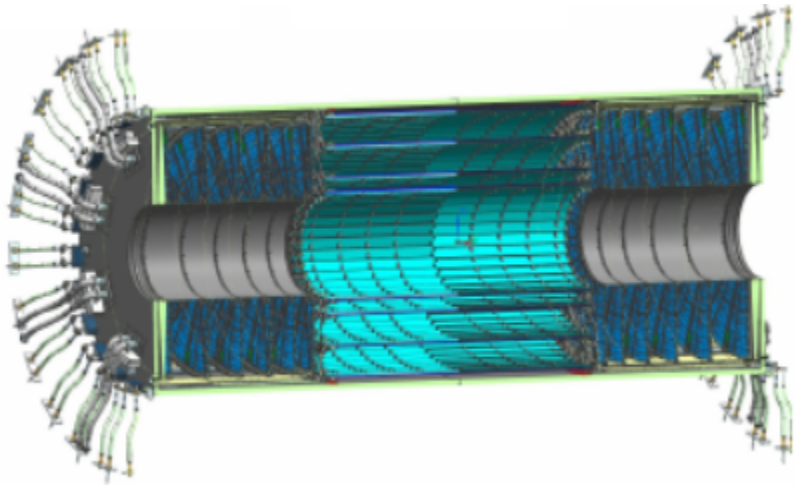
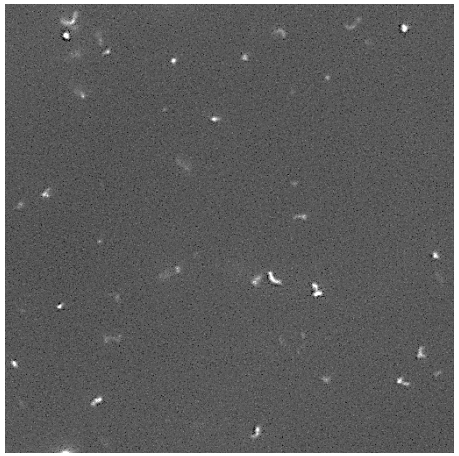
Detector Development

From ATLAS ITk to Medical Physics Applications





FH Fellow Meeting
26th March 2021

HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DESY.

About Jan-Hendrik

How I came to DESY?

- Born and raised near **Osnabrück** (1992-2011)

- Studied physics in **Dortmund** (2011-2016)

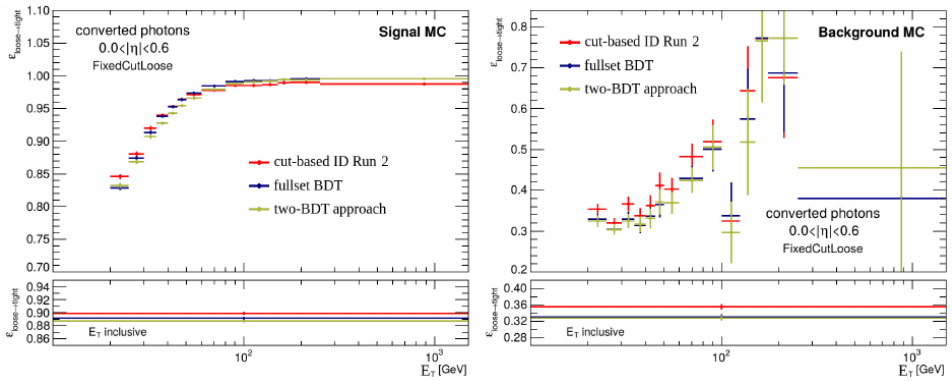
- Summer student at **DESY** (2014) & **CERN** (2015)

- PhD at **DESY Hamburg** (2016-2020)

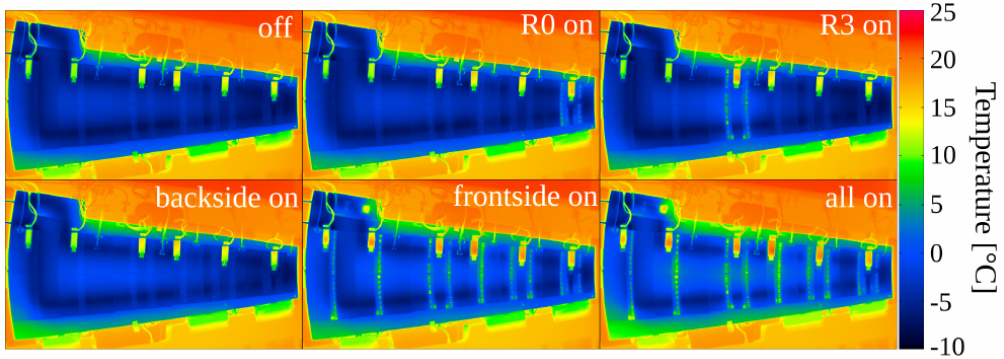
- Living now in **Stade** (2020-20XX)

My previous work

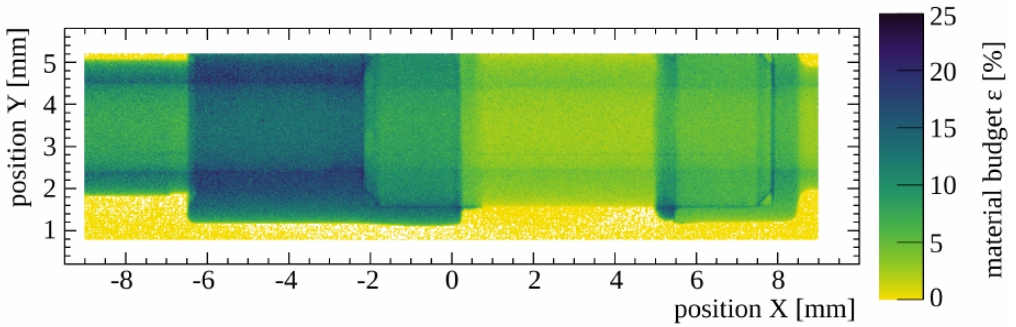
PhD at DESY Hamburg in cooperation with TU Dortmund



Optimization of the photon identification in the ATLAS experiment



Thermo-mechanical studies on petals for the ATLAS ITk Detector



Investigations on Material Budget Imaging at the DESY II testbeam

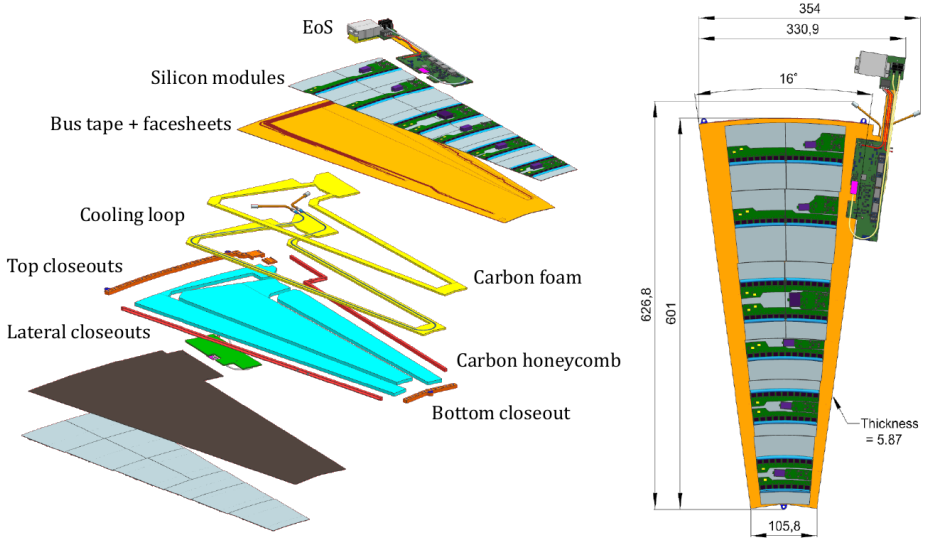
Detection and Identification of Electrons and Photons

- Applications in the ATLAS Experiment, for the ATLAS ITk Detector and at the DESY II Test Beam -

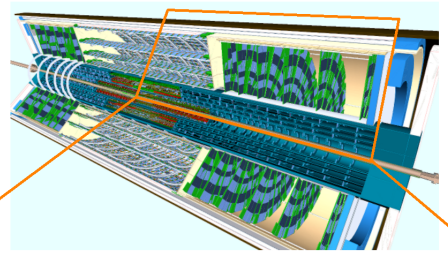
My current work

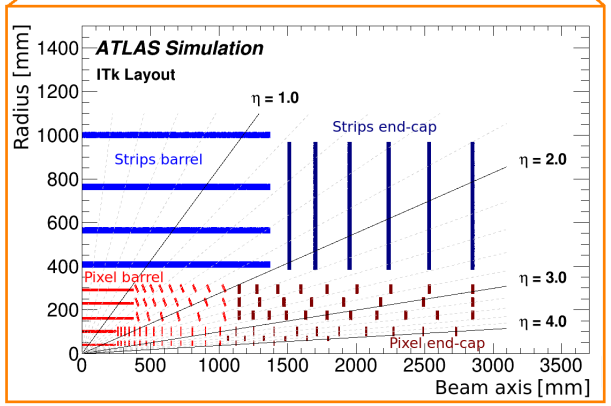
DESY Fellow in the ATLAS Group

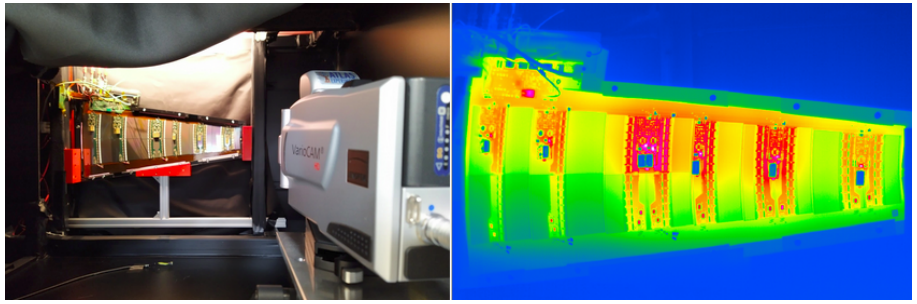
Developments for the ATLAS Inner Tracker End-cap Strip Detector



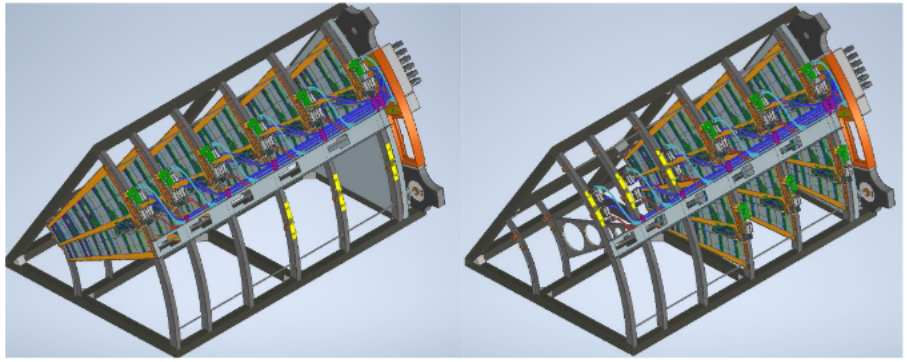
- one full strip end-cap for the ATLAS ITk will be built at DESY
- main building block is the petal (silicon modules + support structure)
- DESY is involved in a lot of tasks starting from module building over building of carbon fiber structure up to global supports and integration







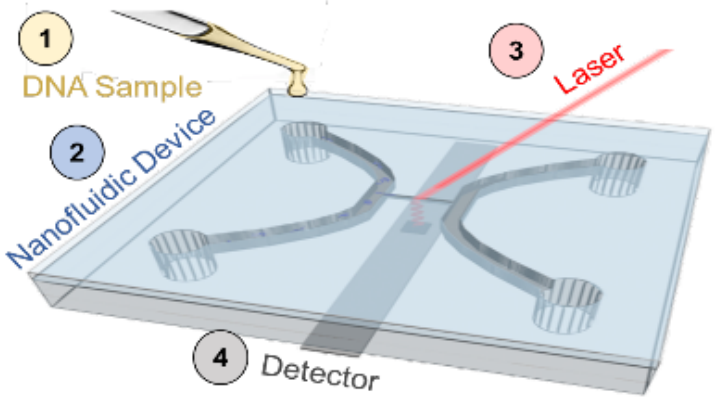
- develop quality control methods for production
- measure performance of modules in the testbeam
- design and assembly of the system test setup



My current work

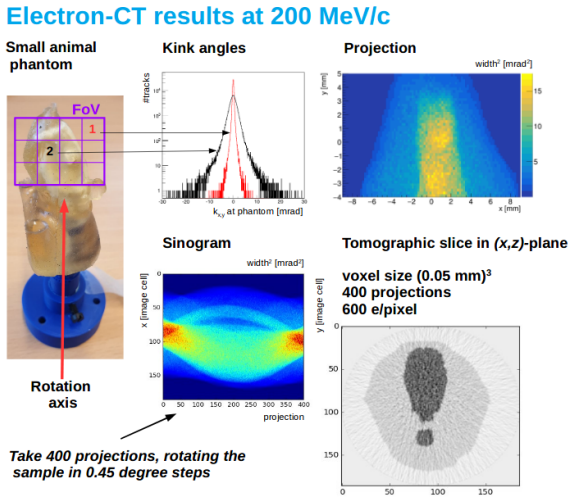
DESY Fellow in the ATLAS Group

R&D: Medical Physics & Detector Development



- **“Developing a portable, fast, high throughput DNA analysis tool”**
  - collaboration with UHH, UKE and DESY including technology transfer
  - virus detector using nano-fluidic devices with bar coding and laser readout
  - design and develop a portable system for easy and fast use

- **“High-energy electron CT for medical applications at the DESY II test beam”**
  - using the material budget imaging technique for medical tomography
  - combine the reconstructed particle tracks and the measured energy loss
  - investigate on suitable calorimeters for this technique



- some more ideas ...

My current work

Other involvements

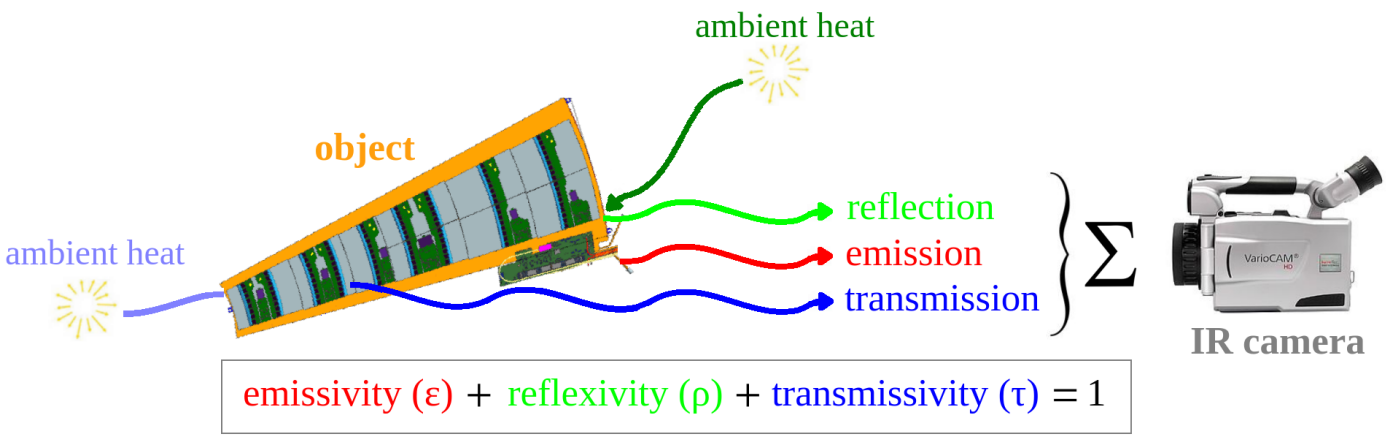
- **Outreach**
  - DESY PR Guide
  - “Wissen vom Fass”
  - DESY Open Day
  - ...

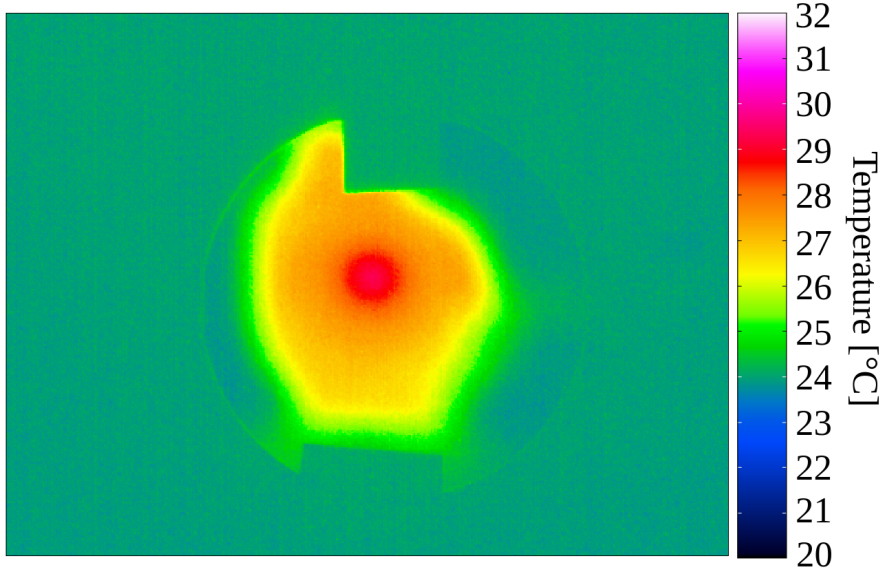
- **ECFA Early-Career Researchers Panel**
  - member of the ECFA-ECR panel (Dec 2020 – Dec 2022)
  - *The objective of the ECFA Early-Career Researchers (ECR) Panel is for its members to discuss all aspects that contribute in a broad sense to the future of the research field of particle physics.*
  - Please contact me/us to represent most of you in the best possible way!

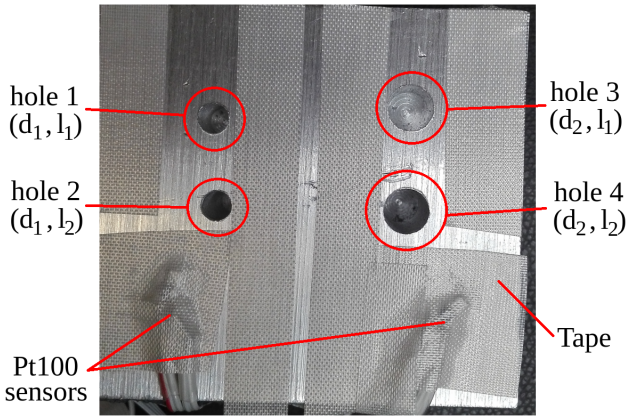
My favorite plot

Or rather a topic I learned during my PhD...

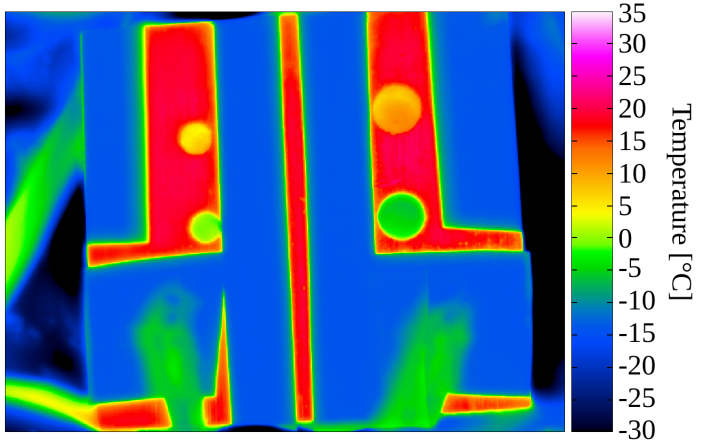
- infrared thermography is a tricky task...

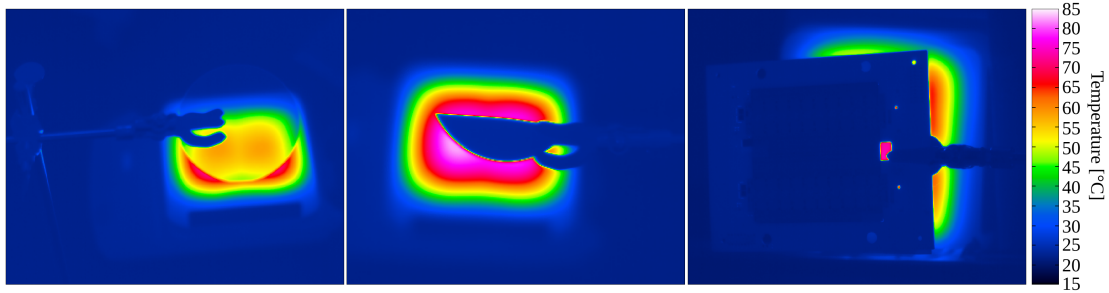






cooled aluminium block

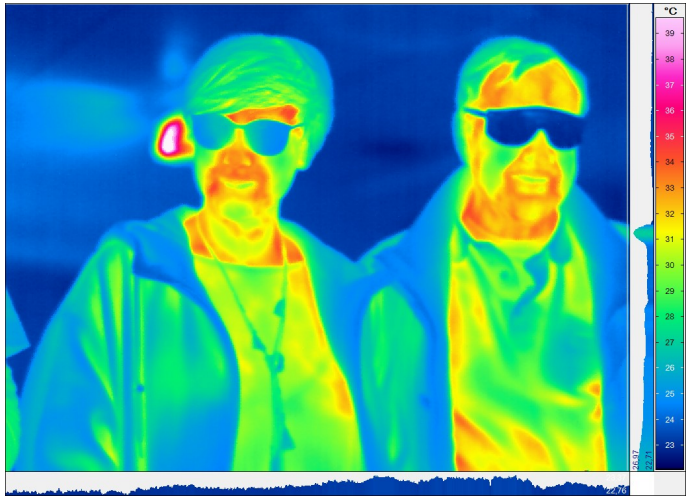




My favorite plot

Or rather a topic I learned during my PhD...

- ...but creates nice pictures!



THANKS.

Contact

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