



INSTITUT ZA FIZIKU SEMINAR

Institut za fiziku, Bijenička cesta 46,
predavaonica u zgradi Mladen Paić

četvrtak, 20. srpnja 2017., u 15:00 sati

NASA MAVEN Mission: How did Mars lose its atmosphere?

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The Mars atmosphere is believed to have been stripped away by the sun and the solar wind over time, changing the climate from a warmer and wetter environment early in its history to the cold, dry climate that we see today. Recent results from NASA's MAVEN (Mars Atmosphere and Volatile Evolution Mission) orbiter offer new insights into physical processes responsible for the atmospheric escape. In this talk, I will introduce the major scientific objectives of the MAVEN mission and present its most important findings up to date in the context of what is presently known about the history of water of Mars.

In the second part of the talk, I will describe in more detail non-thermal escape mechanisms that play a key role in complex interactions between the upper layers of planetary atmospheres, or exospheres, and solar radiation and plasma. Understanding energy deposition and transport driven by such processes requires detailed cross sections for the participating atomic and molecular species in reactive and non-reactive regime at high temperatures. These quantities are typically not well-known – even though they enter the models used to interpret the observations and affect long-term predictions about the evolution of the Mars' atmosphere. Similar non-thermal mechanisms take place in the upper atmospheres of other planets and satellites, such as Titan, and may have played an important role in evolution of exoplanetary atmospheres immersed in hot and volatile stellar environments.

Voditelji seminara IF-a: [Nataša Vujičić](#) i [Damir Starešinić](#)