



# 11<sup>th</sup> INTERNATIONAL CONFERENCE ON MAGNETISM AND METALLURGY

June 19<sup>th</sup> to 21<sup>th</sup>, 2024

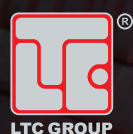
L'Aquila, Italy



Industrial partner



Sponsor



In collaboration with







## SCOPE OF THE CONFERENCE

The 11th International Conference Magnetism and Metallurgy WMM'24 will be held from 19 to 21 June 2024 in L'Aquila (Italy) in cooperation with University of L'Aquila.

It is organized by RINA every two years to bring together experts from the manufacturing industry of Soft and Hard Magnetic Materials scientists and electrical engineers from universities, research groups and industry, as well as companies and institutes involved in industrial applications of Magnetic Materials.

The International Conferences Series on Magnetism and Metallurgy was established in 2004 by the Institute of Metal Forming at the Technische Universität Bergakademie Freiberg. From 2020, RINA is in charge of the organization of the WMM conference series.

Dr. Stefano Fortunati is the Conference Chairman and Dr. Stefano Cicalè is the Programme Manager.

The WMM '24 Conference will be an outstanding forum for exchanging ideas on the status and future trends between experts from the industry and research institutes.

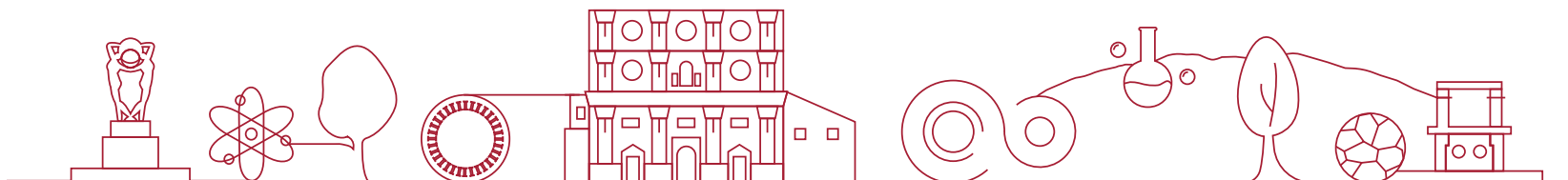
EUROGROUP Laminations, world leader in the design and construction of electrical systems with special focus on the manufacture of rotating electric machines (motors, electric generators) is the Industrial Partner and Sponsor of the Conference.

LTC Group Legnano Teknoelectric Company, world market leader in the production of magnetic cores and laminations for a wide range of transformers and reactors is also Sponsor of WMM'24 Conference.

WMM '24 is also endorsed by the Associazione Italiana di Metallurgia and the UK Magnetic Society, and, as in the previous edition, will benefit from the collaboration with QUICKFairs and L'Aquila Congressi.

The 11th International Conference WMM'24, to be held in L'Aquila in June 2024, will present the latest developments in the field of industrial Magnetic Materials, of their characteristics, their production, and their applications.

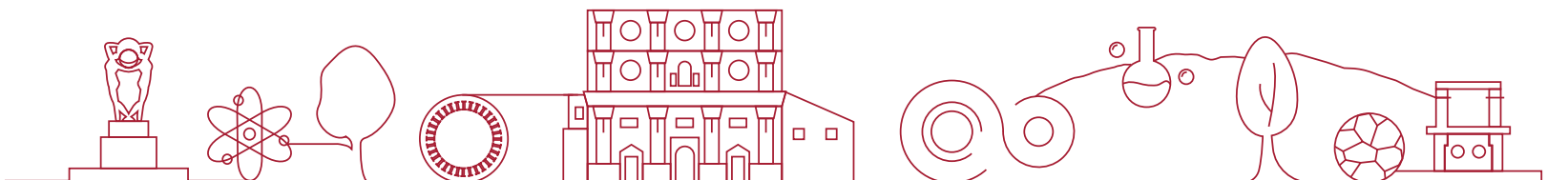
Industrial Producers of Magnetic Materials and Electrical Machines manufacturers from all over the world, as well as the main Research and Academic institutions, will have the valuable opportunity to discuss together the needs and the progress made in the field, consolidating professional relationships and establish new ones. The programme will include invited lectures and posters, which will certainly be a good reference point for future work and developments in the field in the coming years. All papers will be published in the conference proceedings, which will be distributed to participants at the conference venue. The conference proceedings, which will be distributed to participants at the conference venue.





## TOPICS OF THE WMM'24

- Progresses in Electrical Steels and other Soft Magnetic Materials grades
- Development in Fabrication of Electrical Steels and other Soft Magnetic Materials, and progress on equipment for their manufacturing
- FeSi Steels, and other Soft Magnetic Materials: advances in the optimum microstructure/texture development, and control along processing route
- Modeling of Microstructure evolution along processing routes of Electrical Steels and other Soft Magnetic Materials
- Microstructure and Magnetic properties relations: advances in understanding and products design
- Soft and Hard Magnetic Materials via Additive Manufacturing
- New Amorphous and Nanocrystalline magnetic materials to build Motors and Transformers cores
- High quality "semifinished" electrical steel with high characteristics and their application
- Electric Mobility applications - Tailoring Material Grades for the different Types of Vehicles
- Viable solutions to the problem of recharging the EV/HEV batteries
- "Conventional" and "unconventional" soft magnetic materials adapt to build distribution transformers, suitable in the realization of smart grids for EV/HEV batteries recharging
- Grades for the diverse Types of Vehicles/Motors: Optimum magnetic materials and Optimum Design
- Advances in Magnetic measurements and characterizations of soft and hard Magnetic Materials
- Electrical steel and other Soft Magnetic Materials, and their application to Magnetic field shielding





## CONFERENCE CHAIRMAN

- Dr. Stefano Fortunati, RINA, Italy



## PROGRAM MANAGER

- Dr. Stefano Cicalè, RINA, Italy.



## PROGRAM COMMITTEE

- Prof. Marco Villani, University of L'Aquila, Italy
  - Prof. Jürgen Schneider, Stahlzentrum Freiberg
  - Prof. Antony Moses, Emeritus Professor of Cardiff University School of Engineering
- Coordinated by the PROGRAM MANAGER, Dr. Stefano Cicalè



## INTERNATIONAL ADVISORY COMMITTEE

- Giuseppe Carlo Abbruzzese, RINA, Italy
- Philippe Anderson, Cardiff University Wales
- Stefano Comerio, LTC GSM, Italy
- Carolina Cesconetto Silveira, Aperam South America
- Leonard Franchini, Eurotranciatuura México S.A de C.V.
- Li Guangqiang, Wuhan University of Science and Technology China
- Erik Hilinsky, Nanoneal Technologies, LLC, US
- Bevis Hutchinson, Swerim Kista, Sweden
- Sigrid Jacobs, Arcelor Mittal global R&D, Belgium
- Leo Kestens, Ghent University, Belgium
- Fernando Ladgraf, Universidade de São Paulo, Brazil
- Francesco Parasiliti Collazzo, University of L'Aquila, Italy,
- Jong Tae Park, POSCO, South Korea
- Giuseppe Pasquarella, Icd Laser Cut, Switzerland
- Carlo Stefano Ragusa, Politecnico of Torino, Italy
- Indradev Samajdar, IIT Bombay, India
- Stefan Siebert, Brockhaus, Germany
- Matthew Swallow, Bunting Magnetic Europe, UK
- Yoshiyuki Ushigami, Nippon Steel, Japan
- Niklas Volbers, VACUUMSCHMELZE GmbH, Germany
- Markus Weber, ThyssenKrupp ES, Germany
- Liu Xian Dong, BaoWu Iron and Steel Co., China



## WMM'24 IMPORTANT DATES

- Abstract Submission 29.11.2023
- Registration (early bird) 05.02.2024
- Manuscripts Submission 04.03.2024



## SECRETARY'S OFFICE OF THE WMM'24

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Tel: +39 3356682147  
Email: WMMconference@rina.org

Dr. Cristina Forzanti, RINA  
Viale Benedetto Brin 218, Terni  
05100 Terni, Italy  
Tel: +39 3332396093  
Email: WMMconference@rina.org





## CONFERENCE WEBSITE

All the information about WMM24 can be found in the conference website: [WMM '24 - RINA.org](https://www.wmm24-rina.org)



## REGISTRATION FEES

The registration fee includes conference proceeding, refreshments, lunches, welcome party on the first day as well as a social program and Gala Dinner at the second day.

Conference attendance early bird:	650 EUR (up to 05.02.2024)
Conference attendance:	750 EUR (after 05.02.2024)
Exhibitors:	2500 EUR (conference + exhibition space fee)
Conference attendance for PHD students:	350 EUR (no social program included)
Gala Dinner for accompanying person:	100 EUR
Online conference attendance:	450 EUR

For registration you are kindly asked to complete the registration form that is available in the conference website.



## POSTERS AND EXHIBITS

WMM'24 will include a limited number of exhibits and poster papers. Preference will be given to posters presenting R&D results on materials technologies and/or devices. Authors of posters can present a paper of up to 14 pages that strictly follows the template and guidelines provided in the conference website. The papers should be uploaded in the conference website and will be submitted to the program manager that will inform applicants on their acceptance

**POSTER SIZE DIMENSIONS:** 0.7m (l) x 1 m (h). Panels to attach the posters will be provided at the conference

**EXHIBIT SPACE:** table, two chairs, electric outlet. If there are different needs, possible supplement will be evaluated. Exhibitor roll-up or banner are well accepted



## PROGRAM

The WMM24 is planned to start in the morning of June 19th 2024 (around 9 AM) and to close in the afternoon of Friday, June 21st 2024. Secretary will be open for registration from the afternoon of June 18th 2024 and throughout the entire conference.

On the first day of the conference, after the afternoon session, a Welcoming Party will be held in the city center offered by LTC.

On the second day of the conference, after the afternoon session, a sightseeing trip to appreciate the host city of L'Aquila followed by the conference Gala Dinner offered by Eurogroup.





## PRELIMINARY LIST OF SPEAKERS

NAME	TITLE	INSTITUTE	STATE
Giuseppe Carlo Abbruzzese	On the role of Primary Recrystallized Microstructure and Texture on HGOES Magnetic Properties (with MOGOKA Analysis)	SplReS Srl	Italy
Ruilin Pei	Properties of New Soft-magnetic Materials Under Multi-physical Field and Its Application Technology in an Electric Machine	Shenyang University of Technology	China
Jurgen Shneider	Evolution of Microstruture and Texture for NO-Electrical Steels with Different Si - Content - Ongoing Processes and Role of the Hot Band	Stahlzentrum Freiberg e.V.	Germany
Bevis Hutchinsson	Effects of stress relief annealing in NGO steels	Swerea Swedish Research	Sweeden
Konrad Krimpelsteatter	Progress on equipment and technology for a sustainable manufacturing of new generations of thin-gauge high-permeability electrical steels	Primetals Technologies	Japan
Marco Villani	Effect of the manufacturing process on the Synchronous Reluctance motor performance	University of L'Aquila	Italy
Stefan Helfert	Recent Development on Quality Control of self-bondable electrical steel	Kansai - Helios	Austria
Mircea Popescu	Rare-earth free traction motor solutions: performance comparison using CoFe vs SiFe electrical steel	ANSYS Motor Lamination	UK
Sigrid Jacobs	The modelling of excess loss impact in ferromagnetic materials, linking material parameters for optimised material behaviour towards application targets	Arcelor Mittal	Belgium
Mario Villalon	Composite materials perspective on electrical motor glue bonded stator core properties	EUROGROUP	Mexico
I-Ching Hsiao	Texture evolution of non-oriented electrical steels for electric vehicle motors	China Steel Corporation	Taiwan
Nobusato Morishige	Recent Development of Grain-Oriented Electrical Steel and the Effect of the Inhibitors on Primary Recrystallization Texture	Nippon Steel Cooperation	Japan
Liu Xiangdong	New breakthroughs in the performance and manufacturing process of electrical steel in the context of carbon neutrality and digital transformation era	BAOSTEEL	China
Kyuseok Han	New Products and Technologies of Non-Oriented Electrical Steels for Traction Motors developed in POSCO	POSCO	South Korea
Gangquiang Li	Effect of annealing temperature on precipitates and properties of high Al-bearing non-oriented silicon steel	Wuhan University of Science and Technology	China
Franco Marini	Distribution Transformers Perspectives	SIM Srl	Italy
Fernando Landgraf	Effect of thicknesses from 0.65 to 0.23mm on hysteresis and excess loss of GNO electrical steels taking into account grain size variation	University of San Paulo	Brazil
Eric Thiesen	Manufacturing methods for utilizing amorphous electrical steel in transformer and motor applications	METGLASS	USA
Carolina Cesconetto Silveira	The effect of the spinel and forsterite ratio on the HGO ceramic film properties	Aperam South America	Brazil
Soichiro Yoshizaki	Advantages of silicon gradient electrical steels in permanent magnet motors	JFE Steel Corporation	Japan





## PRELIMINARY LIST OF SPEAKERS

NAME	TITLE	INSTITUTE	STATE
Anton Vidovic	Application oriented material development and characterization for advanced NGO electrical steel for e-mobility	ThyssenKrupp steel Europe	Germany
Erik Hilinski Marius Kruezeder	The advanced Descaling and Annealing Line:A New Concept for Hot Band Normalization	NanoNeal Technologies, LLC	USA, Austria
Leo Kestens	Texture control in Non-Oriented Electrical Steel: the effect of rolling temperature on the formation of recrystallisation textures	University of Gent	Belgium
Gwynne Johnston	Where will the steel come from?	MTS	USA
Stefano Fortunati	On the microstructure parameters regulating Goss texture sharpness of GOES for transformers cores	AS&T Consulting	Italy
Pablo Rodríguez Calvillo	Hot Rolling Model of FeSi Steels: Constitutive Equations in the Ferritic, Austenitic and Inter-critical Regions	NLMK	Belgium
Song Huang	Two-dimensional magnetic properties of electrical steels under controlled temperatures and complex mechanical stress	Politecnico di Torino	Italy
Jian Gong	Recent progress of electrical steel products in Shougang Steel with microstructure and texture control	ShouGang Steel	China
Simone Sormani	Evolution of Transformers Core Design and GOES	LTC GROUP	Italy







## PRELIMINARY LIST OF POSTERS

NAME	TITLE
Adrianna Lozinko	Characterization of precipitates in non-grain oriented electrical steels - insights from small angle neutron scattering
Adriano Alex de Almeida	The effect of laser scribing spacing on core loss of grain oriented electrical steel
Ahmed Abouelyazied	A deep dive into high-performance non-oriented electrical steels aiming for increased motor torque and power density
Seil Lee	A Comparative Study on Heat Transfer Characteristics of Bonded Stator Cores for Electric Vehicle Traction Motors
Gabriel Alves Mendonça	Evaluation of stress relief annealing process on non-grain oriented steel magnetic performance improvement focused on a sustainable electric vehicle market
Guilhem DROUET	Mechanical characterization and modelling of lamination stack
Jaewan Hong, Jong-tae Park	High strength and low core loss electrical steel applicable to high efficiency traction motors
Kyu-Seok Han, Jung-Woo Kim, Jae-Hoon Kim, Jong-Tae Park	Recent New Products and Technologies of Non-Oriented Electrical Steels for Traction Motors developed in POSCO
Lukas Neundlinger	Double stage cold rolling of non grain oriented electrical steels
Y.K. Ahn	Development of {100}<0vw> texture in steel induced by stress during heat treatment
Piotr Klimczyk	Challenges in Power Loss Measurements Across the Coil Width in Production and Slitting Lines
Ram Jee Soni	Microstructure, texture, and mechanical properties of carbon-free Fe-Si alloy
Jan Senzel	Formation of cube-on-face texture in an iron-cobalt-vanadium alloy by controlled phase-transformation $\gamma \rightarrow \alpha$
Stanislas Mauuary	Cutting edge technology to reach the electromobility market
Tuomo Nyysönen	Texture and magnetic anisotropy in NGO steels
Feng ZHANG	Effect of mechanical shearing method on the magnetic properties of 3.4% Si non-oriented silicon steel sheets
Aldo Boglietti, Marco Villani	AC Motor Iron Losses Evolvment: From the Sinusoidal to the Inverter Supply







## PRELIMINARY LIST OF EXHIBITOR

Brockhaus	<a href="http://www.brockhaus.com">www.brockhaus.com</a>
Coiltech	<a href="http://quickfairs.net">quickfairs.net</a>
EUROGROUP LAMINATIONS	<a href="http://www.eurogroup.com">www.eurogroup.com</a>
LTC	<a href="http://www.ltc-group.com">www.ltc-group.com</a>
University of L'Aquila	<a href="http://www.univaq.it">www.univaq.it</a>
RINA	<a href="http://rina.org">rina.org</a>
LCD LaserCut AG	<a href="http://www.lcd-lasercut.ch">www.lcd-lasercut.ch</a>
Metglas	<a href="http://metglas.com">metglas.com</a>





## PROCEEDINGS

The WMM'24 proceedings book including all the papers from invited speakers and posters will be printed in full color and distributed at the conference.

Digital edition will be distributed to attendants to the conference on line



## VISA APPLICATION

All regularly registered conference attendees who need an invitation letter for the VISA application can send their request to the **WMM24 SECRETARY'S OFFICE** mail address:

[WMMconference@rina.org](mailto:WMMconference@rina.org)



## CONFERENCE VENUE

The 11<sup>th</sup> International Conference Magnetism and Metallurgy WMM'24 will take place in L'Aquila at:

### Centro Congressi "Luigi Zordan" ex monastero S. Basilio

Piazza San Basilio  
67100 L'Aquila Italy

The "Luigi Zordan" Conference Center is located inside the Monastery of San Basilio, in the heart of the historic center of L'Aquila.

The structure can host conferences, concerts, exhibitions, private citizens and public bodies events, and significant events organized by the University of L'Aquila.

The Conference Center, provided with the most sophisticated technical equipment, has wide areas, essentials for carrying out networking activities.

All the rooms are equipped to play videos and films on DVD, VHS and SVHS, to manage presentations in various formats via PC – both from the control room and the Center rooms-, to organize video conferences with one or more external offices and record events in multisystem audio and video.

The Center hosts five rooms: Aula Magna "Vincenzo Rivera", "San Basilio" Room, A, B, C Rooms. The entire location will host this event .

### Services

- Reception
- Office secretary
- Technical staff
- Bar for welcome coffee and coffee breaks
- Wardrobe

### Technical equipment

- Technical equipment
- Control room
- Wi Fi in the conference rooms
- LCD video projectors in the San Basilio and Aula Magna rooms





## THE CITY HOSTING THE CONFERENCE: L'AQUILA

L'Aquila, the regional country seat of Abruzzo is a city that boasts an incredible cultural heritage, including monumental castles, churches, precious courtyards, historic fountains, and wonderful historical buildings. L'Aquila was founded in 1254. It was built on a pre-existing site of immeasurable beauty: it lies on the slopes of the Gran Sasso mountain, situated on the left bank of the Aterno river, the so-called "L'Aquila basin".

There are dozens of reasons to visit L'Aquila, but one of it is worthy to mention: today the city offers visitors the possibility to admire it shining again after its rebuilding. The city was destroyed in 2009 by a violent earthquake, but nowadays, after its reconstruction, the city can show again a particular enchanting combination of medieval, Renaissance and baroque artistic evidences.

Once you arrive in the city, all you need to do is to take a taxi to reach the center hosting the event and fully experience the atmosphere of the historic center.



## HOW TO REACH

Buses provide convenient transportation from Rome and Pescara to L'Aquila. Avoiding the train, three primary bus lines facilitate the journey: TUA, Flixbus, and Gaspari Bus.



### Arrival by airplane

#### From Fiumicino (FCO) / Ciampino (CIA)

Both Flixbus and Gaspari Bus offer services from Ciampino and Fiumicino Airports to L'Aquila. Flixbus takes about 2 hours for the journey, and Gaspari Bus operates on similar timelines for the Ciampino and Fiumicino Airport routes to L'Aquila.

Your bus stop will be "Aminternum", then we suggest a cab. Please follow

**From Pescara Airport (PSR)**, the Pescara Airlink Bus provides a swift 15-minute connection to Pescara Central Station. From there, travelers can then board the TUA bus to L'Aquila, with a similar travel time of around 1.5 hours. Tickets for the airport-to-L'Aquila journey are obtainable online or at the TUA bus station ticket office.

Your bus stop will be "Terminal Lorenzo Natali". You are in the city center but you may prefer to take a cab for your accommodation. Please follow



### Arrival by bus

#### Rome - L'Aquila

When departing from Tiburtina Station in Rome, you have multiple options for traveling to L'Aquila. The TUA bus service allows you to reach L'Aquila within approximately 1.5 hours. Tickets for L'Aquila can be acquired either online or at the TUA bus ticket office located within the station.

Gaspari Bus offers another reliable option, departing from Tiburtina Station, as well as Ciampino and Fiumicino Airports. Similar to TUA, tickets for L'Aquila through Gaspari Bus can be purchased online or at the station's ticket office. The travel duration from Rome Tiburtina to L'Aquila is around 1.5 hours.

Flixbus also operates from Tiburtina Station and both Ciampino and Fiumicino Airports. Similarly, tickets for L'Aquila are available online or at the station's ticket office, with a travel time of approximately 1.5 hours.

Your bus stop will be "Aminternum", then we suggest a cab. Please follow

#### Pescara - L'Aquila

For those traveling from Pescara to L'Aquila, the TUA bus is the recommended choice. From Pescara Central Station, this service will take you to L'Aquila within approximately 1.5 hours. Tickets can be bought online or at the TUA Bus ticket office within the station.

Your bus stop will be "Terminal Lorenzo Natali". You are in the city center but you may prefer to take a cab for your accommodation. Please follow







## Arrival by car

### From Rome

To reach the city of L'Aquila from Rome by car, follow these directions:

- Start on the A24 highway heading east from Rome
- Continue on the A24 for approximately 115 kilometers (71 miles) until reaching L'Aquila

### From the North

If you're coming from the northern regions, follow these directions to L'Aquila:

- Take the A14 or A24 highway, depending on your starting point
- Head towards the Abruzzo region, following signs for L'Aquila
- Continue on the most suitable highway until reaching L'Aquila

### From the South

For travelers coming from the southern areas, follow these steps to reach L'Aquila by car:

- Take the A25 highway or the SS17, depending on your specific departure location
- Follow signs and directions pointing towards L'Aquila
- Continue on the chosen route until arriving in L'Aquila

Please note that these directions serve as a general guide. Ensure to consult maps or GPS for the most accurate and updated route information, as road conditions and construction may affect the journey.



## PRELIMINARY HOTELS LIST NEAR THE CONFERENCE VENUE

HOTEL	B&B
My Suite Hotel	B&B Bone Novelle
Hotel Federico II	B&B Charme Celestino V
Hotel San Michele	B&B Torrione
Relais Magione Papale	B&B Palazzo Cappa
Hotel Azzurro	B&B Eden
Canadian Hotel	B&B del Viale
Residenza San Flaviano, Relais di Charme	B&B Quarto Santa Maria



## SOCIAL EVENTS FOR ALL DELEGATES

**First Day** Welcome Party, offered by LTC

**Second Day** Gala Dinner, offered by EUROGROUP



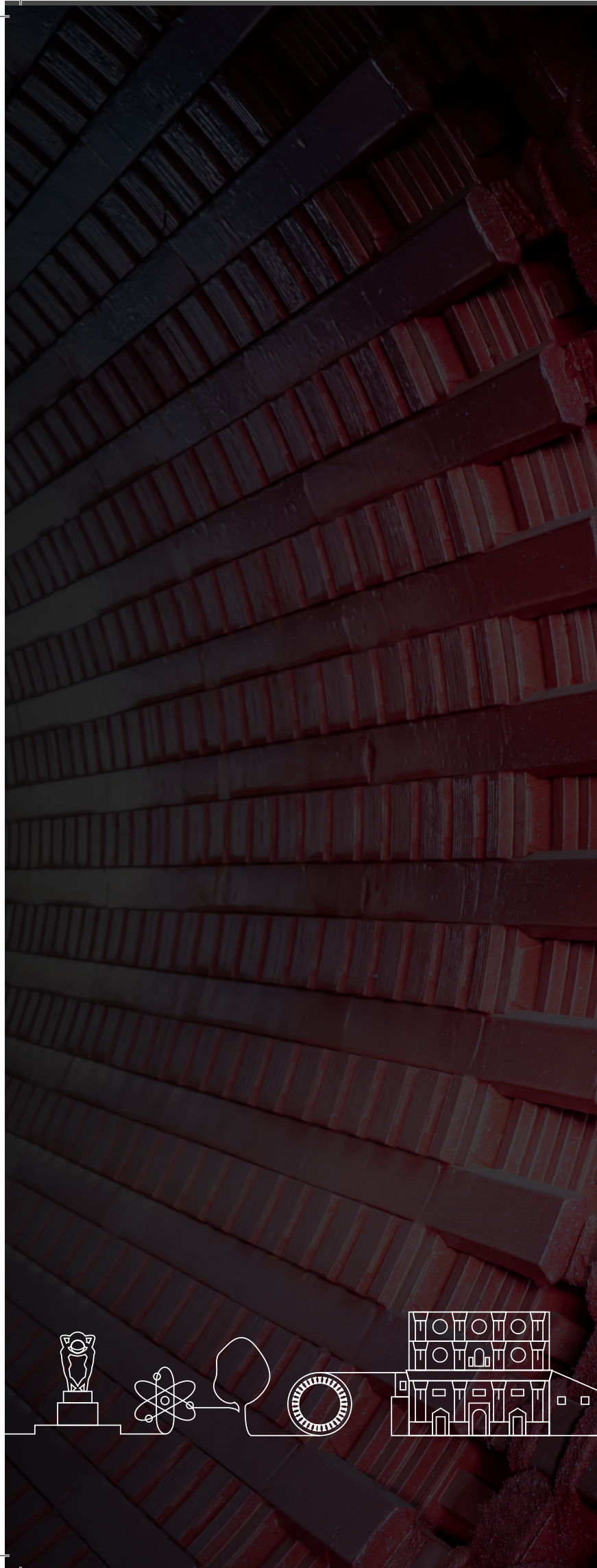












Third announcement - March 2024