

# How did life begin? A unique opportunity for science outreach in the context of the GENESIS-SKA project

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## Abstract

The GENESIS-SKA project (GEneral conNditions in Early planetary Systems for the rISe of life with SKA) is supported as a PRIN (Public Research Project of National Relevance) of Italian National Institute for Astrophysics (INAF) and its main goal is to study dust evolution, planet formation, and pre-biotic chemical complexity, in the context of preparation of SKA Key Programmes. The project also accounts for communication, public and industrial outreach of its scientific goals and results: this makes it one of the rare examples in which outreach and dissemination are professionally developed in the framework of a research project. GENESIS-SKA has a dedicated outreach work-package and a specific activities' plan which we would like to present and discuss with the scientific community. Exoplanets and the physical conditions for the emergence of life are strongly attractive topics for the public in general and we will leverage on them in order to create and promote our communication.

## 1. Introduction

The recipe to make a habitable planet like our own Earth requires a relatively small rocky planet, at the right distance from the host star, with a not too thick atmosphere rich in volatiles and capable of developing complex organic molecules chemistry. The GENESIS-SKA project, is carrying on studies of planet formation, and pre-biotic chemical complexity, in the context of preparation of SKA Key Programmes [1, 2]. GENESIS-SKA endorses a multi-wavelength approach to proto-planets formation (e.g., at infrared, optical, sub-mm, mm- and cm-wavelengths) and it will identify new

scientific case studies to be deepened when the SKA telescopes will be operative.

The big question that the project would like to address is: What are the proper (physical, chemical, and dynamical) conditions – during the early formation phases of planetary systems – which can determine the rise of life?

## 2. The communication activities

It is quite clear that the GENESIS-SKA project scientific aspects are especially well suited for outreach, being related to the fundamental question of broad interest: How did life emerge?

In this context, the work will be done in synergy with the central INAF Communication Office as well as with the SKA Organisation (in particular the Cradle of Life working group), in order to communicate the motivations for building the SKA observatory and to promote broadly the INAF image focusing on its leading role on the SKA-related activities on the origins of life.

Regarding communication and outreach activities we have identified the following main goals:

1. dissemination of the main scientific aspects of this project to peers, creating a visual identity for posters and presentations and procedures for press releases and public communications;
2. dissemination of the main scientific aspects to the general public, through dedicated presentations, public talks, participations in science festivals and science events, realization of comics, production of original materials for exhibitions and public events. We will take advantage of previous professional engagement in other outreach

activities, in general, and, in particular, in the INAF supported GAPS (Global Architecture of Planetary Systems) observational project [3]; also, in order to better exploit our goals, we are setting up collaborations with other international projects aimed to communicate the scientific aspects related to stars and planets formation (e.g. using comics or cartoons [4]);

3. communication to students and schools, with education oriented presentations and educational materials and activities, tailored accordingly to the knowledge level of different targets;
4. strengthening of the relationship between INAF and national industries already involved in SKA and fostering business involvement and new collaborations with the entrepreneurial sector potentially interested in SKA. This will also be done participating in technological fairs and promoting an *Innovation day* and initiatives for industries interested in being involved in the development of technological projects)

An important issue in outreach is also the ability to trigger the *wow factor* in order to get the youngest interested and to leave them with the awe that will make them quest for more. SKA is a very big scientific and technological project, but it is not yet physically built: for this reason, we are studying the realization of a virtual reality exhibit, integrating the virtual rendering of the antennas array with virtual content.

## Acknowledgements

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## References

- [1] Codella, C., Podio, L., Fontani, F., et al. Advancing Astrophysics with the Square Kilometer Array, Proceedings of Science AASKA14 (2015), 123
- [2] Testi, L., Pérez, L.M., Jiménez-Serra, I., et al. Advancing Astrophysics with the Square Kilometer Array, Proceedings of Science AASKA14 (2015), 117
- [3] <http://altrimondi.inaf.it/>
- [4] [http://www.oact.inaf.it/exoit/EXO-IT/Projects/Entries/2011/12/27\\_GAPS.html](http://www.oact.inaf.it/exoit/EXO-IT/Projects/Entries/2011/12/27_GAPS.html)
- [5] [https://www.costellazionemanga.eu/index\\_en.html](https://www.costellazionemanga.eu/index_en.html)