European Society for Mathematics and the Arts

Newsletter

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Dear All,

1) Around the beginning of the last century, geometers encouraged the creation and the use of solid models of current and new mathematical objects for pedagogical and research purposes. Some of them inspired artists for a while (cf : the content of banner 2 ; several banners of that type could have be shown). It seems that nowadays these models are primarily of historical interest and are no longer used in pedagogy.

A general characteristic of these old models is the fact that they are static. Except for a few of them, they were rigid models made of metal, plaster or wood.

Some recent solid models have other characteristics, depending on the material with which they are constructed.

- First, we have the class of recent models created by 3D-printing, but they have the disadvantage of being static.

- Next, we have the class of what can be called « split models ». Models of this class are made of rigid pieces that can be fitted together to build up mathematical objects. These are mainly puzzles, polyhedra and tesselations. Others could easily be created to illustrate knot theory. It seems that their mathematical pedagogical potential is undeveloped at the present time. The teaching of group theory at several levels could better use these split models.

- Models of the last class will be called flexible. They are made of flexible elements which are textile or metallic threads. The consideration in differential geometry of a textile thread, in French a « fil », seems to appear for the first time in Monge's lectures as « Application de l'Analyse à la Géométrie » (pp.119-120). A complete visualization of the content of the book using modern techniques from computer science remains to be worked out. That was very partly done by Monge's student, Theodore Olivier.

Models with metallic threads, or wire models, are modern attracting models. A part of their attraction is due to the shining qualities of the threads, to the fact that one can see the interior of the objects they represent or which are created, as well as to their frequent flexibility, allowing sometimes various spectacular deformations.

There are two kinds of such wire models depending on whether the elements of wire are all straight or not. The first ones relate to tensegrity whose origin goes back to the Russian constructivist school. This subject is a favorite of the French artist Philippe Rips.

Apéry's first models of the Boy surface, Rips' torus knots, Dmitri Kozlov's nodus (or nodi) (Knots and Links As Form-Generating Structures), belong to the second type of wire models. These models are of particular interest because pedagogical experiences using them have been very successful.

The public is astonished by their unexpected mathematical or mechanical properties. People are happy to touch the objects and to manipulate them by themselves in order to produce the appearance of specific properties. In this way, they have a truly stronger impact than when they appear in films and on computer screens.

2) The short tale Les délicieuses glissades de Sphalos now is in its completed form. As the previous one (Le Kangourou Merveilleux), the text is aimed at children from 3 to 103. It is however probable that here only a few beautiful illustrations will attract those less than 10. Reading the text might require more maturity.

3) Please note that the Marseille exhibition will definitely open on September 14, and not on September 7 as was originally planned.

A new, small exhibition should take place in Paris in March, in answer to the wishes of the Parisian pedagogical authorities.

4) Many thanks to the ESMA members and readers who paid their 2013 dues. Late dues will be also warmly accepted. It is now very easy to pay from any country as one can read from http://www.math-art.eu/adhesion.php .

Best wishes,
Claude

P.S. A new nice film just appeared : "Chaos" by Alvarez-Ghys-Leys on http://www.chaos-math.org

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