

Overview of the project IN TIME

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Alessio Di Iorio, degree in Astronomy and Master in IT, has been working for more than 12 years, full time in the space market, and another 20 years shared between Space, Research and Development and Information Technology. He is currently ALMA Sistemi CEO and Project Manager of three on-going projects coordinated by ALMA. He has been project manager of several ESA, ASI and EU projects.

Abstract: As the ongoing robotic exploration to Mars has made some tantalizing discoveries, the next major step should be retrieving samples from the Martian surface, so they can be investigated in detail in terrestrial laboratories. However, considering the huge costs associated to such missions, an in-situ dating of rock samples is a more cost-effective approach. Accurate estimation of absolute ages is required in order to understand Mars surface and atmosphere evolutionary processes.

Furthermore, knowledge on occurrence and time frequency of such processes allow a hazard evaluation for locations/areas, essential for future deployments, missions and eventually humans on Mars. However, a chronology for recent events on Mars is problematic, as uncertainties associated with current methodology (crater counting) are comparable to the younger ages obtained (~ 1 Million years).

IN-TIME project addresses the technological and economic viability of a leading-edge instrument for dating of Mars' surface: a miniaturized Luminescence dating instrument for in-situ examination. Thanks to the



development of its innovative technology, and in addition to planetary exploration application, it will also address Earth's field applications as a light and portable dating instrument in geology and archaeology as well as a risk assessment tool for accident and emergency dosimetry and nuclear mass-casualty events. The project is funded under European Union H2020-MSCA-RISE-2018 research programme (G.A. n. 823934) and involve a consortium of seven European organizations and industries from Italy, Spain and Cyprus coordinated by ALMA Sistemi Srl and University of Texas as associated US partner to the project.