

# Table-Top EUV/Soft X-ray Source

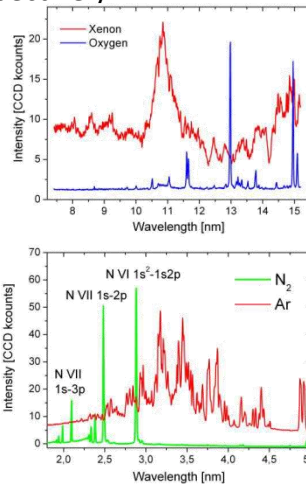
Laser-  
Laboratorium  
Göttingen e.V.

A laser-based plasma source for generation of EUV/soft x-ray radiation was developed at the Laser-Laboratorium Göttingen. The plasma is produced by an Nd:YAG laser (1064nm, 800mJ, 7ns) that is focused into a pulsed gas jet. Different target gases can be used for the generation of either intense broad-band (XUV: Krypton, Argon, EUV: Xenon) or less intense narrow-band radiation (XUV: Nitrogen, EUV: Oxygen), respectively.



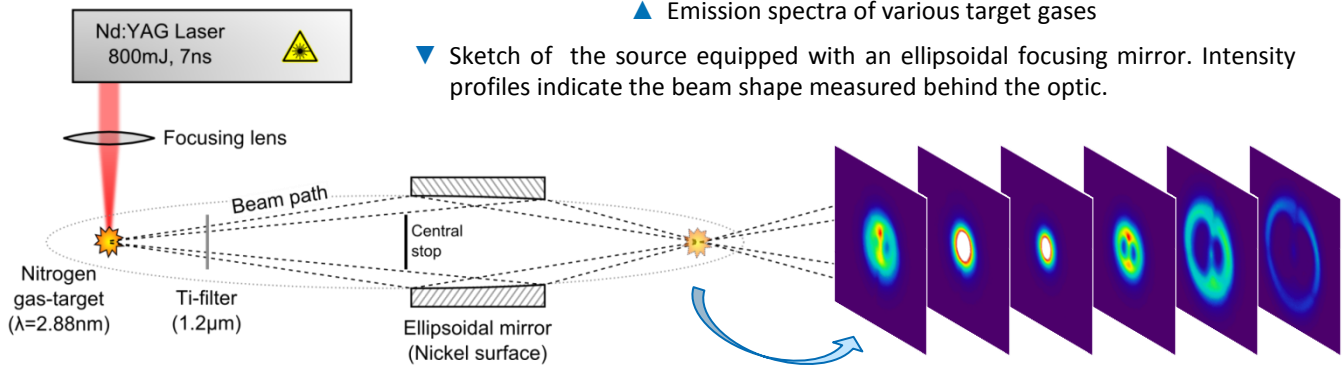
## Specifications

- ▶ Wavelength 1...20 nm
- ▶ Pulse duration 7 ns
- ▶ Pulse energy (Xe) 3.5 mJ  
( $4\pi$  sr, 2% BW)
- ▶ Conversion eff. (Xe) 0.45 %
- ▶ Plasma shape  $\varnothing \sim 300 \mu\text{m}$
- ▶ Repetition rate up to 10 Hz



▲ Emission spectra of various target gases

▼ Sketch of the source equipped with an ellipsoidal focusing mirror. Intensity profiles indicate the beam shape measured behind the optic.



## Advantages

- ▶ Low debris
- ▶ High EUV energy (3.5 mJ)
- ▶ Minimum gas consumption  
(duration of gas pulse: < 1 ms)
- ▶ Simple target gas exchange
- ▶ Table-top system

## Applications

- ▶ Metrology: Reflectometry, absorption spectroscopy (NEXAFS)
- ▶ Optics/sensor testing
- ▶ EUV damage investigations
- ▶ Fundamental studies on material interaction
- ▶ Water window microscopy ( $\lambda = 2 \dots 4 \text{ nm}$ )