

Abstract Submitted
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3-D Plasma Crystals in the lab and in space PETER HUBER, Institute for Extraterrestrial Physics, V.E. FORTOV, Institute for High Energy Densities, A.V. IVLEV, Max Planck Institute for Extraterrestrial Physics, A.M. LI-PAEV, V.I. MOLOTKOV, Institute for High Energy Densities, G.E. MORFILL, M. RUBIN-ZUZIC, H.M. THOMAS, Max Planck Institute for Extraterrestrial Physics — The crystallisation of complex plasmas under microgravity conditions performed in the PKE-Nefedov laboratory on the ISS was restricted to a small area close to the sheath region at the electrodes. Now, it is possible to grow large crystals of different type (fcc, bcc etc.) by a special developed annealing procedure. The latter will be explained and the 3-D analysis of the resulting crystal will be presented. Even larger crystals of more than 100 particle distances ($\Delta = 0.1$ mm) in every direction can be formed in the PK-3 Plus lab on Earth due to the usage of particles of $\sim 1\mu\text{m}$ diameter. PK-3 Plus is the follow-up experiment to PKE - Nefedov and will be launched to the ISS end of 2005. Beside the smaller particles PK-3 Plus provides larger electrodes and better plasma conditions also necessary for this large crystal formation. By depth scans of the usual 2-D particle diagnostics, we are able to study the crystallization process and phase transition in 3-D.

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