

EUROPEAN  
CURRICULUM VITAE  
FORMAT



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## PERSONAL INFORMATION

Name	BORGHESI COSTANZA
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## EDUCATION AND TRAINING

<ul style="list-style-type: none"><li>• <i>Title of qualification awarded</i></li><li>• <i>Dates (from – to)</i></li><li>• <i>Name and type of organisation providing education and training</i></li><li>• <i>Supervisors</i></li><li>• <i>Thesis title</i></li></ul>	International Ph.D. in Civil and Environmental Engineering November 2021 – On going (Ends on 31 <sup>st</sup> October 2024) Università Degli Studi di Perugia (UniPG - Italy) Principal supervisor (UniPg): Giacomo Giorgi Internal co-supervisor (UniPg): Anna Laura Pisello International co-supervisor (DTU): Ivano Eligio Castelli From functional to next-generation oxides: materials engineering for high-performance passive radiative cooling
<ul style="list-style-type: none"><li>• <i>Title of qualification awarded</i></li><li>• <i>Dates (from – to)</i></li><li>• <i>Name and type of organisation providing education and training</i></li><li>• <i>Supervisors</i></li><li>• <i>Thesis title</i></li></ul>	Joint European Master in Theoretical Chemistry and Computational Modelling September 2018 - July 2020 Università Degli Studi di Perugia (UniPG - Italy) and Autonomous University of Madrid (UAM - Spain) Supervisors: Filippo De Angelis, Edoardo Mosconi and Sergio Diaz-Tendero. Electronic structure and spectroscopic properties of surface-adsorbed macrocyclic molecules for photovoltaic applications
<ul style="list-style-type: none"><li>• <i>Title of qualification awarded</i></li><li>• <i>Final Mark</i></li></ul>	Joint European M.Sc. Chemical Sciences 110 cum laude
<ul style="list-style-type: none"><li>• <i>Title of qualification awarded</i></li><li>• <i>Dates (from – to)</i></li><li>• <i>Name and type of organisation providing education and training</i></li></ul>	Bachelor of Science in Chemistry October 2015 - September 2018 Università Degli Studi di Perugia (UniPG - Italy)

• Supervisor	Francesca Nunzi
• Thesis title	The nature of Pb-I bond in Pbl2 as case study of lead halide perovskites
• Final Mark	110 cum laude

## INTERNATIONAL EXPERIENCE

• Dates (from – to)	June 2024
• Name and type of organisation providing education and training	Cardiff University/Prifysgol Caerdydd (Cardiff, United Kingdom) - Chemistry Department
• Position	Visiting Academic
• Mentor	Prof. Stefano Leoni
• Dates (from – to)	May-November 2023
• Name and type of organisation providing education and training	Guest Ph.D., Technical University of Denmark - DTU (Kgs.Lyngby, Denmark) - Energy Department
• Position	Guest Ph.D.
• Mentor	Prof. Ivano Eligio Castelli
• Dates (from – to)	May-June 2022
• Name and type of organisation providing education and training	Guest Ph.D., Technical University of Denmark - DTU (Kgs.Lyngby, Denmark) - Energy Department
• Position	Guest Ph.D.
• Mentor	Prof. Ivano Eligio Castelli
• Dates (from – to)	September 2020 – April 2021
• Name and type of organisation providing education and training	University College London - UCL (London, United Kingdom) - Department of Physics and Astronomy
• Position	Ph.D. student in Condensed Matter and Materials Physics
• Mentor	Prof. Alexander Shluger
• Project title	Modelling intrinsic defects at $\alpha$ -SiC/SiO <sub>2</sub> interface and investigation of the processes responsible for SiC-based devices (e.g. MOSFET) deterioration
• Dates (from – to)	September-December 2019
• Name and type of organisation providing education and training	Autonomous University of Madrid - UAM (Madrid, Spain) in Chemical Sciences
• Position	Guest Master Student
• Mentor	Prof. Sergio Diaz-Tendero

## SCHOOLS AND COURSES

• Dates	August 2023
• Location and name of organisation providing education and training	University of Copenhagen (Metalskolen - Jørlunde, Denmark)

<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	CHEAC Summer School 2023 - High Entropy Materials and their Properties
<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	April 2022
<ul style="list-style-type: none"> <li>• <i>Location and name of organisation providing education and training</i></li> </ul>	ICTP - International Centre for Theoretical Physics (Trieste, Italy)
<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	Ab-initio Many-Body Methods and Simulations with the Yambo Code
<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	March 2022
<ul style="list-style-type: none"> <li>• <i>Location and name of organisation providing education and training</i></li> </ul>	CINECA (Bologna, Italy)
<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	Introduction to Parallel Computing with MPI and OpenMP
<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	March 2022
<ul style="list-style-type: none"> <li>• <i>Location and name of organisation providing education and training</i></li> </ul>	CINECA (Bologna, Italy)
<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	Introduction to Python Programming
<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	July 2021
<ul style="list-style-type: none"> <li>• <i>Location and name of organisation providing education and training</i></li> </ul>	EPFL (Lausanne, Switzerland)
<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	Automated Interactive Infrastructure and Database for Computational Science (AiiDA) Virtual Tutorial 2021
<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	September 2020
<ul style="list-style-type: none"> <li>• <i>Location and name of organisation providing education and training</i></li> </ul>	University Paul Sabatier Toulouse III (Bagnères-de-Luchon, France)
<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	Theoretical Chemistry and Computational Modelling Winter School
<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	September 2019
<ul style="list-style-type: none"> <li>• <i>Location and name of organisation providing education and training</i></li> </ul>	Autonomous University of Madrid (Madrid, Spain)
<ul style="list-style-type: none"> <li>• <i>Principal subjects/occupational skills covered</i></li> </ul>	14th edition of the International Intensive Course of the European Master in Theoretical Chemistry and Computational Modelling

## CONFERENCES AND CONTRIBUTIONS

<ul style="list-style-type: none"> <li>• <i>Dates</i></li> </ul>	July 1- 4 2024
<ul style="list-style-type: none"> <li>• <i>Location</i></li> </ul>	Hanoi, Vietnam
<ul style="list-style-type: none"> <li>• <i>Topic</i></li> </ul>	The 24 <sup>th</sup> International Conference on Computational Science and Its Applications (ICCSA 2024)

For more information go to  
[www.cedefop.eu.int/transparency/europa.eu.int/comm/education/index\\_en.html](http://www.cedefop.eu.int/transparency/europa.eu.int/comm/education/index_en.html)  
[eurescv-search.com/](http://eurescv-search.com/)

• <i>Type of contribution</i>	ORAL CONTRIBUTION: DFT+U optical features of thermochromic VO <sub>2</sub> : A powerful tool towards functional daytime radiative passive cooling implementation
• <i>Dates</i>	13-14 June 2024
• <i>Location</i>	University of Perugia (Perugia, Italy)
• <i>Topic</i>	X AICInG Workshop - Sustainable materials for a circular economy and a better quality of life
• <i>Type of contribution</i>	ORAL CONTRIBUTION: Electronic properties and optical behaviour of silicon doped vanadium dioxide: a DFT+U study POSTER CONTRIBUTION: Defect dependent infrared properties of cerium based nanoceramics for passive radiative cooling
• <i>Dates</i>	21-23 February 2024
• <i>Location</i>	University of Valencia (Valencia, Spain)
• <i>Topic</i>	XV Conference of Young Researchers in Atomic and Molecular Physics
• <i>Type of contribution</i>	ORAL CONTRIBUTION: Tailoring High Entropy Oxides (HEOs) as emerging radiative materials for green energy saving buildings
• <i>Dates</i>	29 May – 2 June 2023
• <i>Location</i>	Strasbourg (France)
• <i>Topic</i>	E-MRS 2023 SPRING MEETING
• <i>Type of contribution</i>	POSTER CONTRIBUTION: Tailoring High Entropy Oxides (HEOs) as emerging radiative materials for green energy saving buildings.
• <i>Dates</i>	13–14 April 2023
• <i>Location</i>	Centro Interuniversitario di Ricerca sull'Inquinamento e sull'Ambiente "Mauro Felli" (CIRIAF) - Perugia, Italy
• <i>Topic</i>	XXIII Congresso Nazionale CIRIAF
• <i>Type of contribution</i>	ORAL CONTRIBUTION: Doping-induced Control of the Metal-Insulator Transition (MIT) Temperature in Thermochromic VO <sub>2</sub> for Radiative Cooling Applications: a Combined Density Functional Theory and Ab-initio Molecular Dynamics investigation.
• <i>Dates</i>	11-13 January 2023
• <i>Location</i>	ICTP - The Abdus Salam International Centre for Theoretical Physics, Trieste (Italy)
• <i>Topic</i>	21th International Workshop on Computational Physics and Materials Science: Total Energy and Force Methods
• <i>Type of contribution</i>	POSTER CONTRIBUTION: Tailoring High Entropy Oxides (HEOs) as emerging radiative materials for green energy saving buildings
• <i>Dates</i>	8-9 September 2020
• <i>Location</i>	Virtual
• <i>Topic</i>	NanoGe Internet Conference on Theory and Computation of Halide Perovskites (ComPer)
• <i>Type of contribution</i>	POSTER CONTRIBUTION: Surface-Absorbed Macrocyclic Molecules for Photovoltaic Applications

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## AWARDS AND ACHIEVEMENTS

• <i>Dates</i>	June 2024
• <i>Type of award</i>	Best Poster Award (awarded by MDPI)
• <i>Event</i>	X AICIng Workshop, Perugia (Italy)

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## JOURNAL COVERS

• <i>Dates</i>	December 2023
• <i>Journal</i>	Chemistry of Materials
• <i>Number of issue</i>	vol.35, no.24

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## WORK EXPERIENCE

• <i>Dates (from)</i>	24 February 2022
• <i>Name of employer</i>	Università Degli Studi di Perugia (UniPG - Terni, Italy)
• <i>Subject</i>	Materials chemistry for technologies (Degree course in Materials Engineering and Sustainable Processes)
• <i>Occupation or position held</i>	Subject expert ("Cultore della materia")
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• <i>Dates (from)</i>	21 February 2022
• <i>Name of employer</i>	Università Degli Studi di Perugia (UniPG - Terni, Italy)
• <i>Subject</i>	Chemistry (Degree course in Industrial Engineering)
• <i>Occupation or position held</i>	Subject expert ("Cultore della materia")
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• <i>Dates</i>	January-March 2021
• <i>Name of employer</i>	University College London (London, UK)
• <i>Subject</i>	Computational Physics
• <i>Occupation or position held</i>	University teaching assistant
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• <i>Dates (from – to)</i>	September 2017 – January 2018
• <i>Name of employer</i>	Università Degli Studi di Perugia (UniPG - Italy)
• <i>Subject</i>	Organic Chemistry
• <i>Occupation or position held</i>	University laboratory assistant

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## REFeree ACTIVITY

• <i>Journal/Volume</i>	Springer (book series: Lecture Notes in Computer Science, volume 14823)
• <i>Topic</i>	The 24th International Conference on Computational Science and Its Applications (ICCSA 2024)

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## ORGANISATIONAL COMPETENCES

• Location	University of Perugia (Perugia, Italy)
• Topic	X AICing Workshop - Sustainable materials for a circular economy and a better quality of life (13-14 June 2024)
• Role	Organising committee

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## OTHER PROJECTS

• Location	University of Perugia (Perugia, Italy)
• Project title	STEAMigPOWER : STEAM approaches at higher education for mIGrants, refugees and asylum seekers' emPOWERment
• Role	Volunteer and facilitator

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## LANGUAGES

MOTHER TONGUE	ITALIAN
OTHER LANGUAGES	ENGLISH
• Reading skills	Excellent
• Writing skills	Excellent
• Verbal skills	Excellent

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## COMPUTATIONAL SKILLS

OPERATING SYSTEMS	Deep knowledge of Linux environment, iOS and Windows
SCRIPTING	Bash, gnuplot
CODING	Fortran, Python, LaTeX
RENDERING AND GRAPHICS	Blender

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## RESEARCH PUBLICATIONS

### JOURNAL ARTICLES

C. Borghesi, C. Fabiani, R. Bondi, *et al.*, "Tailoring high-entropy oxides as emerging radiative materials for daytime passive cooling," *Chemistry of Materials*, vol. 35, no. 24, pp. 10 384–10 393, 2023.

DOI: <https://doi.org/10.1021/acs.chemmater.3c01205>

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C. Borghesi, G. T. Marlotti, E. Canadell, G. Giorgi, and R. Rurali, "Chirality effects and semiconductor versus metallic nature in halide nanotubes," *The Journal of Physical Chemistry C*, vol. 127, no. 15, pp. 7162–7171, 2023.

DOI: <https://doi.org/10.1021/acs.jpcc.3c00244>

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M. Palumbo, S. Postorino, C. Borghesi, and G. Giorgi, "Strong out-of-plane excitons in 2D hybrid halide double perovskites," *Applied Physics Letters*, vol. 119, no. 5, 2021.

DOI: <https://doi.org/10.1063/5.0059441>

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C. Borghesi, E. Radicchi, L. Belpassi, D. Meggiolaro, F. De Angelis, and F. Nunzi, "The nature of the lead-iodine bond in  $\text{PbI}_2$ : A case study for the modelling of lead halide perovskites," *Computational and Theoretical Chemistry*, vol. 1164, p. 112 558, 2019.

DOI: <https://doi.org/10.1016/j.comptc.2019.112558>

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### CONFERENCE PROCEEDINGS

C. Borghesi, C. Fabiani, A. L. Pisello, and G. Giorgi, "DFT+U optical features of thermochromic  $\text{VO}_2$ : A powerful tool towards functional daytime radiative passive cooling implementation," in *International Conference on Computational Science and Its Applications*, Springer, 2024, pp. 415–426.

DOI: [https://doi.org/10.1007/978-3-031-65329-2\\_28](https://doi.org/10.1007/978-3-031-65329-2_28)

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C. Borghesi, C. Fabiani, R. Bondi, *et al.*, "Doping-induced control of the metal-insulator transition (mit) temperature in thermochromic  $\text{VO}_2$  for radiative cooling applications: A combined density functional theory and ab-initio molecular dynamics investigation," in *XXIII CONGRESSO NAZIONALE CIRIAF Sviluppo Sostenibile, Tutela dell'Ambiente e della Salute Umana-Atti*, Morlacchi Editore srl, 2023.

<https://hdl.handle.net/11391/1554453>

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C. Borghesi, C. Fabiani, A. L. Pisello, and G. Giorgi, "Quantum confinement effects in materials for daytime radiative cooling: An ab-initio investigation," in *International Conference on Computational Science and Its Applications*, Springer, 2022, pp. 305–318

DOI: [https://doi.org/10.1007/978-3-031-10592-0\\_23](https://doi.org/10.1007/978-3-031-10592-0_23)

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### UNPUBLISHED REPRINTS

Borghesi C, Bondi R, Marchini F, Fabiani C, Latterini L, Pisello AL, *et al.* Optical Behaviour and Defect-dependent Spectral Design of Cerium-based Nanoceramics for Emerging Passive Radiative Cooling Technologies. ChemRxiv. 2024;

DOI: <https://doi.org/10.26434/chemrxiv-2024-ppr19-v2>

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