

KOSMOS, an artistic model of the Solar System with same scale for size and distance

By Xavier DANIEL¹ and Guy PIGNOLET²

¹Artist, Reunion Island

²Reunion Island Space Initiative

KOSMOS is a poetic representation in the territory where the immeasurable interacts with our human scale. Based on real distance and size scientific data, Kosmos is an exact scale representation of the solar system. Designed for the general public, built with participation of 200 students and many institutions, the Kosmos scientific artwork is the creation of visual artist Xavier Daniel in Reunion Island. Kosmos is the root for an arborescence of projects that may extend in Reunion and outside as well, that may become mobile, and become part of an augmented reality.

Key Words: Solar system, Scales, Ecosystem, Kosmos, Reunion Island

1. Introduction : in situ artwork

To represent for himself the size of the Solar system is complicated to common people. KOSMOS gives the opportunity of an intuitive, almost tactile awareness, of our space environment: the immensity becomes palpable. Walking from the Sun to Eris, and through this journey seeing what was hidden from us. Ah yes ! Well really ! I say to myself: then the Earth is that, a seed, a very small seed of life in the heart of the immensity.

Kosmos is a reproduction of the solar system featuring the exact same scale both in size and distance. The Sun and the 13 planets and dwarf planets of the artwork, designed in cooperation with Reunion students and a glass blower, are installed in places open to the public (Fig. 1.) : museums, parkings, public gardens, roadsides, regional and departmental equipment, on an area covering more than 2 200 km². This brings many opportunities to change paradigms while traveling on an island in the Indian Ocean.

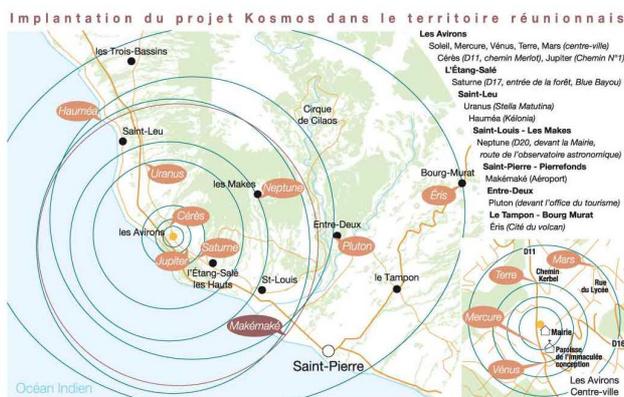


Fig. 1. : The Solar System the size of Reunion Island

2. A scientific and technical work

We discover Neptune on the side of the road across Les Makes village. We look down towards Pierrefonds airport near the ocean. That's where Makémaké is to be found. Suddenly the point of view changes. Kosmos gives us to see and feel the size, the dimension, the distance that the numbers alone fail to represent. Thus scientific knowledge is shared.

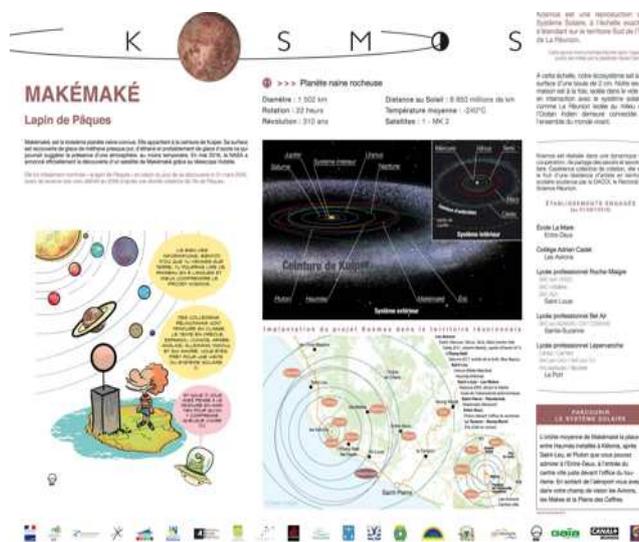


Fig. 2. : Information board for dwarf planet MakéMaké

All the planets are accompanied by an information board (Fig. 2.) with the characteristics of the celestial body and with a map which locates them in the solar system as well as in the territory. Scientific data are supplemented with anecdotes and latest news from space missions. KOSMOS is also a global project that extends into space and time (next page) :

- Partnership with RiSi / Reunion Island Space Initiative
- Outreach presentation at world space congresses:
 - Presentation at ISTS 2017, Matsuyama, Japan
 - Presentation, from a different point of view, at IAC 2017, in Adelaide, Australia
- Extension of the work with new celestial bodies to be displayed in the Indian Ocean, in continental France, and worldwide.

3. Setting up Kosmos across a territory



Fig. 3. : Inauguration of the Sun in the city of Les Avirons.

Standing in the garden of Les Avirons Town Hall (Fig. 3.), watching Mercury, this small, fragile ball standing out against the mass of our star, allows ourselves to ponder over things for a while. Let's take a moment to visit Ceres in the asteroid belt, to wonder about our place in this world. And then let's set up a meeting with ourselves near Venus.

As men, what are we to do with these perceptions? Are they an inspiration? For what?

The information written in French will be translated into Creole, English, Spanish, German, Chinese and Tamil.

This is a tangible medium (Fig. 4.) for a cultural tourist trail in open access, from the Astronomical Observatory of Les Makes, to the airport of Pierrefonds, including the towns of Les Avirons, L'Etang-Salé, the Stella Matutina and Kélonia museums, the visitor center of l'Entre-Deux and the 'Cité du Volcan'.

Sedna, one of the dwarf planets, is on its way to settlement in Mauritius. A partnership is being set up with Corde-sur-Ciel, in mainland France, for the Hyakutake comet to be installed at 9 500 km from the Sun in Les Avirons - to scale!

4. Pedagogical and cooperative project.

More than 200 students were involved, and 50 people from the world of education, 7 municipalities, thousands of visitors.

Offer children of all ages a privileged access to art, you will see them radiate. Promote science, knowledge, consciousness you will see them be amazed. Enhance technological and professional education in demanding projects you will see them enthusiastic. Beyond the technical and scientific challenge, these two years of experimental work brought into play inter-generation, institutional, and municipal cooperation as well as trans-political, pro-social and regional-territorial.



Fig. 4. : "Feeling" the Earth to size.

KOSMOS is the fruit of an Artistic Residency on school territory, at Sciences Réunion, supported by the DACOi and the Regional School Board Rectorat / DAAC.

5. An auto-portrait of the artist

A French artist, as well as a 'citizen of the world', Xavier Daniel (Fig. 5., next page) has been living in Reunion Island since 1996. The son of an architect, he started out a scientific career before devoting himself to art. He graduated from the ESBA in Le Port in 1999, and since then has made a living out of his artwork, leading workshops and completing artistic residencies, showing his work throughout Reunion Island, the Indian Ocean area and in mainland France.

Xavier Daniel's art is eclectic and hard to fit into existing categories. But it belongs without a doubt, mostly, to the very large Land Art movement. Now, its specific, original and anthropogenic approach makes it a true manifesto.

Here are some comments by fellow artists that may give an approach to the path taken by Xavier Daniel for his work and the creation of Kosmos (next page) :

“Nevertheless his method of intervention *in situ* and "by surprise", as he likes to say, radically places him into the field of contemporary art, along the lines of street art or performance.” *C.Fauvre-Vaccaro – Art Theoretician, Author.*

“It is Earth that shapes the esthetics of his visual research and it is throughout the whole territory of the island and farther that he scatters unusual works that challenge passers-by, spectators and visitors alike. His *in situ* installations are inspired by Earth and its planarity (...). A horizontality often associated with elevation.” *Caroline De Fondaumière - Director of the Artothèque de La Réunion.*

“With the KOSMOS project and its dynamics of participatory growth, the artist invites us to walk an artistic path that acts as a catalyst for everything that is larger than us.” *Benoît Falques - Consultant for CEO's and Executive Managers.*



Fig. 5. The 'Father' of the Kosmos project with dwarf planet display.

6. Conclusion and future outlook

KOSMOS is eventually a dynamic tree structure of projects.

Since the inauguration of the installation on 1 September 2016 (Fig. 6.), under the combined auspices of the sun and the moon (annular eclipse of the sun), induced rhizomes sprout in Reunion Island and in many other parts of the planet as well.

A mobile exhibition, in the 24 municipalities of the island, is a means of spreading scientific and technical culture and an unprecedented bridge between junior and senior high-school.

Some contacts have already been made in order to install

other bodies outside Reunion, to forge further links, create and exchange. An innovative project will be KOSMOS 1/10th system in augmented reality.

The mobile exhibition, which will last one month, can be moved to places where new stellar objects are to be installed, or by invitation.

7. Acknowledgements

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- Sciences Réunion
- Région Réunion and Département de La Réunion
- iCom, Gaïa, CANAL+ Réunion, Kom'Com / Babook, IRT

Our special thanks will go the towns and locations that have hosted the Sun and the planets:

- Commune des Avirons
- Commune de l'Étang-Salé
- Commune de l'Entre-Deux
- Commune de St Louis
- Réunion des Musées Régionaux /
- Kélonia - St Leu
- Stella Matutina - St Leu
- Cité du Volcan - Tampon
- Aéroport de Pierrefonds – St Pierre
- Observatoire Astronomique des Makes

And we shall never forget the great experience of working together with the students of committed institutions:

- Ecole La Mare, Entre-Deux (2014-2015)
- Collège Adrien Cadet in Les Avirons (2015-2016)
- Lycée Professionnel Roches Maigres, Saint Louis
- Lycée Professionnel Bel Air, Sainte Suzanne
- Lycée Professionnel Lepervanche, Le Port



Fig. 6. : Invitation to the Kosmos inauguration ceremony.