



European Society for Mathematics and the Arts

Newsletter

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Dear All,

Modern mathematical artwork is to Renaissance artwork as Mathematics is to the Christian religion : you might find it pleasant to write a paper discussing that Platonic proportion.

Italy is the well-known amazing place to look at Renaissance artworks. The mathematical background is particularly visible in the architecture of religious buildings. Ease of construction has doubtless imposed the use of multiples of 2 and 3. In the cathedral of Santa Maria del Fiore for instance, one can look at one of the oldest clock whose unique hand turns in the opposite sense of the usual one, and whose face is divided into 24 petals.

Italy does not have museums only for Renaissance art. It has a few museums for mathematics like the Giardino di Archimede (www.archimede.ms) in Florence. This pedagogical museum does not shelter painted artworks, but prints some nice tales. With or without mathematical background, tales belong to literary art, so that tales with mathematical background will appear on the ESMA website.

Readers of our website will now find a special sub-section devoted to tales, indeed the section titled «Documents» is now replaced by the section titled «[Tales and Documents](#)».

More or less written in the style of the Discorsi by Galileo, «[La Matematica in Cucina](#)» by Enrico Giusti belongs to that series. For instance, through witty dialogues, people will learn about some properties of the machine which makes spaghetti, or the reasons for the shape of some kinds of Italian bread. Among others, the book shows the incarnation of maths into the conception and the construction of some practical devices. Its philosophy is quite different but complementary to that of «Pâtisserie mathématique».

These lectures focus on some main elements of the architecture of mathematics, among which the concept of foliation. A lot of mathematical objects are made of stacked leaves. An immediate thickening of leaf can be a stratum or a plate or a layer, or the trace of a pencil on a sheet of paper. A physical incarnation of the concept appears also in architecture



when, for instance, a wall is built with horizontal layers of bricks. It also appears in the realization of objects by printing machines.

Thus, looking at <http://www.youtube.com/watch?v=x6WzyUgbT5A>, we discover that the future of pastry art is deeply linked with mathematics through the design and the physical elaboration of food.

The decoration of the ceilings and of the ground levels of the important buildings of the past was carefully prepared and realized. We could expect that the floor on which the great ballets deploy be similarly decorated. A lot of symmetries frequently appear when the dancers do their figures, specially of course those who practice math and dance like for instance the UC-Berkeley square dancing club. Taking into account these symmetries, the projections on the floor of the trajectories of the dancers could inspire new motifs of decoration.

Best wishes,
Claude

P.S. People interested in tensegrity, in incarnation of polyhedral structures, (The cell has a regular octahedron as its core, surrounded by eight regular tetrahedra distributed on its faces (Fig. 1)), in incarnation of foliations as well through the fabrication by layers, may look at [Ultralight, ultrastiff mechanical metamaterials](#) (Science 20 June 2014 : Vol. 344 no. 6190 pp. 1373-1377).

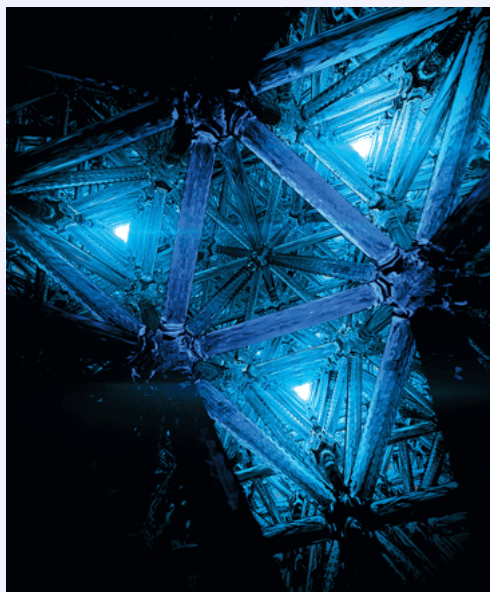


FIGURE 1 – Tensegrity : polyhedral structure

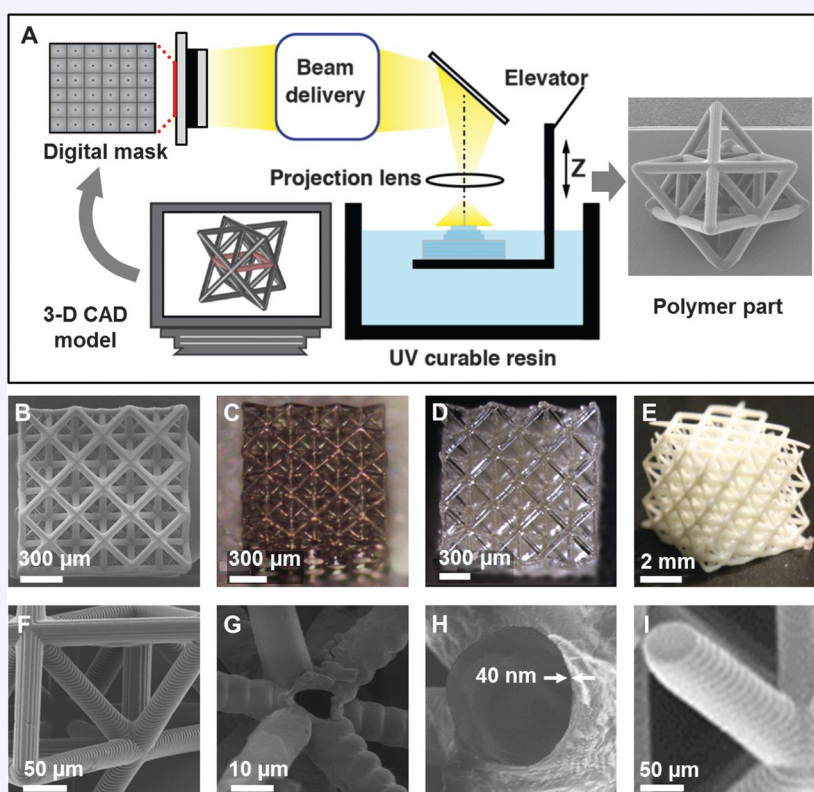


FIGURE 2 – Fabrication by layers

Italian tessellations in Firenze (mainly in the Cathedral of Santa Maria del Fiori) and in Pisa (Baptistery)



FIGURE 3 – P1060560



FIGURE 4 – P1060562



FIGURE 5 – P1060564



FIGURE 6 – P1060573



FIGURE 7 – P1060619

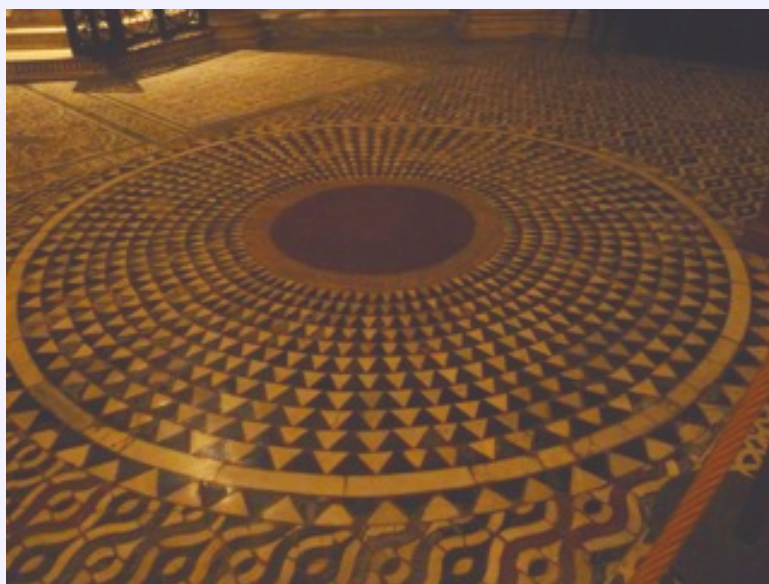


FIGURE 8 – P1060632



FIGURE 9 – P1060629

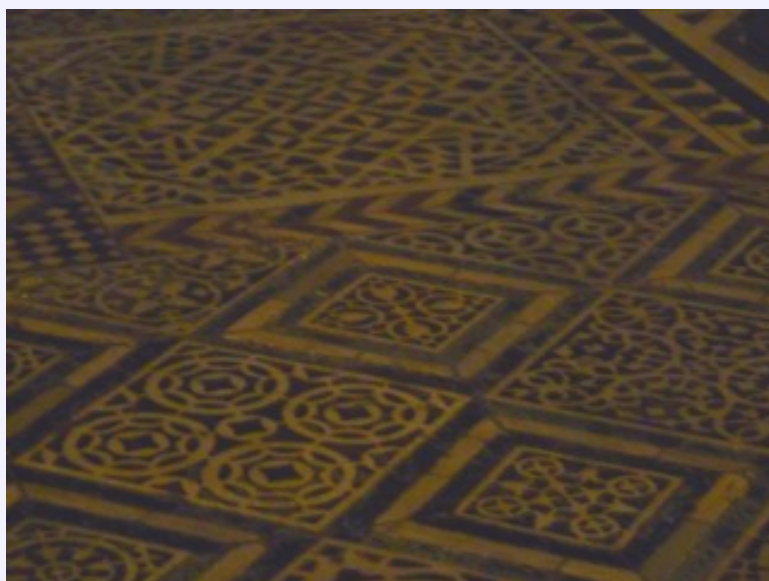


FIGURE 10 – P1060630



FIGURE 11 – P1060676



FIGURE 12 – P1060833



FIGURE 13 – P1060834



FIGURE 14 – P1060835



FIGURE 15 – P1060836



FIGURE 16 – P1060837

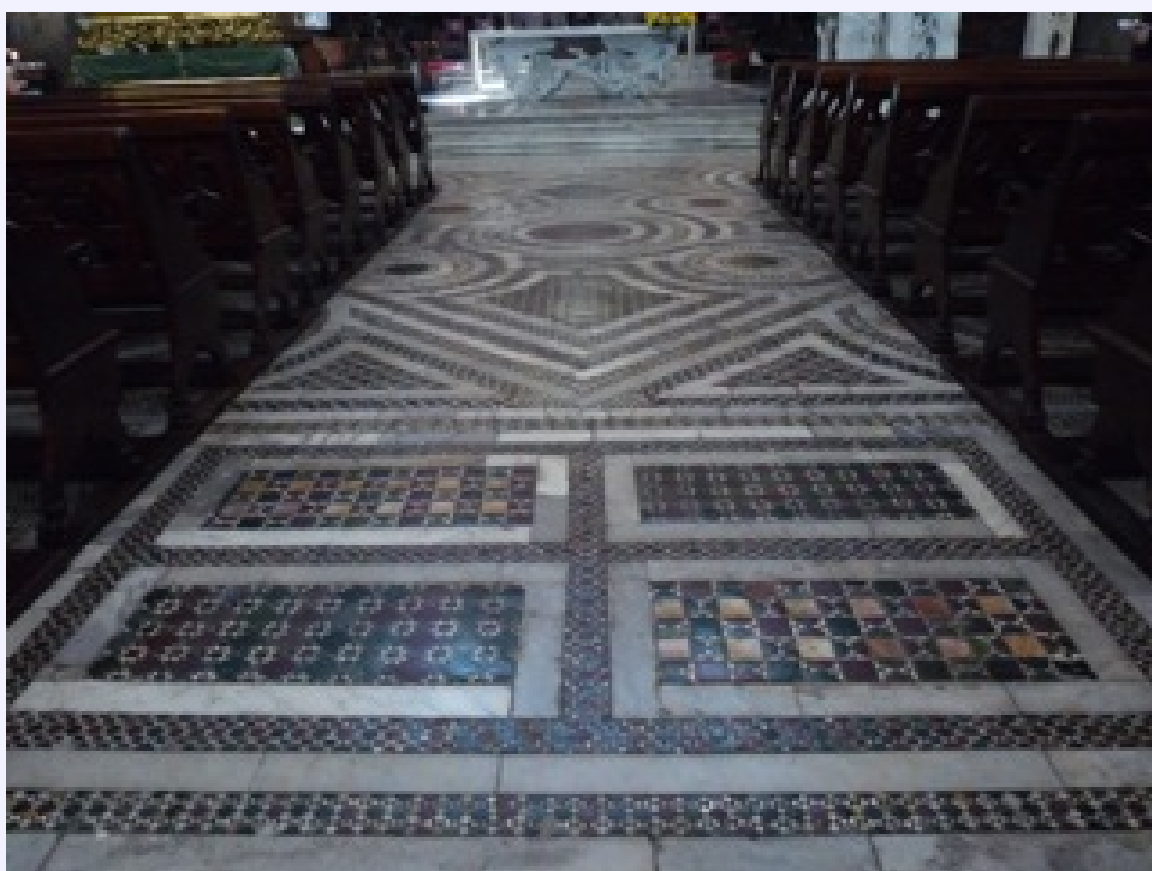


FIGURE 17 – P1060933

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