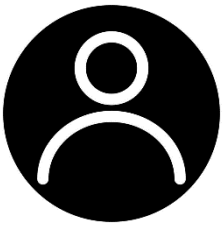
Maja Danovska

CURRICULUM VITAE



[1] Personal Information	Name and Family Name: Maja Danovska
[2] Education	**[2.1] Sept. 2012 – Sept. 2015**

Bachelor's Degree in environmental engineering at University of Trento

Thesis title: "Celle a combustibile a scambio protonico" (3 CFU).
Final Mark: 102/110.
Supervisor: Professor Paolo Scardi (University of Trento).

[2.2] Oct. 2015 – Oct. 2018

Inter faculty master's degree in energy engineering at University of Trento and Free University of Bozen-Bolzano
Thesis title: "Characterization of thermal physical properties of timber specimens".
Final mark: 110/110 with Honors.
Supervisors:

(1) Prof. A. Gasparella (Free University of Bozen-Bolzano),
(2) Prof. Paolo Baggio (University of Trento),
(3) Dr. Giovanni Pernigotto (Free University of Bozen-Bolzano).

[2.3] Nov. 2018 – Oct. 2022

PhD Student at the Free University of Bozen-Bolzano (Italy)
PhD in Sustainable Energy and Technologies. Faculty of Science and technology.
Field: Building Physics and Energy Systems.
Research topic: "Heat and moisture transfer in timber buildings components". Study of heat and moisture transfer across timber and timber-based materials adopted in wooden constructions.
Lab: Building Physics Lab (Head: Prof. A. Gasparella, Place: Bolzano).
Supervisors:

(1) Prof. A. Gasparella (Free University of Bozen-Bolzano),
(2) Prof. Paolo Baggio (University of Trento),
(3) Dr. Giovanni Pernigotto (Free University of Bozen-Bolzano).

[3] Working Experiences

[3.1] Dec. 2017 –Mar. 2018

Support activity at the University of Trento "150 ore"
Supervisor in the computer activities at the University of Trento, Faculty of Engineering.

[3.2] Feb. 2018 – Apr. 2018

Collaboration at "Trentino Ingegneria S.r.l.-Consulenza e Progettazione"
Location: Trentino Ingegneria S.r.l., Via del Brennero 316, 38121, Trento, Italy.
Activity commissioned by the society Dolomiti Energia, for the public competition "Gara per l'affidamento del servizio di efficentamento energetico degli impianti di illuminazione pubblici", contratto Consip, in the municipality of Bassano, Cles, Molveno and others local valleys. (i) Mapping of the public lighting system with GIS technology. (ii) Identification of the light typology, geometry of the streets, identification of the electricity meter. (iii) post-processing of data with DIALUX software.

[3.3] Sept. 2019 – Sept. 2021

Teaching Assistant
Course: Special Issues of Building Physics (master's degree in Energy Engineering LM-30 at Free University of Bozen-Bolzano).
Language: English.
Professor: Giovanni Pernigotto.
Topics & Activities: indoor lighting and visual comfort in the built environment; requirements and methodologies for the design of lighting systems able to ensure proper levels of visual comfort while minimizing the energy uses. Explanation of main instruments: (i) luxmeter, (ii) spot luminance meter, (iii) HDR camera, (iv) spectrophotometer. Software: (i) Rhinoceros, (ii) Dialux.
Additional info: the course was completely held online, and students were helped by means of short demos about the instruments functioning and adoption.

[3.4] Dec. 2021 – Today

Teaching Assistant
Course: Technical Physics (Bachelor Degree in Civil and Environmental Engineers "Civile – Ambientale" & Single-Cycle Master's degree Building Engineering and Architecture "Edile-Architettura") – DICAM (University of Trento).
Language: Italian.
Professors: Paolo Baggio (until 2023); Alessandro Prada.
Topics & Activities: (i) explanation of thermal instruments, e.g., the thermal conductivity measurements HFM, HOT-BOX chamber. (ii) Development of MATLAB® simulation scripts for the dynamic heat transfer, the dynamic

vapor diffusion and the dynamic coupling of the two across buildings materials. (iii) Supporting activity during exams preparation and supervision during exams. (iv) Front-class exercise activities regarding heat generators comparison, preparation for exams, analysis of thermal bridges, technical physics topics, e.g., first and second laws of thermodynamics, ideal gas transformations, direct and indirect vapor cycles, winter and summer building conditioning (psychometrics), building energy balances, convective and radiant heat exchanges, advection, mass transfer, heat transmission, heat exchangers. (v) Exams support activity and examination of exam reports regarding thermal bridges.

[3.5] Feb. 2022 – Gen. 2023

Research Fellow at the University of Trento (Italy)
Project: "*The energy FLEXibility of enhanced HEAT pumps for the next generation of sustainable buildings*".
Reference: Paolo Baggio.
Sponsors: MIUR-Italian Ministry of Education, Universities, and Research (PRIN 2017).
Abstract: The project aims at giving a breakthrough contribution to the reduction of the carbon footprint due to energy consumption for buildings heating and air conditioning, through an integrated approach that goes beyond the state of art. The research products will define the roadmap for the competitiveness of different buildings and of the most innovative heat pumps solutions for renewable energy integration. The project will be based on an extensive experimental activity and the adoption of dynamic simulations.

[3.6] Feb. 2023 – Sept. 2023

Research Fellow at the University of Trento (Italy)
Project: "*The energy FLEXibility of enhanced HEAT pumps for the next generation of sustainable buildings*".
Reference: Paolo Baggio.
Sponsors: MIUR-Italian Ministry of Education, Universities, and Research (PRIN 2017) with the involvement of APRIE (Agenzia Provinciale per le Risorse Idriche e l'Energia).
Abstract: The project aims to make a breakthrough contribution to reducing the carbon footprint from energy consumption for building heating and air conditioning, through an integrated approach that surpasses the current state of the art. It will explore innovative heat pump solutions for renewable energy integration and foster the development of energy communities. Based on extensive experimental work and dynamic simulations, the research will define a roadmap to enhance the competitiveness of buildings and cutting-edge energy solutions.

[3.6] Oct. 2023 – Oct. 2024

Lecturer
Course: Energy Efficiency in Wood Production and Final Uses (Wood Engineering @ Free University of Bolzano – Bozen).
Language: English.
Lecture hours: 60 h.
Professor: Maja Danovska (lecturer).
Topics & Activities: the course is focused on the aspects of energy efficiency applied to the wood industry sector. The course is composed of a theoretical part regarding concepts of technical physics and thermodynamics and a practical part in which thermodynamics exercises are solved and some laboratory activity are performed (e.g., laboratory characterization of biomass). Students are required to prepare a project in which energy and mass fluxes of a sawmill are analysed and different sustainable solutions are proposed, like utilization of biomass waste for energy production or self-consumptions. A technical-economic analysis is performed, as well.

[3.7] Oct. 2023 – Today

Scientific Laboratory Technician (full-time)
Place: University of Trento, Department of Civil, Environmental and Mechanical engineering (Via Mesiano, 77, 38123, Trento).

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[4] Research Projects

Active participation at different Projects:

- Measurements of thermal resistance and apparent thermal conductivity of specimens, with experimental apparatus based on the heat flux meter HFM and according to the technical standards ISO 8301, EN 1946-3 and ASTM C518 *(@ Building Physics Lab of the Free University of Bozen-Bolzano*).
    - Lambda-Finstral:Tests of apparent thermal conductivity, funded by *Finstral SpA-2019*.
    - *Lambda-EURAC:Tests of apparent thermal conductivity funded by Eurac*-2019.
- Evaluation of thermal conductance and transmittance of opaque components by means of the hotbox methods with heat flux meter according to the technical standards EN 1934, EN 1946-3 and ASTM C518. Steady state tests according to EN 1934 of two timber walls with hotbox test rig, analysis of the results and preparation of reports (*@ Building Physics Lab of the Free University of Bozen-Bolzano*).
    - LignaWalls: Thermal conductance and resistance tests on timber wall specimens, funded by *IDM Suedtirol-Alto Adige*-2019.
- Measurement of the thermal performance of real-scale building components by means of the hotbox method with heat flux meter according to the technical standards EN 1934, EN 1946-3 and ASTM C518.

Steady state tests according to EN 1934, as well as, tests in dynamic and periodical regimes, in order to complete characterize the component (@ *Sustainable Energy Laboratory of the University of Trento*).

    - ReLUIS project (https://www.reluis.it/it/).

- Active participation in on-going projects: (i) SAFER REBUILT - Sustainable Approaches For Earthquake Resistant Rehabilitation solutions for BUILT environment, (ii) HYBREHEAT - Strategie di controllo avanzato ottimizzate per generazione di calore ibrida ad alta efficienza energetica e basse emissioni (Bando Fondazione VRT Valorizzazione Ricerca Trentina), (iii) Il ruolo dei materiali a cambiamento di fase nelle strategie di efficientamento energetico degli edifici (Bando Fondazione VRT Valorizzazione Ricerca Trentina), (iv) Produzione di idrogeno tramite il riciclo delle bottiglie di PET (Bando Fondazione VRT Valorizzazione Ricerca Trentina).

[5] List of Publications

Proceedings of international conferences (Indexed)

1. **Danovska M.**, Libralato M., Pernigotto G., De Angelis A., Saro O., Baggio P., Gasparella A. 2019. Numerical and experimental study on the impact of humidity on the thermal behavior of insulated timber walls. Proceedings of Building Simulation Applications BSA 2019, Bozen-Bolzano, Italy, June 2019.
   Link:
   http://www.ibpsa.org/proceedings/BSA2019/9788860461766_12.pdf
2. **Danovska M.**, Pernigotto G., Baratieri M., Baggio P., Gasparella A. 2019. Influence of moisture content, temperature and absorbed solar radiation on the thermal performance of a spruce XLAM wall in the Italian climates. Proceedings of the 37th UIT Heat Transfer Conference and Symposium Refrigerants: Heat Transfer and Application 2019, Padova, Italy, 24th-26th June 2019. URL:
   https://iopscience.iop.org/article/10.1088/1742-6596/1599/1/012028
   DOI: 10.1088/1742-6596/1599/1/012028.
3. **Danovska M.**, Pernigotto G., Baggio P. and Gasparella A. 2019. Assessment of the Thermal Performance of Timber Walls under Nominal or Moisture and Temperature Dependent Properties. Proceedings of Building Simulation 2019, Rome, Italy, 2nd-4th September 2019.
   Weblink: http://www.ibpsa.org/proceedings/BS2019/BS2019_211069.pdf
4. Libralato M., **Danovska M.**, Pernigoto G., Gasparella A., Baggio P., D'Agaro P., Cortella G. 2022. Effects Of Different Moisture Sorption Curves On Hygrothermal Simulations Of Timber Buildings. Proceedings of Building Simulation Applications BSA 2022, Bozen-Bolzano, Italy, June, 29th – July, 1st 2022.
5. **Danovska M.**, Prada A., Baggio P. 2022. Calibration of the energy simulation model of a library with a meta-model-based optimization approach. Proceedings of Building Simulation Applications BSA 2022, Bozen-Bolzano, Italy, June, 29th – July, 1st 2022.
6. **Danovska M.**, Cassol D., Giongo I., Prada A. 2024. Simulation tests for the determination of the u-value of walls by using response factors theory with noisy boundary conditions. Proceedings of Building Simulation Applications BSA 2024, Bozen-Bolzano, Italy, June, 26th – 28th 2024 (To be puslished).

Journal papers

1. **Danovska, M.**; Pernigotto, G.; Baggio, P.; Gasparella, A. Simulation uncertainty in heat transfer across timber building components in the Italia cimates: The role of thermal conductivity. Energy Build. 2022, 268, 112190. Weblink: https://doi.org/10.1016/j.enbuild.2022.112190
2. Cassol, D.; **Danovska, M.**; Prada, A.; Giongo, I. Timber-Based Strategies for Seismic Collapse Prevention and Energy Performance Improvement in Masonry Buildings. Sustainability 2024, 16, 392. https://doi.org/10.3390/su16010392

[6] Participation To scientific Conferences & Schools

International Conferences

- **Building Simulation Application BSA 2019**, Bozen-Bolzano, Italy, 19th – 21st June 2019.
  Number of papers as presenting author: **1**
  Title: "Numerical and experimental study on the impact of humidity on the thermal behavior of insulated timber walls".
  Award: student competition.
- **37th UIT Heat Transfer Conference 2019**, Padova, Italy, 24th-26th June 2019.
  Number of papers as presenting author: **1**
  Title: "Influence of moisture content, temperature and absorbed solar radiation on the thermal performance of a spruce XLAM wall in the Italian climates".
- **Building Simulation 2019**, Rome, Italy, 2nd-4th September 2019
  Number of papers as presenting author: **1**
  Title: "Assessment of the Thermal Performance of Timber Walls under Nominal or Moisture and Temperature Dependent Properties".
- **Building Simulation Application BSA 2022**, Bozen-Bolzano, Italy, 29th June – 1st July 2022.
  Number of papers as presenting author: **1**
  Title: "CALIBRATION OF THE ENERGY SIMULATION MODEL OF A LIBRARY WITH A META-MODEL-BASED OPTIMIZATION APPROACH".
- **Building Simulation Application BSA 2024**, Bozen-Bolzano, Italy, 26th – 28th June 2024.
  Number of papers as presenting author: **1**
  Title: "SIMULATION TESTS FOR THE DETERMINATION OF THE U-VALUE OF WALLS BY USING RESPONSE FACTORS THEORY WITH NOISY BOUNDARY CONDITIONS".
- **CLIMA 2025 Decarbonized, healthy, and energy-conscious buildings in future climates**, Milan, Italy, 4th – 6th June 2025.
  Number of papers as presenting author: **1**
  Title: "Evaluating the Effects of Building and HVAC Features on Solar Battery Degradation in residential building".

Schools

- Data analytics for engineers and scientists. Bressanone, Italy, 8-12 July 2019. Total hours: 42 h.
  Organizers: Prof. Luigi Salmaso (University of Padova), Prof. Arne Bathke (University of Salzburg), Georg Zimmermann (University of Salzburg).

[7] Other

Workshops

- **Active participation at the Euregio Academy, 2015.**
  Project born in an inter-regional context (Trentino-Südtirol and Tirolo) aimed to have an effective collaboration among different regions, to cooperate for the common good of the cross-border regions and to develop a legal valid project on the European level. The objectives during this academia were to discuss and propose different solutions and improvements on the educational, infrastructure and juridical level.
  Locations: Bozen-Bolzano, Trento and Alpbach (Austria).

- **"Atelier di riqualificazione della città consolidata", 2017.**
  Collaboration between Free University of Bolzano and University of Torino.
  Coordinator: Dr. Giovanni Pernigotto.
  Topic: discussion and proposal of new solutions for the upgrading of the military camps in Bolzano, in terms of architecture and energy efficiency.

Awards

- Merit Scholarship *"Orientare e sostenere giovani con particolare interesse ed impegno verso percorsi di eccellenza. Formazione scolastica universitaria"* given by the Province of Trento – 2012 -2017.
- Winner of the student competition for the contribution of **[Paper 1]** at the BSA conference, 2019, Bozen-Bolzano, Italy.

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[8] Thesis Support Activities

1. "*Sviluppo di un sistema di prova in laboratorio dei generatori di calore per l'ottimizzazione delle logiche di regolazione*". Student: Marco Bettoncelli. Supervisors: Prof. Alessandro Prada, Prof. Paolo Baggio. Co-supervisor: Ing. Maja Danovska, Ph.D. 2023. Corso di laurea magistrale in Ingegneria Civile. Università di Trento.
2. "*Caratterizzazione sperimentale in camera climatica delle prestazioni termiche delle pareti*". Student: Sara Zanotti. Supervisors: Prof. Alessandro Prada, Prof. Paolo Baggio. Co- supervisor: Ing. Maja Danovska, Ph.D. 2023. Corso di laurea magistrale in Ingegneria Civile. Università di Trento.
3. "*Misura della trasmittanza termica in laboratorio di pareti in muratura post-riqualificazione energetica*". Student: Angelica Pozzani. Supervisor: Prof. Alessandro Prada. Co- supervisor: Ing. Maja Danovska, Ph.D. 2024. Corso di laurea triennale in Ingegneria Civile. Università di Trento.
4. "*Analisi della riproducibilità di misure di conducibilità termica di materiali isolanti*". Student: Kostyantyn Alimov. Supervisor: Prof. Alessandro

Prada. Co-relatori: Ing. Maja Danovska, Ph.D., Ing. Cintelli Elena. 2024. Corso di laurea triennale in Ingegneria Civile. Università di Trento.

5. "*Analisi dell'effetto dei PCM sulla risposta termica delle pareti edilizie*". Student: Felice De Pellegrin. Supervisor: Prof. Alessandro Prada. Co-supervisor: Ing. Maja Danovska, Ph.D. 2024. Corso di laurea triennale in Ingegneria per l'Ambiente ed il Territorio. Università di Trento.
6. "*Internships in the South Tyrol Wood Industry: Production Processes and Valorization of Timber Products*". Student: Giulia Lucia Dillon. Supervisor: Ing. Maja Danovska, Ph.D. 2024. PROFESSIONAL BACHELOR IN WOOD ENGINEERING. Free University of Bolzano/ Bozen.
7. "REGOLAZIONE E OTTIMIZZAZIONE DELLA GESTIONE DELL'UNITÀ PER IL TRATTAMENTO DELL'ARIA DELLA BIBLIOTECA DI MESIANO". Student: Miriana Rosa. Supervisor: Prof. Alessandro Prada. Co-supervisor: Ing. Maja Danovska, Ph.D. 2025. Corso di laurea magistrale in Ingegneria Civile. Università di Trento.

[9] Statement of research Interest

Research Interest:

- Thermal behavior of building envelope components through numerical simulations and laboratory experimental tests.
- Hygrothermal performance of opaque building components.
- Energy Efficiency in buildings and in Energy systems.
- Renewable Energies and Renewable Energy technologies.
- Heat pump systems.
- Energy Engineering.
- Optimization strategies of building and HVAC systems.

[10] Competences & Skills

[10.1] Languages

Mother tongue: Italian and Macedonian.

Other languages (either self-assessed according to Common European reference Framework for Languages or certified):

Comprehension		**Speaking**		**Written production**
Listening	Reading	Oral interaction	Oral production	
English				
B2	B2	B2	B2	B2
German				
C1	C1	C1	C1	C1
Spanish				
B2	B2	B2	B2	B2

Other: attended French course level A1 and Chinese course attended in the Highschool for 4 years.

Certifications:

- English:
  - **IELTS (level B2 or 6.5)** on 03.05.2012. Constant adoption of the English language since Master studies (technical glossary). Remarkably improved during my PhD where the official language was English. Thus, self-certified a complete C1 level with fluent speaking skills.
- German:
  - **DSD Deutsches Sprach Diplom (level C1)** on 21.02.2012 and **local bilingualism license Italian-German level A** (max) on 22.09.2014.
- Spanish:
  - **DELE certification (level B2)** on 22.02.2011.

[10.2] Experimental

- **Thermal conductivity measurements** on building materials with **HFM (Netzsch HFM 436)**: advanced knowledge.
- **Thermal diffusivity measurements** (indirectly thermal conductivity) on building materials with **Hot Disk® (Transient Plane Source, or TPS)**: advanced knowledge.
- **Conditioning procedures with climate chambers, e.g., ATT Angelantoni chambers**: advanced knowledge.
- **Thermal characterization of real-scale building components in hot-box apparatus, e.g., BIEMME double climatic chambers, in stationary and dynamic regimes**: advanced knowledge.
- **Thermal measurements with heat flux meters (Hukseflux) for the heat flux; in terms of temperature, thermocouples, RTD, and indirect measurements with thermal camera, e.g., FLIR:** advanced knowledge.
- Expertise in sensors' **calibration**: temperature sensors (thermocouples, RTD) and heat flux meters.
- **Humidity measurements, e.g., capacitive sensors, or indirect measurements with electronic scales and ventilated ovens, chilled mirror hygrometers:** advanced knowledge.
- **Light measurements, e.g., fixed & portable luxmeters – Konica Minolta, spot luminance meters -Konica Minolta, HDR camera, spectrophotometer-Konica Minolta:** advance knowledge.
- Advanced knowledge in working with **logging systems like DataTaker and KeySight.**
- **Chemical skills, e.g., salt solution preparation:** basic knowledge.
- Experience with **HOBO sensors for indoor humidity/ temperature** for **Indoor Air Quality** measurements. Instruments for the **determination of VOC & indoor contaminants**.
- Knowledge of testing **mechanical ventilation systems** of small capacity (400 m3/h airflow) with **Air Handling Units**; adoption of

testing rigs for compact ventilation units coupled with heat pumps; Adoption of **Pitot Tubes**.

- Expertise with **hydronic circuits** including heat generators as heat pumps, boilers, biomass furnaces. Measurements of volumetric flow measurements, RTD sensors (e.g., PT100).
- Knowledge in developing acquisition and control systems through the **LabView program** and the adaption of *National Instruments* acquisition and control cards.
- **In-situ** thermal and lighting measurements. Expertise in setting up in-situ acquisition systems.
- Knowledge in **continuous gas monitoring systems** (e.g., **maMoS – modular stationary gas analyser**) for the measuring of carbon dioxide and methane mass concentrations.
- Knowledge in testing **compact air ventilation units** under control conditions.

[10.3] Software & Codes

- **MATLAB, Office Pack, Dialux, TRNSYS, LaTeX, Adobe InDesign, AutoCAD, COMSOL Multiphysics, THERM:** advanced knowledge.
- **QGIS, LabView:** good knowledge.
- Experience in **Rhinoceros, Energy Plus, Python, R, Arduino, DesignBuilder, WUFI, Delphin, Aspen Plus, HTML coding.**

[10.4] Skills

- Good communication and writing skills, excellent ability to listen.
- Excellent ability to relate with different people, to manage and optimize different assignments at the same time, teamwork, problem solving. Very collaborative.
- Adaptable, flexible, tolerant of change and uncertainties.
- Capable to organize and give lessons to students (University).

[10.5] Others

- B driving license.
- Experience as Poll Clerk at the municipality of Trento for the National Elections of the year 2018.

[11] Licenses and certifications

- Abilitazione all'esercizio della professione di Ingegnere (da dicembre 2022). Esame di stato superato presso la facoltà di ingegneria dell'Università di Trento. English translation: government exam and licensed as a profession engineer.

- Sistemi di assicurazione della qualità nelle Università e valutazione esterna – Università di Trento/ University of Trento. Data di rilascio: nov 2023. ID credenziale InfBpUdC-

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[12] Links	**ResearchGate** https://www.researchgate.net/profile/Maja-Danovska **LinkedIn** https://www.linkedin.com/in/maja-danovska-b44293105/ **ORCID:** https://orcid.org/0000-0002-9660-9843 **RA:** https://webapps.unitn.it/du/en/Persona/PER0146635/Didattica **SEL**: https://sustainableenergy.dicam.unitn.it/

Trento, June. 2025