

Imagine Maths 4: Between Culture and Mathematics



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This book is the Proceedings volume of the conference “Mathematics and Culture 2014,” the 19th in a series conceived and inspired by Michele Emmer. The annual conference takes place in Venice, Italy, at the *Istituto Veneto di Scienze, Lettere ed Arti*.

The book presents successful crosstalks between Mathematics and Arts. The authors are either scientists—mainly mathematicians—or artists, or, more generally, experts in various fields, aiming to explore the reciprocal connections between different aspects of modern culture through the interdisciplinary and imaginative power of mathematics.

In the introduction Michele Emmer outlines a sort of manifesto of this (series of) book(s): “Imagine mathematics, imagine with the help of mathematics, imagine new worlds, new geometries, new forms. Imagine building mathematical models that make it possible to manage our world better, imagine solving great problems, imagine new problems never before thought of, imagine music, art, poetry, literature, architecture, theater and cinema with mathematics. Imagine the unpredictable and sometimes irrational applications of mathematics in all areas of human endeavor.”

The math–art connection is the most frequent theme of the book. Many of the papers linking mathematics to literature, music, design, architecture, or cinema are quite original, containing fertile ideas and suggestions for further readings and developments.

We can find, for example, three papers paying homage to Max Bill (1908–1994), an artist who grew up at the Bauhaus and who was subsequently a member of the Ulm School of Design. In 1994 he wrote a famous paper titled “The Mathematical Way of Thinking in the Visual Art of Our Time,” in which he tackled the problem of the relationship between Art, Form, and Mathematics.

There are interviews of fractal artists and painters putting their experience in dialogue with professional mathematicians. Mathematical rules hidden in poems and lyrics, for instance in the poetry of Giacomo Leopardi, or in the music of Béla Bartók, are widely discussed in the book. In an innovative collaboration between a mathematician and a composer, an attempt is made to literally translate Leopardi’s poem into modern music using tools from arithmetic and geometry.

Michèle Audin’s paper in the chapter of Mathematics and Literature is remarkable. She gives a taste of her book *Une vie brève* (2013), which describes the brief life of her father Maurice Audin. He was a 25-year-old teaching assistant in mathematics at the University of Algiers, when, during the Battle of Algiers in 1957, he was arrested, tortured, and eventually murdered by French soldiers. The author assumes various positions, as a mathematician, as an historian, and as a daughter. She tackles the question of how we as mathematicians and citizens react to extreme political situations, a theme of great actuality all over the world.

In the same chapter Francesco Biccari analyzes something completely different: the “Math Girls” phenomenon in Japan. The Japanese author Hiroshi Yuki wrote a series of books, half youth novels and half textbooks of mathematics, which have become a great editorial success in Japan.

Many papers focus on the extraordinary power of geometry in shaping both our understanding of the space surrounding us and the built environment in which we live. We find an elegy of Symmetry, “a bridge between Nature and Culture,” with its endless ramifications in physics, chemistry, or biology. Innovative and artistic applications of geometry in design and architecture are described, for instance the D*Haus project aiming to construct a house based on the geometric formula that divides an equilateral triangle into four pieces to be reassembled into a square.

As examples of the ever-increasing and often astonishing applications of mathematics to concrete and strategic problems, the book considers several unusual and quite disparate projects, ranging from optimization problems of airplane or ship traffic (for instance, in the Venetian Lagoon) to the modeling of seismic events, and even up to some curious applications of mathematics to gastronomy.

Michele Emmer personally contributed four articles, including a personal memory of Max Bill and an updated account of mathematics in the movies, one of his favorite topics.

To summarize, the book is an intriguing collection of ideas, projects, and experiences illustrating in a charming way the beauty and effectiveness of mathematics in our modern world. Each book of the series, including this one, is self-contained. It can be of great interest for a wide range of the public: professional mathematicians can discover unexpected uses and applications of their theories; artists, on the other hand, can learn how to disclose, with the help of mathematics, hidden harmonies in their works. It could be a great didactic tool for teachers and students to stimulate the study of mathematics through exciting applications or artistic interpretations. The book will make amusing reading for anyone interested in the innovative power of mathematics in modern culture.

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