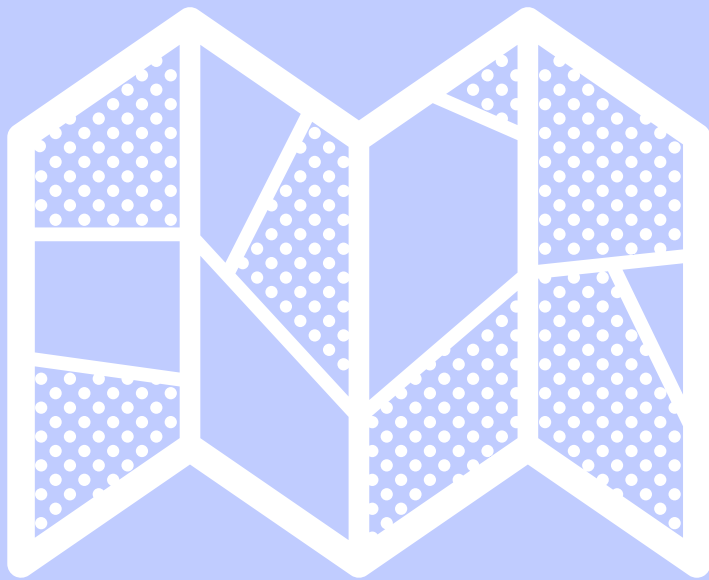


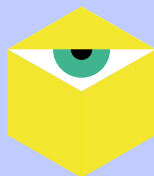
A mapping of Italian Packaging Design Research



ALMA MATER STUDIORUM
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(L. 232 DEL 1/12/2016)



Advanced
Design Unit



osservatorio
innovazione
packaging

Introduction

We are going through [uncertain times](#) due to different synchronised crises and with interconnected impacts, a context which makes us wonder about the role of Design in simplifying complexity into projects able to have a 5P perspective¹ a 5th helix approach², and a holistic vision, considering all material and immaterial elements as part of an integrated ecosystem that needs One Health³.

To better understand design production processes in complex contexts such as the packaging sector, an [online survey](#) was conducted among **Italian universities dealing with Packaging Design**, both at research and teaching level, investigating approaches and tools used. Considering in fact the urgency, in terms of time, to give correct answers to the need for resilience and transition of companies in the sector, we consider it essential to think as a broad community, in a networked integration that goes beyond the knowledge of a single university.

The survey was aimed at understanding the work of the different universities in the training of young designers and in the production of [tools](#) and [methods](#) to manage the accelerated transition, and not least how they relate to the Italian and International manufacturing world.

The collection and analysis of excellent cases of Italian universities and research groups dealing with packaging design, took place in several [stages](#):

- Identification of the main Italian research groups dealing with the topic;
- Selection by number of research projects, dedicated courses and masters, publications;
- Contact of reference figures;
- Supply of online forms, aimed at collecting information about the team's working methods;
- Analysis and synthesis of information.

According to the **methodology** explained, the investigation involved eight universities: Alma Mater Studiorum-Università di Bologna, Politecnico di Milano, Politecnico di Torino, Sapienza Università di Roma, Università degli Studi di Palermo, Università degli Studi di Parma, Università di Scienze Gastronomiche di Pollenzo, Università luav di Venezia.

The [results](#) show that the design methods and tools applied in these universities are contributing to the shaping of a **Transitional Industrial Packaging Designer**, who is able to bring a holistic, transdisciplinary and collaborative approach to the manufacturing sector, in a timeframe closer to the market.

For a detailed interpretation of the results please refer to the full article [Holistic approach in design research. Made in Italy Circular Packaging Innovation by Transitional Industrial Designers \(Giardina, 2023\)](#) in [diid n.79](#)

1 United Nations. (n.d.). Transforming our world: the 2030 Agenda for Sustainable Development. Retrieved February 20, 2023, from <https://sdgs.un.org/2030agenda>

2 Carayannis, E. G., Barth, T. D., & Campbell, D. F. (2012). The Quintuple Helix innovation model: Global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, 1(1), 2. <https://doi.org/10.1186/2192-5372-1-2>

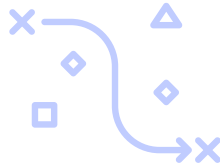
3 One Health Center of Excellence - University of Florida, Institute of Food and Agricultural Sciences - UF/IFAS. (n.d.). © Copyright 2018, UF/IFAS. Retrieved February 20, 2023, from <https://onehealth.ifas.ufl.edu/>

Survey questions

1. Which approach to packaging design do you use as a research group?

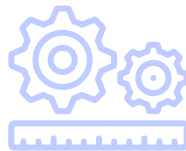
Please describe the design-driven approach applied to Packaging product-service-systems projects by your research team.

It is possible that there are several approaches which are working in parallel within your university/department: please describe your own.



2. Which main research tools and methods are used?

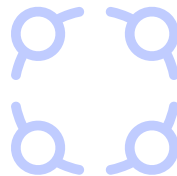
Please describe design-driven practices, tools and methods used in the collection, analysis and transformation of data in research projects. Example projects can be mentioned, if necessary (as well as entities, spin-offs, observatories that may have been created by the research team), while remaining focused on the methodology.



3. What kind of national/international networks and collaborations did you activate as a team?

Please indicate a maximum of five Italian corporate/university partners (both public and private) with whom you have collaborated in the last three years, and related projects, with eventually a very brief explanation of the project itself.

Please indicate a maximum of five global corporate/university partners (both public and private) with whom you have collaborated in the last three years, and related projects, with eventually a very brief explanation of the project itself.



4. Relevant Research Group publications on the topic

Mention a maximum of 5 relevant publications - possibly from the last 10 years - related to the topic of packaging design written by your research group.



Alma Mater Studiorum - Università di Bologna

<https://www.unibo.it/it>

This form was completed with the contribution of:
[Flaviano Celaschi](#), [Erik Ciravegna](#), [Clara Giardina](#), [Davide Pletto](#).

1. The research activity focuses on packaging as a multidimensional subject, as an accelerator of the social, economic and environmental phenomena in which it is immersed, and as a map for the consumer, who is oriented by the container in the complex system of information provided by stakeholders. The Advanced Design Unit-ADU research group (within the Department of Architecture), and in particular the Packaging Innovation Observatory, works in order to narrate, interpret and act on the phenomenon of packaging as expression of contemporary cultural complexity, triggering innovation and supporting companies in the ecological transition, with a collaborative, holistic, 5P and quintuple-helix approach.

2. Continuous industry monitoring and archive of significant case studies. Collection of industry trends and insights, with an anticipatory approach. Analysis and interpretation of qualitative and quantitative data from a multidisciplinary, design-oriented perspective. Realisation of studies and research for specific sectors on phenomena leading to innovation. Simplification of the complexity and narration at different levels of the observed phenomena. Facilitation of the relationship between the various players (companies, associations, administration, citizens, research centres, environment) in an integrated system logic, in order to create a cross-sectoral network of stakeholders.

3. Italians

- Conai: definition of Design for recycling guidelines for steel packaging.
- Conai: involvement in the Ecodesign Competition Jury.
- Giflex: Research Valuing flexible packaging: observing innovation, defining identity, telling the value story, to define the identity profile of flexible packaging, based on elements of innovation and the positive impacts of this kind of packaging.
- ICESP - Italian Circular Economy Stakeholder Platform: collaboration on working tables on TAM and plastics, and co-writing of white papers on the topic
- Istituto Italiano Imballaggio: involvement in the Best Packaging Competition Jury.
- Master Executive-Summer School (Unipr, Unimore, Unibo, Cipack) Packaging challenges for the circular economy: participation in training.
- Master DESI-Design and Sustainability Packaging: participation in master's degree planning and training
- Packaging Première trade fair: involvement in the jury for Packaging Avant-Garde call for entries.
- PNRR PE 1, Made in Italy Circolare e Sostenibile - MICS: coordination of Spoke 1-Digital Advanced Design: technologies, processes, and tools.

Global

- CIRCES Circular design: Skills for future people (Erasmus +): the objective is to foster the development of

circular design skills in VET systems and to improve the competencies of trainers and new generations.

- Circular Change: Slovenian research and advisory organization on circularity collaborating with Packaging Innovation Observatory-Unibo.
- Cosmetica Italia and Quantis: Research Consumers, Cosmetics & Packaging. A sustainability data collection for a snapshot of change.
- Diid: an open access, peer-reviewed scientific design journal edited by Bologna University Press since 2021. Issue 79 focuses on Life-centred design of a packaging value cycle and features the collaboration of the Swedish RISE centre.
- Ecomondo fair for the ecological transition: annual organisation of events on the topic of packaging design and circularity.
- International Forum Disrupting Geographies in the Design World promoted by the Latin Network for the Development of Design Processes. Track 1: There's No Plan(et) B: Sustainable Transitions to Systemic Planet-Centric Design.
- International Symposium The Future of Packaging Design. Towards a smart and sustainable era: event reporting qualitative-quantitative research of +300 cases of global packaging innovation. Six global enterprises and seven major companies from the Packaging Valley were involved.
- Packaging Innovation Observatory: organization that connects players in the supply chain and analyses knowledge and case studies in a predictive logic, to produce advanced research for companies, and trigger innovation in the packaging system.
- Pontificia Universidad Católica de Chile- Diseño UC: collaboration on international responsible packaging design projects.
- Winter School-Design for Responsible Innovation: an international project involving three universities (Italy, Chile and Mexico), united by the common objective of investigating the theme of Responsible Innovation applied to Design.

4.

- Ciravegna, E. (2017). Diseño de packaging. Una aproximación sistémica a un artefacto complejo. RChD: creación y pensamiento, 2(3). 1-17.
- Ciravegna, E. (2020). Repensar los envases en tiempos de crisis: implicancias éticas y enfoque sistémico en el Diseño de Packaging, Rchd: Creación Y Pensamiento.5 (9), 1 - 6
- Giardina, C. (2022) Packaging consapevole: una sfida di dati, spazio, tempo., in Petrini, C., Cattaneo, C., Il chilometro consapevole, Bra, Slow Food Editore, pp. 119-122
- Giardina, C, Celaschi, F., (2020). Collaborative and Responsible Innovation in the Packaging System Towards a New Normal, Rchd: Creación Y Pensamiento. Vol.5 N.9, 1 - 14
- Giardina, C, Celaschi, F., (2022). The contemporary role of flow wrap packaging, in B. Lema, D. Dal Palù (a cura di), Flow wrap packaging, the most with the least: high protection, low impact. Milano: Edizioni Ambiente, pp.55-59

This form was completed with the contribution of: [Valeria Bucchetti](#), [Barbara Del Curto](#).

1. The research activity has developed from the use of functional materials in the food packaging sector. The approach was then widened and ranges from the study and use of new biobased materials to the development of treatments for cellulosic substrates. At the same time, the research activity focused on material selection paths and eco-efficient packaging redesign in collaboration with companies and included the drafting of guideline manuals for the design of low-impact packaging. The research group has been collaborating with the Food Sustainability Observatory of the Milan Polytechnic since 2018.

The communication design perspective directs the second line of research. Packaging becomes the object of study in relation to its functions of 'communication interface'. It is a mediating device that directs behaviour, translates, and provides information, conveying brand identity. A research field that conceives the artefact in a systemic way requires a direction capable of harmonising processes and technical and technological innovations according to the principles of 'access design' to guarantee users.

2. Both work streams make use of case study scouting. Mappings and visualisations. State of the art of existing solutions and regulatory frameworks. Definition of guidelines for packaging design. Aimed, on one hand, at experimenting with new composite materials (POMOPLA2, Polypaper); on the other hand, aimed at the experimentation of expressive languages and the production of tools for the growth of a design culture centred on the communicative dimension.

3. Italians

- Comieco: analysis, mapping and insights into emerging materials for packaging and disposable products
- Conai: definition of guidelines to facilitate the recycling of packaging made from mainly cellulosic materials
- SMEG S.p.A.: drafting of a manual of packaging design strategies for the ecodesign of packaging for large and small household appliances starting from the LCA results of two case studies
- Italian Institute of Technology (IIT): development of a composite material for food packaging starting from agri-food waste
- Grondona: Packaging Identity System Research
- Istituto Italiano Imballaggio: promoter of Quality Design section of the Oscar dell'Imballaggio
- Consorzio Grana Padano: Progetto Life partner in the area: environmental sustainability and communication - Design of a communication system aimed at consumer involvement and awareness.

Global

- Loughborough Design School: aesthetic-sensory characterization of compostable materials for packaging
- Lappeenranta University of Technology (LUT): study of surface treatments to increase the barrier properties of cellulosic substrates
- R3PACK: European project with 24 partners including industrials, retailers, experts and innovators aimed at developing innovative fiber-based food packaging and implementing reuse schemes. This project is funded by the European Union's Horizon Europe research and innovation program under grant agreement No. 101060806.

4.

- Santi R, Garrone P, Iannantuoni M, Del Curto B.(2022). Sustainable Food Packaging: An Integrative Framework. Sustainability. 14(13):8045. <https://doi.org/10.3390/su1413804>
- Marinelli A, Diamanti MV, Lucotti A, Pedferri MP, Del Curto B. .(2022) Evaluation of Coatings to Improve the Durability and Water-Barrier Properties of Corrugated Cardboard. Coatings. 12(1):10. <https://doi.org/10.3390/coatings12010010>
- Santi, R., Elegir, G., & Del Curto, B. (2020, May). Designing for sustainable behaviour practices in consumers: a case study on compostable materials for packaging. In Proceedings of the Design Society: DESIGN Conference (Vol. 1, pp. 1647-1656). Cambridge University Press.
- Bucchetti, V. ; Casnati, F., .(2020) Packaging as a link to the environmental issues. Tools and languages for the communication of sustainability, RCHD: CREACIÓN Y PENSAMIENTO, Vol 5 No 9. <https://dx.doi.org/10.5354/0719-837X.2020.57924>
- Marinelli, A., Santi, R. & Del Curto, B. Linee guida per la facilitazione delle attività di riciclo degli imballaggi in materiale a prevalenza cellulosica. <http://www.progettarericiclo.com/docs/linee-guida-la-facilitazione-delle-attivita-di-riciclo-degli-imballaggi-prevalenza-cellulosica>
- Marinelli, A., Santi, R., Sossini, L. & Del Curto, B. Imballaggio cellulosico con proprietà barriera. <https://www.comieco.org/downloads/16177/9158/STAMPATO-Imballaggio%20cellulosico%20con%20proprietà%20barriera.pdf>

This form was completed with the contribution: [Silvia Barbero](#), [Marco Bozzola](#), [Doriana Dal Palù](#), [Claudia De Giorgi](#), [Claudio Germak](#), [Beatrice Lerma](#), [Amina Pereno](#), [Chiara Lorenza Remondino](#), [Paolo Tamborrini](#).

1. The design-driven approach applied to the design of product-service systems in packaging at the Politecnico di Torino (Design area) is articulated on several fronts. Functional, communicative and linguistic innovation are the cornerstones of an approach to packaging as a tool with a high utility and service content, capable of making the product recognisable and usable. The design addresses the aspects of sustainability, accessibility, sensoriality and interaction with it, materials and production technologies, focusing on its function as a vehicle of identity in the context of territorial production. The systemic design approach applied to the design of the packaging system aims to provide a holistic vision aimed at reducing the environmental impact of the product and the packaging, using eco-design guidelines and a qualitative-quantitative and comparative analysis, to shape the relationships between actors with a view to industrial symbiosis, to generate circular economies in the territories and to prefigure new logistic scenarios. Finally, it provides tools and methods for the design of the communication system in order to provide clear information with a view to safety and well-being, promoting original experiences, accessibility and inclusion.

2.

- **Nudi o Vestiti? Communicating with packaging: on packaging and its communicative role (social, exhibitions, etc.).** The archive contains over 3000 good practices, useful for defining trends, emergencies and future scenarios.
- **MATto materials library: archive and service for resolving critical issues relating to products, materials/semi-finished products or processes, sustainability and sensory expressiveness issues, and the search for margins of innovation.** It now has over 1000 new-generation materials and semi-finished products.
- **Eco-Packaging Observatory: teaching and research based on a screening of the packaging sector and methodological choices that take into account quantitative and qualitative aspects, with the aim of developing design guidelines.**
- **SounBe, Sensotact®, Eye-tracking: tools for acoustic, tactile and visual sensory analysis of materials and products, as well as a portable cabinet and tasting panels for perceptual and sensory analysis of finished products and materials.**
- **White paper, events, ad hoc portals to share research and design for packaging innovation through the creation of virtuous production-consumption systems.**
- **Pollenzo Index Environmental and Economic Design, for typical and territorial packaging, a tool for communicating**

values, including intangible ones, and the production chain as the fruit of material culture.

3.

- **Torino Chamber of Commerce and Slow Food. MATto for Terra Madre: 5 months of online events on food research.**
- **Cuki Cofresco and Banco Alimentare. Save Bag: research and development of packaging and transport products for the recovery of food waste.**
- **Ri-Generation. Development of innovative packaging systems in the context of the recovery and re-marketing of refurbished appliances.**
- **University of Parma and CIPACK. Open dialogue through institutional agreements between universities.**
- **Conai Consortium. Research and definition of guidelines for the design of aluminium packaging.**
- **Cavanna. Technical-scientific analysis of flowpack production technology. Implementation of production chains and network of related manufacturing companies.** As part of the Master Eco Packaging Design:
 - **Bottega Veneta. Foldable packaging to optimise logistics and become an integral part of the sales ceremony.**
 - **Lavazza. Development of reusable packaging and cardboard box concepts.**
 - **SIPA. Development of PET containers for the innovative transport of liquids for e-commerce and food delivery.**
 - **Verallia Group. New business models for the reuse of glass packaging in e-commerce channels**

4.

- Barbero, S., & Pereno, A. (2020). *Packaging Design in the Digital Age: A systemic approach to e-commerce*. FrancoAngeli.
- Bozzola M., Covone C., Rovera F., Savina A., Zich, U., *Vaschetta pieghevole in foglio di alluminio per alimenti*, 2017, Patent (Utility model) co-ownership Politecnico and Cuki Cofresco. n. 202016000056574
- De Giorgi, C., (Ed.). (2013). *Sustainable Packaging?/ Packaging sostenibile? A multicriteria evaluation method for food packaging*. Torino, Allemandi. ISBN: 8842222534
- Lerma, B.; Dal Palù, D., (Ed.). (2022). *Flow wrap packaging: the most with least. High protection, low impact*. Milano, Ed. Ambiente, P. 112. ISBN: 978-88-6627-358-5
- Remondino C. L., Marino, C., Tamborrini P., (2020). *Silver Linings: Design Strategies and Projects for Packages Born in Times of Crisis and Analyzed with a Systemic Approach*. ISSN 0719-837X - 5:9(2020), pp. 1-13

This form was completed with the contribution: [Loredana Di Lucchio](#), [Angela Giambattista](#).

1. Our interest in the packaging sector stems from the awareness that it currently represents one of the most complex systems in its definition-production-consumption-disposal process. In this sense, the most correct methodological approach to dealing with it is that one of Systemic Design, where the value chain is generated by the convergence between product/service, with particular attention to 4 emerging phenomena:

- from a social point of view, the phenomenon of conscious consumption;
- from a technological point of view, the exploitation of digital techs for manufacturing;
- from an economic point of view, the phenomenon of open-sourcing;
- from an environmental point of view, the phenomenon of the zero-impact, zero-waste and zero-resources.

2. The experiences carried out in this area of interest, have mainly had a design training character, both at the second and the third level, thanks to projects where also companies have been involved as technical partners and stakeholders of the design results. Methodologically, as mentioned in the previous point, we worked on identifying the critical factors in the sector from the point of view of production (sustainable performance) and consumption (usability).

In the experiences carried out involving second-level students, the operational tools were: desk research, benchmarking, UX tools, low and fidelity prototyping and, finally, business model canvas. In the experiences carried out within the doctoral research, the attention was focused on Human-centred Design approaches and in particular on cognitive ergonomics and neuroscience as a support for the identification of usability risks and/or the dynamics of appealability of packaging as first contact between user and product. The sectors on which we worked were mainly food and medical.

3.

- Eta-Ro s.p.a. has been partner in a project aimed at using a poly laminates (paper/pla) for safety packaging in the food, medical and shipment sectors.

- Sca Packaging Italia S.p.a. has been a partner in an applied project aimed to develop low-material-use boxes for shipment.

Brainsigns, a Sapienza University spin-off, has been partner in an applied project included in wider research, to testing and validating with users of the factors of perception and usability of packaging for the beverages sector.

- Ginevri srl, is partner in an applied project, included in wider research, aimed at developing low environmental impact packaging for medical consumables.

- Catalent Pharmaceutical Solutions is partner in a project focused on the innovation in the packaging of self-medication products considering in particular the user awareness and the usability.

All these companies gave a technical contribution to define the design intervention and to verify the manufacturing possibilities.

4.

- Di Lucchio, L. Caruso, I., (currently being published). Good for Good. Designing packaging in the era of deliveries". In Proceedings of 8th International Forum of Design as a Process - Disrupting Geographies in the Design World, Bologna, 20-22 June 2022.

- Cito, G. M., Giambattista, A., (currently being published). Building green design methodologies for hospital disposables manufacturers. Promoting design tools for LCA. In Proceedings of 8th International Forum of Design as a Process - Disrupting Geographies in the Design World, Bologna, 20-22 June 2022.

- Cito, G. M., Giambattista, A., (currently being published). Curb the environmental impact of hospitals through the redesign of single-use procedural kits. In Proceedings of the 11th International conference Senses & Sensibility 2021 – Designing next genera(c)tions, 09 | 11 Dec 2021 – Bari, Italy.

- G.M. Cito, A. Giambattista (2021). Design for sustainable healthcare. Cutting the impact of medical products through disposable packaging. In: Design Culture(s). Cumulus Conference Proceedings Roma 2021, Loredana Di Lucchio, Lorenzo Imbesi, Angela Giambattista, Viktor Malakuczi (Eds.), 2021. CUMULUS CONFERENCE PROCEEDINGS SERIES, ISBN: 978-952-64-9004-5, ISSN: 2490-046X, Roma.

- Paoletti, A., Imbesi, L., Giambattista, A. (2021). Towards Neurodesign. The Mental Effort in packaging design. In Design Culture(s). Cumulus Conference Proceedings Roma 2021, Loredana Di Lucchio, Lorenzo Imbesi, Angela Giambattista, Viktor Malakuczi (Eds.). ISBN:978-952-64-9004-5. In CUMULUS CONFERENCE PROCEEDINGS SERIES - ISSN:2490-046X, Roma.

- Paoletti, A.; DI LUCCHIO, L.; Babiloni, F. (2020). Emotional Design and Neuroscience: definition and application of a tool for designers. Design for Inclusion, Gamification and Learning Experience, Franco Angeli, pp. 319-329 - ISBN: 9788891797780

This form was completed with the contribution of: [Anna Catania](#).

1. The research proposes the development of a model for sustainability applied to packaging product-service systems, investigating the territory, the concept of circularity, waste from production and their second life. The research analyzes the relationship between packaging and territory to develop packaging capable of enhancing typical food, the identity of a territory, and a consumption model with a zero-waste supply chain. The goal of the research is the experimentation of sustainable packaging which has the function of protecting, conserving, transporting, storing a product, and transmitting the communication of its sustainable value.

2. The research since 2014 with the project, Design and food for the identity of a territory, aims to develop artefacts and services through a systemic management of the agri-food of a territory, to define a new model of economic and social development based on the circular economy.

The research project aims to create sustainable innovations, considering the excellence of Sicilian agri-food as a factor of identity, well-being and to convey biodiversity and territories. Food is proposed as a local resource both to promote the territory and to initiate innovations in the area from the valorisation of waste to the promotion of traditions, crafts and local products. The methodological approach used to achieve sustainable innovation pursues the methods and tools for environmental sustainability (Systemic Design, Strategic and Service Design, Food design) through a transdisciplinary collaboration and with stakeholders, and it is aimed at examining: the agri-food throughout the supply chain, the enhancement of agri-food derivatives and waste to produce sustainable innovation in the food, nutraceutical and materials sectors.

Equally important for discovering forms of interaction between research and the agri-food chain is the service offered by MATeD to explore new packaging materials and the market challenges that agri-food companies have to face from sustainability to conservation and logistics.

Since 2013, MATeD (Materials and Design) has been an archive of new generation materials and semi-finished products, to support the teaching and research of the Department of Architecture, SMEs and artisans of the Sicilian territory.

3. The research experiences were also born through the know-how and the collaboration that the companies, Joeplast, Salerno Packaging, Comieco, Frantoi Cutrera, Department of Engineering, Department of Agricultural, Food and Forestry Sciences, University of Palermo

have contributed to the projects: "Design and food for the identity of a territory. Sustainable innovation for Ragusan olives and oil, Syracuse fimmellino lemon and mazarin almond"; "Ballarò: food, history and art between sustainability and interculturality" and "Capo: food, history and art between sustainability and interculturality."

4.

- Catania, A. (2011) (a cura di), Design, territorio e sostenibilità Ricerca e innovazione per la valorizzazione delle risorse locali, Franco Angeli, Milano, ISBN 978-88-568-4114-5

- Catania, A. (2015) Ri. Pack Design. Progettare in carta e cartone. Buone pratiche e nuovi modelli di consumo contro lo spreco alimentare, Aracne, Roma, ISBN 978-88-548-8746-6

- Catania, C. A. (2016) Design, agro-food and cultural heritage for sustainable local economy development, in Sustainable Energy for All by Design. Proceedings of the LeNSes Conference, Cape Town, South Africa. Edited by Emanuela Delfino and Carlo Vezzoli, Milano POLI design, pp.311-318, ISBN: 978-88-95651-23-1

- Catania, C. A. (2017) Design e cibo tra cultura e identità, in Identity The Colors of Project. Proceeding Convegno Internazionale, Favignana, Trapani. A cura di Dario Russo, Palermo University Press, pp.84-89, ISBN: 978-88-99934-72-9

- Catania, C. A., Modica, A. (2019) Design and Agrifood for new sustainable local development, in Designing Sustainability For All. Proceeding of the 3° LENS world distributed conference Vol 2. Edited by Marcello Ambrosio and Carlo Vezzoli. Milano POLI design, pp.313-318, ISBN 978-88-95651-26-

This form was completed with the contribution of:
[Eleonora Fiore](#), [Cristina Marino](#), [Paolo Tamborrini](#).

1. The research group in Design at the University of Parma (Unipr) carries out its activities within CIPACK - Centro Interdipartimentale per il Packaging (Interdepartmental Centre for Packaging), a certified Lab set up in 2009 to promote and coordinate fundamental and applied research activities related to the world of packaging, in particular for the agri-food and pharmaceutical sectors - www.centritecnopolo.unipr.it/cipack/.

The research group dialogues and collaborates actively with the EcoPackaging Observatory of the Politecnico di Torino, thanks to a series of institutional agreements between the two universities www.osservatorioecopack.polito.it.

The approach employed by the research group is systemic and data-driven, which allows for the generation of production strategies aimed at achieving environmental, economic, and social sustainability.

2. The research is conducted using a qualitative-quantitative method. Data are gathered and analysed thanks to the synergy between the different scientific and technical skills and devices present within CIPACK (sensory analysis through an electronic nose; microbiological analysis; reverse engineering for formal/typological aspects and communication aspects). Design and Artificial Intelligence for Packaging aims to provide researchers, companies and designers with the necessary tools and data to design new packaging (product and communication) based on values, elements and actions to improve the sustainability aspects of the product. This is achieved through artificial intelligence and machine learning for packaging analysis and reverse engineering and applied to specially designed databases. Research and design, also in dialogue with companies in the sector, is conducted according to user-centred design methodologies, believing that the significant changes, from the point of view of sustainability, pass through the choices and behaviour of individual users. In this case, too, data collection makes it possible to study the state of the art and to understand and define new future consumer needs with a view to responsibility and the correct use of resources, even in the domestic sphere.

The Unipr Design research group, in its research and design activities, involves, through a challenge-based learning teaching model, the students of the design courses. The students are primarily those studying Sustainable Design for the Food System (DSSA) an Interfaculty Bsc programme that involves the University of Parma and the Politecnico di Torino, in the "Packaging Design for Food" studio (divided into Concept Design and Consumer Behaviour, Branding and Advertising courses), but also the Design Labs of the Master in Eco Packaging Design - Systemic Innovation Design of the Politecnico di

Torino.

3. Italian company/university partners

- Verallia Italia, research for the study and definition of systemic reuse models for the design and innovation of sustainable glass packaging;
- Unico.Si, for communication in the supply chain through "physical-web" objects, packaging as a medium for integrated sustainability.

- PHOENIX. PusH fOr a valuable sEcoNd lIfe to PlasmIX a project funded by the call for proposals "Circular Economy: research for a sustainable future" of the Cariplo Foundation 2019, realised in collaboration with Università degli Studi di Milano, Università del Piemonte Orientale, with the active involvement of the COREPLA consortium.

Global corporate/university partners

- ARTEVELDE UNIVERSITY OF APPLIED SCIENCES <https://www.artevelde-uas.be> (Ghent, Belgium) Erasmus+ Inter-institutional Agreements for the three-year BSc in Sustainable Design for the Food System. Lecturer mobility (Staff Exchange (E+ STA)). Joint mapping activities in design.
- Partnership with Packaging School ESEPAK <https://www.esepac.com> (Saint-Germain-Laprade, France) for the joint organisation of seminars on packaging, the first of which took place on May 10th with the students of DSSA, Master in Packaging at Unipr, and ESEPAK.

4.

- Marino, C., Remondino, C., Tamborrini, P. (2022) 2030 there we are! A systemic review on the role of packaging design to reach the Sustainable Development Goals. In: ABITARE LA TERRA. - ISSN 1592-8608. - STAMPA. - Quaderni 7-8. Supplemento al n. 58 della Rivista Abitare la Terra, pp. 92-95.

- Systemic reuse models for sustainable glass packaging design and innovation / Marino, Cristina; Tamborrini, PAOLO MARCO; Miotto, Laura; Ferronato, Giulia. - STAMPA. - Antifragile Glass:(2022), pp. 34-43. ((Intervento presentato al convegno Antifragile Glass tenutosi a Venezia nel 17-19 Novembre 2022 [10.57623/979-12-5953-096-7]).

- Tamborrini, P.M., Marino, C. (2022). Carta, cartone e territori: scenari futuri per il packaging sostenibile e innovativo. In: Il packaging al centro dell'e-commerce. Best practice e linee guida per un uso sostenibile del packaging per l'e-commerce. Bagliani, M., Filippini, V., Bono, L., Brumen, F., Bonori, B.. - ELETTRONICO. - Milano: Comieco, Netcomm. pp. 29-45

- Pereno, A., Fiore, E., Tamborrini, P.M., Barbero, S. (2021) Circular perspectives in Design Education: Packaging disassembly as a tool for enhancing critical thinking. In: DIID. DISEGNO INDUSTRIALE INDUSTRIAL DESIGN. - ISSN 1594-8528. - ELETTRONICO. - 75. pp. 146-157. [10.30682/diid7521o]

Università di Scienze Gastronomiche di Pollenzo

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This form was completed with the contribution: [Chiara Chirilli](#), [Franco Fassio](#), [Fabiana Rovera](#), [Luisa Torri](#).

1. The design-driven approach of the University of Gastronomic Sciences of Pollenzo starts from the adoption of a systemic and circular thinking applied to the food packaging scenario, meant as the result of a necessary dialogue between content and container. This approach brings together different skills and disciplines: a modus operandi based on transdisciplinary relationships that bridges the design and research sphere (enhancing the role of design and food technologies) with the corporate sphere (consolidating relationships with and among the companies in its network).

2. To best define the needs and requirements of a given packaging, UNISG's design-driven approach aims to focus on two complementary aspects, the content (i.e., the product inside it) and the container (i.e., the packaging itself). When we talk about the container, for example, we develop market analyses, studies on packaging materials, packaging technologies, communication, brand identity, and labels, often involving industry players, be they packaging manufacturers or end-of-life recovery consortia.

In terms of content, on the other hand, studies are developed on the shelf life of products, their sensory characteristics, the perception of food packaging, aseptic and vacuum packaging of food or in a protective atmosphere, functional, active, intelligent packaging, etc. The collection, visualization, and interpretation of these data is the basis for the development of new research that often finds concrete experimentation thanks to the collaboration of companies that support the University.

3. At the Italian level, among the collaborations activated we can mention:

- Novamont: PRIME research on biodegradable and compostable mulching sheets (<https://www.novamont.com/prime>);
- Comieco, Rilegno: www.sistemicfooddesign.it project, education platform for circularity in food;
- SIAD: sensory tests for innovative mixtures for special applications (<https://www.siad.com/it/prodotti/gas-per-settore/gas-alimentari/foodline>);
- Turin Chamber of Commerce (Competitiveness Development and Internationalisation Sector): Savor Piemonte project (<https://www.to.camcom.it/savor-piemonte>);
- Eurostampa: Envelope project, creativity workshop for label production (<https://www.unisg.it/docenti-ricerca/laboratorio-creativita-gastronomica/pollenzo-eurostampa/envelope-2021/>)

At global level, collaboration with:

- University of Bologna's Packaging Innovation Observatory: participation in the work of the

Observatory, which has international boundaries as is evident from the Scientific Committee to which UNISG itself contributes (<https://adu.unibo.it/osservatoriopack/>);

- Metsä Board (Helsinki, Finland): staff training activities (<https://www.metsagroup.com/metsaboard>).

4.

- Chirilli, C.; Molino, M.; Torri, L. (2022). Consumers' Awareness, Behavior and Expectations for Food Packaging Environmental Sustainability: Influence of Socio-Demographic Characteristics. *FOODS*, 11, 2388. <https://doi.org/10.3390/foods11162388>
- Piochi, M.; Cabrino, G.; Torri, L. (2021). Check-All-That-Apply (CATA) Test to Investigate the Consumers' Perception of Olive Oil Sensory Properties: Effect of Storage Time and Packaging Material. *FOODS*, 10, 1551. <https://doi.org/10.3390/foods10071551>
- Fassio, F.; Tecco, N. (2019). Circular Economy for Food: A Systemic Interpretation of 40 Case Histories in the Food System in Their Relationships with SDGs. *Systems*, 7, 43. <https://doi.org/10.3390/systems7030043>
- Fassio F. (2017). Systemic Food Design.it A website that narrates food supply chains from a systemic perspective. *The Design Journal*, vol. 20, ISSN: 1460-6925. <https://doi.org/10.1080/14606925.2017.1352662>
- Torri L., Piochi M. (2016). Sensory methods and electronic nose as innovative tools for the evaluation of the aroma transfer properties of food plastic bags. *Food research international*, vol. 85; p. 235-243, ISSN: 0963-9969.

This form was completed with the contribution of: [Laura Badalucco](#).

1. The approach to packaging design is specifically aimed at the issues of environmental sustainability and design strategies for the circular economy. In particular, the activities concern:

- design solutions to facilitate and promote Recycling and Reuse;
- the designer's activity for a "Good Packaging" as a point of balance between the quantity and quality of packaging materials and the environmental impact of the content-container combination, with particular attention to overpackaging and under-packaging;
- the possibilities for improvement offered by Ecodesign and the transformative and regenerative ones of Circular Design.

2. Research for specific sectors and multidisciplinary training in a design-oriented perspective in dialogue with various players and stakeholders of packaging sector (Associations, Companies, Public Administrations, Research Centers). Qualitative and quantitative analysis of the state of the art and of packaging trends with the aim of developing design guidelines and toolkits for sustainable and regenerative packaging. Desk research and collection of data and significant case studies. Three kinds of situations can be distinguished. For activities aimed at facilitating the recyclability of packaging, we use also the "Guidelines for facilitating the recycling of packaging" and the checklists created together with Corepla and Conai in 2017 (first guidelines for designers in Italy and basic methodology for the Conai ProgettareRiciclo project). For the activities aimed at the sustainability of packaging in paper and cardboard, we use the guidelines and checklists developed with Comieco in 2011 as part of the "Good packaging" project and in 2018 in the "Packaging design for beginners" toolkit. Finally, for the activities aimed at the circularity of packaging, the main methodological tools are the "Design for X Tool" (Iuav doctoral thesis by Alessio Franconi), the "Upstream Innovation" strategies of the Ellen MacArthur Foundation and a 32-factor matrix created by Iuav for the search Circular Design Maps.

3. Italians

- Conai – research on Circular Packaging designer Maps.
- Conai – definition of Design for recycling guidelines for plastic packaging.
- Conai, Polimi, Polito, Unibo, Legambiente, Edizioni Dativo - involvement in the Ecodesign Competition Jury.
- Comieco – workshop on Solutions for the reusability of e-commerce packaging.
- Comieco – Graphic Days, Torino, workshop on Packaging Design for Beginners Toolkit.

- Intesa San Paolo, Circular Economy Lab – participation in the Circular Economy and Value Creation for the Agri-Food Supply Chains. Redesigning the system through circular design.
- Fondazione Studi Universitari di Vicenza – planning and coordination of the Advanced Course in Luxury Packaging Design & Sustainability.
- Politecnico di Torino and Cavanna Packaging Group – Flowpack and sustainability.
- Regione Veneto, Unioncamere del Veneto, Arpav, University of Padua, Ca' Foscari University, University of Verona - Working table on GPP and Food Packaging (2022) and Working table on GPP and Plastic Packaging (2021).

Global

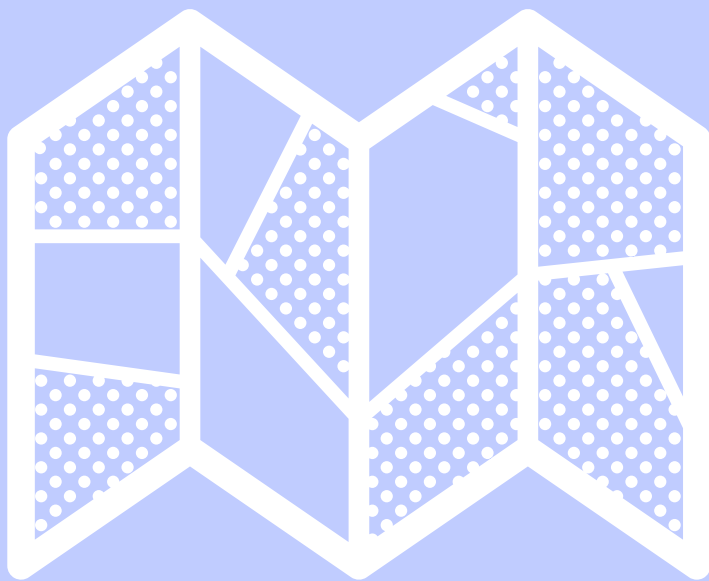
- University of Bologna's Packaging Innovation Observatory: participation in the work of the Observatory, which has international boundaries as is evident from the Scientific Committee to which IUAV itself contributes.

4.

- Badalucco, L. (2023), Cosa vuol dire ecodesign per gli imballaggi, in A. Acampora, C.A. Pratesi (a cura di), Economia circolare. La sfida del Packaging, Milano: Franco Angeli, pp. 297-316
- Badalucco, L. (2022), Contain, protect, communicate. Packaging and design, in B. Lema, D. Dal Palù (a cura di), Flow wrap packaging, the most with the least: high protection, low impact. Milano: Edizioni Ambiente, pp.43-48.
- Franconi, A., Badalucco, L., Peck, D., Nasr, N., (2020). A multi-hierarchical "Design for X" framework for accelerating circular economy. Proceedings of the Conference: Product Lifetimes And The Environment, 3. Berlin, Germany: Technical University of Berlin, pp. 257-266.
- Badalucco, L., Casarotto, L., Costa, P. (2017), Packaging Design. Elementi, processi e attori dell'innovazione, Milano: Edizioni Dativo.
- Badalucco, L., Casarotto L., Costa, P. (2017). Linee guida per la facilitazione delle attività di riciclo degli imballaggi in materiale plastico. Milano: Conai.



A mapping of Italian Packaging Design Research



This investigation was conducted by [Clara Giardina](#) for [Osservatorio Innovazione Packaging](#), a project by Advanced Design Unit - Department of Architecture, Università di Bologna, with the collaboration of Politecnico di Milano, Politecnico di Torino, Sapienza Università di Roma, Università degli Studi di Palermo, Università degli Studi di Parma, Università di Scienze Gastronomiche di Pollenzo, Università Iuav di Venezia. The individual contributors per university are indicated in the respective sheets.

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