

## **Veronica Lucia Castaldo**

Master Degree in Building Engineering

Professional Engineer

PhD candidate in Energy Engineering



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## **CONTACT INFORMATION**

Birthday: 11/11/1988

Home-town: Perugia, Italy

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## **EDUCATIONAL BACKGROUND**

2015-present **Visiting PhD at the Department of Civil Engineering and Engineering Mechanics, Columbia University** New York City, USA

Visiting researcher in the field of CFD (computational fluid dynamics) analysis applied to urban built environment.

2014-2015 **PhD student in Energy Engineering, University of Perugia** Perugia, Italy

- Main Research Focus:
  - buildings energy efficiency assessment through building dynamic simulation analysis, also considering the Inter-building effect;
  - buildings' energy dynamic simulation;
  - envelope reflectance assessment (albedo impact) as innovative strategy for improving indoor comfort and reducing building environmental impact;
  - microclimate and meteorological in field monitoring of advanced technologies neighborhoods and calibration of numerical models.
  - indoor-Outdoor CFD analysis for studying natural ventilation and the influence of the interaction with surrounding buildings in urban context.

- 2013            **Professional qualifying examination in Building Engineering**            Perugia, Italy  
Code: A-3598
- 2013            **Master Degree in Building Engineering**            Milan, Italy  
Polytechnic University of Milan, Building Engineering  
*109/110*
- Defended thesis on the dynamic simulation of the thermal-energy performance of buildings in urban environment to evaluate the impact of both urban and climate boundary conditions on the buildings' energy requirement.
  - Main focuses: Integrated building design and architectural technology; Building physics (thermodynamics, acoustics, illuminating engineering); Energetic systems and environmental suitability; Building energy equipment - theory and design; Construction materials; Structural design; Seismic building analysis and adapting, Architecture history and city planning; Project finance and management; Urban design and city planning.
- 2011            **Bachelor of Science in Civil Engineering**            Perugia, Italy  
University of Perugia, Civil Engineering  
*105/110*
- Main focuses: Building structural analysis and design; Applied Physics; Topography; Hydrology; Geotechnics, Digital design.
- 2007            **High school Diploma**  
Classic Lyceum "A. Mariotti"            Perugia, Italy  
*100/100*
- Main subjects: international history, philosophy, Italian literature, chemistry, biology, English as a second language, English literature, International art (painting, architecture, sculpture).

## **PROFESSIONAL EXPERIENCE**

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- 2013            **Licensed Building Engineer by Italian Institute of Engineers**  
Registration code: A-3598
- 2013-present    **University of Perugia**            Perugia, Italy  
Biomass Research Center  
*PhD candidate and Research assistant in Energy Engineering*
- Building thermal-energy calibrated dynamic simulation.
  - CFD analysis of flows in urban environments.

- Managed research project and experimental activity regarding local climate and energy monitoring in residential buildings, to validate numerical models.
- Participated in several research projects and experimental activities regarding building energy monitoring and indoor-outdoor microclimate assessments.
- Collaborated and provided highly specialized lectures to engineering students regarding building energy plants design, efficiency strategies assessment, buildings' envelope improvement, and buildings' energy efficiency law evolution and implementation into design procedures.
- Supervised engineering doctors in undertaking research and experimental activity and in managing thesis works and final dissertations.
- Cooperated to several European calls in the framework of Horizon 2020. In 2015, she was involved and won two European projects, "IMPATH TES- Innovation pathways for energy storage technologies" and "ZERO PLUS- Achieving near Zero and Positive Energy Settlements in Europe using Advanced Energy Technology".

2013 **Kiss and Cathcart, Architects** New York City, Usa

Intern

*Executive Integrated Designer*

- Main focuses: architectural design, building envelope technology design, energy modeling.

2013-present **Cooperation with private companies** Perugia, Italy

Technical consulting (technical support through numerical and experimental analysis)

- Cooperation with the italian company Fornaci Briziarelli Marsciano S.p.a. for the experimental analysis and LEED certification of high performing clay tiles.
- Cooperation with the italian company CVR for the experimental characterization and optimization of the optic-thermal properties of cool membranes and paintings for building envelopes.
- Cooperation with the italian company Metelli S.p.a. for the experimental characterization and optimization of the thermal properties of a natural and local gravel for roof and paving applications.

2013-present **Teaching activity for private/public institutions** Perugia, Italy

- Tutoring activity for the course of Applied Physics at University of Perugia
- Technical lectures for the training courses about building energy certification organized by Scuola Edile of Perugia

## LANGUAGES

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- Italian - native speaker
- English – excellent (level B2)
- French – basic (level A1)

PUBLICATIONS

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*Original Papers (international peer reviewed journals):*

1. Pisello A.L., Pignatta G., **Castaldo V.L.**, Cotana F., 2014, "Experimental Analysis of Natural Gravel Covering as Cool Roofing and Cool Pavement", *Sustainability*, doi:10.3390/su6084706.
2. Pisello A.L., **Castaldo V.L.**, Taylor J.E., Cotana F., 2014, "Expanding Inter-building effect modeling to examine primary energy for lighting", *Energy and Buildings*, doi:10.1016/j.enbuild.2014.02.081.
3. Pisello A.L., **Castaldo V.L.**, Poli T., Cotana F., 2013, "Simulating Buildings' Thermal-Energy Performance at Urban Scale: Evaluation of Inter-Building Effect in Different Urban Configurations", *Journal of Urban Technology*, doi:10.1080/10630732.2014.884386.
4. Pisello A.L., **Castaldo V.L.**, Pignatta G., Cotana F., 2015, "Experimental analysis and optimization of polyurethane waterproof liquid membrane for cool roof application and urban heat island mitigation", *Energy and Buildings*, doi:10.1016/j.enbuild.2015.05.026.
5. Pisello A.L., Petrozzi A., **Castaldo V.L.**, Cotana F., 2015, "Energy refurbishment of historical buildings with public function: pilot case study", *Applied Energy*, doi:10.1016/j.apenergy.2015.05.026.
6. **Castaldo V.L.**, Coccia V., Cotana F., Pignatta G., Pisello A.L., Rossi F., 2015, "Thermal-energy analysis of natural "cool" stone aggregates as passive cooling and global warming mitigation technique", *Urban Climate Journal*, , doi:10.1016/j.enbuild.2015.05.026.
7. Pisello A.L., Petrozzi A., **Castaldo V.L.**, Cotana F., "On an innovative integrated technique for energy refurbishment of historical buildings: Thermal energy, economic and environmental analysis of a case study", *Applied Energy*, 2015, doi:10.1016/j.apenergy.2015.05.061.
8. Pisello A.L., Pignatta G., **Castaldo V.L.**, Cotana F., 2015, "The impact of local microclimate boundary conditions on building energy performance", *Sustainability*, doi:10.3390/su7079207.
9. Pisello A.L., **Castaldo V.L.**, Pignatta G., Cotana F., 2015, "Integrated experimental and numerical methodology for thermal-energy analysis and optimization of heritage museum buildings", *Building Service Engineering Research and Technology*.
10. Kiss G., Jansen H., **Castaldo V.L.**, Orsi L., 2015, "The 2050 City", *International Conference on Sustainable Design, Engineering and Construction Procedia Engineering*, doi:10.1016/j.proeng.2015.08.434.
11. Pisello, A.L., **Castaldo, V.L.**, Fabiani, C., Cotana, F., 2016, "Investigation on the effect of innovative cool tiles on local indoor thermal conditions: Finite element modeling and continuous monitoring" *Building and Environment*, <http://dx.doi.org/10.1016/j.buildenv.2015.11.038>.
12. Pisello, A.L., **Castaldo, V.L.**, Cotana, F., 2015, "Dynamic thermal-energy performance analysis of a prototype building with integrated phase change materials", *Energy Procedia*.
13. Pisello, A.L., **Castaldo, V.L.**, Piselli, C., Pignatta, G., Cotana, F., 2015, "Combined thermal effect of cool roof and cool façade on a prototype building" *Energy Procedia*.
14. **Castaldo V.L.**, Taylor J.E., Cotana F., 2016, "The impact of natural ventilation on building energy requirement at inter-building scale", Pisello A.L., *Energy and Buildings*.
15. Pisello, A.L., Fabiani, C., Makaremi, N., **Castaldo, V.L.**, Cavalaglio, G. Nicolini, A., Barbanera, M., Cotana, F., 2016, "Sustainable new brick and thermo-acoustic insulation panel from mineralization of stranded driftwood residues", *Energies*.
16. Pisello A.L., **Castaldo V.L.**, Piselli C., Fabiani C., Cotana F., 2016, "How peers' personal attitudes affect indoor microclimate and energy need in an institutional building: results from a continuous monitoring campaign in summer and winter conditions", *Energy and Buildings*.

17. Pisello, A.L., **Castaldo, V.L.**, Pignatta, G., Cotana, F., Santamouris, M., 2016, "Experimental in-lab and in-field analysis of waterproof membranes for cool roof application and urban heat island mitigation", *Energy and Buildings*.
18. Pyrgou A., **Castaldo V.L.**, Pisello A.L., Cotana F., Santamouris M. 2017, "On the effect of summer heatwaves and urban overheating on building thermal-energy performance in central Italy", *Sustainable Cities and Society*.
19. Pisello A.L., Fabiani C., Makaremi N., **Castaldo V.L.**, Cavalaglio G., Nicolini A., Barbanera M., Cotana F. 2016, "Sustainable new brick and thermo-acoustic insulation panel from mineralization of stranded driftwood residues", *Energies*.

*Original Papers (national and international conference papers):*

1. Pisello A.L., **Castaldo V.L.**, Petrozzi A., Cotana F., "On an innovative integration strategy of renewable energy system in historic building with public function Strategia innovativa di integrazione con fonti rinnovabili del sistema impiantistico di un edificio storico con funzione pubblica", Aicarr Conference, Rome, February 26th-28th, 2014.
2. Pisello A.L., **Castaldo V.L.**, Castellini I., Cotana F., "Experimental evaluation of the indoor thermal environment of an Italian historical subterranean museum space", 14th CIRIAF National Congress Energy, Environment and Sustainable Development, Perugia, Italy, April 4th-5th, 2014
3. Pertosa M., Pisello A.L., **Castaldo V.L.**, Cotana F., "Environmental sustainability concept applied to historic buildings: the experience of LEED international protocol in the stable of Sant' Apollinare fortress in Perugia", 14th CIRIAF National Congress, Energy, Environment, and Sustainable Development, Perugia, Italy, April 4th-5th, 2014
4. Pisello A.L. Petrozzi A., **Castaldo V.L.**, Cotana F., "Energy refurbishment of historical buildings with public function: pilot case study", 6th International Conference on Applied Energy – ICAE2014, Taipei City, Taiwan, Province Of China, May 30th – June 2<sup>nd</sup>, 2014
5. Petrozzi A., Pisello A.L., Cavalaglio G., Coccia V., Gelosia M., Pertosa M., **Castaldo V.L.**, "Energy enhancement of Arundo phragmites reed as biofuel for thermal boiler", 15<sup>o</sup> World lake conference, Perugia, September 1st-4th, 2014
6. Pisello A.L., **Castaldo V.L.**, Cotana F., "Dynamic thermal-energy performance analysis of a prototype building with integrated phase change materials", 69th Conference of the Italian Thermal Machines Engineering Association, ATI2014, Milano, September 10th-12<sup>th</sup>, 2014
7. Pisello A.L., **Castaldo V.L.**, Pignatta G., Cotana F., "Evaluation of the thermal-energy performance of naturally "cool" gravel covering for cool roof and cool pavement application: a case study", 3<sup>o</sup> International Conference on *Countermeasures to Urban Heat Islands*, IC2UHI, Venice, October 13<sup>th</sup>-15<sup>th</sup>, 2014
8. Pisello A.L., **Castaldo V.L.**, Pignatta G., Cotana F., "Experimental analysis and optimization of polyurethane waterproof liquid membrane for cool roof application", 3<sup>o</sup> International Conference on *Countermeasures to Urban Heat Islands*, IC2UHI, Venice, October 13<sup>th</sup>-15<sup>th</sup>, 2014
9. Pisello A.L., **Castaldo V.L.**, Cotana F., "Dynamic thermal-energy performance analysis of a prototype building with integrated phase change materials", 69th Conference of the Italian Thermal Machines Engineering Association, ATI 2014.
10. Rosso F., Pisello A.L., Pignatta G., **Castaldo V.L.**, Piselli C., Cotana F., Ferrero M., "Outdoor thermal and visual perception of natural cool materials for roof and urban paving", International Conference on Sustainable Design, Engineering and Construction, Chicago, USA, May 11-13<sup>th</sup> 2015
11. Kiss G., Jansen H., **Castaldo V.L.**, "The 2050 City", International Conference on Sustainable Design, Engineering and Construction, Chicago, USA, May 11-13<sup>th</sup> 2015

12. Pisello A.L., **Castaldo V.L.**, Piselli, C., Fabiani, C., Cotana, F., "Role of occupants' background and education on their vulnerability in urban overheating conditions", IC2UHI-20164th International Conference on Countermeasures to Urban Heat Island, Singapur, 30-31 May and 1 June 2016.
13. Pisello A.L., **Castaldo V.L.**, Piselli, C., Fabiani, C., Cotana, F., "Thermal performance of coupled cool roof and cool façade: results from a continuous monitoring campaign and sensitivity analysis", IC2UHI-20164th International Conference on Countermeasures to Urban Heat Island, Singapur, 30-31 May and 1 June 2016.
14. Paolini,R., Zani, A., **Castaldo, V.L.**, Pisello, A.L., Antretter, F.,Poli, T., Cotana, F., "The influence of urban microclimate on building energy needs and hygrothermal performance", IC2UHI-20164th International Conference on Countermeasures to Urban Heat Island, Singapur, 30-31 May and 1 June 2016.
15. Pisello, A.L., **Castaldo, V.L.**, Cotana, F., "Inter-Building Effect: a review of the state of art", 16th CIRIAF National Congress Sustainable Development, Human Health and Environmental Protection Assisi, Italy. April 7-9, 2016.
16. Pisello, A.L., **Castaldo, V.L.**, Piselli, C., Pigliautile, I., Cotana, F., "Combined experimental and numerical assessment for investigating the impact of different boundary conditions on local microclimate", 16th CIRIAF National Congress Sustainable Development, Human Health and Environmental Protection Assisi, Italy. April 7-9, 2016.
17. Pisello, A.L., **Castaldo, V.L.**, Piselli, C., Pigliautile, I., Cabeza L.F., Perez, Cotana, F., "Microclimate Mitigation by means of Thermal-energy Storage: A case study in Central Italy", Eurosun 2016, Palma de Mallorca, 11-14<sup>th</sup> October 2016.
18. Pisello, A.L., **Castaldo, V.L.**, Piselli, C., Pigliautile, Cotana, F., "Microclimate Mitigation for Reducing Summer Overheating in Historic District", Eurosun 2016, Palma de Mallorca, 11-14<sup>th</sup> October 2016.
19. Pisello, A.L., **Castaldo, V.L.**, Piselli, C., Fabiani, C., Cotana, F., "Can we assume that peers behave the same? Results from a continuous monitoring campaign in an office building", Clima 2016, 22nd-25th May 2016, Aalborg, Denmark.

*Books:*

1. Pisello A.L., Paolini R., Diamanti M.V., Fortunati E., **Castaldo V.L.**, Torre L., "Nano and Biotech based materials for energy building efficiency- Nano-based cool materials for building energy efficiency", Editors: F. Pachego-Torgal, C. Buratti, S. Kalaiselvam, C.G. Granqvist, V. Ivanov., Springer Edition, 2015.

NATIONAL AND INTERNATIONAL RESEARCH PROJECT

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- FBM cooperation: LEED certification of innovative cool tiles.
- CVR cooperation: implementation of innovative and high-performing materials for building envelope.
- Participation to three European Horizon 2020 projects: ZEROPLUS (grant agreement n° 678407), INPATH TES (grant agreement n° 657466), and HERACLES (grant agreement n° 700395).

NATIONAL AND INTERNATIONAL MEETING PRESENTATIONS and SEMINARS/SUMMER SCHOOLS

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- 49<sup>th</sup> International Congress Aicarr "Historical and existing buildings: designing the retrofit. An overview from energy performances to indoor air quality", September, 22<sup>nd</sup> – 24<sup>nd</sup>, 2014, Roma, Italy.

- 14<sup>th</sup> National Ciriak Congress, “Energy, Environment and sustainable development”, 4-5 April, 4<sup>th</sup>- 5<sup>th</sup>, 2014, Perugia, Italy.
- International World Lake Conference, September, 1<sup>st</sup>-2<sup>nd</sup>, 2014, Perugia, Italy.
- Summer School of Applied Physics, July, 5<sup>th</sup>- 9<sup>th</sup>, 2014, Benevento, Italy.
- Summer School of thermo-fluid dynamic, September, 8<sup>th</sup> -13<sup>th</sup>, 2014, Siena, Italy.
- Ansys Fluent Summer School, September, 22<sup>th</sup> -24<sup>th</sup>, 2014, Polytechnic of Milan, Milan, Italy.
- Doctoral course “Applicazioni energetiche della Chimica Verde”, Università degli Studi di Perugia, Italy, June, 10-24<sup>th</sup>, 2015.
- Doctoral course “Performance Based Design of Buildings’ Networks: Radiative - Convective Modelling of Urban Microclimates”, December, 1<sup>st</sup>- January,15<sup>th</sup> 2015, Politecnico di Milano, Italy.
- Doctoral course “Thermal-energy efficiency in buildings”, December, 9<sup>th</sup> – January, 26<sup>th</sup> 2015, Università degli Studi di Perugia, Italy.
- Doctoral course “Life cycle assessment”, November, 14<sup>th</sup>- December, 3<sup>th</sup>, 2014, Università degli Studi di Perugia, Italy.
- Doctoral course “Termofluidodinamica Computazionale”, 2014, November, 4<sup>th</sup>- December, 3<sup>th</sup> Università degli Studi di Perugia, Italy.
- 6<sup>th</sup> International conference IBPC 2014, “International Conference on Building Physics for a Sustainable Built Environment”, Torino, Italy, June 14<sup>th</sup> -17<sup>th</sup> 2015.

## SKILLS

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### SOFTWARE:

- OS: **Windows, Mac, Linux**
- **Autocad**, Google SketchUp (building design)
- **Fortran** (Microsoft Developer Studio)
- **Adobe Photoshop**
- Microsoft **Office** (Word, Excel, Power Point)
- **Energy Plus**, Design Builder (dynamic thermal-energy simulation)
- **Termus** Acca (building energy certification)
- **COMSOL Multiphysics** (CFD analysis)
- **OpenFoam** (opensource tool for CFD analysis)
- **SPSS** (statistical analysis)
- **Matlab**

### LABORATORY and IN-FIELD MEASUREMENT INSTRUMENTS: proper use of

- Spectrophotometer
- Thermal emissometer
- Albedometer (or double-pyranometer)
- Thermo-hygrometer sensors
- Indoor-Outdoor Microclimate monitoring stations
- Weather stations
- Thermal imaging camera

## INTERESTS AND HOBBIES

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- Sailing
- Traveling
- Reading
- Historical and Contemporary Architecture

- Interior design
- Impressionist and European avan-garde painting
- Classical Ballet
- Skiing and Snowboarding