IACPES Exchange Report

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An exchange was held at the Royal Belgium Institute for Space Aeronomy (Brussels, Belgium) in January and February of 2017. The work was primarily supervised by Dr. Frank Daerden.

The research conducted during the exchange applied a computational General Circulation Model (GCM) of Mars to determine the locations and seasons on Mars where liquid water can exist in the form of magnesium perchlorate brines. The main goals were to examine the possibility of Recurring Slope Lineae (RSL) features being formed through the deliquescence of perchlorate salts and to provide a broader guideline for future missions aimed at detecting liquid water on Mars. Additionally, a detailed high time-resolution analysis was carried out, both at the surface and at height in the atmosphere, at the high northern latitude Mars Phoenix site to provide further context for measurements made by instruments on board the NASA Mars Phoenix lander. This work has now been completed and will be submitted for publication in the literature.

During the exchange, I had the opportunity to present my work twice. An oral presentation was given at the 6th International Workshop on the Mars Atmosphere in Granada, Spain in January. This was followed by a more detailed seminar talk which was given at the Royal Belgian Institute for Space Aeronomy in February. Several constructive individual discussions were also held with members of the institute during the exchange.

Lastly, I had the good fortune to sit in on multiple team meetings regarding the NOMAD (Nadir and Occultation for MArs Discovery) instrument on board the ExoMars Trace Gas orbiter. NOMAD is a 3-channel spectrometer, designed and lead by The Royal Belgian Institute for Space Aeronomy, which will provide measurements constituents in the Martian atmosphere. These meetings provided me with the opportunity to directly experience the decision-making process during an active planetary space mission.