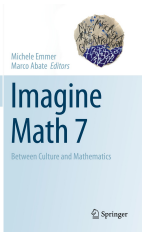
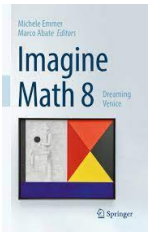
Imagine Math, vols 7 & 8 Michele Emmer, Marco Abate (eds.). Springer Nature, 2020, 2022 (473, 604 p.), isbn: 978-3-030-42652-1, 978-3-030-92689-2.






Michele Emmer

Marco Abate

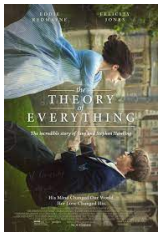
Volume 7 of the Imagine Math series contains the proceedings of the *Mathematics and Culture* held in Venice in 2019 and volume 8 is a conference-free pandemic successor. Like other volumes, these also contain a selection of original papers highlighting the relation between mathematics and almost all aspects of society and culture, from science to art and from biology to comic strips. I have reviewed in this Newsletter previous volumes in more detail, but it may be a good idea to remind the readers of the existence of the series. With a total of more than 1000 pages in these two volumes, it is impossible to cover here all the topics separately. So I will restrict myself to mentioning some of the topics and show that in several cases the relation with mathematics goes both ways.

Cinema has been a returning topic in several of the previous volumes, and we find it also in these. That includes for example mathematical methods for the restoration of old films, but also a survey of movies about mathematicians of which we had a few winners lately (*Good Will hunting, A beautiful mind, The imitation game, The theory of everything, Hidden figures*) with a separate paper devoted to Octavia Spencer, one of the actresses in *Hidden figures*.



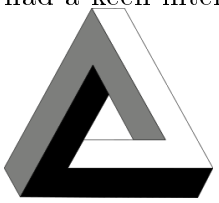








Most contributions are dealing with mathematics and *art* in a broad sense and also that goes both ways. Art in Venice is discussed, but also the MOSE project that should somewhat protect Venice against flooding. There are proposals to measure aesthetics, and a discussion how painters and stage performers deal with the fourth dimension. The role of polytopes and polyhedra in art and in mathematics is discussed and how symmetry can bring beauty, not only in these constructs but also in tilings of the plane, which brings us back to the mathematics of groups. Another returning subject is a discussion of *origami*. How can the folding algorithm be denoted? The rationalism and abstraction of the *Bauhaus* can be seen as a parallel to the movement in mathematics early 20th century. A separate paper discusses Paul Klee who had a keen interest in mathematics. The Bauhaus relates to architecture and design, represented as usual by several papers, classic as well as modern designs. For example, if you do not want a staircase to have only equal steps bringing you in a straight line from level 1 to level 2, but you want this to follow a sigmoid curve like the sine increases from -1 to 1. How should we calculate the steps? Soap bubbles are not only the subject of mathematical research with Joseph Plateau from Ghent as a protagonist, but we find also a discussion of an exposition of paintings showing soap bubbles, and minimal surfaces and shapes of bubbles in foam have been used in architecture. Literature is also represented with several papers. In a remarkable contribution we learn about François Le Lionnais (1901-1984), a French chemical engineer and mathematician who combined science and literature. Connections are made with Bourbaki and *Oulipo*.



Perhaps I should mention a paper devoted to Roger Penrose whom we know from his impossible triangle, Penrose tilings, (impossible figures and tilings are both intensively explored in the work of M.C. Escher). Penrose got the Nobel Prize in 2020 (he was then 89) for his study of black holes.

These two Imgagine Math volumes are once more two excellent books for any reader interested in mathematics and culture.

Adhemar Bultheel