

Wednesday June 26th

4th Students School on Building Performance Simulation Applications

Study of the Urban Heat Island effect: from weather data to UBEM simulations with building archetypes

9.00-9.30 Welcome and introduction to the Urban Heat Island phenomena - Room E3.22 (unibz campus)

Giovanni Pernigotto - Free University of Bozen-Bolzano

9.30-10.15 Weather data for energy simulation - Room E3.22 (unibz campus)

Marco Manzan - University of Trieste

10.15-10.30 **Short Break**

10.30-11.15 UBEM in a changing climate: from the building archetype to the urban archetype concept - Room E3.22 (unibz campus)

Ilaria Ballarini - Politecnico di Torino

11.15-12.15 Modeling outdoor thermal comfort in urban canyons: methods and experiences - Room E3.22 (unibz campus)

Gianpiero Evola - University of Catania

12.00-12.15 Q&A - Room E3.22 (unibz campus)

12.15-14.00 **Lunch Break (not provided)**

14.00-14.15 Introduction to the afternoon session - Room E3.22 (unibz campus)

Giovanni Pernigotto - Free University of Bozen-Bolzano

14.15-15.15 Goals and challenges of building archetypes for urban scale energy simulations - Room E3.22 (unibz campus)

Laura Carnieletto - University of Venice - Cà Foscari

15.15-15.30 **Short Break**

15.30-16.30 Urban Scale Energy Simulations: modelling approaches, practical aspects and challenges for researchers - Room E3.22 (unibz campus)

Angelo Zarrella, Jacopo Vivian, Enrico Prataviera - University of Padova

16.30-17.00 Q&A - Room E3.22 (unibz campus)

18.30-20.00 **Welcome aperitif - Room F6**

Thursday June 27th

- 8.30-9.00** Participant registration - (NOI TechPark)
- 9.00-9.15** Welcome speeches - Seminar Room 1 (NOI TechPark)
Andrea Gasparella - Free University of Bozen-Bolzano & President of IBPSA-Italy
- 9.15-10.00** Thursday Keynote Speech 1 - Seminar Room 1 (NOI TechPark)
Smart technology to enable autonomous buildings and connected communities
Panagiota Karava - Purdue University
- 10.00-10.30** Coffee Break
- 10.30-12.15** Technical Sessions (in parallel)
- S1.1: Characterization of the building stock and special buildings (chair: Prof. Lori Barbara McElroy, Prof. Vincenzo Corrado) - Seminar Room 1 (NOI TechPark)**
- 192 Examining the influence of climatological parameters on cluster geometry and building design features in a rural Indian context: The case of Sugganahalli Village (India)
Jeswin Varghese, Andrea Magdalene Pais, Suchi Priyadarshani, Monto Mani
- 199 The challenge of archetypes representativity for wide scale building investigation in Italy
Laura Carnieletto, Lorenzo Teso, Wilmer Pasut, Angelo Zarrella
- 106 Normalization of building's actual energy consumption for normalized building energy benchmarking
Young-Seo Yoo, Deuk-Woo Kim, Dong-Hyuk Yi, Cheol-Soo Park
- 137 Analysis of energy consumption scenarios of the Italian residential building stock
Enrico Prataviera, Jacopo Vivian, Francesca Gaudino, Angelo Zarrella
- 119 Controlled environment agriculture energy modelling and calibration in a cold climate using building performance simulation tools
Gilbert Laroche Martin, Danielle Monfet
- 141 Simulating the Microclimate of a Pilot Greenhouse for Testing Innovative Agri-Voltaic System Technology
Cristina Cornaro, Marcello Petitta, Walter Fornari, Paolo Miraglia, Catalin Voinea, Catherine Baxevanou, Chryssoula Papaioannou, Nikolaos Katsoulas, Gianluigi Bovesecchi
- S1.2: Performance simulation of educational buildings (chair: Prof. Gianpiero Evola, Prof. Ilaria Ballarini) - Seminar Room 2 (NOI TechPark)**
- 156 Environmental quality analysis in school environment by measurements and numerical methods
Leonardo Guglielmi, Samantha Di Loreto, Matteo Falone, Mariano Pierantozzi
- 169 Mitigating summer overheating of a primary school building based on dynamic simulations
 gnes Marosi, Bal zs Nagy
- 206 An attempt to model ventilation rate in classrooms based on the measurement of relative humidity
Federica Morandi, Alessandro Prada, Ilaria Pittana, Francesca Cappelletti, Andrea Gasparella
- 103 Data-driven digital twinning of ventilation systems for performance optimization: A university building case study
Andres Sebastian Cespedes Cubides, Muhyiddine Jradi, Jakob Bj rnskov
- 208 Analysis of Control Strategies for Energy Performance Optimization for Educational Buildings: Comparison of Two Kindergartens in the Municipality of Bolzano, Italy
Angelica El Hokayem, Giovanni Pernigotto, Andrea Gasparella
- 173 Simulation-based optimization for Energy- and Cost Efficient Refurbishment of an Educational Building
Levente Szatm ri, Bal zs Nagy

S1.3: Acoustic studies and simulations (chair: Prof. Ernest Kin Wai Tsang, dr. Marco Caniato) - Seminar Room 3 (NOI TechPark)

- 120 *Microclimate conditions in the SS. Salvatore Church of Bologna*
Haruna Saito, Massimiliano Manfren, Kristian Fabbri, Maria Cristina Tommasino, Lamberto Tronchin
- 155 *The Impact of Classroom Acoustics on Student Well-Being and Noise Disturbance at the University of Pescara, Italy*
Samantha Di Loreto, Alessandro Ricciutelli, Sergio Montelpare
- 219 *The influence of acoustic stressors in Educational Environments for Neurodivergent Individuals*
Marco Caniato, Federica Bettarello, Arianna Marzi, Andrea Gasparella
- 134 *Installation of reflecting panels in the main church of Aversa*
Silvana Sukaj, Amelia Trematerra, Ilaria Lombardi, Giovanni Amadasi, Luigi Guerriero
- 129 *Acoustic correction of the regional theatre of Bejaia (Algeria)*
Gino Iannace, Ferial Saidan
- 131 *Acoustic improvements of the opera theatre of Benevento*
Gino Iannace, Antonella Bevilacqua, Umberto Berardi

12.15-13.00 Thursday Keynote Speech 2 - Seminar Room 1 (NOI TechPark)

Building Performance Simulation: Doing things right, or doing the right things?
Ardeshir Mahdavi - Technische Universität Graz

13.00-14.15 Buffet lunch

14.15-16.00 Technical Sessions (in parallel)

S2.1: Energy efficiency measures and energy flexibility for the existing building stock (chair: Prof. Angelo Zarrella, Dr. Laura Carnieletto) - Seminar Room 1 (NOI TechPark)

- 132 *Economic and Environmental Optimization of Retrofitting Options for a Community Building, a case study from Grevie Parish, Sweden*
Azadeh Hana Hassanzadeh, Sepideh Rabie, Marko Ljubas, Henrik Davidsson, Denis Johansson
- 149 *A Design Assistant Tool for Optimised Building Energy Retrofit*
Ilaria Di Blasio, Julius Emig, Dietmar Siegele, Dominik T. Matt
- 165 *Integration of Rooftop Photovoltaics and Roof Retrofitting Strategies for Enhanced Energy Efficiency in Warm Climates*
Krithika Panicker, Prashant Anand, Abraham George, Ardeshir Mahdavi
- 154 *Energy flexibility study of a hotel using TRNSYS*
Michele Libralato, Giovanni Cortella, Paola D'Agaro
- 124 *ClustEnergy OpTool: an open tool for assessing the energy flexibility provided by Cluster of Buildings*
Patricia Ercoli, Alice Mugnini, Fabio Polonara, Alessia Arteconi
- 160 *A building renovation concept based on a low-temperature geothermal loop with decentralized plug-and-play heat pumps*
Sara Bordignon, Jacopo Vivian, Agnese Tagliaferri, Davide Quaggiotto, Michele De Carli
- 161 *The urban-scaled EnergyPlus simulation using Korean GIS to aid development of energy normalization for shading effect*
Dong-Hyuk Yi, Deuk-Woo Kim

S2.2: IEQ and occupants' behaviour (chair: Prof. Athanasios Tzempelikos, Dr. Federica Morandi) - Seminar Room 2 (NOI TechPark)

- 195 *Calibrated BEMs and LSTM Neutral Networks for Indoor Temperature Prediction: a Comparative Analysis in Pre- and Post-retrofit Scenarios*
Gianluca Maracchini, Nicola Callegaro, Rossano Albatici
- 162 *Thermal comfort and environmental impact in the heating system refurbishment of a Victorian Hall with Infrared ceiling panels*
Roberto Rugani, Marco Picco, Fabio Fantozzi
- 211 *Predicting daylight preferences using HDRI and deep learning*
Dongjun Mah, Athanasios Tzempelikos

- 179 *Achieving a deeper understanding of user-related influences on artificial lighting energy demand using high performance computing*
Sascha Hammes, Johannes Weninger, Philipp Gschwandtner, Philipp Zech
- 203 *Calibrating a clothing insulation model for thermal comfort assessment in educational buildings*
Ilaria Pittana, Federica Morandi, Andrea Gasparella, Athanasios Tzempelikos, Francesca Cappelletti
- 193 *Estimating indoor TVOCs in response to varying humidity regimes in vernacular and conventional dwellings*
Shreyata Khurana, Monto Mani
S2.3: Use of BIM and ML techniques to support advanced building design and optimization (chair: Prof. Gregor Henze, Prof. Cristina Cornaro) - Seminar Room 3 (NOI TechPark)
- 105 *Identification of Function and Utility Requirement for Enhancing Productivity in the Duct and Plumbing System Design using BIM*
 Suwhan Jang, Sanghoon Tae, Soobin Lee, Myunghoon Kim, Sean Hay Kim
- 151 *BIM2FEM: From Building Information Modeling to Finite Element Analysis - An automated open source-based workflow*
Julius Emig, Dietmar Siegele, Dominik T. Matt
- 135 *Building Information Modeling (BIM) and Building Energy Modeling (BEM): interoperability and interactive data representation for the energy management of the existing buildings*
Cristina Cornaro, Gianluigi Bovesecchi, Iliaria Giannetti, Giulia Scimia, Cristian Tolù, Pier Paolo Valentini
- 172 *Recommendations to Make Reinforcement Learning Practical in Building Control Applications*
 Sourav Dey, Gregor Henze
- 104 *Computational cost reduction of a simulation-based optimization process through machine learning methods: neural networks vs. random forest*
 Iuri Praça Vergínio, Mario Alves da Silva, Rafael de Paula Garcia, Joyce Correna Carlo
- 220 *Machine Learning and data augmentation techniques to cope with solar data scarcity to simulate PV generation in mountain environments*
Aleksandr Gevorgian, Giovanni Pernigotto, Andrea Gasparella
- 16.00-16.30** **Coffee Break**
- 16.30-18.30** **Technical Sessions (in parallel)**
- S3.1: Students competition (chair: Students Tutoring Scientific Committee) - Seminar Room 1 (NOI TechPark)**
- 157 *A comparative analysis of simplified calculation procedures for assessing the energy losses of heating emission systems*
Franz Giorgio Maria Bianco Mauthe Degerfeld, Iliaria Ballarini, Vincenzo Corrado
- 163 *Personal Comfort Systems (PCSs) in offices: efficient utilization threshold based on energy consumption*
Roberto Rugani, Marco Picco, Giacomo Salvadori, Fabio Fantozzi
- 101 *Synthetic indices for comfort assessment. An application to a historical building in Catania*
Andrea Longhitano, Gianpiero Evola, Vincenzo Costanzo, Francesco Nocera
- 194 *Examining indoor moisture regimes in response to varying window-to-wall ratio, ventilation, and climate zone for dwellings with earth-based plaster*
Suchi Priyadarshani, Monto Mani
- 204 *Alternative affordable solutions in reducing the number of hours with heat strain inside buildings*
Atlas Ramezani, Marco Manzan
- 116 *Virtual simulator for predicting vertical illuminance of window with external Venetian blind*
Seon-Young Heo, Young-Sub Kim, Seon-Jung Ra, Cheol-Soo Park
- 196 *Impact of different radiation decomposition models and datasets on building energy simulation results: A case study in Brazil*
Matheus Körbes Bracht, Matheus Soares Geraldi, Ana Paula Melo, Roberto Lamberts

S3.2: Simulation of the building envelope and hygrothermal analyses (chair: Prof. Francesca Cappelletti, Prof. Roberto Bruno) - Seminar Room 2 (NOI TechPark)

- 122 *The impact of thermal zone resolution on the energy simulation results of complex buildings*
Christiane Berger, Ardeshir Mahdavi
- 143 *Analysis of thermal insulation systems for summer heat protection under different climatic conditions using simulation tools and real measurements*
Ayman Bishara
- 170 *The Re-use of Surgical Mask as Insulation Panels in Construction: a Trnsys analysis*
Vincenzo Ballerini, Paolo Valdiserri, Manuela Neri, Mariagrazia Pilotelli, Edoardo Piana, Jan Kaspar, Eugenia Rossi di Schio
- 213 *An Investigation into Thermal Bridging effects in an Envelope integrated with End-of-Life Photovoltaic panels*
Roshan Raghavendra Rao, Monto Mani
- 153 *Hygrothermal analysis of most common historical slabs in Hungary*
Fanni Petresevics, Balázs Nagy
- 142 *Hygrothermal Performance Assessment of a Paper-Based Building Envelope*
Nadja Bishara
- 168 *Mold growth affecting the achievement of NZEB in the long term in tropical climates*
Cristina Carpino, Miguel Alejandro Chen Austin, Cihan Turhan, Dafni Mora, Natale Arcuri

18.30-19.15 **IBPSA Italy General Meeting - Seminar Room 1 (NOI TechPark)**

18.30-19.30 **Transportation to the city center**

20.00-20.30 **Evening Lecture - Castel Mareccio / Schloss Maretsch**

Andrea Gasparella - Free University of Bozen-Bolzano

20.30-22.30 **Conference dinner at Castel Mareccio / Schloss Maretsch**

Friday June 28th

8.45-9.30 Friday Keynote Speech - Seminar Room 1 (NOI TechPark)

ZEB and CSHPSS: a way to comply with the EBPB requirements using MINSUN 6
Livio Mazzarella - Politecnico di Milano

9.30-11.00 Technical Sessions (in parallel)

S4.1: Modelling and simulation of HVAC and Renewable Energy Systems (chair: Prof. Paola D'Agaro, Prof. Alessandro Prada) - Seminar Room 1 (NOI TechPark)

- 128 *Modeling a Dew Point Indirect Evaporative Cooling System for TRNSYS building simulations: proposal and validation*
Alessandra Urso, Gianpiero Evola, Francesco Nocera, Vincenzo Costanzo, Ana Tejero Gonzales, Eloy Velasco Gomez
- 209 *Optimization of a solar assisted heat pumps designed to increase thermal efficiency working on the cold sink*
Piero Bevilacqua, Stefania Perrella, Roberto Bruno, Daniela Cirone, Dimitrios Kaliakatsos
- 187 *Is solar hydrogen a viable solution for energetically self-sustainable off-grid buildings?*
Stefania Perrella, Roberto Bruno, Piero Bevilacqua, Daniela Cirone
- 191 *TRNSYS dynamic simulation model of a typical air-handling unit: experimental calibration and validation based on field operation data in the south of Italy*
Antonio Rosato, Rita Mercuri, Mohammad EL Youssef, Francesco Romanucci, Mohamed G. Ghorab
- 197 *Effects of different wind speed databases on the performance of a vertical axis micro wind turbine integrated with a typical residential house: a comparative simulation analysis for five Italian cities*

Antonio Rosato, Achille Perrotta, Luigi Maffei

S4.2: Simulation of the building stock and urban-scale analyses (chair: Prof. Iliaria Ballarini, Dr. Michele Libralato) - Seminar Room 2 (NOI TechPark)

- 144 *Building archetypes supporting the national building renovation plan*
Matteo Piro, Iliaria Ballarini, Vincenzo Corrado
- 190 *Exploitation of Energy Performance Certificate database in urban energy modeling.*
Sebastiano Anselmo, Maria Ferrara, Piero Boccardo, Stefano Paolo Corgnati
- 202 *The role of dynamic Primary Energy Factors (PEFs) in building performance assessment: a case study*
Matteo Bilardo, Riccardo Oldini, Enrico Fabrizio
- 214 *Modelling actions at the building stock level for decision-making towards carbon-neutral cities*
Erminia Consiglio, Luca Ferraris, Iacono Mirella, Gaetano Noè, Maria Ferrara
- 216 *A new evaluation framework to assess the prosumer efficiency in thermal source district heating networks*
Alireza Etemad, James O'Donnell, Alessandro Maccarini, Alireza Afshari

S4.3: Modelling and simulation of case-studies (chair: Prof. Giovanni Pernigotto, Dr. Federica Morandi) - Seminar Room 3 (NOI TechPark)

- 185 *Strategic Synergy: Enhancing Building Performance through Advanced Simulation and Shading Integration*
Shahryar Habibi, Giovanni Pernigotto, Andrea Gasparella
- 188 *Assessment of simultaneity factor between PV production and electric demand in a real scholar canteen belonging to a REC through TRNSYS dynamic simulations*
Daniela Cirone, Roberto Bruno, Piero Bevilacqua, Stefania Perrella, Natale Arcuri

- 136 *Modelling of aquifer thermal energy storage connected to hospital buildings: A case study in Denmark*
Mohammed Burhanuddin Rabani, Alessandro Maccarini, Michael Wetter, Alireza Afshari
- 207 *Assessment and mapping of the Urban Heat Island effect: a preliminary analysis on the impact on urban morphology for the city of Turin, Italy*
Gregorio Borelli, Ilaria Ballarini, Vincenzo Corrado, Andrea Gasparella, Giovanni Pernigotto
- 123 *Development and Calibration of an Urban Building Energy Model for the city of Padua*
Jacopo Vivian, Enrico Prativiera, Gianmarco Bano, Angelo Zarrella
- 11.00-11.30** **Coffee Break**
- 11.00-11.30** **IBPSA Italy Working Groups - Seminar Room 3 (NOI TechPark)**
 Web & Newsletter (Prof. Ilaria Ballarini, Prof. Gianpiero Evola)
 Education (Prof. Andrea Gasparella, Prof. Cristina Cornaro)
 Technical standards (Prof. Francesca Cappelletti)
- 11.30-13.00** **Technical Sessions (in parallel)**
- S5.1: Modelling and simulation of façades and fenestration systems (chair: Prof. Piero Bevilacqua, Dr. Maria Ferrara) - Seminar Room 1 (NOI TechPark)**
- 117 *Modelling Solar Disability Glare Reflected off Modern Building Facades*
Matthew J Glanville, Mohammed Alsailani, Pallava R Kodali, Roberto P M Neto
- 167 *Effects of an Indoor Living Wall on room lighting conditions: comparison between measured and simulated data*
Matteo Ghellere, Alice Bellazzi, Anna Devitofrancesco, Benedetta Barozzi
- 138 *Automating solar shading control in residential buildings located in a temperate climate: a household-specific decision*
Lotte Van Thillo, Stijn Verbeke, Amaryllis Audenaert
- 150 *A simulation study on the performance of machine learning daylight-linked lighting control under urban topography*
Ernest Kin-Wai Tsang, Emmanuel Imuetinyan Aghimien, Danny Hin-wa Li, Zhenyu Wang
- 148 *Integration of Machine Learning-Based CIE Standard Skies Model with Daylight Simulation for Building Energy Performance Analysis*
Emmanuel Imuetinyan Aghimien, Ernest Kin Wai Tsang, Danny Hin Wa Li, Zhenyu Wang
- 210 *Simulative applications of novel indicators for the characterization and performance evaluation of transparent facades*
Riccardo Gazzin, Giuseppe De Michele, Stefano Avesani, Giovanni Pernigotto, Andrea Gasparella
- S5.2: New tools and methods for BPS (chair: Prof. James Edward Braun, Prof. Francesca Cappelletti) - Seminar Room 2 (NOI TechPark)**
- 100 *Sustainable Analytical Model (SAM 2.0): A New Frontier in Open-Source Building Energy Simulation*
Michal Dengusiak, Jakub Ziolkowski
- 159 *Simplified and fully detailed dynamic building energy simulation tools compared to monitored data for a single-family NZEB house*
Ana Paola Rocca Vera, Giovanni Cortella, Paola D'Agaro
- 200 *Comparison between real energy consumption, Italian APE and dynamic energy simulation*
Vincenzo Pennisi, Davide Varesano
- 125 *Simulation tests for the determination of the U-value of walls by using response factors theory with noisy boundary conditions*
Maja Danovska, Davide Cassol, Ivan Giongo, Alessandro Prada
- 221 *Transferring Building Performance Simulation from research to professional practice – challenges and opportunities*
Lori McElroy, Andrea Gasparella
- 13.00-13.30** **Student Award and closing ceremony - Seminar Room 1 (NOI TechPark)**
- 13.30-14.30** **Buffet lunch**

15.00-16.00

Visit to Building Physics Labs at the NOI TechPark (optional)