

IIHE Annual Meeting 2019

22 Nov 2019



9:15	IIHE general report	directors
9:45	Physics with CMS	Chhibra Simranjit Singh
10:10	Physics with IceCube	Simona Toscano
10:35	CMS Tracker Upgrade	Inna Makarenko
10:55	Break	
11:15	CMS GEM upgrade	Elizabeth Starling
11:35	R&D in radio arrays	Nick van Eindhoven
11:55	SoLid	Petra Van Mulders
12:15	Lunch + presentation newcomers	
14:15	JUNO	Shuang Hang
14:35	Phenomenology activities	Aqeel Ahmed
14:55	LOFAR	Katharine Mulrey
15:15	Break	
15:35	Auger	Koun Choi
15:55	IT	Denis Dutrannois / Shkelzen RUGOVAC
16:15	Short presentations (each 10 min)	
17:05	End	

ULB

UNIVERSITÉ
LIBRE
DE BRUXELLES

ULB-IIHE director
Prof. Laurent Favart



VUB

VRIJE
UNIVERSITEIT
BRUSSEL

VUB-IIHE director
Prof. Jorgen D'Hondt

Interuniversity Institute for High Energies

since 1972

Physics at Colliders

CMS@LHC
H1@HERA
Future Colliders

Neutrino Physics

JUNO
SoLiD

Astroparticle Physics

IceCube
ARA
LOFAR
Auger

Phenomenology

Beyond the Standard Model

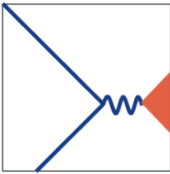
Instrumentation and Computing

Radar/Radio detection
DAQ systems
Silicon Tracking devices

A variety of research themes (some examples)

	Physics at Colliders	Neutrino Physics	Astroparticle Physics	Pheno	Instrumentation & Computing
EW & Higgs sector	x			x	
Beyond the SM	x			x	
Dark Matter	x	x	x	x	
Neutrino Oscillations		x	x		
Multi-messenger			x		
Sterile neutrinos		x	x		
Radar/Radio detection			x		x
DAQ Systems	x	x			x
Silicon Tracker	x				x
TIER-2	x	x	x	x	x

- ✓ An important 5-year VUB grant on **HEP@VUB** (connected theory-pheno-experiment on particle, astro-particle and astrophysics), 260k Euro/year (2018-2022)
- ✓ A 4-year Belgian **EOS program** (Excellence of Science, 2018-2021) on “The Higgs gateway to physics beyond the Standard Model”
- ✓ The **FWO International Research Infrastructure (IRI)** programme: for the period 2019-2022 (CMS: ~5MEuro; IceCube: ~4MEuro; budgets shared among Flemish universities)
- ✓ Construction project for the **CMS Tracker** is funded (10.4MEuro in Belgium in core cost)



HIGH-ENERGY PHYSICS RESEARCH CENTRE

Coordinator: Prof. J. D'Hondt
Secretariat: M. Fabre and M. Goeman

Theoretical physics

- string theory
- holography
- cosmology

Prof. B. Craps
Prof. A. Sevrin

Part-time:
Prof. V. Balasubramanian
Prof. C. Blair
Prof. O. Evnin
Prof. L. Lopez Honorez
Prof. D. Thompson

Particle physics experiments

- high-energy colliders
- neutrino physics

Prof. F. Blekman
(Odysseus 2)
Prof. J. D'Hondt
Prof. S. Lowette
(Odysseus 2)

Part-time:
Prof. P. Van Mulders

Active emeriti:
Prof. S. Tavernier
Prof. W. Van Doninck

Astro-particle physics

- cosmic neutrinos
- dark matter
- multi-messenger observations

Prof. K. De Vries
(ERC Starting Grant)
Prof. N. van Eijndhoven
(Odysseus 1)

Part-time:
Prof. O. Scholten

Active emeriti:
Prof. C. De Clercq

High-energy astrophysics

- radio transients
- binary evolution
- gravitational waves

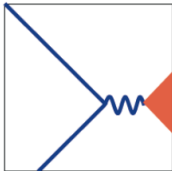
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Prof. J. Blommaert
Prof. T. Huege
Prof. K. Kolenberg

Guest professor:
Prof. D. Vanbeveren
Prof. J. Horandel
(ERC Advanced Grant)

Phenomenology

Prof. A. Mariotti



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International
Solvay Institutes

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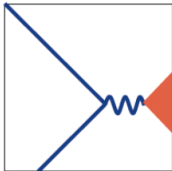
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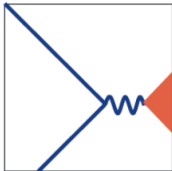
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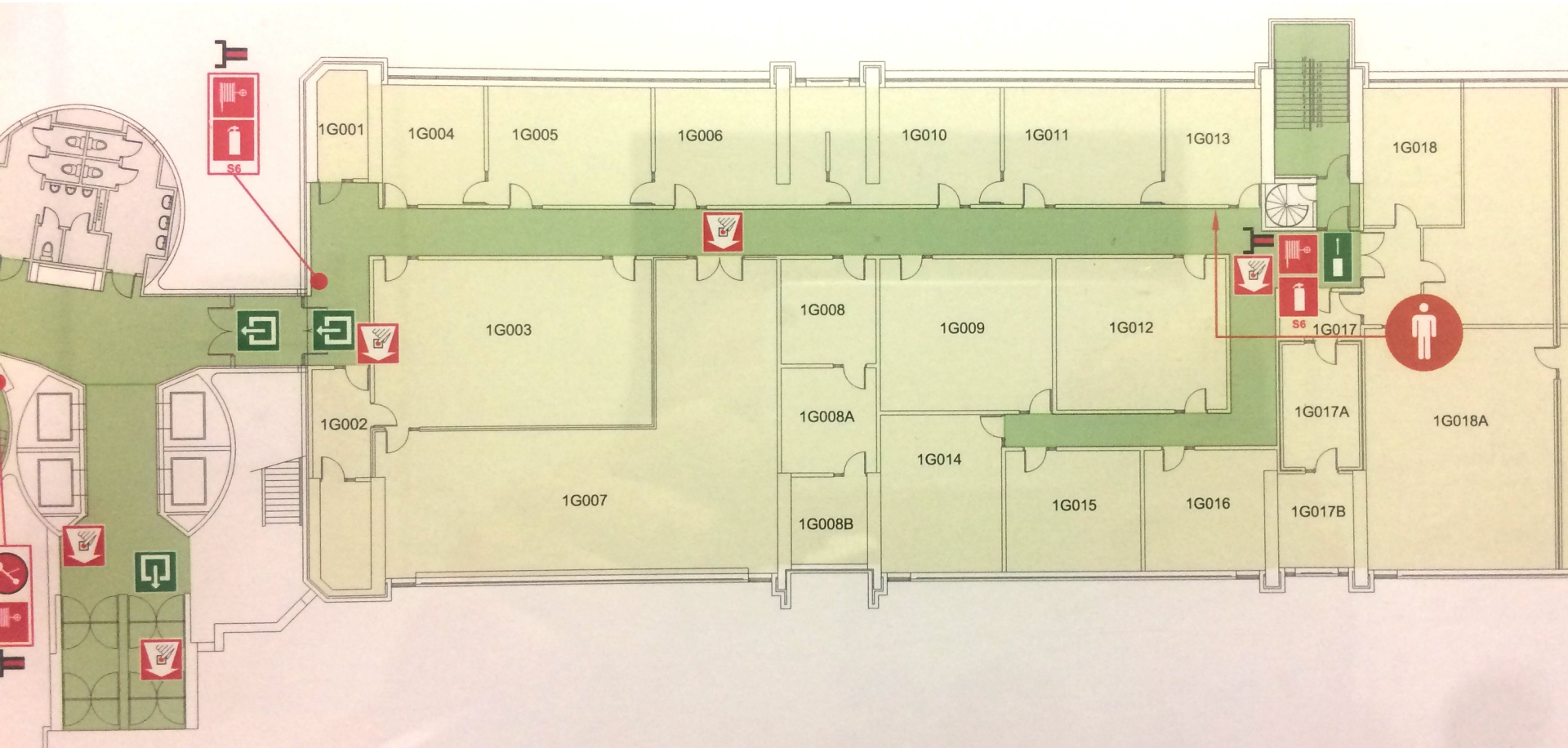
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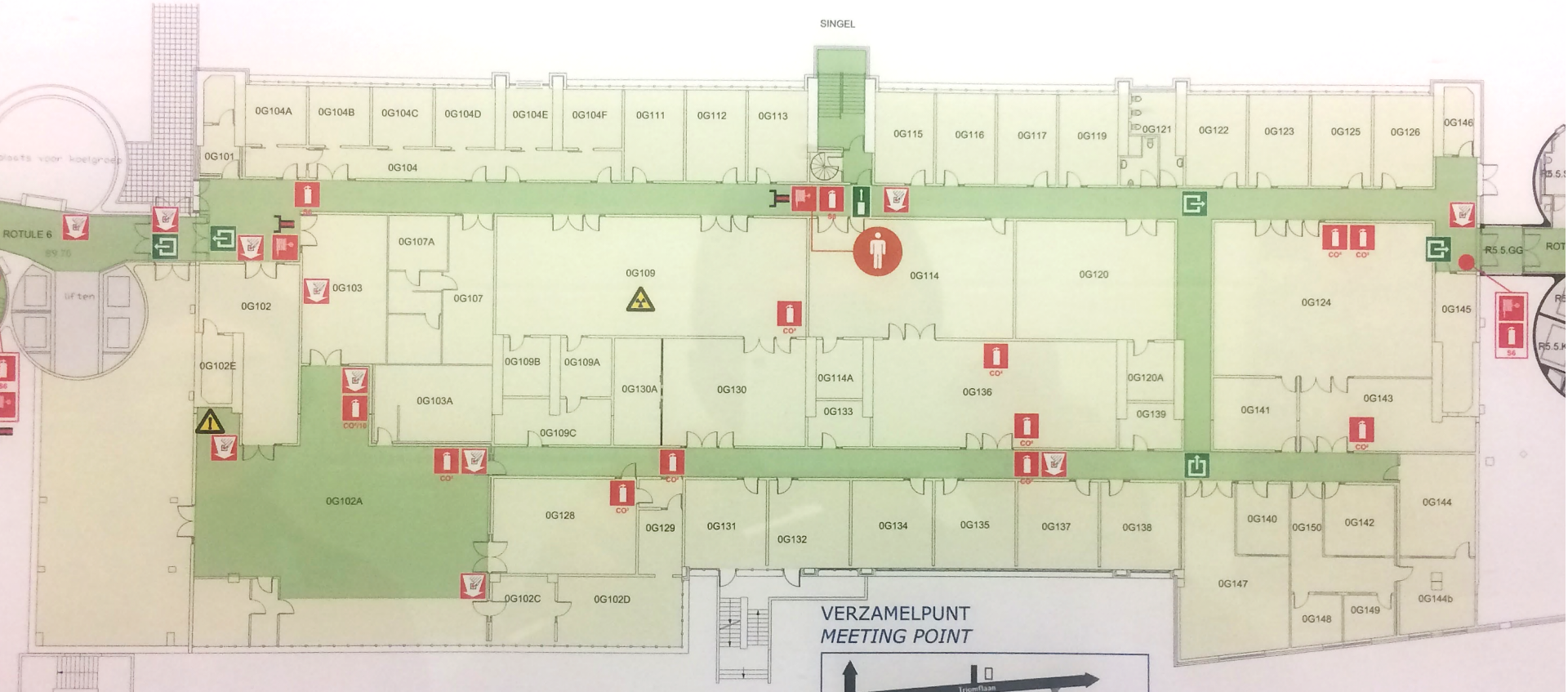
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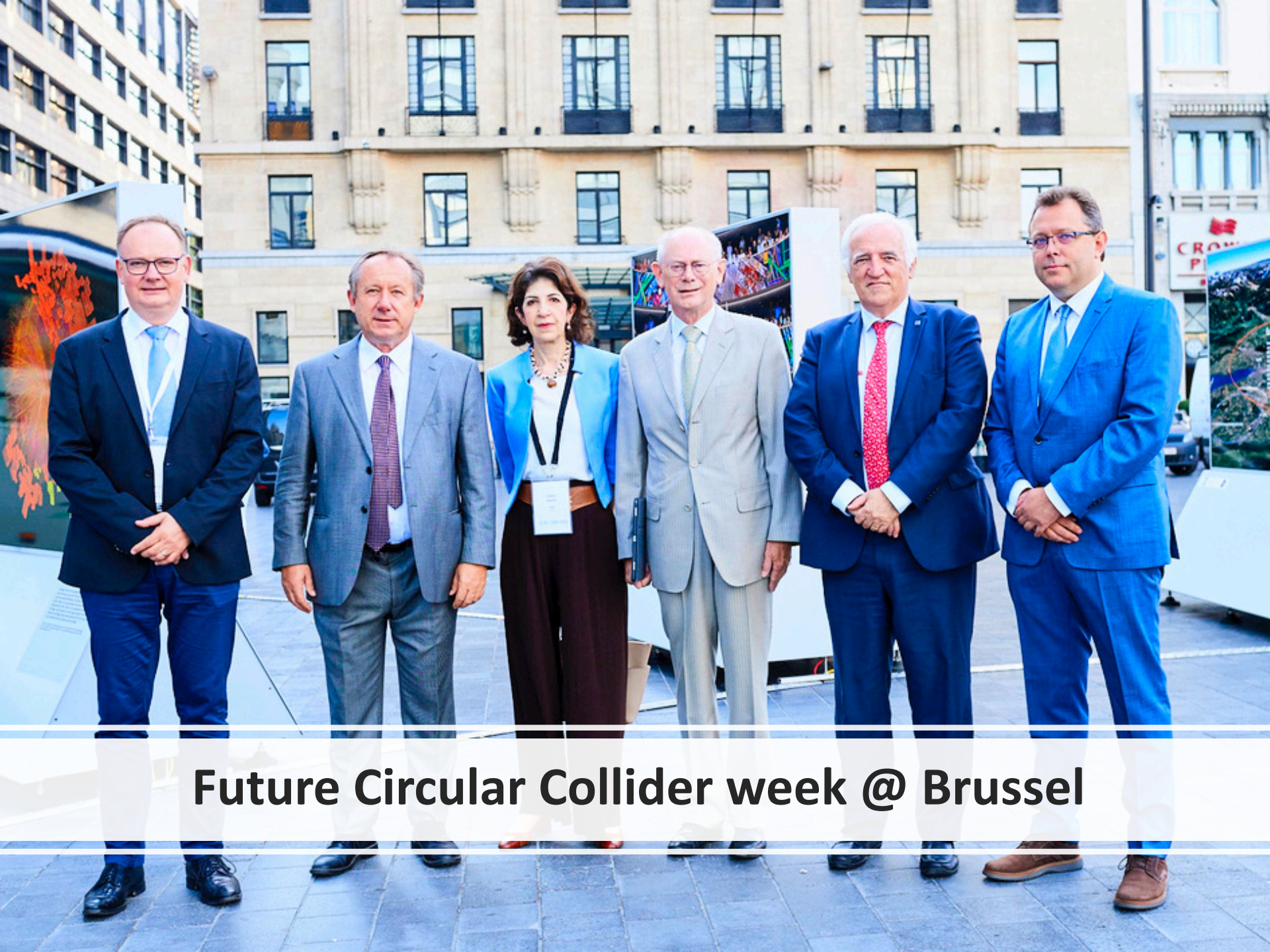


- Future Circular Collider (500 people, Le Plaza Rogier square, Brussels, 24-28 June 2019)
- EPS-HEPP conference (800 people, Ghent, 10-17 July 2019)
- IceCube week (250 people, Brussels, May 2020)



FCC week @ Brussel Exhibition at Place Rogier





Future Circular Collider week @ Brussel



EPS-HEPP conference @ Ghent

PhD thesis 2018-2019 (16 in total) + 12 master thesis

David Vannerom [Search for new physics in the dark sector with the CMS detector](#)

Hugo Delannoy [Search for a heavy scalar boson in the \$ZZ \rightarrow 2l2\nu\$ channel with the CMS experiment at the LHC using 2016 data at 13 TeV](#)

Quentin Python [Search for displaced Supersymmetry in events with two leptons with large impact parameters with the CMS detector at the LHC](#)

Seth Moortgat [When charm and beauty adjoin the top: First measurement of the cross section of top quark pair production with additional charm jets with the CMS experiment](#)

Wenxing Fang [Search for new physics in dilepton final states at the CMS experiment](#)

Xuyang Gao [Search for high mass resonances in electron-electron and electron-muon final states with CMS data and study of exotic states with BESIII data](#)

Dominic Smith [Search for new physics in 13 TeV proton-proton collisions, using jet substructure techniques with the CMS detector at the LHC](#)

Douglas Burns [Precision measurements of differential \$t\bar{t}\$ production cross sections as a function of kinematic event variables at 13 TeV at CMS](#)

Isabelle De Bruyn [Search for Dark Matter in the Monojet and Trackless Jets Final States with the CMS Detector at the LHC](#)

Isis Van Parijs [A search for flavour changing neutral currents involving a top quark and a Z boson, using the data collected by the CMS experiment at a centre-of-mass energy of 13 TeV](#)

Lieselotte Moreels [Direct measurement of the top quark decay width in the \$\mu\text{on}+\text{jets}\$ channel using the CMS experiment at the LHC](#)

Qun Wang [Measurement of the differential cross section of Z boson production in association with jets at the LHC](#)

Shimaa AbuZeid [Search for Top Quark Flavour Changing Neutral Couplings with the CMS Experiment at the LHC](#)

Gwenhaël de Wasseige [Solar Flare Neutrinos in the Multi-Messenger Era: Flux Calculations and a Search with the IceCube Neutrino Observatory](#)

Simon Vercaemer [Commissioning of the SoLid experiment for the observation of electron antineutrinos at the BR2 reactor](#)

David Ndayizeye [Validation de la réponse du détecteur de neutrons WENDI-2 dans un faisceau de neutrons quasi-monoénergétiques pour son utilisation dans un centre de protonthérapie](#)

The ABC principle @ VUB : Avoid, Book an alternative, and Compensate (in brief: <http://vubtoday.be/en/content/vub-aims-climate-neutrality-new-travel-policy>)

The ABC-principle: the 3 pillars of the travel policy

The travel policy is applicable to all work related trips by VUB staff, its students, researchers and guests and is based on three pillars:

AVOID | Don't travel if not strictly necessary

Use Skype or video conference tools when possible.

BOOK AN ALTERNATIVE | Travel by train

When train travel from Brussels-Midi takes less than 6 hours, this mode of transportation becomes the default choice. VUB presents a [city list](#) with an overview of destinations that are always available through train travel. The city list is also applicable to parts of work trips that require a stop-over, more specifically on transport to airports that can be reached in less than 6 hours. Air travel to these destinations will exceptionally be allowed following an acceptable motivation and clearance from a superior staff member. In the case where train travel from Brussels-Midi takes between 6 and 8 hours this option is still highly recommended. That is why the city list also includes these destinations with preferred train travel.

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COMPENSATE | CO2-compensation of emissions through air travel

For air travel in light of a VUB assignment or project a default contribution to compensate for the emissions of greenhouse gases will be added to the travel cost. These compensation contributions will only benefit certified climate projects, with climate credits rendered per effectively reduced ton of CO2.

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City list for train travel

Duitsland

Aken	Bochum	Bonn
Bremen	Dortmund	Düsseldorf
Essen	Frankfurt	Freiburg
Göttingen	Hannover	Heidelberg
Jülich	Karlsruhe	Keulen
Mainz	Mannheim	Münster/Osnabrück
Nürnberg	Paderborn	Saarbrücken
Stuttgart	Trier	Tübingen

Frankrijk

Arras	Bordeaux	Brest
Calais	Caen	Deauville
Dijon	Grenoble	Lille (Rijsel)
Lyon	Le Havre	Le Touquet
Marseille	Metz	Montpellier
Nancy	Nantes	Parijs
Reims	Rennes	Strasbourg

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City list for train travel

Groothertogdom Luxemburg

Alle bestemmingen

Nederland

Alle bestemmingen

Verenigd Koninkrijk

Ashford	Birmingham	Brighton
Bristol	Cambridge	Cardiff
Durham	Leeds	London
Newcastle	Oxford	Sheffield
Southampton	York	

Zwitserland

Basel		
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City list for train travel – recommended to travel by train

Duitsland

Berlijn	Erfurt	Hamburg
Leipzig	Lübeck	Memmingen
München	Nürnberg	Zweibrücken

Frankrijk

Aix-en-Provence	Basel	Clermond-Ferrand
Nice	Toulouse	

Verenigd Koninkrijk

Plymouth		
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Zwitserland

Bern	Genève	Zürich
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