



## FRAUNHOFER CAPS – USER FACILITY FOR ULTRASHORT PULSE LASERS WITH HIGHEST AVERAGE POWERS

### Task

Ultrashort pulse lasers enable research not only to develop new applications through precise structuring in micro material processing along with a minimal heat-affected zone, but also to generate coherent radiation in the XUV range. When the power of ultrashort pulse lasers is scaled, their precision can be transferred to large-area applications with high throughput as well as highly demanding processes such as the machining of ultra-hard ceramics and fiber-reinforced plastics. The User Facility of the Fraunhofer Cluster of Excellence Advanced Photon Sources CAPS will provide laser users from research and industry with a new generation of ultrashort pulse lasers for application studies.

### Method

Fraunhofer CAPS is developing ultrashort pulse lasers whose average power is one order of magnitude higher than that of the ultrashort pulse laser sources available today. The CAPS User Facility at Fraunhofer ILT was officially opened on September 18, 2019, and aims to make these novel laser beam sources available to industry and research at an early stage. Together with other Fraunhofer partner institutes, the facility will also advance the development and investigation of future-oriented applications.

In the next few years, the researchers plan to reach up to 10 kW average output power at pulse durations of less than 50 fs. This laser radiation is variably guided into three fully equipped user cabins. These can be flexibly adapted for the respective application investigations.

### Results

The CAPS User Facility offers a unique opportunity for industry and research to investigate optical processes using a laser beam source with unprecedented average power for their purposes. As the application laboratory continues to be developed, interested persons are invited to approach the contact persons listed below.

### Applications

The foreseen applications cover a broad spectrum in the fields of production, imaging, materials and basic research, such as high-precision machining of materials with high productivity, generating coherent EUV radiation and soft X-rays for imaging and lithography processes, and modifying materials for use in quantum technology.

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*2 Amplification of the average power of ultrashort pulse lasers up to 10 kW.*