UIE-2024 Conference Program
Nice, France October 8th-11th, 2024

Tuesday, October 8th, 2024:

17:00 - 19:30: Registration at the conference venue
19:30 - 21:00: Welcome Cocktail at the conference venue

Wednesday, October 9th, 2024:

08:30 - 09:00: Conference opening: F. Bay, J. Alves, K. Van Reusel, E. Baake

09:00 - 09:30: Keynote 1: Exposure of workers and the general public to magnetic fields at 50 Hz
Prof. K. Van Reusel
Laborelec, Rodestraat 125, B-1630 Linkebeek, Belgium

09:30 - 10:30: Decarbonisation of Thermal Processes by Electrification – 1
Chairman: Prof. K. Van Reusel

09:30 - 09:50: Electrification - A sustainable solution for defossilization of thermoprocess technologies
E. Baake, I. Niedzwiecki
Leibniz University Hannover, Institute of Electrotechnology Wilhelm-Busch-Str. 4, D-30167 Hannover, Germany

09:50 - 10:10: Towards sustainable decarbonization of industrial heat treatment processes
S. El Aouad, G. Lissoni, L. Ratte, L. Sardo
Sciences Computers Consultants, 10 rue du plateau des Glières, 42 000 Saint-Etienne, France

10:10 - 10:30: Evaluation of the substitution potential of fossil burners by resistive heating elements in existing thermoprocessing applications
I. Niedzwiecki, E. Baake
Leibniz University Hannover, Institute of Electrotechnology Wilhelm-Busch-Str. 4,D-30167 Hannover, Germany

10:30 - 11:00 - Coffee-Break

11:00 - 12:20: Decarbonisation of Thermal Processes by Plasma Heating
Chairman: Prof. E. Baake

11:00 - 11:20: Development of an inductive hot gas torch for the decarbonization of metallurgical processes
L. Mastaler[1], G. Wolf[1], A. Keßler[1], T. Buddenberg[2], M. Rische[3], M. Ennen[3],
[1]TU Bergakademie Freiberg, foundry department, Bernhard-von-Cotta Straße 4, 09599 Freiberg, Germany,
[2]Mitsubishi Heavy Industries EMEA Ltd. Düsseldorf Branch Office, Kennedydamm 19, 40476, Düsseldorf, Germany
[3]ABP Induction Systems GmbH, Kanalstraße 25, 44147, Dortmund, Germany

11:20 - 11:40: High Power Plasma Torches Enabling the Decarbonization of High-Temperature Industrial Processes
N. Alavandar, S. Salem, H. Basche, G. Hintz, E. Mann, C. Winnewisser
TRUMPF Hüttinger GmbH + Co. KG, Freiburg, Germany

11:40 - 12:00: Substitution of fossil Combustion in Industrial high-temperature processes by Advanced Electrical and plasma heating technologies – the CITADEL project
D. Castano, G. Dolanc, S. Eckert, N. Egido, A. Gebremariam, B. Glaser, C. Grabner, J. Jyrinki, G. Krese, C. Leyva, M. Mallah, P. Perumal, R. Pio Iavagnillio, I. Unamuno
Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Department Magnetohdydrodynamics, Bautzner Landstraße 400, 01328 Dresden, Germany

12:00 - 12:20: Investigations on flexible ladle preheating procedures using plasma heated refractory
B. Glaser[1], M. Holmström[1], H. Köchner[2], D. Sundberg[3], A. Arteaga[4], N. Egido[4], R.P. Iavagnilio[5], F. Boenzi[5]
[1]Kungliga Tekniska Högskolan, Department of Materials Science and Engineering, Brinellvägen 23, 10044 Stockholm, Sweden
[2]ASenSo GmbH, Am Birkengraben 12, 50259 Pulheim, Germany
[3]ScanArc Plasma Technologies AB, Sweden
[4]Sidenor Investigacion y Desarrollo SA,Spain
[5]Politecnico di Bari, Italy

12:20 - 13:20 – Lunch

13:20 - 14:20: Roundtable 1 "Decarbonization of Industrial Thermal and Manufacturing Processes"
E. Baake
Leibniz University Hannover Institute of Electrotechnology Wilhelm-Busch-Str. 4, D-30167 Hannover

14:20 - 15:20: Induction heating and heat treatment processes - 1
Chairman: Prof. F. Dughiero

14:20 - 14:40: Induction heating for energy and CO2 savings in hot rolling mills,
M. Ennen, M. Rische, A. Walther
ABP Induction Systems GmbH, Kanalstr. 25, 44147 Dortmund, Germany

14:40 - 15:00: Saturated induction heating of magnetic metals: a case study
A. Morandi, M. Fabbri, M. Simonazzi, G. Russo, E. Guerra and F. Mimmi
University of Bologna - Dep. of Electrical, Electronic and Information Engineering
Viale Risorgimento n. 2, 40136 Bologna, Italy

15:00 - 15:20: Suitability of the additive FFF process for copper induction coils,
J. Kimme, J. Gruner, A. Fröhlich, A. Kunke
Technische Universität Chemnitz, Straße der Nationen 62, D-09111 Chemnitz, Germany

15:20 - 15:50 - Coffee-Break

15:50 - 17:30 Induction heating and welding processes
Chairman: Dr. A. Smalcerz

15:50 - 16:10: Simulation of electrically assisted welding processes
S. Marie[1], J. Alves[1], J. Queval[2], K. Mocellin[3], F. Bay[3]
[1] TRANSVALOR S.A, 950 avenue Roumanille, F-06904 Sophia Antipolis, France
[2] Université Bretagne Sud, Institut de Recherche Dupuy de Lôme F-56321, Lorient, France
[3] CEMEF Mines Paris, PSL University, Rue Claude Daunesse F-06904 Sophia Antipolis, France

16:10 - 16:30: Characterization of Soft Magnetic Composite Impeders
S. Muyskens, R. Goldstein
Fluxtrol Inc. 1388 Atlantic Blvd., Auburn Hills MI, 48326, United States

16:30 - 16:50: Geometry optimization and efficiency increase of HFI welding processes while using SMC materials in impeders
D. Günther[1], M. Kroll[1], R. C. Goldstein[2], A. Kunke[1]
[1]Technische Universität Chemnitz Reichenhainer Straße 70, 09126 Chemnitz, Germany
[2] Fluxtrol Inc. 1388 Atlantic Blvd. Auburn Hills MI, 48326, United States

16:50 - 17:10: Advanced designing of induction heating systems with magnetic flux concentrators
A. Nikanorov, E. Baake, I. Niedzwiecki, Y. Zhou
Leibniz University Hannover Institute of Electrotechnology Wilhelm-Busch-Str. 4 D-30167 Hannover, Germany

17:10 - 17:30: Design of an inductive sinter module for power packaging: FEM analysis and thermal management characterization based on multi-die applications
C. Hofmann[1], P. Rochala[2]
[1]Fraunhofer Institute for Electronic Nanosystems Technologie-Campus 3, 09126 Chemnitz, Germany
[2]University of Technology Chemnitz Reichenhainer Straße 70, 09126 Chemnitz, Germany

17:30 - 18:10 Induction heating and heat treatment processes - 2
Chairman: Prof. M. Forzan

17:30 - 17:50: Pushing the Boundaries of High-Temperature Process Heat: Demonstration of the First-of-its-kind Ceramic Induction Air Heater
S. Belik
German Aerospace Center, Institute of Engineering Thermodynamics Pfaffenwaldring 38-40, 70569 Stuttgart, Germany

17:50 - 18:10: Generation of Hot Gas Based on Susceptor Induction Heating
A. Hackert[1], J.Stiller[1], V. Kotlan[2], D. Nestler[1]
[1]Technische Universit¨at Chemnitz – Reichenhainer Straße70 09126 Chemnitz, Germany
[2]University of West Bohemia – Univerzitni 2732/8, 306 14 Pilzen 3, Czech Republic

18:10 - 18:30: FISUEL presentation
M. Maslowski
Presentation of FISUEL (International Federation for the Safety of Electricity Users)
CONSUEL, 6 Espace Henry Vallée, F-69007 Lyon, France

Thursday, October 10th, 2024:

09:00 - 09:30: Keynote 2: Advancing Industrial Electric Furnace Operation and Design Through Mathematical Modeling and Simulation Insights
Prof. D. Gómez
A. Bermúdez, D. Gómez, D. González-Peñas
Galician Centre for Mathematical Research and Technology (CITMAga)
Department of Applied Mathematics, Universidade de Santiago de Compostela Lope Gómez de Marzoa s/n, 15782 Santiago de Compostela, Spain

09:30 - 10:30: Optimisation and Machine-Learning Tools for Design of Electromagnetic-Coupled Processes - 1
Chairman: Dr. J. Alves

09:30 - 09:50: Smart-Tune: Optimizing Induction Hardening with Automatic Model Calibration
R. Klesa, V. Kotlan
University of West Bohemia, Univerzitni 8 30614, Pilsen, Czech Republic

09:50 - 10:10: Simulation of multi-physics processes based on Lagrangian formulations. Application to an industrial problem of electric upsetting
M. Benítez[1], A. Bermúdez[12], P. Fontán[12], I. Martínez[12], P. Salgado[1]
[1]Galician Centre for Mathematical Research and Technology (CITMAga) , Department of Mathematics, Universidade da Coruña, Elviña s/n, 15071 A Coruña, Spain
[2]Galician Centre for Mathematical Research and Technology (CITMAga) , Department of Applied Mathematics, Universidade de Santiago de Compostela Lope Gómez de Marzoa s/n, 15782 Santiago de Compostela, Spain

10:10 - 10:30: Process optimization in foundries with numerical methods
A. Umbrasko
ABP Induction Systems GmbH, Kanalstraße 25 D-44147 Dortmund, Germany

10:30 - 11:00 - Coffee-Break

11:00 - 12:30: Optimisation and Machine-Learning Tools for Design of Electromagnetic-Coupled Processes - 2
Chairman: Prof. F. Bay

11:00 - 11:20: Surrogate Model of a Dual Frequency Induction Heating Device: a Neural Network Approach for Fast Synthesis
P. Di Barba[1], M.E. Mognaschi1[1], A. Ghafoorinejad[1], F. Dughiero[2], S. Lupi[2], E. Sieni[3], M. Forzan[2]
[1]Dept. of Electrical Computer and Biomedical Engineering,University of Pavia, Pavia, Italy
[2]Dept of Industrial Engineering, University of Padova, Padova, Italy
[3]Dept of Theoretical and Applied Sciences, University of Insubria, Varese, Italy

11:20 - 11:40: Towards hybrid FEM-AI simulation and optimization of electrically driven material processing technologies
J. Alves[1], M. Chenaud[1,2], A. Pion[1,2], F. Magoules[2], E. Vazquez[2]
[1]Transvalor S.A, E-Golf Park, 950 Avenue Roumanille, F-06410 Biot, France
[2]CentraleSupélec, Université Paris Saclay, 3 rue Joliot, 91190 Gif-sur-Yvette, France

11:40 - 12:00: Anisotropic Mesh Adaptation for Electromagnetic Modelling
J. Garcia Oswaldo[1], J. Alves[1], U. Ripert[1], J. Barlier[1], F. Bay[2]
[1]Transvalor S.A, E-Golf Park, 950 Avenue Roumanille, F-06410 Biot, France
[2]CEMEF Mines Paris, PSL University, Rue Claude Daunesse F-06904 Sophia Antipolis, France

12:00 - 12:20: Lifting capability analysis of a Longitudinal Electromagnetic Levitator prototype
F. Lucchini[1], G. Poggiana[1], M. Zorzetto[1], R. Torchio[1,3], M. Forzan[1], F. Dughiero[1], P. Di Barba[2]
[1]Dept of Industrial Engineering, University of Padova, Padova, Italy
[2]Dept. of Electrical Computer and Biomedical Engineering, University of Pavia, Pavia, Italy
[3]Dept of Information Engineering, University of Padova, Padova, Italy

12:20 - 13:20 - Lunch

13:20 - 14:20 - Roundtable 2 "Smart Processes: Integrating AI and Digitalization in electro-Thermal Manufacturing"
J. Alves
Transvalor S.A, E-Golf Park, 950 Avenue Roumanille, F-06410 Biot, France

14:20 - 15:20: Numerical Simulation of Electromagnetic-Coupled Processes
Chairwoman: Prof. D. Gómez

14:20 - 14:40: Numerical Investigation of Motion in Oxide Molten Using Indirect Induction Heating
J. Hrbek, V. Putna, B. Mészáros
Research Centre Rez, Hlavní 130, 250 68 Husinec, Czech Republic

14:40 - 15:00: Numerical Simulation of Macrosegregation in Casting Processes with Application of Electromagnetic Stirring
A. Gotti, S. Zhang, G. Puaux, F. Costes
Transvalor S.A, E-Golf Park, 950 Avenue Roumanille, F-06410 Biot, France

15:00 - 15:20: Simulation of an industrial scale reducing electric furnace
D. Van Odyck
Tata Steel R&D, Ijmuiden, The Netherlands

15:20 - 15:50 - Coffee Break

15:50 - 17:10: Induction Cold Crucible and Skull Melting Processes
Chairman: Prof. V. Bojarevics

15:50 - 16:10: Electrical efficiency of cold crucible furnaces - modeling and measurements,
A. Smalcerz, J. Barglik, R. Przylucki, A. Smagór
Faculty of Material Science, Silesian University of Technology, Akademicka 2A, 44-100 Gliwice, Poland

16:10 - 16:30: Advancements in Cold Crucible Induction Glass Melting: Enhancing Glass Homogeneity and Thermal Dynamics through Numerical Modeling
E. Sauvage[1], P. Brun[1], R. Didierlaurent[2]
[1]CEA, DES, ISEC, CEA, Marcoule, F-30207 Bagnols sur Cèze, France
[2]Orano Cycle Marcoule, F-30207 Bagnols sur Cèze, France

16:30 - 16:50: Cold crucible induction melting as an alternative to the electric arc furnace for the production of fused oxides
A. Villalba Weinberg, A. Börger
Imerys Villach GmbH, Dpt. Imerys Technology Center Austria Seebach 2, 9523 Villach, Austria

16:50 - 17:10: The use of ISM technology in metal alloy refining processes,
A. Smalcerz[1], J. Łabaj[1], B, Wecki[2], L. Blacha[1]
[1]Faculty of Material Science, Silesian University of Technology, Akademicka 2A, 44-100 Gliwice, Poland
[2]ZETOM, Ks. Bpa H. Bednorza 17, 40-384 Katowice, Poland

17:10 - 18:10: Electromagnetic Melting and Stirring Processes
Chairman: Dr. V. Kotlan

17:10 - 17:30: Axial Flux Stirrer for Continuous Casting of Thin Aluminium Strips
M. Forzan[1], M. Guglielmi[2], D. Iosa[3], G. Pirovano[3], P. Severini[3]
[1]Dept of Industrial Engineering, University of Padova, Padova, Italy
[2]Leibniz University Hannover, Institute of Electrotechnology Wilhelm-Busch-Str. 4, D-30167 Hannover, Germany
[3]Continuus-Properzi S.p.A, via Emilia km 310, 26858 Sordio (LO), Italy

17:30 - 17:50: Extended Electrode Induction Melting Technique for Metallic Powder Production
V.Bojarevics, K.Pericleous
University of Greenwich, London, UK

17:50 - 18:10: EM control of free surface dynamics in the direct strip casting process
V. Dzelme, A. Jakovics
Institute of Numerical Modelling University of Latvia, 3 Jelgavas str., Riga, Latvia

19:30 - Gala Dinner at the Aston Hotel

Address: Hôtel Aston La Scala Nice, 12 Av. Félix Faure, 06000 Nice

Friday, October 11th, 2024:

09:00 - 09:30: Keynote 3: A process condition selection chart for MW-assisted synthesis
Prof. P. Veronesi
P. Veronesi, E. Colombini, C. Leonelli
Department of Engineering "Enzo Ferrari" University of Modena and Reggio Emilia I-41121 Modena, Italy

09:30 – 10:30: Decarbonisation of Thermal Processes by Electrification - 2
Chairman: Prof. A. Jakovics

09:30 - 09:50: Investigations on heat transfer of electrical resistance heaters in convection-dominated thermal processing plants
J. Wilkers, D. Büschgens, J. Hof, H. Pfeifer, C. Wuppermann
Department for Industrial Furnaces and Heat Engineering, Kopernikusstr. 10 D-52074 Aachen, Germany

09:50 - 10:10: Maximizing decarbonization through electrification of process heat: A comparative analysis for low-to-high temperature applications
A. Chiesa, M. Colombi, S. Quevedo, P. Colbertaldo, M. Binotti. M. Romano
Politecnico di Milano, Department of Energy, via Lambruschini 4, 20156 Milano, Italy

10:10 - 10:30: Electrification and flexible operation of a cement manufacturing plant
S. Quevedo, M. Romano
Politecnico di Milano, Department of Energy,Via Lambruschini 4, 20156 Milano, Italy

10:30 - 11:00 - Coffee-Break

11:00 - 12:20: Dielectric Heating and Electromagnetics in Process Control and Monitoring
Chairwoman: Prof. C. Leonelli

11:00 - 11:20: Investigation of Wafer-Level Electromagnetic Heating of Metallic Frames at Radio Frequencies: Analysis and Characterization of Standing Waves
S. Panhale[1], C. Hofmann[2], M. Kroll[1], P. Rochala[1]
[1]Chemnitz University of Technology Professorship of Forming Technology, 09126 Chemnitz, Germany
[2]Fraunhofer Institute for Electronic Nanosystems ENAS, Technologie-Campus 3 09126 Chemnitz, Germany

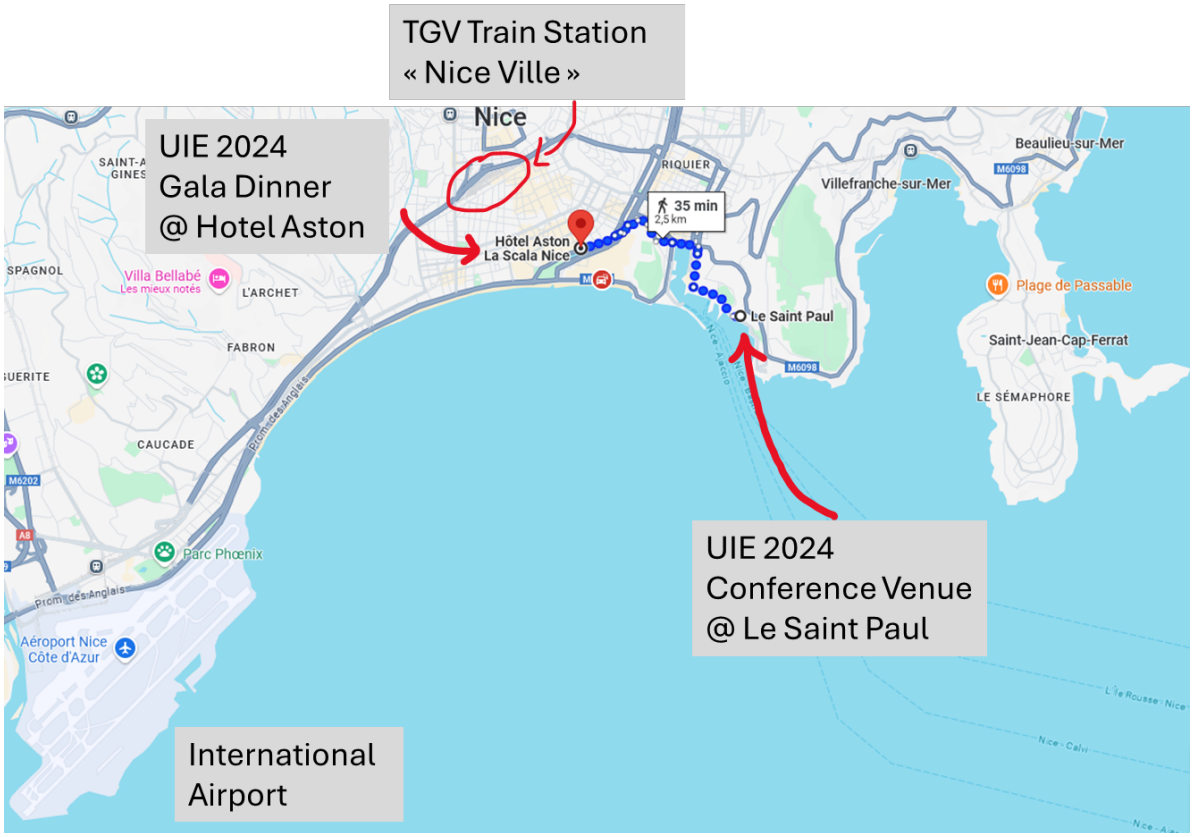
11:20 - 11:40: Microwave heating as electrification option for the cement industry
J. Vermeiren[1], V. Goovaerts[2], C. Groffils[2], J. Vleugels[1]
[1]KU Leuven, Department of Materials Engineering Kasteelpark Arenberg 44 bus 2450, 3001 Heverlee, Belgium
[2]MEAM bv Centrum Zuid 3060, 3530 Houthalen-Helchteren, Belgium

11:40 - 12:00: Optical imaging of bubble flow in external magnetic field
A. Jegorovs, M. Birjukovs, A. Jakovics
University of Latvia, Institute of Numerical Modelling, Jelgavas Str. 3, Riga LV-1002, Latvia

12:00 - 12:20: Innovative industrial process monitoring by inductive measurements
T. Wondrak, M. Sieger, L. Krause, S. Eckert
Helmholtz-Zentrum Dresden-Rossendorf, Institute of Fluid Dynamics, Department Magnetohdydrodynamics, Bautzner Landtraße 400, 01328 Dresden, Germany

12:20 - 12:45: Conference closure: F. Bay, J. Alves, K. Van Reusel, E. Baake

Practical information:



Getting to Nice City Center and the conference venue:

- **Arrival at Nice international airport**: Take the tram line 2 bound to “Port lympia”, get off at the terminal, from here you can walk for 15 minutes to the Saint Paul hotel, or wait for the bus 98 and get off at “La Réserve”, from here, just 2 minutes’ walk to the hotel.
- **Arrival at Nice TGV train station**: walk towards the tram station “Gare thiers”, take the line 1 bound to “Hôpital Pasteur”, get off at “Garibaldi” tram stop, you can walk for 25 minutes or get the bus 98 at “Garibaldi/Le Château” bus stop, get off at “La Réserve”, from here, just 2 minutes’ walk to the hotel.

Recommendations:

- Make sure to visit « La Colline du Château » hill just that it’s just in between Nice Old Twon and the port.
- Take the time to walk around and get lost within Nice Old Twon and enjoy the Mediterranean styled and colorful buildings.
- A photo at the #I Love Nice in front of the sea will certainly be a good souvenir.