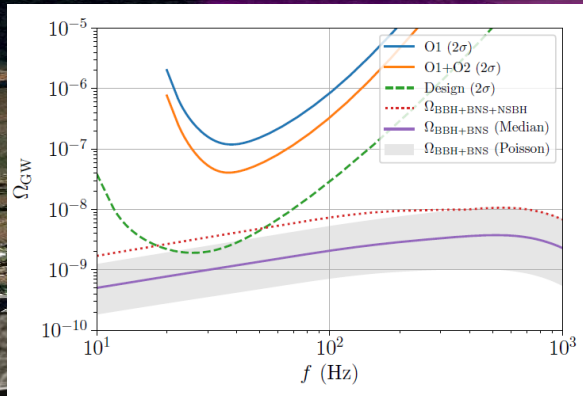


Universiteit Antwerpen

GW physics & instrumentation



Nick van Remortel
University of Antwerpen, Belgium
Belgian GW Workshop
October 27, 2020

www.einsteintelescope.be

www.etpathfinder.eu

www.etest-emr.eu

Some history (relevant to Antwerpen GW development)

- 31 jan 2018: ET meeting Liège
 - Idea raised by NIKHEF to set up R&D lab for GW instrumentation
- **April 2018: ET Meeting Cascina → form idea to join ET effort**
 - Discussion with NIKHEF to write Etpathfinder proposal
 - Formation of experimental consortium in Flanders
- **Sept 2018: Flanders proposes ET IRI @ FWO, KUL is lead**
- Nov 2018: Etpathfinder Interreg takes shape, E-TEST follows soon after
- **Dec 2018: Etpathfinder project submitted**
- **March 13 2019: Etpathfinder approved**
- June 15 2019: E-TEST submitted
- August 2019: UCL joins VIRGO
- **Nov 2019: UAntwerpen joins VIRGO: N. van Remortel + K. Janssens**
- Dec 2019: E-TEST approved!
- **Aug 2020: Hans Van Haevermaet joins Antwerp GW as lecturer**
- **Sept 2020: ET ESFRI proposal submitted: Support from ITA, NL, BEL, SPA, POL**
- Sept 2020: ET-Impact project submitted

R&D Platforms: ETpathfinder



- 500 m² R&D lab in Maastricht : 15 MEur by VL & NL
- Test key technologies for ET at smaller scale (20x20m)
 - Vacuum & beamtubes
 - Suspensions
 - Silicon Mirrors (20cm and 10kg vs 50cm and 200kg at ET)
 - Cryogenic temperatures (120 K)

UAntwerpen@ETpathfinder

- N. van Remortel: ETpathfinder deputy project leader
- W. Beaumont: co-chair WP7 (With B. Swinkels from NIKHEF)
 - Cryo tower lifting system
 - LVDT coils
 - DAQ hardware
- E. Roose: Electronics engineer
 - Cryo tower lifting system
 - LVDT coils
 - DAQ hardware
- H. Van Haevermaet
 - LVDT coils
 - Optics (noise) simulations

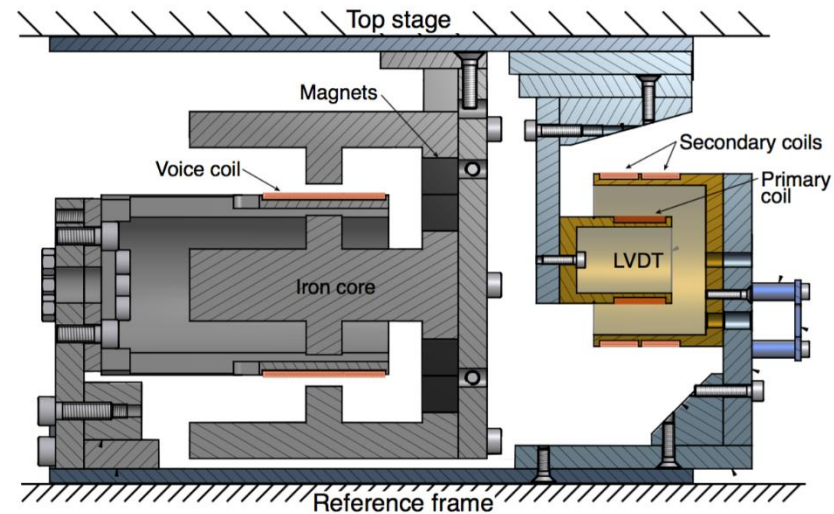
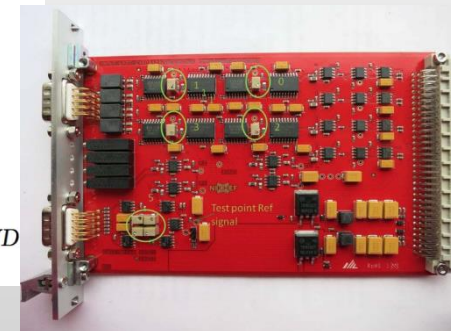
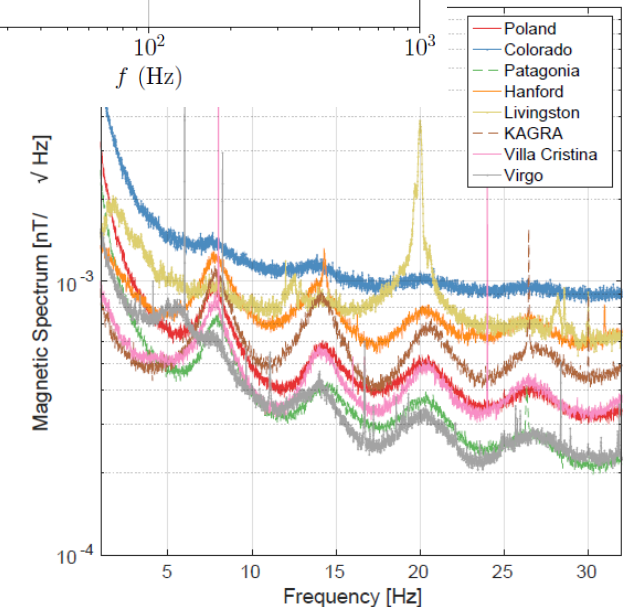
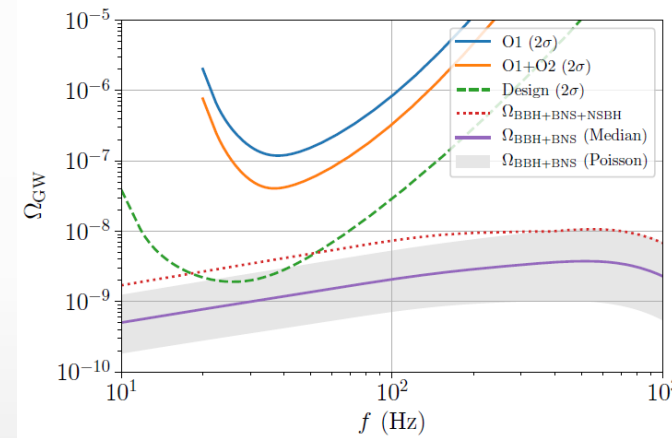


Figure 5.9: Schematic bisection of a magnetic voice coil actuator (left) and an LVDT (right) .

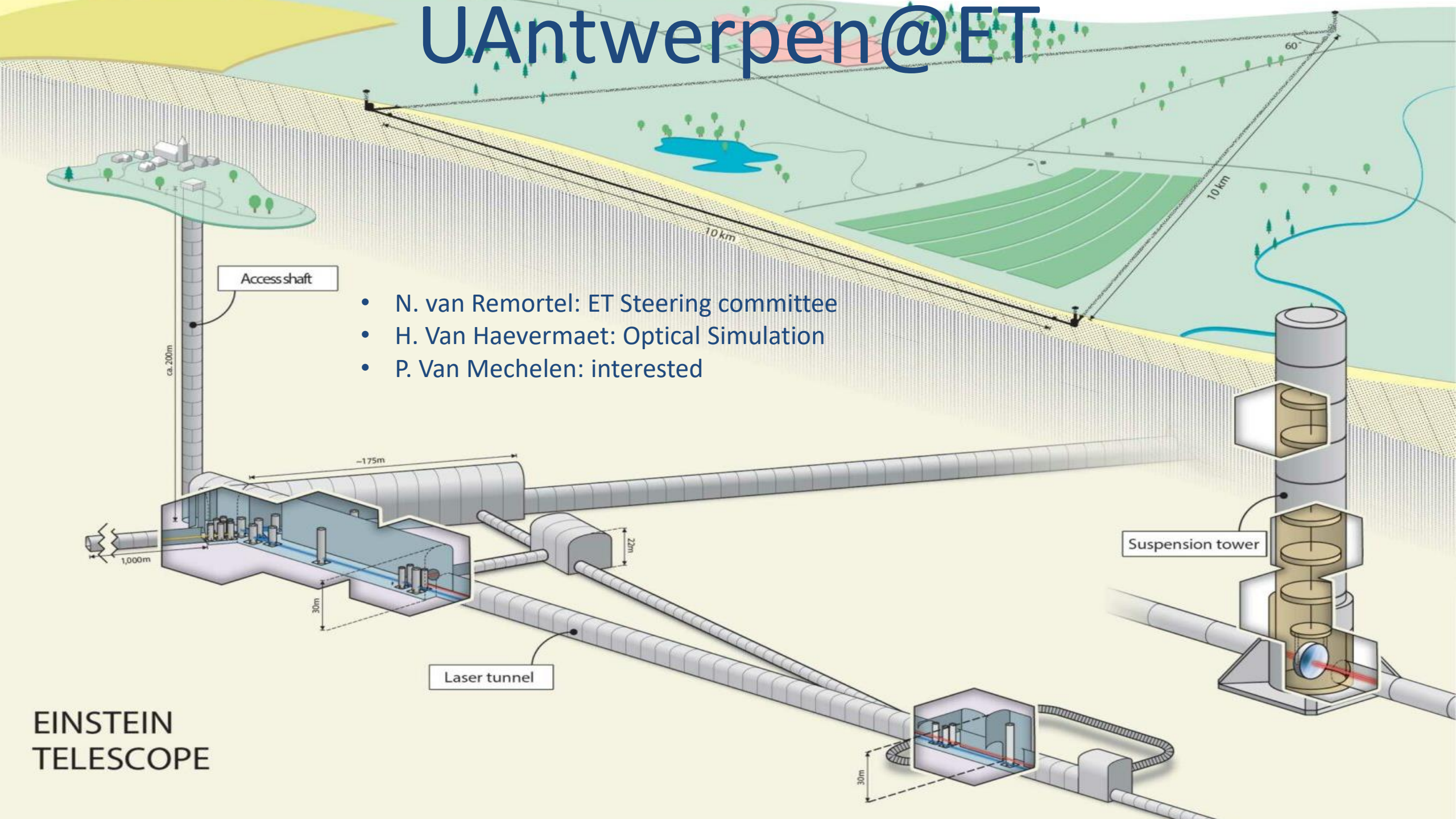


UAntwerpen@VIRGO

- N. van Remortel: VIRGO Stochastic search group co-chair
- H. Van Haevermaet:
 - Looking for possible hardware projects/synergies with ETp hardware development
- K. Janssens:
 - Detchar, noise characterisation for Stochastic group
 - Correlated Magnetic noise measurement : Schumann resonances & others
 - Magnetic noise injection: with F. Paoletti, I Fiori
 - O3 Isotropic stochastic search: With N. Christensen
 - Geodesy project: with N. Christensen, T. Callister, A. Matas, M, Coughlin,
- K. Turbang:
 - Joint PhD with VUB group (A. Mariotti, A. Sevrin, M. Sakellariadou)
 - O4 Isotropic stochastic search
 - Theoretical modeling & interpretation
 - Detchar
- M. Yzewyn:
 - UA BSc student
 - Geodesy project: extension to other configs?



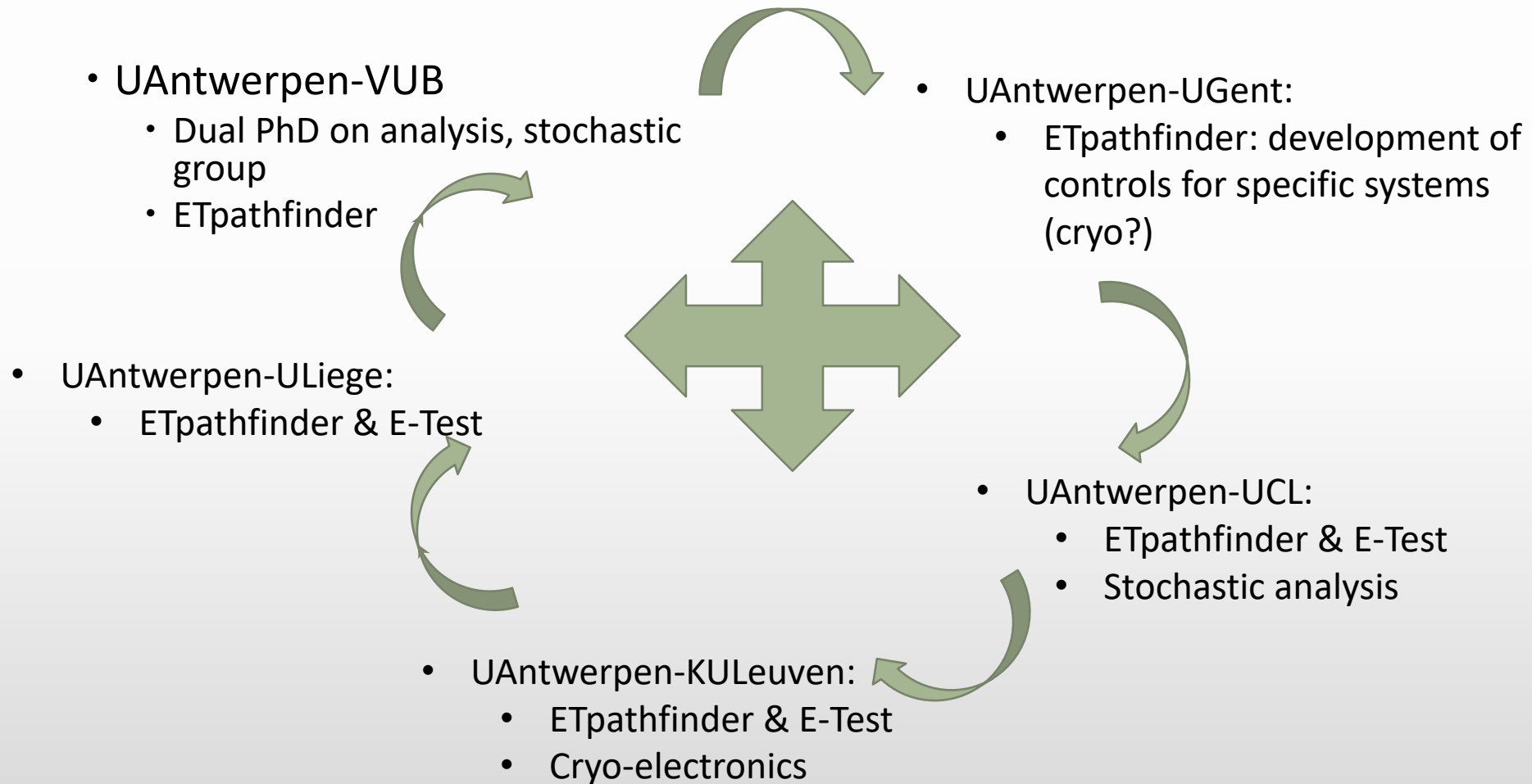
UAntwerpen@ET



- N. van Remortel: ET Steering committee
- H. Van Haevermaet: Optical Simulation
- P. Van Mechelen: interested

EINSTEIN
TELESCOPE

Synergies in Belgium



Open positions@ UAntwerpen

- 2 year Post-doc on LIGO-VIRGO analysis + ET simulations
- 4 year PhD position on ETpathfinder: LVDT coils + DAQ development
- Possibly more to come (depending on outcome other funding applications)