

Nexus Conference 2023 Turin

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# Nexus Conference 2023 Turin

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## Abstract

*Nexus Network Journal* guest editor Roberta Spallone introduces the conference papers in the special issue dedicated to the Nexus Conference 2023 in Turin.

In this edition of “Nexus: Relationships Between Architecture and Mathematics”, it is my honour to chair the conference alongside Kim Williams, who was the creator and founder of this event. It is therefore with great satisfaction that I introduce this supplementary issue of the *Nexus Network Journal*, containing the proposals selected for presentation and discussion, following the call for proposals that precedes each conference.

The conference takes on special significance this year. After the Covid-19 pandemic that prevented Nexus 2020 from being held in Kaiserlautern and then required it to take place online in July 2021, Nexus 2023 represents a return to normalcy, which allows scholars and younger researchers-in-training to meet in person and engage in exchanges that can fuel scientific debate and spark new ideas and collaborations for future research.

This year’s meeting takes place Torino, hosted by the Dipartimento di Architettura e Design (DAD) of the Politecnico di Torino, 12–15 June 2023, in the historical Castello del Valentino (Unesco Heritage).

This fourteenth edition continues the tradition of high-quality, multifaceted research that began with the first Nexus conference twenty-seven years ago, in 1996.<sup>1</sup>

The conference series entitled “Nexus: Relationships between Architecture and Mathematics” began with the first conference in Fucecchio (in the province of Flor-

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<sup>1</sup> For a full history of the Nexus conferences, see Kim Williams, “Twenty Years of “Nexus: Architecture and Mathematics (1996–2016)”, *The Mathematical Intelligencer* **39**(2) (2017): 85–95.

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ence, Italy) held in June 1996. That first meeting has been followed by successive conferences held every two years: 1998 in Mantua, Italy; 2000 in Ferrara, Italy; 2002 in Óbidos, Portugal; 2004 in Mexico City, Mexico; 2006 in Genoa, Italy; 2008 in San Diego, USA; 2010 in Porto, Portugal; 2012 in Milan, Italy; 2014 in Ankara, Turkey; 2016 in San Sebastian-Donostia, Spain; 2018 in Pisa, Italy; 2020/2021 in Kaiserlautern, Germany, held online.

In the Preface to the 2018 Conference in Pisa, Kim Williams observed in the conference's lectures over the years, the progressive transformation of the discipline of "architecture and mathematics" from an interesting topic into a field of study in its own right. At the same time, the increasing application of new technologies led to an evolution of the field of study itself.

This trend is fully confirmed in this edition in which emerging disciplines and technologies, from artificial intelligence, digital survey, BIM and H-BIM, parametric and algorithmic modelling show their versatility in becoming a tool for the investigation, interpretation and design of architecture in its relationships with mathematics.

This special issue of the *Nexus Network Journal* is intended as both a guide to and a record of the Nexus 2023 conference. The order of the papers published here reflects the program of the conference organized according to thematic sessions: "Design analysis", "Design theory", "Geometry", "Representation of architecture", "Didactics", "Rule-based design", and "Structure".

The speakers were chosen on the basis of peer reviews of the proposals received after a Call for Presentation Proposals published in June 2022. The Scientific Committee<sup>2</sup> were responsible for evaluating all of the conference papers. Scholars whose proposals were selected for presentation come from four continents and twenty countries.

This year's conference also includes a fourth day devoted exclusively to the research carried out by Ph.D. recipients and Ph.D. candidates. The Ph.D. proposals included here were also selected following a review by the Scientific Committee. Proposals from doctoral students should be observed by senior scholars with the utmost attention: they may point to new directions and represent the future of our research. In this sense, the Ph.D. Day takes on the significance of an intergenerational discussion and is intended to provide suggestions and viewpoints useful for the maturation of young scholars.

The 2023 Nexus conference comprises three days of plenary presentations in both morning and afternoon sessions. Standard presentations are 20 min long, extended presentations – determined on the basis of the highest scores after evaluations – are given 30 min, and Ph.D. presentations have 15 min at their disposal. Each presentation time includes a few minutes for questions and answers.

My warmest thanks go to Kim Williams who guided, advised, and supported me during all phases of the organization of the conference. With her, I spent many days of intense work, the results of which we are both proud.

<sup>2</sup> The Scientific Committee is composed of: Kim Williams, Roberta Spallone, Marco Giorgio Bevilacqua, José Calvo López, Alessandra Capanna, Sylvie Duvernoy, Snezana Lawrence, Cornelia Leopold, Ana López Mozo, Cosimo Monteleone, Michael Ostwald, Mine Özkar, Dario Parigi, Mojtaba Pour Ahmadi, Vesna Stojaković, Marco Vitali, João Pedro Xavier, and Maria Zack.

Special thanks go to Marco Vitali, conference Secretary of Nexus, who flanked me on a daily basis in the organization of the event; Marco Giorgio Bevilacqua, Director of the Conference Coordination Committee of Nexus, for his valuable advice; and Michele Russo, Secretary of REAACH association, for managing the economic organization of the conference.

Thanks to the Dipartimento di Architettura e Design (DAD) of the Politecnico di Torino for hosting the Nexus 2023 conference, the Unione Italiana Disegno (UID), the International Society for Geometry and Graphics (ISGG), the Spanish Society for the History of Construction (SEdHC), the Education and research in Computer Aided Architectural Design in Europe (eCAADe), the Portuguese Geometry and Drawing Teachers' Association (Aproged), the REpresentation Advances And CHallenges Association (REAACH), the img-network (IMG), and the Construction History Group (CHG PoliTo) for their patronage.

Many thanks to the members of the Scientific Committee for the gift of their valuable time to review and comment on the conference papers, the Coordination Committee for patronizing the event, and the Organizing Committee for their behind-the-scenes efforts.

Finally, I would like to warmly thank all the authors for their efforts in writing their research papers; without them, none of this would have been possible.

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