

Flanders, Belgium and CERN

Symposium of the KVAB Thinker's Programme 2018



Friday November 30th 2018
Palace of the Academies,
Hertogsstraat 1
1000 Brussels



KVAB

Koninklijke Vlaamse Academie van België
voor Wetenschappen en Kunsten

KVAB Thinker's Programme 2018

FLANDERS, BELGIUM AND CERN

Thinker-in-residence: Walter Van Doninck

The Thinkers Programme

The Thinkers Programme is a unique multidisciplinary and future oriented initiative with a high-level societal impact. With and around prominent international experts and jointly with members of the Academy and numerous partners and stakeholders, work is performed around an important timely theme which has a specific relevance for Flanders.

The aim is to provide a significant contribution to the further strategic development of Flanders by developing a long term vision and in this way to contribute to governance.

This symposium is part of the 2018 Thinkers' programme on 'Flanders, Belgium and CERN' led by Walter Van Doninck, former Vice President of the CERN Council and Thinker-in-Residence.

CERN is a role model for international scientific research in Europe and beyond. This symposium will offer both a general introduction to CERN as well as a Belgian and Flemish perspective. What is the legacy of CERN for mankind? What is its scientific and industrial return for Belgium? What discoveries and technological improvements await in the future? National and international scientists reflect during the symposium resulting from the KVAB Thinkers' Programme "Flanders, Belgium and CERN" with Walter Van Doninck.

- 09:30 Registration & coffee
- 10:00 **Welcome**
Joos Vandewalle, KVAB
- 10:15 **Introducing CERN**
Frédéric Bordry, CERN
- 10:50 **Flanders & Belgium Highlights**
- Nuclear Physics
Gerda Neyens, CERN & KU Leuven
- Particle Physics
Jorgen D'Hondt, VUB
- 11:40 Coffee break
- 12:15 **CERN in images**
Film intermezzo
- 12:30 **CERN Alumni Testimonials**
- 12:45 **What's out there?**
Gian Giudice, CERN
- 13:30 Lunch break
- 14:30 **CERN's legacy to mankind**
Siegfried Bethke, Max Planck Institute München
- 15:15 **Accelerators in society**
Wim Leemans, Lawrence Berkeley National Laboratory, CA
- 16:00 **Education, training, incubation**
Ana Godinho, CERN
- 16:30 Coffee break
- 17:00 **Science for peace**
Herwig Schopper, CERN
- 17:35 **Wrap up**
Walter Van Doninck, Thinker in Residence
- 18:00 Closing reception

Thinker in residence



Walter Van Doninck

Walter Van Doninck (°1948) is emeritus professor particle physics at the University of Brussels (VUB). He studied at RUCA (Antwerp) and VUB. In 1977 he obtained his PhD from VUB. Since 1992 he participated in the CMS experiment near the accelerator LHC at CERN. He was research director at the Fund for Scientific Research (FWO) and vice-president of the Council of the European Centre for Nuclear Research (CERN). In 2014 Van Doninck was elected as a foreign member of the KVAB.

Steering Committee

Yvan Bruynseraede, Laboratory for Solid-State Physics and Magnetism, KU Leuven

Jorgen D'Hondt, Elementary Particle Physics, VUB

Kris Heyde, Nuclear and Theoretical Physics, UGent

Mark Huyse, Nuclear and Radiation Physics, KU Leuven

Elisabeth Monard, Applied Sciences, FWO

Gerda Neyens, Nuclear and Radiation Physics, CERN & KU Leuven

Alexander Sevrin, Theoretical Particle Physics, VUB

Walter Van Doninck, Particle Physics, VUB

Dirk Van Dyck, Physics, UAntwerp

Nick Van Remortel, Physics, UAntwerp

Eric van Walle, Applied Sciences, KU Leuven, SCK-CEN

Irina Veretennicoff, Photonics Science and Engineering, VUB

Speakers

Frédéric Bordry

In 1978, Frédéric Bordry graduated with a PhD in electrical engineering from the Institut National Polytechnique in Toulouse, and went on to gain his higher doctorate in Science, from the same institute in 1985. Bordry's early career was spent teaching and conducting energy conversion research. Then he moved to Brazil, where he spent two years as a professor at the Federal University of Santa Catarina (Florianópolis). In 1981 he was appointed senior lecturer at the Institut National Polytechnique in Toulouse.

Frédéric Bordry came to CERN in 1986, joining the group working on power converters for the Large Electron-Positron Collider (LEP) before moving in 1988 to the Operations Group as an engineer in charge of the Super Proton Synchrotron and LEP. In 1994, the year that the LHC was approved, he joined the Power Converter Group as the Head of Power Converters Design and Construction for the LHC. He was appointed leader of the Power Converter Group in 2002, a position he held until December 2008.

In 2009, Frédéric Bordry was promoted to Head of the CERN Technology Department – responsible for technologies specific to existing particle accelerators, facilities and future projects – where he has remained until 2013. From 2014 he acted as the Director for Accelerators and Technology, where he is responsible for the operation and exploitation of the whole CERN accelerator complex, with particular emphasis on the LHC and for the development of new projects and technologies.





Gerda Neyens

Gerda Neyens obtained her PhD in nuclear physics from the KU Leuven in 1993. She is now a professor at the same university. Since June 2017, she reduced her KU Leuven activities, to become the Physics Group Leader and collaboration spokesperson of the ISOLDE facility at CERN. Her research activities are devoted to understanding the structure of exotic nuclei: very short-lived combinations of protons and neutrons, that are produced at large accelerator centers. The aim is to unravel the properties of the strong force that binds neutrons and protons to form atomic nuclei.

She has initiated several new experimental research programs to study the fundamental properties of these exotic nuclei, Initially at the Grand Accelérateur National d'Ions Lourds, GANIL at Caen (France), then at the Gesellschaft Fur Schwerionenphysic, GSI at Darmstadt (Germany) and since 15 years she moved her activities to ISOLDE at CERN.

She is a co-author of more than 200 research papers and was awarded two prizes: one given by the Vlaamse Academische Stichting and one from the Royal Flemish Academy of Sciences and Arts, class of natural sciences, of which she became a member in 2014.

Jorgen D'Hondt

Jorgen D'Hondt is professor at the Vrije Universiteit Brussel (VUB) and director of the Interuniversity Institute for High Energies (IIHE). Initially with research at the LEP collider at CERN related to the properties of the W boson, and now about 20 PhD students later he continues with research at the LHC collider where he especially initiated research related to the top quark. For the period 2018-2020 he is elected chairperson of the European Committee for Future Accelerators (ECFA) and represents the European community of particle physicists.



Shortly after the discovery of the Higgs particle by the CMS experiment, he was elected for the prestigious position of president of its Collaboration Board (2014-2017) where all major decisions of this 4000 persons strong enterprise are taken and therefore he was a key person in the organisation of the experiment.

In Flanders he currently runs a major Big Science project for the participation in the CMS experiment as well as the ambitious CMS Tracker Upgrade project, and was elected as the first president of the Young Academy (2013-2015). At the university he was for several years president of the Physics Department and runs an excellence program for high-energy physics including around 20 professors. He received personal awards amongst others from the World Economic Forum, the Academy and the university council.



Gian Giudice

Gian Francesco Giudice is a theoretical particle physicist based at CERN, in Switzerland. After graduating from the University of Padua, he obtained his PhD in theoretical physics in 1988 from SISSA in Trieste. He worked at the Fermi National Accelerator Laboratory, near Chicago, and at the University of Texas, in the group of Prof. S. Weinberg, before moving to CERN, where he is now Head of the Theoretical Physics Department.

His research focuses on the formulation of new theories beyond the Standard Model of particle interactions and on their implications for the early history of our universe. He was awarded the 2013 Jacques Solvay Chair in Physics.

Siegfried Bethke

Prof. Dr. Siegfried Bethke is director at the Max-Planck-Institute of Physics at Munich, Managing Director of the semiconductor Laboratory of the Max-Planck-Society, and professor at the Technical University at Munich.

His field of research is particle physics with experiments at highest energy particle colliders, since 2000 with the ATLAS experiment at the Large Hadron Collider at CERN.

He studied physics at Heidelberg University, received his PhD in 1983 and completed his habilitation in 1987. After three years as post-doc at Lawrence Berkeley National Laboratory and five years of Heisenberg Fellowship spent at CERN, he accepted the call for a full professorship at Aachen Technical University in 1993. In 1999, he was appointed Scientific Member of the German Max-Planck-Society and became director at the MPI of Physics at Munich. He served in many national and international scientific committees, editorial boards and management structures. Since 2009 he is the German Scientific Delegate to CERN Council.





Wim Leemans

Dr. Wim Leemans is Director of the Accelerator Technology and Applied Physics (ATAP) Division and Director of the BELLA (Berkeley Lab Laser Accelerator) Center at Lawrence Berkeley National Laboratory. He obtained an electrical engineering/applied physics degree from the Vrije Universiteit Brussel (VUB) in 1985. Dr. Leemans came to UCLA in 1985 on a Belgian-American Foundation fellowship to participate in experiments at UCLA on a new generation of laser driven particle accelerators.

He received his MS and PhD degrees in electrical engineering with emphasis on plasma physics, in 1987 and 1991 respectively, from UCLA. He joined LBNL in 1991, became a group leader in 1993 and started the LOASIS Program in 1995, which he continues to lead, and is now named the BELLA Center. As ATAP Division Director he oversees accelerator development at LBNL including supporting major national and international projects, operations of the ALS synchrotron, state-of-the-art high field magnet development, accelerator instrumentation and accelerator modeling, and laser-plasma based advanced accelerator and radiation source concepts. His current research interest at the BELLA Center continues to be in laser based advanced accelerator concepts and radiation sources for supporting science and medical applications.

He has received numerous awards including the 1996 Klaus Halbach Award, the 2005 USPAS Prize for Achievement in Accelerator Physics and Technology, the 2009 E.O. Lawrence Award, the 2010 APS J.M. Dawson Award for Excellence in Plasma Physics Research, the 2012 Advanced Accelerator Concepts Prize, the 2014 DOE Secretary's Achievement Award for the BELLA Project and the 2016 IEEE Particle Accelerator Science and Technology (PAST) award. He is a Fellow of the American Physical Society (APS), the Institute for Electrical and Electronics Engineering (IEEE) and of the American Association for the Advancement of Science (AAAS).

Ana Godinho

Ana Godinho is currently Head of Education, Communications and Outreach at CERN, the European Laboratory for Particle Physics. Before joining CERN, Ana was Head of Communications at the Portuguese national funding agency for science and research and previously held posts in science communication at biomedical research centres in Portugal and in the UK. Ana is a scientist turned communicator.



She holds a PhD in Developmental Neurobiology from the University of London, and was a post-doctoral Research Fellow at King's College London. She has an MSc in Science Communication from the Open University (UK).

Ana has presented her work at international science communication conferences, co-authored peer-reviewed papers, a children's book of science experiments and has collaborated in outreach projects in Europe, Africa and Brazil.



Herwig Schopper

Herwig Schopper is an experimental physicist and was the Director General of CERN from 1981 to 1988. He is former Director of the Deutsches Elektronen-Synchrotron (DESY) at Hamburg and President of DPG and European Physical Society, the Scientific Council of Cyprus Institute, and the first SESAME Council.

He is professor emeritus at the University of Hamburg and holds a PhD in Physics from the same university. He did many years of research at Stockholm (with Lise Meitner), Cavendish Laboratory UK (with O.R. Frisch) and Cornell University USA (with R.R. Wilson). His fields of work include Optics, Nuclear Physics and Elementary Particle Physics. He has held various professorships at Erlangen, Mainz, Karlsruhe and Hamburg and has been involved in directing several research institutes at the national and international scales.

Herwig Schopper is a member of various Academies, received several Honorary doctorates, the Grosses Bundesverdienstkreuz, the Grand Cordon of Order of Independence (Jordan), the Great Cross of Order of Merit (Cyprus), the UNESCO Albert Einstein Gold Medal, the Niels Bohr Gold Medal and others.

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**Vlaamse
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