

## Bridges as an Incentive to Collaborative Works II

Anusch Bayens, Carlo De Pauw, Carmen Geens, Mark Pieters,  
André Thomas, Alex Van Bogaert, Samuel Verbieke, Nico Willemsens  
RAM-8 Groep  
c/o Vlierbeekberg 55  
B-3090 Overijse, Belgium  
E-mail: [alex.vanbogaert@skynet.be](mailto:alex.vanbogaert@skynet.be)

### Abstract

Belgian local artist collective 'RAM-8 Groep' comes back with two other collaborative artworks displayed at Bridges art exhibits. After the two first installments (2013 and 2014) described at Bridges Baltimore 2015, this paper details the next two (2015 and this year 2016) presented in high resolution in the relevant catalogs.

### Introduction

For the 4<sup>th</sup> year in a row at Bridges art exhibits [1], as members of the RAM-8 Groep [2], a Belgian local artist community, we have brought our skills together to create collaborative works. The overall structures supporting our personal creativity areas are geometric constructions emphasizing some form of an eight-fold symmetry, suggested by another colleague in turn and developed by all in open discussions. Adhering to a preset agreed-upon theme each of us as a 'band member' most freely can feature some aspects of his/her traditional work, like 'solos in a jazz octet', as kindly put by a reviewer. Last year we presented a joint paper describing our first two Bridges creations (2013 & 2014) [3]. This second paper is devoted to our 2015 and 2016 contributions. We again aim at detailing for each the common setup and the 8 personal works' visual art contents and mathematical ideas, shallow as they are –none of us are mathematicians ourselves!–, yet essential to our intent of contributing to mathematical art.

### Entry at Bridges Exhibit Baltimore 2015

Our Carlo De Pauw, a designer of structures and 3-D printed objects (under George Hart's influence), suggested this year a cube made of struts with subcubes on all 8 vertices with their double vertical outer faces allotted one pair to each partner. These cubes spawn each 5 ones centered on previous' vertex shrinking with the golden ratio  $\phi$  towards the common central notched connecting 5<sup>th</sup>, resized like the 3<sup>rd</sup>.  $\phi$  was also this year's unifying theme for each personal creation. Realization by Alex, Carlo and Nico.

Personal contributions:

**Alex:** *my pet 'halvings' here follow a first asymmetric division of the square panels by the golden ratio.*

**André:** *the left panel symbolizes the way I imagine information transmits and transforms in the brain networks towards new thoughts, lighting a candle meaning 'Eureka', the title of the work. The point between the eyes and the center of the brain lies on the crossing of lines dividing both directions in the golden ratio. An optical illusion makes the eyes follow those of the viewers moving horizontally (pupils rest on bottoms of carved cups); the 7 heads of the right panel dragon, its torso and tail are centered on points dividing the square in golden section surfaces.*

**Anusch:** *a glass play on colors, divided into squares and rectangles along the Fibonacci sequence approaching  $\phi$ .*

**Carlo:** My panels are graced with a series of 5 imaginary dolphins shrinking with the same Golden ratio factor applied to the diagonal series of cubes joining the center of the overall construction.

**Carmen:** Here too one point of each panel simply suggests the presence of  $\phi$ , leaving all the remaining open to my joyful signature creations of colorful 'natural' landscapes.

**Mark:** The two panels represent my pet classical facade architecture play as here  $\phi$ -subdivided in both directions.

**Nico:** The Golden 'sexion' is an opportunity to construct a gently underground mathematical cleavage theory.

**Sam:** I replaced both panels by a Zometool construct hinting at Kepler's building the dodecahedron from a cube by adding 'roofs' on its faces. The only pentagon present here, is filled by a star [from remaining red 'boomerangs' assembled by the RAM-8 Groep in Overijse for the 'PentiDisc' that the regretted Fabien Vienne developed for the Zometool barn raising stunt at Bridges Enschede], transformed by a central blue pentagon into a pentagram which, with the outer pentagon forms a K5 graph functioning, amongst others, as the projection of my Golden Pyramid. The construction then enters the cube with a blue pyramid built on the pentagram center (actually an inside view of part of the Kepler-Poinsot small stellated dodecahedron built from 12 pentagrams indeed a  $\phi$  'salad' !), and further proceeds to the common center of the cube and dodecahedron with a white 'red' strut. From this central node, white 'yellow' struts join the polyhedra vertices.

To further hint at the involvement of the RAM-8 Groep in Zometool, the series of reducing cubes starting with this open one is mainly realized in white Zometool inventory and only holds together thanks to the 'yellow' struts. The 5<sup>th</sup> cube (and last because the smallest possible strut before 'kissing balls' doesn't presently exist) having about the right proportions of the Atomium, represents the Zometool model that appeared on the back cover of the Bridges London 2006 Proceedings, with color struts and chromed balls.



Figure 1: 'Making of' work for Bridges Baltimore 2015

### Entry at Bridges Exhibit Finland 2016

This year, Mark Pieters took the helm as designer and, in his tradition of honoring classic buildings of the past, realized an imaginary palace he calls the 'Polygoneum' (one can accept a circle and an ellipse being polygons, as this is the way they are modeled here with a finite number of edges), on a 1/50 scale, with eight large rooms around a central patio partially covered by a tower. The plan shapes of the rooms modeled in connected rigid laser-cut foam plates by Carlo and Sam, are all different geometrical figures that were allotted to the group members during a harmonious discussion. The virtual visitors can not only stroll through the rooms, but also use a couple of helicoidal stairs to discover from above on the roof the works of the artists through the glass ceilings. A 3D-printed 1/250 scale model of the complete palace by Mark, Carlo and Sam is installed in the central patio, which thus appears to the visitors at a 1/5 scale.

Personal contributions:

**Alex:** (square room): *my square base is divided in successively halved black and red triangles. The last two have an equal size and one of them has another, yellow, color. The triangles are stacked, creating many possible 3-D variations.*

**André** (rectangular entry room): *my aim is bringing a natural landscape inside of the palace in this first room seen by the visitors, yet doing this in a simple mathematical way: all the features, tree, flowers, sky and even the sun are made of rectangles, indeed basic geometrical objects.*

**Anusch** (elliptical room at opposite side): *bubbles in hot glass blow round, glass that melts will not make angles, it will always flow along curves. I naturally tend to work with curves as I also design jewelry which is meant to adorn the curves of the body. My elliptical room is meant to be playful and let light go through its glass dome. The glass beads are like giant flowers rooted on the glass structure.*

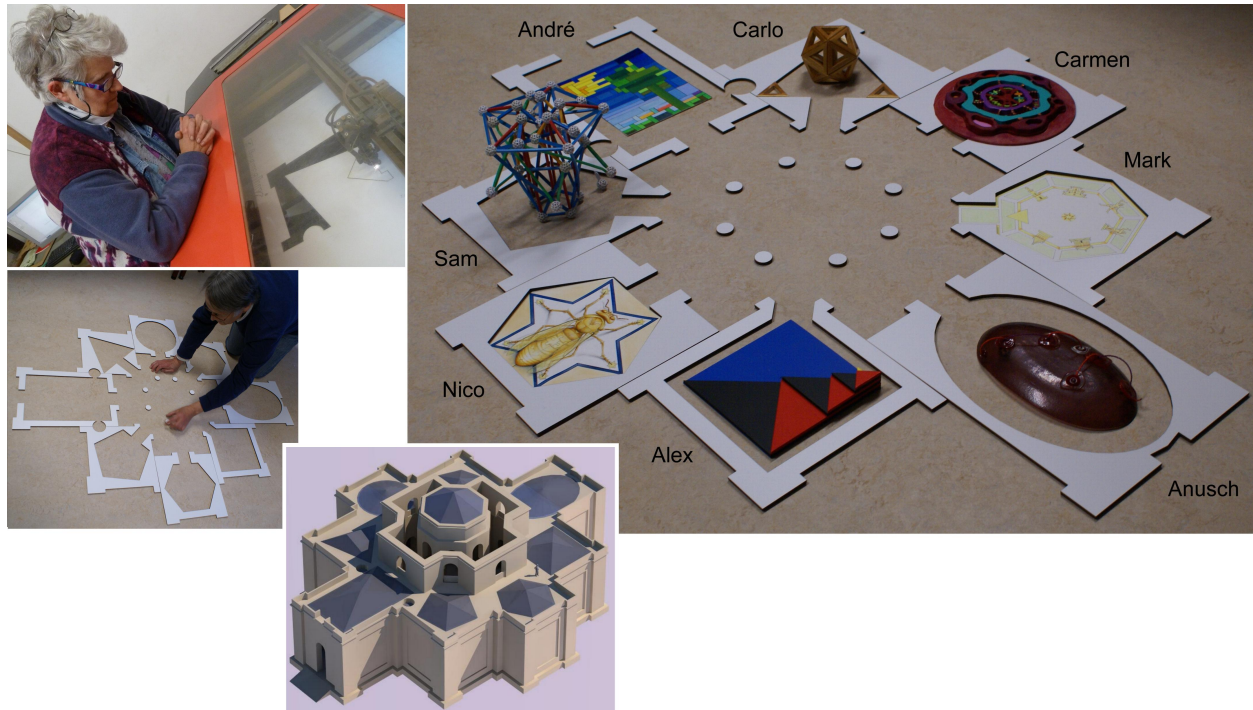
**Carlo** (triangular room): *the twenty shiny equilateral triangles of the huge (about 5 meter tall, here on a 1/50 scale) golden icosahedron on display in harmony with the shape of my room of this Renaissance palace should remind the visitors of Leonardo's polyhedra models.*

**Carmen** (circular room): *happy to honor this circular room! Straight lines never occur in my projects, and if I sometimes start from one, I feel immediately disturbed and transform it into a curved, organic line. In most of my works a central kind of a focus point catches the eye. I also like mandalas, but otherwise : again the exact symmetry, still suggested at first sight, is readily broken. Everything needs to be rounded and nicely flowing together. For this design, a 3D sculpture in a round space, from inception I saw a sort of adventurous playground trail : I like surprise and discovery to pep life up, versus predictability, yet I need some tune, but not too intrusive. Hence the 'safe' circular edge. It is made to walk within, creep over things, jump or slide from wooden objects, crawl carefully under something, not knowing what's upstream, indeed a very real journey.*

**Mark:** (heptagonal room): *My idea for the seven-sided space consists in determining a smaller heptagonal floor, along which figurative representations of the Seven Wonders of the Ancient World are placed. One must figure out the whole setup as a pavement of white marble with an inlaid belt of mosaic in imitation gold. The different monuments are represented as elevation views as free reconstructions. At the entry of the space comes the Great Pyramid of Giza (Cheops Pyramid), its top pointing to the octagonal central space of the Polygoneum. Next clockwise, the Lighthouse of Alexandria, the Hanging Gardens of Babylon, the Colossus of Rhodes, the Statue of Zeus, the Temple of Artemis at Ephesus and the Mausoleum of Halicarnassus. The center of the space can be adorned with a small uplift, in the shape of a seven-pointed star from which the visitors can overview the whole.*

**Nico** (hexagonal room): *From the hexagon to the Star of David. To stay in the 'region', the 'Golden Calf' is mutated to a golden botfly. Painful beast that might be standing in front of the state of Israel, still referring to the Shoah small yellow Jewish stars to justify its aggression policy. Political mathart?*

**Sam** (pentagonal room): *I brought-in Zometool again, but here using mostly vintage struts and balls with some assembled partly in a 'criminal' (un-orthodox) way inducing bending and torsion deformations propagating in the whole structure with the balls no longer looking in the same direction, as a tribute to Jean-François Diord, sculpture professor at the Royal fine arts academy of Brussels, who iconoclastically relaxed the first rule of 'straight struts' towards beautiful artworks. The work is also a tribute to Fabien Vienne who designed the shadows of the green struts, and several barn-raising large Zometool structures for Bridges conferences.*



**Figure 2:** *'Making of' work for Bridges Finland 2016*

### Acknowledgments and Copyright

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### References

- [1] RAM-8 Groep, artworks in the Bridges Exhibit Catalogs Enschede 2013, Seoul 2014, Baltimore 2015 and Finland 2016, <http://bridgesmathart.org/bridges-galleries/art-exhibits/>, eds. Robert Fathauer and Nathan Selikoff.
- [2] RAM-8 Groep, <https://sites.google.com/site/ram8groep/>
- [3] A. Bayens et al. (RAM-8 Groep), *Bridges as an incentive to Collaborative Works*, Proceedings of the Bridges Baltimore 2015 Conference, <http://archive.bridgesmathart.org/2015/bridges2015-499.html>
- [4] RAM-8 Groep, *Further details of works and large color images*, Appendix on CD-Rom