

## Characterization instruments

### Optics characterization



**GOBI®**

Characterization of chirped mirrors & dispersive optics

WHITE LIGHT INTERFEROMETER

- Spectral phase and Group Delay Dispersion (GDD) measurements (accuracy of  $\pm 5 \text{ fs}^2$ )
- 250–2400 nm



**GLACIER®**

Characterization of highly reflective mirrors

CAVITY-RINGDOWN REFLECTOMETER AND LOSS METER

- Reflectivity up to 99.9995% (5–1000 ppm losses)
- Wavelengths (additional diode-based wavelengths can be added to all models):
  - GLACIER: 375–1550 nm
  - GLACIER-123: 355, 532 and 1064 nm
  - GLACIER-C: 450–2000 nm (supercontinuum laser source)

### Pulse characterization



**TUNDRA®**

Characterization of laser pulse contrast

THIRD-ORDER AUTOCORRELATOR

- Up to  $10^{14}$  dynamic range
- Up to 3.8 ns scan range
- Wavelengths: 800, 1030 nm (others upon request)



**MADEIRA**

Single-shot CEP measurements

PHASEMETER

- Input pulse duration:  $\leq 4.5 \text{ fs}$  @750 nm central wavelength
- Wavelength: 500–1000 nm

### XUV characterization



**EVEREST**

Soft X-ray/XUV/VUV characterization

SOFT X-RAY / XUV / VUV SPECTROGRAPH

- Modular, compact design
- Detector: X-ray CCD camera or MCP camera available
- Wavelength:
  - Soft X-ray: 1–17 nm (73–1240 eV)
  - XUV: 5–80 nm (15–248 eV)
  - VUV: 30–200 nm (6–41 eV)
  - All-in-1 possible: 1–200 nm (6–1240 eV)

## XUV attosecond science

### Generation



#### NEPAL

HHG of XUV/soft X-ray radiation

XUV LIGHT SOURCE – ATTOSECOND BEAMLINER

- Up to 360  $\mu\text{W}$  @3 kHz high-harmonic power
- Operating pressure: few mbar down to  $<10^{-3}$  mbar. Base pressure  $<10^{-7}$  mbar
- Quick and easy exchange of the gas jet target



#### CALDERA

Generation of MHz XUV radiation

ENHANCEMENT CAVITY

- Stable operation at repetition rates  $\geq 10$  MHz
- Average powers on the 100-kW level



#### SAVANNA

Pulse compression

HOLLOW-CORE FIBER COMPRESSOR

- Standard (capillary based)
  - Input pulse energy: 0.5–2 mJ @  $\leq 10$  kHz
  - Compression factor: 5–6 x
- HP (stretched fiber, high-power)
  - Input pulse energy: few 10s mJ
  - Peak power: up to 400 GW. Average power: up to 100 W
  - Compression factor: 5–30 x
- Wavelength: 800, 1030 nm (others upon request)

### Manipulation

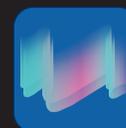


#### K2

Pump-probe XUV/IR experiments

PULSE DELAY UNIT

- Temporal resolution: 3 as
- Scan range: 300 fs
- Includes a wavelength tailored 2-segment mirror



#### AURORA

Generation of circularly polarized light

XUV PHASE RETARDER

- Maximum ellipticity ( $P_c$ ): up to 0.8
- Up to 40% transmission
- Spectral range: 10–35 eV or 40–85 eV



#### CAPELLA

Shaping and sub-cycle control of field waveform

LIGHT FIELD SYNTHESIZER

- Shortest available output pulse: 2 fs FWHM
- Stability:  $<50$  mrad
- Temporal accuracy: 7 as
- Wavelength: 400–1000 nm