

Carla Langella

Architect, **PhD** in Architectural Technology. **Assistant Professor** at the Department of Architecture and Industrial Design (DAD) of the University of Campania Studies "Luigi Vanvitelli" in the sector ICAR / 13 (Industrial Design), where he teaches "Bio-Innovation Design" (8 credits) and "Design for Scientific Visualization "(8 CFU) in the Master's Degree in Design for Innovation and" Industrial Design I Laboratory "(12 CFU) in the three-year Degree Course in" Design and Communication ". **She** also teaches "Product Design and Communication Laboratory 1" (5 CFU) at the Master's Degree Course in "Product Design and Visual Communication" at the IUAV University of Venice.

Graduated with honors in Architecture in 1997 at the University of Naples Federico II, with an interdisciplinary thesis entitled: "Information technologies for sustainable tourism. Proposal for an integrated system of ecomuseum and cultural areas in Campania", with supervisor Prof. Arch. Virginia Gangemi.

From 1997 to 2002 she carried out research, teaching and seminar activities at the Architecture Configuration and Implementation Department of the Faculty of Architecture of the University of Naples Federico II.

In 2001 she obtained the PhD title by discussing an experimental thesis on the topic "Towards new qualities of the subject: evolutionary scenarios in the field of materials for architecture and design", at the Department of "Architecture Configuration and Implementation "University of Naples Federico II, Faculty of Architecture, in collaboration with the Department of" Materials Engineering and Production "(DIMP) of the University of Naples Federico II.

From 2001 to 2006 she carried out research, teaching and seminar activities at the IDEAS Department in the Degree Course in Industrial Design of the Faculty of Architecture of the Second University of Naples, first as a research fellow and then with scholarships.

Since 05/15/2006 she has been working as a **University Researcher in the ICAR / 13 Industrial Design sector** , with University: Second University of NAPLES, Department of Industrial Design, Environment and History.

Since 2006 she has founded and coordinates the Hybrid Design Lab (www.hybriddesignlab.org), a design laboratory of the University of Campania "Luigi Vanvitelli" dedicated to the mutual relations between design and science with particular attention to the experimentation of biomimetic in design and the integration of designers in the development processes of new materials to which the specific *Designer in lab* project is dedicated . As part of the HDL, she has configured and tested a new hybrid design methodology that intersects different languages and disciplines called "Hybrid Design".

In the Lab she coordinates cultural activities, research and design experimentation on the themes of biomimetic design and environmentally sustainable design and material design that are disseminated through the organization, scientific coordination and realization of conferences, seminars, exhibitions, courses and workshops of which he is the Scientific Responsible.

She has coordinated several research projects admitted to funding on the basis of competitive public tenders that include peer review and research projects commissioned by organizations and companies.

She has been Scientific Coordinator in the DICDEA Department design research unit at SUN

University (today University of Campania "Luigi Vanvitelli") of the **FIRB Futuro** project in **Research 2007** titled "**Photonic and micromechanical properties of diatoms**" and Scientific Responsible for the entire project "**CHEESE Cultural Heritage Emotional Experience See-through Eyewear**" funded under the PON projects in the START UP Call 2 - Increased Impact Culture Area - Spaces of Culture 2.0.

She is Scientific Coordinator of the Convention for research activity between the Department of Architecture and Industrial Design of the University of Campania "Luigi Vanvitelli" and the Kineton company stipulated in January 2019 for the execution of the research service: "**Kinocar : design of a bio-inspired, connected and assisted-guided electric microcar for user comfort and safety**".

She is Scientific Coordinator of the Convention for research activities between the Department of Architecture and Industrial Design of the University of Campania "Luigi Vanvitelli" and the National Archaeological Museum of Naples (MANN) stipulated in March 2018 for the performance of the service research **project : " Scientific research project for the design of museum fruition experiences within the MANN for kids Laboratory "**.

She coordinated the design research activity of the Research Unit of the DICDEA Department on the Convention between the DICDEA Department and the company "Cooperativo Operatori Fonici e Transcriptori" (co-op. OFT) for third party services with the subject: **Design and realization of concepts and prototypes of keyboards for stenotyping** within the VETRINA project (Computer Assisted Verbalizations and Transcriptions), with Scientific Responsible Patrizia Ranzo, funded under POR FESR Lazio 2007-2013 Axis I, managed by FILAS.

She has been Scientific Coordinator in the monitoring activities related to the design of the **D.RE.AM Academy Design and REsearch in the Advanced Manufacturing International Advanced Training Program** of Città della Scienza di Napoli funded by the MIUR and the Campania region.

She has been among the referents of the **Contamination Lab Naples**, a project approved by the Ministry of Education, University and Research (directorial decree n. 1674 of 09/17/2013) with particular attention to the definition of innovative design methodologies oriented to the relationship between design and technological and material innovation.

In 2009, together with Mario De Stefano and Antonia Auletta, she received an Honorable Mention in the "**International Science & Engineering Visualization Challenge**" award, promoted by **the Science magazine and the National Science Foundation (NSF)**, in the category Illustrations with the image "Back to the Future," for the year 2009.

In 2010 she was rewarded with a **medal for scientific merit** by the Mayor of Naples Rosa Russo Iervolino at the headquarters of the Municipality of Naples at Palazzo S. Giacomo.

In 2015 she received the first prize, as scientific coordinator of the DARTE project. Design for Augmented Reality Technology and Engineering, in **the SCINTILLE | competition** permanent workshops promoted by the CNI (National Council of Engineers), in collaboration with CERN, Technical Professions Network, IC Association, Digital Champions Italy, Sardinia 2050, at the Palazzo del Cinema in Venice.

Since 1997 she has produced publications and participated in conferences as a speaker on issues related to the project of fruitive experiences of cultural and environmental heritage using new technologies (ecomuseums). **Since 2000** she has produced publications and participated in conferences as a speaker on the theme of design with new materials and new materials (smart

materials and sustainable materials). **Since 2001** she has produced publications and participated in conferences as a speaker on issues related to bio-inspired design and the relationships between design and science (hybrid design).

The research projects and publications of the last 15 years are connected by a common thread that concerns the relationships between design and science, observed from different points of view (**design and biology, design and chemistry of the subject, design and optical physics, design and science medical, scientific visualization**) and through comparison and collaboration with experts from different scientific fields including chemists, engineers, biologists, physicists. She is author of essays, articles, published mainly in international journals and texts with *peer review* and *blind review* , and books concerning the collaboration between design and science among the specific themes emerge: biomimetic design (design and biology), material design (design and chemistry), sustainable innovation in design (design and ecology), the application of the parametric approach in design (design and mathematics), design for energy autonomy (design and physics), design for communication scientific.

Parallel to these issues, since the thesis, she has studied and experimented **new design strategies for the enhancement of territories (ecomuseums) and cultural heritage based on the use of new technologies** such as augmented reality and the application of neuroscientific principles in design of fruitful experiences.

In the activity of design experimentation she investigates the opportunities to build hybrid paths that involve the most advanced scientific contributions in the design project to bring contemporary science closer to people's lives.

She coordinates the research line entitled "Intersections between design and science and biomimetic design" in the research group of Sustainable industrial design / Sustainable industrial design Scientific Director Patrizia Ranzo of the DADI Department of the University of Campania "Luigi Vanvitelli". She was a member of the Material Science and Engineering / Science and Materials Engineering Research Group with Scientific Responsible: Alberto D'Amore. Conducts an intense research activity with design oriented companies.

She was a member of the Board of Professors of the Research Doctorates in "Doctorate in Industrial, Environmental and Urban Design", "Design and Innovation" of the Second University of Naples (later University of Campania "Luigi Vanvitelli"), in the ambit of which frequently played the role of Tutor and co-Tutor of PhD students.

She coordinates scientific research, exhibitions, workshops and design experiments working with national institutions (Città della Scienza, Department of Environmental Sciences Vanvitelli; Institute for Microelectronics and Microsystems IMM, CNR, Institute of Chemistry and Technology of ICtM Polymers, CNR; Assocanapa, INBAR, BENECON), design oriented companies (Kineton, 3D Factory, Electronic Workshops, Enjina, KIMBO, Dyson, Ditron, Jmec, Bluenet, Foxbit) and museums (Città della Scienza, Capodimonte Museum, National Archaeological Museum of Naples).

The research and design experimentation carried out with companies is oriented towards technology transfer and uses design tools for environmental sustainability, human center design, and scientific design and to bring innovation to the local and national entrepreneurial fabric.

She is one of the founders of the national "Design4Materials" network consisting of professors and researchers from Italian universities who conduct research in the field of design of the subject.

She has curated numerous exhibitions of both research and educational projects, which have

also included professional designers, artists, companies and scientists, nationally and internationally (Diatom De-Science, San Francisco, Shenzhen).

She collaborated in the implementation of the project "**Italy: the beauty of knowledge** " (<http://www.cittadellascienza.it/italiabellezzadellaconoscenza/>), promoted and financed by the Italian Ministry of Foreign Affairs and International Cooperation and implemented with the contribution of the Council National Research Center in partnership with four scientific-excellence institutions nationally: IDIS Foundation City of Science of Naples, G. Galileo Museum of Florence, Trento Science Museum, National Museum of Science and Technology of Milan.

The project concerns the realization of an interactive exhibition, inaugurated on April 16th 2018 in Rome, at the Farnesina, to talk about Italian scientific research and its actors, highlighting the contribution that the Italian research and innovation system brings to the great adventure of knowledge and technological development at national and international level and its social implications.

The exhibition includes some projects of the Hybrid Design Lab and, thanks to the support of the MAECI, the exhibition was presented to the public in various countries starting from 2018, the first stages of itinerancy were to Alessandra of Egypt, in Singapore, in New Delhi in India, in Jakarta in Indonesia.

As part of **internationalization** she carried out research and teaching activities in collaboration with international bodies and universities (California College of Arts, San Francisco, USA; Center of Biomimetics, Reading, England; University of Applied Arts, Vienna, Austria; Department of Design and Building Construction, Vienna University of Technology, Austria, CNRS USR 3246, La Salpêtrière, Paris, France).

In 2008 and 2009 she was included in the panel of evaluators of projects to be funded in the context of the Fundação para Ciência e Tecnologia, IP Departamento de Programas and Projectos de ICDT, Portugal.

In 2018 and 2019 she was the winner of the tender for non-EU mobility grants from the University of Campania "Luigi Vanvitelli" to carry out missions in Japan and Brazil.

In summary, the main research topics addressed are:

- Application of biomimetic and bio-inspired strategies to the design project through the experimentation of the "Hybrid Design" approach;
- Mutual relations between design and science and interdisciplinary methods;
- The role of design in the enhancement of Made in Italy, of productive identities and of local production of excellence;
- The role of design in the interpretation of new materials, with particular attention to sustainable and renewable materials;
- The role of design and innovation in the enhancement of cultural heritage with human-centered approaches and innovative technological tools such as augmented reality;
- Design with renewable energy;
- The design of integrated systems of products and services for environmentally and socially sustainable development;

- Design for scientific visualization.

The permanent research projects in the Hybrid Design Lab are:

- Bio-inspired Design: Transfer of structures, strategies, principles and details from nature to industrial products.
- Designers in lab: Experiments with new materials and processes in collaboration with the sciences;
- Diatom Design: Transfer of functions and biological principles transferred from the study of diatoms;
- + Design - Waste: upcycling strategies for design;
- From Nature with Nature: Design that "collaborates" with nature;
- Hemp Design: From the past the resource of the future;
- Growing Design: Design that incorporates living matter.
- Design for Energy Consciousness: Design strategies for awareness on the management of energy resources
- Food Experience Evolution: Design for the dimension of taste, from the study of packaging to the perceptive project.
- Design for science visualization.
- Relational design.