CAETS WORLD CONGRESS IN VERSAILLES
PARIS - FRANCE
27-28 September 2022

Engineering a Better World:
Breakthrough Technologies for Healthcare

25 leading international scientists present their contributions for a better health

▶ **All lectures at a glance, with a direct access to each video presentation**

CAETS
Engineering a better future

ACADÉMIE
POUR UN PROGRÈS **DES**
RAISONNÉ
CHOISI
PARTAGÉ **TECHNOLOGIES**

NATIONAL ACADEMY OF TECHNOLOGIES OF FRANCE
SHARING A REASONED, CHOSEN PROGRESS

Engineering a Better World
Breakthrough Technologies for Healthcare

All lectures of the conference at a glance*
with a direct access to each video presentation in the online format*
* For access to a 40 pages PDF presenting more complete speakers' biographies and abstracts of their lectures, click here

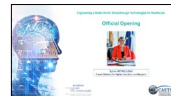## Opening adresses

Click on the pic.
to watch videos

Gérard CREUZET - Chairman of the organizing and steering CAETS 2022 Committees

Denis RANQUE - *Chairman of the National Academy of Technologies of France and Chairman of CAETS*

Sylvie RETAILLEAU - *French Ministry for Higher Education and Research*

Keynotes

Elias ZERHOUNI - *Emeritus Professor, Radiology and Biomedical Engineering, Johns Hopkins University, Fellow of the National Academy of Technologies of France and of the National Academy of Medicine*
Grand challenges in life sciences R&D

Christiane WOOPEN - *Director of the Center for Life Ethics, University of Bonn; former Chair of the European Group on Ethics in Science and New Technologies, former member of IBC International Bioethics Committee UNESCO*
Ethics by design in technologies for health

Emerging Technologies for Innovative Treatments and Drug Discovery

Patrick COUVREUR - *Professor at Paris-Saclay University and member of the academy of Science, Technology, Medicine and Pharmacy*
Advanced nanomedicines and drug delivery

Thomas CLOZEL - *Chief Executive Officer of Owkin*
The medicine of tomorrow

Melissa J. MOORE - *Chief Scientific Officer, Platform Research, Moderna*
mRNA as Medicine

The Foundations of Information and Communication Technologies for Biology and Health

Patrick JOHNSON - *Fellow of the National Academy of Technologies of France, Senior Vice-President Corporate Research & Science Strategy of Dassault Systèmes*
Virtual twins for Healthcare

Sushmita MITRA - *Full professor at the Machine Intelligence Unit (MIU), Indian Statistical Institute, Kolkata, Fellow of the Indian National Academy of Engineering*
Intelligent Analysis of Biomedical Images

Kristin LAUTER - *Director of West Coast AI Research, Meta*
Private AI for human health and genomic data

Egidio d'ANGELO - *Full Professor of the Department of Brain and Behavioural Sciences, University of Pavia*
Multiscale brain modelling for health and technology

Disruptive Technologies and Global R&D Trends

Denis LE BIHAN - *Founding Director, NeuroSpin, CEA, Saclay, France, Fellow of the French Académie des Sciences, of the National Academy of Technologies of France, of the National Academy of Medicine*
Science without instruments is the ruin of the soul: the MRI example

Mathias FINK - *Fellow of the French Académie des Sciences and of the National Academy of Technologies of France, Professor at ESPCI Paris*
Ultrafast ultrasonic imaging: the future of ultrasound

Gondi Kondaiah ANANTHASURESH - *Professor of Mechanical Engineering and the Dean of Mechanical Sciences at the Indian Institute of Science, Bengaluru*
Micromachinery for mechano-diagnostics

Carrie HILLYARD - *AM FTSE, Fellow and Director, Australian Academy of Technology and Engineering (ATSE)*
Turning health tech into better health outcomes:
how ready are we to adopt disruptive healthcare technologies?

Virtual Brain

Viktor JIRSA - *Director of the Inserm Systems Neuroscience Institute*
Personalized virtual brain technology for drug-resistant epilepsy and neurosurgery

Sridevi SARMA - *Associate director of the Johns Hopkins Institute for Computational Medicine, and an associate professor in the Johns Hopkins Department of Biomedical Engineering*
A noninvasive EEG marker of the epileptic brain: how dynamic brain network properties reveal epileptogenicity during rest

Randy McINTOSH - *Director of the Institute for Neuroscience & Neurotechnology, Dept. of Biomedical Physiology and Kinesiology, Simon Fraser University*
Using The Virtual Brain to trace trajectories of brain health in ageing

Technologies for Repair – Repairing the Human Body

Zhongchao HAN - *Full Professor at the Institute of Hematology and Hospital of Blood Diseases, Chinese Academy of Medical Sciences, Fellow of the National Academy of Technologies of France, and of the National Academy of Medicine*
Stem cells based technologies

Stéphanie LACOUR - *Full Professor, Foundation Bertarelli Chair in Neuroprosthetic Technology (EPFL)*
Neuroprosthetic medicine: innovation, interdisciplinarity and translation

Serge PICAUD - *Director of the Paris Vision Institute*
Restoring vision in blind patients: from prosthesis to optogenetic and sonogenetic therapy

Panel session on Ethics and Societal Impacts of Technological Breakthroughs

Coordinated by **Claudie HAIGNERÉ** - *French doctor, politician and former astronaut, Fellow of the National Academy of Technologies of France and* **Christiane WOOPEN** - *Director of the Center for Life Ethics, University of Bonn.*
Introduction of the session by Claudie HAIGNERÉ.

Panelists:
Patrick COUVREUR -*Professor at Paris-Saclay University and member of the academy of Science, Technology, Medicine and Pharmacy*
Virginia DIGNUM - *Professor at the Department of Computing Science at Umeå University*
Thierry MAGNIN - *Fellow of the National Academy of Technologies of France, author of numerous works, especially on science and theology*
Alison NOBLE - *Technikos Professor of Biomedical Engineering at the University of Oxford, Fellow of the Royal Society and Fellow of the Royal Academy of Engineering*

Engineering a Better World:
Breakthrough Technologies for Healthcare

About CAETS – International Council of Academies of Engineering and Technological Sciences

CAETS is an independent non-political, non-governmental, international organization of engineering and technological sciences academies, one member academy per country, that advances the following objectives:

- Provide an independent non-political and non-governmental international forum for enlightened dialog and communication of engineering and technological sciences;
- Contribute to advancing engineering and technological sciences in order to promote economic growth, sustainable development, and societal well-being throughout the world;
- Foster collaboration and the development of bi- and multilateral programs between the member academies;
- Prepare science-based proposals in order to advise governments and international organizations on policy issues related to engineering and technology development;
- Promote diversity and inclusion in the global engineering profession;
- Promote ethics in engineering education, research and practice;
- Contribute to continuous improvement and modernization of engineering education and practice internationally;
- Foster a balanced public understanding of the applications of engineering and technology;
- Foster establishment of additional engineering academies in countries where none exist.

About the National Academy of Technologies of France

The National Academy of Technologies of France (NATF) is a member of the CAETS, it's a national public administrative institution placed under the supervision of the Minister of High Education and Research and under the protection of the President of the Republic.

It has more than 300 elected members, from various backgrounds that reflect the diversity of technologies. Its organization ensures the collegiality and relevance of its action in the exercise of its missions: opinions and reports, general orientations and action programs are voted in plenary assembly. Four strong ideas govern the action of the Academy for an increasingly reasoned and collective appropriation of technologies: **progress, sense of general interest, listening, anticipation**.

Created at the beginning of the 21st century, the National Academy of Technologies of France is also heir to the Age of Enlightenment. Its motto "Sharing reasoned, chosen progress" calls for technological development at the service of mankind, the environment and sustainable growth.