

The importance of the Einstein Telescope for Belgian science

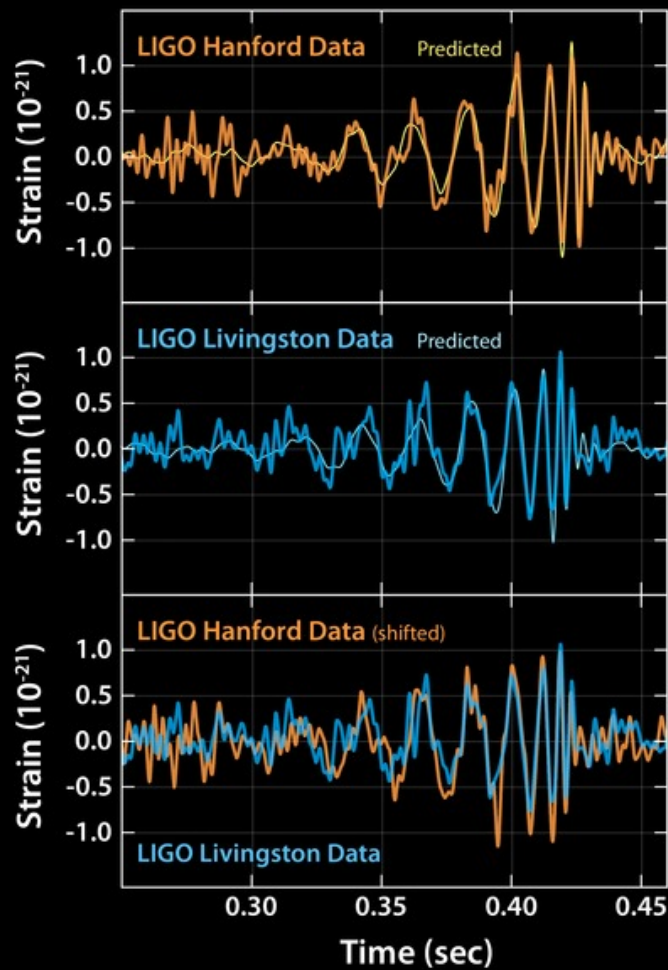
Jean-René Cudell

ULiège

January 30, 2018

- ★ **Why the Einstein Telescope?**
- ★ **Impact on sciences**
- ★ **Situation in Belgium**

14/09/2015



LIGO Black-hole merger



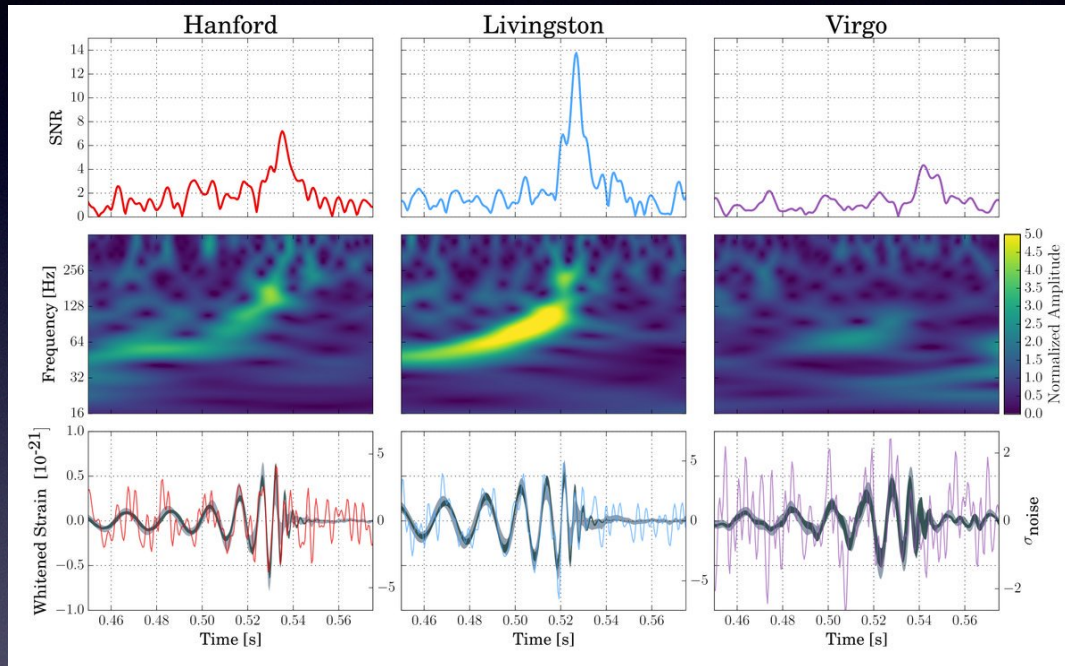
The Nobel Prize in Physics 2017

Rainer Weiss, Barry C. Barish and Kip S. Thorne

"for decisive contributions to the LIGO detector and the observation of gravitational waves"

Birth of gravitational wave astronomy

08/06/2017

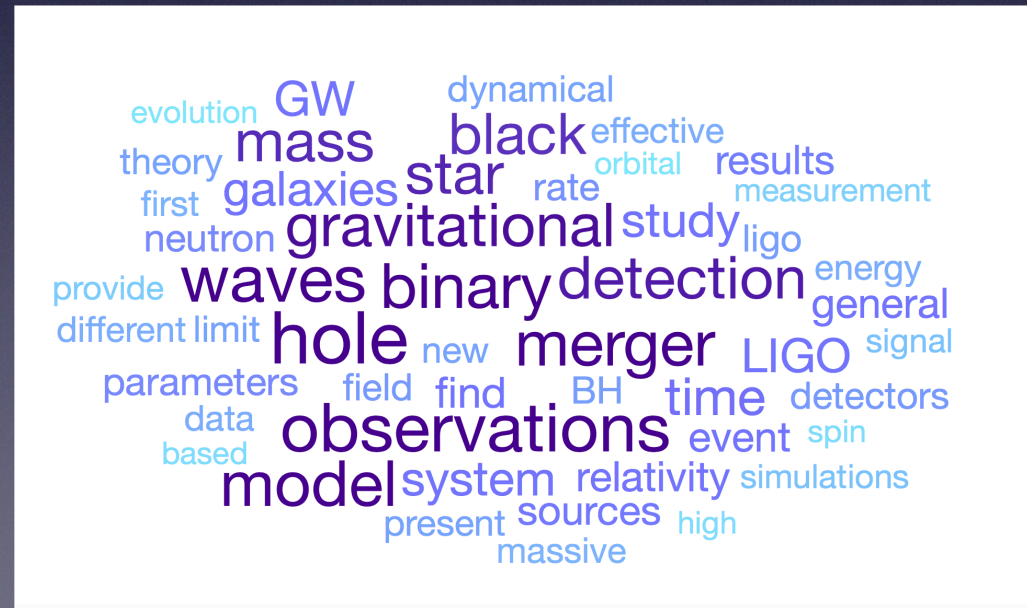
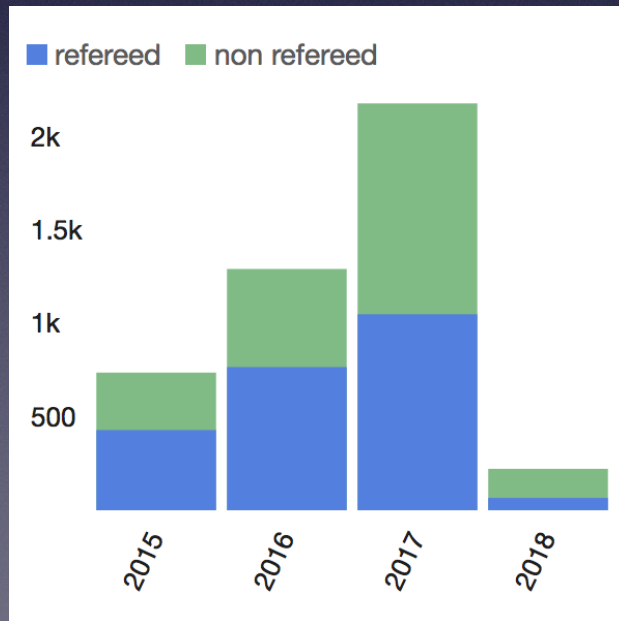


LIGO+Virgo Neutron-star merger

Birth of multi-messenger astronomy

Emergence of a new field

- gravitational waves instead of light !
- so far 7 events and about 5000 papers since 2015

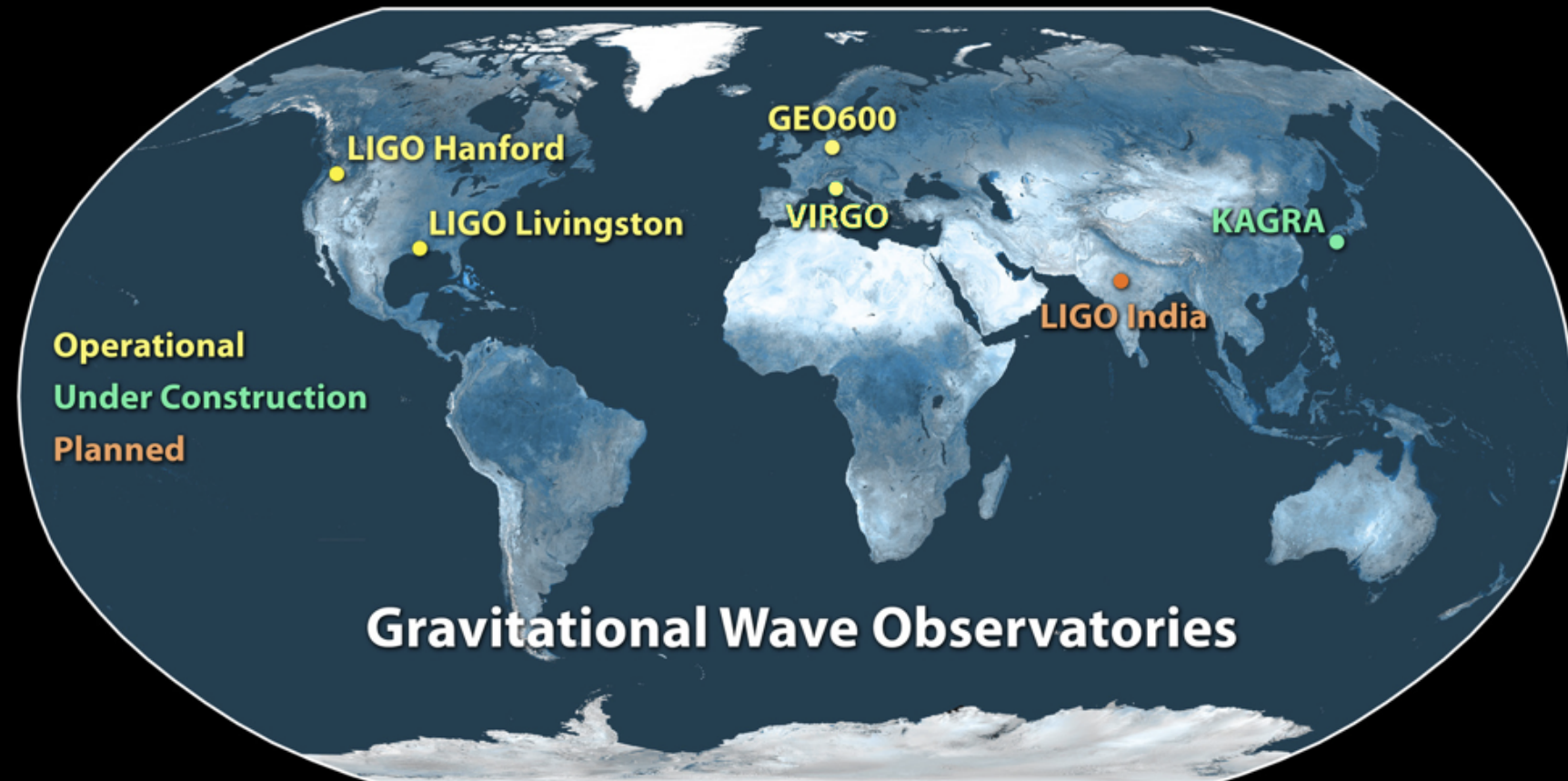




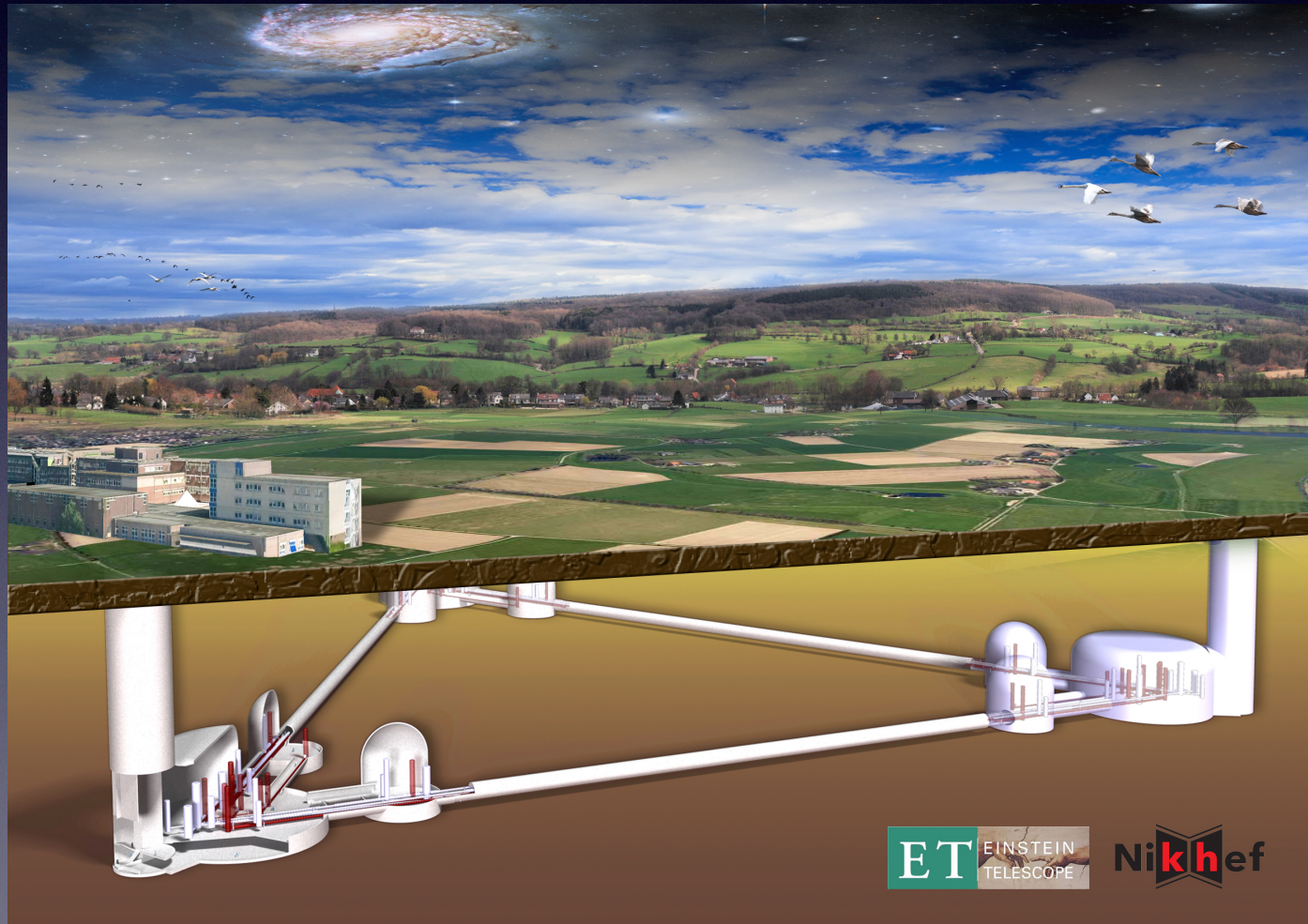
Why the Einstein telescope?

2nd generation observatories

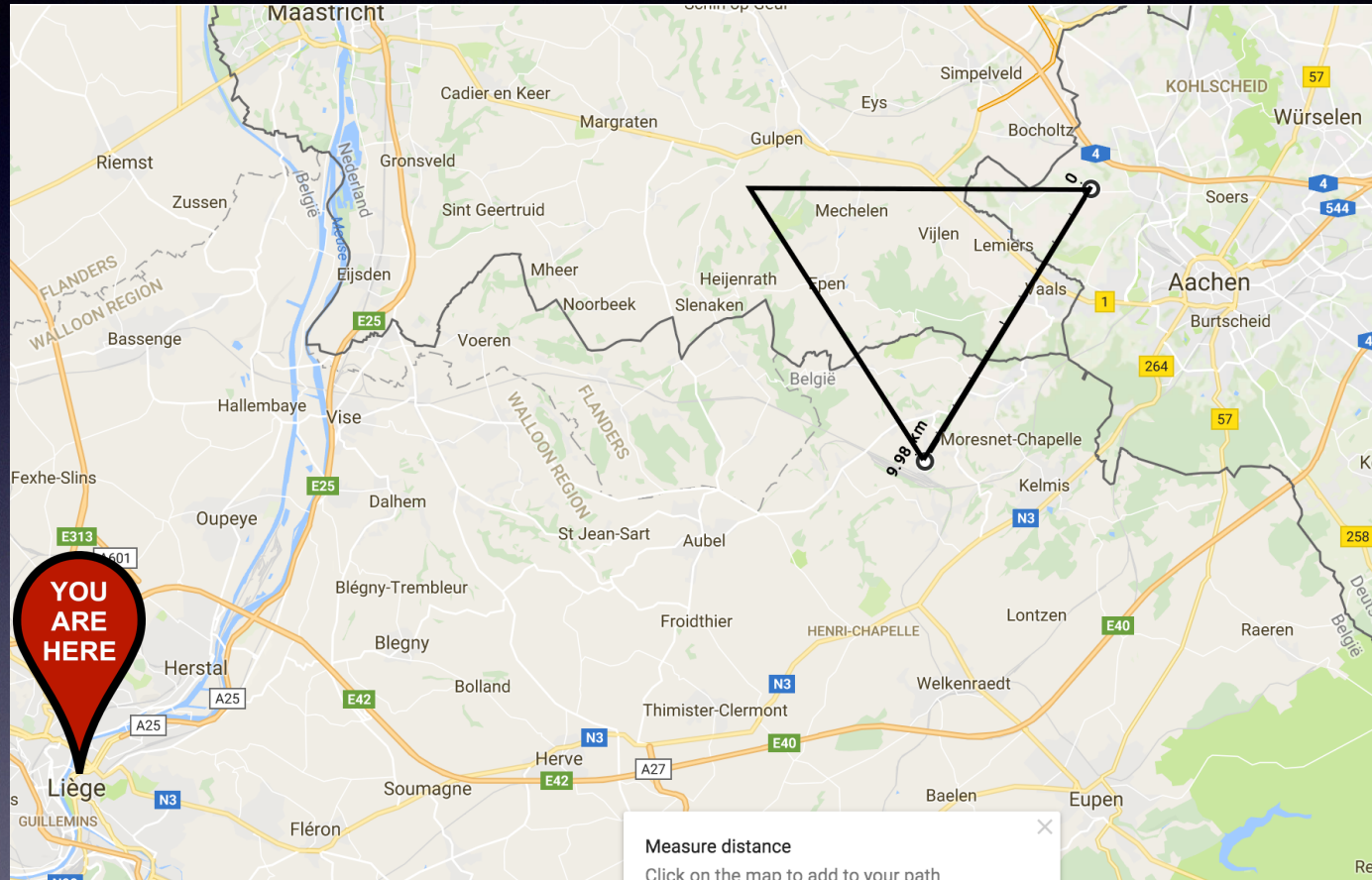
L-shape interferometers, on the ground, km arms



3rd generation: Einstein Telescope
triangle, 10 km side, underground
> 100 000 events/year



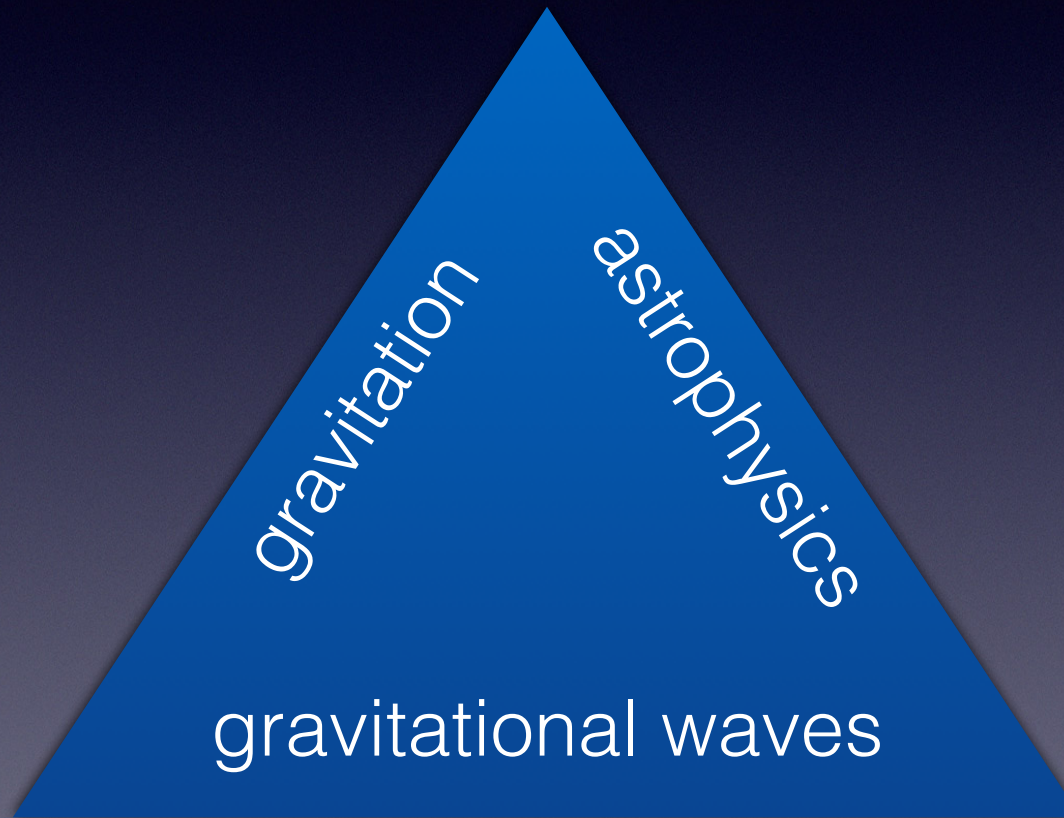
One of the Einstein Telescope projects



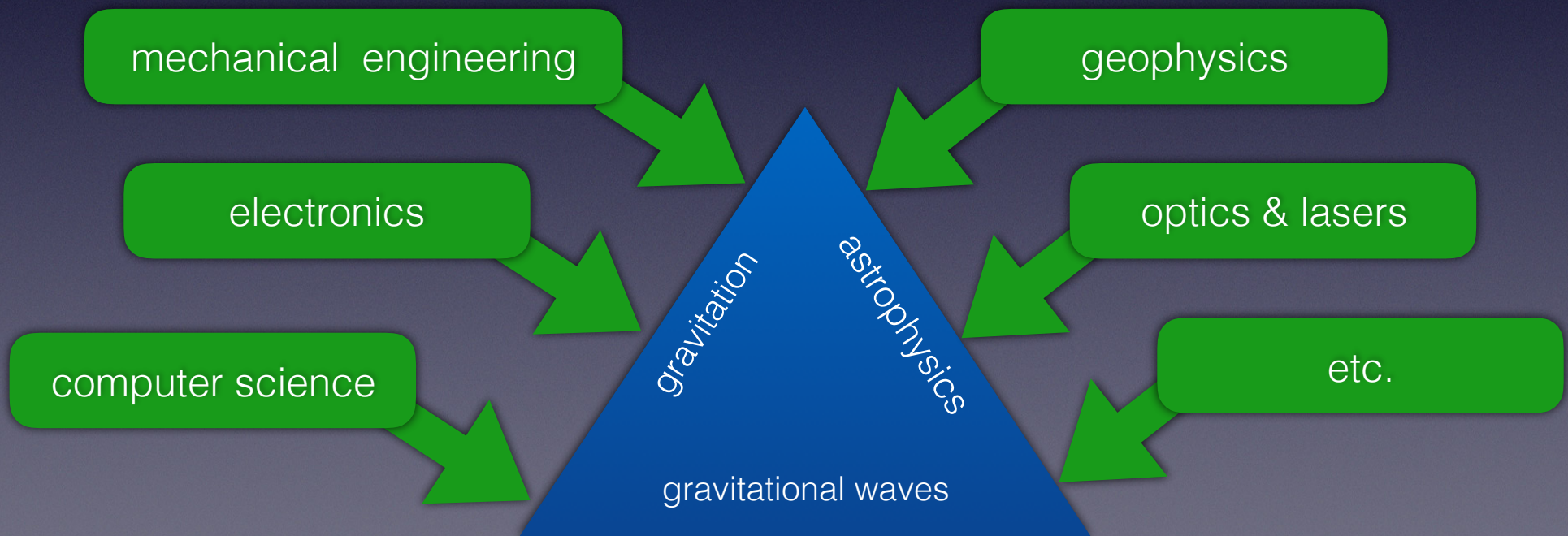


Impact of the Einstein Telescope

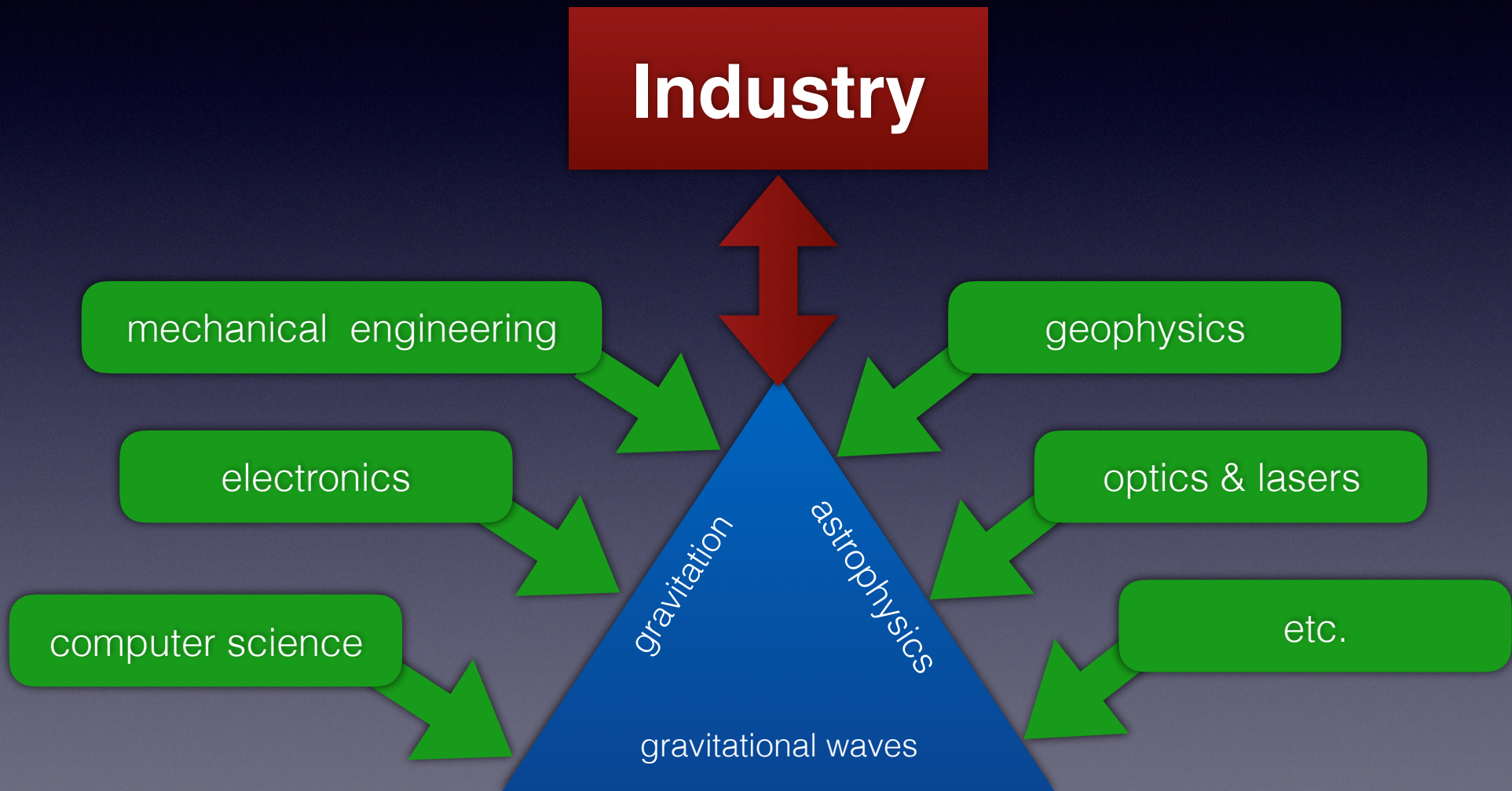
The science case



The bigger picture

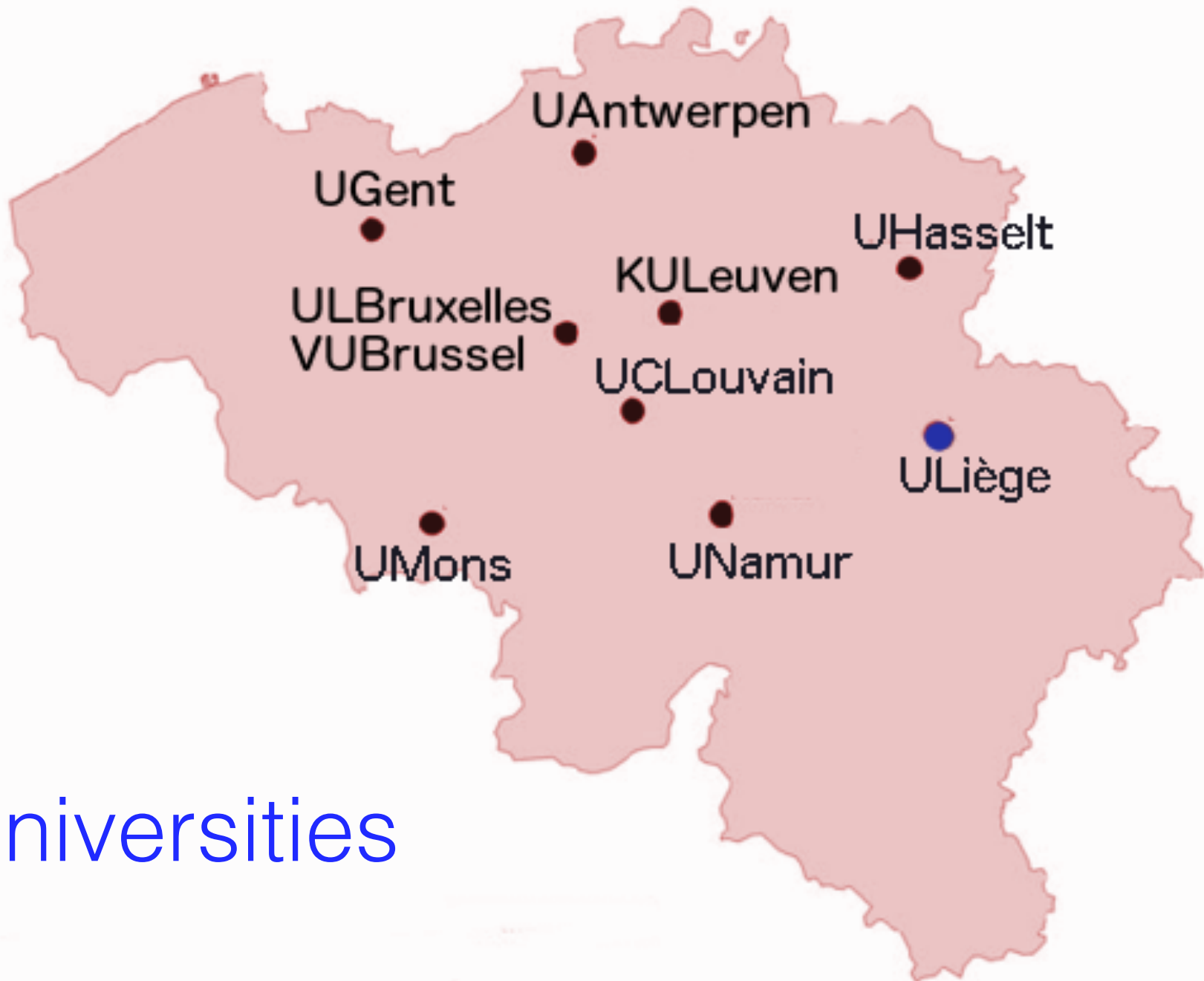


The bigger picture

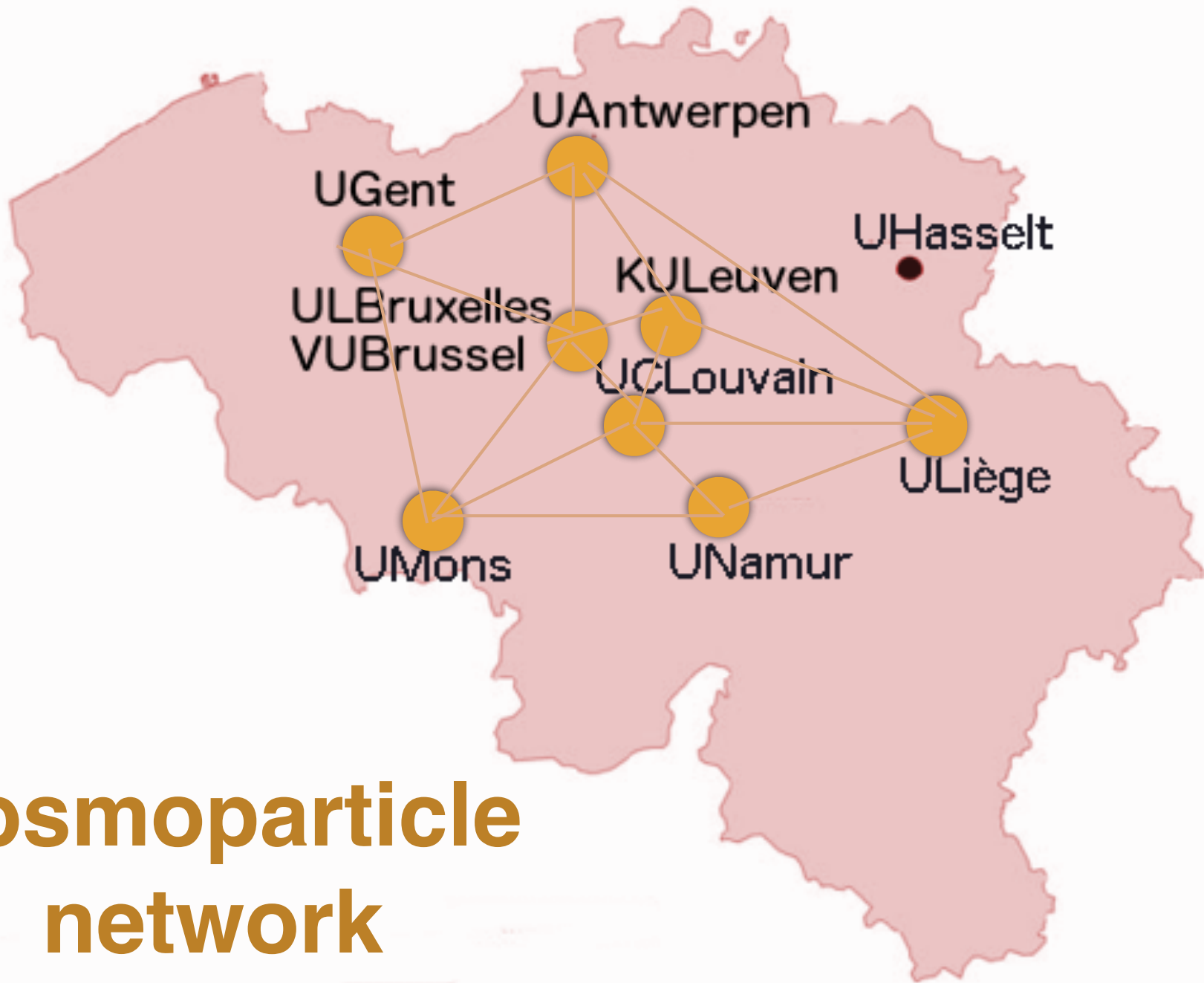


The background of the slide is a 3D visualization of a curved spacetime metric tensor field. It features a blue grid that is distorted into a series of concentric, wavy ridges and valleys, representing the curvature of spacetime. Two bright blue, glowing spheres are positioned on the right side of the image, resting on the surface of the grid. The overall color scheme is dominated by various shades of blue, from deep navy to bright cyan.

Belgian situation



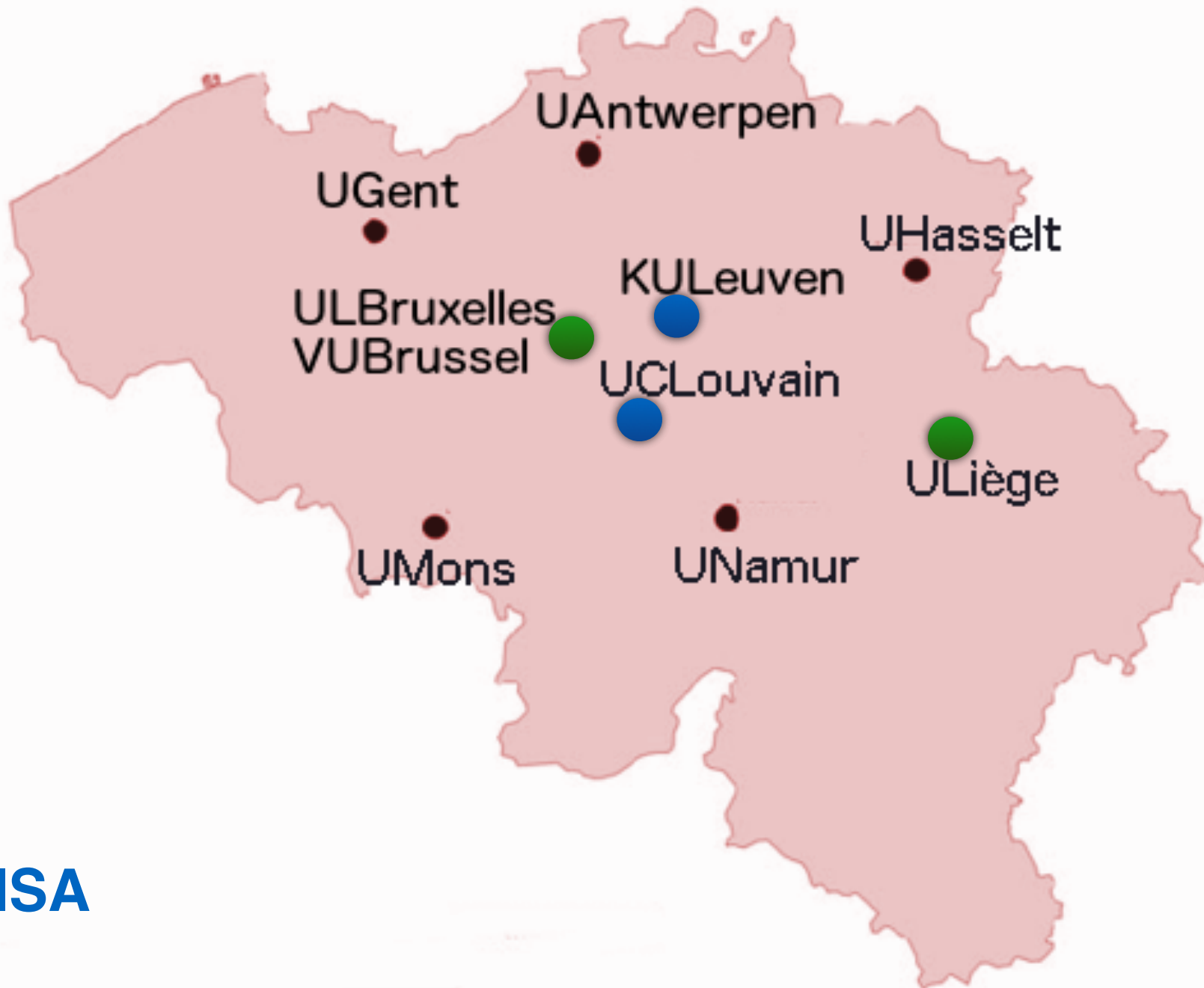
Universities



Cosmoparticle network



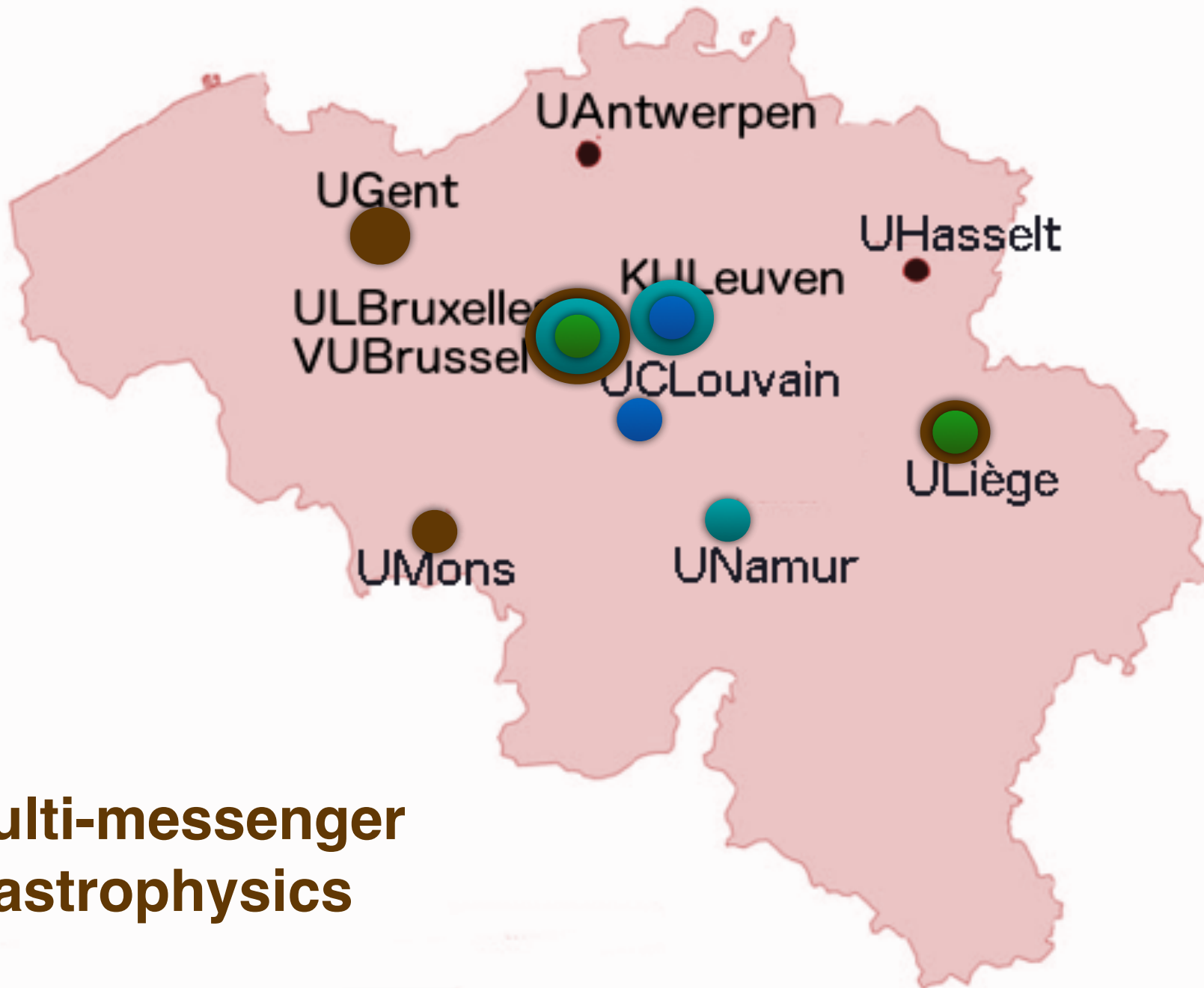
LIGO



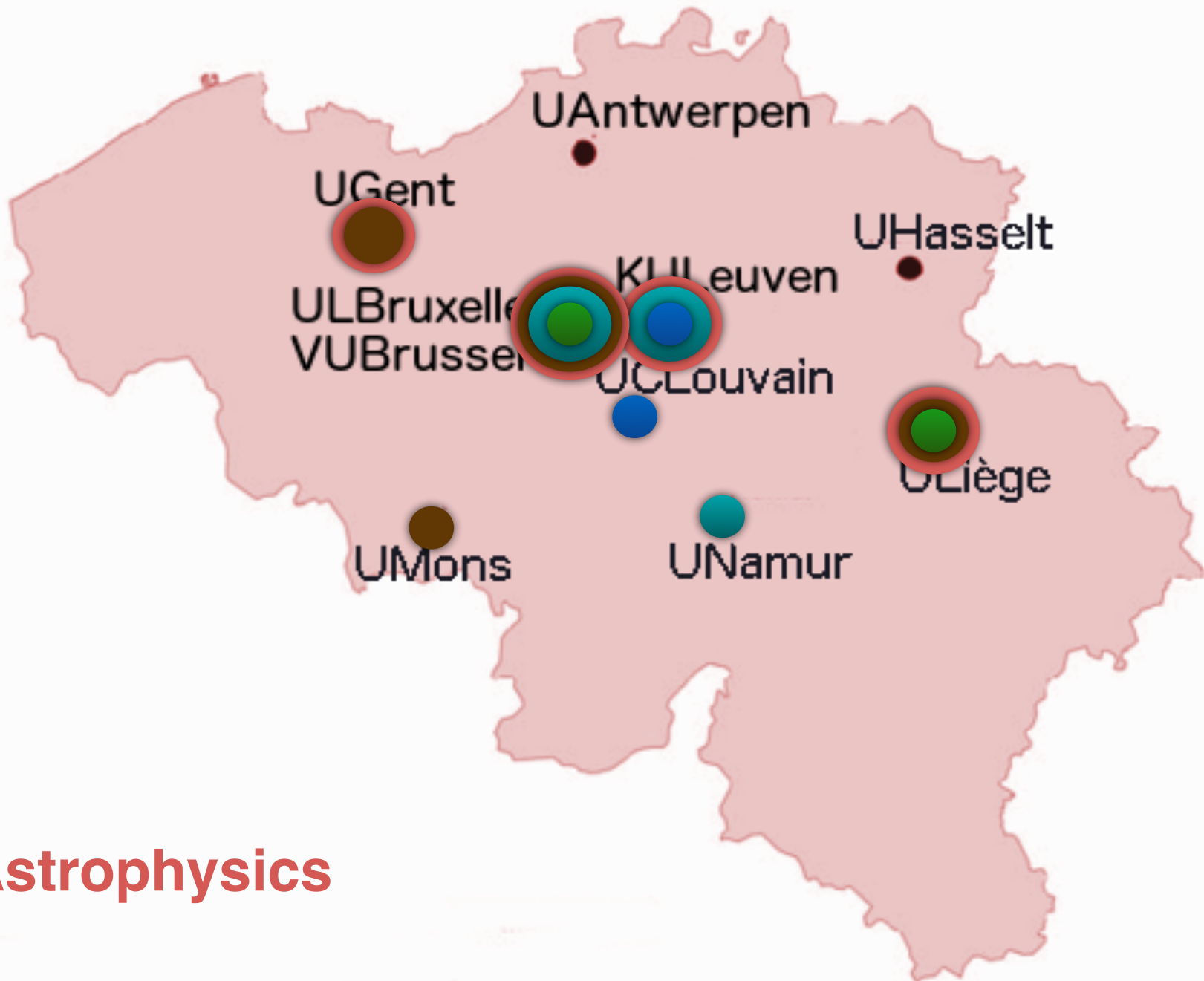
LISA



Gravitation & cosmology



Multi-messenger astrophysics



Astrophysics

The time to act is now!

- sciences
- applied sciences
- industry
- funding agencies