

Belgium in Outreach and Education for High Energy Physics



GHENT
UNIVERSITY

Michael Tytgat

Many many activities over the past years (not all covered in this talk):

- Newspaper/television/radio interviews & articles
- Public lectures
- Articles in popular science magazines
- Social media (Twitter, Facebook ...)
- Science Weeks
- Visits to CERN
- Particle Physics Masterclasses
- Children's university
- Science movies
- Science stand-up comedy
- ...



Jorgen D'Hondt and Petra Van Mulders in *De Schuur van Scheire* television show March, 2015

Outreach Awards for Belgian Particle Physicists

- Science Communication Prize of the Royal Flemish Academy of Belgium for Science and the Arts (KVAB): **Jorgen D'Hondt (2013) & Freya Blekman (2016)**
- VUB Prize for Social Valorization: **Jorgen D'Hondt (2014)**



Activities driven by Scientific News

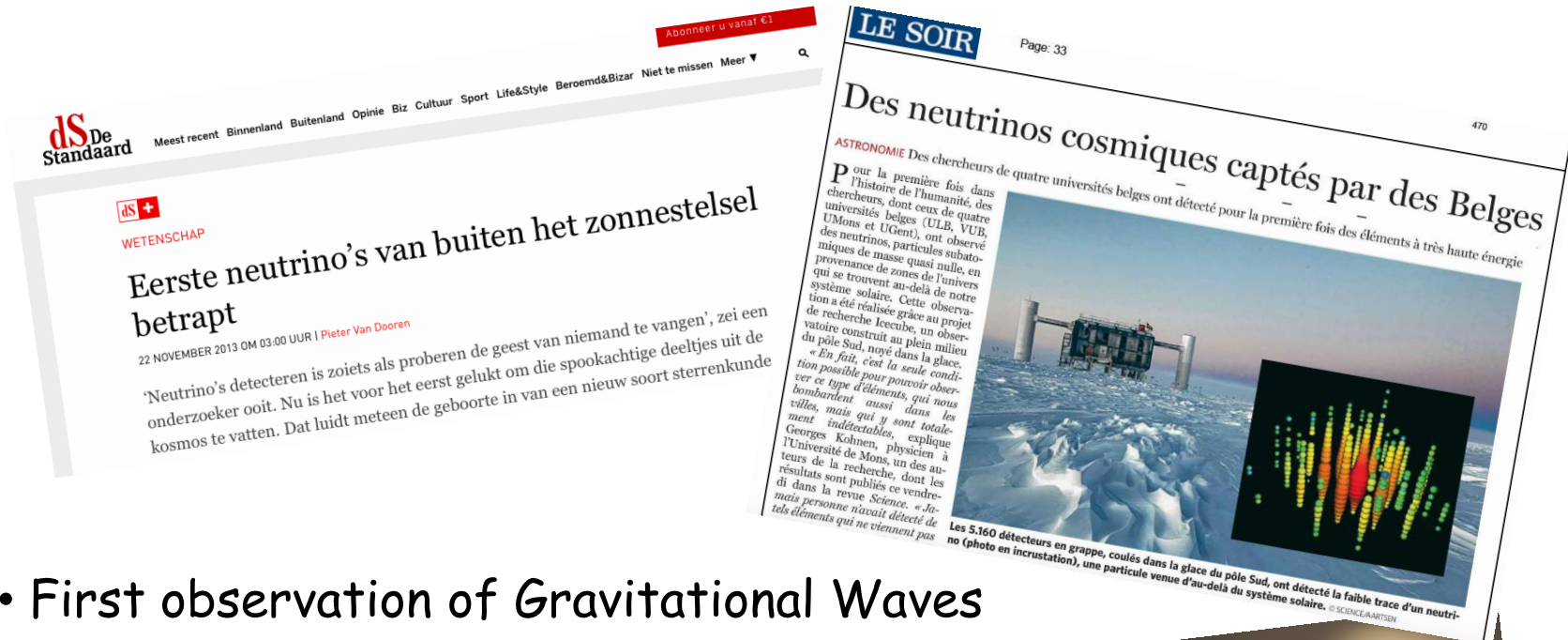
Belgian Physics/HEP community received a boost after Nobel Prize 2013 for François Englert

- Major media attention
- Very nice argument in funding proposals
- For some universities even significant increase in #physics students



Activities driven by Scientific News

- First observation of extraterrestrial neutrinos in IceCube



- First observation of Gravitational Waves

Public event at IIHE (VUB-ULB)
with >200 participants
March 2016



Special Occasions

2016 marked the 50th anniversary of the passing of Georges Lemaître (1894-1966), the father of the Big Bang Theory

Année Georges Lemaître

L'année 2016 marque le 50^{ème} anniversaire du décès de Georges Lemaître. Scientifique illustre et professeur de l'UCL, père de la théorie du « Big Bang », de l'origine et de l'évolution de l'Univers, ses idées audacieuses, présentées dans des contributions scientifiques de premier plan, n'ont cessé d'être confirmées par les avancées les plus récentes de la cosmologie et de l'astrophysique observationnelle.

En hommage à son travail et à l'homme qu'il était, de nombreux événements sont organisés à l'UCL sous le Haut Patronage de Sa Majesté le Roi tout au long de cette année académique. Conférences, projection, expositions, pièces de théâtre, les activités s'adressent à la fois au grand public, aux étudiant(e)s et futur(e)s étudiant(e)s, en partenariat avec le Mundaneum qui n'a pas hésité à accueillir celui dont l'intuition a guidé des générations de scientifiques.



Long list of public events, interviews, lectures, exhibitions ... in his honor @ UCL

Many news reports and events everywhere in Belgium



Special Belgian €5 coin

VIP & Educational Visits to CERN

Regular Belgian VIP visits to CERN (politicians & policy makers, our King, university rectors, funding agencies ...) and also **many educational visits every year** (mostly BSc & MSc university students in physics)



François Englert, King Filip and State Secretary Philippe Courard
@ CERN, May 21, 2014



State Secretary Elke Sleurs during HIE-Isolde celebration @ CERN, Sept. 28, 2016



Honors students UAntwerpen
@ CERN-CMS, April 3, 2017



MSc students UGent
@ CERN-CMS, March 11, 2017

Several Belgian (staff) members are official CMS guides

Annual Belgian Dutch German summer school in particle physics



The screenshot shows the homepage of the BND School website. At the top, it says "BND SCHOOL" and "Belgian Dutch German graduate school in particle physics". Below this is a banner image with four panels: a blue and yellow abstract pattern, the Atomium structure, a field of colorful tulips, and a statue of a figure on horseback. The main content area has a "Home" heading and a paragraph describing the school's focus on experimental high energy physics. Below the text, it announces the "28th BND School 2016, Belgium" from "Su 28.8.2016- Fr 9.09.2016" at the "University of Antwerp". On the left side, there is a search bar and a navigation menu with links for Home, List of BND schools, Organizing institutes, Impressum, Sitemap, Print Version, and Mailform.

Belgium:

- [Universiteit Antwerpen](#) (Nick van Remortel)
- [Vrije Universiteit Brussel](#) (Nick van Eijndhoven, Steven Lowette)
- [Université libre de Bruxelles](#) (Pascal Vanlaer)
- [Universiteit Gent](#) (Dirk Ryckbosch)
- [Université catholique de Louvain](#) (Krzysztof Piotrkowski)
- [Université de Mons](#) (Evelyne Daubie)

Netherlands:

- [Vrije Universiteit Amsterdam](#) (Jo van den Brand)
- [Nikhef / Universiteit van Amsterdam](#) (Frank Linde, Stan Bentvelsen)
- [Utrecht Universiteit](#) (Thomas Peitzmann)
- [Radboud Universiteit Nijmegen](#) (Nicolo de Groot)

Deutschland:

- [RWTH Aachen](#) (Achim Stahl, Günter Flügge)
- [Universität Bonn](#) (Ian Brock)
- [Bergische Universität Wuppertal](#) (Dominic Hirschbühl, Frank Ellinghaus)
- [DESY, Zeuthen](#) (Klaus Mönig)
- [Technische Universität Dresden](#) (Michael Kobel)

Recent editions in Belgium:

- 2013: ULB (85 part.)
- 2016: UAntwerpen (55 part.)

<http://bnd-graduateschool.org/>



Continuing Training Lectures

Particle physics lectures @ UGent, continuing training for seniors, mostly retired academics

Dirk Ryckbosch
UGent - Oct. 2016



Jean-Marc Gérard nous parle du Boson de Higgs



Particle physics lectures @ "Université des Aînés" (linked to UCL), continuing training for all ages

Jean-Marc Gérard
UCL - Feb. 2013



Educating Children



Lecture for 8-12 y.o. kids
@ Technopolis
Petra Van Mulders
Jan. 2017



Children's University



“Geweldig wijs op het Zuidpoolijs”
Dirk Ryckbosch
UGent, Nov. 27, 2011

<http://www.kinderuniversiteit.be/>

Educating High School Students

Belgium is a member of IPPOG:

- Both FWO and FNRS signed MOU of IPPOG Collaboration
- Annual Masterclasses on CMS and IceCube at several universities, aimed at final year high school students



- Particle Physics Masterclasses, including lab visits and hands-on experiments during annual "Printemps des Sciences" weeks in Wallonia



printemps '17
des
scien
ces
les sciences à portée de main

**Printemps des Sciences :
Tous connectés !**

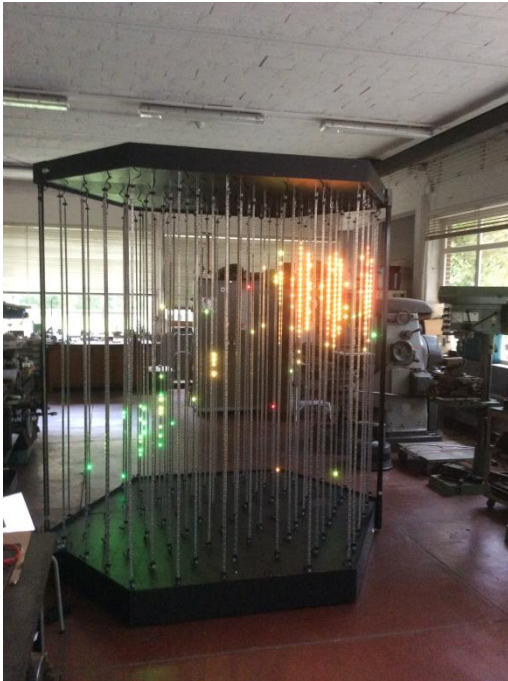
**Un festival gratuit d'activités
scientifiques pour tous et dans
toute la Fédération Wallonie-
Bruxelles du 20 au 26 mars 2017**

Ce lundi, c'est parti pour la 17e édition du Printemps des Sciences ! Près de 50.000 visiteurs de tous âges sont attendus la semaine prochaine aux très nombreuses activités du Printemps des Sciences, accessibles gratuitement un peu partout en Fédération Wallonie-Bruxelles. Devenu un événement incontournable de la culture scientifique et technique, il fédère les universités, hautes écoles, associations et acteurs culturels autour d'un même projet : fêter la science dans toute la Belgique francophone.

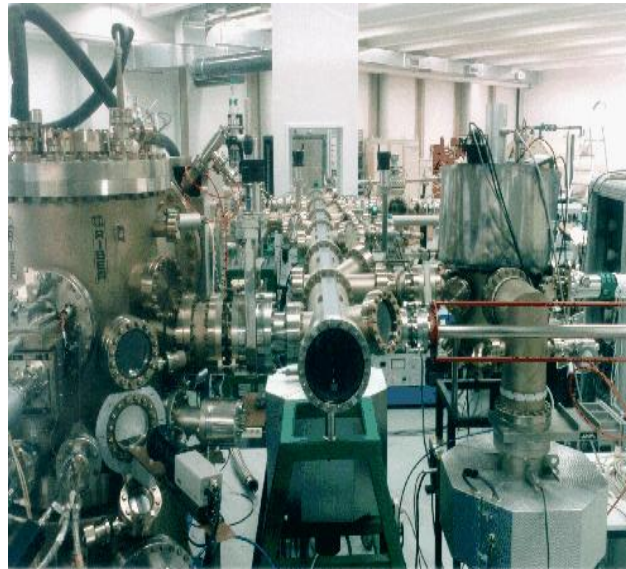
Educating High School Students

"Flemish Science Week", a bi-annual event for high school students organized by universities, colleges and research institutes

IceCube scale model with
>5000 colored LEDs; real
event demos;
2.5x2.5x2.5m³
UGent - Oct. 2016



Guided visits to the Ion- and
Molecular Beam Laboratory and
various hands-on experiments
KULeuven - Oct. 2016



"Van quarks tot oerknal"
UAntwerpen - Oct. 2016



Educating High School Students

ASGARD PROJECT (ENGLISH, SECONDARY SCHOOLS)

In school year 2016-2017, the 7th edition of the ASGARD project will take place. All schools over the world can participate, also yours!



What?

Student teams think of their own scientific experiment to send to the stratosphere (near-space) with the ASGARD VII stratospheric balloon. The conditions are similar to being on the surface of Mars. Teams whose proposals are selected by the jury, can then build their experiment for real, and launch it in Brussels.

ASGARD Project @ UAntwerpen

in collaboration with European Space Education Resource Office (ESERO) and Royal Meteorological Institute (RMI)

Nick van Remortel

HACORD Project @ UAntwerpen

local university student project and "Technasium" project for high school students from The Netherlands

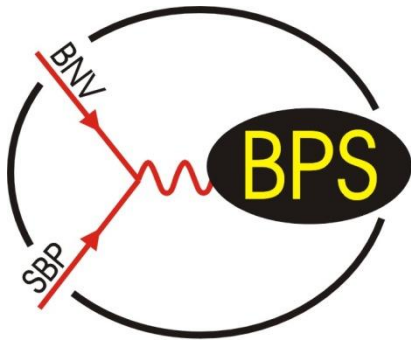


Who are we?

The HACORD project (High Altitude Cosmic Ray Detector) is a project by the University of Antwerp which has been selected for the REXUS/BEXUS programme in 2015 and will be part of the BEXUS 20 mission. The detector will be flown on board of a stratospheric balloon and will be launched in October 2015 from the ESRANGE site near Kiruna, Sweden.

Outreach at annual Scientific Meeting of the Belgian Physical Society

- Session on Physics and Education
- Large interest from high school physics/science teachers
- Collaboration with Science on Stage



Annual continuing education of science teachers

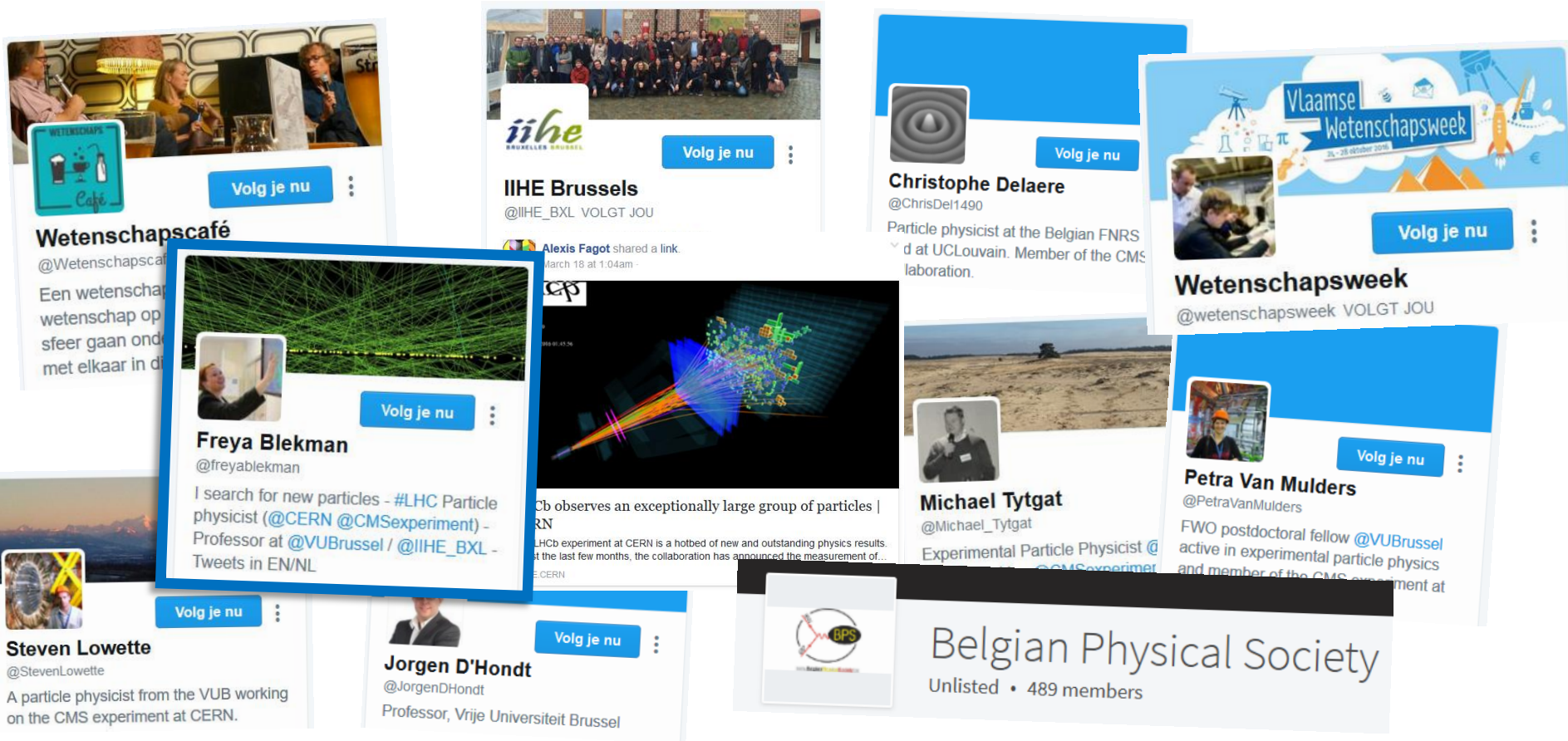
- "Particle Physics anno 2017" @ UGent

Science on Stage during Scientific Meeting of the Belgian Physical Society
UGent, May 18, 2016

Social Media

Large increase in use of social media in outreach and communication

- Twitter, Facebook, LinkedIn ...
 - New @CMSvoices initiative with contributions from Belgian physicists
- Many personal but also institute or society based contributions



Popular Science Magazines

Cooperation with popular science magazines

- New Scientist (Jorgen D'Hondt)
- EOS (Pierre Van Mechelen, EOS Advisory Board)

New Scientist readers visiting
CERN - 2014



New Scientist CERN Festival - 2015



New Scientist book
2017

Krachtpatser ziet barensweeën van het heelal

20 maart 2014 - door PVM

Amerikaanse astronomen beweren het eerste experimentele bewijs voor te hebben voor de theorie dat het heelal na de oerknal razendsnel is uitgebreid. Deeltjesfysicus Pierre Van Mechelen (UAntwerpen) schat de ontdekking naar waarde.



BICEP2 results in EOS - 2014

Somewhat Experimental Approaches ...

TED^x Ghent
x = independently organized TED event



“Chasing the ghost particle”
Dirk Ryckbosch
28 May 2014



**Stand-up Comedy by
CMS physicists ☺ (Steven
Lowette, Freya Blekman)**



**Bright Club BXL: Science Bar Comedy Night
with Lieven Scheire**

🕒 Tuesday, 13 October, 2015 - 19:00
to
Tuesday, 13 October, 2015 - 21:00

📍 Rits Café
Dansaertstraat 70, Brussel
Wtnschp | Expertisecentrum
Wetenschapscommunicatie Brussel
contact@wtenschp.be
www.wtenschp.be

Science Comedy Night

Bright Club is an evening of stand up, by researchers, for everyone! Since Bright Club started at University College London, it has taken the UK by storm. Now Brussels, as well, gets its very own science comedy night! Participating researchers receive a short but intense training from Steve Cross. After which they get three weeks to come up with a funny act. Expect an evening full of scientifically correct humor, brought by researchers from various domains, and Lieven Scheire as MC.



<https://www.youtube.com/watch?v=HrJRN8lgamY>

Science Bars

Similar initiatives in many cities



Di 13/12
19u - RITCS CAFE

SCIENCE BAR BRUSSEL
DONKERE MATERIE

DEC 13
Public · Hosted by Wtnschp and RITCS café

★ Interested ✓ Going

Tuesday, December 13, 2016 at 7 PM - 9 PM
about 3 months ago

RITCS café
A. Dansaertstraat 70, 1000 Brussels, Belgium

Steven Lowette
Stijn Buitink
Catherine De Clercq



ONTSTAAN EN
TOEKOMST
VAN HET HEELAL

SPECIALE
EDITIE
op DOK



DO 13 JUNI
VANAF 19.45u

DOKSITE
SPLITSING
KOOPVAARDIJLAAN –
AFRIKALAAN, GENT

TOEGANG GRATIS!

Met:
Sven De Rijcke (UGent)
Karel Van Acoleyen (UGent)

Gastheer:
Joël De Ceulaer (De Standaard)

Hoe is het heelal ontstaan?
Wat weten we over de oerknal?
Hoe worden sterren geboren?

Waarom zitten sterren samen in
sterrenstelsels?
Wat is donkere materie precies?
Hoe groot is het heelal?
En waar gaat het naartoe?

Ober, aub.

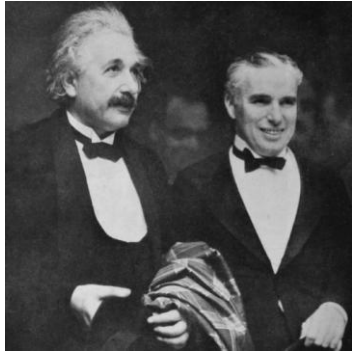
meer Info:
www.wetenschapscafegent.be



Science Related Movies

Karel Van Acoleyen (UGent):

- InScience - Dutch International Film Festival
- Film Fest Gent 2015 & 2016
- Seminars & other public events



"Einstein @ the Movies"
UGent - 2015



"Captain Einstein"
Virtual Reality experience - 2017



"Dr Film: or how I learned to love the photon"
Film Fest Gent - 2016

"LHC Season 2: new frontiers in physics", featuring Freya Blekman (VUB) et al.



<https://youtu.be/ffM0XysgFWw?list=PLAk-9e5KQYEpm9HTFxBw44K9QAkbJTJ5X>

90° South (IceCube)

Dedicated IceCube outreach @ IIHE (VUB-ULB)

Your experiment at the South Pole?

- Experiment contest for primary and secondary school students with >200 participants
- 3 experiments carried out at the South Pole
 - 1 exhibition day in Brussels



Gwenhael De Wasseige
Catherine De Clercq

Tintin at the South Pole

The most famous Belgian reporter discovered the South Pole

- news illustrating the science and life at the South Pole, starring Tintin and Snowy

<http://www.tintin.com>



"Antarctikaartjes":

Greetings exchange between Belgian people and South Pole scientists, > 600 postcards received from 2 to 88 years old



Closer look from the South Pole:

Games and challenges on social media, illustrating life and science at the South Pole + Exhibition



Future: EPS-HEP2019



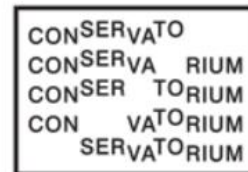
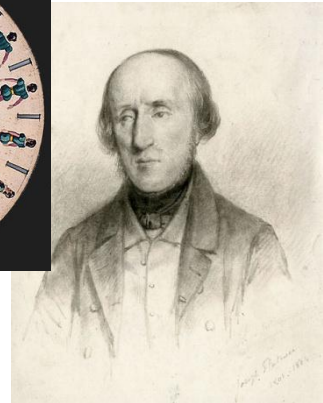
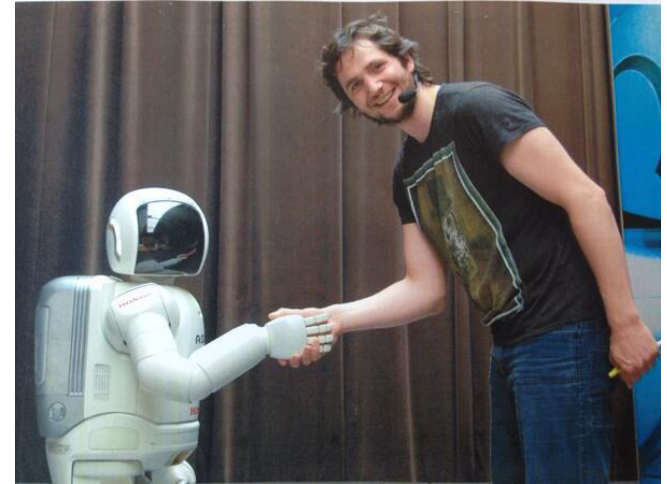
 **HEP2019** Conference 2019
European Physical Society
Ghent (Belgium)
10-17th of July 2019

EPS-HEP2019 Outreach Program

Initial brainstorming and discussions ongoing; preliminary ideas for events:

- Science comedy night
- Public lectures
- Exhibition on renowned physicists from UGent/Belgium
- Physics Cinema: movie afternoon/evening
- Physics concert/party
- art@CMS initiated locally in Ghent:
 - Collaboration with KASK - School of Art
 - SMAK - Contemporary art museum
- ...



S.M.A.K.

Conclusions & (Personal) Observations

- In general, outreach in Belgium is following the global, international trends:
 - next to “old-fashioned” newspaper interviews and dry seminars, more and more dedicated, interactive, hands-on experience events, reaching out to much more diverse audience
 - large amounts of ongoing efforts from many different angles (universities, colleges, science societies, non-profit organizations ...)
- Our universities and funding agencies actually expect us to do outreach !
- However, outreach comes at a price:
 - requires large investment of time (and money sometimes)
 - mostly driven by a few selected individuals
- Many local efforts, but not much national or even inter-university coordination
 - extend the role of organizations such as IPPOG towards the future ?