

# News from DESY.

**XFEL  
PETRA III & FLASH II  
Particle Physics 2015-19  
DESY Test beam**

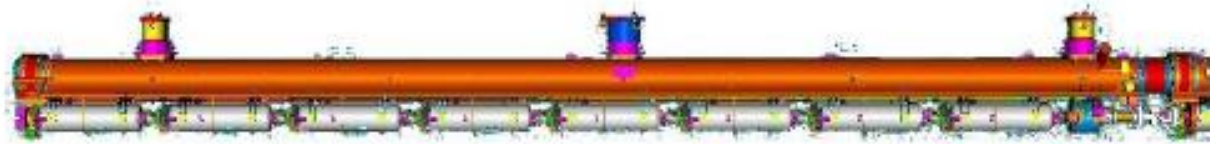
**Joachim Mnich**

Plenary ECFA  
CERN November 20, 2014

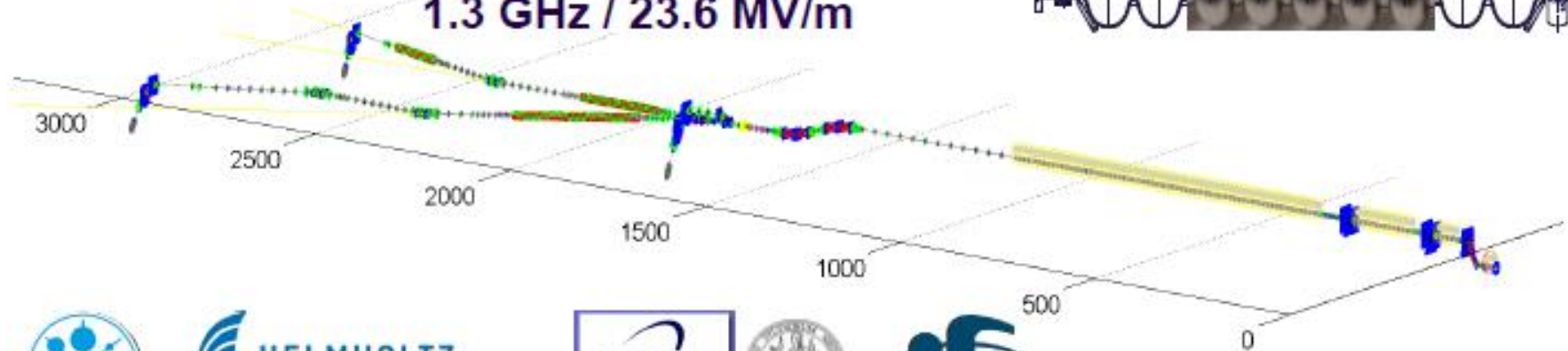


# European XFEL: Accelerator

100 accelerator modules



800 accelerating cavities  
1.3 GHz / 23.6 MV/m



Wroclaw University of Technology



# European XFEL

- 6 out of 100 accelerator modules already installed in tunnel!

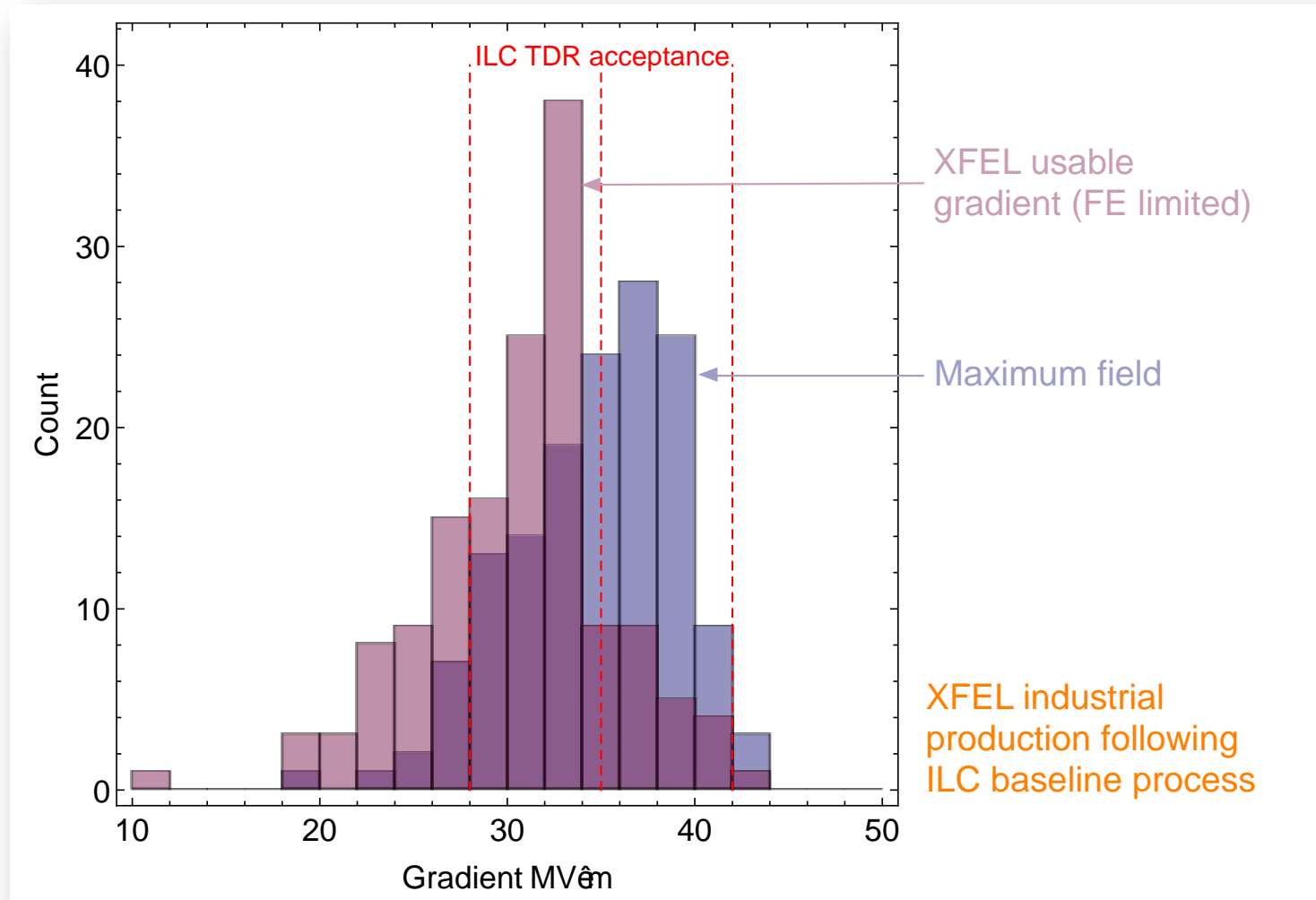
- European XFEL at Hamburg



**In total almost 20  
modules produced**

# Cavity Performance

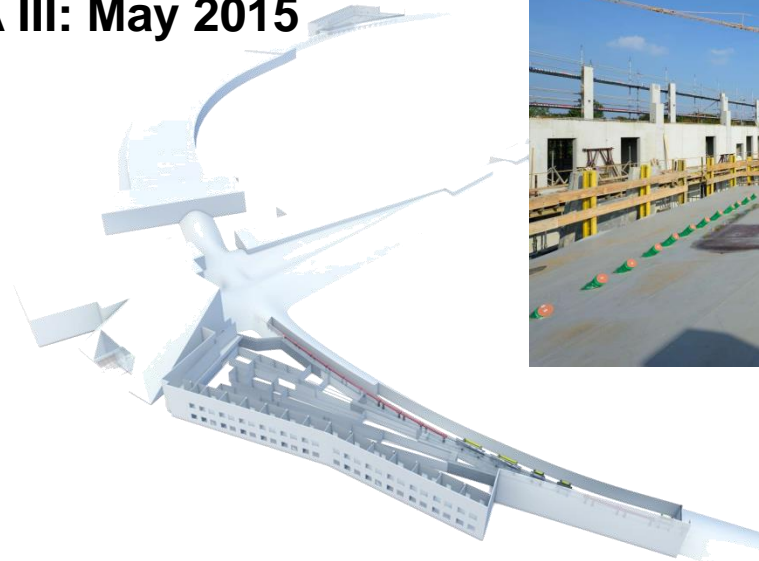
- > Exceeding XFEL specifications
- > Cavities almost suitable for ILC





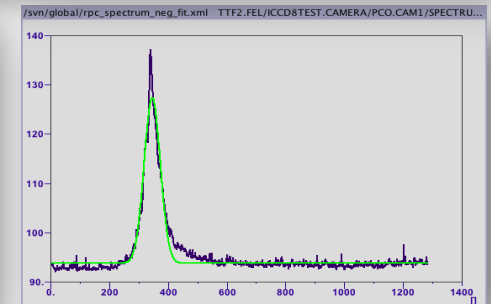
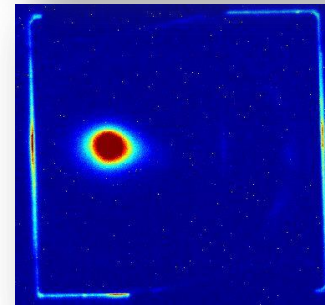
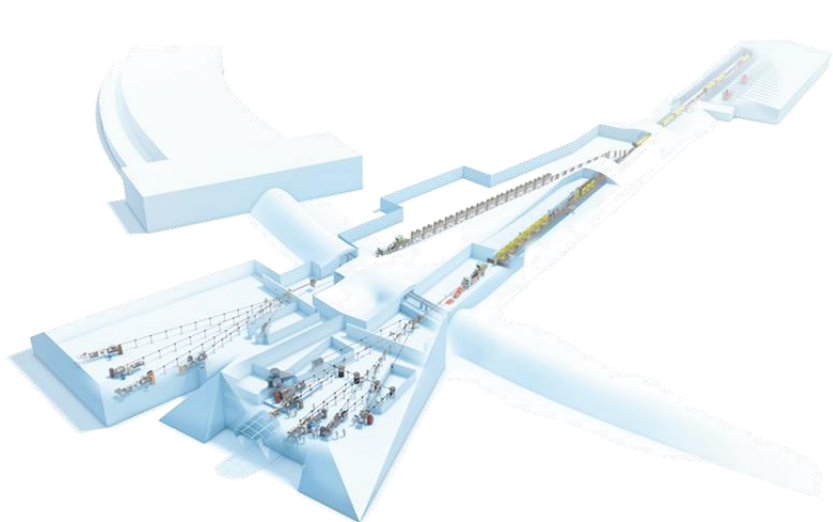
# PETRA III Extensions

- **Work on schedule**
- **10 new beamlines**
- **Double topping-out celebrations on 15. Sept. 2014**
- **Tunnels closed**
- **Installation of infrastructure, magnets and vacuum components in tunnel started**
  
- **User operation PETRA III: May 2015**
- **Start of P3X: Fall 2015**



# FLASH II

- Construction completed
- First FEL-beam at FLASH II
- Tunable undulators
- Test bed for seeding schemes
- up to 7 new beamline ports
- First experiments: April 2015
- Parallel operation to FLASH 1





# DESY Testbeam

- > Shutdown in 2014
- > Time used to rework shielding, targets, infrastructure, safety ...



## > Operation 2015: Mid-January – end of year

## > Main improvements

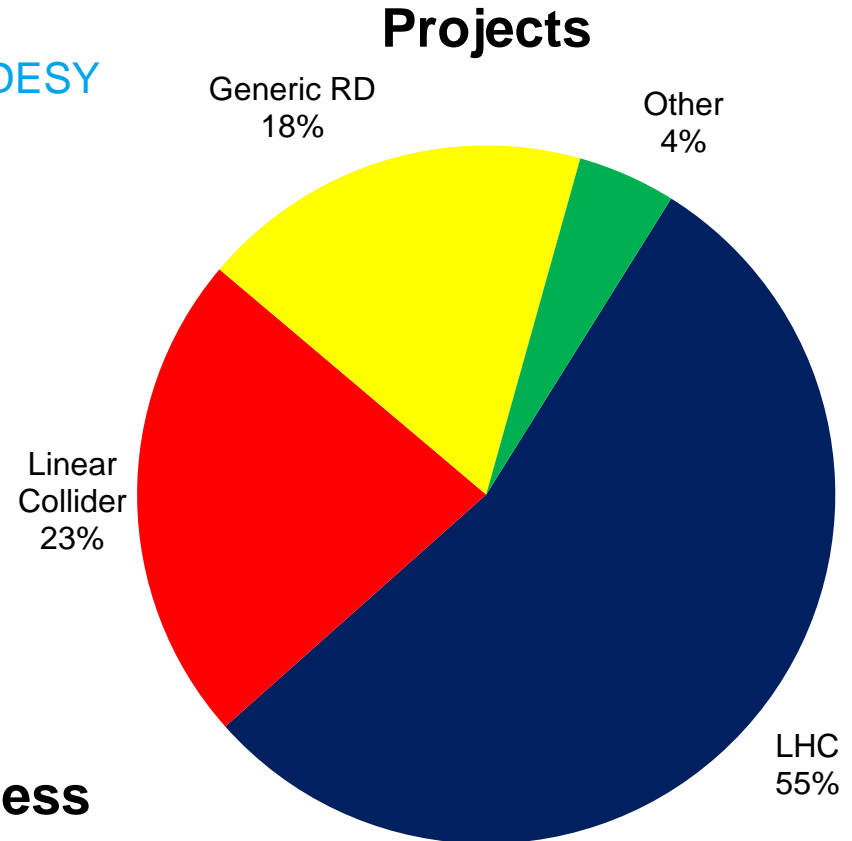
- Second telescope permanently installed at DESY
- Laser-alignment system
- Improved beam diagnostics
- Improved infrastructure (floor, cables etc.)

## > Call for beam time Jan – June 2015

- 30 weeks of beam time
- 22 Groups
- Mostly for LHC: 55 % of groups

## > EU-funded infrastructure a big success

- 68 % of groups request EUDET/AIDA Telescope
- 28 % request the EUDET-PCMAG solenoid





- > **Proposals for funding period 2015-19 evaluated in spring 2014**
  - **Matter and Universe (AP, HEP, HuK): HEP strategy based on LHC exploitation, precision e+e- physics, and theory.**

## **From the evaluation report (Particle Physics):**

*“Topic 1: The proposed activities are a scientifically excellent choice in order to build on outstanding past achievements and to guarantee that DESY, KIT, and the large German community that benefits enormously from DESY’s facilitating role, can remain major and leading partners in the large international collaborations at CERN and possibly ILC in the future, addressing the most fundamental issues of particle physics.”*

- **Astroparticle KIT + DESY also very positively evaluated**
- > **Matter and Technology (accelerators, generic detector R&D)**
  - **Similarly well received**
- > **Many thanks to ECFA for constructive comments!**



# Helmholtz LHC Large Investment Proposal

## > Common DESY-GSI-KIT proposal to Helmholtz for strategic investments for ALICE, ATLAS and CMS

- **Volume: 48 M€ for 2016 – 22**
- **Phase 2 Upgrades and Computing**

Centre	Detector	Computing	Experiments
DESY	20 M€	4,5 M€	ATLAS, CMS, Tier-2+NAF
GSI	4,2 M€	3,0 M€	ALICE, Tier-2
KIT	3,8 M€	12,5 M€	CMS, Tier-1
<b>Total</b>	<b>28,0 M€</b>	<b>20,0 M€</b>	

## > Submitted to Helmholtz in June 2014

- **Under evaluation, result in spring 2015**



DESY  
GSI  
KIT

Proposal for a large investment (> 15 M€)

### Full Scientific Exploitation of the Large Hadron Collider

The Helmholtz centres DESY, GSI and KIT are leading partners in the large international experiments ALICE, ATLAS and CMS and constitute the backbone of the scientific exploitation of the Large Hadron Collider (LHC) in Germany. This proposal lays the foundation for fostering this role through significant detector upgrade contributions and the extension of the computing capabilities at a level commensurate to the expected LHC data rates and volumes. It provides the cornerstone of Germany's mid- and long-term contribution to the LHC. The proposal is embedded into a coherent national, European and global concept for high-energy physics and promises technological advances for the benefit of all Helmholtz research areas and beyond.



# Helmholtz LHC Large Investment Proposal: Detector

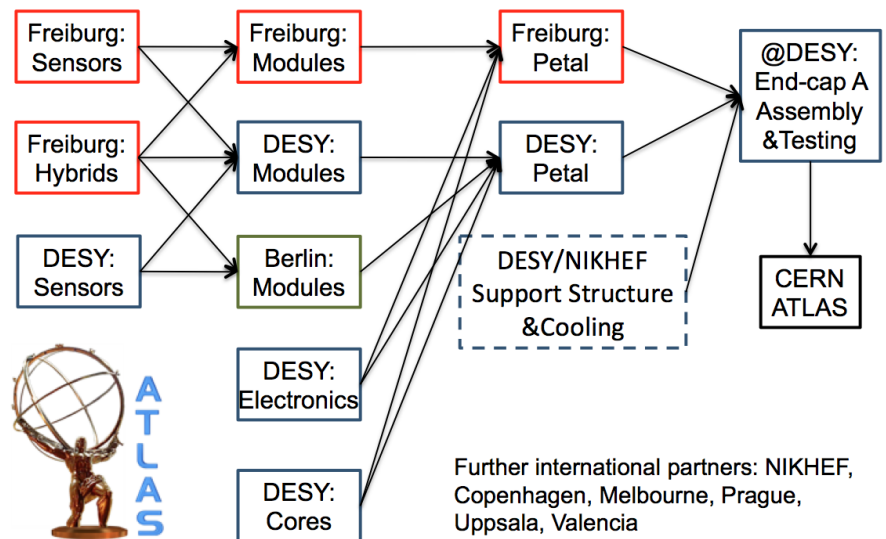
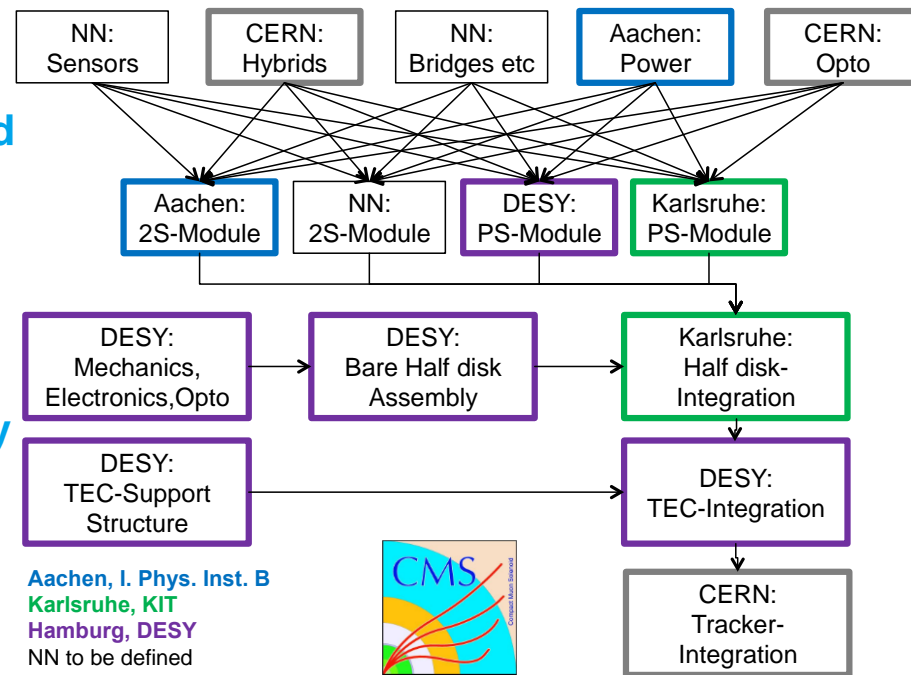
## > LHC phase 2 upgrades:

- DESY 2 x 10 M€ investment for ATLAS and CMS
- Construction & integration of one tracker endcap for ATLAS and CMS in Germany together with universities
- DESY plans to set up a Detector Assembly Facility
- KIT 3.8 M€ for CMS tracker electronics

## > GSI 4.2 M€ for TPC upgrade & trigger for LS2

## > Embargo for research field „Matter“: no money before 2018!!!

## > Good prospects for university funding (BMBF)



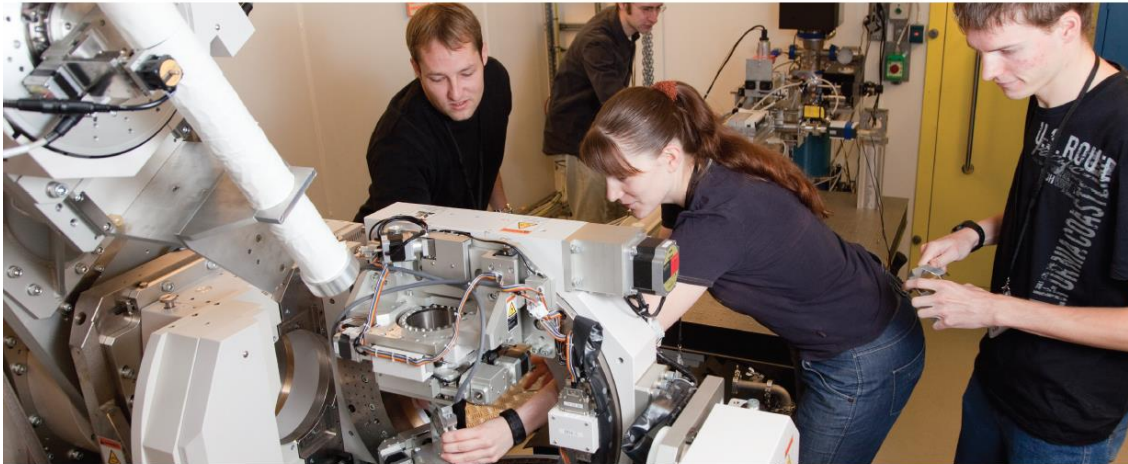
Further international partners: NIKHEF, Copenhagen, Melbourne, Prague, Uppsala, Valencia

# DESY Summerstudent Programme 2015

# SUMMER STUDENTS.

DESY International Summer Student Program 2015  
21 July to 10 September

**Application deadline  
for 2015:  
January 31, 2015**



DESY is one of the world's leading accelerator centers for investigating the structure of matter. DESY develops and builds large particle accelerators and conducts research in the fields of photon science and particle physics. The research facilities of DESY are used by a large international community of scientists. Each summer DESY offers students in physics or related natural science disciplines the opportunity to participate in its research activities. About 100 students from all over the world take part in DESY's research and attend the lecture program.

[www.desy.de/summerstudents](http://www.desy.de/summerstudents)



## **Photon Science**

Summer students join experiments which are carried out with soft and hard X-rays using a variety of spectroscopic and scattering techniques for research in the fields of physics, chemistry, biology etc. Activities range from preparation, realization and evaluation of measurements to improvements of instrumentation.

## **Elementary Particle Physics, Astroparticle Physics and Accelerators**

Summer students will work in the analysis, software or detector related fields of experiments in elementary particle physics (LHC, ILC, BELLE II, ALPS-II) and astroparticle physics (CTA), development of particle accelerators, theory of elementary particles or computing.

## **Application Deadline is 31 January, 2015.**

Qualified applicants should have completed three years of full time studies on a university level by summer 2015.

All participating students will obtain financial support.

