

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Science, Instruments and Technologies (3B)

Author: Mr. Gabriel Pont
Centre National d'Etudes Spatiales (CNES), France, gabriel.pont@cnes.fr

Dr. Roger Wiens
Los Alamos National Laboratory, United States, rwiens@lanl.gov

Dr. Sylvestre Maurice
Institut de Recherche en Astrophysique et Planétologie (IRAP), France, sylvestre.maurice@cesr.fr

Dr. Olivier Gasnault
Institut de Recherche en Astrophysique et Planétologie (IRAP), France, olivier.gasnault@cesr.fr

Mr. Scott Robinson
Los Alamos National Laboratory, United States, shr@lanl.gov

Mrs. Pernelle Bernardi
Observatoire de Paris, France, pernelle.bernardi@obspm.fr

Mr. Philippe Caïs
Laboratoire d'astrophysique de Bordeaux, Univ. Bordeaux, CNRS, France, philippe.cais@u-bordeaux.fr

Mr. Tony Nelson
Los Alamos National Laboratory, United States, tenelson@lanl.gov

Dr. André Debus
Centre National d'Etudes Spatiales (CNES), France, andre.debus@cnes.fr

Dr. Jean-Michel Rees
LESIA - Observatoire de Paris, France, jean-michel.rees@obspm.fr

Prof. Fernando Rull
Universidad de Valladolid, Spain, rull@fmc.uva.es

Mr. Raymond Newell
Los Alamos National Laboratory, United States, raymond@lanl.gov

Mr. Ivair Gontijo
Caltech/JPL, United States, ivair.gontijo@jpl.nasa.gov

Dr. Peter Willis
Jet Propulsion Laboratory - California Institute of Technology, United States, peter.a.willis@jpl.nasa.gov

Mr. Vishnu Sridhar
Caltech/JPL, United States, vishnu.sridhar@jpl.nasa.gov

SUPERCAM ONBOARD PERSEVERANCE AT JEZERO CRATER, MARS

Abstract

Following the footsteps of the ChemCam instrument, which has been successfully operated on Mars for nearly nine years as part of NASA's Curiosity rover instrument suite, an improved instrument, called SuperCam, has been developed and integrated on NASA's Mars 2020 rover. SuperCam is a suite of five different remote techniques in order to identify the chemical composition of rocks and soils, and also their molecular composition. In addition to the elemental characterization offered by Laser-Induced Breakdown Spectroscopy (LIBS) already implemented on ChemCam, time resolved Raman (TRR) and infrared spectrometry (IR) have been added for a complete mineralogical and chemical

characterization of the samples at remote distances (1.5 - 7 m for laser-induced techniques, up to infinity for the passive techniques). A context color imaging capability (RMI) is also implemented to place the analyzed samples in their geological context, as well as a microphone (MIC) that provides information on the hardness of the targets when coupled to LIBS, and acoustic data from the wind and rover-induced sounds.

SuperCam consists of three units: The “Body Unit” built by LANL (Los Alamos National Laboratory) in the US, the “Mast Unit” built by a French consortium of 7 laboratories from CNRS and French Universities, under the authority of the French Space Agency (CNES), and a “Calibration Target Unit under the responsibility of the University of Valladolid in Spain.

Perseverance landed on Mars on February 18th, 2021 in Jezero crater, and SuperCam successfully went through the first commissioning tests.

By the time of the IAC 2021, the mission should be in regular operations and we should be able to show a few preliminary results from the first few months on Mars.