



Västerås, Sweden
September 25-28, 2023

64th International Conference of Scandinavian Simulation Society

SIMS 2023

Credit photo front page: *Pia Nordlander & Hans Nordlander (bottom photo), Avig Kazanjian (top photo), © Västerås marknad & näringsliv AB*

About the Conference

The **SIMS2023 conference** covers broad aspects of recent research and development work in modeling, simulation and optimization in engineering applications. The scientific program includes 2 keynote sessions, 1 panel session, 15 technical sessions with 53 full-length peer-reviewed original contributions, and a poster session.

The conference themes include:

- Modeling and simulation for design, planning, optimization, control, and monitoring
- Tools for modeling and simulation, numerical methods for simulation, novel techniques
- Visualization of modeling and simulation results
- Practical case studies of industrial automation

The conference application areas include:

- Renewable energy systems: bioenergy and biofuels, geothermal, hydro, solar, thermal, wave, tidal, and wind energy
- Hydrogen technologies: production, storage and transportation, hydrogen value chain
- Energy systems: electric power, energy storage, fuel cells, heat pumps, industrial plants, energy use in buildings, power plants
- Transportation: automotive, hybrid and electrical vehicles, marine, infrastructure
- Industrial processes including carbon capture and storage, chemical processing, hydrogen production, oil and gas, and water treatment
- Cyber-physical systems
- Biosystems and medical systems

The conference proceedings will be published open access through *Linköping Electronic Conference Proceedings* (peer reviewed). Selected articles will be published in two special issues with MDPI *Energies* and *Applied Sciences*.

For last minute updates please check the conference webpage: <https://scansims.org/>

About SIMS

SIMS is the Scandinavian Simulation Society with members from the five Nordic countries Denmark, Finland, Norway, Sweden and Iceland. The SIMS history goes back to 1959. SIMS practical matters are taken care of by the SIMS board. It consists of two representatives from Denmark, Finland, Norway, Sweden, and Iceland. The SIMS annual meeting takes place at the annual SIMS conference or in connection to international simulation conferences arranged in the Nordic countries.

SIMS2023 Hosting and Sponsoring Institutions

MDU Mälardalen University

LiU Linköping University

AR Automation Region

TFEK Tekniska Föreningen i Västerås med Elektriska Klubben

SIMS2023 Conference Chair

Prof. Konstantinos Kyprianidis (Mälardalen University)

SIMS2023 Organizing Committee

Prof. Konstantinos Kyprianidis (Mälardalen University)

Prof. Erik Dahlquist (Mälardalen University)

Dr. Ioanna Aslanidou (Mälardalen University)

Dr. Avinash Renuke (Mälardalen University)

Dr. Hao Chen (Mälardalen University)

Dr. Amare Desalegn Fentaye (Mälardalen University)

Dr. Valentin Scheiff (Mälardalen University)

Dr. Valentina Zaccaria (Mälardalen University)

Dr. Amir Vadiiee (Mälardalen University)

Dr. Stavros Vouros (Mälardalen University)

Dr. Xiaodan Shi (Mälardalen University)

Prof. Mirko Morini (University of Parma)

Dr. Gaurav Mirlekar (University of South-Eastern Norway)

Dr. Vadim Engelson (Wolfram MathCore AB)

Prof. Tiina Komulainen (Oslo Metropolitan University)

Prof. Esko Juuso (University of Oulu)

Prof. Lars Eriksson (Linköping University)

SIMS2023 Industrial Organizing Committee

Dr. Lokman Hosain (Hitachi-Energy Research)

Dr. Moksadur Rahman (ABB)

Dr. Esin Iplik (Linde)

Prof. Rebei bel Fdhila (Hitachi-Energy Research)

Schedule at a Glance

KL: Keynote Lecture | **PAN:** Panel Session | **PSX:** Parallel Sessions (X papers)
POS: Poster Session | **LT:** Lab Tour

Monday, September 25th

Social Program	
16:30	Gathering at Prison Island main entrance (Kopparbergsvägen 13, 722 13)
16:45-18:45	Social activity for doctoral students
18:45-19:00	Short walk to Ruths Ölhus Västerås (Stora Gatan 3, 722 12)
19:00-22:00	Dinner for doctoral students

Tuesday, September 26th

8:30-9:00	Registration, Steam Hotel			
9:00-9:15	Opening and Welcome: Prof. Tiina Komulainen (Oslo Metropolitan University) Prof. Konstantinos Kyprianidis (Mälardalen University)			
9:15-09:50	KL	Keynote Lecture: <i>Automation and Industrial Autonomy</i> , Dr. Alf Isaksson (ABB, Sweden)		
9:50-10:50	PAN	Panel Session: <i>Simulation and Modelling in Energy Transition and Future Directions</i> Panelists: Dr. Claes Orsholm (CEO of Savantic AB) Prof. Rebei Bel Fdhila (Fellow, Hitachi Energy Research & Mälardalen University) Dr. Jianping Wang (Senior Principal Scientist, Hitachi Energy Research) Dr. Nina Shulumba (Hitachi Energy Research) Dr. Adhemar Araoz (Energy and Processes, Modelon AB) Dr. Stefan Thorburn (Senior Principal Scientist, ABB) Dr. Eva Nordlander (Energimyndigheten) Ms Elena Tomas-Aparicio (Manager, Sweco) Moderators: Dr Lokman Hosain (Hitachi Energy Research, Sweden) Dr Moksadur Rahman (ABB, Sweden) Dr Esin Iplik (Linde, Sweden)		
10:50-11:20	Coffee Break			
11:20-13:00	PS4	Technical Session: <i>T1-1 Hydrogen</i>	Technical Session: <i>T1-2 Machine Learning Applications I</i>	Technical Session: <i>T1-3 Modelling Applications I</i>
13:00-14:15	Lunch at The Chamberlin Grill (inside Steam Hotel)			
14:15-15:55	PS4	Technical Session: <i>T2-1 District Heating I</i>	Technical Session: <i>T2-2 Machine Learning Applications II</i>	Technical Session: <i>T2-3 Bio-Based Energy Systems</i>
15:55-16:15	Coffee Break			
16:15-17:30	PS3	Technical Session: <i>T3-1 Heat Pumps</i>	Technical Session: <i>T3-2: Energy Storage & Wind Energy</i>	Technical Session: <i>T3-3 Oil & Gas Applications</i>
17:30	End of Day 1			
17:30-18:30	SIMS Annual Meeting			
18:30-19:30	History and tour of the powerplant at Steam Hotel (pre-registered only)			
19:30	Conference Dinner at The Grand Hall (inside Steam Hotel)			

Wednesday, September 27th

9:00	Start of Day 2, Steam Hotel			
9:00-11:05	PS5	Technical Session: <i>W1-1 District Heating II + TUTORIAL</i>	Technical Session: <i>W1-2 CO₂ Capture Processes</i>	Technical Session: <i>W1-3 Building & Solar Energy Systems</i>
11:05-11:35	Coffee Break			
11:35-12:20	KL	Keynote Lecture: <i>Power System protection: Demand, Trends and Challenges</i> Dr. Jianping Wang (Hitachi Energy Research, Sweden)		
12:20-13:00	POS	Poster Session Organiser: Dr. Valentin Scheiff (Mälardalen University) Dr. Eva Thorin (Mälardalen University)		
13:00-14:15	Lunch at The Chamberlin Grill (inside Steam Hotel)			
14:15-15:55	PS4	Technical Session: <i>W2-1 Modelling Applications II</i>	Technical Session: <i>W2-2 Propulsion Applications</i>	Technical Session: <i>W2-3 Power-to-X + TUTORIAL</i>
15:55-16:15	Coffee Break			
16:15-17:00	Best Paper Awards & Closing Prof. Tiina Komulainen (Oslo Metropolitan University) Prof. Erik Dahlquist (Mälardalen University)			
17:00	End of Technical Program			

Thursday, September 28th

Laboratory Tour Program (Chair: Dr Hao Chen, Dr Valentin Scheiff, Prof. Erik Dahlquist)	
8:00	Gathering at Steam Hotel main entrance (meeting point)
8:15-8.30	Shuttle bus leaves from Steam Hotel to Grindtorpsängen
8:30-9:00	LT Lab Tour of MDU pilot test-bed at Grindtorpsängen.
9:00-9:15	Shuttle bus leaves from Grindtorpsängen to MDU, Västerås Campus
9:15-10:00	LT Lab tour of Future Energy Center experimental facilities.
10:00-10:15	Walk from MDU campus to Hitachi-Energy at the Mimer complex
10:15-12:00	LT Participation in Industry Expo event at Hitachi Energy
12:00-14:00	Lunch and Mingle
14:00	End of Laboratory Tour Program

Keynote Session Program

Keynote Lecture 1: *Automation and Industrial Autonomy* by **Dr. Alf Isaksson** (ABB, Sweden)



About the speaker: Alf Isaksson received an MSc in Computer Engineering and a PhD in Automatic Control, in 1983 and 1988 respectively, both from Linköping University, Sweden. He stayed at Linköping University until 1991 as an Assistant Professor. From 1991 to 1992 he spent one year as a Research Associate at The University of Newcastle, Australia. Returning to Sweden in 1992 Isaksson moved to the Royal Institute of Technology (KTH) in Stockholm, where eventually in 1999 he was promoted to full Professor. In 2001 he made the shift from academic to industrial research and joined ABB Corporate Research in Västerås, Sweden, where he has held several different positions. Most prominently, from January 2014 until March 2019 he was Group Research Area Manager coordinating all Control research globally at ABB Corporate Research. Meanwhile Isaksson still kept a

connection to the academic world as Adjunct Professor in Automatic Control at Linköping University 2006-2015. At ABB he is now Corporate Research Fellow for Automation and Control, and from November 2021 also back in academia as Adjunct Professor at KTH, Stockholm, Sweden. He is Senior Member of IEEE since 2003, Member of the Royal Swedish Academy of Engineering Sciences since 2013 and was in 2023 appointed IFAC Fellow.

Keynote Lecture 2: *Power System protection: Demand, Trends and Challenges* by **Dr. Jianping Wang** (Hitachi-Energy Research, Sweden)



About the speaker: Jianping has obtained his Ph.D in Belgium in 1993 in power system automation area. He joined ABB in 1995 and worked with different roles such as R&D engineer, application specialist, system engineer, technical market manager, technical director, and senior principal scientist within ABB until June of 2019. Since summer of 2019, Jianping has been working as a senior principal scientist in Hitachi Energy Research Center within Hitachi Energy AB in Vasteras in Sweden. Jianping's main interested area is power system protection. Jianping has published more than 50 papers in the related international conferences and journals and co-invented more than 30 patents in power system protection domain. Jianping is a fellow of IET and senior member of IEEE as well as CIGRE B5-55 working group regular member representing Sweden CIGRE.

Poster Session Program

<i>Wednesday, September 26th</i>	12:20-13:00
POSTER SESSION	
Holistic approach forwards a data driven sensor technology for underground mining safety <i>Madeleine Martinsen</i>	
Simulation of Hydronic Underfloor Heating with the finite element method <i>Joakim Nyberg</i>	
Optimizing Energy storage at transformer stations: a technical study <i>Pontus Netzell</i>	
Harnessing Industrial Batch Process Data for Effective Remaining Useful Life (RUL) Modelling <i>Simon Mählkvist, Wilhelm Söderkvist Vermelin and Konstantinos Kyprianidis</i>	
Heat and Power Laboratory at Mälardalen University <i>Valentin Scheiff</i>	
Environmental Impact of Electrification in Parallel-hybrid Turbofan <i>Dimitrios Bermperis, and Stavros Vouros and Konstantinos Kyprianidis</i>	
Approach for simulation of energy system planning and operation using resilience framework <i>Kasuni Guruvita</i>	
Session Chair: <i>Dr. Valentin Scheiff (Mälardalen University)</i> Session Co-Chair: <i>Dr. Eva Thorin (Mälardalen University)</i>	

Parallel Session Program

Tuesday, September 26th		11:20-13:00
T1-1: Hydrogen		
3261	Sustainability analysis and simulation of PEM electrolysis for green hydrogen production <i>Jordi Béjar Rabascall and Gaurav Mirlekar</i>	
4391	Insight into the thermodynamic model for reforming of methane over nickel catalyst <i>Rakhi, Vivien Günther, Tim Franken and Fabian Mauss</i>	
5488	A Comparison of Strain Gauge Measurements and FEA for a Confined Channel Geometry Subjected to a Hydrogen-Air Mixture Explosion <i>Daniel Eckhoff, Magne Bratland and Mads Mowinckel</i>	
6568	Simulation of blue hydrogen production <i>Chidapha Deeraksa and <u>Britt Margrethe Emilie Moldestad</u></i>	
Session Chair: <i>Dr. Valentina Zaccaria (Mälardalen University)</i> Session Co-Chair: <i>Mr. Jean-Paul André (Örebro University)</i>		
T1-2: Machine Learning Applications I		
792	Applied Machine Learning for Electric Load Forecasting in a Swedish City <i>Pontus Netzell, Hussain Kazmi, Moksadur Rahman and Konstantinos Kyprianidis</i>	
877	Design of a data-driven method for reliability improvement in the investment casting process <i>Antonia Antoniadou, Konstantinos Kyprianidis, Ioanna Aslanidou, Anestis Kalfas and Dimitrios Siafakas</i>	
5899	Information extraction from operator interface images using computer vision and machine learning <i>Eirik Illing, Nils-Olav Skeie and Ole Magnus Brastein</i>	
7175	Data-driven reinforcement learning-based parametrization of a thermal model in induction traction motors <i>Anas Fattouh and Smrutirekha Sahoo</i>	
Session Chair: <i>Dr. Amare Desalegn Fentaye (Mälardalen University)</i> Session Co-Chair: <i>Mr. Muhammad Baqir Hashmi (University of Stavanger)</i>		
T1-3: Modelling Applications I		
1776	Modelling approaches for control design by simulations - Heat exchanger application and lessons learned <i>Matias Waller and Leonardo Espinosa Leal</i>	
2599	Visualization of Industrial Production Processes using 3D Simulation Software for Enhanced Decision-Making <i>Akshay Goyal</i>	
4005	Model implementation of a bolted joint in Modelica <i>Nils Dressler and Lars Eriksson</i>	
4134	Numerical Investigation on Performance of Gas Turbine Blade: Effects of simulation Models and Blade Geometry <i>Heng Hu, Narmin Hushmandi and Magnus Genrup</i>	
Session Chair: <i>Dr. Moksadur Rahman (ABB)</i> Session Co-Chair: <i>Dr. Ioanna Aslanidou (Mälardalen University)</i>		

T2-1: District Heating I

2943	Optimal flexibility for thermal peak shaving in district heating substations <i>Mathilda Cederbladh, August Dahlberg, Stavros Vouros, Konstantinos Kyprianidis, Costanza Saletti and Mirko Morini</i>
9211	An embedded industrial control framework for model predictive control of a district heat substation <i>Joakim Örnescans, Konstantinos Kyprianidis, Stavros Vouros and Gunnar Bengtsson</i>
9680	Machine learning assisted adaptive heat load consumption forecasting in district heating network <i>Avinash Renuke, Stavros Vouros and Konstantinos Kyprianidis</i>
	EMPTY SLOT

Session Chair: Prof. Mirko Morini (University of Parma)

Session Co-Chair: Ms. Claudia Balan (Mälardalen University)

T2-2: Machine Learning Applications II

5496	A Deep Learning Approach for Fault Diagnosis of Hydrogen Fueled Micro Gas Turbines <i>Muhammad Baqir Hashmi, Mohammad Mansouri, Amare Desalegn Fentaye and Shazaib Ahsan</i>
6920	Banks of Gaussian Process Sensor Models for Fault Detection in Wastewater Treatment Processes <i>Heidi Lynn Ivan and Jean-Paul André Ivan</i>
2239	Multimodal sensor suite for identification of flow regimes and estimation of phase fractions and velocities – Machine Learning Algorithms in Multiphase flow metering and Control <i>Noorain Syed Kazmi, Ru Yan, Håkon Viumdal and Saba Mylvaganam</i>
3506	Phase Fractions and Velocities in Multiphase Flow – Estimation using Sensor Data Fusion and Machine Learning <i>Andreas Lund Rasmussen, Kjetil Fjalestad, Ru Yan, Håkon Viumdal, Saba Mylvaganam and Tonni Franke Johansen</i>

Session Chair: Dr. Valentin Scheiff (Mälardalen University)

Session Co-Chair: Prof. Rebei bel Fdhila (Hitachi-Energy Research)

T2-3: Bio-based Energy Systems

5031	Modeling and control of WRRF biogas production <i>Tiina Komulainen, Bilal Mukhtar, Truls Ødegaard, Hilde Johansen, Kristine Haualand, Kjell Rune Jonassen and Simen Antonsen</i>
6671	Estimation of effluent nutrients in municipal MBBR process <i>Tiina Komulainen, Abdul Malik Baqeri, Einar Neramo, Arvind Keprate, Torgeir Saltnes, Katrine Marsten Jansen and Olga Korostynska</i>
7093	A Semi-Automatic Translator from System Dynamics to Modelica with Application to Socio-Bio-Physical Systems <i>John Tinnerholm, Mariano Zapatero, Adrian Pop, Peter Fritzson and Rodrigo Castro</i>
7630	Green production of dimethyl ether (DME) - indirect conversion of synthesis gas produced from biomass. <i>Sebastian Larsen, Oliver Numme, Eivind Johan Trasti, Terje Bråthen and Marianne Eikeland</i>

Session Chair: Dr. Hao Chen (Mälardalen University)

Session Co-Chair: Prof. Erik Dahlquist (Mälardalen University)

Tuesday, September 26th		16:15-17:30
T3-1: Heat Pumps		
833	Economic investigation of heat pumps for heat recovery from data center <i>Vahid Zangeneh and <u>Lars Erik Øi</u></i>	
3770	A Python-based code for modeling the thermodynamics of the vapor compression cycle applied to residential heat pumps <i>Rebecca Allen, Eirik Svortevik and Henrik Bergersen</i>	
6081	Dynamic Modelling and Part-Load Behavior of a Brayton Heat Pump <i>Matteo Pettinari, Guido Francesco Frate, Konstantinos Kyprianidis and Lorenzo Ferrari</i>	
Session Chair: <i>Dr. Valentina Zaccaria (Mälardalen University)</i> Session Co-Chair: <i>Mr. Dimitrios Bermperis (Mälardalen University)</i>		
T3-2: Energy Storage & Wind Energy		
619	Pumped Thermal Energy Storage for Multi-Energy Systems Optimization <i>Alessandra Ghilardi, Guido Francesco Frate, Antonio Piazzi, Mauro Tucci, Konstantinos Kyprianidis and Lorenzo Ferrari</i>	
7386	Thermodynamics analysis of a novel compressed air energy storage (CAES) system combined with SOFC-MGT and using low grade waste heat as heat source <i>Chen Yang and Li Sun</i>	
6519	Future Potential Impact of Wind Energy in Sweden's bidding area SE3 <i>Justin Warners, Stavros Vouros, Konstantinos Kyprianidis, Benders and Nienhuis</i>	
Session Chair: <i>Prof. Eva Thorin (Mälardalen University)</i> Session Co-Chair: <i>Mr. Nima Monghasemi (Mälardalen University)</i>		
T3-3: Oil & Gas Applications		
2532	Simulation of Oil Recovery Through Advanced Wells Using a Transient Fully Coupled Well-Reservoir Model <i>Madhawe Anuththara, Ali Moradi, Amaranath S. Kumara and <u>Britt M. E. Moldestad</u></i>	
3737	ESP Lifted Oil Field: Core Model, and Comparison of Simulation Tools <i><u>Bernt Lie</u></i>	
6594	The Impact of Autonomous Inflow Control Valve on Enhanced Oil Recovery in SAGD Application <i>Farhan Hasin Alam, Amin Tahami, Nora C.I. Furuvik, Britt M.E. Moldestad and Soheila Taghavi</i>	
Session Chair: <i>Prof. Erik Dahlquist (Mälardalen University)</i> Session Co-Chair: <i>Ms. Shahrzad Marashian (Mälardalen University)</i>		

W1-1: District Heating II + TUTORIAL

333	Building heat demand characteristics in a planned city district with low-temperature district heating supply <i>Karin Israelsson, <u>Vartan Ahrens Kayayan</u>, Fatemeh Johari, Mattias Gustafsson and Magnus Åberg</i>
503	Heat Demand Modelling for a Sustainable Urban Development Project: A Case Study of Kopparlunden in Västerås, Sweden <i>Alaa Krayem, <u>Mohammed Guezgouz</u> and Fredrik Wallin</i>
7222	Simulation of distribution system for low temperature district heating in future urban areas – Case study of a planned city district in Gävle <i>Oskar Olsson, Mattias Gustafsson and Magnus Åberg</i>
	TUTORIAL: Smart control in district heating: Implementation, challenges, & opportunities By <i>Dr. Stavros Vouros and Dr. Avinash Renuke</i>

Session Chair: *Dr. Stavros Vouros (Mälardalen University)*

Session Co-Chair: *Prof. Mirko Morini (University of Parma)*

W1-2: CO₂ Capture Processes

582	Reducing CO₂ capture solvent cost by conversion of OZD to MEA <i>Federico Mereu, <u>Jayangi D. Wagaarachchige</u>, Zulkifli Idris and Klaus-Joachim Jens</i>
1314	Process Simulation, Dimensioning and Automated Cost Optimization of CO₂ Capture <i>Lars Erik Øi, Shirvan Shirdel, Sumudu Karunaratne and Solomon Aromada</i>
3309	Process Simulation and Cost Estimation of CO₂ Capture configurations in Aspen HYSYS <i>Lars Erik Øi, Madhawe Anuththara, Shahin Haji Kermani, Mostafa Mirzapour, Soudeh Shamsiri and Sumudu Karunaratne</i>
3685	Process Simulation and Cost Optimization of a Gas based Power Plant including amine based CO₂ Capture <i>Lars Erik Øi and Esmaeil Aboukazempour Amiri</i>
5755	Hydrodynamic study of a CO₂ desorption column using computational fluid dynamics <i>Sumudu Karunaratne, Kristoffer Eikeseth, Rune Teigland and <u>Lars Erik Øi</u></i>

Session Chair: *Dr. Gaurav Mirlekar (University of South-Eastern Norway)*

Session Co-Chair: *Prof. Erik Dahlquist (Mälardalen University)*

W1-3: Building & Solar Energy Systems

1494	Energy Performance Parametric Study of Location and Orientation in a Typical House in Norway <i>Amirhossein Ghazi, <u>Zahir Barahmand</u> and Lars Erik Øi</i>
3381	Feasibility study of a solar absorption system driven by solar collector for cooling season in Sweden <i><u>Nima Monghasemi</u>, Amir Vadiie, Konstantinos Kyprianidis and Stavros Vouros</i>
4645	Developing a Multi-Building Scale Energy Model for a University Campus using URBANopt <i><u>Hamed Mohseni Pahlavan</u> and Natasa Nord</i>
5827	MoSES – The New Techno-economic Optimization Modeling Tool <i><u>Salvatore Guccione</u> and Rafael Guedez</i>
	EMPTY SLOT

Session Chair: *Dr. Amir Vadiie (Mälardalen University)*

Session Co-Chair: *Prof. Eva Thorin (Mälardalen University)*

<i>Wednesday, September 27th</i>		14:15-15:55
W2-1: Modelling Applications II		
7239	Models for a hydropower plant: a review <i>Tajana Nepal, Diwakar Bista, Thomas Øyvang and Roshan Sharma</i>	
9017	Mapping Simulation optimization requirements for construction sites: A study in heavy-duty vehicles industry <i>Abdulkarim Habbab, Anas Fattouh, Bobbie Frank, Koteswar Chirumalla and Markus Bohlin</i>	
9531	Development of a MATLAB-based code for quantification of effective void space in porous pavement <i>Rebecca Allen, Berthe Dongmo-Engeland and Saja Al-Batat</i>	
8352	Enhancing Indoor Environmental Simulations: A Comprehensive Review of CFD Methods <i>Shahrzad Marashian, Amir Vadiee, Omid Abouali and Sasan Sadrizadeh</i>	
Session Chair: <i>Dr. Avinash Renuke (Mälardalen University)</i> Session Co-Chair: <i>Dr. Alaa Krayem (Mälardalen University)</i>		
W2-2: Propulsion Applications		
3423	In-Depth System-Level Energy Analysis of Hybrid Electrified Commuter Aircraft for Improved Energy Efficiency <i>Dimitra Eirini Diamantidou, Valentina Zaccaria and Anestis Kalfas</i>	
5973	Modeling and identification of the Quanser Aero using a detailed description of friction and centripetal forces <i>Mathias Dyvik, Didrik Efstad Fjereide and Damiano Rotondo</i>	
7367	Traceable System of Systems Explorations Using RCE Workflows <i>Jorge Lovaco</i>	
	EMPTY SLOT	
Session Chair: <i>Dr. Amare Desalegn Fentaye (Mälardalen University)</i> Session Co-Chair: <i>Mr. Nima Monghasemi (Mälardalen University)</i>		
W2-3: Power-to-X + TUTORIAL		
9712	Retrofitting Biomass Combined Heat and Power Plant for Biofuel <i>Hao Chen, Daheem Mehmood, Erik Dahlquist and Konstantinos Kyprianidis</i>	
	TUTORIAL: IFAISTOS and Power-to-X <i>By Prof. Mirko Morini and Dr. Hao Chen</i>	
Session Chair: <i>Dr. Hao Chen (Mälardalen University)</i> Session Co-Chair: <i>Prof. Mirko Morini (University of Parma)</i>		

Conference Locations

Västerås is an industrial city, with a strong economy based on manufacturing and technology. The city is home to several major companies, including the headquarters of ABB Group, a global leader in electrification products. Västerås is also known for its cultural attractions, including several museums, parks, and lakes, as well as its historic Old Town, which features well-preserved medieval architecture. The city is also a popular destination for sports, with several professional sports teams and facilities for activities such as skiing, sailing, and golfing.

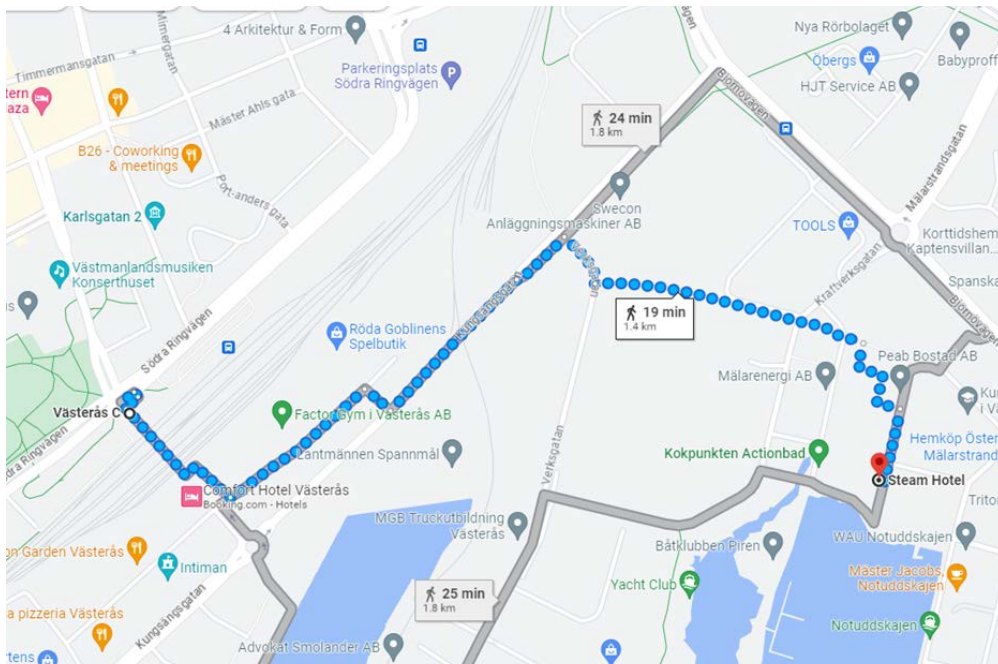
Getting to Västerås

Arlanda Airport is the main international airport in Sweden, located about 40 kilometers north of Stockholm. There are several options for getting from Arlanda to Västerås:

- **Bus:** Västerås is easily reachable using the **Bus4You** service: <https://www.bus4you.se/> The journey takes a little less than 1 hour and 25 minutes and goes directly from Arlanda airport to Västerås Central Station.
- **Train:** Another quick way to get from Arlanda to Västerås is by train. You can take the fast (18min) **ArlandaExpress** service from Arlanda Airport to Stockholm Central Train Station: <https://www.arlandaexpress.com> From there you can switch to the intercity train service by SJ that goes to Västerås and takes about 50-55mins: <https://www.sj.se>
- **Taxi:** You can take a taxi from Arlanda to Västerås, which takes about 60 minutes, depending on traffic. Remember to ask for a fixed price before leaving with the taxi (instead of using the taxi meter). Even better, order your taxi from <https://taxijakt.se> or the related App to get a much better fixed price.
- **Car rental:** Renting a car at Arlanda is another option, which allows you to drive to Västerås at your own pace.

Regardless of the means of transportation you choose, it is advisable to check the schedules and availability beforehand.

The conference scientific program will be held at the Steam Hotel (Ångkraftsvägen 14, 721 31 Västerås, Sweden). The **conference lunches** on the two main days of the program will be held at The Chamberlin Grill instead the Steam Hotel. Similarly, the **conference dinner** on Tuesday September 26th will be held at The Grand Hall located inside the Steam Hotel.

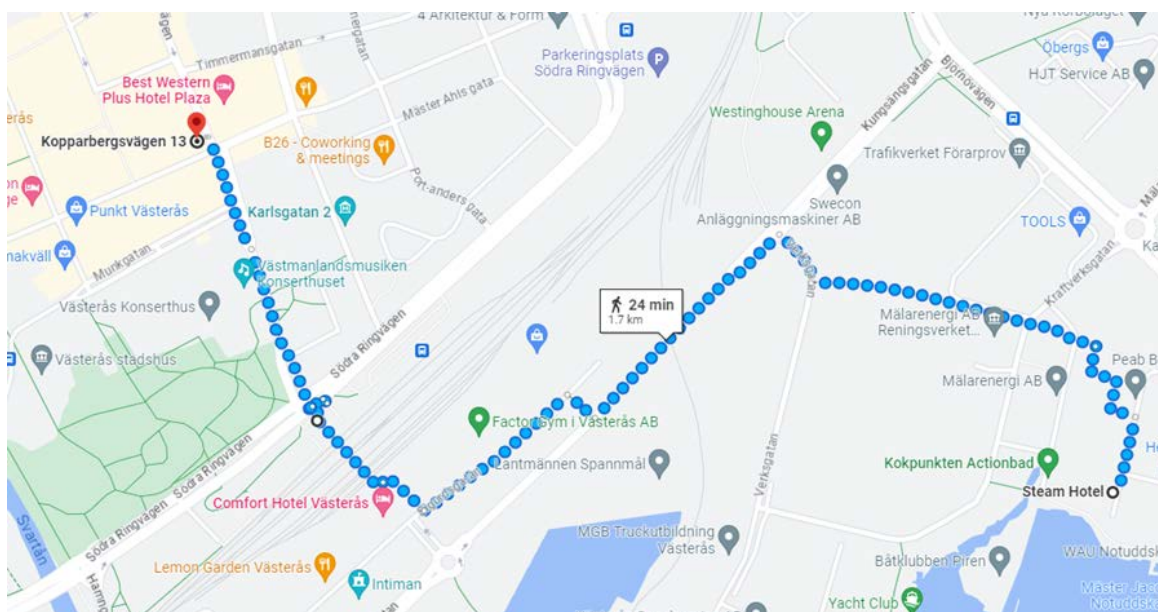


Steam hotel from Central Station: <https://goo.gl/maps/bY7E2zmb6vHfeFgw5>

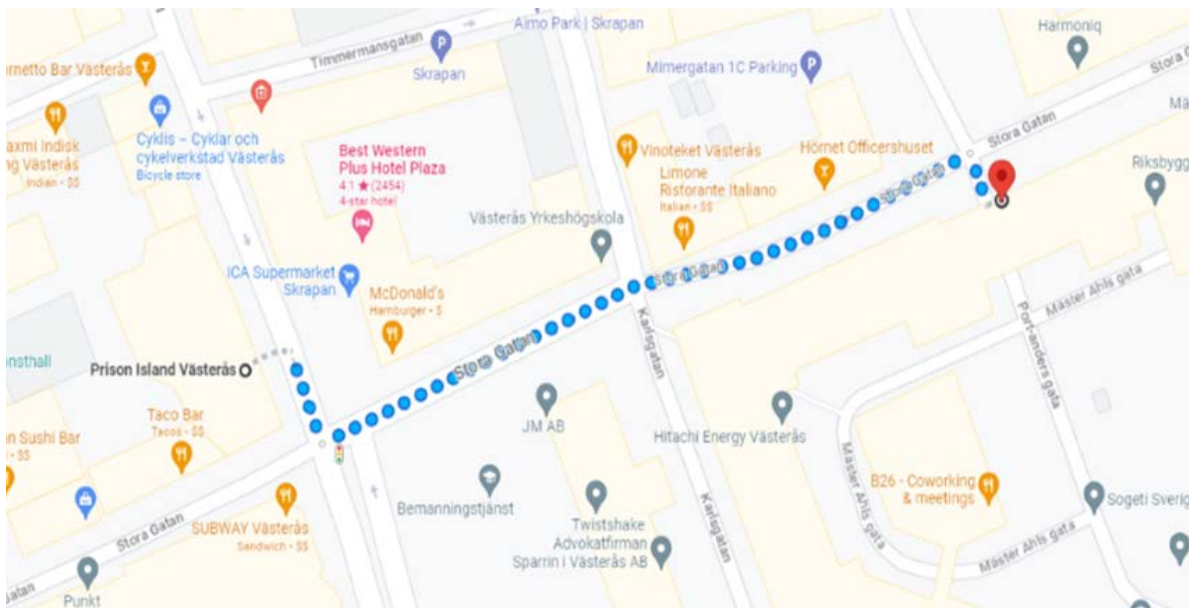
The **doctoral student social event** will take place on Monday September 25th and will be an adventurous team activity at Prison Island (Kopparbergsvägen 13, 722 13 Västerås) followed by dinner at the nearby pub Ruths Ölhus Västerås (Stora Gatan 3, 722 12 Västerås). At Prison Island, you must divide yourselves into teams of 3-5 people and choose a team name. Register the team at the reception and get your electronic key. All cells that are green are free and ready for play. You can run the cells in any order you want. Each cell is ranked by difficulty (tactics, technique, physics) and has a maximum score. Good luck to escape!

More information on the official website: <https://prisonislandvasteras.se/prison-island/>

Prison Island is directly located in the city center and within 20-minute walking distance from the conference hotels. We meet directly there at the Prison Island main entrance!

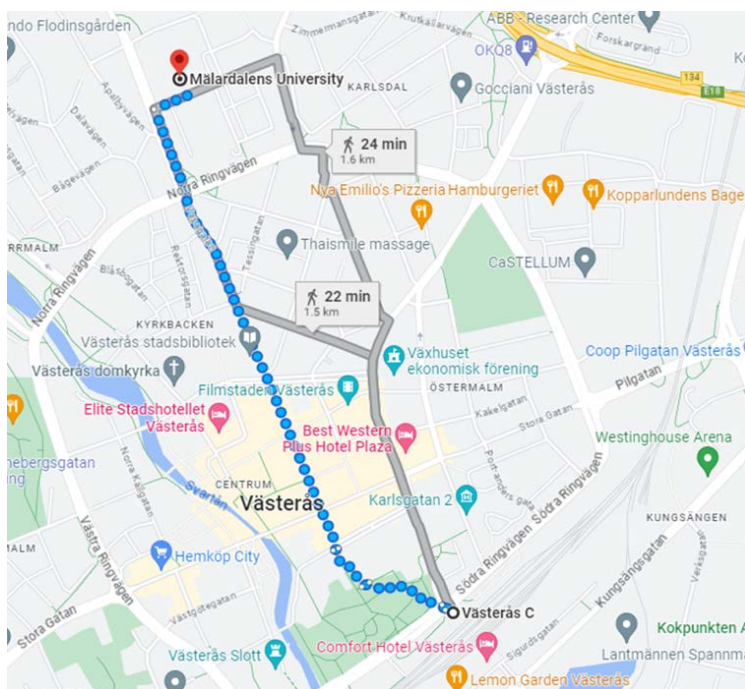


Steam hotel to Prison Island: <https://goo.gl/maps/vaEWr38aQX9rqfVt8>

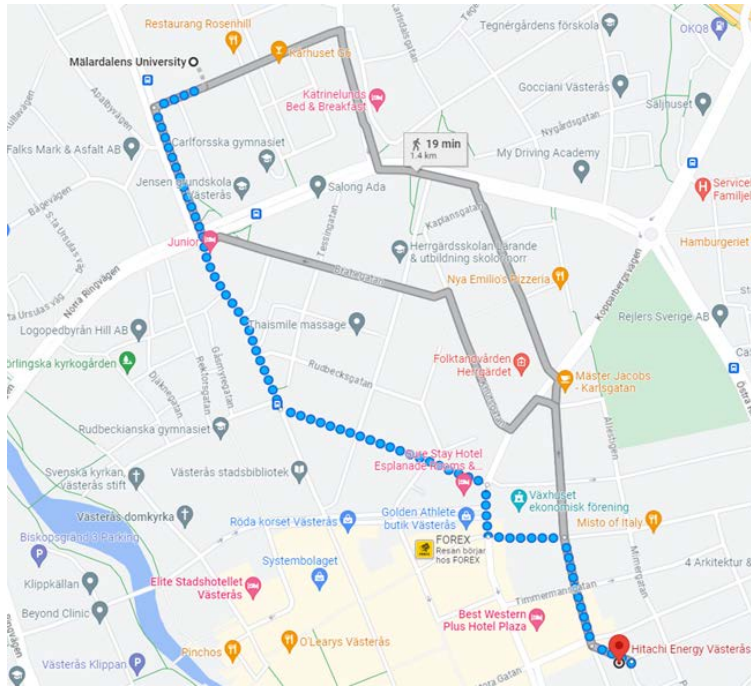


Ruths Ölhus from Prison island: <https://goo.gl/maps/TUKGNMcQnvzFUWbT8>

The **laboratory tour program** will start from the main entrance of Steam Hotel where the shuttle bus will depart for the MDU pilot test-bed at Grindtorpsängen. Afterwards, the shuttle bus will depart anew for the MDU Västerås Campus for a laboratory tour of the Future Energy Center experimental facilities. The program will continue with a walk downtown to the historical Mimer industrial complex and entrance to the *Industry Expo* event organized by Automation Region, Electrification Hub and Railway Cluster of Sweden and hosted at Hitachi-Energy (Mäster Ahls gatan 16, 721 82 Västerås). The program will close with lunch and mingle at the same location.



Mälardalen University from Central Station: <https://goo.gl/maps/n2q62U289tfXMGGm7>



Hitachi Energy from Mälardalen University: <https://goo.gl/maps/GZnAtvCMtbHMzEsf6>

The Venue



The Steam Hotel
Ångkraftsvägen 14
721 31 Västerås
Sweden

www.steamhotel.se
[@steamhotel](https://www.instagram.com/steamhotel)

