

MM 6 Invited talk Klaumünzer

Time: Monday 14:00–14:30

Room: IFW A

Invited Talk

MM 6.1 Mon 14:00 IFW A

Solid-State Physics with Fast Heavy Ions — •SIEGFRIED KLAUMÜNZER — Ionenstrahllabor, Hahn-Meitner-Institut, Glienicker Str. 100, 14091 Berlin, Germany

Fast heavy ions in solids create a narrow cylindrical track of strongly heated matter. The most obvious response of amorphous materials to this kind of excitation is a change in shape (ion hammering). After a brief outline of this phenomenon two examples will be presented in more detail to demonstrate how high-energy ion beams can contribute to solid-state physics. The first example addresses the longstanding question of liquid polymorphism in silicon, i.e. the existence of a liquid silicon phase with coordination number 4 in comparison with common liquid silicon, which has a coordination number of 6. Exploiting the effect of ion hammering it could be shown that a tetrahedrally coordinated liquid silicon phase must exist on a time scale of about 100 ps. The second example deals with texture modification of nanocrystalline titanium. Starting again from ion hammering it will be argued that a collective rotation of crystalline grains is possible if the grain boundaries are amorphous. The experiments could provide a direct access to the dynamic behavior of grain boundaries.