



RI A

WNI
2020

November 3rd to 5th, 2020 - **Rome, Italy**



ASSOCIAZIONE
ITALIANA
DI METALLURGIA



9th International Conference Magnetism and Metallurgy November 3rd to 5th, 2020 - Rome, Italy

SCOPE OF THE CONFERENCE

The series of International Conferences, Magnetism and Metallurgy was established in 2004 by the Institute of Metal Forming at the Technische Universität Bergakademie Freiberg by the enlightened initiative of Prof. Rudolf Kawalla and Prof. Jurgen Schneider.

WMM conferences take place every two years. The conferences of 2004, 2006, 2010, took place in Freiberg. The editions of 2008 and 2012 took place in Ghent and the last three editions took place respectively in Cardiff, 2014, Rome, 2016, and Dresden 2018. Starting from the 2020 edition, as already announced in Dresden 2018, RINA will be in charge of the organization of WMM series of conferences.

Chairman of the conference will be Dr. Stefano Fortunati together with Prof. Rudolf Kawalla co-chairman of WMM'20. Dr Stefano Cicalè will be the Program Manager.

Prof Jürgen Schneider will continue to actively participate to the organization of WMM '20 conference.

Organised by RINA, the 9th International Conference Magnetism and Metallurgy WMM'20 will take place from November 3rd to 5th, 2020 in Rome, Italy. The consolidated aim of this series of International Conferences on Magnetism and Metallurgy is to bring together scientists from universities and research groups working on the development of magnetic materials, experts from the Industrial companies producing magnetic materials as well as electrical engineers from universities and industry, who are engaged in applications of magnetic materials.

The WMM '20 conference will once again be a forum for the exchange of ideas on the status and further trends between experts from the industry and research institutes. The 9th International Conference WMM '20 in Rome, November 2020, will cover the latest developments, and participants will have the chance to discuss the progress in the field of Magnetism and Magnetic Materials and their Applications. The program will include invited lectures and posters.

All the contributions will be published in a book of conference proceeding. The participants will receive the book of proceedings at the conference site.

TOPICS OF THE WMM'20

- Electrical steels and other soft magnetic materials: advances in product quality, new grades, and applications
- Advances in manufacturing methods: metallurgical routes and technological solutions
- Status of the Use of Thin Slab and Thin Strip casting technology for GO and NGO
- Hard magnetic materials: trends in product grades and manufacturing processes
- Progress in modelling the evolution of microstructure and texture along the metallurgical processing route for electrical steels
- Relationships between microstructure and magnetic properties
- Surface quality and coatings development for GO/NGO electrical steel
- Advancement on magnetic materials characterizations
- Progress on modelling the effects of magnetic materials characteristics on the electrical machines performances
- Electrical steels for Electric Mobility applications (E-cars and power supply infrastructures): trends, technical solutions and strategies for development
- Development of Higher Efficient Motors and the role of electrical steels
- Optimum selection of electrical steels for given applications and optimum manufacturing methods

CONFERENCE UPDATE DUE TO COVID-19 & REMOTE ATTENDANCE

The current extraordinary situation determined in the world by COVID-19 has provided the opportunity to rethink our conference and we are pleased to announce exciting new opportunities for remote presentations and remote attendance for WMM20.

The organizing committee has decided to open WMM20 also to remote access (via web) to allow participants coming from the countries which are still under lock down restrictions and are not in condition to travel during the days of the conference, November 3rd-5th, 2020, to follow the conference works as well as give speeches and participate to discussions.

We confirm WMM20 will be anyway held in the traditional form for onsite participants. Strict social distancing rules will be enforced throughout the entire conference; access will be granted only with facial masks and alcohol based gel will be provided at the entrance of each conference area. The seats in the main hall will be spaced in order to maintain social distancing at all time.

The onsite conference will be held in Rome at Hotel NH Roma Villa Carpegna as already planned and previously announced, with the additional chance of direct interaction in speeches and discussions with the participants in remote connection around the world.

The conference room for the Invited Lectures will be specifically equipped for remote connection on large screen and video cameras. Poster contributions will be located in a room adjacent to the Conference room and in parallel a Virtual Poster Room will be available by dedicated remote connection to participants.

In parallel with the Exhibitors Stands in the conference site, a Virtual Exhibitors Room will be available to participants not able to travel to Rome with the chance to explore the various stands and get in contact with the stand holders. The Conference Proceedings will be distributed to each participant at the conference and they will be sent by courier to participants who will attend the conference by remote attendance.

INTERNATIONAL ADVISORY COMMITTEE

Chair of committee

- Prof. Antony Moses, University of Cardiff, United Kingdom
- Prof. Jürgen Schneider, University of Freiberg, Germany
- Prof. Marco Villani, University of L'Aquila, Italy

Members

- Carlo Abbruzzese, RINA, Italy
- Erik Hilinski, Tempel Steel, US
- Indradev Samajdar IIT Mumbai, Indian Institute of Technology - Mumbai, India
- Jong-Tae Park, Posco, Korea
- Kay Hameyer, IEM RWTH Aachen, Germany
- Ludger Lahn, ThyssenKrupp Electrical Steel, ThyssenKrupp Electrical Steel, Germany
- Niklas Volbers, VAC, Germany
- Sebastião da Costa Paolinelli, Aperam South America, Brazil
- Shenglin Chen, BaoWu Iron and Steel Co., China
- Sigrid Jacobs, ArcelorMittal Global R&D, Belgium
- Stefan Siebert, Brockhaus Messtechnik GmbH, Germany
- Steve Sprague, Proto Lam LLC, US
- Fernando Landgraf, Institute of Technological Research (IPT), Brazil
- Yoshiyuki Ushigami, Nippon Steel Sumitomo Metals Corporation, Japan

Conference Chair

- Dr. Stefano Fortunati, RINA, Italy
- Prof. Rudolf Kawalla, Germany

Program Manager

- Dr. Stefano Cicalè, RINA, Italy.

SECRETARIAT OF THE WMM'20

Dr. Elisabetta Amici, RINA

Via di Castel Romano, 100
00128, Rome, Italy
Mob: +39 335 6682147
Email: wmm20@rina.org

Dr. Ing. Cristina Forzanti, RINA

Viale Benedetto Brin 218, Terni
05100 Terni, Italy
P: +39 0744487306
Email: wmm20@rina.org

REGISTRATION FEES

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

- Conference attendance (in person): **750 EUR**
- Exhibitors: **2500 EUR** (conference fee + exhibition space fee)
- Conference attendance for PHD students (in person or online): **350 EUR**
- Social Event participation for Accompanying person or PHD student: **100 EUR**
Including social program and conference dinner for second day only
- Social Event participation for Accompanying person or PHD student: **150 EUR**
Including social program and conference dinner for first and second day
- Conference attendance (online): **450 EUR** (40% less than in person attendance!)

For registration you are kindly asked to complete the registration form that can be found in the conference website.

CONFERENCE WEBSITE

All the information about WMM20 can be found on the conference website.

<https://www.rina.org/en/wmm20>



POSTERS AND EXHIBITS

WMM'20 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 15 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 1.80m x 0.70 m, two chairs, electric outlet for a maximum of 1 kw each. If there are different needs, possible supplement will be evaluated. Exhibitor roll-up or banner are well accepted

Posters will be uploaded in a dedicated section of the conference website for the attendees in remote connection; a dedicated chatroom will be provided to allow online attendees to interact with poster authors.

Poster contributions will be located in a room adjacent to the Conference room and in parallel a Virtual Poster Room will be available by dedicated remote connection to participants.

In parallel with the Exhibitors Stands in the conference site, a Virtual Exhibitors Room will be available to participants not able to travel to Rome with the chance to explore the various stands and get in contact with the stand holders.

PROGRAM

The WMM'20 is planned to start at 10:00 AM of November 3rd, 2020 and to close at 5.00 PM of November 5th 2020.

Secretary will be open for registration in person from the afternoon of November 2nd, 2020 and throughout the entire conference.

Online participants will be provided with a personal set of credentials to log onto the conference site; the secretary office will be available online throughout the conference to help.



LIST OF INVITED SPEAKERS

NAME	AFFILIATION	SUBJECT FOR LECTURE	STATE
Dr. Stefan Zaefferer	Max-Planck-Institut fuer Eisenforschung	Investigations on microstructural reasons for Goss texture formation in GO electrical steels - a search for the needle in the haystack	Germany
Prof. Leo Kestens	University of Gent	Innovative Methods of Texture Control in the Manufacturing of Non-Oriented Electrical Steels	Belgium
Prof. Luca Ferraris	Politecnico of Torino	Overview of SMC characterization for their adoption in electromechanical systems	Italy
Prof. Marco Villani	University of L'Aquila	High performance Synchronous Reluctance motor for electric vehicles: comparison between NGO and GO electrical steels	Italy
Dr. Mircea Popescu	Motor Design Limited	Electrical steel and high torque density motors performances, role of lamination grade and thickness	Wales-UK
Prof. Indradev Samajdar	Indian Institute of Technology-Mumbai	Microstructural Origin of Goss (110)<001> Grains in Hot Rolled Grain Oriented and Non-Grain Oriented Silicon Steel	India
Dr. Eric Theisen	Metglas Inc	New Trends in the Amorphous and Nanocrystalline Soft Magnetic Ribbon Market	USA
Dr. Nimitkumar Sheth	Magnequench GmbH	Bonded Magnets: developments in the field of material grades (e.g. new grades by improved processes, Cerium containing materials) and magnetization design improvements	Germany
Dr. Seil Lee	Posco	Effect of the Final Annealing Conditions for High Quality NO Electrical Steels	South Korea
Mr. Marco Alveli	G-iron SRL	G-iron SuperFlex® is a low frequency magnetic shielding metal fabric made of grain oriented magnetic steel: from the "first thought" to the performance "on the field"	Italy
Dr. Shenglin Chen	Wuhan Iron and Steel Co.	Research Development on Preparation of Fe-6.5%Si Steel Strip by Near-net Shape Technology	People's Republic of China
Dr. Sigrid Jacobs	Arcelor Mittal global R&D	Electromagnetic materials suited for electrified transport	Belgium
Dr. Mario Villalon	Eurogroup	Effect of housing on iron loss of electric motor cores fastened with gluefastec® and conventional methods	Mexico
Dr. Erick Hilinsky	Tempel	Adhesive bonding of laminations.	U.S.A.
Dr. Gwynne Jhonston	Metals Technology Consulting	Electrical Steel market status and vision for the future	U.S.A.
Mr. Liu Xian Dong	BAOSTEEL Europe Technical Service Center	New developments of BAO STEEL in the field of Grain Oriented Electrical Steel	People's Republic of China
Dr. Lin Cheng	Shougang	Demand and New Development of High-grade NGO material of China	People's Republic of China

NAME	AFFILIATION	SUBJECT FOR LECTURE	STATE
Prof. Jürgen Schneider	University of Freiberg	Evolution of Microstructure and Texture for ES Non-Grain Oriented (NGO) vs Grain Oriented Electrical Steels (GO) - Part 1: NGO	Germany
Dr. Stefano Fortunati	RINA-CSM	Evolution of Microstructure and Texture for ES Non-Grain Oriented vs Grain Oriented Electrical Steels Part 2: GO	Italy
Dr. Takashi Kataoka	Nippon Steel Corporation	Recent Development of Grain-Oriented Electrical Steel at Nippon Steel Corporation	Japan
Dr. Fiona Robinson	Cogent Power	Low thickness NGO FeSi Electrical Steel for high frequency automotive application	Wales - UK
Prof. Guo Yuan	Northeastern University	The development of strip casting electrical steel	People's Republic of China
Dr. G. Carlo Abruzzese	Spires RINA-CSM	Metallurgical Model of HTCA for GO Silicon Steel including prevision of Magnetic Properties (B800) and Secondary Grain Size (MOGOCA-EVO)	Italy
Prof. Fernando Landgraf	Universiade de São Paulo	A review of the concept and results of hysteresis loss subdivision into Low and High induction components	Brazil
Dr. Niklas Volbers	Vacuumschmelze	Soft magnetic materials for highest power densities and related part production technologies	Germany
Dr. Boris Meary	Solaronic	Infrared drying technology to GO and NGO electrical steel production	France



WMM'20 SPECIAL SESSION

As part of WMM'20 conference, in the framework of the Plenary Session, the Organizing Committee has decided to include a "Special Theme Session" titled:

"New Equipment and Technology for production of High Grade Non-Oriented Electrical Steel"

With rapid acceptance of electric vehicles using high grade electrical steels for the motors, together with new energy efficiency requirements for industrial electric motors, the interest by producers and consumers for the production and adoption of top quality grade NOES is significantly growing.

For this reason, we see a very major interest by many ES producers to upgrade both capacity as well as technology to manufacture high quality NGO grades and fulfill the more and more challenging users' requirements. In parallel the Industrial Plant Equipment suppliers are working and investing in order to propose new technological solutions to fulfill ES producer's needs.

The special session is designed to focus the state of art and innovative solutions to industrial manufacture high quality NGO grades along the main significant phases of their industrial production route.

The special Theme Session in WMM'20 will be approximately 2 ½ hours long, consisting of 5 presentations. The process phases selected in this conference edition will follow the production sequence of:

- Continuous Casting and Hot Rolling
- Hot rolled coil annealing and pickling
- Cold Rolling
- Final Continuous Annealing
- Coating and Coating Equipment

Each presentation will be approximately of 25 minutes.

SPECIAL SESSION				
New Equipment Technology for High Grade Non-Oriented Electrical Steel				
PROCESS PHASE	NAME	AFFILIATION	SUBJECT FOR LECTURE	STATE
Casting&Hot Rolling	Dr. Christian Bilgen	DANIELI WEAN UNITED	QSP-DUE – Danieli's ultimate technology for non-oriented electrical steel production	Germany/ Italy
HRC Annealing&Pickling	Ing. Stefano Luperi	RINA-CSM	Innovative solutions for continuous HRC Annealing&Pickling treatment of high quality NGO ES grades	Italy
Cold Rolling	Ing. Konrad Krimpestaetter	PRIMETALS	Overview of cold rolling technologies for successful production of NGO thin-gauge electrical steels	Austria/ Japan
Final Continuous Annealing	Dr. Christian Wuppermann	TENOVA LOI THERMOPROCESS	Final Continuous Heat Treatment Lines for NGO Silicon Steel	Germany
Coating	Dr. Johan Schellemborg	REMBRANDTIN	Coating and Coating Equipment for high grade NGO Electrical Steels	Austria

INDUSTRIAL SPONSORS

MATERIALS AND SERVICES

Euro Group S.p.A.

Eurotranciatura Mexico

TECHNOLOGY AND EQUIPMENT

Primetals

Tenova LOI Thermoprocesses

Rembrandtin

Castellini Officine Meccaniche

Danieli Wean United

EXHIBITORS

Coiltech	www.quickfairs.net
----------	--

Brockhaus	www.brockhaus.com/measurements/about-bmt
-----------	--

G-Iron	www.g-iron.it
--------	--

Elkem	www.elkem.com
-------	--

University of L'Aquila	www.univaq.it
------------------------	--

R13 technology	www.r13technology.it
----------------	--

LCD laser cut	www.lcd-lasercut.ch/DE/Home.html
---------------	--

Axalta	www.axalta.com/corporate/en_US.html
--------	--

Stiefelmayer Lasertechnik	www.stiefelmayer-lasertechnik.de/lasertechnik/startseite.html
---------------------------	--

Innovent	www.innovent-jena.de
----------	--

Metglas	www.metglas.com
---------	--

Castellini	www.castellini.it
------------	--

RINA	www.rina.org
------	--

Arcanum Alloys	www.arcanumalloys.com
----------------	--

MEDIA PARTNER

Webcom Communications Corporation	www.magneticsmag.com
-----------------------------------	--

PROCEEDINGS

The WMM'20 proceedings book including all the papers from invited speakers and posters will be printed in full color and distributed at the conference. Online participants will receive them through courier in the weeks after the conference.

VISA APPLICATION

All regularly registered conference attendees who need an invitation letter for the VISA application can send their request to the wmm20 secretary mail address: wmm20@rina.org.

CONFERENCE VENUE

The 9th International Conference Magnetism and Metallurgy WMM'20 will take place in Rome at:

Hotel NH Roma Villa Carpegna
Via Pio IV,6. -
00165 Rome, Italy
T. +39 06 393731
nhvillacarpegna@nh-hotels.com
<https://www.nh-hotels.com/hotel/nh-romavilla-carpegna>

NH Roma Villa Carpegna is set in a quiet residential area, just a few kilometers away from the historical center and within easy reach of the Vatican City and St. Peter's square. The hotel offers an attractive alternative for your stay in Rome. Lying outside the bustling and chaotic center, it provides the perfect balance between city life and suburban tranquility.

During the warmer months guests can lie back and relax around the large swimming pool. Just a few minutes' drive away, the city's main metro line provides easy access to all major attractions and frequent buses will take you straight to the heart of the city. NH Roma Villa Carpegna has 201 comfortable rooms, all of which are decorated in classic style with wooden and red details. They all come equipped with TV, minibar and free Wi-Fi connection and offer views of the swimming pool or the garden. Every morning a healthy breakfast buffet is served to make you start your day in the right mood. The "Gelsomino" restaurant offer both regional and international dishes, prepared with the freshest ingredients by our experienced chef. If you prefer a quick snack, or just a glass of wine, our bar is the perfect choice.

After a long business meeting or a day sightseeing, guests can unwind and sunbathe by the peaceful outdoor swimming pool. If you're arriving by car, the hotel is provided with a private parking too. The hotel boasts its own congress center with 15 multi-purpose rooms, the biggest of which measures 370 square meters and can seat up to 350 people. Our attentive and supporting team can provide you with the required technologies: amplification system, flipchart, screen, overhead projector. The versatility of the spaces makes them suitable for any sort of planned event.

WMM20 CONFERENCE AREA

WMM20 conference will have at its disposal a very large and well-connected area:

- LEONARDO PLENARY ROOM devoted to the conference sessions
- RAFFAELLO ROOM to host the Exhibitors
- Leonardo Foyer to host the POSTER sessions

ACCOMMODATION AT HOTEL NH ROMA VILLA CARPEGNA 4*

For the conference delegates an allotment of 100 rooms is available at the NH Roma Villa Carpegna conference site with the following SPECIAL RATES:

Double Room Single Use Standard BB 129,00 EUR per room per night - IN 22/06/2020 OUT 25/06/2020 (3 nights)
American Buffet Breakfast included
Rome City Tax 6,00 EUR per person per day

These rates are valid by booking through the dedicated BOOKING SERVICE of the conference only.

Distance from the hotel

ROMA Fiumicino Airport
27 km / 30 min

ROMA Termini train station
6 km / 15 min

Vatican City
2,7 km / 7 min

City centre
6 km / 15 min

SOCIAL EVENTS FOR ALL DELEGATES

First Day

- Due to the current COVID-19 pandemic it was decided that, instead of a "on site" visit to the Rina Consulting laboratories, a "Virtual Tour" will be proposed. RINA_CSM laboratories will be connected on-line, and an expert will show the most important equipment and describe the testing facilities. The on-line connection will be registered, and videos will be available in streaming

Second Day

- Conference dinner. Access will be granted only with facial masks and alcohol based gel will be provided at the entrance of the restaurant. The tables and seats will be spaced in order to maintain social distancing at all time

HOTELS NEAR THE CONFERENCE VENUE

HOTELS 4 Stars

Cardinal Hotel St Peter
(4 minutes drive, 5 minutes walking, 400 mt)
Via Leone Dehon, 71 - Tel. 06 632252

Hotel Occidental Aurelia
(7 minutes drive, 20 minutes walking, 1500 mt)
Via di Torre Rossa, 80 - Tel. 06 6610551

HOTELS 3 Stars

Hotel Alessandrino
(7 minutes drive, 20 minutes walking, 1600 mt)
Via Clemente Alessandrino, 9 - Tel. 06 39674144

Hotel Gravina San Pietro
(7 minutes drive, 20 minutes walking, 1600 mt)
Via della Cava Aurelia, 17 - Tel. 06 39674205

Hotel Il Cantico
(7 minutes drive, 20 minutes walking, 1600 mt)
Via del Cottolengo, 50 - Tel. 06 94362401

Hotel San Pietro
(7 minutes drive, 20 minutes walking, 1600 mt)
Via Cardinal Cassetta, 9 - 06 630876

BED & BREAKFAST

- **Casa Piccole Ancelle di Cristo Re** (5 minutes drive, 15 minutes walking, 1100 mt)
Via Aurelia, 325 - Tel. 06 39366242
- **Villa San Giovanni Casa per Ferie di Suore** (5 minutes drive, 15 minutes walking, 1200 mt)
Via del Casale di S. Pio V, 1 - Tel. 06 6638977
- **Casa San Juan de Avila** (5 minutes drive, 15 minutes walking, 1300 mt)
Via Torre Rossa, 2 - Tel 06 88801391

INDUSTRIAL SPONSORS



EXHIBITORS



MEDIA PARTNER



Webcom Communications Corp



wmm20@rina.org
rina.org