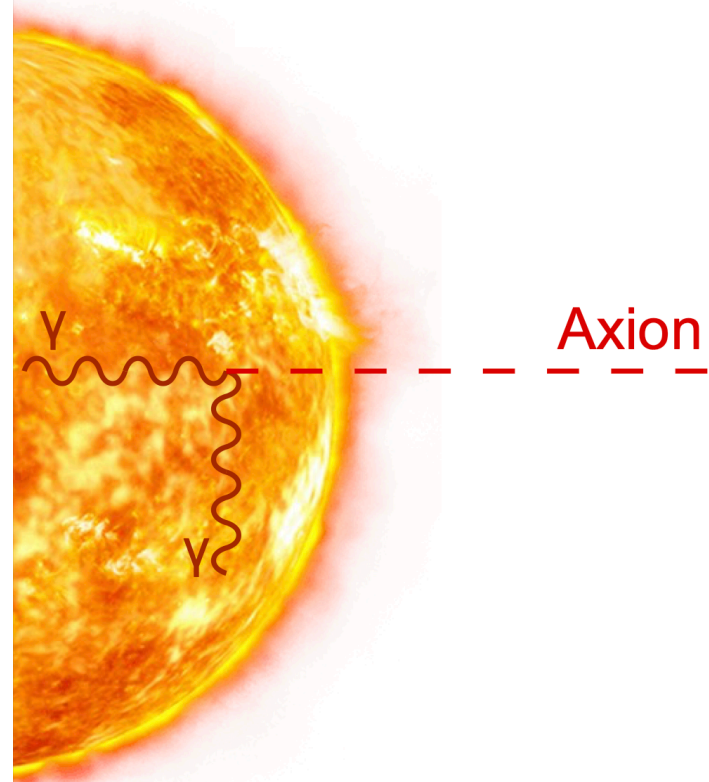


BabyIAXO

A New Generation Axion Helioscope at DESY

Daniel Heuchel
daniel.heuchel@desy.de
FH Fellow Meeting
28th April 2023



HELMHOLTZ



About Me

My Path Through Germany and Different Experiments

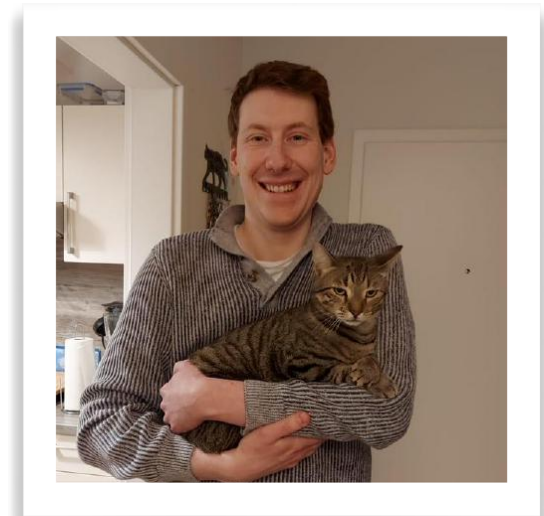
Cat-Dad Daniel



About Me

My Path Through Germany and Different Experiments

- Born in Giessen (Hessen) in 1992

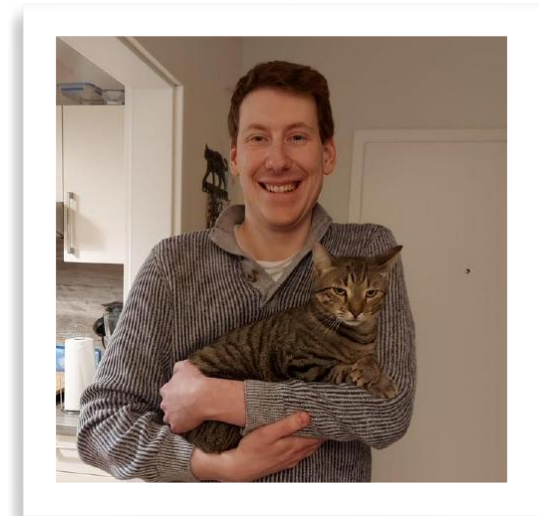
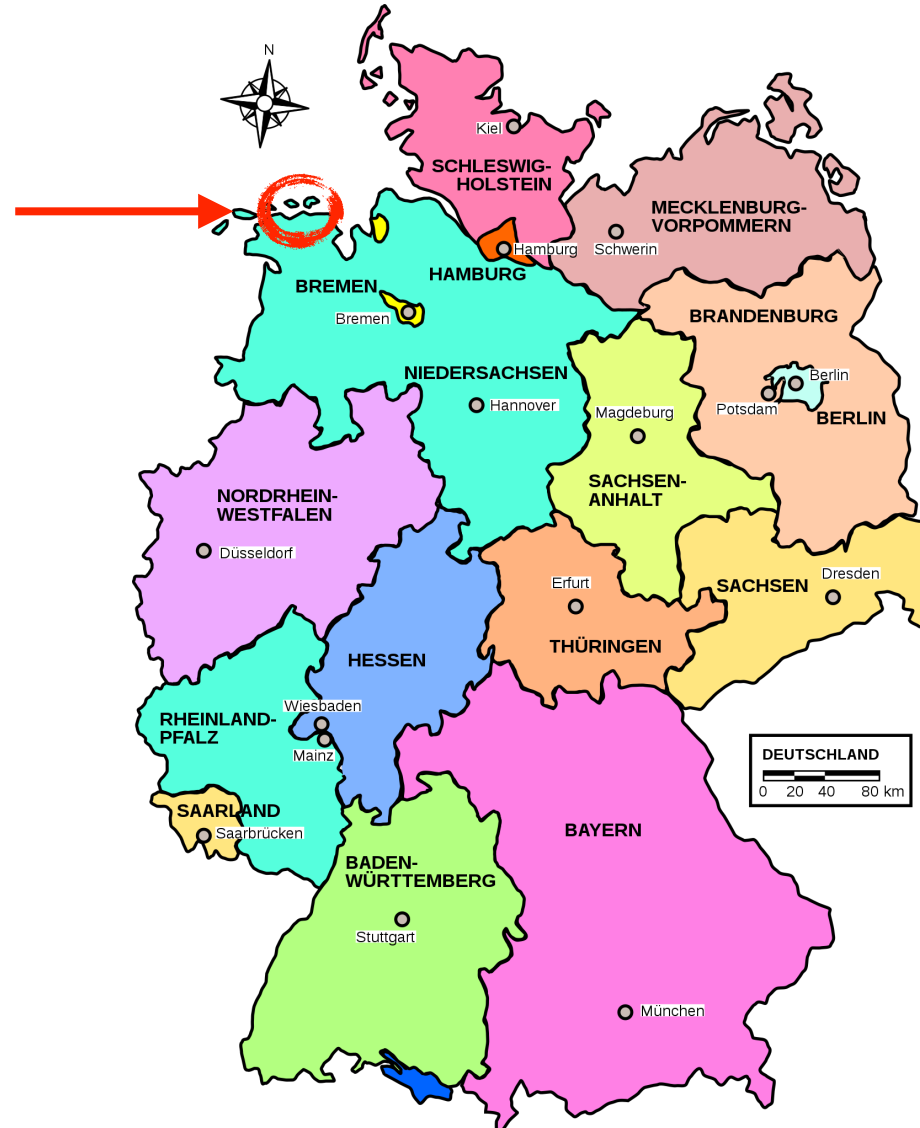


About Me

My Path Through Germany and Different Experiments



- Grown up in Neuharlingersiel...



About Me

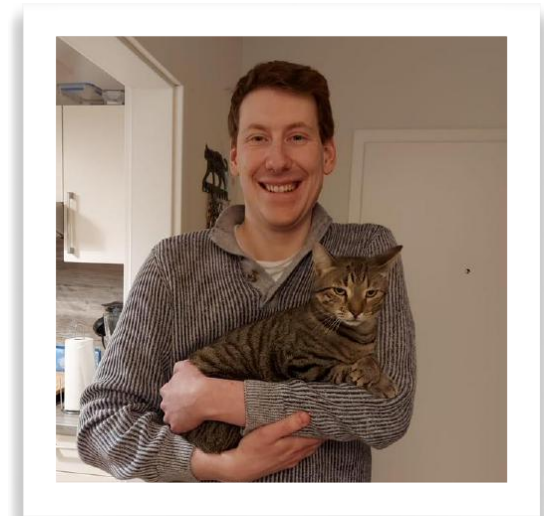
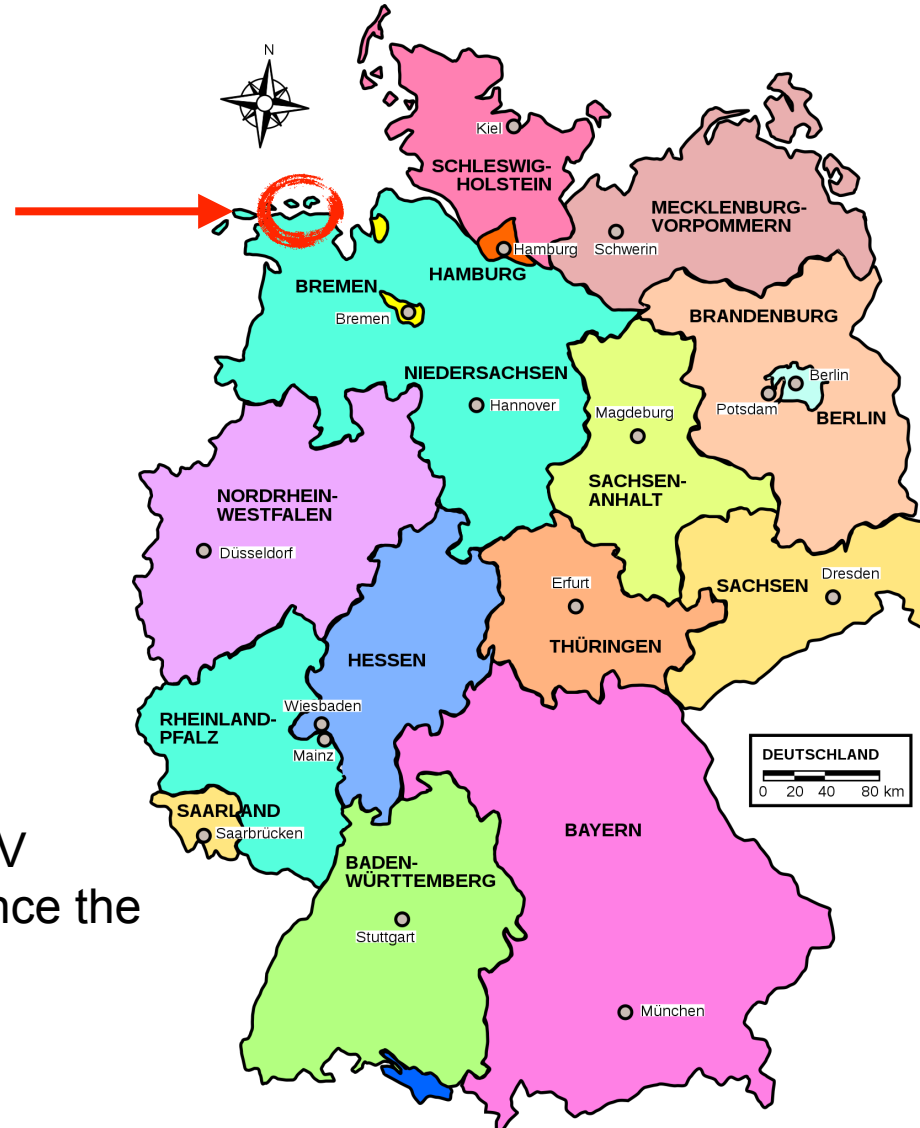
My Path Through Germany and Different Experiments



- Grown up in Neuharlingersiel...



... and a HSV supporter since the early days



About Me

My Path Through Germany and Different Experiments

Technische
Universität
München



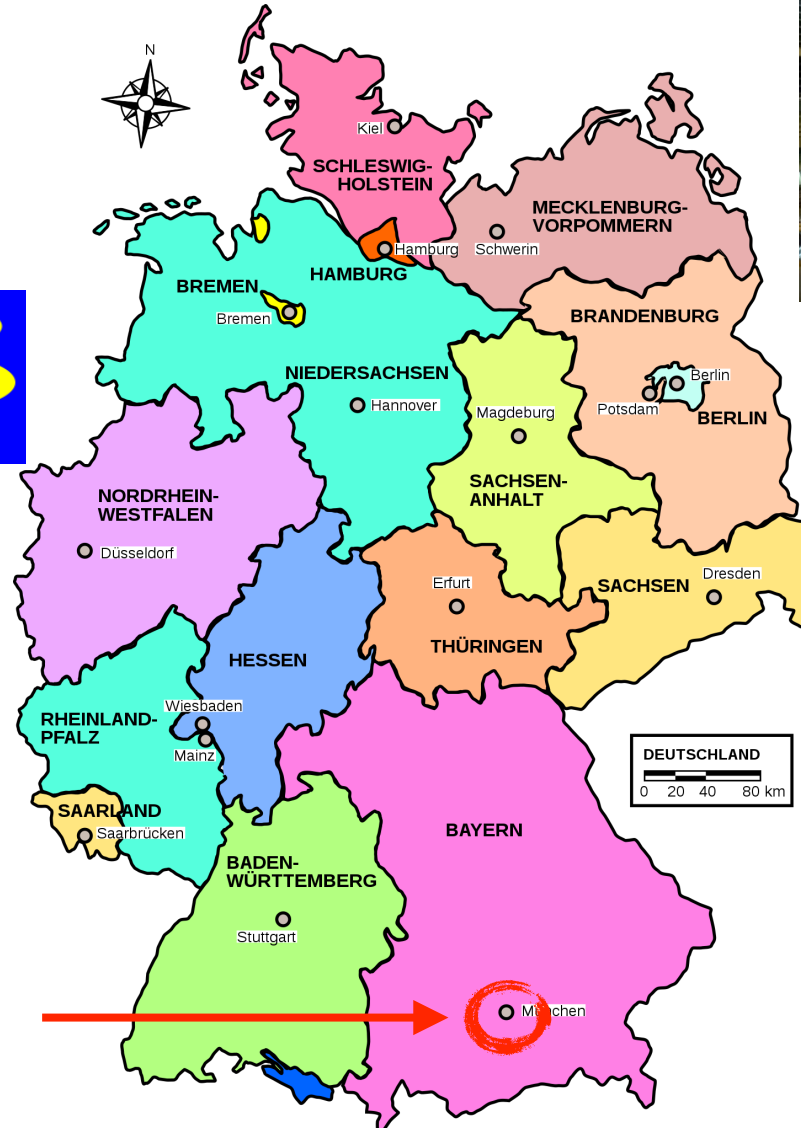
Max-Planck-Institut
für Physik



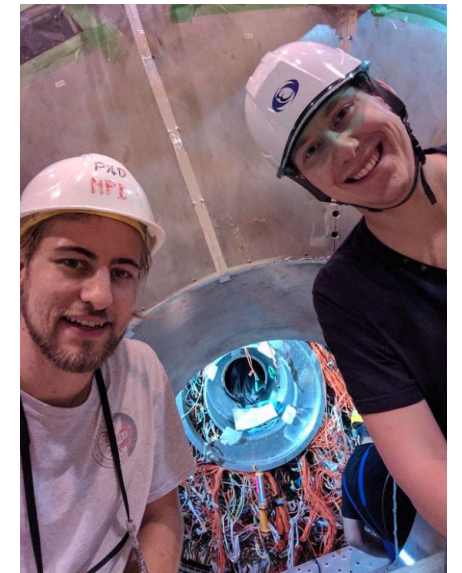
ALICE



- TUM and MPP Munich (2011-2018):
 - ➔ Bachelor: performance studies for GEM-based TPC prototypes for the ALICE TPC upgrade
 - ➔ Master: construction and commissioning of radiation monitoring detector CLAWS for BEAST II as part of the Belle II collaboration



BEAST II team in front of Belle II IP



CLAWS team

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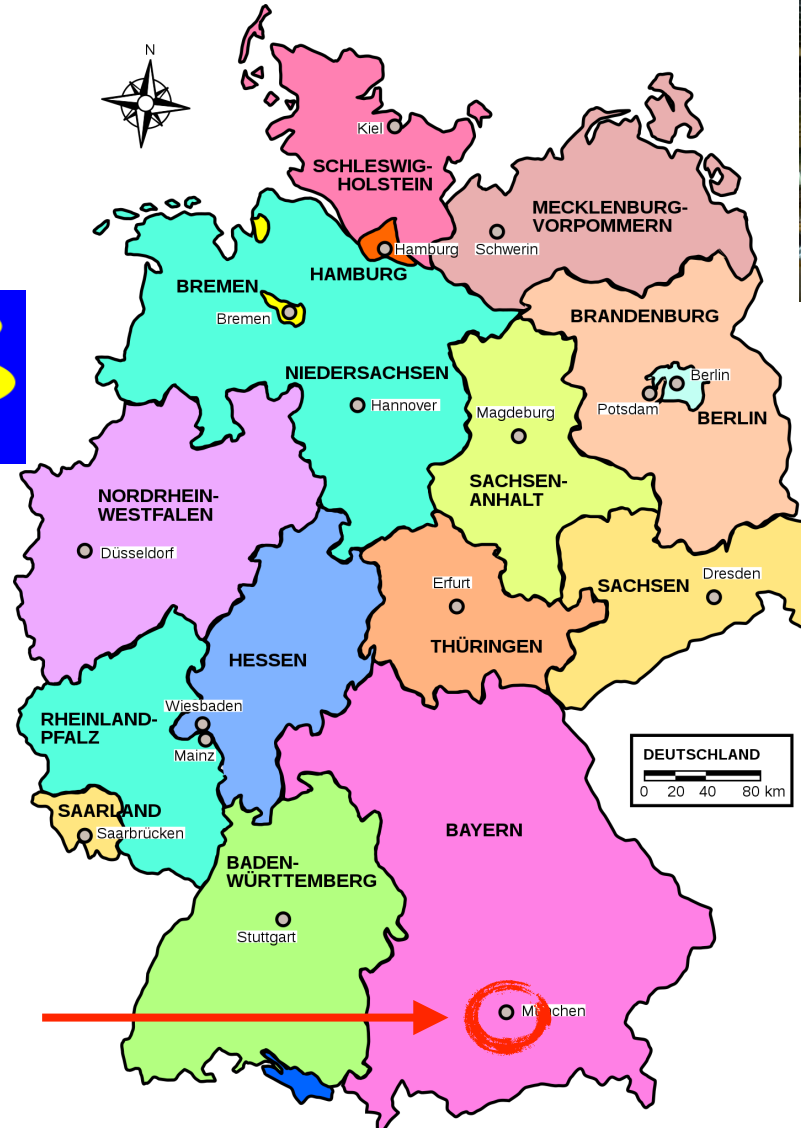
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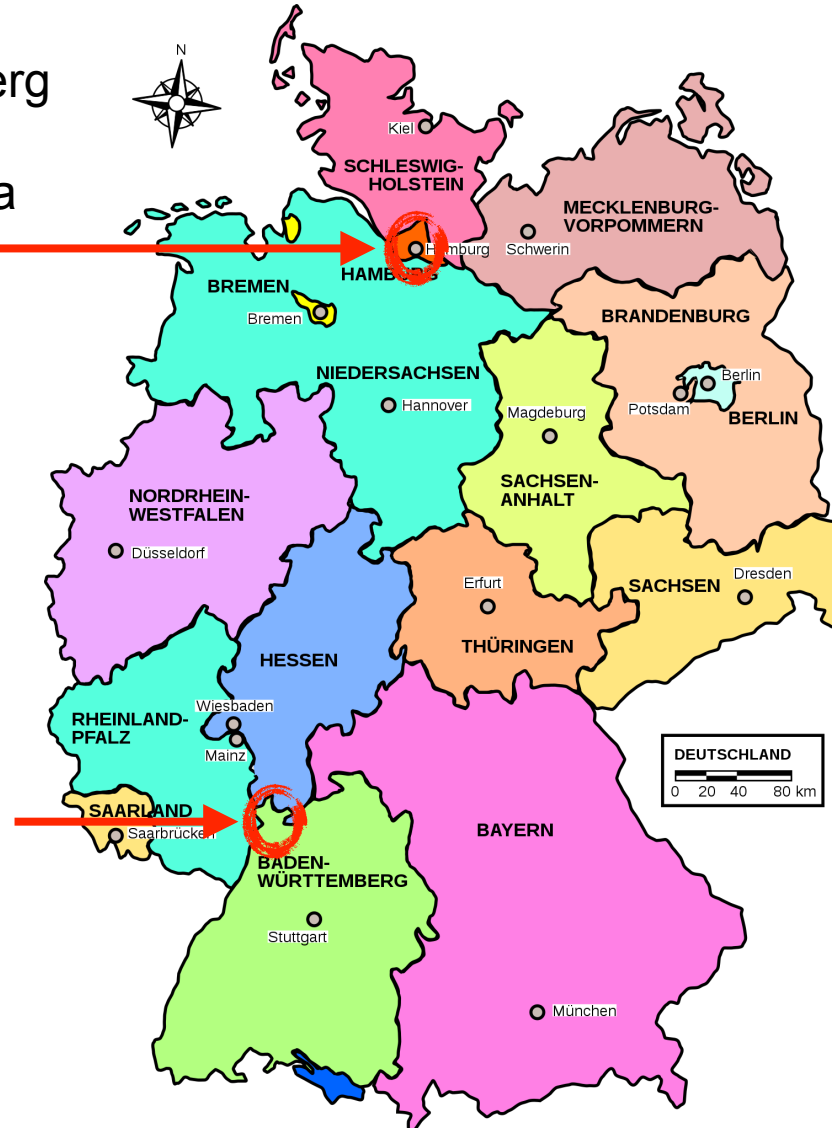
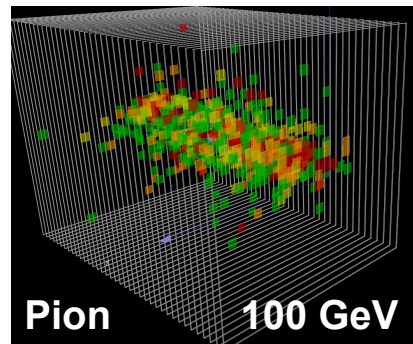
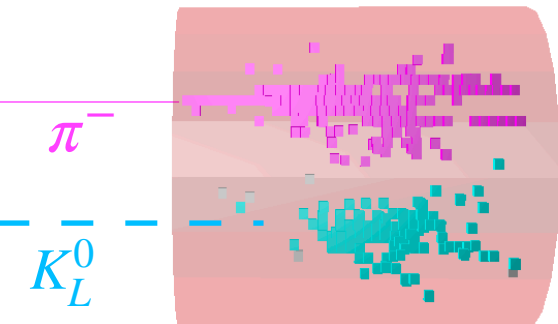
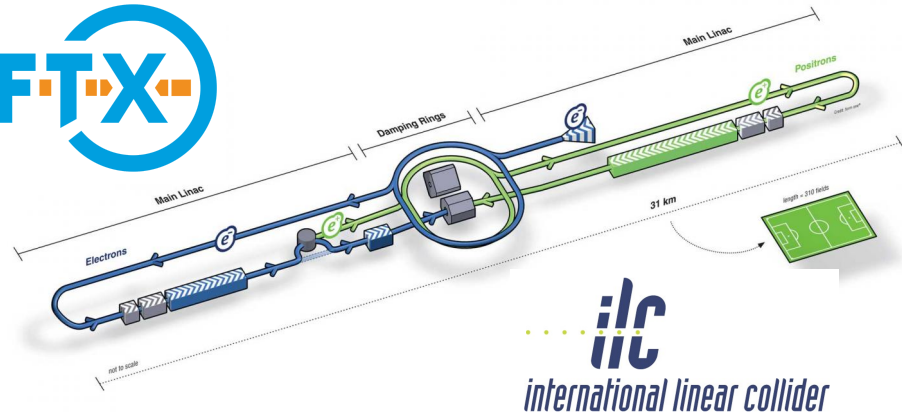
... and some painful visits in the Allianz arena...



About Me

My Path Through Germany and Different Experiments

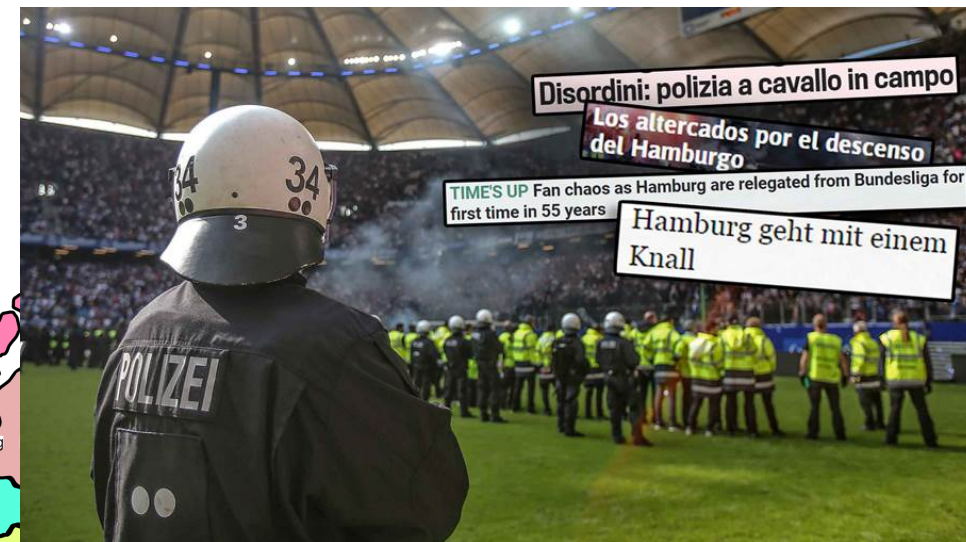
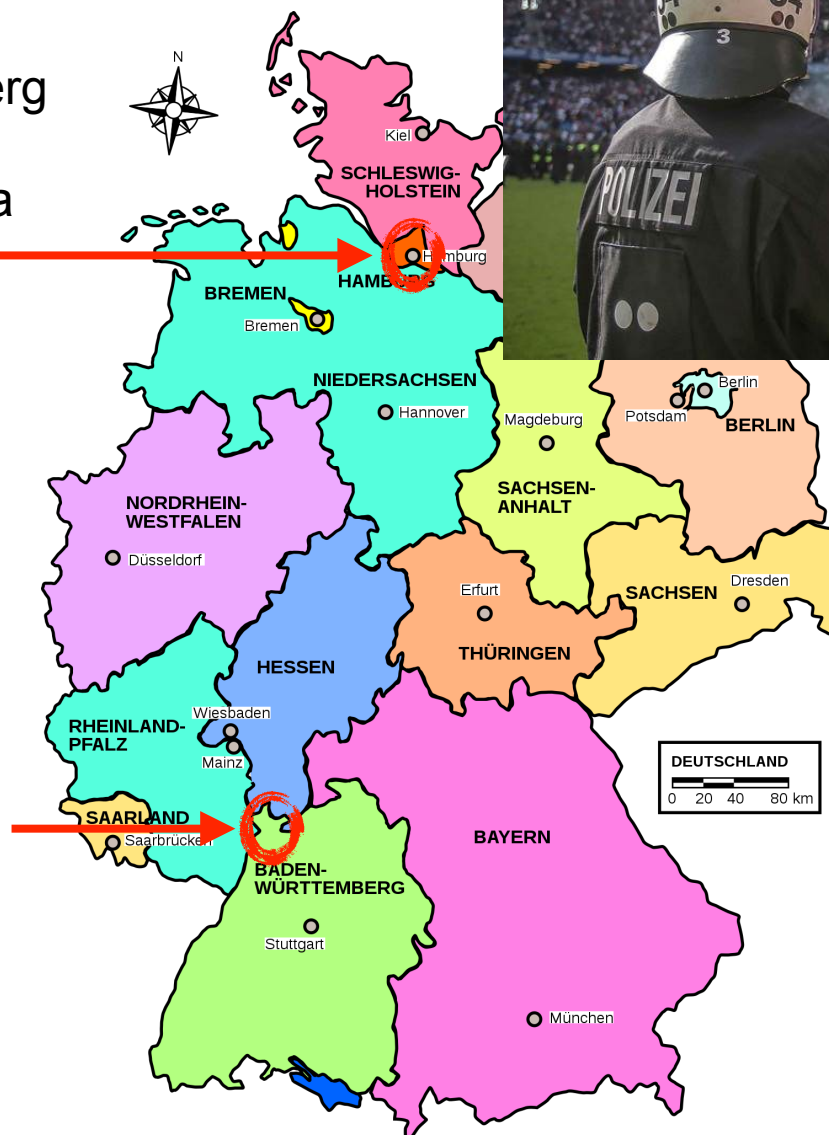
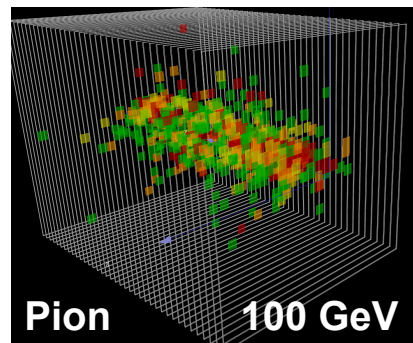
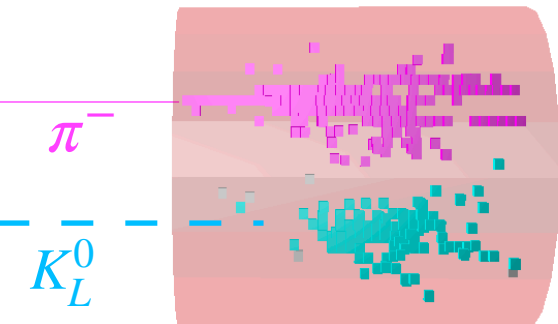
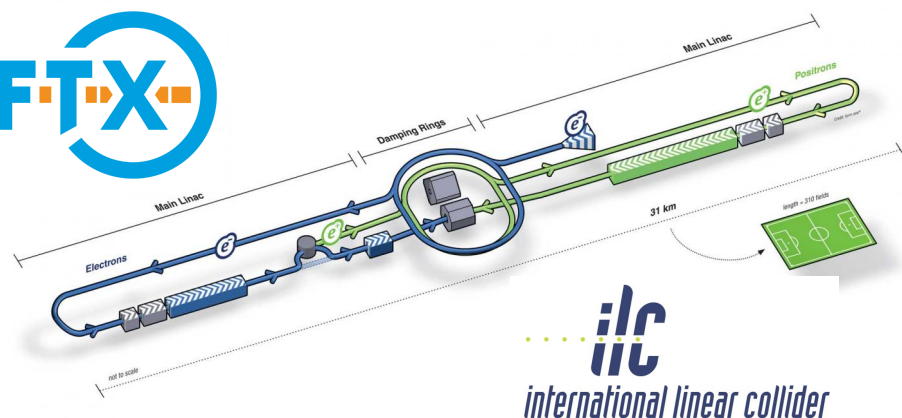
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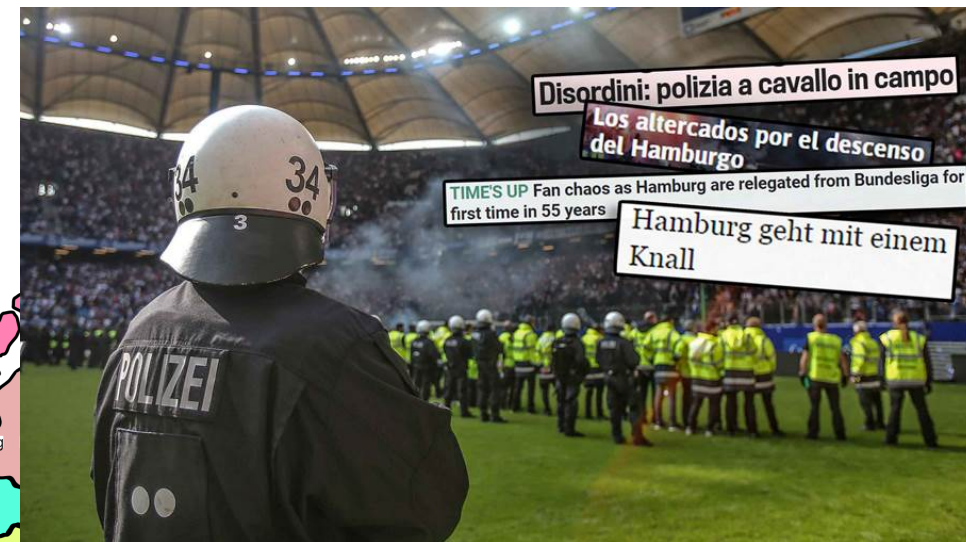
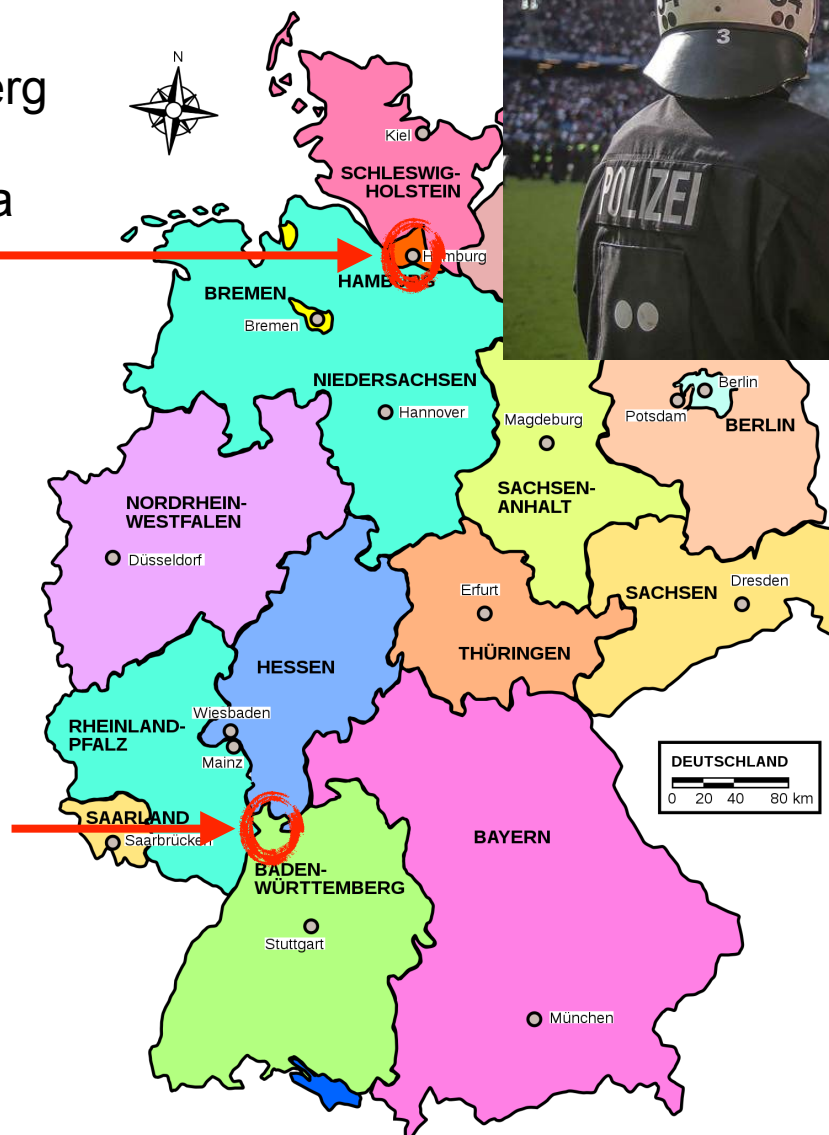
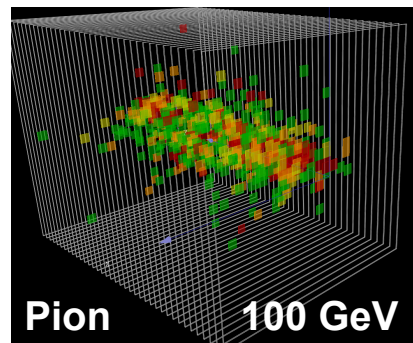
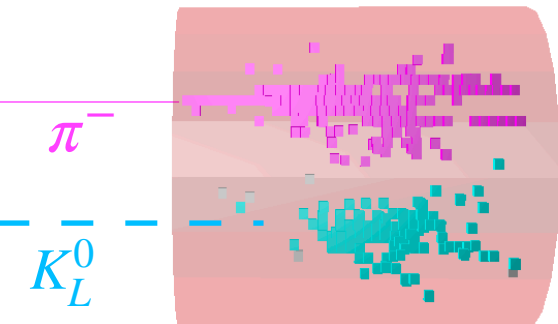
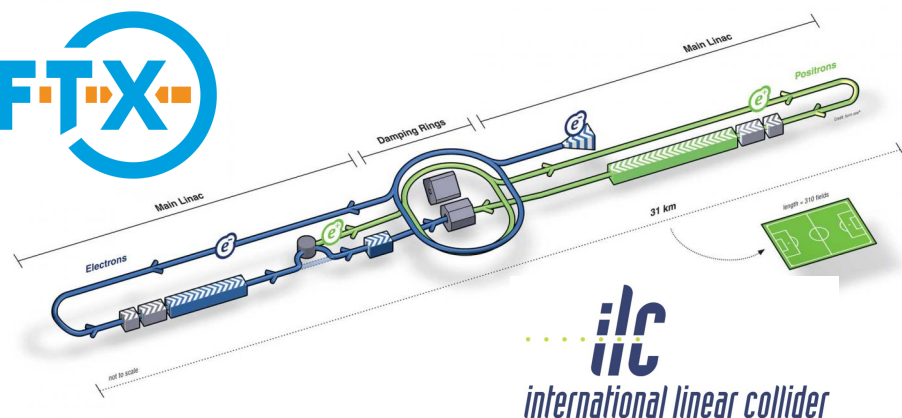


...and 2018 was indeed a special year for my “homecoming” to Hamburg to start my PhD and for the HSV...

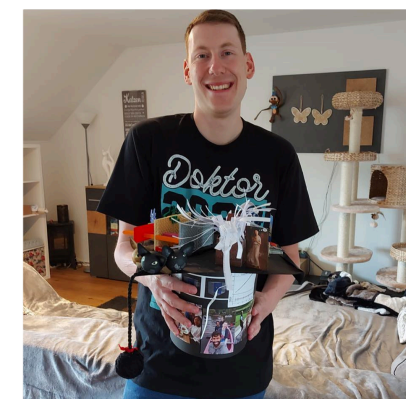
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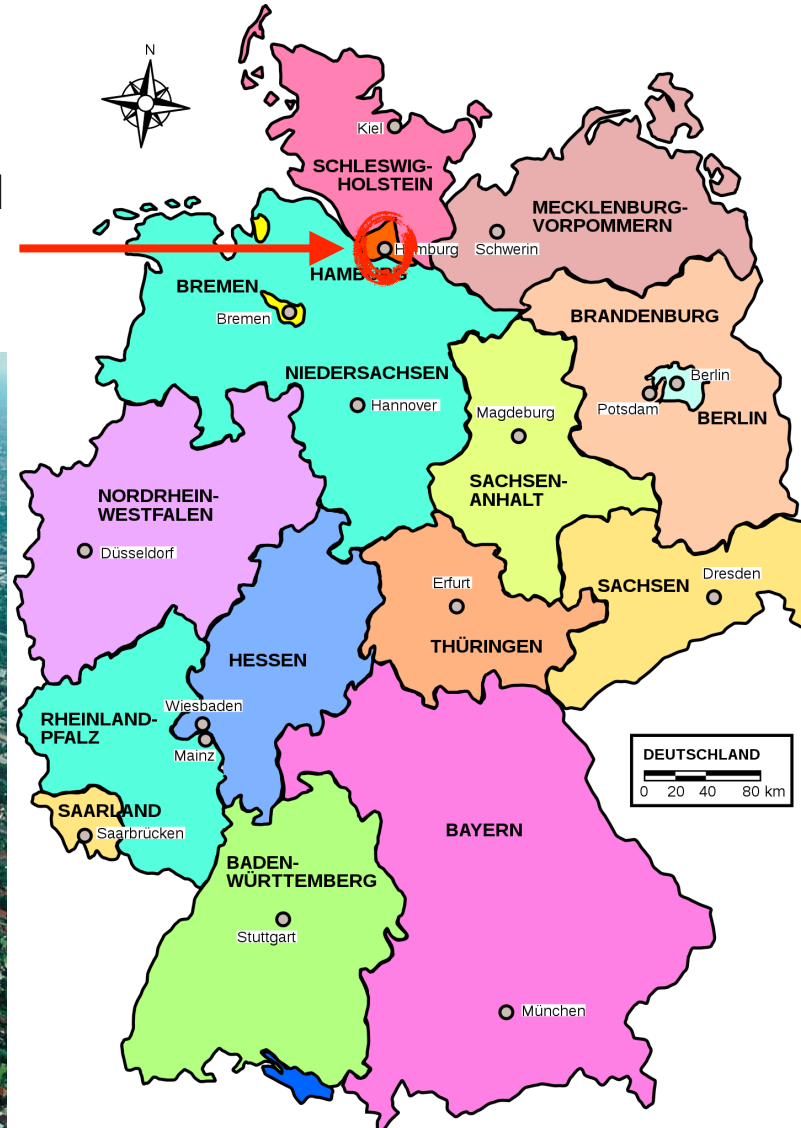
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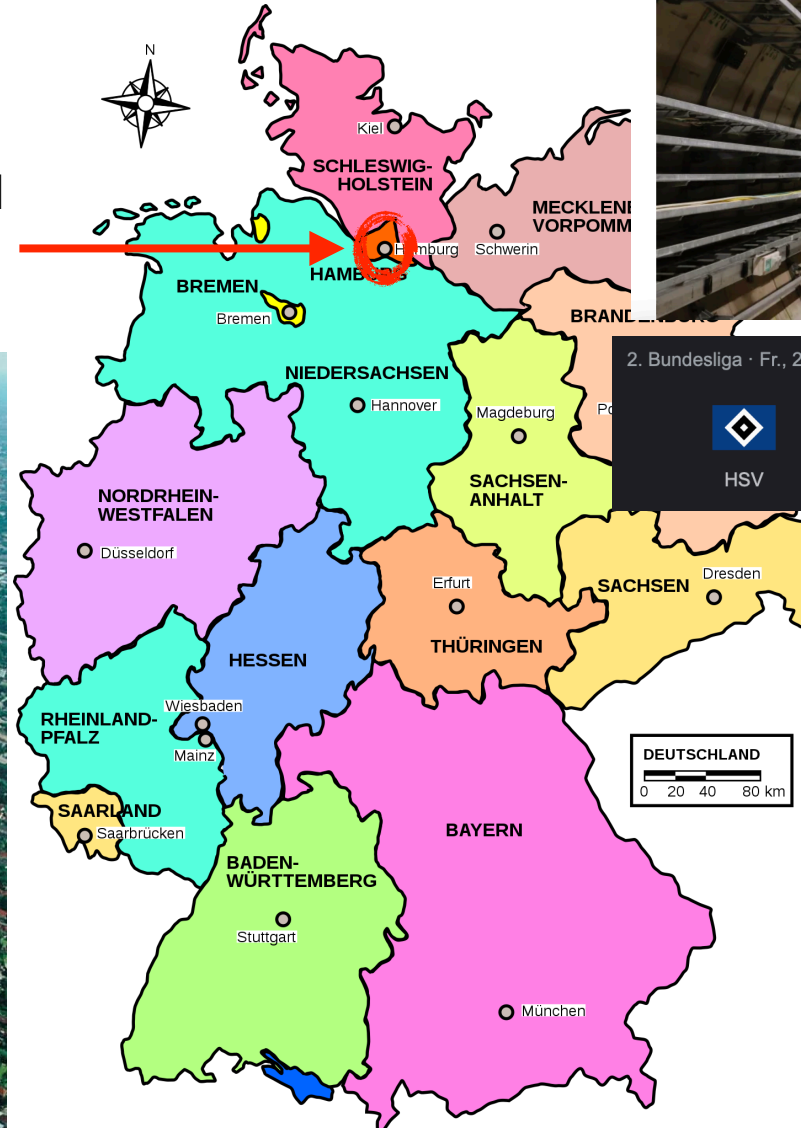


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Ist dieser Tunnel Grund für den HSV-Aufschwung?



2. Bundesliga · Fr., 21.4.

Endstand



4

3



St. Pauli

Special thanks to
ALPSII optics team!

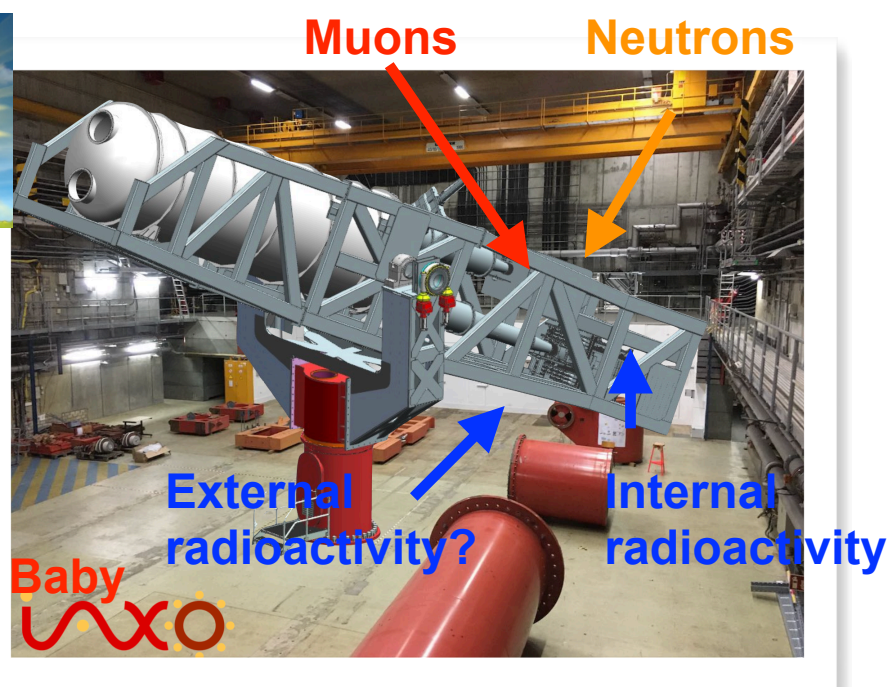
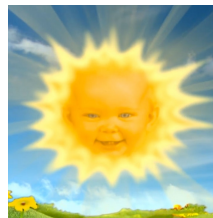
...and finally closer than
ever to the Volkspark.
Perfect year(s) to find
axions/ALPS and get
back to the Bundesliga!



My Work

Backgrounds and Physics: BabyIAXO in Hera South Hall

- Challenge: 1 X-ray photon per week (month?), rare event search!



My Work

Backgrounds and Physics: BabyIAXO in Hera South Hall

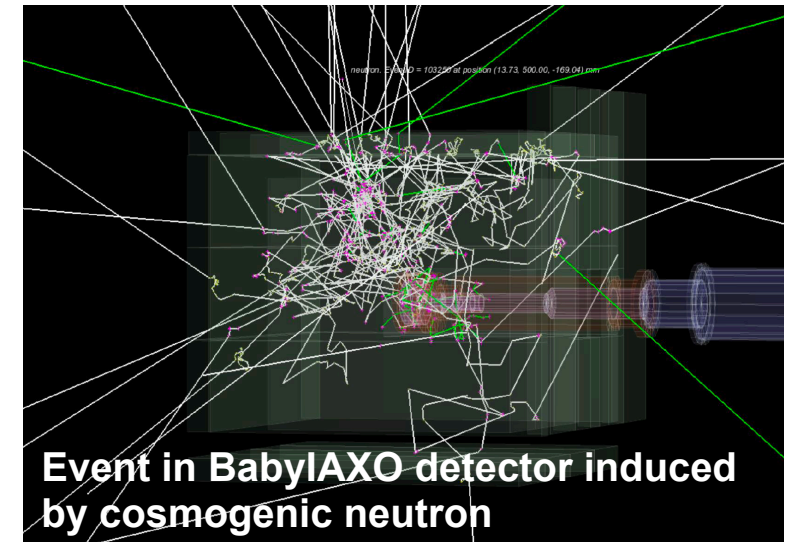
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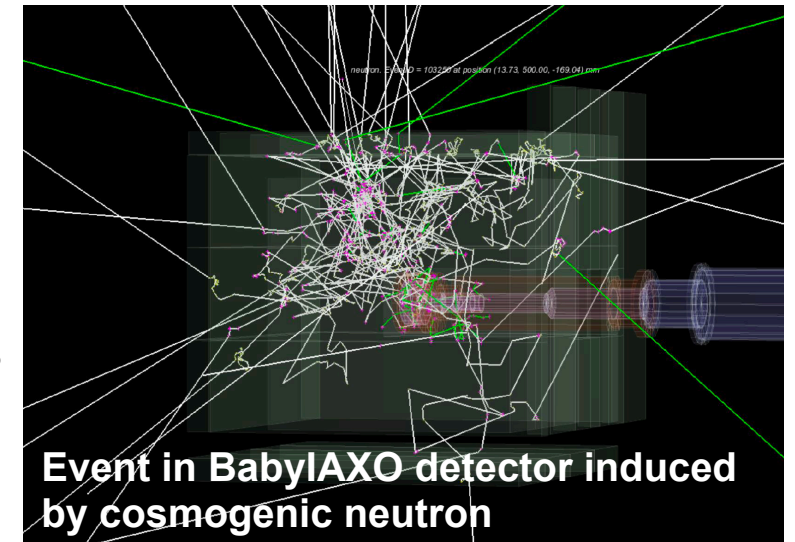
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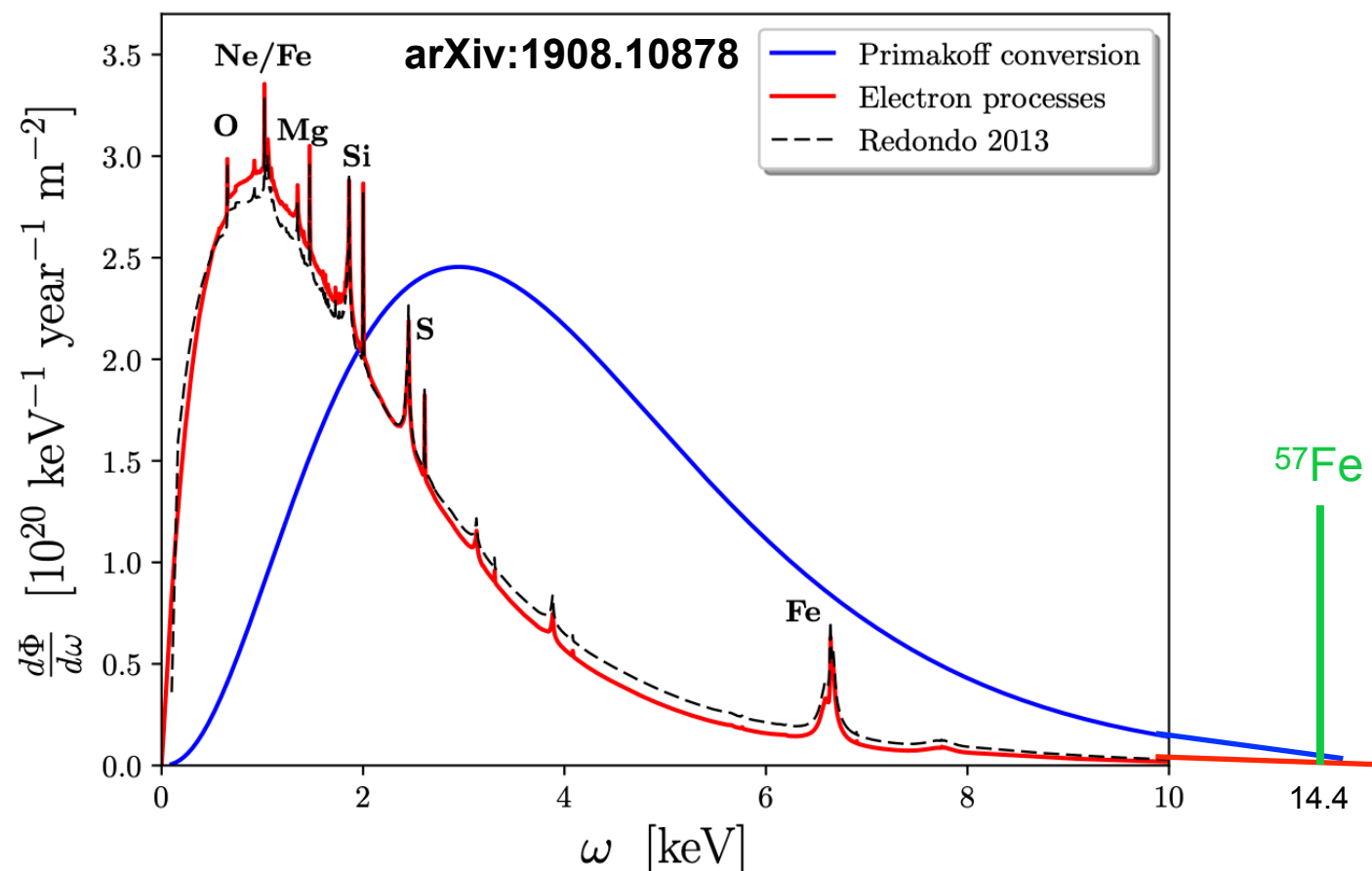
Backgrounds and Physics: BabyIAXO in Hera South Hall

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 - ➔ Simulations: shieldings + vetos + event discrimination (ML)
- Advanced physics case studies (ML):
 - ➔ Measurement of X-ray polarisation possible?
 - ➔ Investigation of potential axion-electron and axion-nucleon couplings
 - ➔ Peaks in X-ray energy spectra measurable?



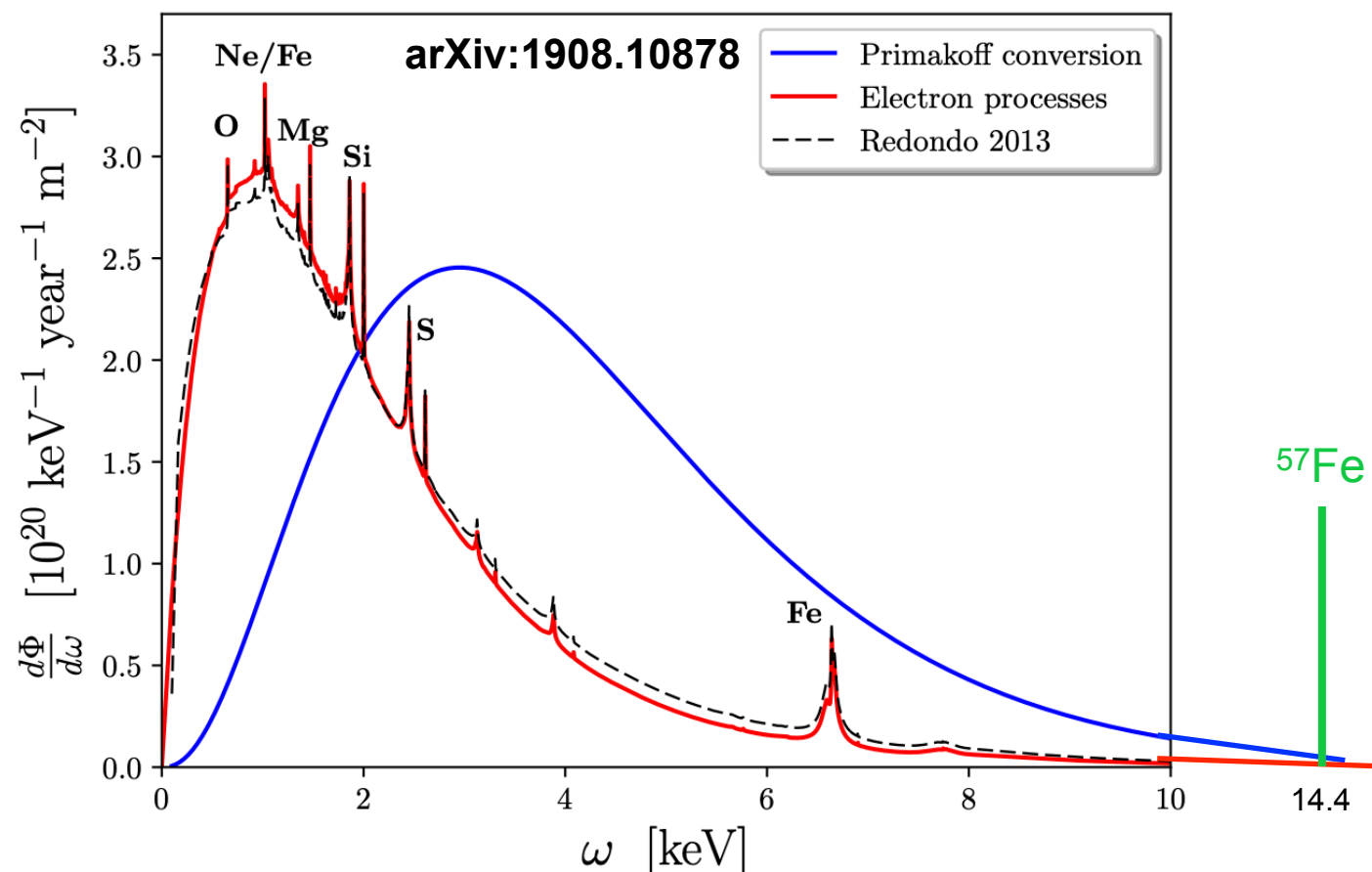
My Favourite and Most Inspiring Plot currently (and a Dream...)

Elemental Peaks in the Measured X-Ray Spectra of BabyIAXO & IAXO?



My Favourite and Most Inspiring Plot currently (and a Dream...)

Elemental Peaks in the Measured X-Ray Spectra of BabyIAXO & IAXO?



Take an X-ray image of our Sun's core!

Backup

Copyright and Reference Business...

- Slide 2 (map Germany): https://de.wikipedia.org/wiki/Datei:Map_Germany_Länder-de.svg
- Slide 2 (Elefantenklo): <https://www.youtube.com/watch?v=f8hcwcBJIP4>
- Slide 2 (Neuharlingersiel): <https://www.ndr.de/ratgeber/reise/ostfriesland/Neuharlingersiel-Strand-Krabben-und-Meer,neuharlingersiel110.html>
- Slide 2 (Dino Herrmann): <https://www.hsv.de/kids/dino-hermann/steckbrief>
- Slide 2 (FCB-HSV): https://www.facebook.com/FCBayern/photos/euer-tipp-für-morgen-/2205676266115719/?paipv=0&eav=AfYkjpgYONhscIQVcAQD75nCZ5t_VeDTh4WBOgYAnUd1uGzJ4stkByZ0eKjGoQ-IWD3Y&_rdr
- Slide 2 (Police HSV): <https://www.sportbuzzer.de/artikel/internationale-pressestimmen-hsv-steigt-aus-bundesliga-ab/>
- Slide 2 (BILD ALPSII HSV): <https://www.bild.de/regional/hamburg/hamburg-aktuell/seit-bei-desy-wieder-laserlicht-durch-roehren-schiesst-laeufts-im-volkspark-ist-81512802.bild.html>
- Slide 3 (Teletubby Sun): <https://www.90s90s.de/das-sonnenbaby-der-teletubbies>
- Slide 4 (Xray Doctor): <https://gamma-sci.com/2021/10/13/electromagnetic-spectrum-101-x-rays/>