# MMA24
# Magnetic Materials and Applications

22-24 October 2024
CERN, Geneva

## Digital Delegate Book & Programme

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# Programme Day 1 - Tuesday 22nd

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| 10:30 | **Innovations in Magnetic Field and Electric Current Measurement Based on SENIS's Advanced Hall Sensor Technology** | Dragana Popovic<br>*SENIS Group* |
| 11:00 | Break | |
| 11:30 | **Development of International Standards for Permanent Magnet Measurements** | Stuart Harmon<br>*NPL* |
| 12:00 | **Primary Tesla Standards and Magnetic Calibration Chains** | Franziska Weickert<br>*PTB* |
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| 14:15 | **Metrology for Magnetic Laminations and Power Electronics Cores: Loss Measurement Techniques and Uncertainties from DC to the Microwave Regime** | Massimo Pasquale<br>*INRIM* |
| 14:45 | **An Integrated MEMS Magnetic Gradiometer** | Gaël Close<br>*Melexis Technologies SA* |
| 15:15 | Break | |
| 15:45 | **Hovering Steel Over a Permanent Magnet: A Design and Optimization Case Study** | Doug Craigen<br>*Integrated Engineering Software* |
| 16:15 | **Optimal Segmentation of Permanent Magnets for Electric Drive** | Mike Könings & Philippe Scheuber<br>*Bomatec AG* |
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| 22:30 | Bus return to Novotel Geneva Central | |

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|---|---|---|
| 08:30 | Registration Opens | |
| 08:45 | Welcome | |
| 09:00 | **Exploring Market Opportunities in Magnetic Materials for Safety: From Non-Destructive Testing of Critical Assets to Electromagnetic Shielding** | André Pereira<br>*Faculty of Sciences, Porto University – IFIMUP* |
| 09:30 | **Tailored Composites with Permanent Magnet Properties for Fabricating Hard Magnetic 3D Objects by Extrusion- and Stereolithography-Based Additive Manufacturing** | Ester Palmero<br>*IMDEA Nanociencia* |
| 10:00 | **Distinct Modelling Approaches to Static and Dynamic Field Modelling Applied to Electrical Machines** | Mitrofan Curti<br>*TU Eindhoven* |
| 10:30 | **Simulation of Magnetic Position Sensor Systems and the Magnetization Process** | Michael Ortner<br>*Silicon Austria Labs* |
| 11:00 | Break | |
| 11:30 | **Looking Inside Magnets Using Magnetic Field Cameras and Advanced Data Analysis** | Koen Vervaeke<br>*Magcam* |
| 12:00 | **The HyMPulse: An Open-Loop Pulsed Field Permeameter for Testing of Advanced Permanent Magnets** | Luc van Bockstal<br>*Metis Instruments* |
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| 16:15 | **High Field Post Assembly Magnetising Systems – From Prototype to Volume Manufacturing** | Chris Riley<br>*Bunting Magnetics Europe Ltd* |
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| 16:45 | Tour Groups 7 & 8: Gather for Synchrocyclotron Tour in Lower Foyer | |
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| 17:45 | End of Day | |
| 18:00 | End of Synchrocyclotron Tour Groups 7 & 8 | |

**Tours of Permanent Magnet, Electromagnet, and Superconducting Magnet Facilities**

09:00 Groups 1-4 Gather at Big Bang Cafe

09:30 Tour departs

12:30 Tour ends at Big Bang Cafe



## Event Feedback & Follow Up Contacts

Please take a moment to complete our online feedback survey. It should take at most 5 minutes, and offers you the opportunity to request a follow up with either speakers or delegates you missed during the event. Note, we'll forward your contract details, but we cannot guarantee a response.

**https://forms.office.com/e/1vYQGnnKg9**

**CERN's Scientific Programme and the Pivotal Role of Magnet Technology**
Mike Lamont
*CERN*

This presentation introduces the cornerstone elements of CERN's scientific agenda and outlines our strategic vision for the future. We will explore the essential functions and innovative applications of magnet technology within CERN's array of projects, sketching how these technologies not only support current scientific endeavors but also shape potential future developments.

**Innovations in Magnetic Field and Electric Current Measurement Based on SENIS's Advanced Hall Sensor Technology**
Dragana Popovic Renella
*SENIS Group, Switzerland*

Pioneering advancements in magnetic field and electric current measurement are introduced, emphasizing SENIS's advanced Hall sensor technology. Key applications, such as those at CERN, demonstrate the significance of these state-of-the-art devices. SENIS's vertical and horizontal Hall sensors lead the industry in magnetic field sensing, featuring a patented vertical Hall sensor with an exceptional noise voltage spectral density of 0.8 $\mu$V/√Hz at 1 kHz, offering an unparalleled signal-to-noise ratio. By integrating these sensors within CMOS technology, versatile 3D Hall sensors have been developed. The SENIS Low Noise Teslameter, equipped with the world's smallest 3D Hall probe, delivers high-resolution, temperature-stable measurements. Additionally, the K3A cryogenic low-noise transducer operates at temperatures as low as 1 K, providing accurate measurements in confined spaces. Revolutionary tools like the SENIS 3D magnetic field mapper and SEN-3D-CAM camera offer high-precision field mapping and imaging. SENIS sensors and instruments are critical for precise, reliable measurements in advanced applications.

**Developing International Standards for Design and Modelling, Materials Manufacture, In-Service and End-Of-Life**
Stuart Harmon
*NPL*

With the push towards a net zero carbon economy and the development of clean technology supply chains, electrification technologies, including power electronics machines and drives (PEMD), require significant underpinning metrology to give precise, reliable data at conditions representative of the operational conditions of use. The starting point for material supply chains is the range of IEC 60404 standards for magnetic materials, but increasingly, researchers, design & modelling and end users require more robust data. This presentation will outline the traceability routes NPL develops and disseminates to bridge the gap from the IEC standards to real-world applications, ensuring greater confidence in performance for industry.

**Primary Tesla Standards and Magnetic Calibration Chains**
Franziska Weickert
*Physikalisch – Technische Bundesanstalt (PTB)*

In this talk, we will review the current primary Tesla standards of the magnetic flux density B at PTB that is based on nuclear magnetic resonance methods on protons in water samples. They trace B back to a frequency respective time measurement. Furthermore, we describe current efforts of NMR methods with hyperpolarized 3He-gas. 3He has advantages over established methods due to significant longer relaxation times, lower background contributions, and higher nuclear polarization rates. These advantages ultimately lead to reduced measurement uncertainties. Moreover, they help to close a traceability gap above 0.2T that is a long standing issue within the metrology community.

**Metrology for Magnetic Laminations and Power Electronics Cores: Loss Measurement Techniques and Uncertainties from DC to the Microwave Regime**
Massimo Pasquale
*INRIM*

Magnetic laminations and cores for power electronics play a crucial role in modern energy conversion systems, enabling efficient and reliable power transfer. Accurate measurements of the magnetic properties and losses in these laminations and cores is essential for optimal design and performance of motors, transformers and power electronics devices. This work provides an overview of the available international measurement standards, as well as examples of hysteresis loops and power loss figures obtained by broadband measurements on laminations as well as ferrite, nanocrystalline, and amorphous magnetic cores, encompassing different experimental setups and methods. The measurement techniques discussed in this presentation allow, in particular, for dynamic B-H measurement at different induction levels up to the MHz range and also for permeability measurements up to the GHz range. The energy losses are analyzed by the loss separation method, taking into account the eddy current and spin damping dissipation mechanism, besides the magnetic flux penetration issues. They are posed in direct relationship with the real and imaginary permeability components, by discriminating between domain wall and rotational contributions. Available measurement standards are discussed and the analysis of the measurement uncertainties is provided. Calibration procedures to assess and reduce the uncertainties arising from circuitry, instrument resolution, temperature, and environmental effects are considered. Since the DC-MHz frequency range is particularly relevant for power electronics, the power loss measurement techniques here discussed and the related uncertainties specifically address the challenges associated with this frequency range. Through their comprehension, engineers and researchers involved in the design and optimization of power electronics devices can make well-informed decisions. The insights provided in this presentation may directly contribute to the reduction of uncertainties in power electronics measurements, facilitating the development of more efficient and reliable energy conversion systems.

**An Integrated MEMS Magnetic Gradiometer**
Gaël Close
*Melexis Technologies SA*

Due to electrification, magnetic sensors are increasingly deployed in magnetically polluted environments. To reject stray fields, differential sensing schemes are typically used. In this talk, we will present a single-point gradiometric sensing scheme based on the force exerted on a magnet, which is directly related to the magnetic field gradient. Our prototype is the first single-point MEMS gradiometer that can operate unshielded in various orientations. The talk will conclude with an outlook for MEMS-based magnetic sensors.

**Hovering Steel Over a Permanent Magnet: A Design and Optimization Case Study**
Doug Craigen
*Integrated Engineering Software*

Recent benchmarking of simulated magnetic force distributions led to the observation of configurations where there was static repulsion between steel and a permanent magnet. The presentation will demonstrate how this idea was explored with simulation to learn more about how works, which then guided further simulation, which enabled much stronger repulsion devices than initially predicted. This is a case study in ways that simulation enhances design besides simply replacing physical prototyping. Some fun desktop toys that resulted from the study will be demonstrated.

**Optimal Segmentation of Permanent Magnets for Electric Drives**
Philippe Scheuber & Mike Königs
*Bomatec AG*

To reduce the reliance on heavy rare earth elements in electric drives, OEMs are intensifying efforts to understand and mitigate eddy currents and therefore improve the segmentation of magnets. This presentation proposes and demonstrates optimization procedures from both technical and economic perspectives. Technically, we focus on optimal segmentation methods to reduce eddy currents, while economically, we aim to achieve the optimal cost-to-performance ratio.

**Exploring Market Opportunities in Magnetic Materials for Safety: From Non-Destructive Testing of Critical Assets to Electromagnetic Shielding**
André Pereira
*Faculty of Sciences of Porto University – IFIMUP*

The demand for enhanced safety measures in various industries has propelled the market for magnetic materials into a period of unprecedented growth. This presentation, titled delves into the lucrative prospects within this dynamic sector. We will explore how magnetic materials are revolutionizing safety protocols through advanced non-destructive testing (NDT) techniques, ensuring the integrity and longevity of critical infrastructure. As electromagnetic interference (EMI) from electronic devices continues to proliferate, the need for effective shielding solutions becomes critical, particularly in protecting human health. Textiles with embedded magnetic materials offer a versatile and practical approach to EMI shielding, providing both protection and comfort. This discussion will highlight the growing market potential for these advanced textiles in personal health protection, workplace safety, and everyday consumer products. By examining current market trends, technological advancements, and investment opportunities, we aim to provide industry stakeholders with insights into leveraging these innovations to enhance health protection, drive market growth, and achieve competitive advantage. Join us to discover how magnetic materials in textiles are set to revolutionize safety and health protection.

**Tailored Composites with Permanent Magnet Properties for Fabricating Hard Magnetic 3D Objects by Extrusion- and Stereolithography-Based Additive Manufacturing**
Ester Palmero
*IMDEA Nanociencia*

Additive manufacturing is attracting much interest in high-tech sectors, such as energy, transport, aerospace or medicine, for fabricating high-performance objects with complex shapes, tuned properties and minimal waste generation. For developing permanent magnets through these technologies, the challenge is to fabricate them with a high filling factor, while avoiding the deterioration of the magnetic properties during their fabrication and processing. Along this talk, the last results that we have obtained about the fabrication of hard magnetic objects using rare earth-free (Mn-Al-C and Sr-ferrite) and rare earth-based (Nd-Fe-B) particles embedded in polymer, inks and resin by extrusion- and stereolithography-based additive manufacturing will be shown. The effect of key parameters such as particle size and its distribution and the use of additives in the composite synthesis on the printability and particle load of the printed parts will be analyzed. Moreover, the possibility of enhancing the permanent magnet properties of nanostructured Sr-ferrite powder by recycling the residue generated in the fabrication of commercial ferrite magnets, and then using it for fabricating hard magnetic objects by 3D-printing will be demonstrated. The combination of the synthesis of composites made of functional nanostructured materials and advanced fabrication technologies shows a novel route for fabricating a new generation of hard magnetic objects with tuned and non-deteriorated magnetic properties.

**Distinct Modelling Approaches to Static and Dynamic Field Modelling Applied to Electrical Machines**
Mitrofan Curti
*Eindhoven University of Technology*

With this presentation we will explore the latest advancements in static and dynamic field modelling for electric machines and other magnetic components, driven by the increasing operating frequencies of power electronics and the need for more accurate iron loss estimation. Significant advantages that higher-order finite elements offer in AC simulations and hysteresis modelling will be demonstrated. Special emphasis will be placed on the critical role of coupled electric and magnetic simulations which requires full Maxwell's equations, to accurately account for the resistive, inductive, and capacitive effects in windings. Drawing from recent research, we will demonstrate how leveraging symmetries and invariances in winding geometries can simplify these models without compromising accuracy with respect to measurements. This approach not only enhances computational efficiency but also ensures precise simulation outcomes, paving the way for more robust and reliable electromagnetic designs.

**Simulation of Magnetic Position Sensor Systems and the Magnetization Process**
Michael Ortner
*Silicon Austria Labs*

Magnetic position sensor systems infer the relative position and orientation between a magnet and a magnetic field sensor from the sensor output. Currently, over 50% of global sensor production is dedicated to these applications. In my presentation, I will discuss the modeling of such sensor systems, with an emphasis on the permanent magnets and the challenges arising from inhomogeneous magnetizations due to the magnetization process.

**Looking Inside Magnets Using Magnetic Field Cameras and Advanced Data Analysis**
Koen Vervaeke
*Magcam*

Magcam specialises in advanced quality control and characterization of permanent magnets and magnet assemblies using a powerful combination of magnetic field camera technology and proprietary data analysis software, aiming at extracting a maximum of information out of measured high resolution magnetic field distributions. This combination has resulted in many useful solutions to high end customer applications, ranging from optimizing the performance of permanent magnet race car motor/generators, over 100% production quality assurance of automotive magnetic position sensor systems, to selection of optimal miniature magnets for Swiss wrist watches. Even within the world of electric drives, different magnet applications require different measurement and data analysis strategies in order to get a consistent high quality end product. We present some spectacular examples of how different aspects of magnet quality are characterized for different end applications.

**The HyMPulse: An Open-Loop Pulsed Field Permeameter for Testing of Advanced Permanent Magnets**
Luc Van Bockstal
*Metis Instruments*

The HyMPulse, an open-loop pulsed field magnetometer, is used for quality control of magnetic properties. Its accurate and repeatable measurements are the basis for worldwide acceptance. The capability to measure quickly a variety of sample shapes and sizes is an added bonus. In the HyMPulse, a Helmholtz-type coil is used as a basis for the measurement of the magnetic response of the sample. It therefore relates to simple standards. Linking the open-loop with closed-loop measurements is important to correlate with classical BH curves. Besides geometry effects, the instrument can also be used to analyze other properties: examples show the capability to assess losses due to eddy currents and to determine initial saturation and demagnetization of partially saturated samples.

**Advancing Magnetic Measurements: Integrating NMR Measurements with Simulation Software for Predictive Analysis**
Julian Songeon
*Metrolab Technology SA*

Nuclear Magnetic Resonance (NMR) is an essential technique for investigating the magnetic properties of materials at the atomic scale. In this presentation, we present a comprehensive methodology of the application of advanced NMR measurement techniques for magnetometry with a custom-developed simulation software. By simulating potential measurement outcomes prior to experimental measurements, this tool provides a predictive capability that facilitates more informed decision-making and enhances the planning of experimental procedures. The presentation will encompass the precise methodologies employed in NMR magnetometry, the development and features of the simulation software, and illustrative case studies that highlight its practical application. This integrated approach not only deepens the understanding of the magnetometry instruments we develop but also equips users with the ability to predict measurement outcomes, thereby promoting more efficient and accurate scientific investigations.

UK Magnetic Society

# What could the Society possibly do for you?

People involved with the UK Magnetics Society believe that magnetism in all its forms is an amazing force, and that by understanding and harnessing it people can deliver amazing things.

We believe magnetics science and engineering can change the future for the better – we can create more effective forms of energy generation, develop less polluting transport, discover the secrets of the universe, manufacture materials which do less environmental damage; we can establish and build research groups, as well as companies to use that research.

We believe that people achieve more when they work together, have opportunities to share what they know and to learn from different subjects, to develop connections with like-minded people whichever country they're from, finding partners, suppliers and customers worldwide.

**UKMagSoc delivers on its beliefs by connecting the 'people who do'.**

We help them share what they know, learn from each other, and find each other. We organise meetings to bring them together, we publish emails and magazines to share their news and knowledge, put on courses to provide them with new information, run events to bring new people into the community, support students in developing their careers.

In the over 30 years since its founding, UKMagSoc has connected thousands of these people, delivering:

- new companies;
- new research projects;
- new products and services;
- careers developing to Chief Engineer, VC or MD levels;
- new research proposals;
- £ Ms in research funding;
- £ Ms in sales worldwide.

**How have we done this? Well, we have several activities:**

- **seminars** with leading experts focused on specialised topics of interest;
- **information exchange** and **networking opportunities**, bringing together academic, industrial and government participants;
- **MagNews**, the Society's magazine has a wide but targeted international readership;
- **technology brokerage** and **technical enquiries** – putting future customers or collaborators in touch to generate business and research leads;
- **Resource Directory** of relevant services – maintaining a comprehensive list of member and non-member products and services;
- **publicise magnetics** – channelling members' information to a wider and relevant audience;
- **website** – providing the latest information about the Society and relevant organisations;
- **student bursaries** – helping member students present at conferences world-wide;
- **student engagement** events, promoting careers in magnetics to students;
- **alternative streams** – bringing together different types of magnetics at conferences to see what sticks;
- **training courses** – keeping people up to date with new developments and decades-long experience.

**On a personal level, you could**

- **Find employees** – advertise vacancies; see new people coming into magnetics careers;
- **Find employers** – find out about vacant positions, or new opportunities;
- **Create something new** – develop new partnerships, create new companies, processes, research groups, products or services;
- **Develop your brand** and **Advertise** – speak at an event; publish a technical article or paper; sponsor events; advertise across our platforms;
- **Find customers**, **suppliers** and **projects** – find new research groups or companies to work with;
- **Learn about new areas of magnetics** – hear or read about research, developments, opportunities, ideas from areas you know and areas you don't;
- **Keep up to date** – hear about the latest research or product launches, hone your skills with courses from world-renowned experts;
- **Get funding to attend conferences** – a student bursary could help pay for you to go to a conference anywhere in the world;
- **Generate publicity** – get word out about your event, conference, new capabilities, upgraded products, research results.

**There are two ways to get these benefits.**

Short answer: any way you want by contacting us.

Longer answer:

- **Become a Member**; sign up yourself or your organisation;
- **Promote events and the Society** through your network, your website or social media;
- **Join the committee**;
- **Write content for our platforms**, MagNews, eNewsletter, LinkedIn, Twitter;
- **Events**:
  - Speak
  - Attend
  - Engage with speakers and delegates
  - Co-chair / organise
  - Promote
- **Advertise with us**;
- **Sponsor the Society**.

We are called the UK Magnetics Society, but only because we started there. There are no limits to members, delegates, events or content – as our resources allow, we always have and always will engage worldwide.

On that note, the Society was founded by industrialists and academics, and has only ever been supported by research groups and companies. We receive no government support and are a non-profit organisation. Your engagement with the Society is critical to its survival, and to help us to help you to gain the benefits above.

In 2016 we celebrated our 30th anniversary. With your help we look forward to working with you whatever country you're based in over the next 30 years, and seeing the new research, processes, companies, products, groups, services, whatever, you create!

# UK Magnetic Society


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**Innovative Permanent Magnets Made by Injection Molding**
Thomas Schliesch
*Max Baermann GmbH*

For injection molded magnets their sometime complex pole shapes and pole patterns can have an essential impact on their final performance in magnetic sensor applications, electrical machines or other. This often makes the development of related systems challenging, but on the other hand opens a wide field of chances to devise new and innovative applications. Also, the large number of geometric capabilities as well as the easy mechanical combinability of injection molded magnets can be an advantage to use these magnets in various applications, especially when it comes to high production rates as it is the case e.g. in automotive industry. The design and manufacturing of injection molded magnets will be explained by examples both for magnets used in sensors as well as in electrical machines. Ways to tailor specific pole shapes for specific behavior of the originated field distributions will be explained in detail. Predicted results from foregoing simulations will be compared to measurements. Some interesting insights especially for new sorts of magnetic sensor systems will be discussed also in more detail. Also, different systems where magnets have been combined with other mechanical parts will be presented. The design of injection molded magnets by FEM or by analytical as well as semi-analytical methods will be covered in addition. Multi-sequential FEM methods which include the manufacturing stage will be explained. These methods are both related to in-mold magnetization as well as to pulse 3 magnetizing processes. But also, general approximations, which can handle a multitude of complicated magnet configurations without considering the specific manufacturing process, will be discussed.

**Smart Sensor Systems Using Intelligent Technologies for the Implementation of Sophisticated Applications**
Philip Beran
*Fraunhofer Institute for Integrated Circuits IIS*

Magnetic sensor systems form an important backbone of measurement technology in countless applications. Our research group at the Fraunhofer Institute has been developing magnetic field sensors for over 20 years and has established several intelligent technologies to make the best possible use of the information contained in magnetic fields for sophisticated applications. We show the latest innovations related to our technologies that have been developed to meet the challenges of today and tomorrow. We present our advanced HallinOne 3D magnetic field sensors that can be fully configured to the customer's needs as well as the technology HallinSight for mapping, visualizing and characterizing magnetic fields. We give a deep insight into the innovative single chip solution "FH6D04" that can be used for multi axis position sensing with our technology HallinMotion as well as for stray field robust current sensing with HallinPower just depending on programming of the system. This has the great advantage that several applications can be implemented with the same chip and at the same time component shortages due to lack of availability can be avoided.

**High Field Post Assembly Magnetising Systems – From Prototype to Volume Manufacturing**
Chris Riley
*Bunting Magnetics Europe Ltd*

The presentation will take a detailed look at the key considerations for the design of rare earth magnet post assembly magnetising systems for volume manufacturing of magnetic assemblies. This will include the challenges of achieving and monitoring saturation in the magnets, as well as extreme mechanical and thermal issues that occur because of the high magnetic fields in the windings and must be managed to achieve acceptable manufacturing cycle times. The downstream advantages of this process will be highlighted.

**Rare Earth Permanent Magnets for Beam Guiding Applications**
Michael Weickhmann
*Vacuumschmelze GmbH*

At Vacuumschmelze (VAC), the world of magnetism is our home. Besides soft magnetic materials and components manufactured from these materials, VAC is producing highest-grade rare earth permanent magnet material since 1973. However, VAC is not just a supplier of high end magnetic materials, but highly specialized on developing customized solutions for the demand of our customers, including the buildup of complex magnet systems. In this talk we will present recent examples of highly customized solutions for research institutions working with charged particle beams. While many undulators for synchrotron facilities have already employed permanent magnet structures for several decades, the lattice components, i.e. beam guiding applications, are just recently being adopted from resistive magnets to permanent magnet technology. This allows to improve the density of magnetic structures, hence promising greatly reduced emittance as demonstrated by some pioneering projects in the field and further to reduce the energy consumption, avoiding vast heat loads and therefore reduce the complexity of the facility by eliminating or reducing the need for cooling of lattice components. In this talk we will present recent examples of highly customized solutions for research institutions working with charged particle beams. While many undulators for synchrotron facilities have already employed permanent magnet structures for several decades, the lattice components, i.e. beam guiding applications, are just recently being adopted from resistive magnets to permanent magnet technology. This allows to improve the density of magnetic structures, hence promising greatly reduced emittance as demonstrated by some pioneering projects in the field and further to reduce the energy consumption, avoiding vast heat loads and therefore reduce the complexity of the facility by eliminating or reducing the need for cooling of lattice components.

**Wakey-Shakey: An Innovative Power-On Self-Test for Magway's Discontinuous Linear Motors**
Rupert Cruise
*Magway Ltd*

In the early days of personal computing, IBM's Power-On Self-Test (POST) performed a comprehensive check of all hardware components, including a full memory test. This design was inspired by IBM's larger mainframe systems, which conducted a complete hardware test during their cold-start process. Drawing inspiration from this legacy, Magway has developed its own power-on self-test, affectionately named "Wakey-Shakey." The distinctive feature of Magway's discontinuous linear motors and system architecture enables a thorough system test during start-up. This process includes detecting each carriage's position without relying on position sensors, showcasing a significant advancement in the field. This technical presentation will delve into the details of Magway's innovative approach, highlighting the safety-first methodology that led to the development of "Wakey-Shakey." Attendees will gain insights through a blend of technical information and anecdotal stories, illustrating the journey and challenges faced in achieving this breakthrough. Magway's innovative power-on self-test sets a new standard in system reliability and safety for autonomous transport applications using magnetic materials.

| First Name | Surname | Organisation | Role in Seminar |
|---|---|---|---|
| Patrick | Aeschlimann | Absolute Magnetics | Exhibitor |
| Sahin | Alacacayir | Minviro | |
| Paul | Allen | HV Wooding Ltd | |
| Neda | Bahremandi | REIA | |
| David | Bayer | VACUUMSCHMELZE | |
| Hervé | Bayle | Bergoz Instrumentation | |
| Alexander | Benkstein | Arnold Magnetic Technologies | |
| Philip | Beran | Fraunhofer Institute for Integrated Circuits IIS | Speaker |
| Bruno | Brajon | Melexis | |
| Eilidh | Campbell | Rolls-Royce | |
| Gaël | Close | Melexis | Speaker |
| Doug | Craigen | INTEGRATED Engineering Software | Speaker |
| Rupert | Cruise | Magway | Speaker |
| Mitrofan | Curti | TU Eindhoven | Speaker |
| Rachid | Dadi | VACUUMSCHMELZE | |
| Laura | Dalton | UK Magnetics Society | Organiser |
| Antoine | Daridon | Metrolab Technology SA | Chair |
| Pintu | Das | Indian Institute of Technology Delhi | |
| Maarten | de Bekker | Bakker Magnetics | |
| Maarten | de Jonge | Bakker Magnetics | |
| Alessandro | Ferraiuolo | Marcegaglia Ravenna | |
| Graeme | Finch | NPL | Chair |
| Cornel | Frigoli | Absolute Magnetics | Exhibitor |
| Alexander | Furgeri | JL MAG Rare-Earth Co Europe BV | Sponsor |
| Mariem | Ghnem | Schrader Pacific Advanced Valves | |
| Ryan | Haig Godden | Bunting Magnetics Europe | Exhibitor |
| Stuart | Harmon | NPL | Speaker |
| George | Jeans | Hitachi Energy | |
| Emmanouil | Kasotakis | University of Duisburg-Essen | |
| Stephan | Kliché | Magcam NV | Exhibitor |
| Piotr | Klimczyk | Brockhaus Messtechnik | Exhibitor |
| Mike | Königs | Bomatec AG | Speaker |
| Thom | Konijnenberg | JL MAG Rare-Earth Co Europe BV | |
| Mike | Lamont | CERN | Speaker |
| Dominic | Lavin | Abracadiamond | |
| Diana | Leitao | Eindhoven University | Chair |
| Peter | Leitner | Silicon Austria Labs | |
| Sarah | Lillywhite | Rolls-Royce Submarines | |
| Stefano | Lumetti | Silicon Austria Labs GmbH | |
| Perla | Malagò | Silicon Austria Labs GmbH | |

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| Matthieu | Michiels | HEH Institute of Technology | |
| Amit | Mishra | Jožef Stefan Institute | |
| Michael | Ortner | Silicon Austria Labs | Speaker |
| Ester | Palmero | IMDEA Nanociencia | Speaker |
| Elisavet | Papadopoulou | University of Duisburg-Essen | |
| Massimo | Pasquale | INRIM | Speaker |
| André | Pereira | Porto University | Speaker |
| Tom | Pickford | SG Technologies | |
| Dragana | Popovic Renella | SENIS | Speaker |
| Milan | Poupinet | Paragraf Ltd | |
| Katarina | Removic Langer | DMEGC Germany GmbH | |
| Chris | Riley | Bunting Magnetics Europe | Speaker |
| Kevin | Rodemann | Brockhaus Messtechnik | |
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| Natalia | Shkodich | University of Duisburg-Essen | |
| Fred | Simon | Moonshot Space Ltd | |
| Julien | Songeon | Metrolab Technology SA | Speaker |
| Michael | Spahlinger | Institut Dr Foerster GmbH & Co KG | |
| Sasa | Spasic | SENIS | Exhibitor |
| Alastair | Stewart | UK Magnetics Society | Organiser |
| Matthew | Swallow | Bunting Magnetics Europe | Chair |
| John | Taylor | SG Technologies | |
| Andrey | Timopheev | LEM International SA | |
| Jeremy | Tompkins | VACUUMSCHMELZE | Exhibitor |
| Brody | Tucker | Bunting Magnetics Europe | |
| Luc | Van Bockstal | Metis | Speaker |
| Koen | Vervaeke | Magcam NV | Exhibitor |
| Anubhav | Vishwakarma | Jožef Stefan Institute | |
| Franziska | Weickert | PTB | Speaker |
| Michael | Weickhmann | VACUUMSCHMELZE | Speaker |
| Kai | Wilton | The Magnetics Show | Exhibitor |
| Queenie | Wong | INTEGRATED Engineering Software | Exhibitor |
| Martin | Zeitzheim | Max Baermann GmbH | |

UK Magnetic Society

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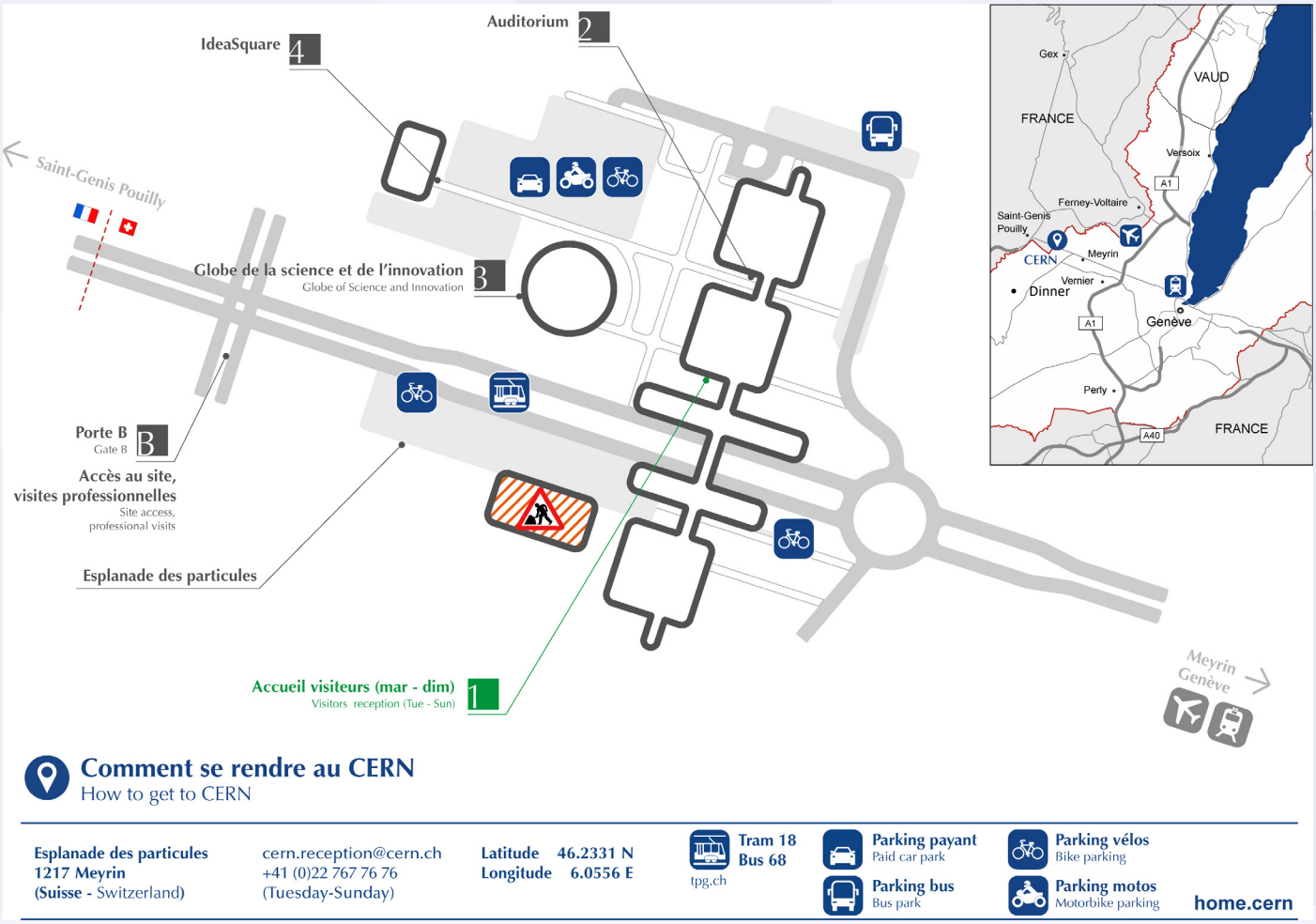


**Seminar Address**
CERN Science Gateway
1, Esplanade des Particules
1217 Meyrin

**Dinner Address**
Clos du Château
Rte du Crêt-de-Choully 29,
1242 Satigny

**Taxis**
**Taxi-phone.ch** +41 22 33 141 33
**Taxis 202** +41 22 3 202 202
**Taxi Ambassador** +41 22 731 41 41

Some places in Geneva you can catch a taxi without reservation:
- Place du lac, 1204 Genève (city centre)
- Geneva Airport, arrivals
- Gare Cornavin, Geneva's train station

**Contacts**
**Laura Dalton** +44 (0) 754 774 9098
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UK Magnetic Society

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MMA24 has two sets of tours. First are the tours on Tuesday and Wednesday, of the Synchrocyclotron. Second are the tours on Thursday morning, of the Permanent Magnet, Electromagnet, and Superconducting Magnet Facilities.

**Conditions for All Tours**

- Footwear must be closed flat shoes suitable for walking
- All strong magnets will be off, however bearers of pacemakers and similar active implanted medical devices are forbidden to enter.
- You will not be able to switch groups for the SC Cern Tours.
- You must wear your CERN visitor badge to go on the tours this is separate to your event badge.
- Non-private or commercial photo taking is not allowed.
- No bags or cases can be taken on any tours.

**Tuesday and Wednesday's Synchrocyclotron Tour**

Please gather in the Lower Foyer of the Science Centre at the times requested, as follows:

Tuesday 12:45 Groups 1 & 2

| Group 1 | Group 2 |
|---|---|
| Alacacayir Sahin | Campbell Eilidh |
| Craigen Doug | Jeans George |
| Haig Godden Ryan | Kasotakis Emmanouil |
| Kliche Stephan | Lillywhite Sarah |
| Klimczyk Piotr | Masseglia Olivier |
| Riley Chris | Papadopoulou Elisavet |
| Rodemann Kevin | Pickford Tom |
| Scheuber Philippe | Poupinet Milan |
| Vervaeke Koen | Spahlinger Michael |
| Wong Ching Fong | Taylor John |
| Stewart Alastair | Shkodich Natalia |
| Allen Paul | Trindade Pereira Andre Miguel |

Tuesday 16:45 Groups 3 & 4

| Group 3 | Group 4 |
|---|---|
| Cruise Rupert | Bayer David |
| Furgeri Alexander | Brajon Bruno |
| Ghnem Mariem | Close Gaël |
| Leitner Peter | Dadi Rachid |
| Lumetti Stefano | de Bekker Maarten |
| Malago Perla | de Jonge Maarten |
| Ortner Michael | Finch Graeme |
| Pasquale Massimo | Harmon Stuart |
| Spasic Tatjana | Michiels Matthieu |
| Spasic Sasa | Van Bockstal Luc |
| Swallow Matthew | Zeitzheim Martin |
| Tucker Brody | Schliesch Thomas |

Wednesday 12:45 Groups 5 & 6

| Group 5 | Group 6 |
|---|---|
| Suttkus Benjamin | Bayle Herve |
| Aeschlimann Patrick | Benkstein Alexander |
| Bahremandi Neda | Curti Mitrofan |
| Beran Philip | Das Pintu |
| Frigoli Cornel | Lavin Dominic |
| Koenigs Mike | Mishra Amit |
| Palmero Rodriguez Ester Maria | Removic-Langer Katarina |
| Popovic Renella Dragana | Saeed Sana |
| Schwartz Lior | Shaukat Sana |
| Simon Fred | Tompkins Jeremy |
| Timopheev Andrey | Vishwakarma Anubhav |
| Weickert Dagmar Franziska | Weickhmann Jan Michael |
| | Songeon Julien |

**Thursday Permanent Magnet, Electromagnet, and Superconducting Magnet Facilities Tour**
Please gather in the Big Bang Cafe at 09:00 on Thursday. Groups as follows:

| Group A | Group B |
|---|---|
| UKMS Lead: Stewart Alastair | UKMS Lead: Taylor John |
| Alacacayir Sahin | Campbell Eilidh |
| Craigen Doug | Jeans George |
| Haig Godden Ryan | Kasotakis Emmanouil |
| Kliche Stephan | Lillywhite Sarah |
| Klimczyk Piotr | Papadopoulou Elisavet |
| Scheuber Philippe | Spahlinger Michael |
| Vervaeke Koen | Shkodich Natalia |
| Wong Ching Fong | Trindade Pereira Andre Miguel |
| Das Pintu | Weickert Dagmar Franziska |
| Lavin Dominic | Bayle Herve |
| Mishra Amit | Benkstein Alexander |
| Removic-Langer Katarina | Curti Mitrofan |
| Spasic Sasa | Saeed Sana |

| Group C | Group D |
|---|---|
| UKMS Lead: Harmon Stuart | UKMS Lead: Finch Graeme |
| Furgeri Alexander | Brajon Bruno |
| Ghnem Mariem | Close Gaël |
| Leitner Peter | Dadi Rachid |
| Lumetti Stefano | de Bekker Maarten |
| Malago Perla | de Jonge Maarten |
| Ortner Michael | Michiels Matthieu |
| Pasquale Massimo | Zeitzheim Martin |
| Tucker Brody | Bahremandi Neda |
| Palmero Rodriguez Ester Maria | Beran Philip |
| Schwartz Lior | Riley Chris |
| Simon Fred | Koenigs Mike |
| Timopheev Andrey | Shaukat Sana |
| Vishwakarma Anubhav | |

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CERN-Visitors

2. Open a network login page.
3. Tick the box to accept the terms and conditions.
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6. Enter the access code on the login page.
7. You should have access to the internet.

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