

# GodWormHoles: Huge, dazzling beautiful inox steel sculptures

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Discovering the *octaloid* In May, 2014 Professor Lins enabled, in practice, the possibility of constructing a family of arbitrarily large, dazzling beautiful steel sculptures ever produced, baptized *GodWormHoles*. There is a small scale plastic model (measuring  $3\text{m} \times 1.5 \times 1.5\text{m}$ ) of such an sculpture and I, Leticida Santana, was the chief architect in its construction. The model took a month to be constructed and is formed of hundreds of regular polygons of 4, 6 and 8 sides posed together by about ten thousand pairs of male-female rivets.

The artworks are based in incremental sculptures made solely of those regular polygons. The first step is an sculpture named *PortalOfInfinite*: Portal do Infinito<sup>0</sup>. It is a ring of 6 FiveCubes to be constructed in polished inox steel with almost 4m of diameter. The above photo is a model (enlarged to the true size). By indefinitely attaching handles this UNIV becomes asymptotically the universal recovering of the GEM  $r_2^{24}$  discovered in 1980. This GEM is the supertrator for the tridimensional torus  $S^1 \times S^1 \times S^1$ , fact proved in 1988.

What enables the periodicity was the discovery of a substructure baptized *octaloid*. An octaloid is composed by six octogons adequately welded forming a topological 2-sphere with four hexagonal holes.

Thanks to the octoloids and their tetrahedral symmetry deformable into an octahedral symmetry, the *PortalOfInfinite* can be indefinitely enlarged by curved handles formed by four octaloids, each handle with about 2.8 m. After about 100 additions the piece becomes larger than every other steel sculpture in the world.

There is a superstage in this construction, the UNIV named *CenterOfInfinite*, whose plastic model has been done. See above. UNIV Center of Infinite<sup>0</sup>. The actual height of the Center of Infinite, to be built in polished inox steel, exceeds 5m. Copies of this Center occupies completely our 3D-space. Depending on which superstages are constructed the resulting sculpture can simulate any form, because the centers play a role of *voxels*, that is, tridimensional pixels.

The asymptotic sculpture for which the *GodWormHoles* converges was partially inspired by a 1952 lithography of M. C. Escher, *Cubic Space Division*, available in the internet, Escher's Lithography<sup>0</sup>. An important difference is that the role of the cubes in Escher's is replaced by truncated octahedra and the bars forming the edges by topological cylinders formed by 3 hexagons, proportionally much shorter. With these replacements the resulting structure is much more dense with the volume of empty space substantially diminished. The visual effect of any *GodWormHoles* sculpture will be dazzling. Asymptotically it is formed only by regular hexagons and octogons. The square will be lost, if there are infinite handles.

A *GodWormHoles* sculpture will be, as the american Richard Serra, considered these days as the greatest steel sculptor in the world, **impossible of being photographed**. So we can create a family of artistic pieces each unique and indivisible, greatly impulsing tourism, because to see it in its totality one has to visit it.

These developments were possible with the **discovery of the octaloid**, in May 2014,

proportioning to him great and perennial pleasure. The symmetry properties of the octaloid guarantees the impossibility with a mathematical certainty: the sculpture will be simply too big and no photo can unveil all its beauty.

The incremental process can take years, but is entirely feasible in practice. He estimates the cost of the of the *PortalOfInfinite* to be about US\$ 30,000 and the one of each increment of about US\$13,000. We need six increments to reach the first voxel, in the shape of the Center of Infinite. He needs to call the attention of people with financial power which are DARING and VISIONARY. In his field of expertise he is daring and visionary: **these feelings, he believes, are what makes life worth to live!**

It would be fantastic, as tribute to Mathematics, if in about ten years a city, which supports the initiative, could be proud of possess **the biggest steel sculpture in the world, with dazzling beauty**. In his city, Recife, Brazil he even suggest a place to put the sculpture: the garden in front of the Convention Center of UFPE (the same scenarium of the first two photos of this document).

On the contrary of another monumental works the result would be always available to be seen: starting with the *PortalOfInfinite* (which is a finished job), the sculpture evolves with small increments being always exposed to the public, except for a few hours to receive an increment. At each such increment the UNIV becomes more beautiful. Finally note that the durability of good quality inox steel is know to be of milleniums: **it would be a work lasting forever!**