

## Workshop »Coatings for Optics and Optical Components«

### Space Optics for the CO<sub>2</sub> Monitoring Mission

Dr. Stefan Schwinde, Dr. Kristin Gerold, Dr. Adriana Szeghalmi, Dr. Sven Schröder

*Fraunhofer IOF, 07745 Jena*

[stefan.schwinde@iof.fraunhofer.de](mailto:stefan.schwinde@iof.fraunhofer.de)

The monitoring of anthropogenic CO<sub>2</sub> by satellites (part of Copernicus, the European Union's Earth Observation and Monitoring program) requires a dispersive spectrometer. As a highly efficient and accurate light dispersing element, a Prism-Grating Prism (PG-P) optical element will operate in the CO<sub>2</sub>M-Mission.

To reduce stray light and to shape the beam, AR-coatings (Anti-reflection coatings) *and* light blocking apertures are requested. A "black" aperture was deposited as a coating, directly on the PG-P element. By this approach, the payload of the satellite can be reduced, in comparison to applying a mechanical aperture.

The fused silica binary gratings of the PG-P is embedded with a high refractive index material by atomic layer deposition (ALD). This deposition enables the reduction of the required grating depth and enables a high efficiency as well as a low polarization sensitivity.