Dear Reader,

We are entering a New Year, and it is my pleasure to send you my best wishes.

Fortunately, until now, the circulation of ideas, including mathematical ideas, has not been subjected to customs formalities. That was not the case with the boxes containing your artworks. They were blocked only for a very few days at their entrance in Switzerland. But to leave this non European country is quite another story. One must obtain the agreement of the customs. Although the Lausanne exhibition ended seven weeks ago, we have not yet been able to get the boxes back. The main possible reason for that exceptional event could be that the custom officers, full of admiration for the works, want first to understand their mathematical meaning before sending them back.

Switzerland does not belong to the present political European community, but cannot it be viewed as an example of what this community could or even should be? May I recommend the reading of two excellent and significant books in the present times: 1177 B.C. The Year Civilization Collapsed by Eric. H. Cline, and mainly To Hell and Back. Europe, 1914-1949 by Ian Kershaw. Among the reasons of collapses were these two ingredients: economic difficulties and nationalism. One can but observe the present awaking of nationalism, a scourge at the root of millions of murdered people along history. It constitutes a brake to the construction of a peaceful and active society. Mathematics and Arts do have universal roots and scopes which transcend local nationalisms. Thus should not it be wise that local organizers of events concerning Math and Art (say *http://imaginary.org* or *http://www.mat.uniroma1.it/venice2017*) place these events in the largest

possible human perspective, and refer to organizations with cooperative aims?

    New works to offer your friends for the coming year.
    Fortunately again, Philippe Charbonneau, who had just finished it, did not try to bring his new work to Lausanne: it is then not sure he would have been able to bring it back People who had a glimpse to the text of Lausanne conference have already seen a photo of Charbonneau's triple tori, see below.
It benefits from the play of reflections between couples of tori, giving birth to some kind of shining fractals sets of images.
    A few people receiving the newsletter might not read French, so that they could not read the texts of the Florence and Lausanne Conferences. In the Lausanne one, in connection with sculptures using tori, the mathematical content of the Conference was focused on the notion of torus, giving an enlarged definition of what is a topological torus (a fiber space whose basis is a knot, the fiber being the one-sphere or the two-topological disk). The lecture and the text were not the place to introduce any new mathematical questions, as for instance, that of describing objects created from the identification of the boundaries of topological tori. The identification may concern the complete boundaries or some well chosen parts of them. From the artistic point of view, « Hommage à Dali » has not been worked on. But its construction shows, from the practical point of view, that a topological torus can have the shape of a geometrical tube with infinite possibilities regarding the shape of its boundary. Through dynamical processes of partial identifications, an infinite number of mathematical and physical objects can be then created. They could be called « gearings ».

    An other new work is the Philippe Rips «Tribute to Robby Cuthbert ». It was presented at the Salon des Réalités Nouvelles (Parc floral de Vincennes, September 2016). It got the 2016 prize of the « XYZ Revue » https://www.aftopo.org/FR/xyz-4.html published by the French Association of Topography. Its beauty comes from its purity, its simplicity and the perfection of the equilibrium of forces ensuring its discrete presence.
    Edges of standard polyhedra are rectilinear. According to a larger conception of a polyhedron, an edge can be a part of any curve. This conception appears in Philippe's work. The two edges ab and cd of a tetrahedron abcd are sufficient to define this polyhedron, and here, each one is a part of a curve. Each one lays into a plane, and each one looks like a part of a parabola. Here the planes are orthogonal, but they can a priori make any angle between them. They constitute a kind of minimal coordinate system. A clever set of threads under convenient tension can create an internal polyhedron, here a regular octahedron. You can deform the whole construction (including of course the values of tensions) so that one can again get an internal polyhedron which is not regular in general. A challenge would be to write

the equations of a set of differential equations describing the evolution of the object.

«Publicity» for ESMA appeared in a recently published Springer book: Aesthetics and Neuroscience http://www.springer.com/us/book/9783319462325 . (look at the article entitled Art, Mathematics, Pedagogy, Pages 165-172).

ESMA is also pleased to welcome two new members, Andjelka Simić who lectured at the Ljubljana Conference (see http://www.math-art.eu/X_School.php , the Serbian School), and the Italian painter Aghatos (Carlo Franzoso) http://www.carlofranzoso.com (the photo P1100142 on http://www.math-art.eu/Documents/pdfs/Florence/Florence2016.pdf shows one of his works).

Donations and dues to keep on our aims (cf our flyers http://www.math-art.eu/Documents/pdfs/Flyer_EN.pdf and http://www.math-art.eu/Documents/pdfs/Flyer_F.pdf) will be gratefully received.

Best wishes,
Claude

P.S. The next ESMA exhibition (March 2017, 27-31) will take place in Paris V City Hall, Salle René Capitant.
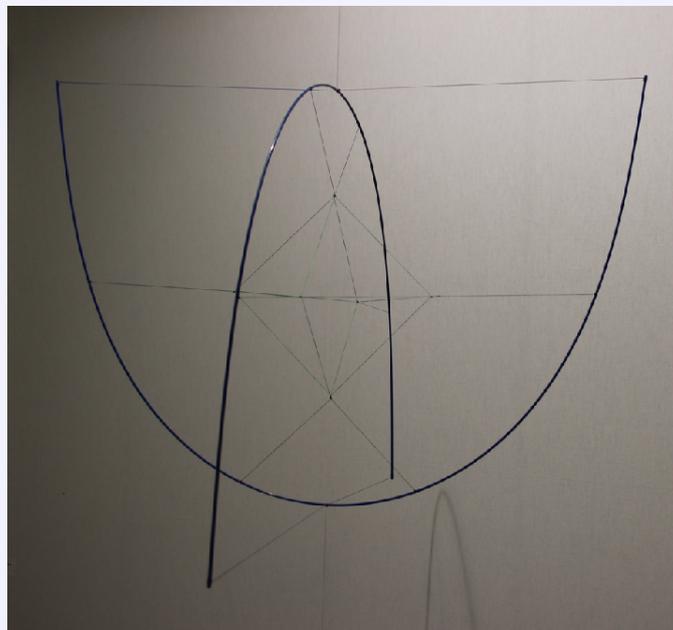
Philippe Charbonneau. Trois Tores en Réflexion, 2016

Philippe Rips. Tribute to Robby Cuthbert, 2016

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European Commission Interest representative