

Cold Plasmas - From Space to Medicine

Markus H. Thoma, 1. Phys. Institut, Univ. Giessen, Heinrich-Buff-Ring 16, 35392
Giessen

Cold or low temperature discharge plasmas have numerous applications in fundamental research as well as technological applications. Here I want to focus on three aspects of these plasmas:

1. Complex or dusty plasmas are low temperature plasmas produced in RF or DC discharges which contain microparticles, e.g. dust grains. Due to the high charges ($10^3 - 10^5 e$) the microparticles are strongly coupled and can arrange in regular structures called plasma crystal. Complex plasmas can therefore be used as model systems for strongly interacting many-body systems but also play a role in astrophysics (e.g. comets, planet formation) as well as technology (e.g. microchip production by plasma etching). Complex plasma experiments onboard the ISS and in parabolic flights, in which the disturbing effects of gravity are absent, will be discussed.
2. Radiofrequency Ion Thrusters (RITs) as electric propulsion for space crafts have been developed at the University Giessen since 1962. Within the LOEWE program RITSAT these thruster are currently improved, constructed and tested for space applications.
3. Cold Atmospheric Plasmas (CAPs) have been proposed as an agent for medical treatments. Recent progress in the fields of sterilization and wound healing will be presented.