

# STATUS OF THE GLUING LAB AT HIM



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On behalf of HIM  
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# Overview

## The PANDA Barrel DIRC:

- Radiator: 48 bars (16 sectors)
- Compact expansion volume: 30cm-deep solid fused silical prisms
- Focusing optics: 3 layers spherical lens system

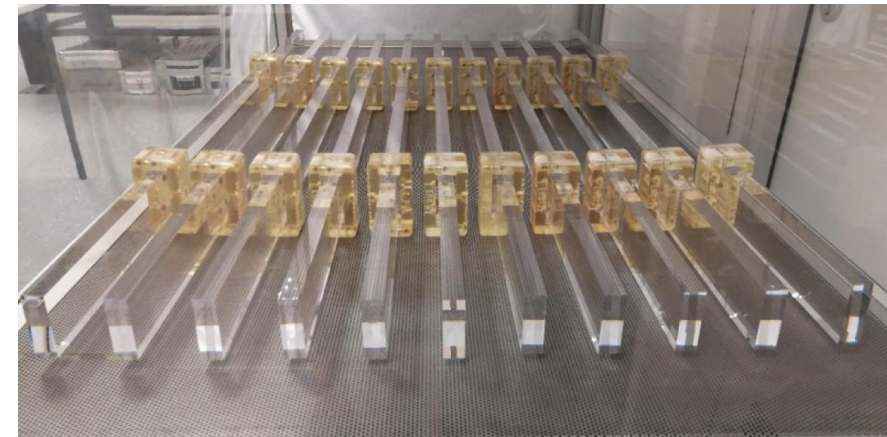
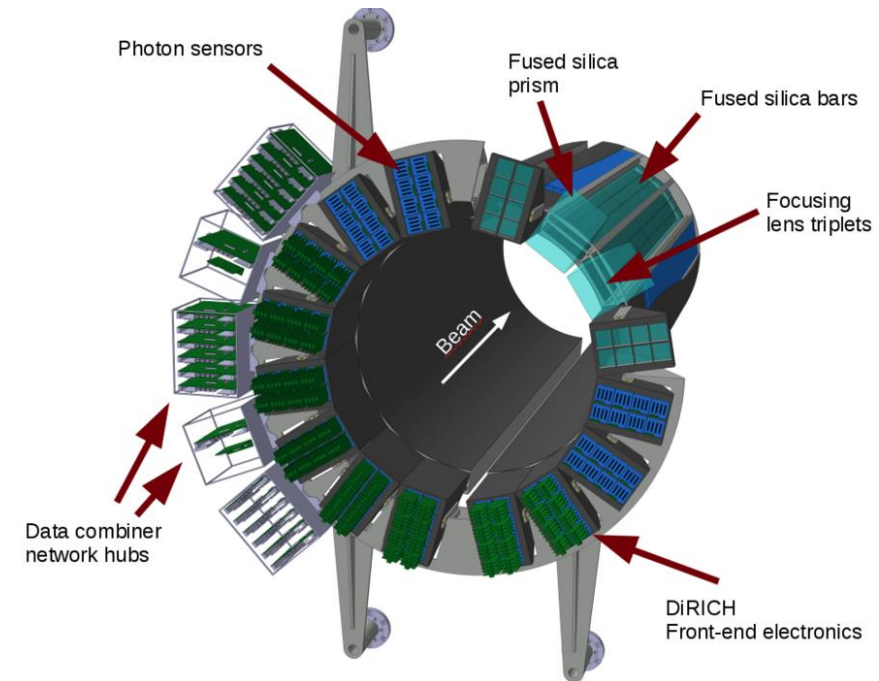
## The bars:

- Highly-polished bar made of synthetic fused silica
- The squareness of the side-to face angles is less than 0.25 mrad and the total thickness variation is less than 10  $\mu\text{m}$ .

## First task

- Two radiator pieces to be glued end-to-end to form a long bar, covering the full length of the Barrel DIRC 17mm (T) x 53mm (W) x 2400mm (L)

8/3/2022





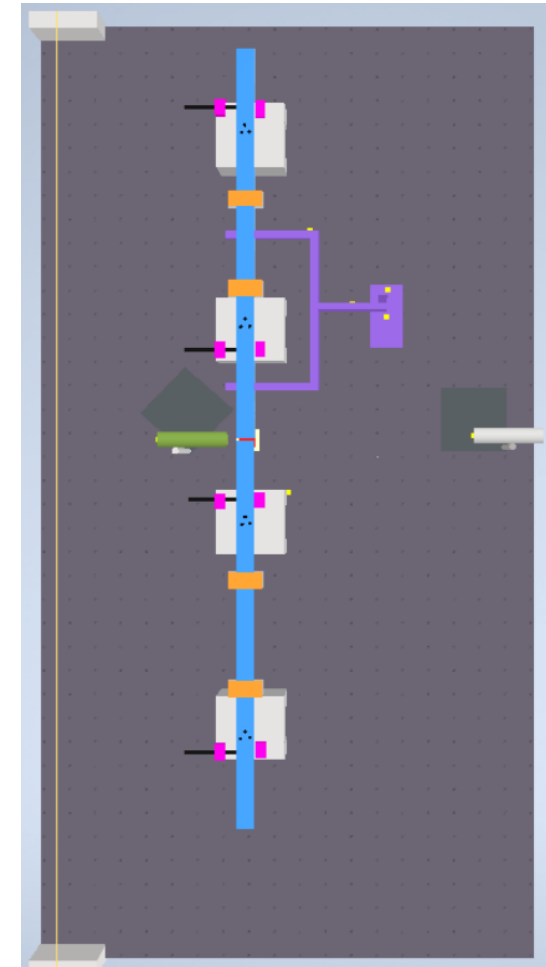
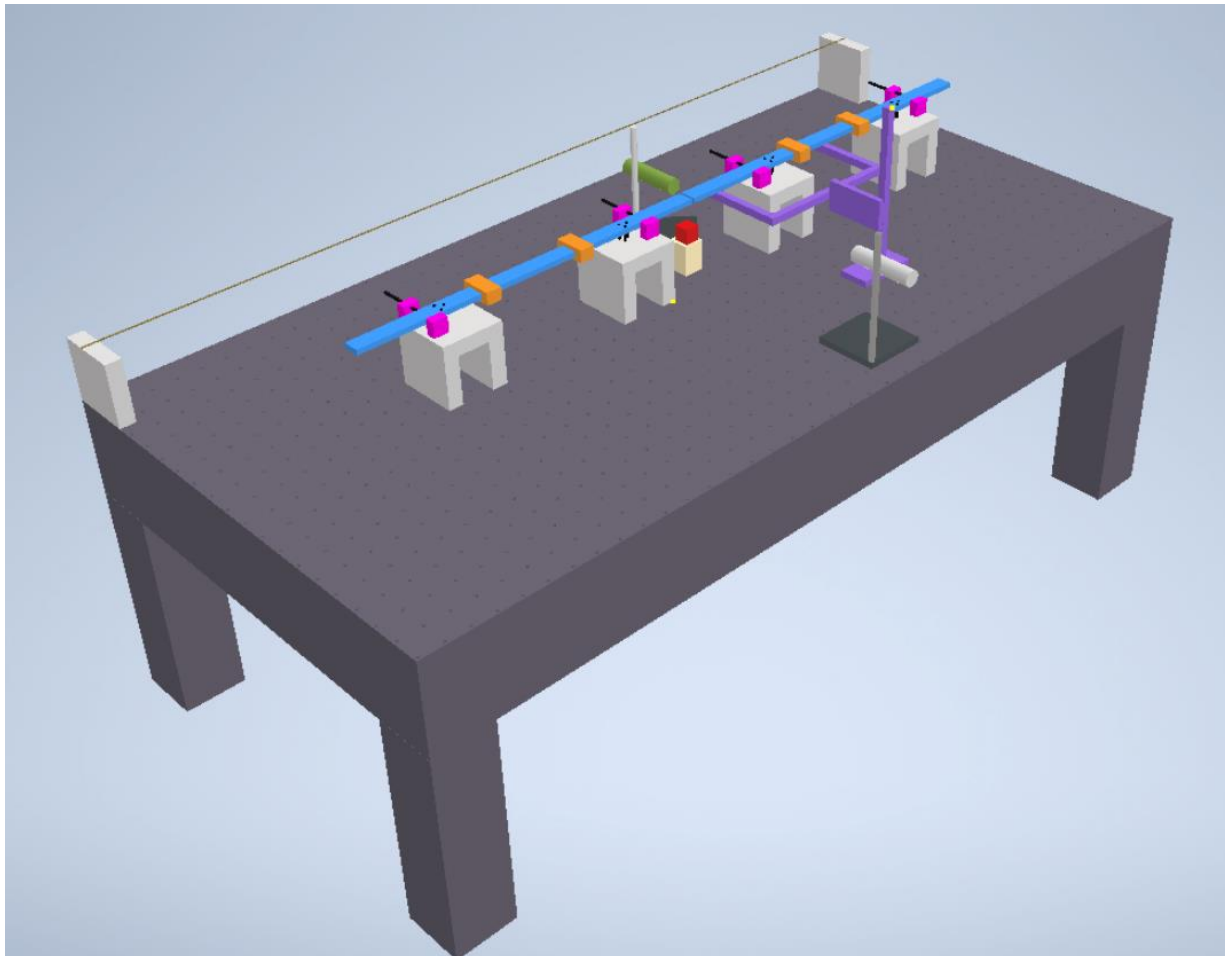


# BaBar DIRC Gluing Setup

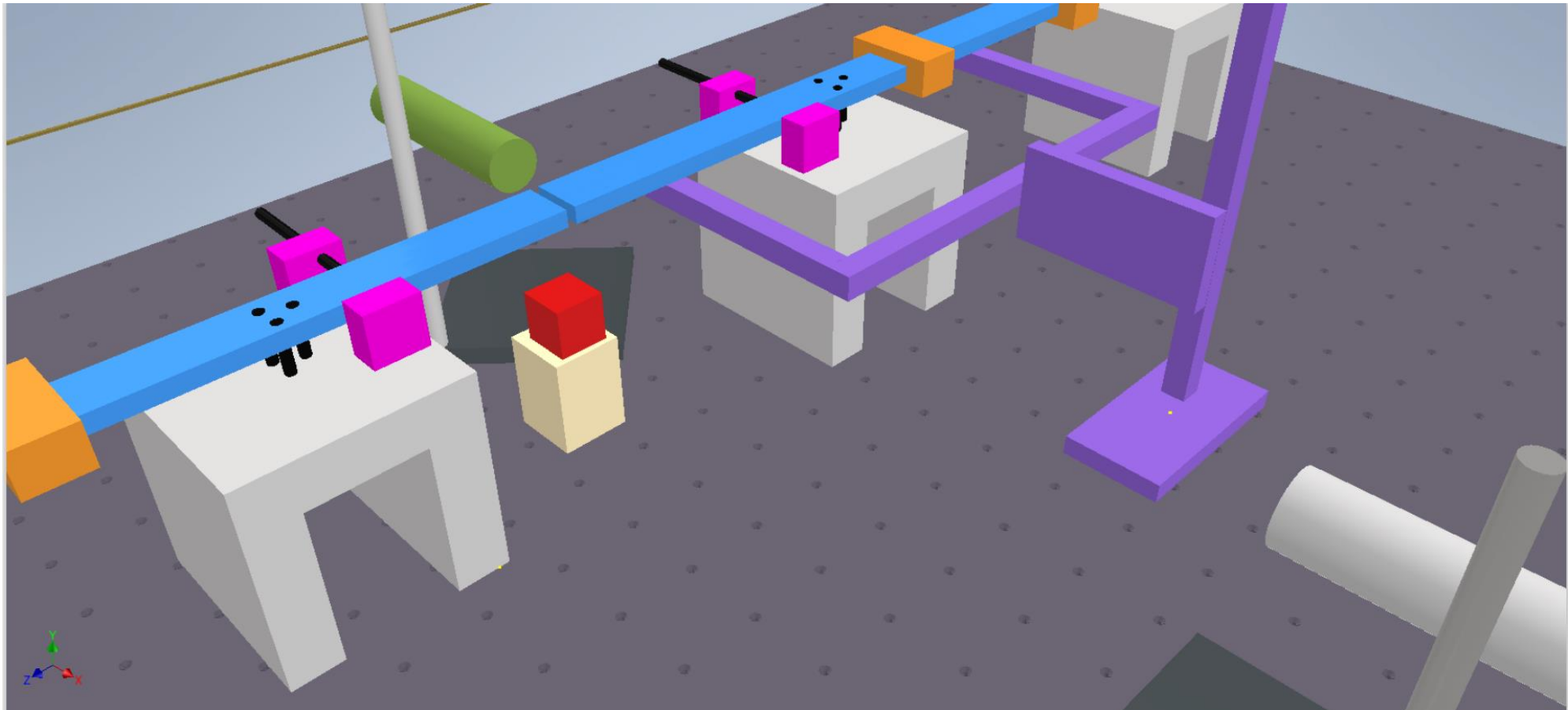
- PANDA Barrel DIRC gluing setup inspired by the BaBar DIRC gluing setup
- Photos of the bar gluing setup in the DIRC room at SLAC
- Large optical table and the DIRC bar support stations



# Preliminary PANDA Barrel DIRC Gluing Setup



# Preliminary PANDA Barrel DIRC Gluing Setup



# Bar Alignment

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- Develop a procedure to minimize mechanical stresses during the gluing process and to maintain the parallelism between the bar ends
- Angular alignment: Using Nikon Autocollimator 6D-LED with a measuring accuracy of 0.5 seconds of arc
- Position alignment: Using highly tight piano wire. The positioning precision will be confirmed by a precision arm at HIM with measuring accuracy of 30 micron.

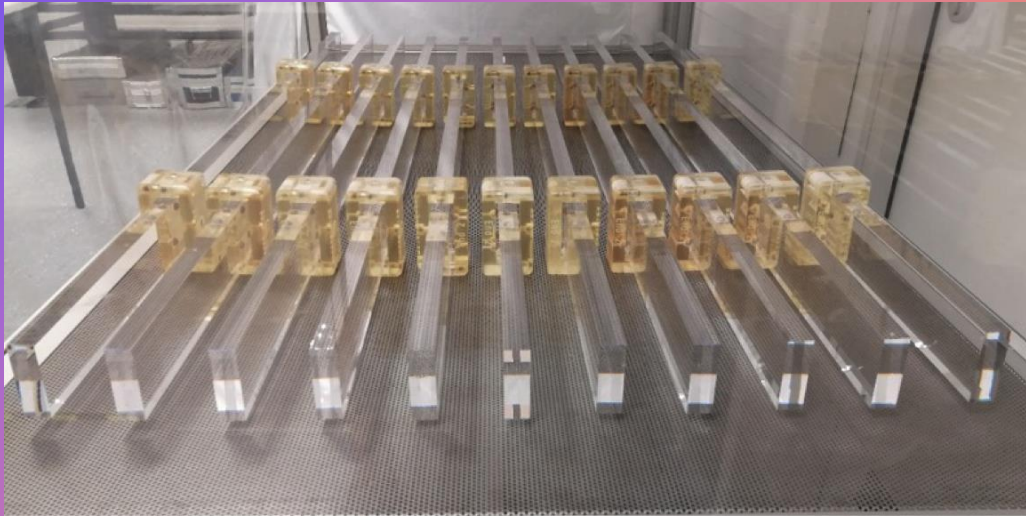
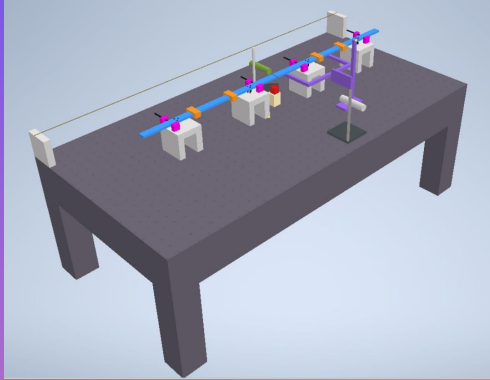
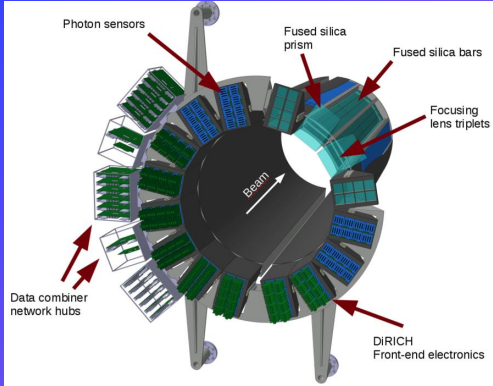
# Gluing Tests

- Temperature
- Humidity
- Shim thickness
- Bubbles
- Glue mixing ratio
- Mechanical



# Orders

- Two Thorlabs optical tables purchase claim confirmed by GSI. The tables expected to be delivered on May +
  - Autocollimator from GSI
  - Pentaprism from GSI
  - Humidity and temperature data logger from HIM
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- Gluing Material (301-2 Optical Adhesive): On the claim
  - R&D Shim: On the claim
  - Digital Camera: On the claim
  - Digital Microscope: On the claim
  - Chemicals: On the claim
  - Bar Clamps: On the claim
  - Support structure: The drawing/requirements will be exported to the workshop at HIM. It is expected to be ready within 3 weeks after the optical tables installation
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- Local ventilation system solution: final decision ongoing
  - Glass samples to perform gluing tests: final decision ongoing
  - Nikon bar dicing to perform gluing tests: final decision ongoing
  - Bubble removal system (vacuum system): will be custom designed at HIM workshop



# Summary

- PANDA Barrel DIRC gluing setup inspired by the BaBar DIRC gluing setup
- Most of the required equipment/tools are expected to be ready soon
- Several glue tests will be performed before the production phase
- Goal: Two radiator pieces to be glued end-to-end with high quality with less than 30 micron misalignment error

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# THANK FOR YOUR ATTENTION

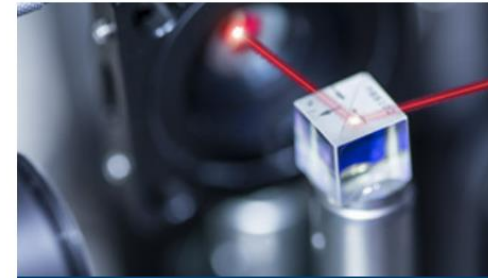


# Helmholtz Institute Mainz

- **Helmholtz Institute Mainz (HIM)** is an institutional cooperation of the JGU and the GSI
- SPECF (Spectroscopy and Flavour) section focus on mesons spectroscopy
- Involved in PANDA activities



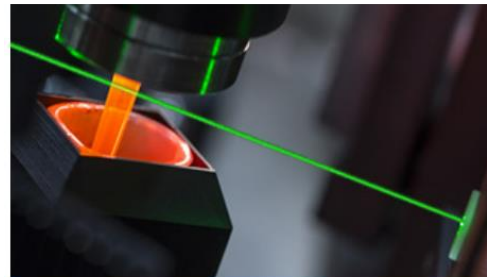
SPECF (Spectroscopy and Flavour)



MAM (Matter-AntiMatter Asymmetry)



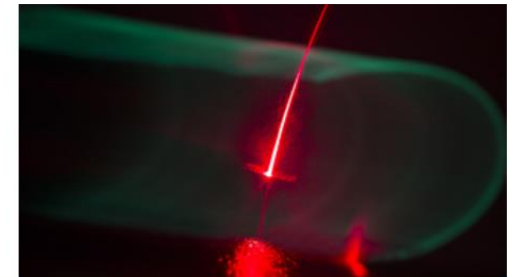
ACID (Accelerator &amp; Integrated Detector)



SHE (Physics &amp; Chemistry of Superheavy Elements)



EMP (Electromagnetic Process in Antiproton Annihilation)



THFL (Theory Floor)