

Out of the box inspiration:

ETEC / MaGIC,

and the opportunity that the *Rewards & Recognition* programme allows you, too!



Nikhef aTopical Lectures, 18th - 20th of May 2026

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Who am I? :)

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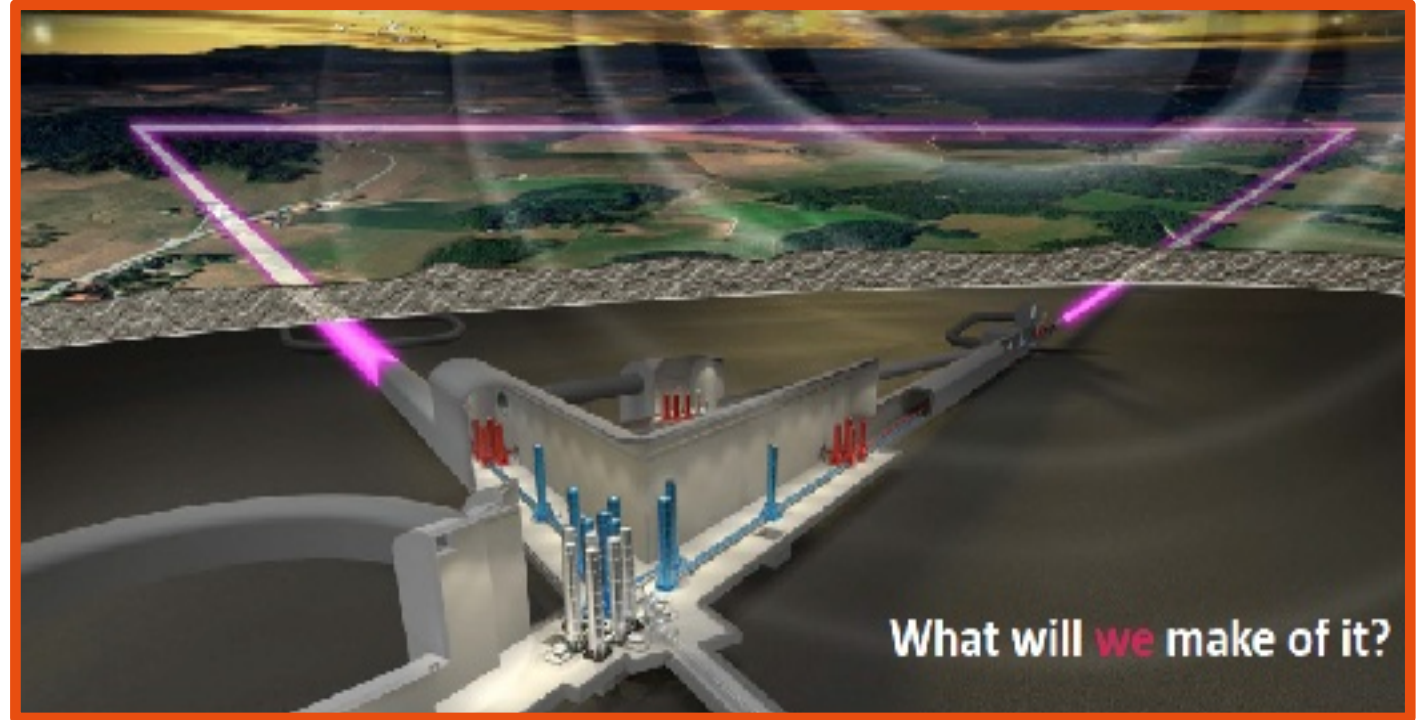


Journal of Education 'Van12tot18', issue December 2014

- BSc, MSc theoretical physics (2006), VU Amsterdam (Theoretical cosmology)
- PhD theoretical physics (2011), Nikhef (Gravitational waves)
- MSc Education (2014), VU Amsterdam, (Physics Education)
- Lecturer at Leiden University and VU Amsterdam, head of physics teacher's team @ high school
- Associate professor of physics @ Maastricht University, Gravitational Waves and Fundamental Physics
- Scientific lead of the Einstein Telescope Education Centre
- Board member & Outreach coordinator at the Dutch Black Hole Consortium
- Lead coordinator of the Maastricht Gravitational Inspiration Curriculum (*MaGIC*)

The Einstein Telescope

- Gravitational waves will reveal mysteries of the universe that has never been seen before!
- Technological spin-off ,
- Magnet for new talent,
- Enormous opportunities to bridge gaps between academia, education, and society



The Einstein Telescope Education Centre



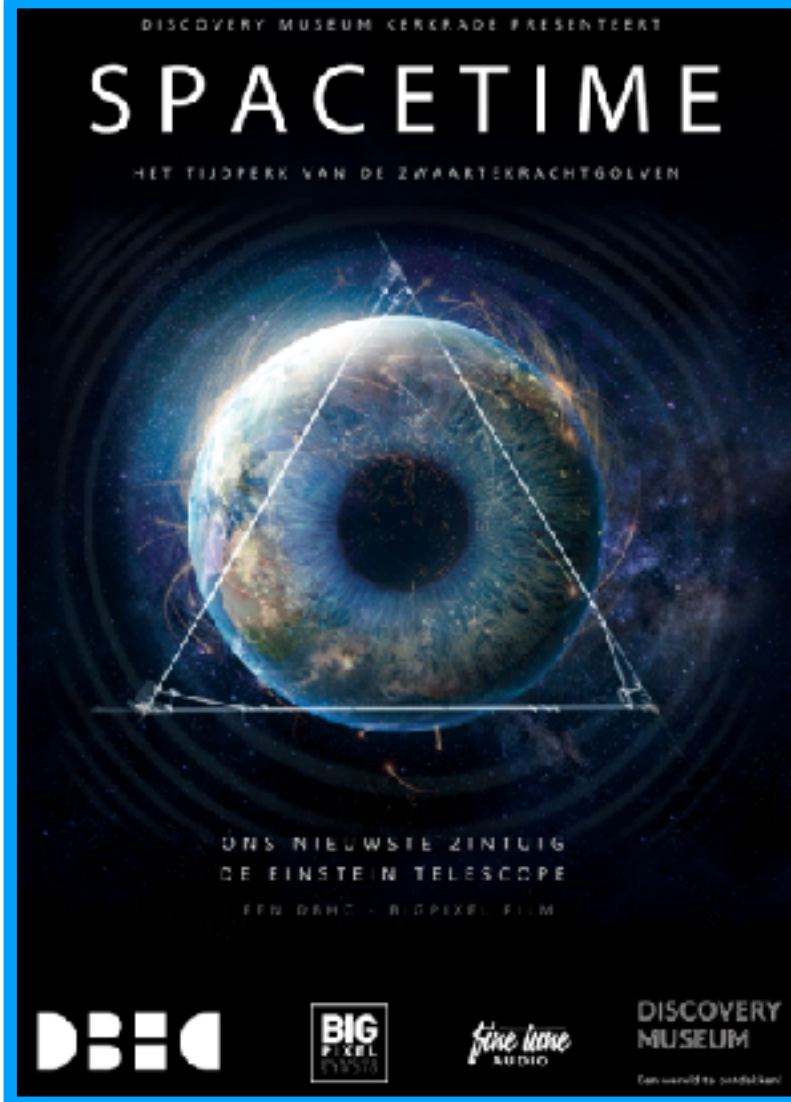
 Einstein Telescope

Discovery Museum Kerkrade gets education centre about the Einstein Telescope

The Einstein Telescope Education Centre (ETEC) lends its name to the education centre that the Dutch Discovery Museum Kerkrade will set up in its five-storey Cube building. School children can walk through leading scientific talks based on current research on the Einstein Telescope. In addition, ETEC will provide a stage for at least three years from school year 2024-2028 to get acquainted with engineering and science education.



www.einsteintelelescope-emr.eu/blog/2024/06/26/einstein-telescope-education-centre-officieel-geopend/



**Part 1:
3D-movie SpaceTime**



**Part 2:
Interactive lecture**



Watch the movie online:

www.youtube.com/watch?v=DWyyNdD-MjA



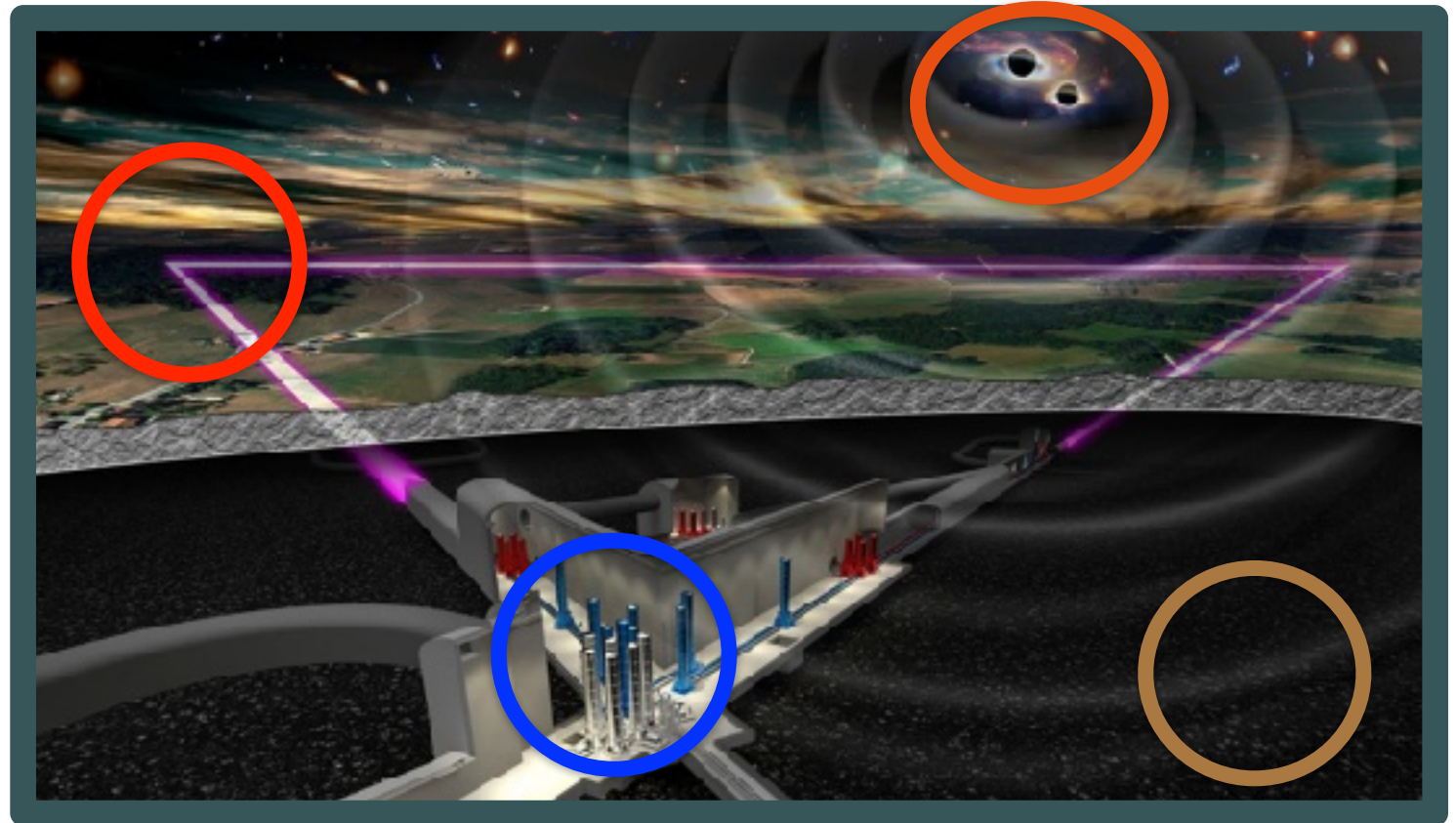
Part 3: Workshops



**Part 4: Creative
assignment**



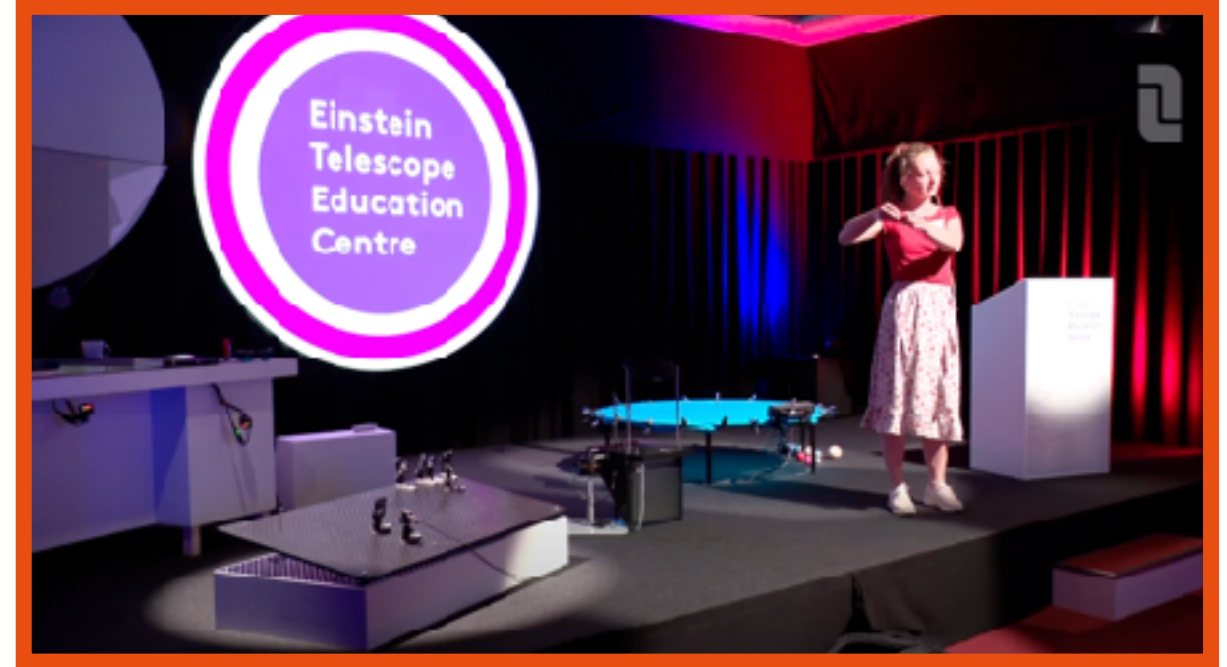
- **Interferometry**
Perform distance measurements using laser light
- **Noise mitigation**
Use Newtonian mechanics to dampen vibrations
- **Data-analysis**
Find and identify black hole collisions in data (we'll see it in a bit)
- **Geophysics**
Acoustic investigations of soil



Einstein Telescope is perfectly suitable for school classes!

ETEC: been running for two years+ now.

- We have ~one class visit ETEC per month, mostly from the Netherlands/Limburg. This cumulatively amounts to about 1000 students (and counting).
- Reactions have been very positive, both from teachers as from students.
- ETEC is now also welcoming school classes from Wallonia, Germany, and France.
- Since last year, ETEC has been opened to general public as well (the *Gravity Tour*)
- (in progress): ETEC @ home is being developed by UM and the Leuven Gravity Institute.
- (in progress): Build hosting of students all over Europe (AI, but will also require native speakers).



..to great success!



How much?
Ask PhD candidate Emma Prins!

dr. Gideon Koekoek: gideon.koekoek@maastrichtuniversity.nl

MaGIC: European teacher training

- ~ 30 teachers secondary education from Europa
- 7 days, 6 nights, at location in Maastricht
- Training in physics, technological applications, and didactics
- Back home: start of *local teacher communities*



 Maastricht University

Einstein Telescope Education Centre 

MAGIC

MAASTRICHT GRAVITATIONAL INSPIRATION CURRICULUM
17 - 23 AUGUST 2025 | MAASTRICHT, THE NETHERLANDS

An all-in summer course for teachers, on the physics of the Einstein Telescope and how to effectively teach this in upper high school physics classes.

MaGIC week programme: themes and activities

- **Mornings: Theory** (“what is the physics”?).
- **Afternoons: Didactics** (“How do I tell this to my students”?).
- **Evenings: Social activities** (“Building learning communities”).

Day	Theme/Topic	Activities
Sunday	Arrival	☉ R... ☉ V... ☉ L... ☉ V...
Monday	Relativ	
Tuesday	Practica	
Wednesday	Measuring Gravitati	laboratories techniques and and education
Thursday		
Friday		
Saturday		

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+ Many more contributors, to build European community.
(Feel welcome to contribute! If so, contact me @ fse-magic@maastrichtuniversity.nl)

First *MaGIC* Summer school was a great success!

MaGIC summer school: physics teachers dive deep into gravitational waves



→ Faculty of Science and Engineering

... take place in Maastricht. The event brought together ... more about gravitational waves and the Einstein

... re the imagination, precisely because they are surrounded by so many mysteries. Yet the physics behind them is n ... of the most exciting mysteries of the universe. We must share that with everyone, even in the classroom!" says Dr ... osely involved in the Einstein Telescope. The telescope provides teachers with an ideal hook to introduce their pupil

... ics teachers came to Maastricht last week for the first MaGIC Summer School for secondary school teachers (Maa ... vitational waves, the methods used to measure them, and how to pass on this knowledge to their pupils at an acc

Effectivity of Pilot:

- * Pre- and post misconceptions
- * *Understanding en willingness/ applicability*
- * Post-event focus discussions.

BARRIERS REMOVED



Emma Prins

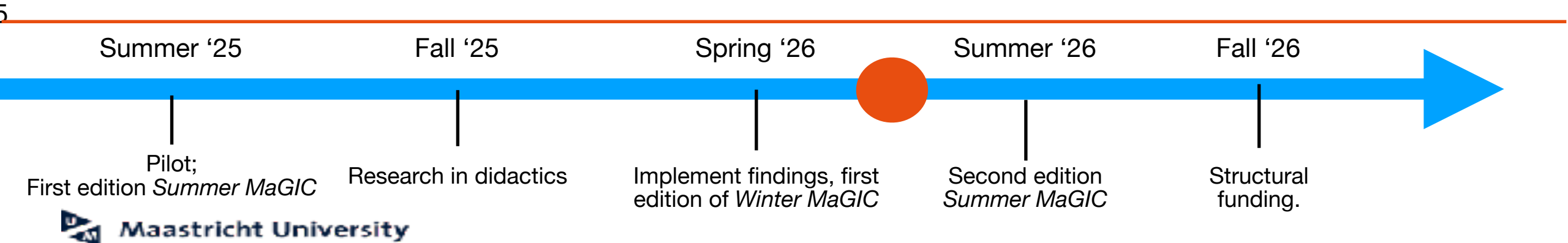
A growing network: *Winter MaGIC*



- Summer *MaGIC* has funding for two years (2025, 2026)
- Local 3-day programmes have been developed: *Winter-MaGIC*. These remove language barriers and allow tweaking to local expertise and curricula
- Take place in winter: January, February, March.
- Local organisers become *MaGIC* Ambassadors (*MaGICians*), who return in Summer to Summer *MaGIC* in Maastricht, to help coach the new teachers
- Greater ambition: creation of a European network of teacher professionalisation, with online shared resources;
- Structural funding for the *MaGICal* network has been granted!

Key Message

NL becomes, besides central point for gravitational wave physics, the European hub for teacher professionalisation!



Conclusions & prospects

- **Outreach is a vital part of our jobs:**
to connect stakeholders, attract talent, and to maintain goodwill from the general public.
- **Educational projects are the gift that keeps on giving:**
Remove the barriers by creating ownership, making audience feel like explorers and scientists, and actively stimulate curiosity
- **Examples include:**
 - *Einstein Telescope Education Centre:*
 - International data-analysis workshop
 - International teacher professionalisation *MaGIC*
 - Many more from other ET / LVK / Nikhef members
- **Prospects:** *Winter MaGIC, ETEC @ Home*, international online platform for GW education

Gravitational wave science and Einstein Telescope offer great opportunities for GW outreach, STEM education and teacher professionalisation, strengthening our position in society, and hugely boosting the goodwill of general public and stakeholders, and bringing in new talent.

Elephant in the room

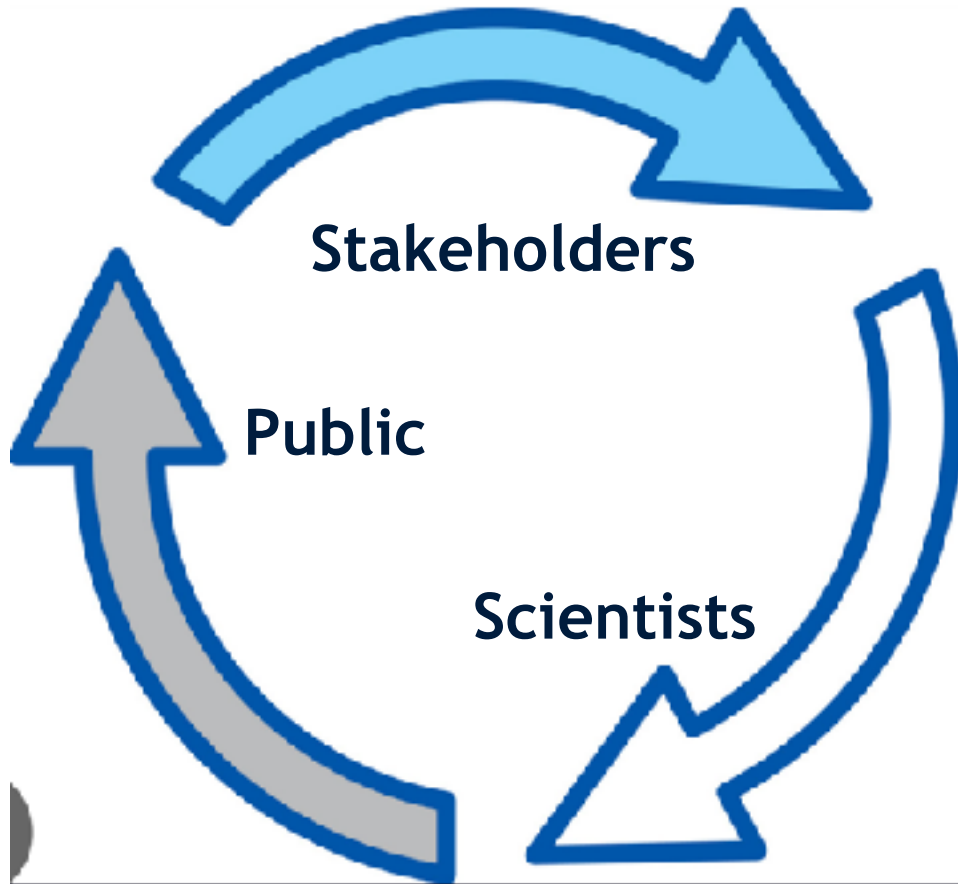


Why would you
spend time on
this??

Get some papers
out instead!

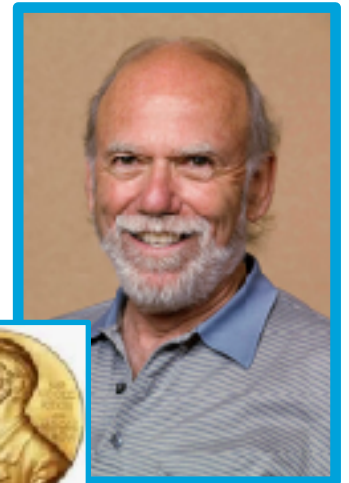
Why are such tasks so important*?

(* especially to counteract *triple threat* pre/misconceptions: - expensive, - abstract, - irrelevant)

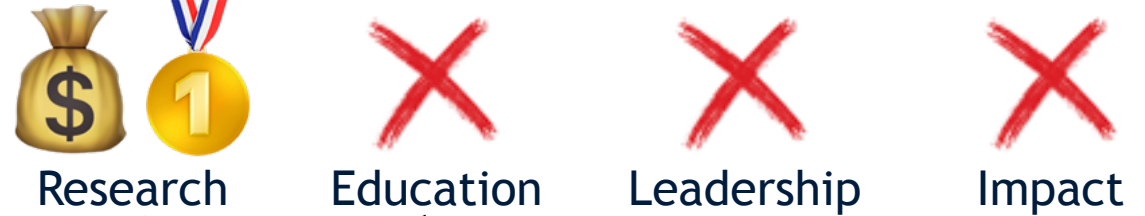


Goals:

- * Let people know what we do and why, and where their investments goes
- * Take away misconceptions and ill-will
- * Let science be part of decision-making
- * Give people relevance and ownership



Recognition and Rewards



- A sustainable scientific enterprise requires a strong interplay between research, education, impact, and leadership
- This should be encouraged by rewarding other branches of academic work aside from (only) research
- In 2022, a position paper was signed by fourteen NL universities on the incentive to change the paradigm
- Many universities have tangibly incorporated this, or are on the way of doing so :)
- This is the platform we need to keep learning from each other and to give scientists room and recognition to work on this important part of their job.



www.maastrichtuniversity.nl/file/umvisiononrecognitionandrewards04pdf

Recognition and Rewards

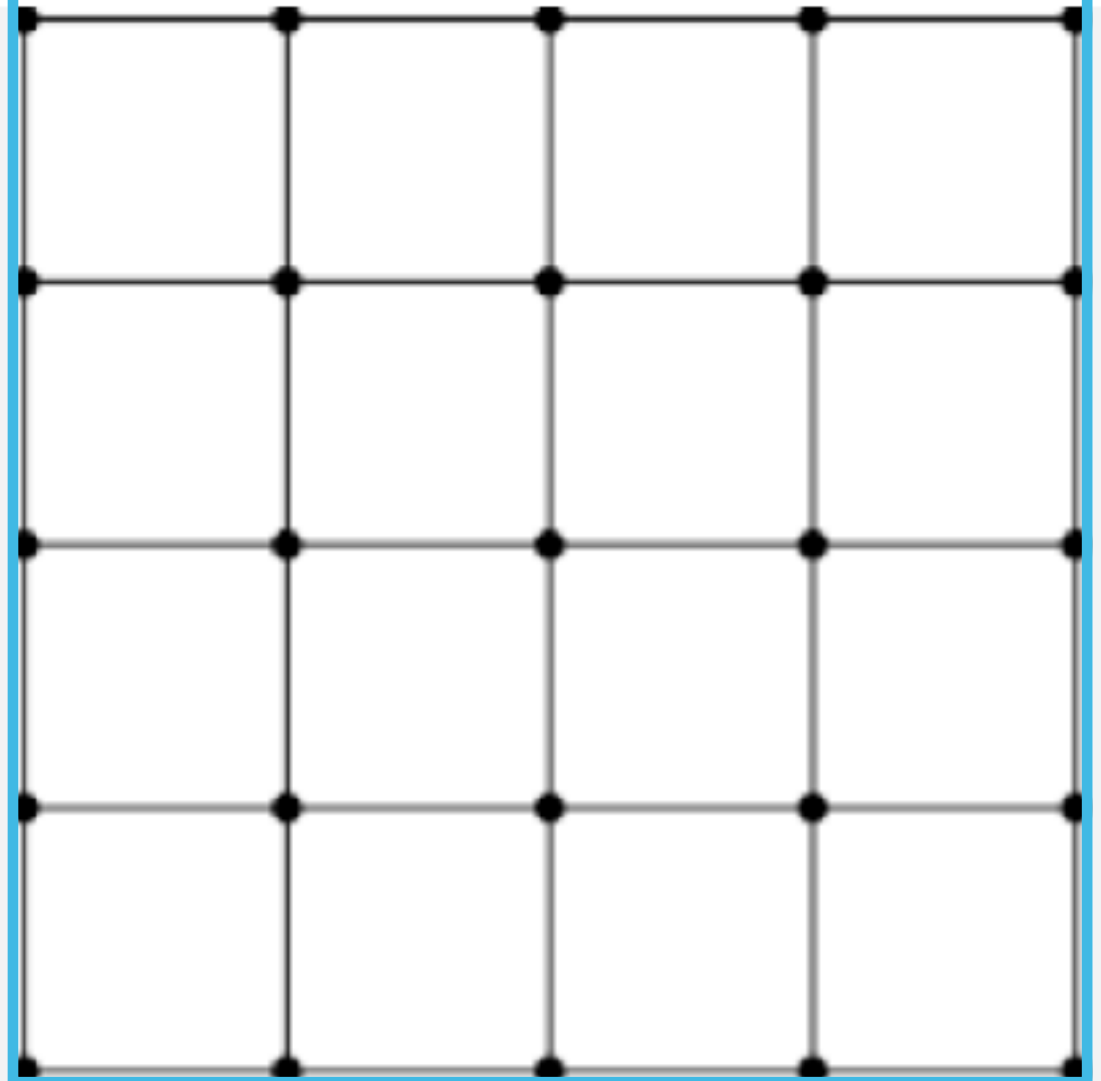
The **original structure** rewarded (almost exclusively) research (citations, #papers published, money brought in, etc.).

In addition: it breeds a handicap for academics who do spend time on the other three pillars, and this handicap is exponential.

There is only one way forward (a **ladder**), and all other tasks are 'outside of your job'.

Rewards & Recognition allows other pillars to be rewarded, too.

In addition, it allows for academics to switch roles: the ladder becomes a **lattice**!



At Maastricht University..

Recognition & Rewards is rector Rianne Letschert's top priority

11 June 2020

In September Rianne Letschert will start her second term as the rector of Maastricht University. One of her highest ambitions is to implement the Recognition & Rewards programme: an entirely new system for assessing and acknowledging the work done by academics. 'Things really need to change. Working at a university is much more than getting your PhD, publishing, obtaining a grant. Education, leadership, teamwork and, for some, the combination with patient care should carry at least as much weight. What impact do you as an academic have on society through the different roles you play? That's the crucial question.' The Recognition & Rewards initiative also dovetails with another major development in the academic world, Open Science, and has—paradoxically—been given a boost by the corona crisis. 'Corona is delaying the completion of PhD dissertations as well as student theses. This is something we want to prevent through a package of solutions, which means we're actually already applying the new approach to assessment.'



Click [here](#) to read more about Recognition & Rewards

Recognition and Rewards: implementation @ UM

Development components for Teaching Fellows, Academic Teachers, Senior Academic Teachers and Teaching Experts

A UM Core Values



B Assessment Components

Applicable to Teaching Fellows



Applicable to Academic Teachers



Applicable to Senior Academic Teachers



Applicable to Teaching Experts



The overall goal of these academic profiles is to align expectations as to what an academic does in the position of Teaching Fellow, Academic Teacher, Senior Academic Teacher and Teaching Expert. Understanding this facilitates both the development as well as the assessment approach for Teaching Fellow, Academic Teacher, Senior Academic Teacher and Teaching Expert.

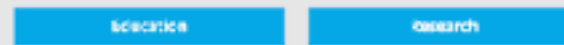
Development components for Assistant, Associate and Full Professors

A UM Core Values



B Core Activities

Applicable to all Assistant, Associate and Full Professors



C Elective Components

Custom selection (for a period ranging from 3 to 5 years)



Development components for Research Fellows and Postdocs

A UM Core Values



B Assessment Components

Applicable to Research Fellows



Applicable to Postdocs



The overall goal of these academic profiles is to align expectations as to what an academic does in the position of Research Fellow and Postdoc. Understanding this facilitates both the development as well as the assessment approach for Research Fellow and Postdoc.

How to 'gauge':

- * Narrative CV
- * Base on team-needs (rather than individual needs)
- * Make clear agreements with leadership

Conclusions & prospects

- **Education, Impact, Leadership a vital part of our jobs (alongside Research):**

to connect stakeholders, attract talent, to maintain goodwill/funds from the general public, help shape&develop society.

- **The NL Rewards & Recognition is the key**
Remove the barriers between the four pillars, allowing for a grid-like structure rather than a ladder.

- **Implementation is well underway**
All dutch universities have signed the position paper, and have pledged to actively build this in.

- **Currently, results vary.** Here is where you come in, too!



In the NL academic system, you *can* invest in education, impact, and leadership, without having to see this ‘on top of your job’, but as a recognised and rewarded *part* of it.

You: make use of this possibility, and work together to build this out, for the betterment of physics, society, and your own talents!

Thank you!



National Rewards & Recognition programme:
<https://recognitionrewards.nl/>

R&R implementation at Maastricht University:
www.maastrichtuniversity.nl/about-um/what-we-stand-for/recognition-rewards

Position paper: 'Ruimte voor iedereen's talent'
www.nwo.nl/position-paper-ruimte-voor-ieders-talent

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