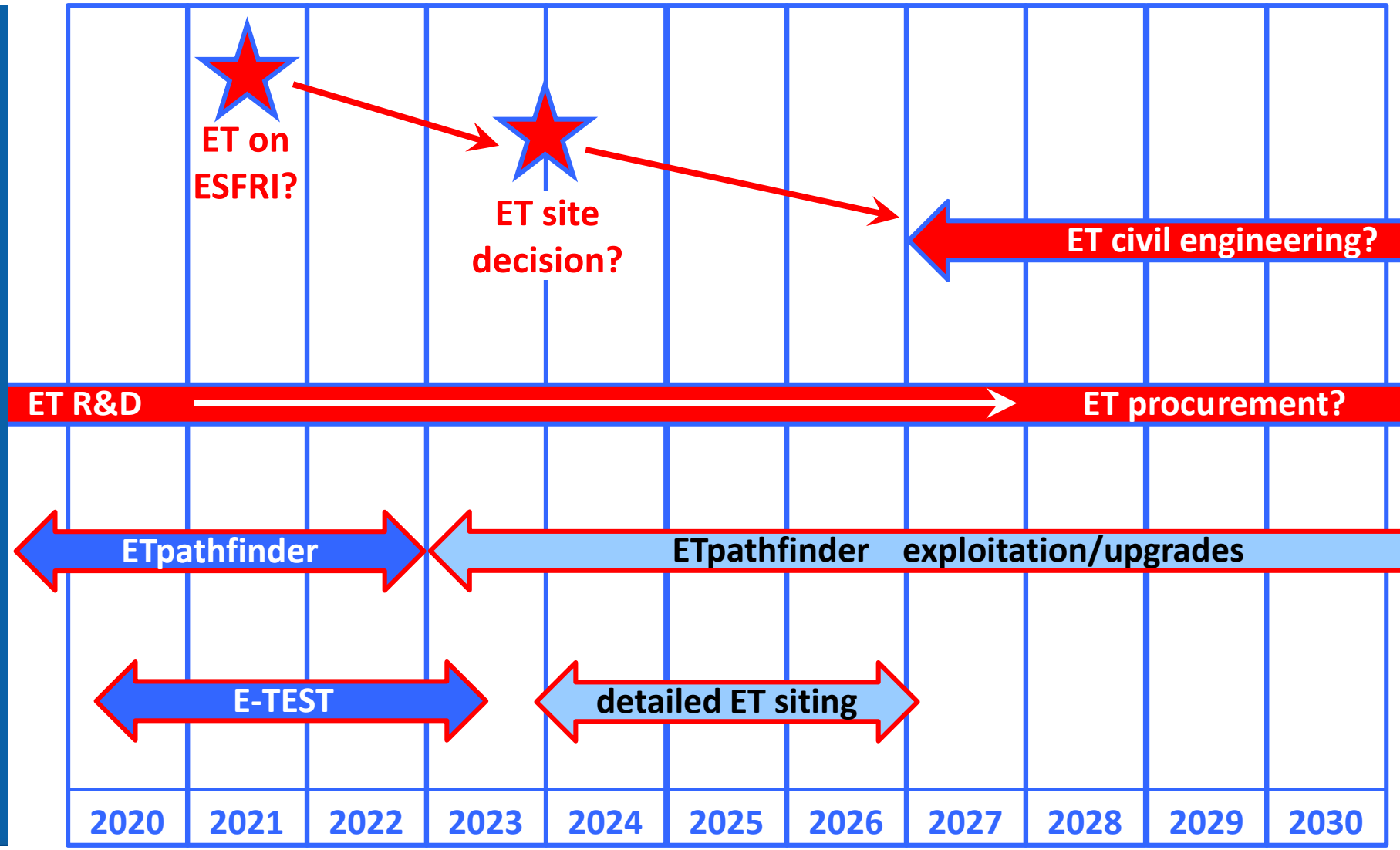
ambition: computing oriented project with German institute(s) as lead partner to complement ETpathfinder (🇳🇱) & E-TEST (🇧🇪)

2021?

Einstein Telescope: *next step & schedule*

my guesses!





September 2020:
ET plans to apply for ESFRI status

anticipated start of ET data taking: 2034/2035

Program for today & 15 July

Wednesday, 1 July 2020

15:00 - 15:10	Welcome *10'*	Speaker: Frank Linde (Nikhef)
15:10 - 15:25	Advanced Instrumentation *15'*	Speaker: Marco Beijersbergen (Cosine)
15:25 - 15:55	Einstein Telescope: Science and instrumentation *30'*	Speaker: Andreas Freise (Nikhef / VU)
15:55 - 16:25	Einstein Telescope opportunities: **orders, co-development, spin-offs** *30'*	Speaker: Stefan Hild (Universit Maastricht)
16:25 - 16:40	Next steps - tenders, voucher funds *15'*	Speaker: Rob van der Meer (Nikhef)
16:40 - 16:55	Q & A *15'*	Speaker: Frank Linde (Nikhef)
16:55 - 17:00	Wrapping up *5'*	Speaker: Frank Linde (Nikhef)

Program for today & 15 July

Wednesday, 15 July 2020 — *morning session*

09:00 - 09:50 Vacuum system
- 09:00 **Vacuum system** *15'*
  Speaker: Prof. Jo van den Brand (Nikhef / Maastricht University)
- 09:15 **Q&A vacuum system** *35'*

09:50 - 10:00 switch

10:00 - 10:50 [TBC] Vibration attenuation
- 10:00 **[TBC] Vibration attenuation** *15'*
  Speaker: TBD
- 10:15 **Q&A vibration attenuation** *35'*

10:50 - 11:00 switch

11:00 - 11:50 [TBC] Cryogenics (vibration free)
- 11:00 **[TBC] Cryogenics (vibration free)** *15'*
  Speaker: TBD
- 11:15 **Q&A cryogenics (vibration free)** *35'*

11:50 - 12:00 switch

12:00 - 12:50 [TBC] Optical systems (mirrors, coatings, lasers, tables)
- 12:00 **Optical systems (mirrors, coatings, lasers, tables)** *15'*
  Speaker: TBD
- 12:15 **Q&A optical systems (mirrors, coatings, lasers, tables)** *35'*

Wednesday, 15 July 2020 — *afternoon session*

14:00 - 14:50 Sensors (low-noise, low-power, miniature)
- 14:00 **Sensors (low-noise, low-power, miniature)** *15'*
  Speaker: Niels van Bakel (Nikhef)
- 14:15 **Q&A sensors (low-noise, low-power, miniature)** *35'*

14:50 - 15:00 switch

15:00 - 15:50 Controls
- 15:00 **Controls** *15'*
  Speaker: Bas Swinkels (Nikhef)
- 15:15 **Q&A controls** *35'*

15:50 - 16:00 switch

16:00 - 16:50 [TBC] Infrastructure (geology, civil engineering, infrastructure)
- 16:00 **[TBC] Infrastructure (geology, civil engineering, infrastructure)** *15'*
  Speaker: TBD
- 16:15 **Q&A infrastructure (geology, civil engineering, infrastructure)** *35'*

16:50 - 17:00 closing