

SUPRA Railway

PROGRAMME

SUPERCONDUCTIVITY for Railway Application

11-12 December 2024
PARIS, UIC HQ



Partners:



Introduction

Superconductor technology, once confined to research laboratories, is now making its way into the industrial sector.

Building on the success of these advancements, the rail industry is turning to this innovation to modernize its infrastructure. Europe is exploring new possibilities with cables and fault limiters, while Asia invests in futuristic rail vehicle projects. SNCF Réseau, at the forefront of this technological revolution, is financing key projects that are shaping the future of rail transport. The project SuperRail was funded by the government as part of France 2030.

Don't miss our inaugural workshop, where you'll discover three world-first railway projects where superconductivity plays a central role.

Join us to witness groundbreaking innovations that will redefine rail transport!

Agenda

DAY 1

- ▶ Welcome remarks
- ▶ Paving the way of high efficient railways networks with Superconducting cables
- ▶ Key note interview
- ▶ Networking Reception Drinks

DAY 2

- ▶ Welcome remarks
- ▶ Enhancing rail network reliability and safety with Superconducting Fault Current Limiters (sFCL)
- ▶ Japanese Maglev train: World's Fastest Bullet train
- ▶ HTS Advanced Conductors and wires: accelerators of the next generation of superconducting electric transmission lines

It's a free event, and registration can be done here:

[HOME - Superconductivity for Railway Application Workshop \(evenium.events\)](https://evenium.events)



For further information please contact:
hassoun@uic.org

International Union of Railways (UIC)
16, rue Jean Rey - 75015 Paris, France





Programme

Day 1 11 December 2024

9:00 Registration and coffee reception

9:30 Plenary session

Welcome speech

UIC – F. Davenne

Why innovation is a core element of SNCF Réseau strategic road map

SNCF Réseau – T. Joindot

Industrial outlook for all sectors

Nexans – J. Fournier

10:10 Networking break

10:30 Session 1: Paving the way to highly efficient railways networks with superconducting cables

Overview of superconductor technology

Grenoble-INP – P. Tixador

State-of-the-art cooling techniques

Absolut System – J. Lacapère

World's first: SuperRail, paving the way towards higher power availability at train stations

SNCF Réseau – T. Joindot

Presentation of the SuperRail project

SNCF Réseau – H. Caron

12:30 Lunch break and discovery of the Innovation Hall

13:45 Session 2: Superconducting power Cables – Unlocking electricity potential

What tools and resources are needed to develop and study superconducting cables?

Université de Lorraine – K. Berger

Superconducting cables activities in Japan

RTRI – T. Masaru

Accelerating the Energy Transition via High Temperature Superconducting Systems and projects

Nexans – Y. Duclot

15:25 Session 3: Superconducting Fault Current limiter (SFCL) – Higher network reliability and safety

AC fault Current Limiter

Nexans – A. Allais

Safe, DC Fault Current Limiter

L2EP – K. Almaksour

16:25 Networking break

16:45 Key Note: Day's wrap-up discussion

Sustainable development prospects for superconductivity

Is climate change a factor in the acceleration of supra/cryo technology market adoption?

How superconducting technology play a role in the energy transition?

With SNCF & Airbus

17:30 Networking Cocktail reception



Programme

Day 2 | 12 December 2024

8:00 **Welcome coffee**

8:30 **Session 4: High Temperature Superconducting wire**

REBCO tape

Theva – A. Smara

MgB2 superconducting cable solutions and Bi-energy distribution grids for the future energy transition

ASG – C-E. Bruzek

HTS Advanced Conductors and wires: accelerators of the next generation of superconducting electric transmission lines

MeTox – M. Hayden

10:00 **Networking break**

10:20 **Session 5: Superconducting systems – Broadening railway applications**

Superconducting traction substation

CentraleSupélec – L. Quéval

Superconducting Maglev in Japan

The University of Tokyo – H. Ohsaki

11:30 **Round table: Keynotes of the event**

Superconductivity's impact on other industrial sectors

Airbus UpNext – L. Ybanez

CEA – W. Abdel Maksoud

Renaissance Fusion – R. Della Giustina

Air Liquide – P. Crespi

12:25 **Closing remarks**

12:30 **Networking Lunch break**

Media Partners:



Speaker biographies



Walid ABDEL MAKSOUD

is a research engineer graduated from the “École Centrale Paris” and Doctor in physics. He has been working in the field of superconducting magnets and cryogenics at CEA Saclay for 17 years. He contributed to the design, manufacturing and testing of large-scale superconducting magnets such as the Iseult 11.7 T whole body MRI.

Since 2016, he led two important CEA projects: The JT-60SA cold test facility project that allowed qualifying the 18 Toroidal Field magnets of this Japanese Tokamak & the Madmax project aiming to detect dark matter thanks to a large-scale dipole of 500 MJ. He is presently the program leader of the new French SupraFusion PEPR aiming to boost the large-scale HTS magnets technology in France towards Fusion and other societal applications.



Arnaud ALLAIS

Fellow Project Director – Advanced Grid Solutions and Architectures in Nexans
Doctor in materials engineering from Mines Paris – PSL
Works on superconductor systems



Khaled ALMAKSOUR

Assistant-professor at Junia school of engineering – Lille - France

Dr. Khaled Almaksour is an Assistant Professor in the Smart Systems and Energies department at JUNIA School of Engineering in Lille, France, and a member of the Power System team at the Laboratory of Electrical Engineering and Power Electronics of Lille (L2EP). He obtained two master’s degrees in electrical engineering from Nantes University in 2009 and Clermont-Ferrand University in 2010. He earned his Ph.D. in Power Systems from Paris-Sud University (Paris XI) in 2014.

Dr. Almaksour’s primary research interests focus on smart grids and railway electrical smart grids. He leads the Electrical Power Management Lab (EPMLab) at JUNIA and manages a smart-grid demonstrator.



Kévin BERGER

received the M.S. and the Ph.D. degree in electrical engineering from the Université Henri Poincaré, Nancy, France, in 2002 and 2006 respectively. His main research interests are currently focused on the study of superconducting cable systems for railway applications and the magnetization of HTS bulks for practical applications such as electrical motors. He is also interested in the potential new bulk materials such as YBCO foams, MgB₂ and iron-based superconductors.

After his Ph.D. in 2016, he worked two years at G2ELab and Néel Institute in Grenoble with Prof. Pascal Tixador on the design and realization of an 800 kJ HTS SMES, the first conduction-cooled SMES realized in Europe. Having spent one year in the industry (Exxelia Group) designing magnetic components for aircraft and space applications, he reached an associate professor position at the University of Lorraine, Group of Research in Electrical Engineering of Nancy (GREEN), in France since 2010. He is the author of five book chapters and more than seventy peer-reviewed international journal articles. He is still involved in the development of analytical and numerical tools and was the organizing Committee Chair of the [8th edition of the International Workshop on Numerical Modelling of High Temperature Superconductors](#), held in Nancy, France, from June 14 to 16, 2022.

Dr. Berger was engaged in two Horizon 2020 projects: [IMOTHEP](#) related to the “Future propulsion and integration: towards a hybrid/electric aircraft”, and [SMAGRINET](#) regarding “Smart grid competence hub for boosting research, innovation and educational capacities for energy transition”. Since many years, he is an expert in the TC 90 of the International Electrotechnical Commission (IEC) which prepare International Standards (IS) related to superconducting materials and devices.



Christian-Eric BRUZEK

received a PHD and engineering diploma in material sciences at Lille University, France. He worked at ALSTOM in superconducting magnet division as technical manager before joining Nexans, where he managed “high-temperature superconducting tapes and Mineral Insulated Cable” division and then he directed the Material and Expertise division within the National Testing Laboratory (LNE). Back to Nexans, he was project director for advanced technical solutions at Nexans where he participated and led several national and international collaborative projects with universities and research institutes. For more than 10 years, he was also chairing of the French and International Superconductivity Standardization Committee NF90/IEC TC 90 Cigré. He is now employed as business development manager for power equipment at ASC Superconductors. He is particularly interested in hydrogen cooled cables for decarbonization, high-power cables for land and offshore grids and fault current limiters. He is also involved in the development of high current cable systems for several industrial applications. He is the author and co-author of over 100 peer-reviewed papers, technical brochures for Cigré, books and several patents.



Hervé CARON

Head of the Energy Consulting and Sustainable Development section in the Network Technical Department, currently in charge of integrating superconductor solutions on the National Rail Network. Joined the SNCF in 1991 in the Equipment Division of the Electrical Construction Equipment Department, working on the power electronics team for high-power locomotives, and since 2001 in the Infrastructure Division on power conversion equipment for energy substations.



Pierre CRESPI

Director of Innovation / Air Liquide advanced Technologies (AL-aT) – Sassenage - France
 Air Liquide International Senior Expert on Innovation in energy transition and cryogenics
 PhD in fluid mechanics with by a post-doc. at NASA in 1990. Aerodynamic test engineer on the Ariane 5 rocket, then on the French TGV between 1991 and 1995, where he did many tests campaigns.

He joined Air Liquide advanced Technologies in 1995, where he created 3 cryogenic machines for scientific experiments in space. In 2002 he created a new division dedicated to orbital cryogenics, before managing all ALAT's space activities. In 2008, he created Advanced Technology Japan in Kobe for Hydrogen energy and Helium, and then became ALAT's director of innovation. He specializes in foresight and innovation in cryogenics for energy transition and hydrogen energy for mobility.



François DAVENNE

graduated from the Ecole Nationale Supérieure des Télécommunications d'Evry in 1988 and from the Ecole Nationale d'Administration (ENA) in 1999. Throughout his career, he has consistently promoted interdisciplinarity as a key factor for success. Having gained experience in international satellite telecommunications, he initially held various roles in the housing sector, making use of his strong financial and legal skills. He was involved in policy and regulation of the sector and managed key operational programmes, most notably for the city of Paris.

After three years with the French Ministry of Transport, working on railway safety and regulation, with an emphasis on European regulations, he was elected in 2012 as Secretary General of OTIF, the Intergovernmental Organisation for International Carriage by Rail. From early 2013 to the end of 2018, he promoted interdisciplinarity and partnership building in order to expand and develop the uniform regulations for international carriage by rail.



Rafael DELLA GIUSTINA

is a product manager at Renaissance Fusion, focusing on high-temperature superconductor materials and technologies. Previously, he served as a business development manager for a consulting company in the semiconductor industry and spent five years in industrial R&D, working on renewable energy technologies and semiconductor applications worldwide.

He began his career as a lead engineer in the oil and gas industry, following a master's degree in electrical engineering. Rafael specializes in creating impactful solutions and strengthening client relationships at the forefront of technological progress.



Yann DUCLOT

is the Nexans Acceleration Units Director at Nexans, where he oversees 4 Business lines, including Nexans Solar Technologies and Nexans MCS (Machines, Cryogenics, Superconductivity). With over 25 years of experience in Business Unit Management, Transformation of organisation, Management of the Innovation, Yann has been instrumental in scaling up business activities and driving company's growth and profitability and. He hold an MSC from Grenoble Ecole de Management (GEM). Yann is also a member of CurrENT and animated by "Making a dent in the Universe". Prior to joining Nexans, he has spent 11 years at Cavotec and was an Executive Member of the company as Chief Sales & Marketing Officer.



Jérôme FOURNIER

is Nexans' Vice President in charge of Innovation, Services & Growth since January 1, 2019. Jérôme joined Alcatel Cables in 1997 in the Metallurgy division. He was in charge of Nexans' R&D from 2007 to 2011 before joining Michelin Group where he held various positions as R&D Director from 2011 to 2018. As VP of Innovation, he is responsible for the Group's R&D, Design Labs teams, innovation partnerships, and acceleration units.



Marie HAYDEN

is part of the MetOx business development team with a focus on European business development and electricity applications. Marie has worked for 30+ years in the electricity industry including 25 years at the Irish Transmission System Operator, EirGrid. Marie held many leadership roles in EirGrid before leaving in 2018 to join technology start-up company Smart Wires initially in a Business Development role and was later appointed Chief Engineer. In 2023 Marie returned to Ireland and established a consultancy business specializing in Grid Enhancing Technologies and has worked with MetOx International since March 2023.



Thomas JOINDOT

has been the Technical Director at SNCF Réseau since 2018, bringing over a decade of expertise to the organisation he joined in 2009. In addition to his role at SNCF Réseau, he serves as President of Leyfa, a position he has held since SNCF Réseau acquired a majority stake in the company three years ago.

He holds an engineering degree from two of France's most prestigious institutions: Mines Paris - PSL and École Polytechnique, which underpin his commitment to innovation and excellence in the rail sector.



Jérôme LACAPÈRE

is an expert in cryogenic technologies and thermo-hydraulic modeling with more than 20 years of experience. He currently co-directs Absolut System, where he leads innovation projects in cryogenics, especially for space applications, superconductivity and liquid hydrogen. Former head of the modeling division at Air Liquide, he also has significant expertise in the management of cryogenic propellants in microgravity. As an expert for the European Commission, he is involved in the evaluation of offers for space programmes.



Tomita MASARU

Director of the Maglev System Technology Division at Railway Technical Research Institute (RTRI). This division focuses on [research and development of Maglev and superconductivity for railway](#). He was received the degree of Doctor in Engineering from the University of Tokyo with superconductive research. He was the Yamanashi Maglev Test Line Project Team member at around the beginning of Maglev running. After a few years working on High-temperature superconductor research at the Superconductivity Research Laboratory (SRL), International Superconductivity Technology Center (ISTEC). "[High-temperature superconductor bulk magnets that can trap magnetic fields of over 17 tesla at 29 K](#)" was his work when researched.

He then worked on research for superconductivity at FBML, Massachusetts Institute of Technology (MIT) for three years. As a new application of superconductivity, he has studied the introduction of superconducting technology into railways. He has new working on Superconducting cables for DC railway electrification system. [The train running test](#) was conducted with superconducting cable in the test track. In addition, [the first of a commercial operation](#) on business hour using superconducting cables was conducted. He also has a project aimed at conducting the demonstration experiment with the long-distance superconducting cable used for an urban area.



Hiroyuki OHSAKI

Professor

Department of Advanced Energy, Graduate School of Frontier Sciences, University of Tokyo
 Hiroyuki Ohsaki received the B. E., M. E., and Dr. Eng. degrees in electrical engineering from the University of Tokyo, Japan, in 1983, 1985 and 1988, respectively. From 2004 he is a Professor at the Department of Advanced Energy, Graduate School of Frontier Sciences, the University of Tokyo, Japan. His research interests include applied superconductivity, electrical machines, linear drive systems, magnetic levitation technology, etc.



Loïc QUÉVAL

Professeur CentraleSupélec

Loïc Quéval received the Ph.D. from the University of Tokyo, Tokyo, Japan, in 2013. He is currently Full Professor with GeePs-CNRS laboratory at CentraleSupélec, University of Paris-Saclay, Gif-sur-Yvette, France. His current research interests include DC electrical grids and applied superconductivity.



Dr. Anis SMARA

holds a PhD in Electrical Engineering, specializing in superconducting technologies, which he completed at École Nationale Polytechnique in Algiers and the GREEN Laboratory in France. His academic research focused on advancing superconducting technologies, laying the foundation for his future work in the field.

He worked at the University of Cambridge on European projects with Airbus and Rolls Royce, focusing on superconducting motors for aviation.

At THEVA, Dr. Smara initially worked in R&D, focusing on the commercialization of HTS magnet applications. He then transitioned into business development and product management, where he now leads efforts to introduce and commercialize HTS technologies, including motors, HTS magnet applications, and cables. He also provides consulting in superconducting systems for various industries.



Pascal TIXADOR

is professor at Univ. Grenoble Alpes – Grenoble-INP. He carries his researches about superconducting large-scale applications in two Grenoble laboratories: G2Elab and I. Néel. He coordinated several French ANR projects and one H2020 project (FASTGRID).

He is now one of the directors of the French Priority Research Programs and Equipment dedicated to Applied Superconductivity: SupraFusion.



Ludovic YBANEZ

After several engineering positions on turboshaft engines and avionics systems at Safran, he was appointed, in 2011, head of the EWIS R&T department before being seconded in 2017 to IRT Saint Exupéry, a French research institute, as head of electric power technologies for future electric aircraft.

In 2019, he joined Airbus to work exclusively on high-power electric propulsion and took charge of cryogenic and superconducting electric propulsion systems for hydrogen-powered aircraft.

He is also Managing Director of Airbus Exo Zero Emissions SAS.

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