Can Art Save Mathematics?

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Aim and Rationale

"Can art save the world?" is a well-known catchphrase in art circles. As most participants to the ICME are mathematicians, the title of this DG was reformulated more modestly as: "Can art save mathematics?" Indeed, some call mathematics a supreme art form as it enjoys total freedom, unrestricted by material limitations. An art form with the "collateral advantage" of having many real life applications, sure. However, if it can be considered as art, why don't art and mathematics more often collaborate, for their mutual benefit?

In the past, carpenters or painters sometimes helped mathematicians in the construction of mathematical models which sometimes had artistic ambitions (intarsia, for instance), but today's computers allow mathematicians to express themselves in total freedom, without the help of intermediate persons or tools. However, mathematicians aren't necessarily artists and so this technological improvement does not necessarily guarantee better art. Also, while in the past the lack of mathematical knowledge by artists was a burden for the development of mathematical art, today this should no longer be the case: computer developments make mathematics more accessible to artists, despite their usual aversion for the pure sciences.

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Yet how do we bridge the gap between mathematics and art so that mathematical art becomes an equally well "established" art field as, for instance, biological art or kinetic art? It would be beneficial for society because it would help to unite the "two cultures" of J.P. Snow, and because today's society needs designers interested in scientific developments.

Key Questions

- How much art should "artistic mathematicians" know in order to produce more than embellished mathematical results, so that their artistic mathematics are not mere "kitschy attempts"?
- How much mathematics should "mathematical artists" grasp in order to get really involved in the pure sciences, so that their mathematical art is not mere "baby math"?
- Or else, instead of turning mathematicians into 'artists' and artists into 'mathematicians', wouldn't it be better both sides simply cooperate—and if so, what should be the framework for such a collaboration?
- How can mathematics departments take mathematical art achievements into account in their output evaluation? For example, are mathematical art journals included in the journal rankings?
- How should the refereeing process work in this case where "peers" are by definition hard to find since the creative process implies every mathematical artwork should be unique? In the art world, refereeing is seldom done by peers.
- What is the difference between a scientific paper on mathematical art and a poetic artistic portrayal? The objectives of a purely mathematical paper are well known, but what about those of a paper on mathematical art?
- As for its implications in teaching mathematical art to art students, what are their specific needs and aspirations? The scientific "aha-Erlebnis" and "problem solving" are not sufficient, so how do we stimulate the creative mathematical approach?
- Is there a need for teaching mathematical art? The implications could be diverting students' attention from classical mathematics material (leading to "easy credit" courses). However, it could also raise awareness of the usefulness and the beauty of mathematics, inspiring students to continue taking math courses