

MM 24: HV Hassel

Time: Wednesday 9:30–10:00

Location: IFW A

Invited Talk

MM 24.1 Wed 9:30 IFW A

From eutectic alloys to metal nanowires — ●ACHIM WALTER HASSEL — Max-Planck-Institut für Eisenforschung, Düsseldorf, Germany

Solidification of eutectic alloys is an invariant reaction in which both phases solidify simultaneously without changing the composition of the melt. Directional solidification of a eutectic alloy of asymmetric composition for example in a Bridgman furnace produces iso-oriented

single crystalline metal nanowires embedded in a single crystalline matrix. Electrochemically a highly selective and precisely controllable release is possible. W, Mo, Re and Cu wires can be produced as well as Au nanobelts. A thorough characterization by HRSEM, TEM, EBSD, AFM, XRD, XPS, GDOES and ICP-OES yields a comprehensive view of these objects. Examples will illustrate that a number of interesting applications are possible such as STM tips, pH-sensors, catalysts, NEMS resonators and model samples for mechanical studies. An outlook will indicate further developments in this field.