

HES-UIE 2026

International Conference on Heating by Electromagnetic Sources

Padua, 15 - 18 September 2026

Preliminary programme - 27 August 2026

The Conference runs as a **single track, with no parallel sessions**. Each oral contribution is allotted 15 minutes: 12 for the presentation and 3 for discussion.

The author shown in **bold** gives the presentation. Conference Chair: Fabrizio Dughiero.

TUESDAY 15 SEPTEMBER 2026

14.00 - 18.00 *PhD School / Summer School (separate programme)*

19.30 - 21.00 Welcome Reception

WEDNESDAY 16 SEPTEMBER 2026

08.30 - 09.15 *Late registration*

09.15 - 09.30 Opening Ceremony

Institutional addresses and opening of the Conference

Fabrizio Dughiero - University of Padova, Italy (Conference Chair)

Egbert Baake - Leibniz University Hannover, Germany

Koen Van Reusel - Laborelec / KU Leuven, Belgium

09.30 - 10.10 INVITED KEYNOTE LECTURE

“Green Steel: Sustainability Challenges of the Ecological Transition and Danieli’s Innovative Technologies for the Decarbonisation of the Steel Industry”

Ing. Claudio Fabbro - Executive Vice President R&D, DANIELI & C. Officine Meccaniche S.p.A.

10.10 - 10.30 *Discussion*

10.30 - 11.00 *Coffee Break - Posters on display*

11.00 - 12.30 Session S1 - Electromagnetic Processing, Electrification and Green Steel

Chairmen: *to be announced*

11.00 - 11.15 [27] Mamdouh Omran, Hao Yao and Timo Fabritius

Microwave processing steel making side streams

Univ. of Oulu (FI)

11.15 - 11.30 [23] Sven Eckert

Electrification of high-temperature industrial processes: the European CITADEL project

HZDR (DE)

11.30 - 11.45 [9] Martins Sarma, Lars Skaarup Jensen and Sven Eckert

Calcination of Limestone via Induction Heating

HZDR (DE)

11.45 - 12.00 [21] Michael Dumont, Ahmed Essyed, Van-Hieu Ngo, Jean Mario Nhut, Cuong Pham-Huu and Arnaud Brazier

Electrification of Chemical processes: methane pyrolysis via induction heating for H₂ production

EMDPI (FR)

12.00 - 12.15 [43] Igor Niedzwiecki and Egbert Baake

Sustainable electrification of fossil fueled thermoprocessing applications

Leibniz Univ. Hannover (DE)

12.15 - 12.30 [2] Thorsten Ott

Ceramic Induction Air Heater Based on Cellular Structures for High-Temperature Process Heat

DLR (DE)

12.30 - 13.30 Lunch

13.30 - 15.15 Session S2 - Materials Processing and Innovative Products

Chairmen: *to be announced*

13.30 - 13.45 [3] Jan Hrbek

Indirect Induction Heating for Tungsten Detritiation

Research Centre Rez (CZ)

13.45 - 14.00 [4] Jan Hrbek, David Rot, Adrian Villalba Weinberg, Dmitrii Komissarenko and Andreas Börger

Electrical conductivity of white fused alumina in the liquid state

Imerys Villach (AT)

14.00 - 14.15 [5] Dmitrii Komissarenko, Adrian Villalba Weinberg, Jasmin Koller, Veronika Müller, Bruno Korner and Andreas Börger

Scandia-stabilized Zirconia for electrochemical cells: Synthesis in Cold Crucible

Imerys Villach (AT)

14.15 - 14.30 [24] Baseer Ahmed, Vaclav Kotlan and Poznyak I. V.

Estimation of the Electrical Resistivity of Gadolinium Oxide inside the Cold Crucible using the Inverse Problem Technique via ANSYS

Univ. West Bohemia, Pilsen (CZ)

14.30 - 14.45 [34] Karel Slobodník and Václav Kotlan

3D Printed Metal-Doped Ceramics for Induction Heating Susceptors

Univ. West Bohemia, Pilsen (CZ)

14.45 - 15.00 [8] Zhi Yi, Alexander Köppen and Baake Egbert

Reliable High-Temperature Electrical Contacting for Structurally Integrated Thermally Sprayed Heating Elements

Leibniz Univ. Hannover (DE)

15.00 - 15.15 [63] G. Gardan¹, G. Poggiana¹, F. Lucchini¹, M. Forzan¹, F. Dughiero¹, and R. Torchio^{1,2}

Electrothermal Processes for Rare Earth Element Recycling from Energy-Transition E-Waste: A Review

Univ. Padova (IT)

15.15 - 16.00 Coffee Break & Poster Session *(listed at the end)*

16.00 - 17.30 Session S3 - Induction Heating: Coil Design and Applications

Chairmen: *to be announced*

16.00 - 16.15 [42] Krzysztof Konopka and Jerzy Barglik

Induction Surface Hardening of Steel Workpieces Examples of Applications

Silesian Univ. of Technology (PL)

16.15 - 16.30 [15] Dmitry Ivanov, John Inge Asperheim, Bjørnar Grande and Prerana Das

Numerical Investigation of AISI304 Steel Induction Tube Welding

ENRX (NO)

16.30 - 16.45 [FLX] R. Goldstein

Changing Goal Functions for Induction Heat Treating Coil Design

Fluxtrol Inc. (US) · provisional title - final title and author list to be confirmed by the author

16.45 - 17.00 [30] Philippe Bocher, Luc Amar, Tom Jaulin, Raynald Guilbault and Louis Berger

Design Considerations and Challenges for Optimizing Rolling Fatigue Performance in Induction-Hardened Components

ETS University of Quebec (CA)

17.00 - 17.15 [25] Johannes Lohn

17.15 - 17.30 [28] Andrea Trovo, Maria Evelina Mognaschi, Fabrizio Dughiero and Paolo Di Barba

Welding techniques for Flow Battery stack manufacturing: a comparative analysis

Univ. Padova / Univ. Pavia (IT)

THURSDAY 17 SEPTEMBER 2026

09.00 - 10.30 Session S4 - Electrified Reactors, Power Supplies and Equipment

Chairmen: *to be announced*

09.00 - 09.15 [62] Marius Weiser, Siegfried Bajohr and Frederik Scheiff

Ohmic Heated Catalytic Reactor Structures: Design and Operational Stability Analysis

KIT (DE)

09.15 - 09.30 [35] Tim Irlweck, Claudius Stockinger and Ulrich Nieken

Inductive Heating of Chemical Reactors: Experimental and Numerical Investigations

Univ. Stuttgart (DE)

09.30 - 09.45 [14] Alejandro Pazvantov, Hector Sarnago and Oscar Lucia

Multi-Load Power Electronic Converter for Induction Heating Domestic Applications

Univ. Zaragoza (ES)

09.45 - 10.00 [13] Maxwell Rodriguez, Hector Sarnago, Jesus Acero and Oscar Lucia

Advanced electronic control architecture for electronic power converters applied to induction heating

Univ. Zaragoza (ES)

10.00 - 10.15 [59] Tianfeng Liu and Xiaobing Luo

An ultra-thin plate-level micropump for liquid cooling systems

Huazhong UST (CN)

10.15 - 10.30 [66] A. Doni, M. Lazzarin, N. Sinigaglia and M. Zerbetto

Thermographic Risk Assessment and Electromagnetic Optimization of an Induction Sealing Process

INOVA LAB (IT)

10.30 - 11.00 *Coffee Break*

11.00 - 12.30 Session S5 - Artificial Intelligence and Numerical Modelling for Electroheat

Chairmen: *to be announced*

11.00 - 11.15 [1] Antons Cvečkovskis

Physics-Informed Graph Neural Network for Fast Thermal Prediction in Induction Heating

CENOS (LV)

11.15 - 11.30 [7] Jesús Acero, Óscar Laherta, Denis Navarro, **Claudio Carretero**, Ignacio Lope and José-Miguel Burdío

Electromagnetic Property Identification of Domestic Induction Heating Loads using Neural Networks

Univ. Zaragoza (ES)

11.30 - 11.45 [37] Yuki Shimizu, Arata Takahashi, **Kengo Sugahara** and Keiko Sugahara

AI Agent-Based Automatic Mesh Generation for Induction Heating Simulation with Automatic Boundary Layer Control

Kindai Univ. (JP)

11.45 - 12.00 [41] Jakub Wyciślik and Sławomir Golak

Comparison of methods based on surrogate models on the example of induction heating process optimization

Silesian Univ. of Technology (PL)

12.00 - 12.15 [64] M. Zorzetto¹, R. Torchio^{1,2}, F. Lucchini¹, M. Forzan¹, and F. Dughiero¹

Discrepancy Correction in Surrogate Models for Nonlinear Thermal Problems

Univ. Padova (IT)

12.15 - 12.30 [46] Andrii Chepurnyi and **Andris Jakovičs**

Acceleration of numerical modeling of methane combustion using a plasma-chemical element in a gas turbine

12.30 - 13.30 Lunch

13.30 - 15.00 PANEL SESSION - AI and Electrification of Thermal Processes

Format: introduction by the moderator (5 min), moderated discussion among the panellists (60 min), Q&A with the audience (25 min).

Topics: the role of AI in the control and optimisation of electrothermal processes; digital twins and surrogate models; high-temperature electrification and green steel; industrial barriers to adoption.

Moderator: Fabrizio Dughiero - University of Padova (Conference Chair)

Panellists: to be announced in the next revision of the programme

15.00 - 15.45 Session S6 - Optimization, Measurement and Safety

Chairmen: *to be announced*

15.00 - 15.15 [19] Borja Lopez-Alonso, Jesus Acero, Eric Agudo, Enrique Gómez-Barrena, Héctor Sarnago and Oscar Lucía

Optimization of an Induction Heating Applicator for Implanted Prosthesis Disinfection

Univ. Zaragoza (ES)

15.15 - 15.30 [67] F. Dughiero, F. Lucchini, **P. Di Barba**, N. Sinigaglia and M. Lazzarin

ARTE: Contactless Temperature Estimation and Energy-Aware Power Optimization for Domestic Induction Hobs

Univ. Padova / Univ. Pavia (IT) · in collaboration with INOVA LAB

15.30 - 15.45 [40] Claudio Carretero, Oscar Lahuerta, Ignacio Lope and Jesus Acero

Self-Heating-Induced Offset Drift in NTC Thermistor for Domestic Induction Heating Systems

Univ. Zaragoza (ES)

15.45 - 16.15 Coffee Break

16.15 - 17.30 Session S6 - Optimization, Measurement and Safety (continued)

16.15 - 16.30 [22] Adrian Smagór, Paweł Gradoń, Grzegorz Moskal and Agnieszka Tomaszewska

The influence of heating power on the sinters microstructure of new cobalt superalloys from the Co-Al-W and Co-Ni-Al-W systems

Silesian Univ. of Technology (PL)

16.30 - 16.45 [11] Thomas Wondrak, **Max Sieger**, Lukas Krause and Sven Eckert

Current tomography for electroheat process monitoring

HZDR (DE)

16.45 - 17.00 [12] Thomas Wondrak, Max Sieger, Lukas Krause and Sven Eckert

Innovative industrial process monitoring by inductive measurements

HZDR (DE)

17.00 - 17.15 [20] Koen Van Reusel

Safety Assessment According to the European Legislation and IEC Standards Regarding the Industrial Use of Microwave Technology

Laborelec / KU Leuven (BE)

17.15 - 17.30 [48] Albert Smalcerz, Roman Przylucki and Jerzy Barglik

Some Aspects of Temperature Measurements in Induction Heating Systems

Silesian Univ. of Technology (PL)

19.30 - 22.30 Gala Dinner

09.00 - 10.30 Session S7 - Microwave and RF Processing

Chairmen: *to be announced*

- 09.00 - 09.15 [17] Muralimohan Juttu Vidyasagar**, Ralph Behrend, Hartmut Krause, Mareen Zöllner, Thomas Krampitz and Holger Lieberwirth
Microwave Assisted Recycling of CFRP Composites in a Continuously Operated Conveyor Belt Furnace - Process Parameters and Results
TU Freiberg (DE)
- 09.15 - 09.30 [47] Matteo Pola**, Irene Mellone and Matteo Albani
Scaling up Microwave-Assisted Pyrolysis for Plastic Valorization: Design and Ongoing Challenges
Univ. of Siena (IT)
- 09.30 - 09.45 [36] Ruth De Los Reyes**, Vicente Sanz, Eduard Palomares and Elias De Los Reyes
Laboratory-Scale adaptation of microwave air heating technology for very low gas flow rates
UPV Valencia (ES)
- 09.45 - 10.00 [44] Elena Colombini**, Magdalena Lassinantti Gualtieri, Isabella Lancellotti, Cristina Leonelli and Paolo Veronesi
Predictive models for copper slag based microwave susceptors
Univ. Modena e Reggio Emilia (IT)
- 10.00 - 10.15 [45] Paolo Veronesi**, Elena Colombini and Cristina Leonelli
Microwave and induction heating of green carbon anodes for aluminium production [title corrupted in the submission file - to be confirmed with the authors]
Univ. Modena e Reggio Emilia (IT)
- 10.15 - 10.30 [49] Carmen Alfaro**, Ismael Viejo, Javier Sagües, Alberto Pascual, Joaquin Javier Perez Aparicio, Begoña García, Ivan Echeverria, Jose Ignacio Tolosa, Ainhoa Bilbao, Paolo Veronesi, Elena Colombini, Marcel Mallah, Panagiotis Davris, Efthymios Balomenos and Marria Herrando
Microwave-Driven Electrification Strategies for High-Temperature Industrial Processes in Ceramic, Asphalt, and Aluminium Production
CIRCE + consortium (ES)
- 10.30 - 11.00 Coffee Break**

11.00 - 12.30 Session S8 - Electromagnetic Melting, Metallurgical Processes and Modelling

Chairmen: *to be announced*

- 11.00 - 11.15 [50] Valdis Bojarevics** and Koulis Pericleous
Marangoni Flow Effects in Levitated Droplets
Univ. of Greenwich (UK)
- 11.15 - 11.30 [52] Maksimilians Pīrs**, Aleksandrs Jegorovs, **Andris Jakovics** and Mihails Birjukovs
Simultaneous 2D Phase & Velocity Field Measurements for Hele-Shaw Bubble Flow in Liquid Metal
Univ. of Latvia (LV)
- 11.30 - 11.45 [53] Ansis Emīls Zīvers**, Ansis Ziemelis, Kristofers Rolands Kangīzers, Pēteris Zvejnieks and **Mihails Birjukovs**
Shape & Collective Dynamics in Geometrically Confined MHD Bubble Flow
Univ. of Latvia (LV)
- 11.45 - 12.00 [31] Vaclav Kotlan**, Iveta Petrasova, Radek Holota and Vjaceslav Georgiev
Numerical Shape Optimization for Uniform Direct Electrical Heating of Test Samples
Univ. West Bohemia, Pilsen (CZ)
- 12.00 - 12.15 [54] Ansis Emīls Zīvers**, Kristofers Rolands Kangīzers and **Mihails Birjukovs**
2WCF-SVD: 2-way consistent Farneback with SVD-based artifact filtering for multiphase optical flow velocimetry
Univ. of Latvia (LV)
- 12.15 - 12.30 [6] Mirco Fuchs** and Egbert Baake
Identification of anisotropic material properties and heat losses in soft magnetic composites
Leibniz Univ. Hannover (DE) · presented by K. Dadzis

12.30 - 13.00 Closing Session & Awards

Fabrizio Dughiero - University of Padova, Italy (Conference Chair)

Egbert Baake - Leibniz University Hannover, Germany

Koen Van Reusel - Laborelec / KU Leuven, Belgium

13.00 - 13.30 *Farewell Lunch - End of the Conference*

POSTER SESSION

Poster Session - Wednesday 16 September, 15.15 - 16.00

Chairmen: *to be announced*

- [16] **Pablo Burgos**, Héctor Sarnago and Oscar Lucia
Load detection strategy in new non-resonant inverters applied to domestic induction heating applications
Univ. Zaragoza (ES)
- [32] **Pablo Guillen**, Héctor Sarnago, Jose M. Burdio and Oscar Lucia
A Coupled Inductors Non-Resonant Inverter Topology for Domestic Induction Heating
Univ. Zaragoza (ES)
- [29] **Ignacio Alvarez-Gariburo**, Héctor Sarnago, Gabriel Costa, Fausto Rene Viteri, Tomás García-Martínez, Ramón Murillo Murillo and Óscar Lucía
Design and Implementation of a Power Electronic Generator for Induction-Heated Electrified Biomass Pyrolysis Reactors
Univ. Zaragoza (ES)
- [10] **Oscar Lahuerta Sediles**, Claudio Carretero Chamarro, Denis Navarro Tabernero and Jesus Acero Acero
Physics-Informed Neural Networks for characterizing thermistors immersed in a magnetic field
Univ. Zaragoza (ES)
- [18] **Borja Lopez-Alonso**, Ismael Perisé-Badía, Nicolás Dulanto, Héctor Sarnago, Óscar Lucía and Ignacio Ochoa
Electrical Characterization System for 3D Tumor Spheroid Models in In Vitro Electroporation Studies
Univ. Zaragoza (ES)
- [57] Victor Demidovich, Yuriy Perevalov and Fedor Chmilenko
Digital Twins of Induction Heaters in the Metallurgical Industry
SPbETU LETI (RU)
- [58] **Robert Goldstein**
Understanding What's Not on the Screen When Modeling Electromagnetic Processing
Fluxtrol Inc. (US)
- [60] **Guoqing Sun** and Xiaobing Luo
A High-performance miniature synthetic jet pump for cooling applications
Huazhong UST (CN)
- [65] M. Bullo, C. De Massari and C. Santoluce
RF Heating for an Energy Storage System Developed in the Horizon Europe Project HYSTORE
INOVA LAB (IT)

SUMMARY

Oral presentations: 51 in 8 sessions, single track, no parallel sessions

Poster presentations: 9 in one session, Wednesday 16 September, 15.15 - 16.00

Duration of each talk: 15 minutes: 12 for the presentation, 3 for discussion

Countries represented: 16