

Press Release

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Biomimetics serving innovation and space technologies

Tuesday 22 October, the 4th edition of the Biomim'expo show is taking place at the Cité des sciences et de l'industrie in Paris. CNES is partnering this operation aimed at all those looking to innovate with bio-inspired technologies. The event shows the increasing interest in the field of biomimetics, which more than ever is opening up surprising and innovative avenues of investigation.

According to CEEBIOS, the European Centre of Excellence in Biomimetics, based in Senlis, France, biomimetics offers a unique opportunity to pursue socially responsible innovations by drawing inspiration from living things and taking advantage of the solutions and inventions the natural world has honed over 3.8 billion years of evolution. Using biological systems as models makes it possible to reconcile industry and economic development with preserving the environment, natural resources and biodiversity. Hailed in France as early as 2007 as the agent of the next industrial revolution, biomimetics combines innovation and social responsibility, as it is based on the study of natural systems to devise new and sustainable products, services and organization models.

The great value of this new research-and-development approach for numerous applications has not escaped the space sector's attention, notably at CNES. Communicating and identifying oneself in space, building and deploying structures, absorbing shocks and defining the trajectories and behaviour of objects in orbit are just some of the many areas where biomimetics could be of use.

Examples of applied research applications include:

- The ability of certain living things like lizards or sea stars to regrow body parts for developing self-healing materials.
- Swarm algorithms for data transmission.
- Insect sensors for defining detection and analysis systems.
- The way beetles deploy their wings for unfurling solar panels on satellites.

Velcro tape is often mistakenly quoted as an example of technology spun off from the space sector. In fact, the origins of this ingenious material go back to 1941, when Swiss engineer Georges de Mestral, on returning from a walk in the woods, noted how certain flowers clung to his clothes and his dog. This observation gave him the idea for a new kind of bio-inspired hook-and-loop fastener.

CNES and CEEBIOS have been working together in these areas of research since early 2018. From this autumn, they will be entering a new phase of their cooperation to identify pilot projects combining biomimetics and space. The findings of this work are expected in the second half of 2020.

CONTACTS

Pascale Bresson
Raphaël Sart

Press Officer
Press Officer

Tel: +33 (0)1 44 76 75 39
Tel: +33 (0)1 44 76 74 51

pascale.bresson@cnes.fr
raphael.sart@cnes.fr

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