

PRESS RELEASE

Sardinia in space Filed an international patent

UNISS, CRS4, DASS UNICA and TOLO Green for the advancement of research in astrobiology

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The University of Sassari, the Center for Advanced Studies, Research and Development in Sardinia (CRS4), the Sardinia AeroSpace District (DASS), the University of Cagliari and the Tolo Green company, all from Italy, have filed an **innovative international patent application** that will contribute, thanks to the potential of the spirulina algae, to expanding the research knowledge in the field of astrobiology, even to the point of foreseeing a future in which humans could reach Mars. This is the scenario emerging in terms of the contribution that Sardinia is able to provide to space exploration.

Three years after the patenting process in Italy, the decision to enter the international arena by filing the application in **Europe, United States, Russia, China, Japan, and India** has been taken.

Spirulina flourishes in the absence of gravity and oxygen

Thanks to a long and patient teamwork that involved researchers and doctoral students from universities and research institutions, it was possible to develop a specific growth medium suitable for spirulina algae, the new “green gold”, under extraterrestrial living conditions. At almost zero gravity, reached by means of a specific tool called clinostat, suitably equipped to simulate the Martian atmosphere, the algae flourishes as demonstrated by the experiments carried out in the laboratory of professor Antonella Pantaleo at the Department of Biomedical Sciences at the University of Sassari. Since 2006, CRS4 and the University of Cagliari, as well as other DASS’ shareholders, have been developing, under the guidance of Professor Giacomo Cao, important research which could allow astronauts to survive on the red planet. In fact, the spirulina algae grown in an extraterrestrial environment can serve the dual purpose of feeding astronauts and generating oxygen using the CO₂ rich Martian atmosphere.

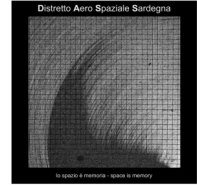
The patent

The patent objective is represented by a kit consisting of a clinostat and a chamber with a CO₂ atmosphere, which can reproduce extraterrestrial conditions such as those on Mars. The purpose of this tool is to permit the growth of microalgae under zero gravity conditions, as well as to evaluate the corresponding behavior of human, vegetable and animal cells under such conditions, even in a simulated Martian atmosphere. The innovation would allow the limitation of the material to be transported on the Earth-Mars journey using in-situ available elements such as atmospheric CO₂, Martian soil and astronauts’ urine for the support of human missions on the red planet. In fact, by using these resources, it would be possible to grow algae on Mars useful for both the production of oxygen and as supplement food for astronauts.

Giacomo Cao, CRS4 sole administrator and chairman of DASS board of directors - “The patent application filed at the international level - says Giacomo Cao - demonstrates once again the important and significant role that Sardinia can play in the aerospace sector through a precious team effort that involves scientific institutions and companies”. Cao concludes: “In particular, the patent application refers to a technology capable to simulate on Earth the environmental conditions taking place on different celestial bodies with



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particular reference to the Moon and Mars, thus allowing the development at bearable costs of new processes that are fully compliant with space exploration topic which is well-known to be quite relevant from financial and economic points of view”.

Gavino Mariotti, Sassari University Rector - “The international patent is the crowning achievement of a long research activity that has had the Department of Biomedical Sciences as its privileged theater. We are proud to be able to contribute with our scientific expertise to the growth of the territory. It still seems necessary, eight years after his passing, to remember Professor Proto Pippia who worked for research in astrobiology at our university”.

Francesco Mola, Cagliari University Rector - “It is a great satisfaction for our university to have contributed to the realization of an internationally significant project. Being part of a team that involves leading companies in the high-tech sector and public and private institutions confirms the importance of cross-disciplinary skills, which can indeed act as a driving force for the growth of our region”.

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