

Science at accelerator-based X-ray sources

DESY
European XFEL
Turkey

Goals
Potentials

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Photon Science at DESY



DESY/European XFEL-Turkey

- since 1990s cooperation DESY-Turkey (MoU with Ankara U/TAC), later also European XFEL
 - Exchange of people, joint projects
- Recently boosted by launch of German-Turkish Year of Science in 2014
- Various activities under this framework



*Ministers Johanna Wanka and Fikri Işık
Kick off German-Turkish Year of Science,
January 2014*



Previous DESY/European XFEL – Turkey Events

> Series of events with Turkish partners

- Turkish delegation visit, January 2014
- First Workshop, July 2014 in Istanbul
- Public Roadshow at Turkish universities, May 2015
- Public German-Turkish Science Day, Dec 2015

> Goals

- Raise awareness/visibility
- Sound out cooperation potential
- Prepare ground/base for future projects



XFEL,
Jan 2014



Istanbul, July 2014



Hamburg
Dec 2015

Ankara
May 2015



Flow of the workshop program

18:30 - 18:45

Short Break

18:45 - 19:45

Closing Session

Wrap up of workshop and discussion on

- *proposal system & best practice*
- *towards joint pilot projects*
- *how to continue/extend the collaboration with Turkey*
- *next steps*

Location: SemR 4a/b

Protein Signaling in

20:00 - 22:30

Workshop Dinner (jointly with FXE speakers/chairs) (Bistro/Canteen)

17:40

Structural biology as a versatile tool to understand bacterial proteins: Enzymes and Immune System Regulation 10'

Speaker: Burcu Kaplan-Türköz (Ege University)

Material: [Abstract](#) 

18:00

Reactivity Zones around Atmospheric Pressure Plasma Jets 10'

Speaker: Özgür Birer (Koc University)

Material: [Abstract](#) 

18:10

Discussions 20'

13:20

Synchrotron Facilities (disclaimer: not the whole list)



A typical synchrotron with multiple beamlines

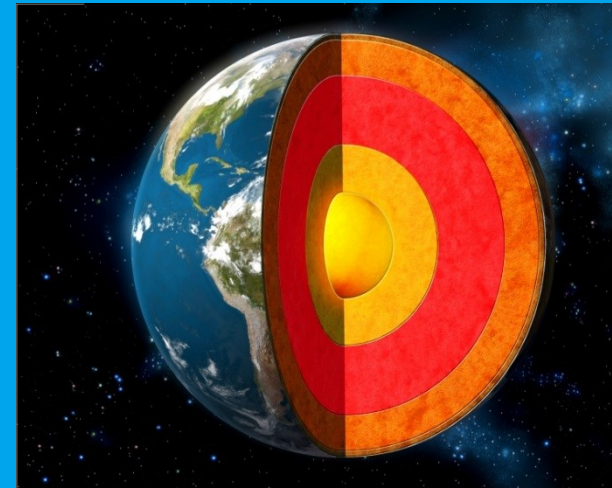
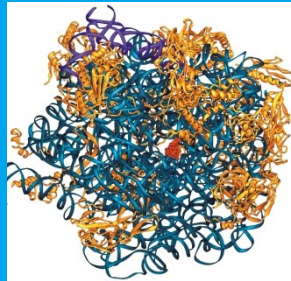
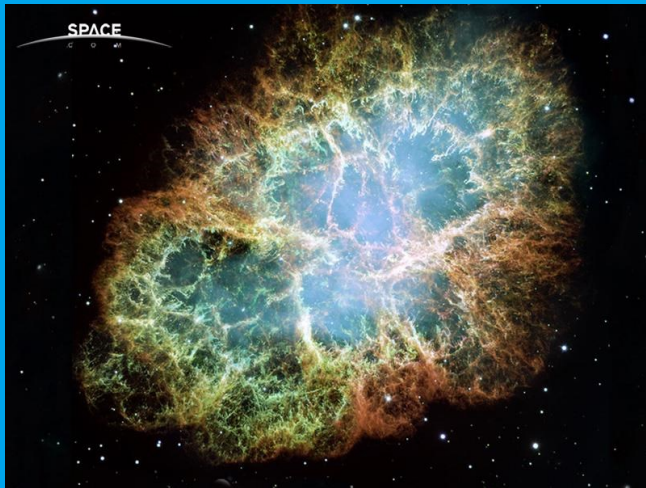


Brilliant Light

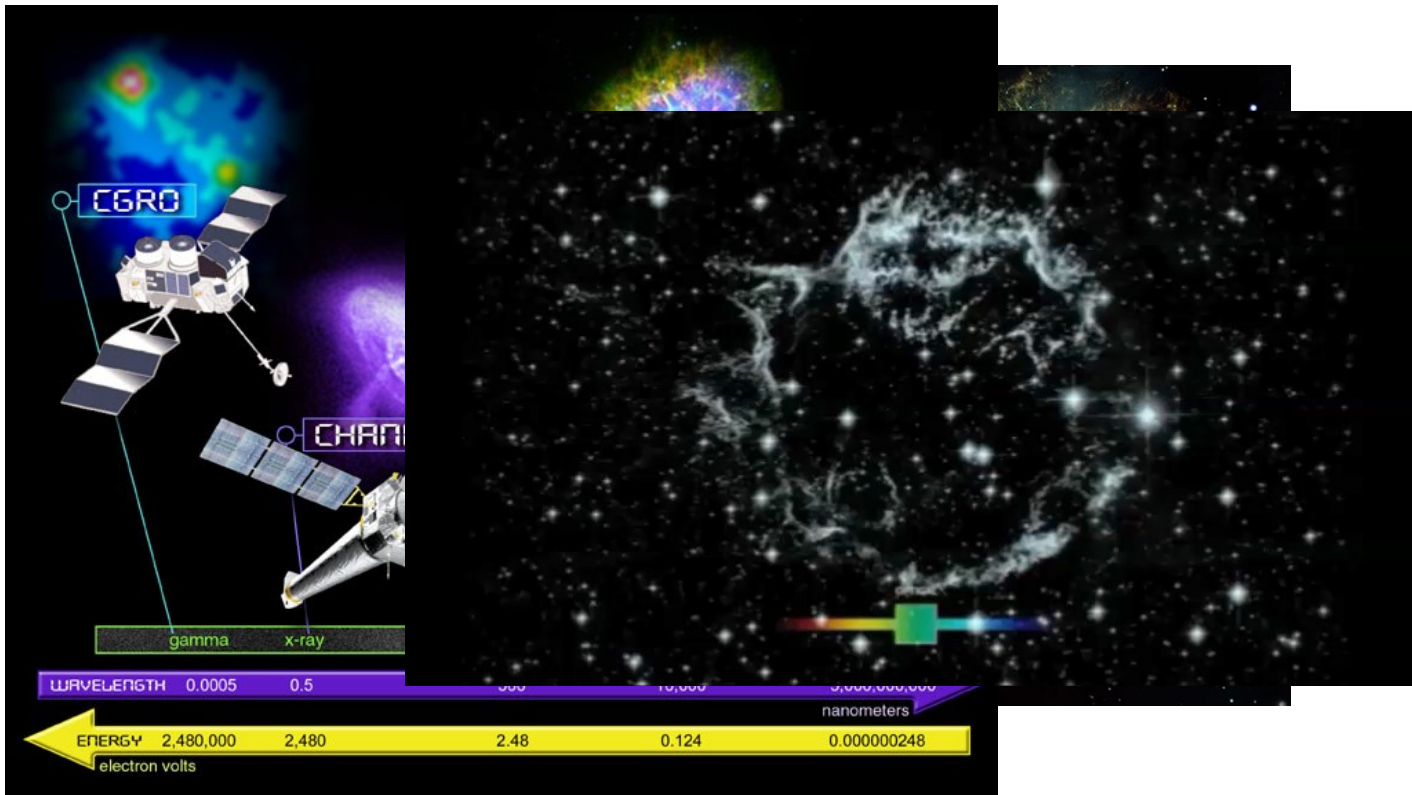
A roadshow about Hamburg's large-scale research facilities

From Galactic Centers to the Earth's Core and much more:

Scientific applications of accelerator-based light sources



X-ray Astronomy



Extreme temperatures cause atoms loose their electrons (highly charged ions)

Heavier atoms emit in the x-ray regime

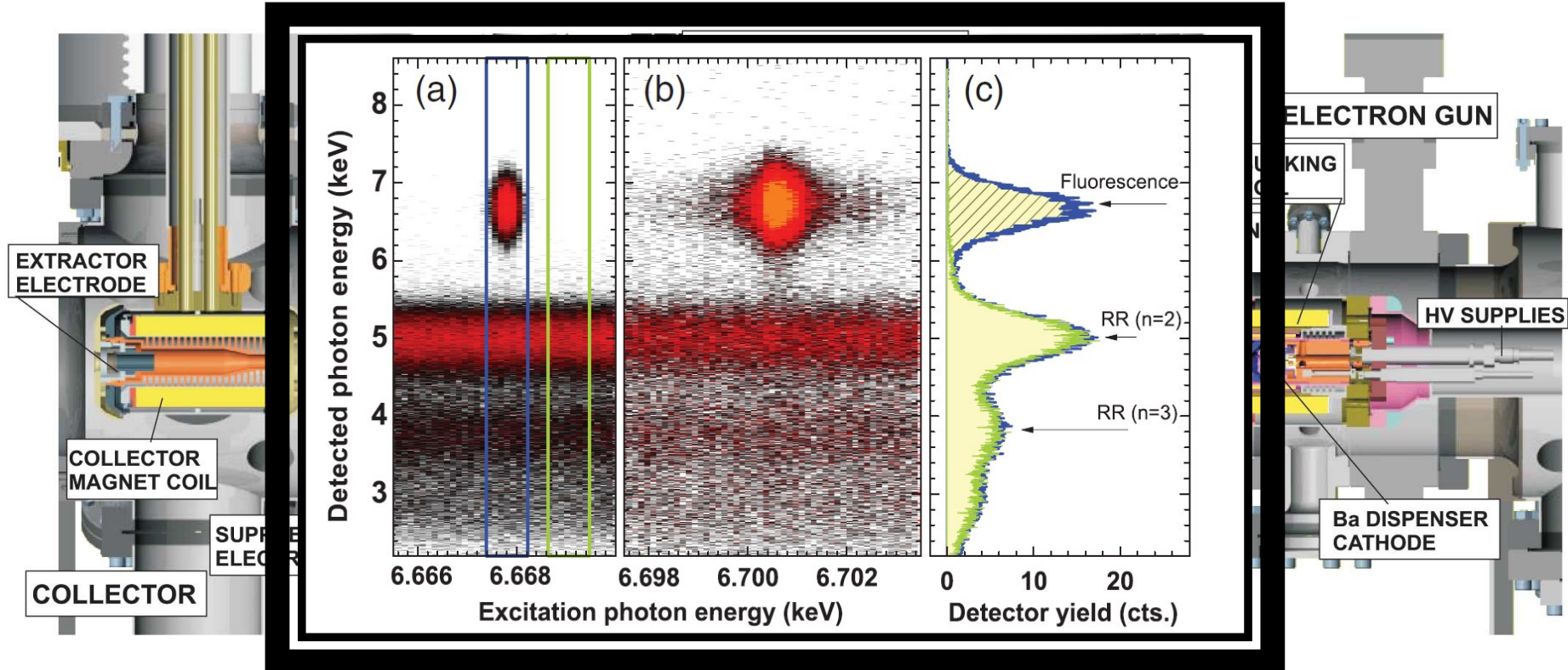
Events are interpreted based on known spectroscopic absorption and emission energies

accurate spectral properties of highly charged ions are needed

Universe in laboratory

Precision Spectroscopy with EBIT & Synchrotron (FEL)

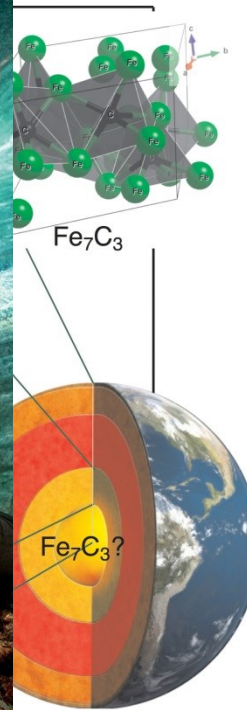
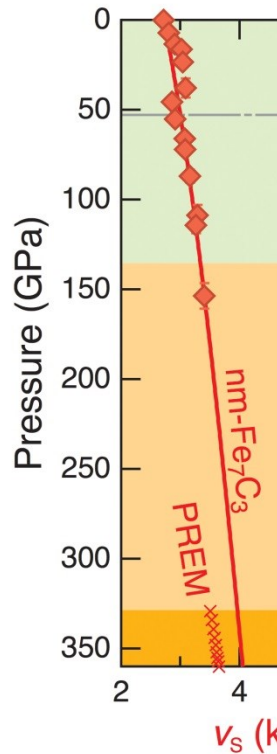
The trap: ^{superconducting Helmholtz coils} electrons attract ions and ionize them more and more and more...



Trap potential $U_t \approx 200$ V

Trap depth ($U_t \times$ ionic charge) ≈ 10000 eV

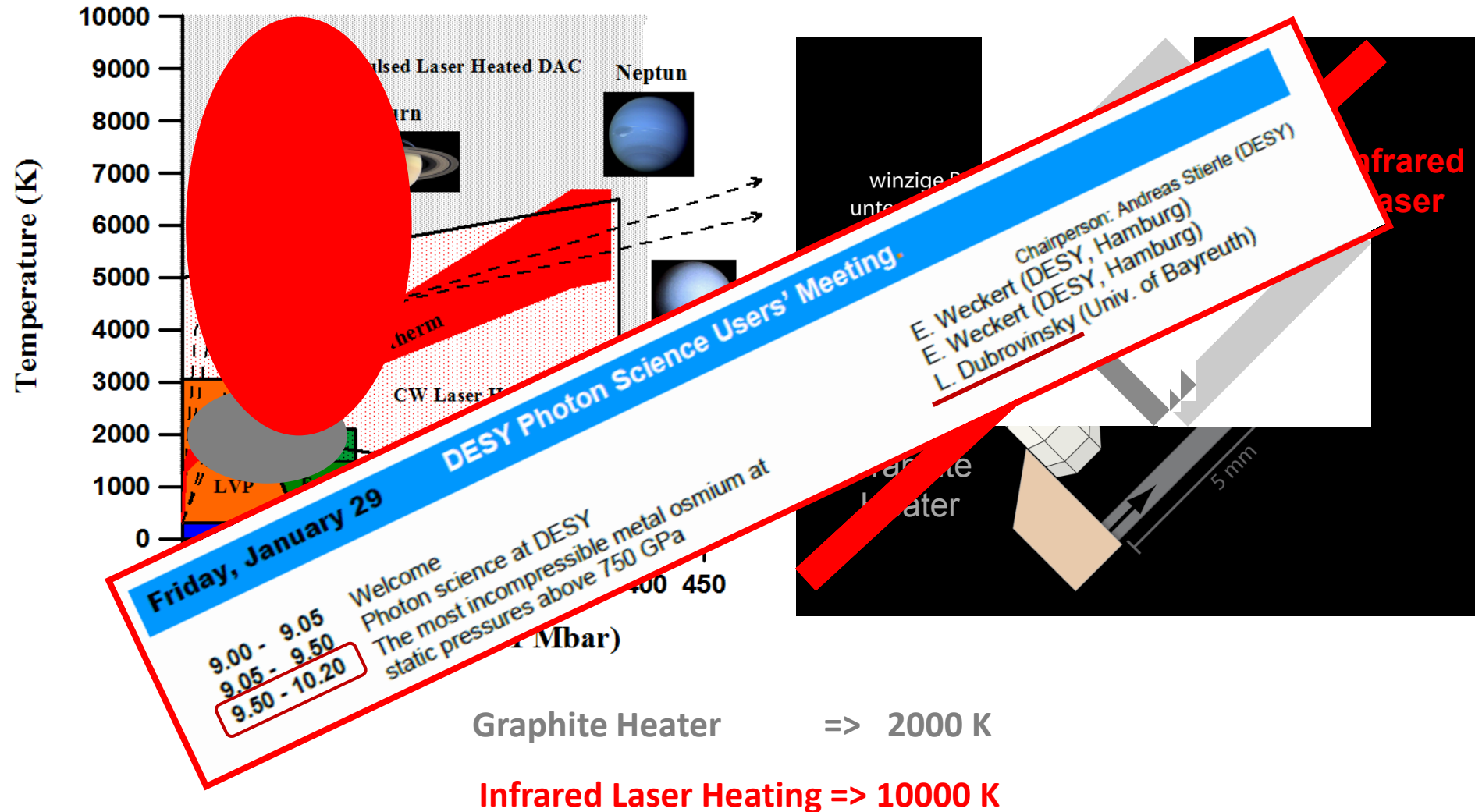
Quest for missing carbon



- Discrepancy
- Content of the

c wave measurements

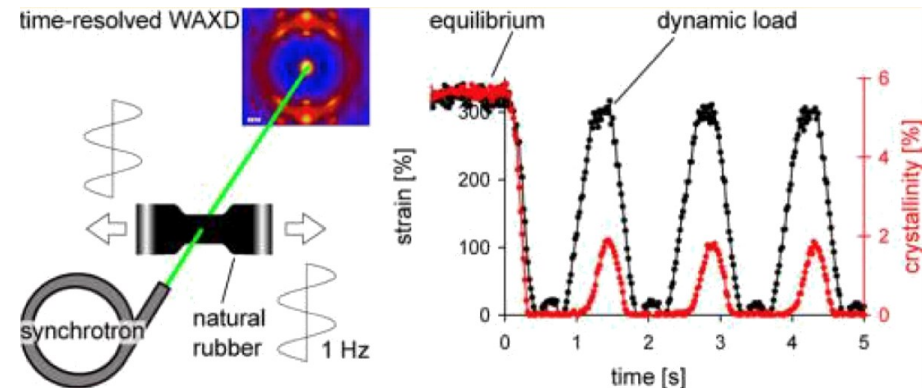
Earth's core and beyond



More science examples from synchrotrons



In-situ SAXS at P03: stress induced crystallization
K. Brüning et al., *Macromolecules* (2012)

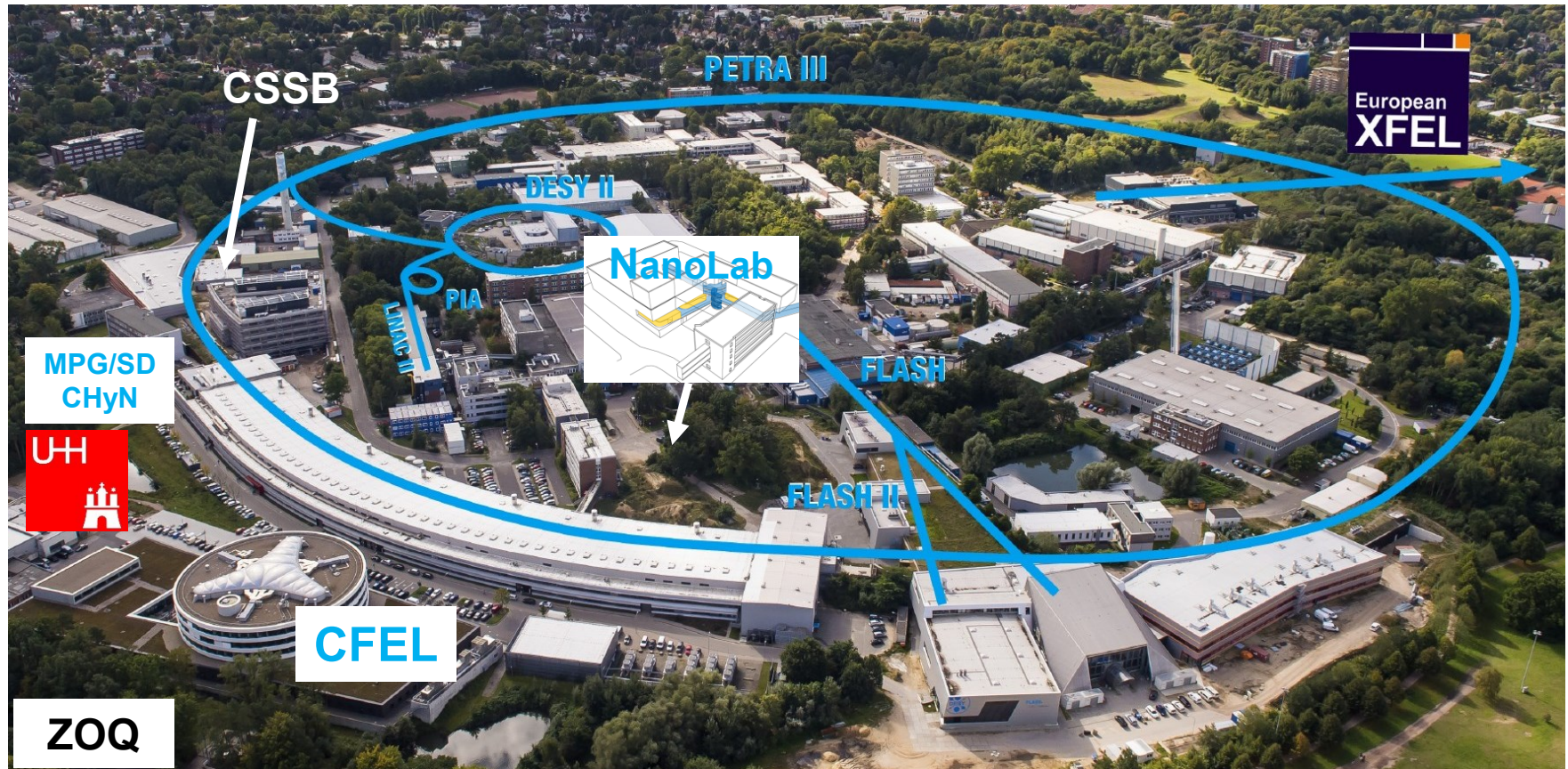


Facilities at DESY: Infrastructure for Science

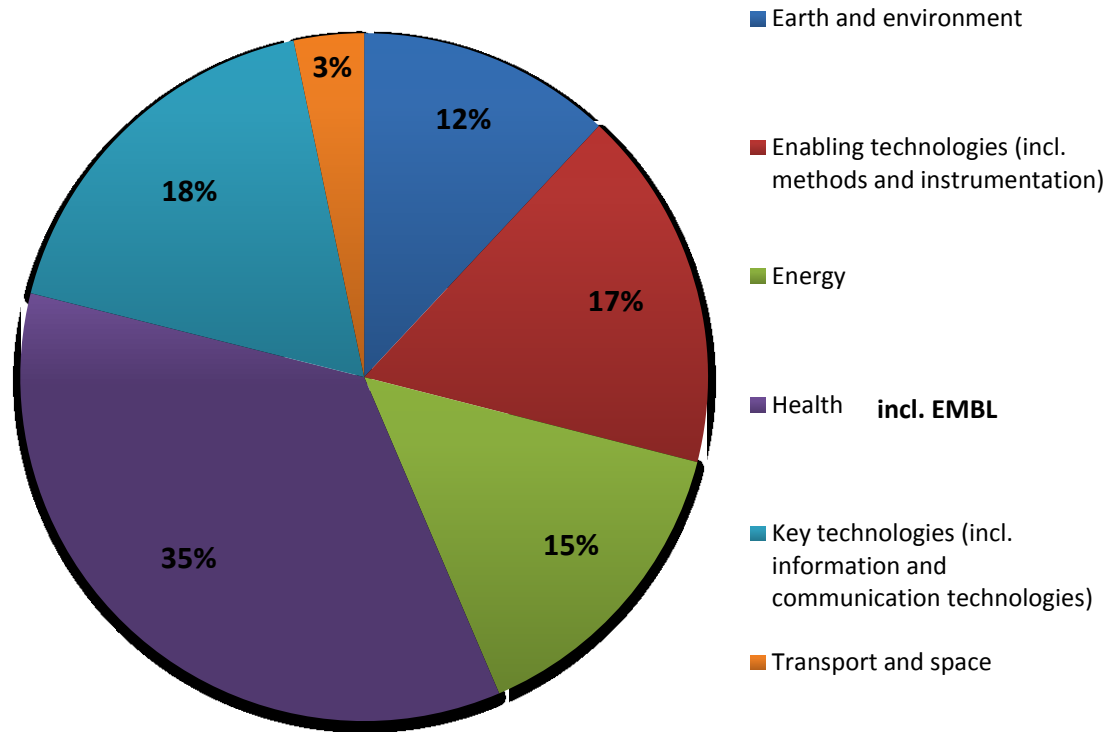
Structural biology:
EMBL, CSSB

Materials science:
HZG

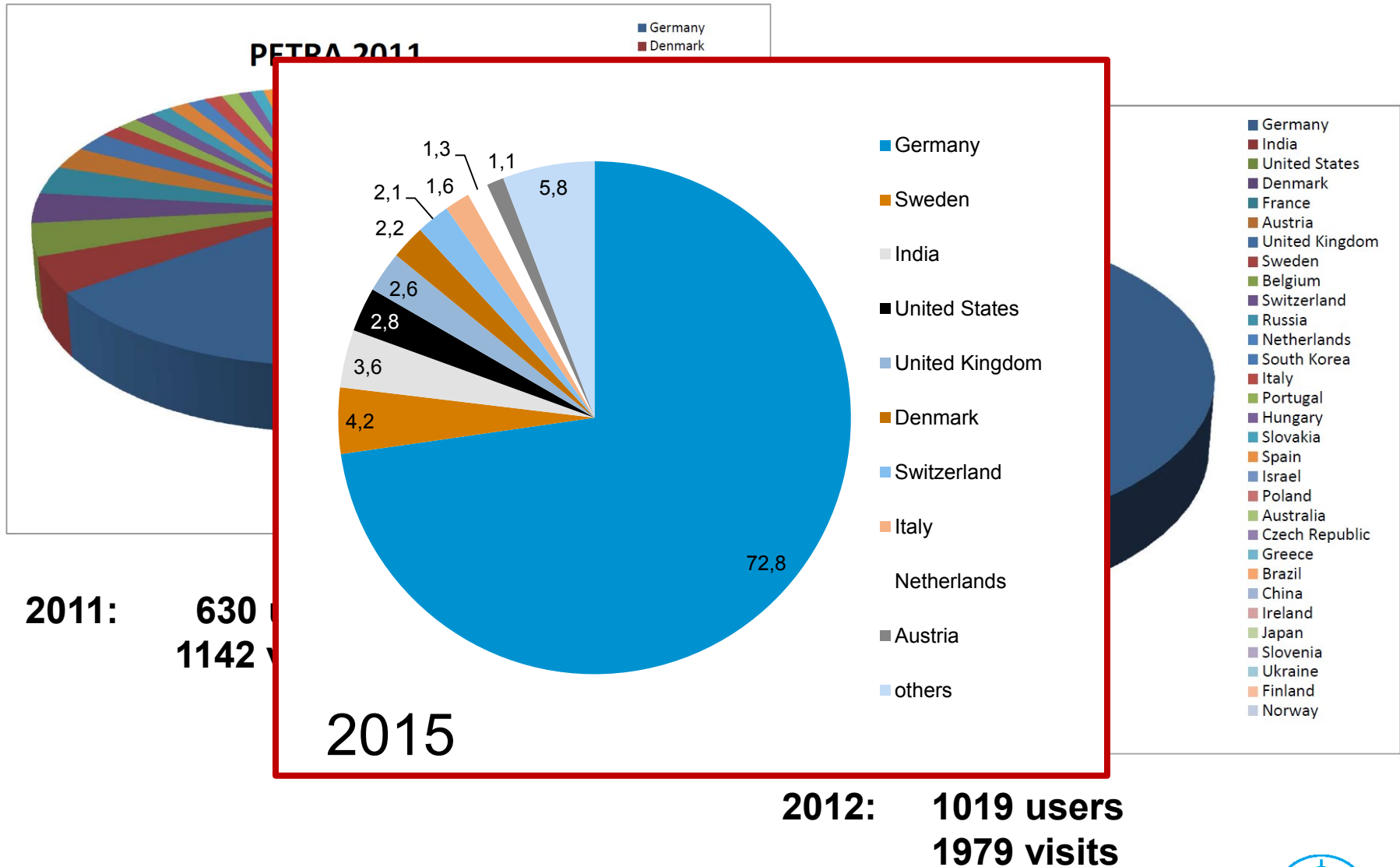
Geo-science:
GFZ, BGI



Proposal Categories – PETRA III 2015

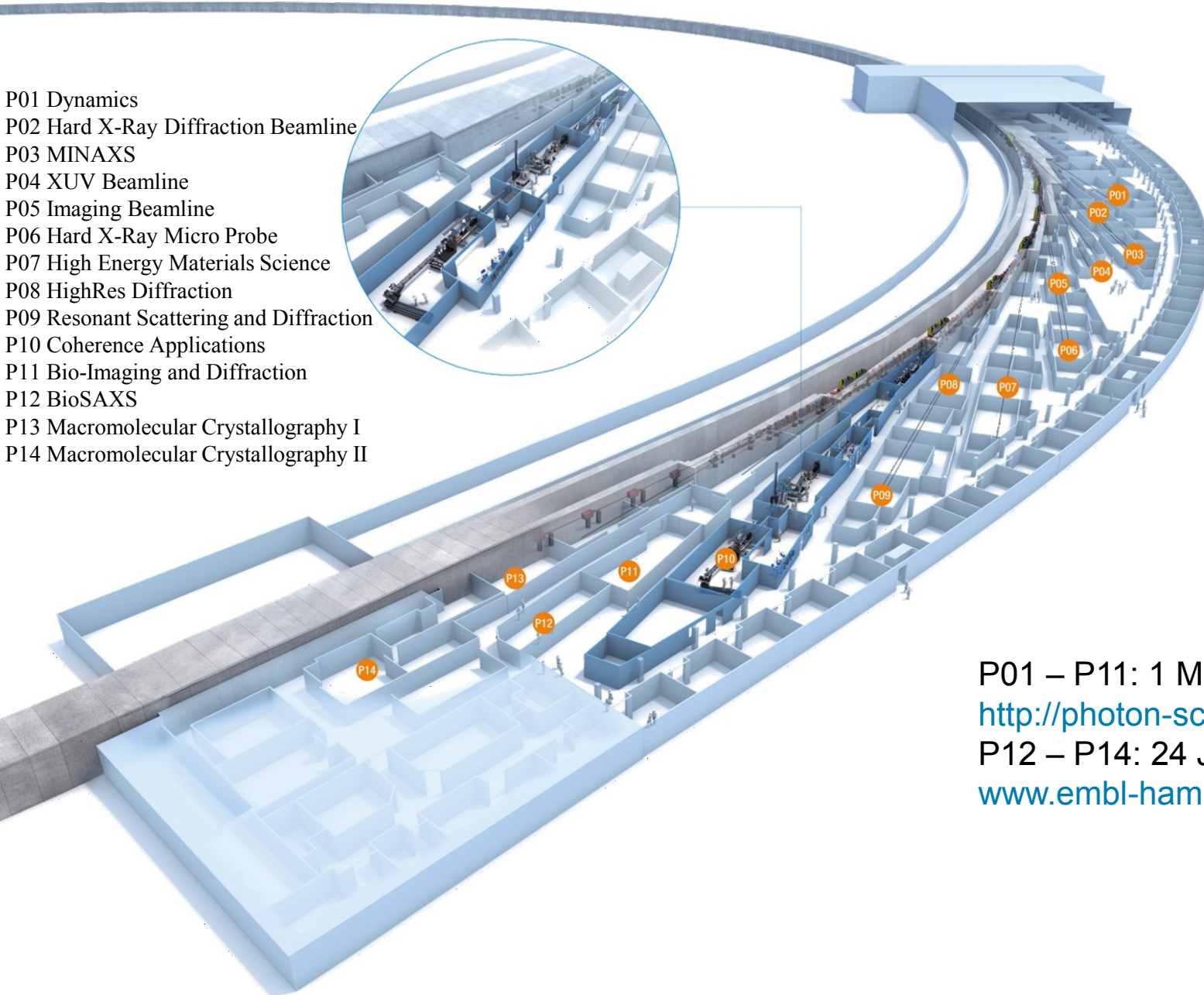


PETRA III: user base



Proposal deadline – 1 March 2016

- P01 Dynamics
- P02 Hard X-Ray Diffraction Beamline
- P03 MINAXS
- P04 XUV Beamline
- P05 Imaging Beamline
- P06 Hard X-Ray Micro Probe
- P07 High Energy Materials Science
- P08 HighRes Diffraction
- P09 Resonant Scattering and Diffraction
- P10 Coherence Applications
- P11 Bio-Imaging and Diffraction
- P12 BioSAXS
- P13 Macromolecular Crystallography I
- P14 Macromolecular Crystallography II



P01 – P11: 1 March
<http://photon-science.desy.de>
P12 – P14: 24 January
www.embl-hamburg.de

BMBF-TÜBİTAK Intensified Cooperation (IntenC)



Bundesministerium
für Bildung
und Forschung



- Mobility measures in the context of a joint research project
- Feasibility and pilot studies within the context of a joint research project
- Bilateral workshops in the context of a joint research project
- Joint research projects, in preparation also for further cooperation under national or European research programmes
- up to 150K EUR for each party
- Deadline: not announced

Teaming Phase 1:

Deadline: 15 November

400K EUR

1 year

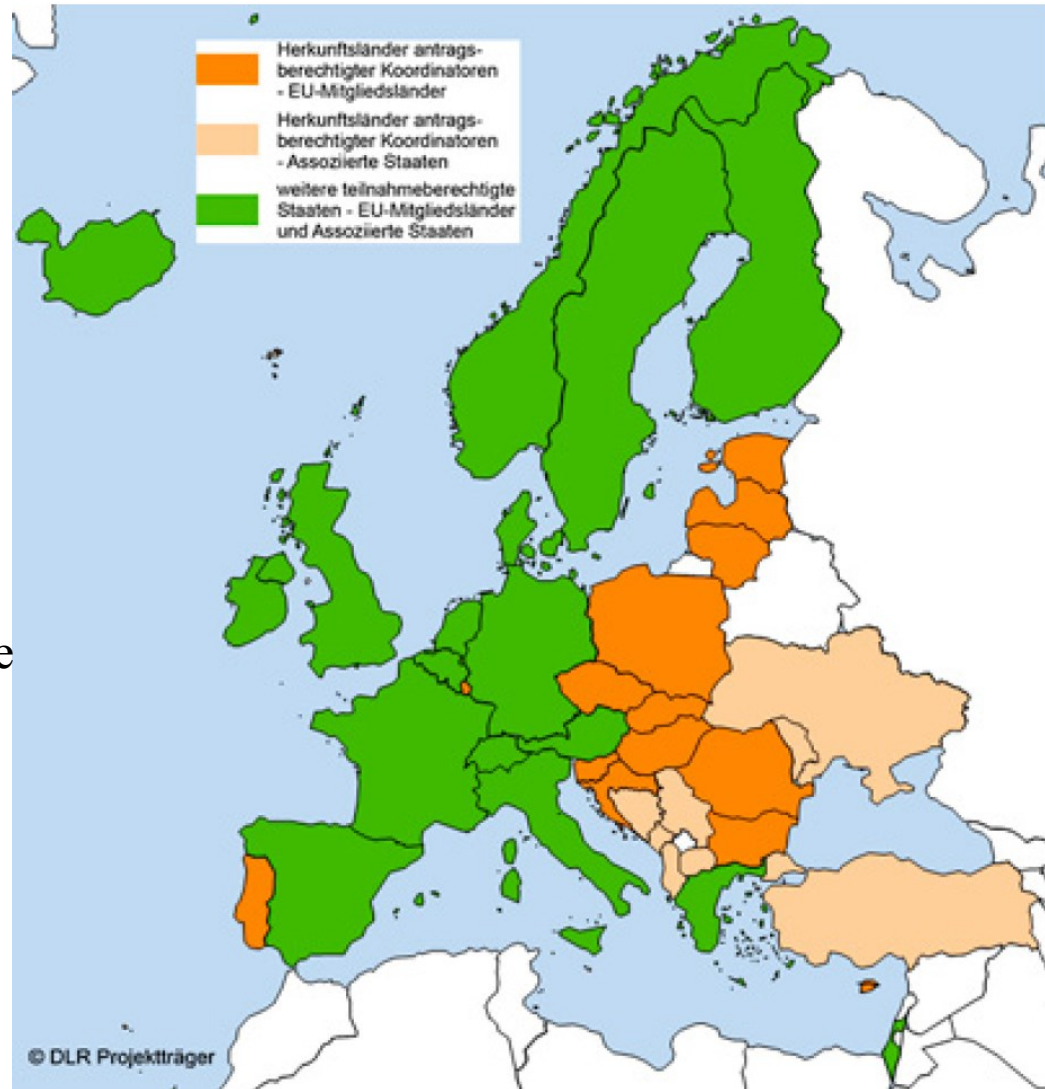
Preparing business plan

Teaming Phase 2

up to 15 M EUR

5-7 Year

Building a center of excellence



Thank you

