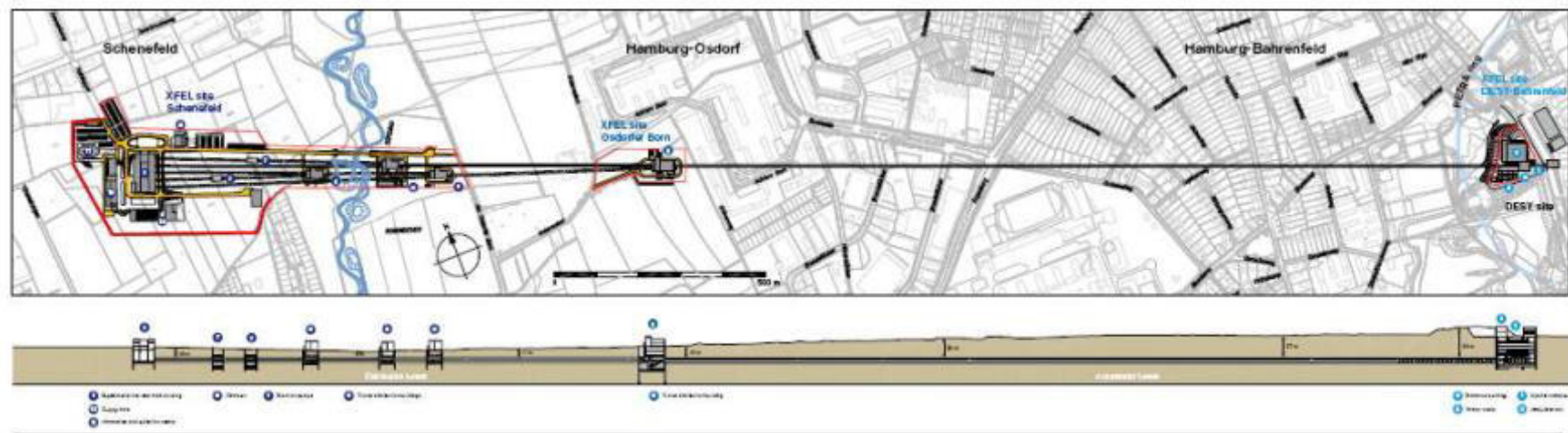




# European XFEL Photon Diagnostics

## *short status update (a selection)*



**Dr. Jan Grünert**

European XFEL GmbH, Hamburg, Germany  
4th Satellite Workshop on Photon Beam Diagnostics

29 January 2016, DESY auditorium, Hamburg

# X-ray Gas Monitor (XGM) from DESY-FS



- Delivery of first XGM unit happened in 05/2015



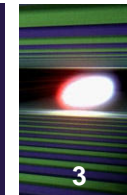
two more XGMs  
arrived later in 2015



in 12/2015 the first  
XGM was installed



# Photoelectron Spectrometer (PES)

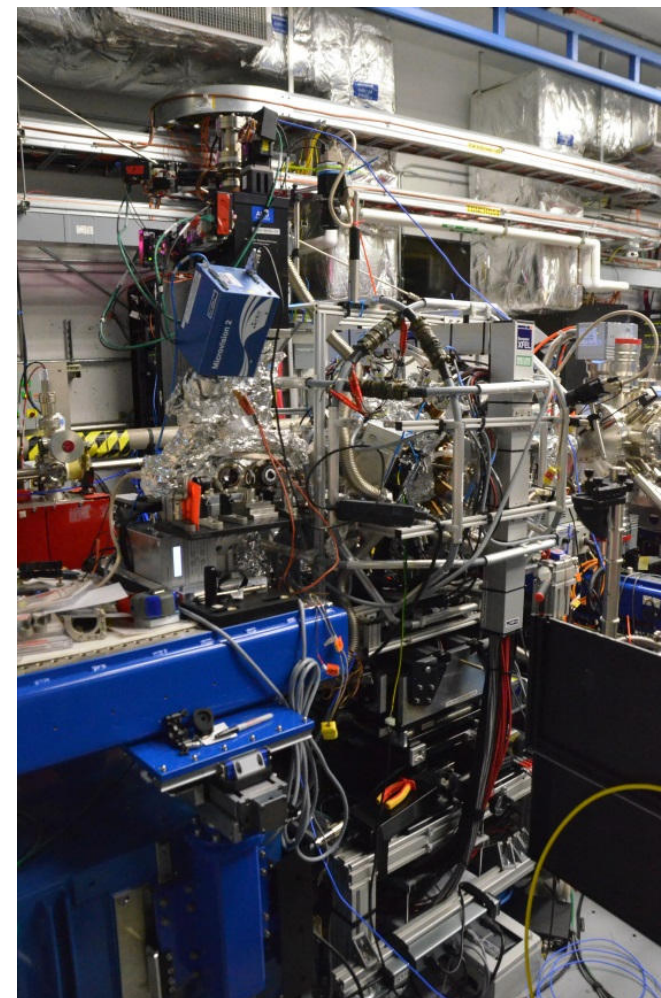
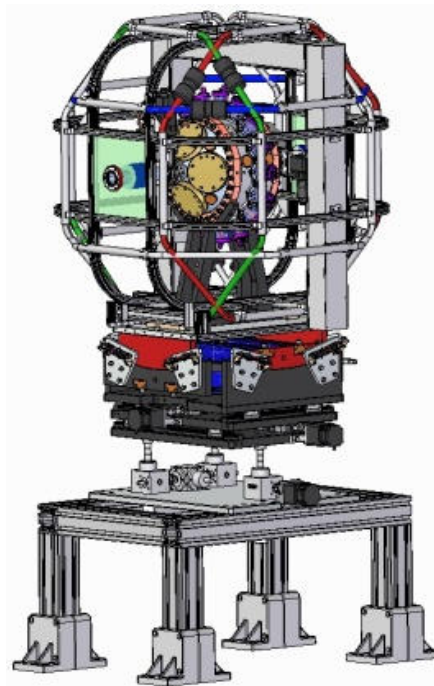


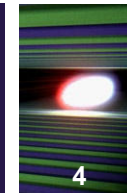
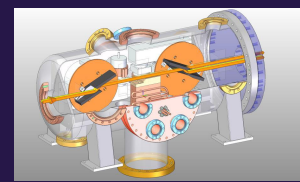
- Beamtimes with “our own” PES at LCLS/AMO in 2015:
  - DELTA undulator commissioning
  - user beamtime (W. Helml, LH-52)
  - inhouse beamtime (R. Coffee)
  - ➔ proof that the device is very **reliable, robust and performant** (currently up to 2kV retardation voltage is possible)



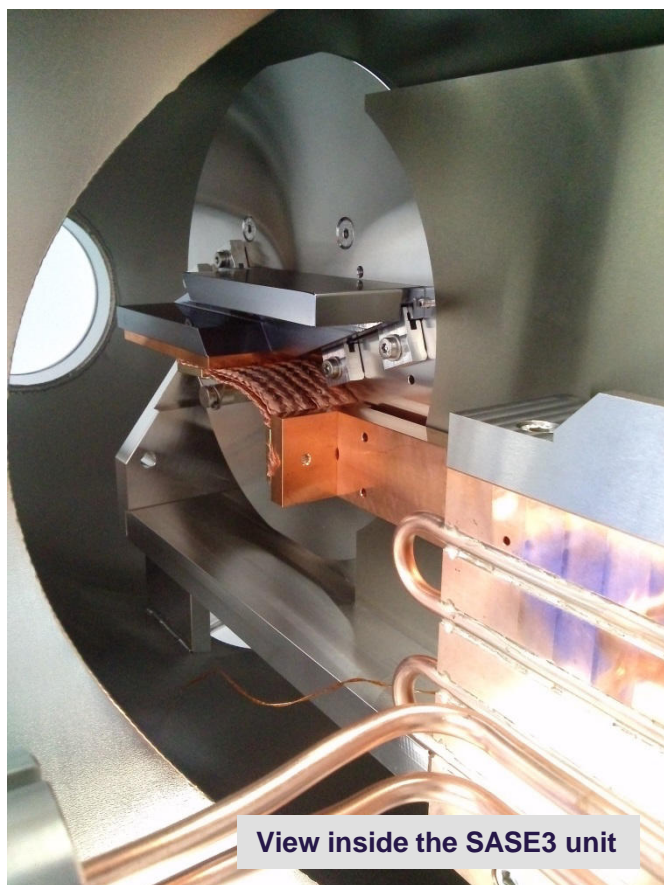
Signals from 16 radially distributed ToF-detectors  
→ spectra and polarization

Ref. G.Hartmann, DESY and J.Buck, European XFEL





- Installation of first K-mono in the SASE1 tunnel XTD2



View inside the SASE3 unit

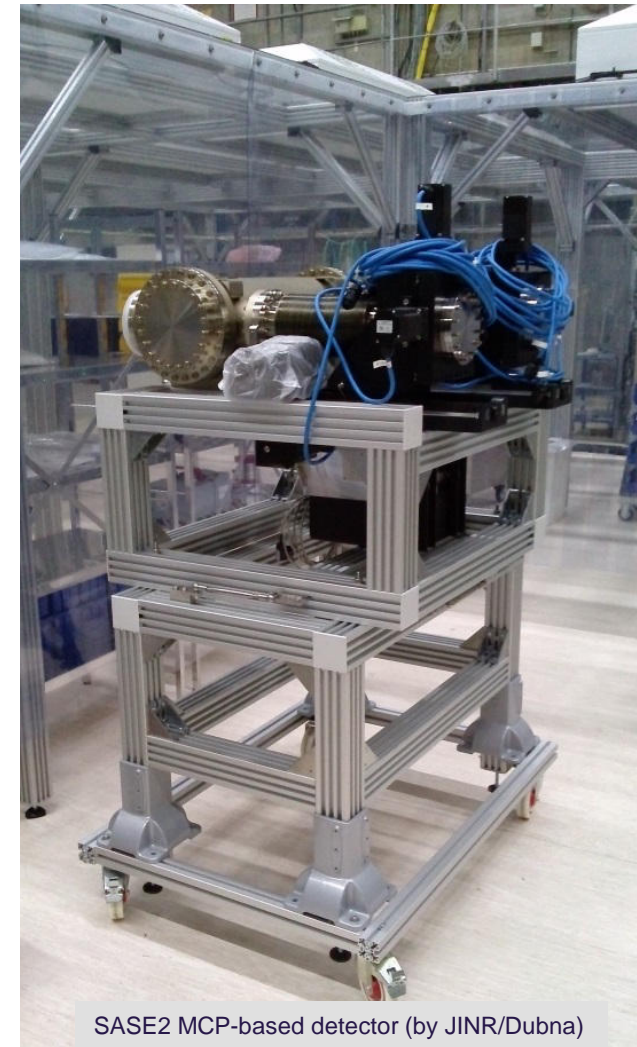
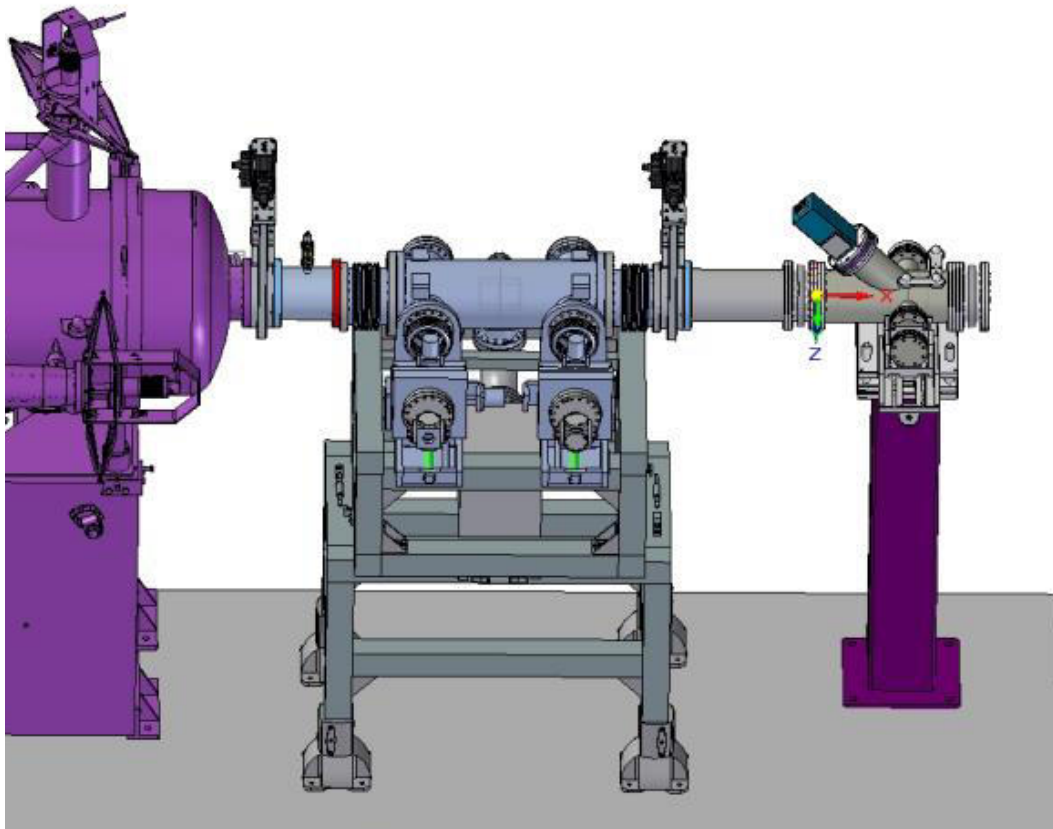




# MCP-based detector and Imagers

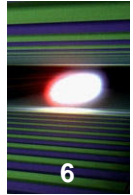


- **MCP-based detector (JINR/Dubna)**
  - SASE1 unit installed in tunnel
  - Local technical commissioning of controls done
  - Final assembly of SASE2 + SASE3 unit done

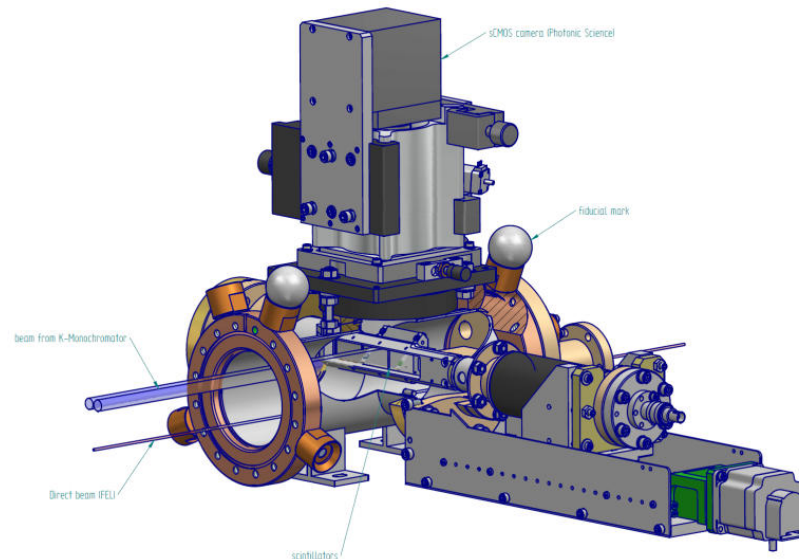


SASE2 MCP-based detector (by JINR/Dubna)

# MCP-based detector and Imagers

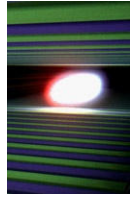


- **MCP-based detector (JINR/Dubna)**
  - SASE1 unit installed in tunnel
  - Local technical commissioning of controls done
  - Final assembly of SASE2 + SASE3 unit done
- **Imagers**
  - all SASE1 pop-in monitors assembled, tested, and installed in the tunnels (XTD2+XTD9)
  - SASE3 Exit Slit imager: under design
  - 2D-imager-FEL for SASE1 assembled and tested
  - 2D-imager-SR: produced at FMB

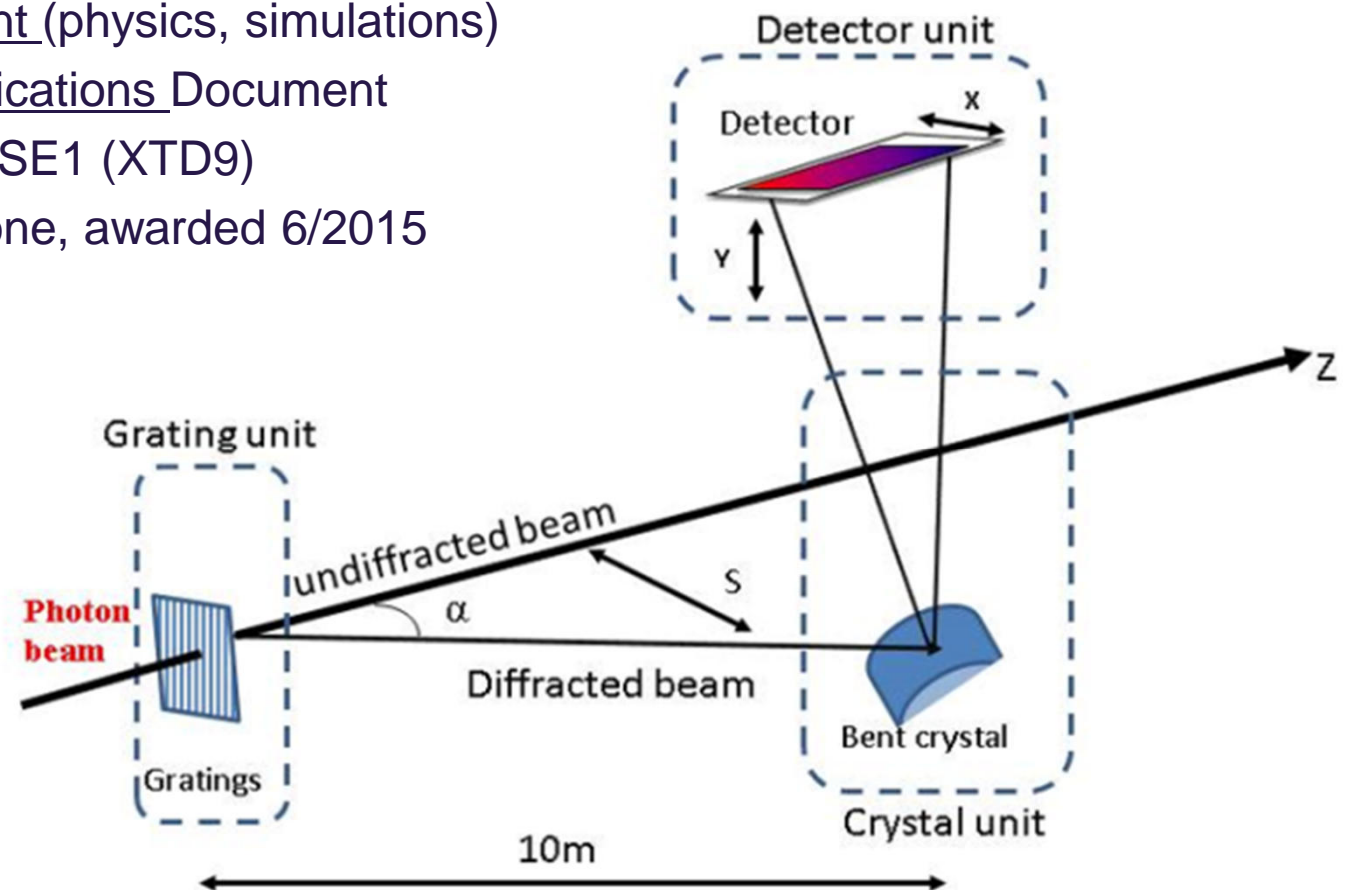


A.Koch (WP74) next to the first installed imager

# HiREX spectrometer

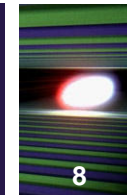


- Hard X-ray High Resolution Single Shot Spectrometer (**HiREX**) new
  - Design Document (physics, simulations)
  - Technical Specifications Document
  - Designed for SASE1 (XTD9)
  - Public Tender done, awarded 6/2015

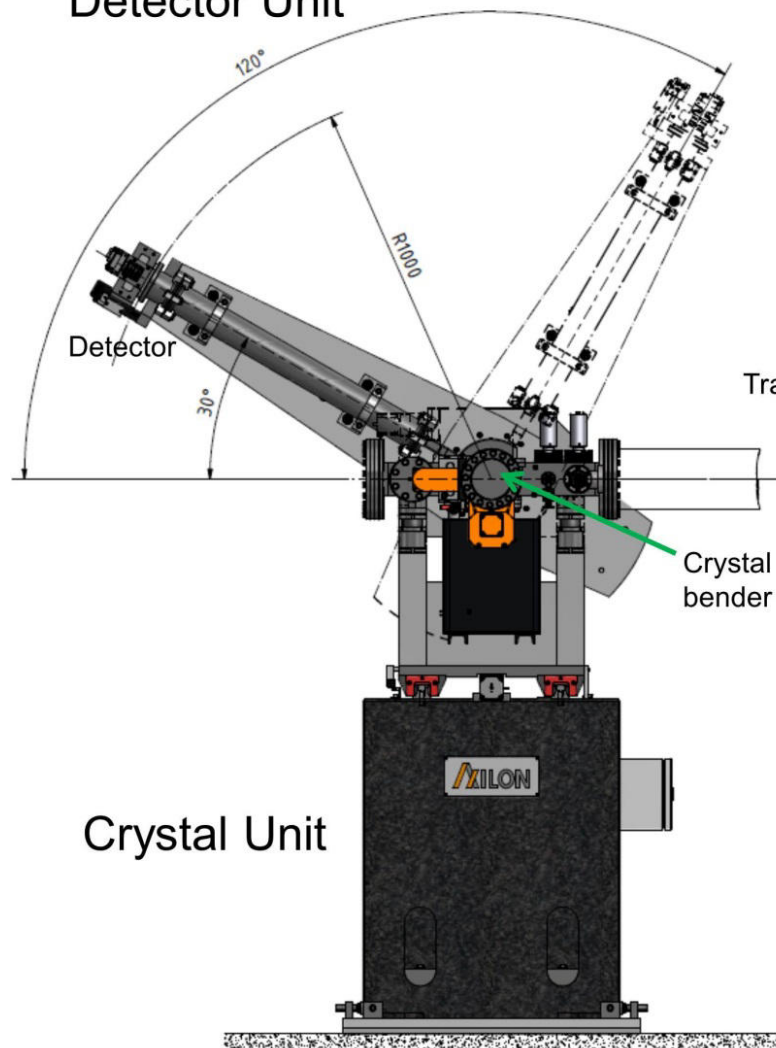




# HiREX spectrometer

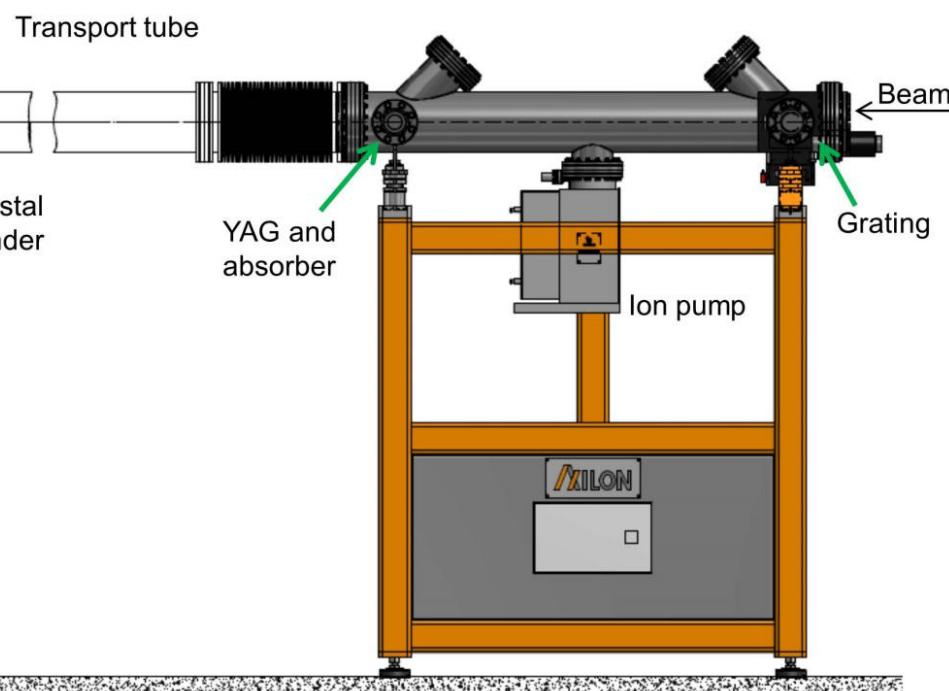


## Detector Unit



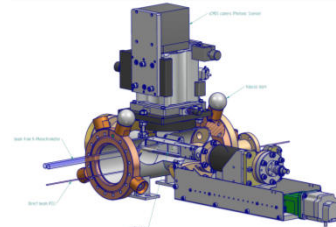
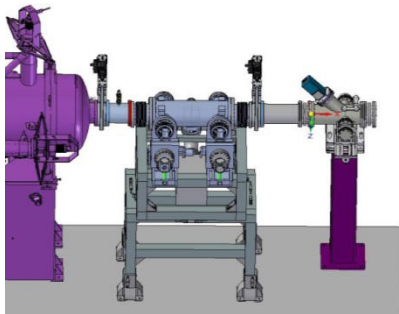
- Detailed technical design completed
- In fabrication at AXILON

## Grating Unit





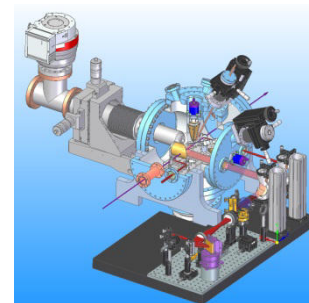
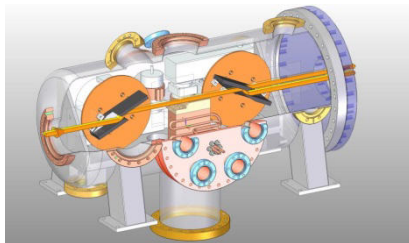
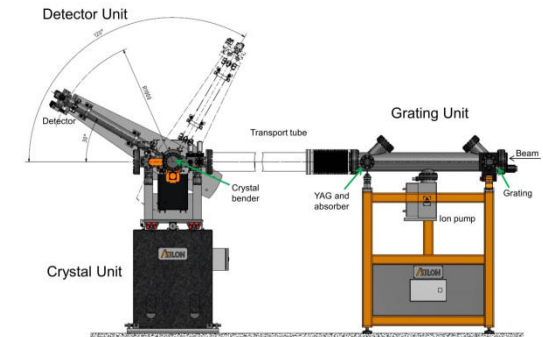
## „Ultrashort summary“



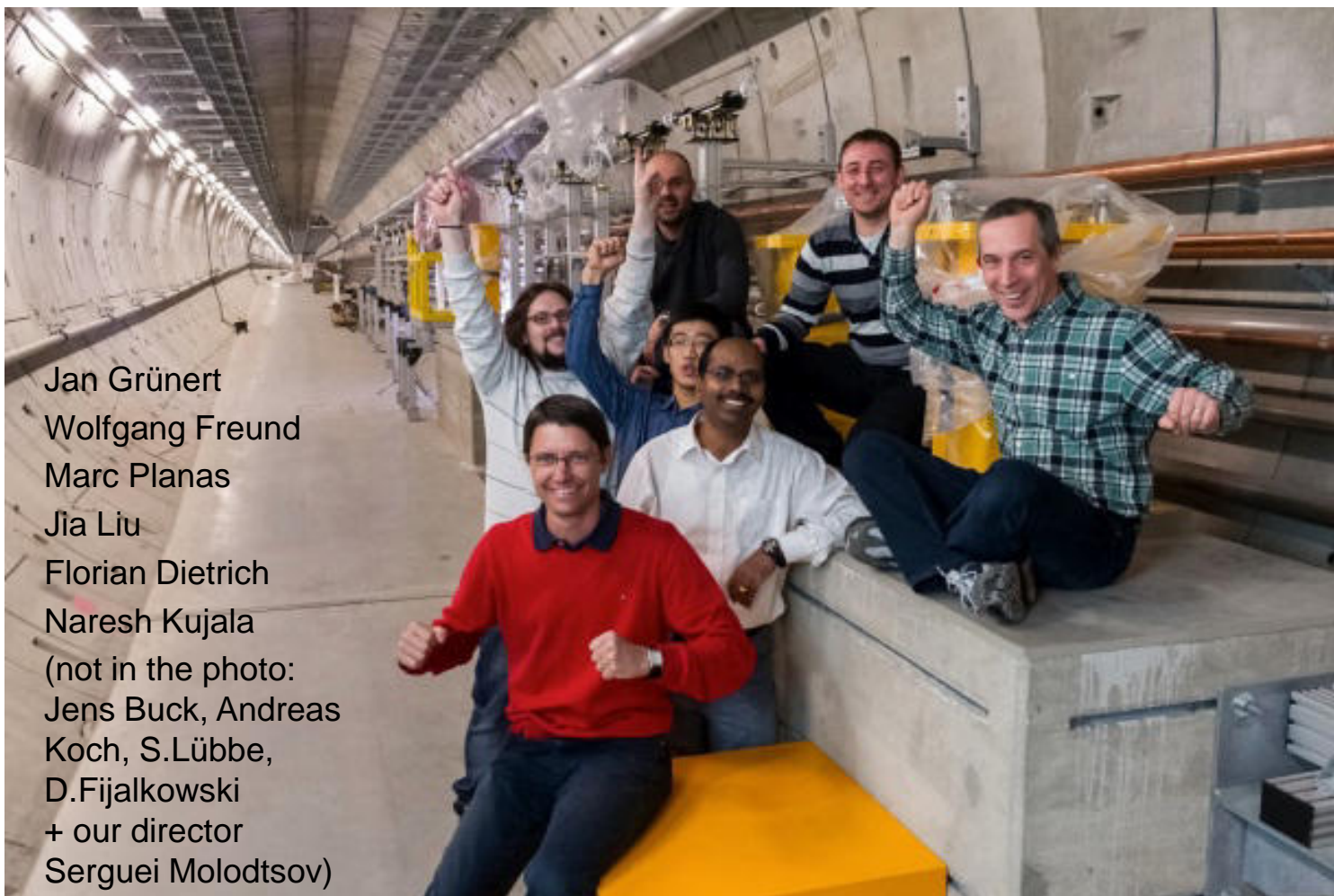
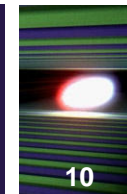
- Most SASE1 diagnostics installed in the tunnels

➔ **Ready by end of 2016 for Commissioning and First Lasing attempt**

- SASE3 devices under final assembly
- Much other important progress: diff.pumping, tunnel gas supply etc
- A few more device *types* under design (eg temporal diags)



## Photon Beam Diagnostics Group (WP74)



Jan Grünert  
Wolfgang Freund  
Marc Planas  
Jia Liu  
Florian Dietrich  
Naresh Kujala  
(not in the photo:  
Jens Buck, Andreas  
Koch, S.Lübbe,  
D.Fijalkowski  
+ our director  
Serguei Molodtsov)

**Thank you for your attention !**