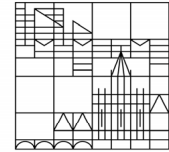


Physikalisches Sonderseminar

Universität
Konstanz



Do 11.05.23
13:30 Uhr
D 432



Dr. Valentin Blickle

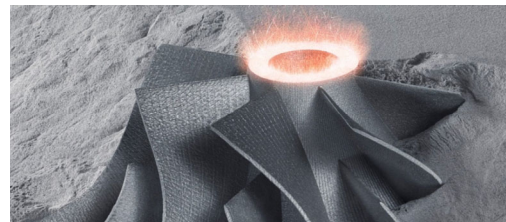
TRUMPF Laser- und Systemtechnik GmbH, Ditzingen

An insight into additive manufacturing at TRUMPF. A physicist reports on engineering challenges in the development of 3D metal printers.

Laser powder bed fusion is an additive manufacturing technique allowing the generation of metal parts, by selectively welding fine metal powder together using a high-power laser beam. This layer-by-layer 3d printing process opens the freedom to manufacture highly complex metal parts which cannot be fabricated using classical machining technology e.g., milling and lathing. This allows to put the function, and not the manufacturability, in the center of the design process of mechanical components. This design freedom can be implemented for example, in efficient heat exchangers, medical implants or lightweight aerospace parts.

At the beginning, I will introduce this novel production technology with the challenges and possibilities behind it, based on typical sample parts. To ensure high part quality, both the welding dynamics and the heat balance of the part must be considered. Therefore, many control parameters such as energy input, focus size, feed rate and shielding gas velocity must be adjusted.

After that I will go into the possibilities of Trumpf process monitoring systems in 3d printing machines. In addition to a camera-based monitoring of the powder application, the Meltpool monitoring system allows a direct monitoring of the molten metal by measuring the emitted thermal radiation.



Host: Prof. Bechinger