

MECHANICAL ENGINEERING | PHYSICS |  
PRESERVATION OF THE ARCHITECTURAL  
HERITAGE | STRUCTURAL, SEISMIC  
AND GEOTECHNICAL ENGINEERING |  
URBAN PLANNING, DESIGN AND  
POLICY | AEROSPACE ENGINEERING |  
ARCHITECTURE, BUILT ENVIRONMENT  
AND CONSTRUCTION ENGINEERING |  
ARCHITECTURAL URBAN INTERIOR DESIGN  
| BIOENGINEERING | DATA ANALYTICS  
AND DECISION SCIENCES | DESIGN |  
ELECTRICAL ENGINEERING | ENERGY AND  
NUCLEAR SCIENCE AND TECHNOLOGY |  
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ENGINEERING | INDUSTRIAL CHEMISTRY AND  
CHEMICAL ENGINEERING | INFORMATION  
TECHNOLOGY | MANAGEMENT ENGINEERING  
| MATERIALS ENGINEERING | MATHEMATICAL  
MODELS AND METHODS IN ENGINEERING



Chair:

Prof. Alessandro Rocca

## DOCTORAL PROGRAM IN ARCHITECTURAL URBAN INTERIOR DESIGN

The Architectural Urban Interior Design (AUID) Ph.D. program firstly refers to the declaration reported in the EAAE Research Charter (2022): "Architectural research is an original investigation undertaken to generate knowledge, insights, and understanding based on competencies, methods, and tools proper to the discipline of architecture. It has its own knowledge base, mode, scope, tactics, and strategies." research by design is defined as "any kind of inquiry in which (...) the architectural design process forms the pathway through which new insights, knowledge, practices, or products come into being. It generates critical inquiry through design work."

The Program promotes research on architectural design, with studies and projects at different scales, contexts, and finalities. Research activities are based on the critical analysis and development of design processes and techniques in dynamic relationships with the urgent questions related to the domestic, urban, and rural environment. Research is supported by acquiring and elaborating insights and skills linked to contemporary architecture's theoretical and critical debate, in relationship with the most advanced international research centers. The Program foresees a constant elaboration and discussion of theoretical and operational tools. This dialectic process aims to foster a critical and creative reflection on architectural design, exploring and testing experimental approaches, and delivering autonomous and innovative scientific products to be disseminated through seminars, publications, and conferences.

An essential and constant character of the Program is a strong relationship with the practicing of architectural design. In particular, the Program aims to investigate the potentiality of research by design or design-driven research (DDR).

Research by design is a broader concept that includes "practice-based research" and "practice-led research," meaning that we focus on two kinds of research methodologies: "research through practice" and "research about practice".

The Program offers an intense sharing of knowledge, information, and practices. AUID is a creative, open, multicultural environment where the researchers frequently exchange with the board of professors, other research centers, and doctoral institutions; the Program supports

international exchanges, conferences, exhibitions, and research networks.

The Program is embedded into the Department of Architecture and Urban Studies (DAStU), which hosts about 200 professors and researchers engaged in an open, multidisciplinary scenario of architectural and urban studies, including every branch of design culture. More, AUID is strongly connected with AUIC, the Polimi Polimi School of Architecture, Urban Design, and Building Construction, that offers positions for assistant professorships, tutoring and teaching to the Bachelor and Master students of architecture. We consider teaching and tutoring as an essential research complement.

The AUID Program is part of the Polimi Ph.D. School, which provides the candidates with a various selection of interdisciplinary courses, keeping them in contact with the larger Polimi doctoral community. The Program aims to train and prepare highly qualified researchers and professionals in academic institutions, research centers, public administrations, and the private sector in architectural, urban, and interior design.

Eligible students hold a master's degree in architecture or close disciplines and can read, write, and speak English fluently. A background in Architecture is most appreciated, but a curriculum based in Design, Media, History, and other programs related to Art and Humanities is accepted. The Program is run by a Head, who coordinates all activities. Then, different actors cooperate in the program development. Deputy Heads have specific areas of interest in foreign relations, interior relations, and departmental research assignments. The Faculty Board has the scientific responsibility of all researchers, with a Board of Experts composed of professors and lecturers with bold academic research experience.

An international Advisory Board connects AUID with an extensive global network.

### Research topics

The Architectural Urban Interior Design (AUID) Ph.D. program promotes research focused on architectural design, with studies and projects aiming at different scales, contexts, and finalities.

Research is based on the acquisition and elaboration

of insights and skills explicitly linked to contemporary architecture's theoretical and critical horizon. Every year, the Program focuses on specific topics to be explored theoretically and designerly in respect of its general directions. Within the 38th Cycle, starting in 2022-23 academic year, the preferential research lines follow these topics, which be pursued choosing various viewpoints and fields:

- Theory of architecture and architectural Design: reframing premises and goals, with case studies from the past and from the present times.
- Architecture and mass media: how architectural design interacts with political and social issues.
- Architecture as a contemporary narrative: research, criticism, education form an elaborate creative engine of producing ideas, ideologies, fetishism, and critical thought.
- Design driven research: this relationship, carefully investigated in the past years, is a test site for specific Design-driven research applied to different contemporary challenges.

The Candidate will develop a research methodology starting from the lectures and assignments of the AUID courses and the courses of the Polimi Ph.D. School.

Studying the different formats, methods, expressions of research in architectural design, the Candidate will profile a personal methodology considering the specificity of the selected object, the target, the attended results.

The Program considers that design is a relevant and necessary component of any research. Together with the AUID Faculty and the Supervisor, each Candidate will find a specific position between design and research.

### Professional opportunities and job market

Educational objectives focus on the deep understanding of a well-selected and defined topic; the main goal is to develop research containing a comprehensive survey of the chosen question, which leads to an original track and output. The Candidate will acquire the skill to organize a consistent analysis of case studies, formulate a clear proposal for an original approach to a question, and elaborate innovative strategies and research methods.

The Candidate will be supported to deliver

autonomous and innovative scientific products to be disseminated through seminars, publications, and conferences.

#### Enrollment: Admission requirements

Italian and International citizens are requested to have graduated according to the pre-existing laws D.M. 3.11.1999 n. 509, or to have a Master of Science degree following D.M. 3.11.1999 n. 509, or a Master of Science following D.M. 22.10.2004 n. 270, or similar academic title obtained abroad, equivalent for duration and content to the Italian title, with an overall period of university studies of at least five years. A Master of Science degree in Architecture is the best background; candidates who graduated in disciplines as Landscape, Design, Art, Media, and Communications can be allowed, integrating their track with extra courses taken in the Master of Architecture.

A certified knowledge of the English language is a requirement for admission. Please refer to the Ph.D. School website for details.

The admission to the Program will be established according to the evaluation of the candidates' curricula, motivation letters, and a proposal of a Ph.D. research, which candidates will send contextually with their application to the admission announcement. A shortlist of applicants may be requested to meet representatives of the Faculty Board.

The Program welcomes both foreign and Italian students. English is the official language. Scholarships are available on general and specific themes, following the parameters illustrated in the call for admission. Candidates supported by scholarships of other national and international institutions may obtain a direct access to the AUID Ph. D. program, after a Board examination.

#### Requirements for the Ph.D. title achievement

The achievement of the Ph.D. title in "Architectural Urban Interior Design" requires a study and research activity of at least three years equivalent of full-time study, focused on the development of a Ph.D. thesis. The research must be done under the guidance of one or more supervisors nominated by the AUID Board. Ph.D. candidates must earn a minimum of 30-course

credits (see paragraph 5.3 below) and regularly conduct studies and research.

The Faculty Board may assign extra course credits to one or more candidates if they need to complete their preparation in specific topics relevant to their research projects.

#### Research development

The main aim of all Polimi Ph.D. Programs is the development, for the candidates, of a research-oriented mindset, with expertise and skills in a specific research topic.

Ph.D. candidates are requested to develop an original research contribution. The Ph.D. thesis must thus contribute to increasing the knowledge in the architectural design research field. Besides, it must be coherent with the general research lines of the Ph.D. Program.

The research results are collected in the Ph.D. thesis, where the candidate's contribution is put in perspective to the research state of the art in the specific research field.

The research develops under the guidance of a supervisor, who supports the candidate in the setting-out and everyday activities related to the thesis development. The supervisor is not necessarily a member of the Faculty Board and may also belong to an institution that is not Politecnico di Milano. The supervisor can be supported by one or more co-supervisors.

Further activities are encouraged during the Ph.D. path to enhance the candidate's personal skills and research expertise. Candidates must acquire the capability to present and discuss their work in the research local and global communities. Consequently, both the participation in international conferences and the publication of the research results in peer-reviewed journals are supported.

The Program encourages the candidates' research interactions with other groups in their research field, in national and international areas. Research visits of at least three months are strongly fostered, as through them, the candidates may acquire different skills to develop their research work and thesis. The minimum duration of the Program is three years.

#### Objectives and framework of the teaching activities

The Ph.D. Polimi Programs and the Ph.D. Polimi School activate teaching forms of different kind and credit value, including courses, seminars, project workshops, laboratories. Teaching activities cover the fundamental research issues (problems, theories, methods), representing the founding element of the Ph.D. Program. Lessons are held in English. Structured teaching activities allow earning ECTS credits.

The Ph.D. School offers courses aiming to train the Ph.D. candidates in soft and transferable skills. These courses' skills and abilities are expected to help candidates across different areas of their careers to respond to the rapidly evolving needs of the global economy and society at large.

The Ph.D. School courses activated for the 2022-2023 academic year will be visible at this link: <http://www.dottorato.polimi.it/en/during-your-phd/>

#### FACULTY BOARD

##### Alessandro Rocca (Head)

Professor of Architectural and Urban Design  
*Research topics*

- 1) *Architectural Media Culture. Architectural criticism and communication analyzed through exhibitions, journals, websites, magazines, conferences, and other publications;*
- 2) *Architectural education. Exploring the multiple tracks of architectural education to understand how the architects' cultures evolve and match contemporary challenges.*

##### Marco Biraghi (Deputy Head, Theory and History)

Professor of History of Architecture

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*Research Topics: According to different themes, co-installations of Co-Supervisors will take place. Themes are somehow specific, and Ph.D. Candidates need to find a way to tackle them by adding a subtitle. When focused on a specific work by a specific architect, the dissertation need also to investigate, to a certain extent, the whole architect's production and concern. New Typologies in Housing; Architecture Ethnography as Design*

phd-level-courses/. At least 10 of the 30 credits (ECTS) that each candidate is required to earn shall be obtained through soft and transferable skills courses organized by the Ph.D. School.

The educational structure can include:

- Lectures, training sessions, guided tours, and seminar cycles.
- Seminar activities and individual stages/internships particularly important for enhancing the students' curriculum.
- Individual research driven by a supervisor and discussed with the Faculty Board.

Each learning activity is subject to grading through oral examination and/or the submission of written papers. Detailed programs are available on the Program's and Polimi websites. Programs and bibliographies of courses are available online and will be communicated at the beginning of each activity.

*Methodology; Details in Architectural and Interior Design;*

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*Research Topics: Narrative spaces. Integrated museum systems for cultural heritage and innovative exhibition design methodologies; From inside to outside. Adaptive reuse of existing buildings for social inclusion; Being sacred. Symbolic, formal, and spatial meanings in modern and contemporary sacred architecture.*

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Associate Professor of Architectural and Urban Design

##### Luigi Cocchiarella

Professor of Architectural Drawing and Graphic Representation  
*Research Topics: Geometry and graphics in history between science, art, and architecture: treatises and*

manuals, masters and pioneers; Analog and digital graphics in architectural research and education: visual processing and computation; Information strategies in interdisciplinary architectural design workflows: digital artifacts as collaborative networks.

#### **Pierre Alain Croset**

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*Research Topics: Architectural Criticism and Media; Architecture as a Modification, a paradigm of late Modernism; Chinese Contemporary Architecture; Aging and Housing; Structural Design and Tectonics.*

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*Research Topics: Thermal comfort in open spaces. Adaptation strategies to the effects of climate change VS urban livability, Design guidelines for the urban realm in the Mediterranean area. Open spaces in schools.*

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*Research Topics: Terre fragili. Inland areas represent a facet of Fragile Lands in which fragility is not the consequence of a traumatic event but of a slow modification of socioeconomic balances and assets. Tomographies. Topographical sections as a tool for contemporary architectural design. Anthropocene Spatialism. The research investigates the spatial configurations in which the effects and criticalities of the Anthropocene take shape. Rurban. New Urban Life in Chinese Rural Landscape.*

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Professor of Architectural and Urban Design

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*Research Topics: Building envelope design and construction; Performance-driven design; Passive and low-energy environmental control strategies; Self-building methods.*

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*Research Topics: 1. architectural and urban design paradigms; 2. the recovery of the architectural and infrastructural heritage – deepening issues related to abandonment and the relationship between heritage and design; 3. the transformation of contemporary public space.*

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*Research Topics: Adaptive Reuse; Difficult-built heritage; Contemporary museums.*

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*Research Topics: Post Industrial Landscape; Recover of Productive Architecture; Evolution of Contemporary Public Space; Architectural Design in Informal Settlement.*

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*Research Topics: Post Industrial Landscape; Recover of Productive Architecture; Evolution of Contemporary Public Space; Architectural Design in Informal Settlement.*

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Associate Professor of Interior and Exhibit Design

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# THE SAFE SPACE. ORDINARY ARCHITECTURE FOR EXTRAORDINARY CONDITIONS

Beatrice Balducci – Supervisor: Prof. Alessandro Rocca

The research, positioning in the field of disaster preparedness, investigates how to design spaces as dual ones, capable of existing in ordinary conditions and becoming shelters in extraordinary ones. By shaping a theoretical framework, collecting and analyzing case studies concentrated in the American and Japanese contexts, the thesis considers disasters as a spatial and temporal challenge that architecture must confront. The chronic risks due to environmental change – rise in temperature and the subsequent shift in climatic conditions in vast areas of the planet – act as a basso continuo on the episodic ones, intensifying the presence or magnitude of disasters in areas already prone, making vulnerable territories that were not before, and therefore provoking a growing need for safety. The degree of uncertainties and difficulties in foreseeing the intensity of certain natural disasters challenges security criteria for buildings, infrastructures, and the works for defense and mitigation against the events. It questions how the human environment and consolidated fabric can dialogue with an increasingly dynamic and changeable environment and how this affects the design, challenging the very nature of architecture: the definition of

a safe space. Furthermore, the ripple effect of certain disasters in provoking the failure of the so-called critical infrastructures – water, power, communication – generates a multiform context which could recall for a multiform and hybrid architecture too. A park could be designed to transform into an off-grid emergency campsite, a mineral square into a temporary water reservoir, a stable into an emergency housing system, a watermill into an off-grid system able to provide energy in the wake of a disaster.

Therefore, how can architecture embody the possibility of a disaster and the multiple temporalities that it can open? How to design a space capable of withstanding ordinary and extraordinary conditions, the state of quiet and a potential phase of emergency? How can this inform the design process and what are the possibilities underpinned? The research explores the implication of normalizing the idea of a disaster, shifting it from a state of exception to a dynamic “as built” to inevitably dialogue with, and thus reflecting on possible scenarios, durations, configurations of a project, its functional or formal dynamicity, stressing principles such as

transformability, adaptability, and typological hybridization. By looking at infrastructures as architectures and considering the lifelines as “commons,” the work questions what a safe space could be today and how to design spaces as dual ones, capable of responding to two parallel conditions: the event and the state of rest.

The research is structured in five parts: one of literature review, one of theoretical discussion leaning on a selection of projects, two of specific case studies analysis, and one of synthesis of the different findings. Three visual essays recollect the analytical redrawing of the case studies.

In a prodromal section, the main terms of the thesis are discussed in the form of a literature



Fig. 1 - Elements, objects, microinfrastructures of Japanese *Bousai Koen* (Disaster Prevention Parks). Author: Beatrice Balducci

review for shaping a theoretical framework, defining the state of the art, and setting the cultural horizon of the work.

The second section, “Architecture for Emergency,” structures an overview of the relationship between architecture and disasters, tracing in history pivotal events that contributed to shaping the multifaceted concept of safe space; discussing contemporary design approaches to natural disasters leaning on projects that move on different logics; reflecting on the multiple space-time conditions entangled with emergency conditions through a set of projects that address both the state of quiet and the different emergency phases (event, response, recovery). The cases are not conceived to be compared; instead, they are portions of reasoning that help argue the thesis, speculatively redrawn according to their possible evolutions at different times of the emergency to illuminate principles and methodologies. Two specific and opposite cases are selected for a vertical analysis, which is led in the following chapters.

The third section, “Architecture for Anticipation,” developed during a period of visiting at the Kengo Kuma Lab at The University of Tokyo, focuses on the Japanese *Bousai Koen* (*bousai*=disaster prevention, *koen*=parks), public open spaces in urban and dense contexts designed to transform into open-air and public shelters for the masses eventually. To frame the specificity of Disaster Prevention Parks, on the one hand, a preliminary

study reflects on the traditional Japanese approach to disasters, which, based on yielding more than reinforcing, shaped a culture of preparedness that is reflected in the contemporary urban fabric. On the other hand, the analysis of fifty-two small parks in Tokyo built after the Great Kanto of 1923 traces the origin of the contemporary parks: fire-breaking voids designed as public plazas for multiple uses. The section explores these pragmatical spaces by combining scientific literature and direct surveys and building a catalog of elements, micro-infrastructures, and principles composing this hybrid typology.

As a reverse side of the coin, the fourth section, “Architecture for Escape,” investigates the Prepper movement’s architecture, a countercultural movement born in the 1960s in the U.S., made of groups and individuals who, through the design and equipment of a safe inhabitable space, actively prepare for a potential emergency: environmental catastrophes, economic collapse, pandemics, nuclear attacks. Unlike the Japanese cases, the Prepper movement sees the distrust of government protective measures and the failure of common infrastructure as the basis for escaping the grid and rethinking the shelter and safe house concept. Often based on accidental design strategies, their architectures respond not to the need to mitigate a disaster risk but to continuously face the worst-case scenario: more than the

transitory present, their spaces address the period during and after a catastrophe by conceptually shifting a disaster from a hypothetical future to a constant disordered context to face, challenging the traditional notions of dwelling. By combining scientific literature, specific cases, and pop-culture materials, the section aims to trace some of the characteristics of this paranoid architecture that, albeit in its eccentric nature, entangles a set of exportable principles and possibilities.

The fourth section, “The safe space,” works as a synthesis, bridging all the sections and discussing the findings of each. Therefore, the thesis explores what a safe space could be by deepening involved themes, principles, and possibilities to build a theoretical discourse that opens up further explorations. In the face of today’s unstable and uncertain environment, where the climatic crisis seems to delineate a global increase in states of emergency that result less and less exceptional, the research discusses the topic beyond the sectorial field of emergency architecture, illuminating the possibilities in designing with potential crisis as a secondary “as built,” conceiving disasters as spatial and temporal challenges, as non-exceptional, always possible, alternative conditions.

## THE FRENCH AND ITALIAN CRITICAL DISCOURSES ON THE TRANSFORMATIONS OF THE COASTS, 1950S-1980S. MEDIA, ACTORS, REPRESENTATIONS

**Alessandro Benetti** – Supervisors: Prof. Hélène Jannièrè, Prof. Marco Biraghi

This research project lies at the crossroads of two fields of study: the history of the city and the territory, on the one hand, and the history of urban criticism and territorial transformations, on the other. It focuses on the discourses on the transformations of the French and Italian coasts between the 1950s and 1980s, articulated through a series of representations of these territories.

In several respects, these decades correspond to a specific age of debates on cities and territories, which underwent major transformations at the time. From the 1950s onwards, a wide range of media, different for their production contexts and their audiences, took an interest in these subjects. They stimulated an increasingly dynamic debate, fueled by contributions from a wide range of personalities: architectural historians and critics, practitioners, art historians, heritage associations

and others. New and fruitful cross-fertilizations between media and authors took place in this context, while the contents of their discourses were disseminated far beyond expert circles. From the 1980s onwards, new processes established themselves, as the debate became increasingly mediatized, and the boundaries between criticism and communication ever more blurred.

This research project claims that coastal areas are a particularly representative sample for investigating this period of debate. The intensity of their transformations is comparable to those of major cities and their surroundings. On the one hand, the debate on the latter has already been the subject of several studies, most notably on the emergence of the notion of historic center. On the other hand, coastlines are a privileged place for unprecedented exchanges between the concerns of

different discourses: on the city as heritage; on the protection of the environment and nature; on mass tourism, its practices and its places.

We focus here on two countries, France and Italy, which bear witness to the international scope of this debate, and to the similarities and specificities it presents in each context. The study is based on a varied corpus of sources, including the specialized press, daily newspapers and weekly magazines from the general press, association newsletters and television broadcasts. The crossing of studies in the fields of the history of cities and territories, the history of criticism



and the history of the press has helped define the criteria for this selection, ensuring its coherence. In particular, the study of the biographies of the authors, often active at the same time in different media, proved to be an important instrument in the constitution of this corpus. The thesis is divided into three parts. The first part (Chapters 1 and 2) is devoted to the construction of the territory. A reasoned account of the transformations of the French and Italian coastlines shows that they are a relevant sample for this study. The second part (Chapters 3 and 4) focuses more specifically on the discourses that comment on these transformations. Here, we outline a map of the actors and media involved in the debate about French and Italian territories, and then specify its contents based on the representations of the coasts, understood as its hotspots. The third part (Chapters 5 and 6) presents, through four case studies, the main representations of the coasts circulating in the debate. Each case study, whether an architectural project, an urban project, an infrastructure or a landscape project, is intended to exemplify a modality of coastal transformation, and the discourses it provoked. Their

reduced scale in space and time enables us to focus more precisely on a specific theme, as well as to consider the use of complementary sources (local press titles, postcards, technical journals) that complement the main corpus. In conclusion, this research presents three main elements of scientific interest. Two concern a repositioning of the discourses studied: in terms of their actors, their media and their audiences, because we define a cartography that testifies to its widening well beyond the circles of experts; and with regard to their contents, because we resituate the transformations of the coastlines at the crossroads of the concerns of different discourses (on heritage, the environment, tourism), often studied in independent historiographies. A third element of originality is disciplinary: the selection of sources used here, often little studied, suggests the possibility of broadening the traditional corpus of the history of criticism.



Fig. 1 - Jean Balladur, residential buildings, La Grande Motte seaside resort, 1960s. Photo © Alessandro Benetti, 2019

## INTERIORS AND “SYNTHÈSE DES ARTS”: A CRITICAL INVESTIGATION METHODOLOGY. ARCHITECTS OF MILANESE CULTURE, BETWEEN FRENCH AND ITALIAN ARTISTIC AND ARCHITECTONICAL INFLUENCES (1948-1972)

Carola D'Ambros

Supervisors: Prof. Immacolata Concezione Forino, Prof. Annalisa Viati Navone

The study focuses on domestic interiors, which stand out for being the site of one of the possible forms of synthesis of the arts. In contrast to the usual historical-critical approach, the research aims to achieve a more detailed and in-depth understanding of interior architecture by applying different investigative tools. The objective is the development of an analytical methodology built from the study of different critical instruments derived from extra-architectural fields such as hermeneutics, literary and art criticism, and neuroscience. We therefore focused on genetic analysis, by reconstructing the genetic dossier of the work and tracing the phases of development and the causes that triggered its evolution; intertextual analysis, which takes into account the factors exogenous and endogenous to the project that can influence the creative process; perceptible analysis which examines the relationships intended by the architect between the inhabitant and his/her environment – the creation of “atmospheres”, the generation of perceptual stimuli, the design of spaces that suggest a certain “behaviour” –; receptive analysis, which studies the way

in which the work was received at the time of its creation and throughout its life, as well as by its inhabitants; finally, spatial analysis, as practised by architectural historians, to study the interrelationship of the different environments from a formal, volumetric, lighting and chromatic point of view. Combined with the tools we have just mentioned, it sheds light on the “sensations” and emotions induced by certain spatialities. The aforementioned critical investigation methodology will be applied to domestic interiors designed by architects of Milanese culture, from the late 1940s to the early 1970s, distinguished by the practice of collaboration with artists or by the application of specifically artistic procedures in the design process. What they have in common is an interest in the synthesis of the arts and the transformation of the project into a field of experimentation of the interactions between architecture and the artistic disciplines. The chronological period of investigation refers indeed to a particularly fervent moment for Italy in which an enlightened clientele largely supports spatial and artistic experiments of architects.

The weaving of the research thread is ensured by a series of focal points corresponding to exhibitions and expositions that regard the concept of synthesis of the arts as crucial. Through the “reading” of these events, it is possible to grasp the network of relationships that is being consolidated between the worlds of art and architecture and, through this, to identify the seeds of future fruitful cooperation. The roots of the debate on the synthesis of the art can be traced back to the VIth *Convegno Volta* held in Rome in 1936 and, subsequently, to the VIIIth C.I.A.M. held in Bergamo in 1949, but the main test-bed is the Milan *Triennale*. Starting from the concept of the unity of the arts, fragily enunciated at the Vth *Triennale* (1933), resolutely proclaimed during the VIth (1936), resumed and valorised with the IXth (1951), the Xth *Triennale* (1954) is aware that the unitary relationship between the arts is a fundamental premise for the creation. In that cultural climate, a series of side events in the arts proliferated. The rise and dialogue of the *Movimento per l'Arte Concreta* (M.A.C.), inaugurated in Milan at the Salto bookstore in December 1948, and the French *Groupe Espace*, which sees its

beginnings in 1951 in Paris. Both, which begin their collaboration within the X Triennial of Milan in 1954, have as their objective the realization of a synthesis of arts, making painting, sculpture and architecture interpenetrating entities. In the wake of their experiences, and referring to a similar exhibition organised by *Groupe Espace* in Biot in 1954, the exhibition *Colori e forme nella casa d'oggi* (1957) is organised in Como with the aim of realising a collaboration between architects, painters, sculptors and local businesses. In the field of art, continuing the reflections of the “concretists”, numerous spatial experiments are developed that merged the boundaries separating each artistic expression, particularly within the current of *Programmed Art*. Once the context and the critical approach have been framed, the thesis takes on an experimental character, focusing on the case studies, three interiors that reflect three types of artistic synthesis: *Villa Fontana*, realised in Lenno between 1967 and 1968, the fruit of collaboration between architects Ico and Luisa Parisi



Fig. 1 - Living room of *Villa Fontana* by Ico and Luisa Parisi, Lenno 1967-1968.



Fig. 2 - Living room of *Villa Carlevaro* by Bruno Morassutti, Segrate 1967-1972.

and the programmed artists; *Villa Carlevaro*, built in Segrate between 1967 and 1972, conceived by Bruno Morassutti borrowing his own creative approach from the artist and designer Enzo Mari; *Villas gemelle*, erected in Toscolano Maderno between 1970 and 1971, a testament to the penchant for the plastic arts of its designers Alberto Salvati and Ambrogio Tresoldi. This study seeks to address the need for adequate operational tools for a deeper understanding of the project through the reading of its maturation process, the deciphering of the forms of interference and assimilation of sources, the comprehension of the space structure and its relationship with the inhabitant, ending with the identification of the variety of forms and “effects” emerging from the dialogue between architecture and art. The aim of the research is not, therefore, to fill a historiographical gap, but to test the effectiveness of a multidisciplinary analytical method for documenting in detail (and interpreting) fragile architectures that form part of



Fig. 3 - Living room of one of Alberto Salvati and Ambrogio Tresoldi's *Villas gemelle*, Toscolano Maderno 1970-1971.

Italy's 20th-century architectural heritage, but which are subject to often radical changes linked to the tastes of their owners. A documentation that we consider crucial when designing a restoration project, aimed at safeguarding the interior from irreversible alterations, that would erase the architect's intentions, its original character and testimonial value.

# TYOLOGICAL STUDIES OF THE SEMI-PRIVATE SPACE. DESIGN CHALLENGES OF THE MOSCOW SOVIET DVOR EXPERIMENT

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This research explores the semi-private spaces between the housing units in the Moscow periphery called “dvor”. The work focuses on the open space model that was generated by the specific architectural conditions during the Soviet standard housing period starting from the mid 1950s. The dvor has become an outcome of mass construction, shaping a unique open space environment whose contrasting characteristics generated the distinctive fusion between public and private.

This historical phenomenon gives us an extraordinary lesson on the use of space between buildings and opens a new perspective to the development of the open space typologies dealing with the recurring topic of the fragility of public space in the contemporary cities, through the past experience of the case study of the dvor. It is important to draw the line and define a clear difference between the accessible public space and the more intimate semi-private character of this typology, representing a great interest due to its controversial qualities of a non-defined physical shape, based on subjective perception.

This work aims to define the qualities of the dvor and dig into the structure of these spaces, so as to analyze them as a complex architectural typology.

Studying the case study of the dvor as an architectural example of an open space typology allows to improve the housing quality introducing a well-defined meaning of the semi-private, thought the physical design experiments able to highlight the physical relation between architectural elements of the buildings and the open space.

The starting point for this research is the morphological analysis. After the thorough studies of the Moscow urban fabric, it is possible to define the three main categories of the dvor in terms of their shape and permeability: open, closed, and semi-open.

Unlike the western model of private and public, the dvor is defined by a liquid structure becoming a transitional space between the private building and the very public street. The perception of its limits is strongly defined by the daily routine along with its physical limits.

From a scientific perspective, there have been numerous studies about the typological development of the housing units from the Soviet period, but there are no sufficient studies about the open space - dvor, which created a peculiar knowledge gap in the research of the public space.

The true meaning of the research is to examine the dvor from a critical point of view and read its architectural context by means of a design-driven approach.

The semi-private characteristics of the dvor represent the unique quality of the space between the buildings. Therefore, this research focuses on understanding the important architectural issues related to the physical aspects of the dvor such as: the questions of subjective perception of its limits and the disproportion of scale.

The work can be divided into two main parts:  
Realistic – Learning from the dvor and utopian- “What if?” scenarios

The starting point of the research is the analysis of the actual condition – reality, through the typological study of the dvor, defining the specific

morphological characteristics and their relation to the context through a precise case study selection.

It is important to focus on the quality of the semi-private space and define its role by understanding the meaning of “liquid space”, i.e., a transitional public space with no precise boundaries and defined by a subjective perception.

The actual condition study is subsequently divided in two main approaches. One is based on the idea of walking through, which illustrates the atmosphere and explores the geometrical aspects of the dvor such as dimensions, distances, and proportions. This step is efficiently represented via a photographical report aiming to communicate the subjective perception of the borders and



Fig.1 - Existing context, by author

the general open space structure from the inside of the living environment.

The other approach is based on the view from the top, focusing on the examination of the maps, the documentary drawings, and the archives related to the development of each selected case study. The meaning of this important step of the research is the development of the analytical drawing background in order to gather and summarize the existing knowledge and information about the dvor. <sup><sup>fig.1</sup>

The second step of the work is related to the experimental design analysis called “What-if?”. The idea is based on the architectural research-by-design approach similar to the scientific laboratory studies by means of experiments. This method focuses on the



Fig.2 - “What if” perspective view, by author

imaginary considerations and hypothetical scenarios in search of proofs and consequences.

Each alteration of the open space condition generates a new “reality” establishing the dialog between the buildings and a different typology of open space, shifting the limits of the dvor. Each of the suggested visions explores a different architectural meaning of the semi-private condition. The utopian design ideas enable to simulate contrasting social and physical relations in order to emphasize the potential qualities of the dvor and the liquid space characteristics. A variety of these imaginary scenarios raise a number of research questions helping to acknowledge the problems and fragilities of the dvor typology in a hypertrophied form as under a magnifying glass.

## ARK ARCHITECTURE. STRATEGIES OF SPACE SUSPENSION

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Co-Supervisor: Prof. Alessandro Rocca

Ancient and contemporary, ark architecture today presents itself as a space within which to withdraw, in which to suspend and evolve, to participate in a future release and challenge reality through inactual acts of resistance and deposition of the whole. Understood as a device whose centre of action is the suspension of use, the research questioned the consequences that this movement has produced and produces in the project: architecture, which has always been built to be put into use immediately, finds itself being designed in advance, to be put on hold and used in the distant future. In particular, therefore, the research has focused on those architectural experiences and events involved in *making the world*, and that only by renouncing use, or by surviving it, can they truly make themselves available for refoundation. Indeed, a suspension has been placed as an elementary particle of the ark that revises the ancient Vitruvian notion of *utilitas* by inverting it, giving maximum power to its opposite, that is, to what architecture has always renounced: the useless, the useless. Only because it is *useless* can an architecture be an ark. Not languages, not forms, not

even materials give a space its *archaeness*. No. It is the useless that here becomes maximally necessary and exceeds what Bataille called “the limit of the useful” (George Bataille, *The Limit of the Useful*, The MIT Press 2023). This is why “strategies”, because only by deploying a series of interlinked actions, retreat, suspension, release, can an architecture be a space of reserve for life. And this, in the words of Agamben in *Homo Sacer*, can only happen by designing a “body without use” (Giorgio Agamben, *The Use of Bodies*, Stanford University Press 2016) whose work lies in inoperativity, or whose action is inaction. The return of the ark from the distant past within the contemporary debate appears as a phenomenon in reaction to the destructive tendencies in the field today that demand the architectural project to respond to a reality that has overcome all forms of radicality. The debate on energy supply, and the dynamics of geopolitical reorganisation on a planetary scale, have brought back to the centre the discourse on hollow figures, available to channel the forces of nature in order to store them and put them to use later, when abundance eventually runs out.

An ark is in the first instance a deprivation, an impoverishment that programmes a promise of abundance. In this sense, the ark can take on two different manifestations. The first is literal and concerns those cases in which the ark is architecture in the strict sense, i.e. a small space in which to store an unmissable and useful good for the future. The second, on the other hand, is in the broad sense, and is that ark constituted by acts of government, rules, regulations, procedures, systems, which populations have designed to organise, manage and hand down, protecting themselves from destruction. The figure has its roots within three great narratives of humanity: religion; politics, as expressed by Giorgio Agamben in his *State of Exception* (Giorgio Agamben, *State of Exception*, University of Chicago Press 2003); and science. In fact, the experiments and realisations that adopt the strategy of the ark open up a double reflection with respect to the contexts with which they relate: on the one hand, they set themselves up as a project of salvation; on the other hand, having to deal with spaces, movements and uncertainties of a gigantic order,

they open up a reflection on their being defenceless, on the role of seals and building materials for hypothetical isothermal and watertight insulation, and finally on the possible failure of the architectural project. The fact remains that an ark, whatever it is and whatever form it takes, has in itself no possibility of existing without one of these narratives intervening to dictate its appearance and action: the narrative seems to be inextricably linked to the emergence of this space that in itself is *without content*: “What the ark of power contains at its centre is the state of exception – but this is essentially an empty space, in which a human action without a relationship to law faces a norm without a relationship to life” (ivi, p. 110). The project of an ark is divided into acts of resistance, through castles and manifestos, and into depositions of the whole that take the form of retreats waiting for better times, because “it is only within space-creating immune structures that men can prolong their process of generation and advance their respective individualisations” (Peter Sloterdijk, *Spheres I. Globes*, Semiotext(e) 2014, p. 38). Contemporary experiences

that echo the strategy of the ark are sometimes based on “manifesto” tones and thus insist on temporal dynamics that concern the immediate assumption of responsibility to be promptly translated into action. The end of the world, the backdrop against which almost all criticism and operations related to the possible recourse to the ark stand out, concerns time and the continual delay of the much evoked end: the horizon on which the ark is called to operate is always current because it is based on predictions that are continually procrastinated on the basis of the present situation, but which require rapid movements on a colossal scale. The future, its absence or, on the contrary, its return, is at the heart of the ark’s strategy because its time is always postponed. Mike Davis’s words “we must start thinking like Noah” (Mike Davis, *Who Will Build the Ark?*, in “New Left Review”, 61, 2010, p. 30) are a clear choice of position with respect to a contemporary condition, judged negative if not desperate (it is Davis again who speaks), with respect to which one *must* take responsibility: “A new Ark will have to be constructed” (*Ibidem*) testifies to the ark as an imperative but not absolute

architecture: “To raise our imaginations to the challenge of the Anthropocene, we must be able to envision alternative configurations of agents, practices and social relations, and this requires, in turn, that we suspend the politico-economic assumptions that chain us to the present” (ivi, p. 45). Having registered the absence of the future as the only certainty of our action, the ark proceeds. Immersed in a cloud of non-knowledge, ignoring, standing *colossal* by virtue of its pose, bracketed and suspending *datitude*, the architecture prepares the *liberation* of its proceeding. The most contemporary image turns out to be the one sketched by Athanasius Kircher in his ancient treatise *Arca Noë* (1675): a black monolith drawn with the same stroke as the deluge that washes over it, where figure and background are allied to form an unbreakable reality where the ark does not stand out but rather contributes together with the rest to form a material architecture. The radicality of reality, and the fields of tension deployed as stage and instrument, lead the project to become cosmogony.

## QUANZHOU, TO DESIGN FROM THE PERSPECTIVE OF WATER: EXPLORING THE POTENTIAL FOR BRIDGING URBAN MORPHOLOGY AND URBAN POLITICAL ECOLOGY IN URBAN REVITALIZATION RESEARCH

Wenyong Song – Supervisor: Prof. Ilaria Valente

*“Water lies at the section of landscape and infrastructure, crossing between visible and invisible domains of urban space... It does not constitute one object of analysis but rather an intersecting set of processes, practices, and meanings that cuts across existing disciplinary boundaries.”* (Gandy, 2014, pp.1-2). The multifaceted meaning of water as waterscape, green infrastructure, water infrastructure, material and capital flows and so on indicates its domain encompassing landscape design, geography, hydrology, anthropology, engineering, and other fields. Taking an interdisciplinary perspective of water, this research seeks a multidisciplinary approach to urban landscape study in the pursuit of design proposals for urban revitalization facing the numerous current challenges, such as urban health promotion, environmental conservation, environmental justice, and socio-cultural innovation for an inclusive and sustainable urban recovery.

The literature review section suggests that water can be taken as an intersection, which could take into account of these aforementioned topics, following an interdisciplinary approach by combining urban morphology and

urban political ecology in urban studies. This section reviews the concepts, approaches, limitations, and implications of traditional urban morphology, and discusses how urban political ecology, as a perspective to thinking and narration rather than a subject seeking its own distinct theory, could contribute to the development of urban morphology (or more specifically, the Conzenian urban morphology) and urban design.

This research first looks to the field of urban morphology, mainly the Conzenian urban morphology, for theoretical and methodological references. The Conzenian historico-geographical approach has been well-established and widely disseminated in the past nine decades, and it provides many valuable concepts and approach for mapping and understanding the evolving urban landscape from a holistic perspective, no matter whatever scale and context the study object is. However, with its origins in geographical studies, it is weakly represented in landscape design and management, although several scholars have advocated for its feasibility and significance to these fields during the past two decades. Among its various

concepts, the fringe belt (FB), both as a concept with which to view urban development and a dynamic spatial structure of towns and cities, proves a valuable topic for both morphological study and urban design, especially concerning the design and management of the blue-green spaces and green infrastructure during urban landscape revitalization. Thus, this research essentially takes the Conzenian historico-geographical approach and the fringe-belt research for mapping and understanding the waterscape and blue-green infrastructure evolution, socio-spatial changes, and their interconnections, in seeking design proposals for urban landscape revitalization.

Second, while seeking inclusive regeneration proposals, urban political ecology (UPE) would be an unavoidable field if this research is to explore the interrelations between water, topography, infrastructure, and urban form without glossing over the underlying complex social-political dynamics. The UPE focuses on taking infrastructure, especially water-related infrastructure, as a lens for examining the contesting metabolism processes of cities. Due to the paramount

importance of water during urban metabolism, UPE scholarship rearranges the position of water (infrastructure) from a typically discursive, apolitical, and neutral layer of the urban form left for engineers to a significant underlying layer—as a battlefield of power interactions among various groups of agencies during urban resource distribution, recycling, and competition—for critical urban studies. Taking water (infrastructure) as a critical lens for understanding the uneven socio-ecological processes and the production of uneven urban environments may provide a complementary perspective to morphological studies. As urban morphology is concentrating more on exploring the power relations of agents and agencies during shaping the urban fabric (Larkham and Conzen, 2014), urban morphology shares and may share more common ground with the UPE thinking.

The following part takes the UNESCO cultural-historical city Quanzhou (mainly the historic city) in China as an exemplifying case for investigating whether or not and how such an interdisciplinary approach could contribute to the urban landscape study and design during urban revitalization.

Following the Conzenian historico-geographical approach and fringe-belt research from a blue-green infrastructure (or green infrastructure) perspective, the first section explores the interconnections of the uncoordinated redevelopment of the inner fringe belt,

disintegration of the historical blue-green system, and socio-spatial and environmental problems in Quanzhou historic city. Based on the findings from such morphological mapping and analysis, this research evaluates the design and practices of urban landscape revitalization in Quanzhou during the past four decades, revealing some common deficiencies and problems that have persisted but have been overlooked not only in Quanzhou but possibly in many other regions during urban landscape revitalization. In response, an integrated spatial strategy is proposed to restore the connectivity, accessibility, multi-scale, and multi-functionality of its inner fringe belt as the urban green infrastructure, with the aim of conserving the historical blue-green system for a more socio-environmentally ecological strategy during its urban landscape revitalization. This part of the case study, in turn, develops the fringe-belt research, through investigating the understudied relationships of the fringe belt and green infrastructure, as well as the potential of a fringe belt as an operational entity during urban design.

Accompanied with the disintegration of the historical blue-green infrastructural system in the historic city is the gradual water modernization process. As a primary element related to the quality of the built environment, public policy, and social services, water infrastructure is viewed as an analytical lens through whose

construction and retrofitting the intentions and conflicts of different groups, as well as the efficacy of urban revitalization, can be discerned. Following the UPE perspective, the second section of the case study focuses on the enclaved modernization of water infrastructure in the historic city, which to some degree reflects the uneven development and regeneration of the historic city. Through observation of small-scale water-related socio-spatial changes following an ethnographic approach, the power relationships of various groups of participants get unraveled and some overlooked aspects during urban landscape revitalization in the historic city are presented. This section displays a collage of the effects of urban revitalization in the historic city that deviates from the official discourse; and presents the need for clarifying the understanding and narrations of the public/governmental and private realms and responsibilities, and for a more inclusive and collaborative planning and design approach during urban landscape revitalization as well.

## MINORITY IN METROPOLIS - MICROCLIMATE ORIENTED ARCHITECTURAL DESIGN

Qian Zhang - Supervisor: Prof. Alessandro Rogora

Global climate change has precipitated a surge in extreme weather events, significantly impacting human life and health on a large scale. This study delves into the intricate interplay between urban morphology and microclimates in the face of these challenges. Urban areas, with their diverse morphologies, create microclimatic variations that, in turn, affect human thermal comfort. However, prevailing urban and architectural design systems, especially in developing countries, often prioritize functionality over climate considerations. This oversight exacerbates housing difficulties, particularly in historical urban areas. In China, where ancient urban areas boast rich cultural heritage, this study employs empirical urban climatology research to systematically investigate the climate adaptation mechanisms in northern cities. The research focuses on Xi'an, a city with a history spanning over 3000 years, and analyzes residential courtyard spaces and block spaces. The study's novelty lies in its simulation of a courtyard with a history exceeding 400 years (Fig1), a groundbreaking approach in microclimate research.

By measuring microclimates at various scales and proposing climate-adaptive design strategies, the study offers valuable insights for architects and urban planners, especially in the context of the neglect of historical and developmental correlations between space and microclimate in existing literature. Undertaking this research, "MINORITY IN METROPOLIS - Microclimate-oriented Architectural Design," has been a pivotal endeavor in my professional journey. This study delves deep into the intricate relationships between historical urban spaces, architectural design, and microclimates, with a specific focus on Xi'an, China. It addresses the pressing challenges posed by global climate change and the often-overlooked impact on urban

microclimates, ultimately proposing innovative climate-adaptive design strategies. The research unfolds a rich tapestry of insights, making substantial contributions to both academic and practical realms. The interdisciplinary approach, intertwining climatology, historical analysis, and empirical research, underscores the complexity of the subject. The study successfully bridges the gap between urban history and microclimate research, advocating for a holistic understanding that integrates the preservation of historical spaces with contemporary sustainability concerns. The detailed exploration of Xi'an lays bare the nuances of its climate, historical evolution, and the dynamic relationship between built environments and natural ecosystems. The focus on

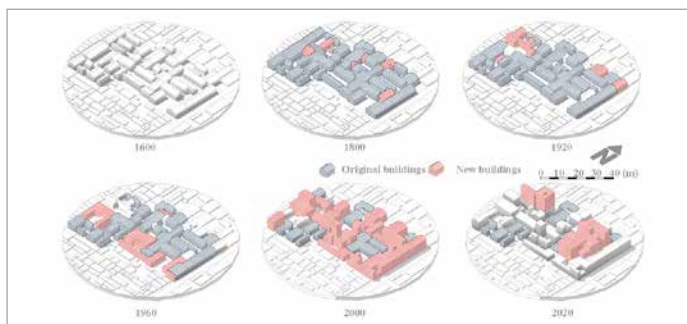


Fig. 1 - Spatial comparison models of Ma' courtyard in different historical periods

Xi'an's Hui inhabited area (Fig2) becomes a microcosm for the broader challenges faced by historic urban spaces globally. The examination of courtyard spaces, from classification to the impact of spatial renewal on wind environments, provides a comprehensive understanding of the microclimatic intricacies within these historically significant structures. The proposed climate-adaptive design strategies offer practical solutions, ensuring the preservation of cultural heritage while meeting the demands of a changing climate. Moving beyond courtyards, the study extends its reach to low-rise, multi-storey, and high-rise building areas. Each chapter contributes unique insights into the optimization of microclimate conditions, addressing specific challenges posed by different urban forms. The comprehensive exploration



Fig. 2 - Aerial view of Xi'an Hui inhabited area

of design elements, energy consumption, and the ecological aspects of architectural interfaces adds depth to the understanding of sustainable urban design. The concluding chapter not only summarizes the wealth of research findings but also emphasizes the continued multidisciplinary nature of this endeavor. The significance of preserving historical urban spaces, the efficacy of climate-adaptive design strategies, and the impact of spatial form on microclimates are highlighted as key takeaways. Furthermore, the proposal for future directions, including the integration of historical climate data and refinement of simulation conditions, sets the stage for ongoing research and advancements in the field. In essence, this research goes beyond being a scholarly contribution; it serves as a guide for architects, urban planners, and researchers alike, navigating the intricate terrain of historical preservation, microclimate considerations, and sustainable design. As our cities grapple with the challenges of climate change, this work stands as a beacon, illuminating a path towards resilient, culturally rich, and environmentally conscious urban spaces.