OLGA BEATRICE CARCASSI, Ph.D.

Associate Research Scientist
Natural Materials Lab,
Columbia University GSAPP
New York NY 10027
obc2101@columbia.edu - o.carcassi@gmail.com
+1.347.207.9625
https://www.obcarcassi.com/

Disciplinary fields

Environmental System, Building Technology, Regenerative Materials, Digital Fabrication

Education

PhD Candidate *// Nov 2018 - May 2022* - PhD awarded *// June 2022*
Department of Architecture, Built Environment, Construction Engineering (ABC) Politecnico di Milano, IT
PhD Thesis title: Designing the climate-neutrality. How to re-think the construction process of buildings by growing mycelium-based biocomposites
Advisors: Prof. Dr. Laura Elisabetta Malighetti & Prof. Dr. Ingrid Paoletti - Tutor: Prof. Dr. Enrico De Angelis

Master's Degree *//Sep 2009- May 2016*
Building Engineering and Architecture at School of Architectural Engineering, University of Pisa, IT
Thesis title: Application of photobioreactors containing microalgae on facades of existing buildings, for the capture of carbon dioxide and cogeneration of heat and biomass
Final grade: 110/110 cum laude

Academic Appointments

Associate Research Scientist, Columbia GSAPP, present
Postdoctoral Fellow, Politecnico di Milano, 2022 – 2023
Adjunct Teaching Professor, IAAC Barcelona, 2023
Adjunct Teaching Professor, School of Sustainability, 2023
Teaching Assistant, Politecnico di Milano, 2019 - 2022

Research Experience

Associate Research Scientist *// March 2023-present*
Graduate School of Architecture, Planning and Preservation (GSAPP), Columbia University, USA
Topic: 3D printing of natural materials
Advisor: Prof. Dr. Lola Ben-Alon

- Supervised and trained students in 3D printing techniques and digital fabrication using Grasshopper/Rhino
- Conducted research and development of earth- and fiber-based materials for 3D printing
- Provided technical expertise and input for multiple design projects
- Presented data and research findings in high level scientific journals
- Conducted customer discovery for potential bioregional commercialization of the research findings to reach the building scale

Postdoctoral Researcher *// June 2022-Feb 2023*
Department of Architecture, Built Environment, Construction Engineering (ABC), Politecnico di Milano, IT
Topic: Biogenic materials for a climate neutral built environment. Development of strategies and indices for establishing a design protocol.
Advisor: Prof. Dr. Ingrid Paoletti

- Supervised and trained master students in digital and bio fabrication

- Gained experience as teaching assistant in design studios
- Advised Master thesis in both the architecture and chemistry department
- Conducted research on natural materials and the current policies to push their use in real architectural projects

Visiting PhD Candidate *// Feb 2022*
LMDC, INSA Toulouse, FR
Field of research: Testing campaign of hygrothermal properties (capillarity, moisture buffer capacity, vapour permeability) of mycelium-based composites as building insulation materials.
Advisor: Prof. Dr. Sophie Claude

Visiting PhD Candidate *// Feb 2020 - May 2020*
Chair of Sustainable Construction ETH Zurich, CH
Field of research: Investigation of bio-based materials as regenerative solutions and replacements of carbon-intensive ones. Co-Supervisor of master thesis students.
Advisor: Prof. Dr. Guillaume Habert, Dr. Francesco Pittau

Research and Teaching Interests

- Waste, living, earth- and bio-based building materials
- Bioregional and cultural analysis and material scouting for building scale projects
- Manufacturing science using both digital fabrication and low-tech approaches
- Environmental life cycle assessment (LCA) and regenerative design

Grants, Honors and Awards

2024 First Prize, Columbia Post-doctoral Poster Session ($500)

2023 Co-Pi and Entrepreneur Leader for National Science Foundation (NSF) Innovation Corps (I-Corps™) "3DP LIFE", cohort Spring-Summer 2023 ($50,000)

2023 First Prize for Ph.D thesis publication (Bando DottorATi 2023) (€2,000)

2021 Co-Pi for the S2P Innovation-challenge at PoliHub (Politecnico di Milano) and Officine Innovazione (Deloitte) "Smush materials" (€30,000)

2021 Co-organizer for international Workshop "How to Develop a 3D printable mycelium-based composite?" (Politecnico di Milano), (€2,000)

2020 First Prize IDEA League scholarship (Politecnico di Milano) (€8,000)

2021 First prize for World-level Achievements of PhD Candidates (Politecnico di Milano) (€1,000)

Publications

Scholarly Publications in Peer-Reviewed Journals

1. Armistead, S.J., Maierdan, Y., Carcassi, O.B., Mikofsky, R.A., Ben-Alon,L., Kawashima, S., Srubar W.V.III. (2026). Bio-inspired 3D-printed Earthen Materials and Structures, *Nature Communications* (accepted, final review)
2. Turco, C., Carcassi, O.B., Teixeira, E., Mateus, R., Ben-Alon, L. (2025).Thin earth: Bio-stabilised pressed thin earth elements for building applications, *Construction and Building Materials*, 494, 143160, https://doi.org/10.1016/j.conbuildmat.2025.143160.
3. Carcassi, O.B., & Ben-Alon, L. (2025). Natural Materials Craft in 3D-Printed Design Inspired by Traditional Basketry. *Craft Research (accepted forthcoming)*
4. Carcassi, O.B., Salierno, R., Falcinelli, P. A., Paoletti, I. M., & Ben-Alon, L. (2024). Upscaling Natural Materials in Construction: Earthen, Fast-Growing, and Living Materials. *Sustainability*, 16(18), 7926. https://doi.org/10.3390/su16187926

5. Carcassi, O.B., & Ben-Alon, L. (2024). Additive manufacturing of natural materials. *Automation in Construction*, 167. https://doi.org/10.1016/j.autcon.2024.105703
6. Carcassi, O.B., Akemah, T., & Ben-Alon, L. (2024). 3D-Printed Lightweight Earth Fiber: From Tiles to Tessellations. *3D Printing and Additive Manufacturing*, https://doi.org/10.1089/3dp.2023.0341
7. Carcassi, O.B., Maierdan, Y., Akemah, T., Kawashima, S., & Ben-Alon, L. (2024). Maximizing fiber content in 3D-printed earth materials: Printability, mechanical, thermal and environmental assessments. *Construction and Building Materials, 425*, 135891. https://doi.org/10.1016/j.conbuildmat.2024.135891
8. Carcassi, O.B., Habert, G., Malighetti, L. E., & Pittau, F. (2022). Material Diets for Climate-Neutral Construction. *Environmental Science & Technology*, 56(8), 5213–5223. https://doi.org/10.1021/acs.est.1c05895
9. Pittau F., Carcassi, O.B., (June 2022), Biobased: tendenze e innovazioni per gli involucri, *ARKETIPO 155*, 36-43, Milan
10. Carcassi, O.B., Habert, G., Paoletti, I., Claude, S., & Pittau, F. (2022). Carbon Footprint Assessment of a Novel Bio-Based Composite for Building Insulation. *Sustainability*, 14. https://doi.org/10.3390/su14031384
11. Carcassi, O.B., Paoletti, I., & Malighetti, L. (2021). Reasoned catalogue of biogenic products in Europe. An anticipatory vision between technical potentials and availability. *TECHNE - Journal of Technology for Architecture and Environment*, 63–70. https://doi.org/10.36253/techne-10578
12. Carcassi, O.B., Habert G., Malighetti L., Pittau F. (2022). Material diets for climate-neutral buildings, *Preprint version at Research Square*, DOI:10.21203/rs.3.rs-113216/v1

Book

13. Carcassi, O.B. (2024). Designing the climate-neutrality. How to re-think the construction process of buildings by growing mycelium based biocomposites, Monfalcone, Italy, EdicomEdizioni, ISBN: 979-12-81229-07-5

Book Chapters

14. Carcassi, O.B., Ben-Alon Lola (2025). DYNAMIC BIOSOURCING. Mapping Supply Chain Actors of Geo- and Bio-Based Waste Streams. In Asma Mehan, Sina Mostafavi (eds) *The New Urban Energy Matters – Actar Publishers (accepted forthcoming)*
15. Carcassi, O.B., (2025). From Variability to Neutrality: Biogenic Carbon in Building Walls. In Lola Ben-Alon (eds) *Material Variance (accepted forthcoming)*
16. Paoletti I., Carcassi, O.B., Anishchenko M. (2024). Material Balance Design: Digital tools and circular innovations for a new technological culture in architecture. In: Bruno Figueiredo, Philipp L. Rosendahl, Michela Turrin, Ulrich Knaack, Paulo J. S. Cruz (eds) A*M Perspectives: Research in additive manufacturing for architecture and construction*, SOAP –Stichting OpenAccess Platforms, Rotterdam, DOI: https://doi.org/10.47982/a82n7r50
17. Carcassi, O.B., (2021). Nature Reloaded. Microalgae as Future Landscape Ecology. In: Paoletti, I., Nastri, M. (eds) *Material Balance. SpringerBriefs in Applied Sciences and Technology*. Springer, Cham. DOI: 10.1007/978-3-030-54081-4_9
18. Carcassi, O.B., De Angelis, E., Iannaccone, G., Malighetti, L.E., Masera, G., Pittau, F. (2020). Bio-Based Materials for the Italian Construction Industry: Buildings as Carbon Sponges. In: Della Torre, S., Cattaneo, S., Lenzi, C., Zanelli, A. (eds) *Regeneration of the Built Environment from a Circular Economy Perspective. Research for Development*. Springer, Cham. https://doi.org/10.1007/978-3-030-33256-3_23
19. Carcassi, O.B., (2018), Anti-disciplinary Design and Bio-Design, Articles on *Magazine D1GIT*, 120g Dossier, issue II, edited by 120g, (ISBN 9788894347715)

Refereed Papers in Conference Proceedings

20. Turco, C., Carcassi, O.B., Teixeira, E., Mateus, R., Ben-Alon, L. (2025). Alternative bio-stabilisers for thin earth building elements*, IOP Conference Series: Earth and Environmental Science*, Volume 1554, Sustainable Built Environment Conference 2025 Zurich 25/06/2025 - 27/06/2025 Zurich, Switzerland, https://doi.org/10.1088/1755-1315/1554/1/012074
21. Posani, M. & Habert, Gu. & Yannick, I., Fogue, D. & Du, Yi & Vereecken, E. & Estève-Bourrel, P. & Pinchard, L. & Losini, A. & Coelho, G. & Ben-Alon, L. & Carcassi, O. B. & Dormohmadi, M. & Rios, A. & Kamath, M. & Libralato, M. & Maia, J. & Makoundou, C. & Malet-Damour, B. & Ranesi, A. & Brás, A. (2025). Bio-stabilised earthen materials: a perspective on the potential contribution to climate change adaptation and mitigation. In *Proceedings of the 1st RILEM YouthSymposium (RYS2025)*, October 2025, Online-coordinated from Paris, France.
22. Carcassi, O.B., Schlek G., & Ben-Alon L. (2025). Dirty mycelium: Materials and structures under the microscope. In *Structures and Architecture. REstructure REmaterialize REthink REuse - Rinke & Frier Hvejsel (Eds)* 10. DOI: https://10.1201/9781003658641-120
23. Turco, C., Carcassi, O.B., Teixeira, E., Mateus, R., Ben-Alon, L. (2025). Alternative bio-stabilisers for thin earth building elements. *IOP Conference Series: Earth and Environmental Science (accepted forhcoming)*
24. Carcassi, O.B., Maierdan Y., Kawashima S., & Ben-Alon L. (2024). Recyclability of Earth-Fiber Materials for 3D Printing. In *Proceedings of the IASS 2024 Symposium Redefining the Art of Structural Design August 26-30, 2024, Zurich Switzerland, DOI: https://app.iass2024.org/files/IASS_2024_Paper_614.pdf*
25. Shin, E., Carcassi, O.B., Maierdan, Y., Kawashima, S., Ben-Alon, L. (2024). Developing 3D-printed Natural Fiber-Rich Earth Materials in Construction. In: Beckett, C., Bras, A., Fabbri, A., Keita, E., Perlot, C., Perrot, A. (eds) *Second RILEM International Conference on Earthen Construction*. ICEC 2024. RILEM Bookseries, vol 52. Springer, Cham. https://doi.org/10.1007/978-3-031-62690-6_4
26. Carcassi, O.B., Zowqi M.-H., Maierdan Y., Kawashima S., & Ben-Alon L., (2024), 3D-Printed Light Straw Clay: Optimizing Printing Paths. In: Proceedings of 19th International Conference on Non-conventional Materials and Technologies. Anais...João Pessoa (PB) UFPB / IFPB, 2023. Available in: https//www.even3.com.br/anais/international-conference-on-non-conventional-construction-materials-and-technologies-311551/663773-3D-PRINTED-LIGHT-STRAW-CLAY--OPTIMIZING-PRINTING-PATHS. Access in: 12/11/2024
27. Perez K.V., Carcassi, O.B., Ben-Alon L. (2024). Traditional Textile Integrity and Avenues for Bio-Based Digital Weaving*,* In *Biocalibrated: Tools and Techniques for Biodesign Practices Symposium*. London
28. Castellano, G., Paoletti, I.M., Malighetti, L.E., Carcassi, O.B., Pradella, F., Pittau, F. (2023). Bio-based Solutions for the Retrofit of the Existing Building Stock: A Systematic Review. In: Amziane, S., Merta, I., Page, J. (eds) *Bio-Based Building Materials. ICBBM 2023*. RILEM Bookseries, vol 45. Springer, Cham. https://doi.org/10.1007/978-3-031-33465-8_31
29. Chadha K., Ramos Montilla N., Paoletti I.M. & Carcassi, O.B. (2023). Programmed Growth: A Living Mycelium and Clay Composite. In: Immanuel Koh, Dagmar Reinhardt, Mohammed Makki, Mona Khakhar, Nic Bao (Eds.), HUMAN-CENTRIC - Proceedings of the 28th CAADRIA Conference, Ahmedabad, 18-24 March 2023, Pp. 311–320. DOI: https://papers.cumincad.org/cgi-bin/works/paper/caadria2023_213
30. Pittau F., Carcassi, O.B., Servalli M., Pellegrini S. & Claude S. (2022). Hygrothermal characterization of bio-based thermal insulation made of fibres from invasive alien lake plants bounded with mycelium, *IOP Conference Series: Earth and Environmental Science*, DOI: 10.1088/1755-1315/1078/1/012069

31. Augello A., Carcassi, O.B.,Pittau F., Malighetti L., De Angelis E. (2022). Closing the loop of textile: Circular building renovation with novel recycled insulations from wasted clothes. (2022). *Acta Polytechnica CTU Proceedings*, 38, 203-209. https://doi.org/10.14311/APP.2022.38.0203
32. Carcassi, O.B., Habert, G., Malighetti, L. E., & Pittau, F. (2022). How can a Climate-Neutral Building Look Like? *Construction Technologies and Architecture*, 1, 279–286. https://doi.org/10.4028/www.scientific.net/CTA.1.279
33. Carcassi, O.B., Malighetti L. (2021). Retrofitting with organic waste metabolism - The Region Lombardy Case Study, In: Areti Markoupoulou (eds) *Responsive Cities - Disrupting through circular design 2019*, Barcelona (ISBN 978-84-120885-1-9)
34. Carcassi, O.B., Lavagna M., Malighetti L. (2019). Life Cycle Assessments of bio-based insulating materials. A literature review, In: *Italian Network Conference on LCA 2019*, Rome (ISBN 978-88-8286-389-0)
35. Carcassi, O.B., Contrada F., Grassi G. (2018). A Review of Bioreactive Envelopes and Their Future Developments for 3D/4D Printing technologies, In: ABS 2018, Bern (ISBN 9783952488348)
36. Gomarasca S., Paoletti I., Carcassi, O.B., (2018), *STRUNA STRucture-NAture: a first study for the design of a domestic photobioreactor*, Elsevier, Poster presentation: The 8th International Conference on Algal Biomass, Biofuels and Bioproducts 2018, Seattle

Extended abstract

37. Carcassi, O.B., Schleck G., Ben-Alon L. (2024). Mycelium Mosaics: Mapping Stakeholder Communities for Accessible Biodesign, In: *How do we grow a Biodesigner? Research Directions: Biotechnology Design*. Published online 2024:1-4. DOI:10.1017/btd.2024.1

Selected Exhibitions/Installations

2025 Exhibition of "**Earthen Rituals**" for the Biennale di Architettura (Venice, IT). A 3 m tall structure completely composed of dried stacked 3D printed natural tiles. Experimental apparatuses, fabrication research, and 3D printing science leader. Curator: Dr. Prof. Lola Ben-Alon

2024 Exhibition of "**Ndidi**" for the Mexico Design Week 2024 (Mexico City, MX). A codesigned stool resulting from the synergy between 3D printing and manual craftsmanship of Mexican women in Oaxaca. Digital design and fabrication strategy leader and curator. Curators: Alejandro Montes and Dr. Olga Beatrice Carcassi

2024 Exhibition of "**3D printed earth and fiber vessels**" for the London Craft Week 2024 (London, UK). Light straw clay 3D printed lightweight vessels. Digital design and fabrication strategy leader. Curator Prof. Dr. Lola Ben-Alon

2023 Exhibition of "**3D printed earth-fiber mashrabiya**" for the From Field to Form: Making with Earth at 1014 space for ideas (New York, USA). Light straw clay 3D printed lightweight tiles. Digital design and fabrication strategy leader. Curator: Prof. Dr. Lola Ben-Alon

2022 Installation of "**Mycelium bricks: let's dance**" inside the "Alchemic Laboratory" for the Unknown Unknowns 23rd International Exhibition (Triennale di Milano, IT). Mycelium and hemp biofabrication. Design and fabrication strategy leader Curator: Prof. Dr. Ingrid Paoletti

2019 Organization of the "**Microalgae Tectonic workshop**" organized by *Material Balance Research Group* and *Atelier Luma*. The final output has been exposed at "Eco-Visionaries" exhibition at *the Royal Academy of Arts of* London (London, UK). 3D printed photobioreactor with a microalgae PLA material to envision a "circular" use and production of material. Material design and fabrication stategy leader. Curators: Atelier Luma

selected talks

Invited guest lecturer

1. *"Newtech for sustainability"* Architecture for Landscape, Alessandro Terranova, YAC Academy, Bologna, IT, September 2025
2. *"Digitally fabricated Earth and fiber-based materials"* Inquiry into Biomaterial Architectures, Prof. Laia Mogas Soldevila, University of Pennsylvania, USA, September 2025
3. *"Material diets for climate-neutral construction"* Tech 1 (Environments in Architecture), Prof. Lola Ben-Alon, Columbia GSAPP, USA, September 2025
4. *"Mycelium-based biocomposites and research at Columbia University"* CAS in Regenerative Materials - Essentials, *Prof. Guillaume Habert, ETH Zurich, CH, April 2025*
5. *"Designing for regenerative cultures"* Workshop *WORKSHOP EUROPÉEN 2025 : "Sharing knowledge for reducing impacts"*, *Francesca Contrada, ENSA Paris, Paris, FR, February 2025*
6. *"Newtech for sustainability"* Architecture for Landscape, *Alessandro Terranova, YAC Academy, Bologna, IT, December 2024*
7. *"Additive manufacturing of Natural Materials"* Construction Technology 2. Resource: The Contemporary Vernacular. *Prof. Gustavo Lopez Mendoza, The New School- Parsons School of Design, USA, October 2024*
8. *"Digitally fabricated Earth and fiber-based materials"* Inquiry into Biomaterial Architectures, *Prof. Laia Mogas Soldevila, University of Pennsylvania, USA, September 2024*
9. *"Mycelium-based composites: How to bond with Nature"* CAS in Regenerative Materials - Essentials, *Prof. Guillaume Habert, ETH Zurich, CH, April 2024*
10. *"Material diets for climate-neutral construction"* Material Kitchens: Mix Designs, Recipes, and Erroneous Imitation, *Prof. Lola Ben-Alon, Columbia GSAPP, USA, February 2024*
11. *"Newtech for sustainability"* Architecture for Landscape, *Alessandro Terranova, YAC Academy, Bologna, IT, October 2023*
12. *"Mycelium-based composites: How to bond with Nature"* CAS in Regenerative Materials - Essentials, *Prof. Guillaume Habert,* ETH Zurich, CH, April 2023
13. *"Concevoir et construire avec la nature"* DPEA Architecture Post-Carbon, *Prof. Jean-Francois Blasses, École de l'architecture et du territoires paris-est Paris, FR, May 2022*
14. *"Designing with nature"* Retrofit and conservation of buildings *ABC Department Politecnico di Milano, October 2021*
15. *"Biodesign in contemporary architecture"* SOS School of Sustainability master's in Design for Sustainability, *Arch. Mario Cucinella, Bologna, IT, May 2021*
16. *"Biodesign in contemporary architecture"* Design and construction studio , *Prof. Ingrid Paoletti, ABC Department Politecnico di Milano, IT, February 2021*
17. *"Fast-growing bio-based materials for construction"* PSCE_ Design of subsystems and building components, *Prof. Andrea Mainini, ABC Department Politecnico di Milano, IT, September2020*

Selected conference talks and panels discussions

18. *"Biobased materials for climate-neutral construction"* RIGENERA, Ordine degli Architetti di Reggio Emilia, *IT, September 2022*

Teaching Experience

Lead Instructor Experience

2025 **"Muddy Making: Natural Materials in Digital Commons"**. GSAPP master's students. At

Columbia GSAPP. Role: Lead Instructor for 15 days workshop:

- Supervised and trained master students in 3D printable models and digital design examples
- Supervised students during the design phase to assure the geometrical integrity of 3D models
- Supervised students while using different 3D printers, e.g. WASP Delta 40100, Scara Elite v2, PotterBot
- Developed natural material 3D printable pastes (in terms of earth, natural fibers) used during the workshop

2025 **"Design and fabricate unique tile shape using 3D printing"**. ENSA Paris Master's students. At *ENSA Paris*. Role: Lead Instructor for 10 days' workshop:

- Supervised and trained master students in 3D pritable models and tessellation logics
- Supervised students during the design phase to assure the printability of 3D models
- Defined the natural material mixtures (in terms of earth, natural fibers) used during the workshop.

2024 **"3D Printed Earth – HACKATHON"**. Columbia GSAPP Master's students. With Prof. Dr. Lola Ben-Alon and Prof. Dr. Shiho Kawashima. At *Carleton Laboratory* (Columbia Engineering). Role: Lead Instructor during five days workshop:

- Supervised and trained master students in digital fabrication and during the 3D printing sessions
- Supervised students during the design phase to assure the printability of 3D models
- Defined the extrudable material mixtures (in terms of earth, natural fibers and biopolymers) used during the workshop
- Prepared the Grasshopper script to generate the GCODE for 3D-printing with the SCARA Elite v2 robotic arm.

2023 "**Circular Materials scouting**". MRAC students. At *Master Material Balance Design: Digital techniques and circular innovations in architecture* (Politecnico di Milano). Role: Faculty member:

- Prepared lectures on the most used construction materials in terms of their origin, processes, sustainability and availability
- Advised on the material selection phase of the students' annual project

2022 "**Material stories - between metrics and narrative**". MRAC01 students At *Master in Robotics & Advanced Construction* (IAAC- Institute for Advanced Architecture of Catalonia). Role: Faculty member:

- Prepared lectures on the most used construction materials in terms of their origin, processes, sustainability metrics and availability
- Moderate discussion on "material debate" among students

2022 "**Material Balance Design and Sustainable Product**s". MRAC students. At *SOS School of Sustainability master's in design for Sustainability*. Role: Faculty member:

- Prepared lectures on materiality and textures of construction materials

Teaching Assistant

2021-2022 Scale-up! DASTU Department Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Simone Giostra

2019 PSCE_Design of subsystems and building components, ABC Department Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Enrico De Angelis

2019 Retrofit and conservation of buildings + Laboratory ABC Department Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Laura Elisabetta Malighetti

Invited Studio Critic and Jury member

Biodesign Challenge	Summit 2025 | Paul Rubery and Michael Balangue 2025
Columbia University	Material Kitchens: Mix Designs, Recipes, and Erroneous Imitations | Lola Ben-Alon 2024
	Tech 5 Construction + Life Cycle Systems | Lola Ben-Alon &Tommy Schaperkotter 2023
	Architecture Studio V | Ada Tolla & Giuseppe Lignano 2023
Pratt Institute	Projected Form Bodies - Materialities – Environments first year project | Kyriaki Goti 2023
University of Minho	Additive manufacturing and construction automation | Bruno Figueiredo 2022

Graduate Student Advisory

2022 Castellanos Salamanca, Laura Giovanna, Ibrahim Fatima, MYC-CET: Bio-fabrication, a negotiation of materiality between alive and inert ABC Department, Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Ingrid Paoletti

2022 Burgess Zoe Alexandra, Urban Microalgae Cultivations: An Ecologic Revitalization of the Abandoned Porta Genova Railyard ABC Department, Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Ingrid Paoletti

2022 Natalia Ramos Montilla, Architectured materials: Development of a 3D printable mycelium-based paste and the related extruder Mechanical Department, Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Serena Graziosi & Prof. Dr. Ingrid Paoletti

2022 Pradella Federica Designing architectural technology for circularity : holistic approach for bio-based materials towards a retrofit of the existing building stock ABC Department, Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Ingrid Paoletti

2021 Bektas Yagmu, Bio-Skin: Mycelium based facade panel system for circularity in architecture. ABC Department, Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Ingrid Paoletti

2021 Pietro Minotti, Carbon footprint assessment of a novel bamboo-mycelium composite for building insulation Chair of Sustainable Construction, ETH Zurich, CH. Teacher of reference: Prof. Dr. Guillaume Habert & Prof. Dr. Francesco Pittau

2021 Marco Lenzi, Luca Ficocelli, A novel bioinspired material: growing Mycelium for tissue engineering, Chemestry Department, Politecnico di Milano, IT. Teacher of reference: Prof. Dr. Sara Mantero & Prof. Dr. Ingrid Paoletti

2021 Servalli Maddalena, Dal Verme Laura Mora, Pellegrini Sara. Nymphaea. Rigenerazione climate neutral dell'area ex-industriale delle Fornaci di Caldè., ABC Departement, Politecnico di Milano, Teacher of reference: Prof. Dr.Francesco Pittau

2020 Marco Lolli, Toni Maksan, Pietro Minotti, Dario Quaglia, Climate-neutral building strategies Chair of Sustainable Construction, ETH Zurich, CH, Teacher of reference: Prof. Dr. Guillaume Habert & Prof. Dr. Francesco Pittau

2018 Livorno Marco. The veil. Rise of a green skyscraper in Beijing, ABC Departement, Politecnico di Milano, Teacher of reference: Prof. Dr.Ingrid Paoletti

membership in professional and academic society

2024-present Co-chair of the Educational Working Group for the Bio-Based Materials Collective (lead by Mass Design Group, Boston)

2023- 2025 North America representative for the RILEM Youth Council

2022 Postdoctoral students' representative for the ABC Department (Politecnico di Milano)

service to the community

2022-present Orange belt Facilitator for the Climate Fresk Workshop

2024-present Regular Volunteer for the One billion oysters project (NYC)

2024-present Creator of the Open-source Website/APP to connect regional waste generators with creators looking for regenerative raw materials what do WE DO with you (beta version available at: www.wedo.earth)

media and press

Earthen Rituals project at Biennale di Venezia 2025:

1. "Columbia and WASP Showcase 3D Printed Earth Installation in Venice" 3D printing Industry website https://3dprintingindustry.com/news/columbia-and-wasp-showcase-3d-printed-earth-installation-in-venice-239559/
2. "Earthen Rituals" Columbia GSAPP website https://www.arch.columbia.edu/research/labs/17-natural-materials-lab/edit/earthen-rituals

ENSA PARIS - European Workshop 2025: Olga Beatrice Carcassi recorded lecture on Designing for regenerative culture : https://www.youtube.com/watch?v=vl0uPrsvxgE&t=17s&ab_channel=ENSAPVS

3D-Printed Earth-Fiber Patterns Inspired by Traditional Basketry project at Formnext 2024, BE-AM website https://be-am.de/exhibition/

CAS Regenerative Materials - Essentials 2024: Olga Beatrice Carcassi recorded lecture https://www.youtube.com/watch?v=ur6YUAbzPug&ab_channel=CASRegenerativeMaterials

work experience

Junior engineer and architect *// Nov 2017 - Nov 2018*
SPAN Paris, FR
http://span.paris/en/

- executive drawings and concept for the refurbishment in ETFE light weight material of the glass roof of the *Cité de Science de la Villette Paris*, France
- consulting mission for the footbridge structure of the Paris PARC building for BIG Engineering, France
- executive drawings and site manager for a footbridge in Arras, France
- architectural concept and technical drawings for a cable stayed footbridge in Winnipeg for the city of Winnipeg, Canada
- architectural concept for an urban railway bridge in Paris in collaboration with the SNCF, France
- conceptual design for the competition for a footbridge in Bressuire, France
- winner conceptual design for the competition for a footbridge and a hospital facade in Luxembourg

Intern *// May 2017 - Oct 2017*
IRC - ESTP Paris, FR
www.estp.fr

- evaluating indoor air quality (IAQ) and performance of ventilation systems
- analyzing existing protocols, and green buildings certifications for IAQ
- preparation and supervision of building physics practice courses for students
- in charge to choose and purchase the IAQ assessment instruments for the laboratory

Co-founder *// Dec 2015 - today*
120g architectural cultural association Pisa, IT
www.centoventigrammi.it

- collaboration for both preparation and mounting of the exhibition "Roberto Mariani Architetto"
- media partner with UNESCO for "Pisa fuori campo" project, for the creation of a community map of Pisa together with high school students

- curating the second number of 120g magazine “Digit” which involves Microalgae and material ecology

Intern // *Jul 2015 - Sep 2015*
ecoLogicStudio London, UK
www.ecologicstudio.com
- prototyping, fabrication and mounting of a microalgae installation “H.O.R.T.U.S ZKM” in ZKM Museum (Germany), winner of “The Best Digital Architecture Design Award” 2016

Consulting Activities

Material consulting and technology innovation scouting// *Apr 2022– Jun 2022*
Giò Forma Milan, IT
- Campari Soda Pavillion competition
- Expo 2025 Osaka Kingdom of Saudi Arabia Pavilion

Zaha Hadid Architects, London, UK
- Expo 2030 at Riyadh competition

Minimal Environmental Criteria (Criteri ambientali minimi – CAM) // *Apr 2022– Jul 2022*
Progetto CMR, Milan, IT
- ISMETT 2, Carini, IT

Continuing Education Courses

McKinsey // *Jul 2022*
Next Generation Women Leaders, remote method
Selected on CV basis

IDEA League Summer school // *Sep 2020*
Computational Design for Additive manufacturing, remote method
Selected on CV basis as the Politecnico di Milano only representative

ASPIRE League Summer school // *Jul 2019*
“Better living” Tokyo Tech, Tokyo, JP
Winner of a personal grant to participate to the international workshop as the Politecnico di Milano only representative

Training school // *Sept 2016*
Adaptive facade HafenCity University, Hamburg, GR
COST Action workshop about adaptive facades

Skills

Software	*Adobe*: Photoshop, Illustrator, InDesign, *Autodesk*: Autocad, 3D Studio Max (+ V-Ray); *Rhinoceros* (Grasshopper, EnergyPlus, Therm, Honeybee, Ladybug, Kangaroo, Diva, Karamba, Bombyx); *Microsoft e Mac Office Suite*; *Python; SIMAPRO; OneClick; GIS*
Others	Hand model making, digital fabrication (laser cutting, cnc, 3D printing, basic robotic); Arduino (basic), instruments for IAQ evaluating
Languages	*Italian* (mother tongue), *English* (advanced: 2016: TOEFL iBT), French (fluently spoken and written at work), Spanish (basic)
Certificates	Mycelium Growth with NetLogo Web // *January 2021*- no expiration date. Issuing authority: Coursera Identifier code: ID URSMJHR2EM8N
	Python Data Structures // *October 2020 - no* expiration date. Issuing authority: Coursera. Identifier code: ID ZM2PL8CXR4AV