

## THE PROJECT

COgITOR is a project funded under the topic H2020-FETOPEN-2018-2020 / H2020-FETOPEN-2018-2019-2020-01 programme, aiming at developing a liquid state cybernetic system prototype. Holonomic memory and computing, pressure sensing, and energy harvesting from thermal gradients will be achieved using colloids. The prototype will be tested in extreme environments for potential space applications.

## IMPACT

The project will create a liquid robot. It will “feel” the external environment like our skin, being sensible to pressure and temperature. It will be able to heal autonomously when wounded. A basic liquid memory and a rudimentary logic will be implemented. It will produce a small amount of energy to “be alive”.



## BENEFITS

The benefits of a base science research are for all the people. Inspiring new forms of art, of understanding, of conceiving a robot are among the expected benefits. The consortium will boost the European position in soft robotics and grant supremacy in liquid robotics.

## RESULTS

The first experiments have explored so far the capabilities of colloidal suspensions at liquid state to undergo learning and memorization. Several media have been characterized, including ZnO, polyaniline nanorods and ferrofluids, and setting of internal states is obtained by applying an external stimulus, such as a steady state potential, while resistance or impedance are monitored. We also have explored particular colloidal compositions able to develop a thermal gradient by radiation absorption, that will be used to scavenge energy in the outer part of the liquid robot. A vessel for extreme environment testing is under design.

