



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3805

Type: **Poster (Non-Student) / Affiche (Non-étudiant(e))**

(POS-13) COMPACT: a new complex plasma facility for the International Space Station

Tuesday 20 June 2023 17:32 (2 minutes)

Complex plasmas are made of micrometer-sized particles immersed in a weakly ionized gas. Due to their interactions with the surrounding ions and electrons, the microparticles usually acquire negative charges of the order of several thousand elementary charges. Due to microparticles interactions, complex plasmas can form gaseous, liquid and crystalline states. For this reason, they are often used as model systems for soft matter. Thanks to their large size, a direct optical observation of individual particles is possible and enables the study of their dynamics at the kinetic level even in systems where the number of particles is large. In ground-based experiments, gravity is the dominant force restricting the research to vertically compressed, inhomogeneous microparticle clouds, or (quasi) two-dimensional systems, and masking dynamical processes mediated by weaker forces. Under reduced gravity conditions, such as provided on the International Space Station (ISS), this limitations are overcome allowing the study of processes otherwise mask by gravity. In this poster, the research goals for the next generation complex plasma facility COMPACT to be operated onboard the ISS are presented. COMPACT is envisaged as an international multi-purpose and multi-user facility that gives access to the full three-dimensional kinetic properties of the particles.

Keyword-1

plasma

Keyword-2

microparticles

Keyword-3

microgravity

Primary authors: Prof. DOVE, Adrienne (Department of Physics, University of Central Florida); Prof. MELZER, Andre (Institute of Physics, University of Greifswald); Dr KNAPEK, Christina (Institute of Physics, University of Greifswald); Dr THOMAS, Hubertus (DLR); Prof. GOREE, John (Department of Physics & Astronomy, The University of Iowa); COUEDEL, Lenaic; Prof. THOMA, Markus (I. Physikalisches Institut, Justus-Liebig-Universität Gießen); Prof. RATYNSKAIA, Svetlana (Space & Plasma Physics, School of Electrical Engineering, Royal Institute of Technology (KTH)); Prof. KONOPKA, Uwe (Auburn University)

Presenter: Prof. KONOPKA, Uwe (Auburn University)

Session Classification: DPP Poster Session & Student Poster Competition (3) | Session d'affiches DPP et concours d'affiches étudiantes (3)

Track Classification: Technical Sessions / Sessions techniques: Plasma Physics / Physique des plasmas (DPP)