The Emirates Mars Mission, the first multi-institution exploration undertaking to Mars by a country in the Middle East, has been a milestone for science and engineering. It challenges our existing concepts of how the planet’s atmospheric gases behave and interact. Tackled by the Mars Helicopter, the Emirates Mars Ultraviolet Spectrometer (EMUS) instrument, the observations show dramatic variations in the concentrations of both atomic oxygen and carbon monoxide in the daytime atmosphere of Mars.

"These observations contain features that were completely unexpected and we believe will have far-reaching consequences for our existing models of the Martian atmosphere and our understanding of its behavior," said Dr. Reem Fares, Assistant Professor in Space Science and Technology at the University of California, Los Angeles, and Lead Scientist for the EMUS instrument. "We’ve been refining our processing pipeline, readying for our first science data release to the global science community, which will take place on 24 April 2021. From now onwards, we will be releasing new data sets every three months without embargo and free for use to the community."

"It was so unexpected that we initially thought the structures might be artifacts in the image, caused by contaminating light from longer wavelengths and atmospheric turbulence. Taken at a time when sunlight splits carbon dioxide molecules in the exosphere. EMUS (Emirates Mars Ultraviolet Spectrometer) is the most sensitive ultraviolet instrument yet to orbit Mars. EMUS 130.4 nm – Dramatic variation in concentrations of Atomic Oxygen on Mars. This observation from the EMUS instrument (Emirates Mars Ultraviolet Spectrometer) was acquired on 24 April 2021 and shows vast structures in the upper atmosphere of Mars. When sunlight splits carbon dioxide molecules the exosphere an increase in atomic oxygen of 50% or more. This is difficult to explain. The EMUS team is currently refining their models to come up with a robust interpretation of this phenomenon."

"The Hope Probe’s historic journey to the Red Planet coincides with a year of scientific breakthroughs. We are currently preparing for the science data release to the global science community, which will take place on 24 April 2021. From now onwards, we will be releasing new data sets every three months without embargo and free for use to the community."