

Europlanet NA1 Expert Program

Project Title: "Djiboutian portion of the Afar Depression"

Visitor: Dr. Antoine Marie Caminiti, C.E.R.D., Djibouti, Republic of Djibouti

Host: Dr. Barbara Cavalazzi, BiGeA Dept. Unv. Bologna

Dates of Visit: 24.03.2019 - 30.03.2019

Europlanet NA1 Expert exchange report of Dr. Antoine M. Caminiti's visit to Bologna University in March 2019.

Dr. Caminiti from the C.E.R.D., Djibouti, Republic of Djibouti, has visited Dr. Cavalazzi and Prof. Barbieri of the Astrobiology and Geomicrobiology Group of the Biological, Geological and Environmental Sciences of the University of Bologna, from 24 to 30 of March 2019.

The Danakil Depression PFA in Ethiopia that also include the Dallol area, contains a huge variety of geological environments including active volcanoes and hydrothermal vents that produce acidic and saline lakes with a huge variety of evaporitic deposits, mineral assemblages, and diverse bacterial communities. The unique nature of the Danakil Depression provides a natural and complex analogue for extreme planetary environments. Since 2017, the site was part of the Transnational Access. The main purposes of the visit has been to discuss and better understand the geology and geodynamic of the Afar Depression and the role of its eastern portion that is included into the border of the Republic of Djibouti. The portion of the African Rift System of the Republic of Djibouti present many geological similarities to the Danakil Depression and the Dallol area, being also strongly affected by intense hydrothermalism.

We have discussed deeply and extensively about if and how we could use the hot connectives fluids circulating through a fractured network, contributing as well to a discrete and disseminated mineralization, and generating geological characteristic suitable for planetary geology. Otherwise, during this visit the geological characteristic of the Republic of Djibouti and its potential as field analogues has also been discussed, evaluated and compared to other situation in the Afar Depression. We agreed and already started a collaboration that will involve Dr. Caminiti and C.E.R.D. of the Republic of Djibouti and Dr. Cavalazzi of the University of Bologna in the frame of the Danakil Depression PFA of Europlanet, to better define and design the planetary potential of some extremely interesting area of the Republic of Djibouti, and compare those characteristic with those described of the Danakil field analogue.

Moreover, this starting collaboration is very promising in sponsor the emplacement of the space research in the Republic of Djibouti, as well as in open new research lines at C.E.R.D. in collaboration with Europlanet. During the visit, Dr. Caminiti has introduced the geological fieldwork that he has been carried out in the last 20 years in the Djiboutian Afar Depression emphasising its different aspects including carbonate facies analyses, hydrocarbon source and deposits, and active and extinct hydrothermalism. Finally, Dr. Caminiti had chance to visit and been introduced by his Italian hosts to the mud volcanoes and related extreme environments cropping out at the Nirano National Park close to Bologna.