This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under GA No 101004730.

# Task 9.2 progress @ INFN LNL

## 1.3 GHz cavities deposition facility

10th IFAST WP9 online meeting

14/09/2023

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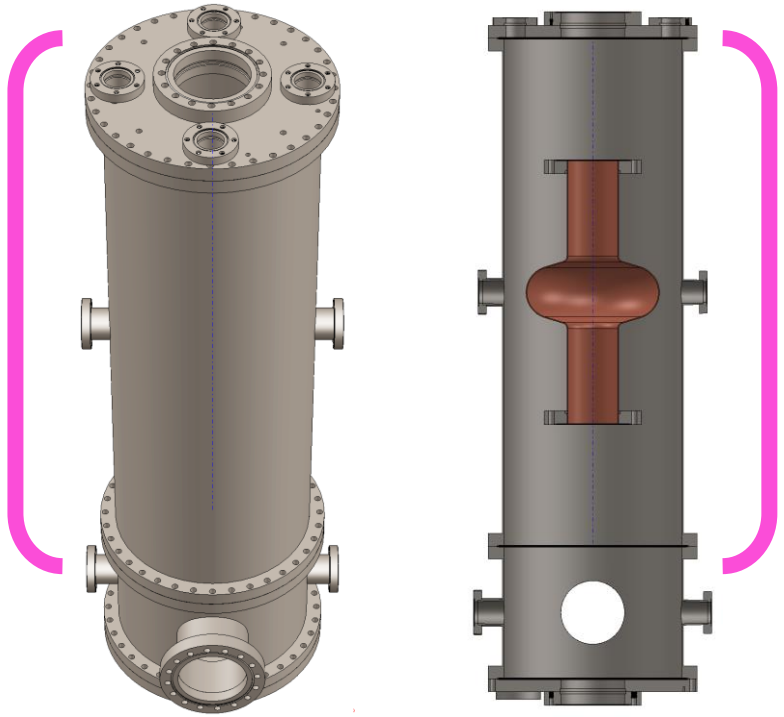
IFAST

# Objective recap

- «Hybrid» coating system for 1.3GHz cavities
  - Rectangular magnetron & rotating cavity
  - Post magnetron configuration with $Nb_3Sn$ cylindircal target produced via dipping

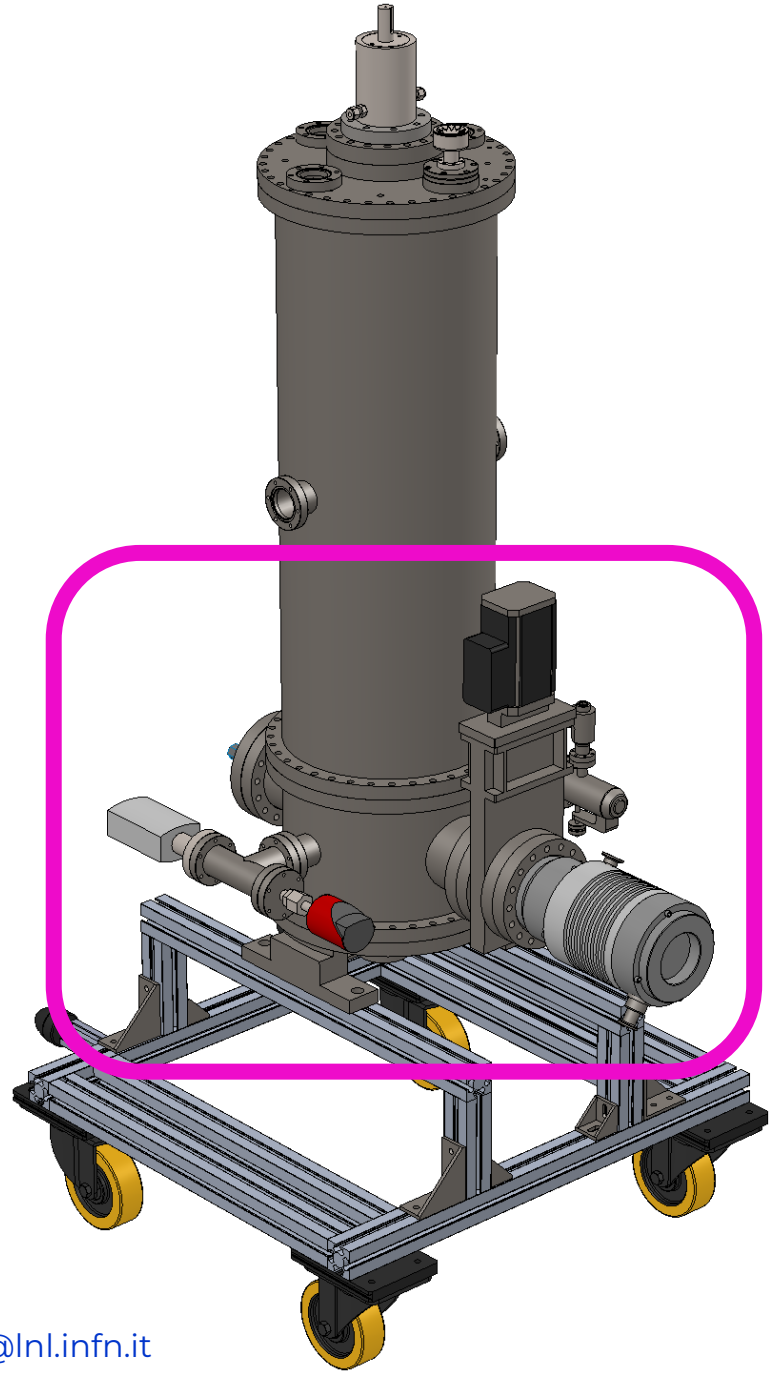
# Coating system design

- Commisioned a 80cm long chamber to reduce the number of flanges (to be delivered mid-october)
- Prototype system assembled to test the pumping system and other components



# Coating system design

- «Utilities» on the lower part
  - Pump unit
  - Gauges
  - Gas inlets
  - Electrical and water feedthrough

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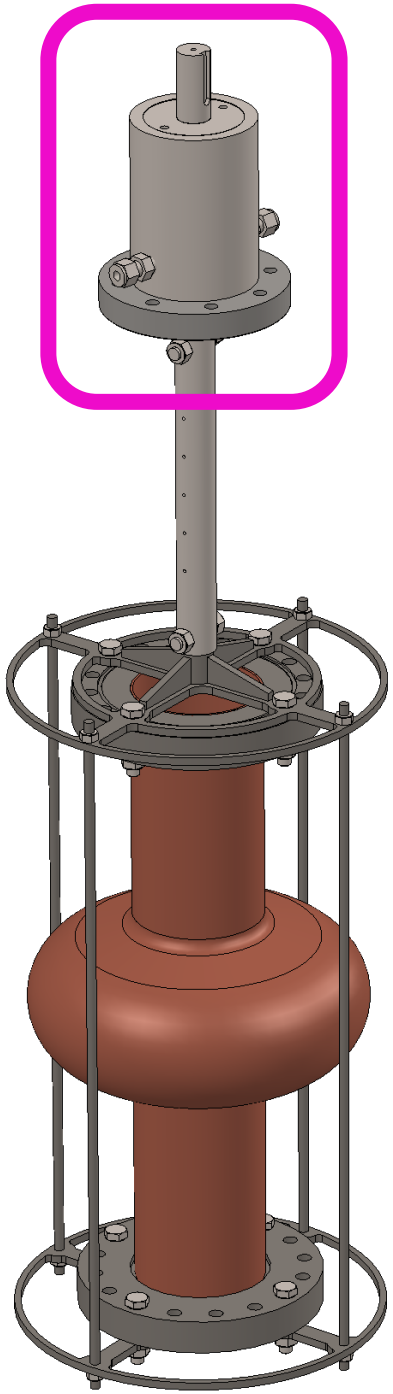
# Cavity stand

- Cavity suspended from rotating ferrofluidic vacuum feedtrough
- Stand designed to center the cavity and minimize deformation due to high temperature deposition

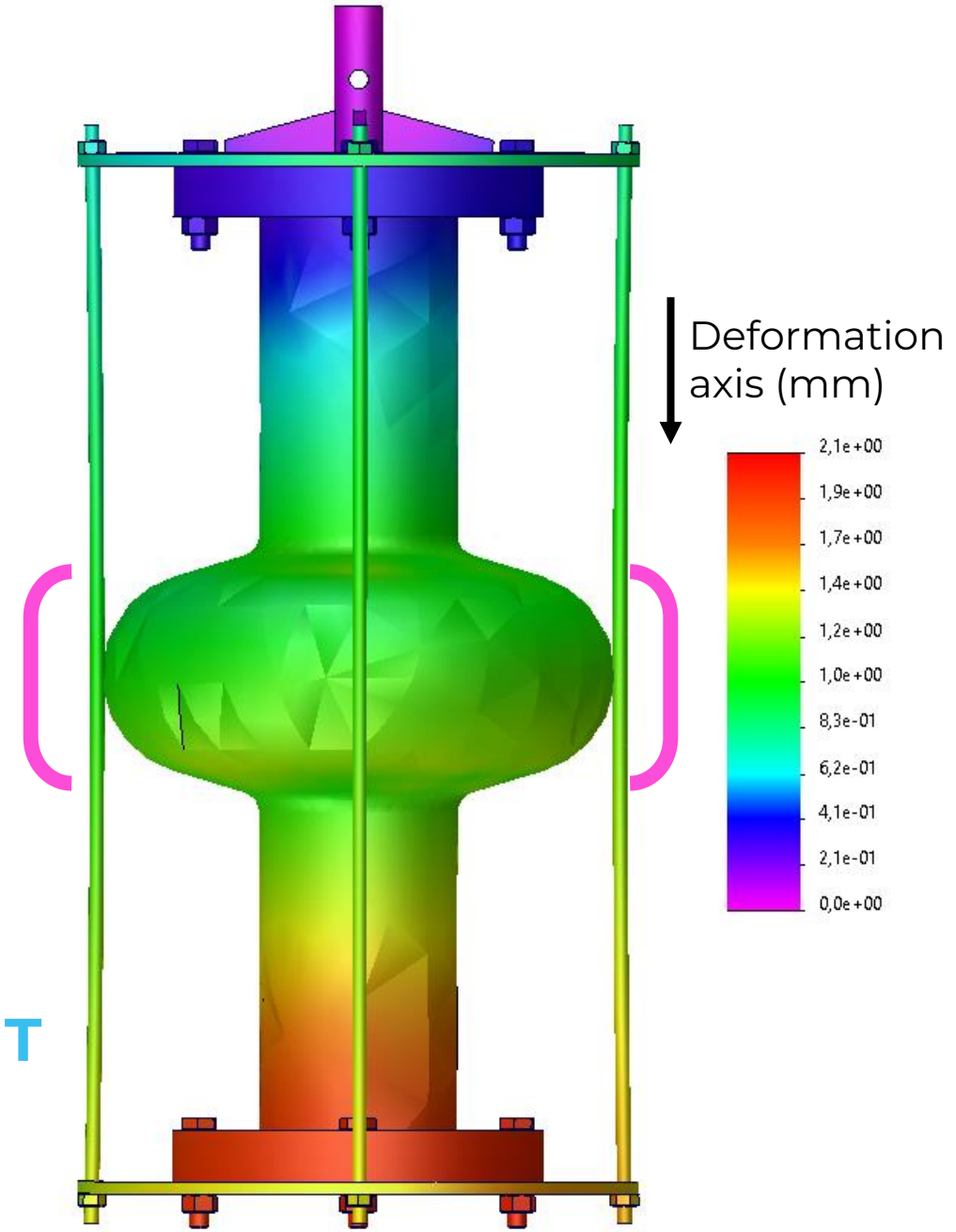
Torque: 80Nm
Load: 60 kg

Stand weight: 8kg (max)



# Deformation at 700°C

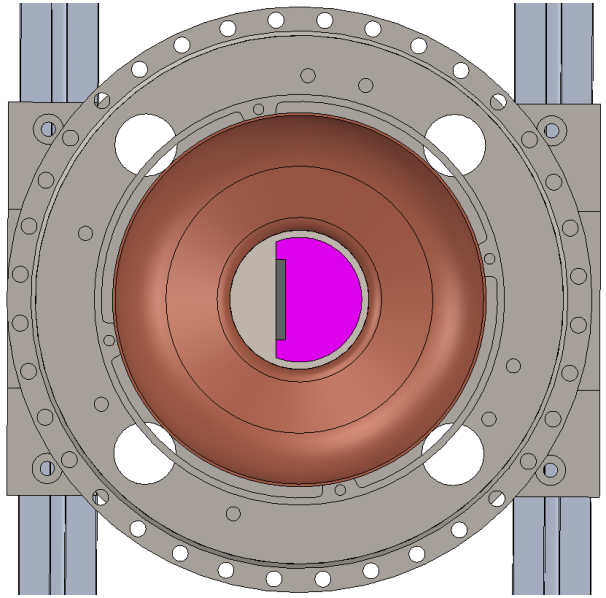
- Solidworks static simulation of the cavity at 700°C
- Deformation along cavity axis about 1mm at the cell
- To be simulated and tested whole thermal cycle:

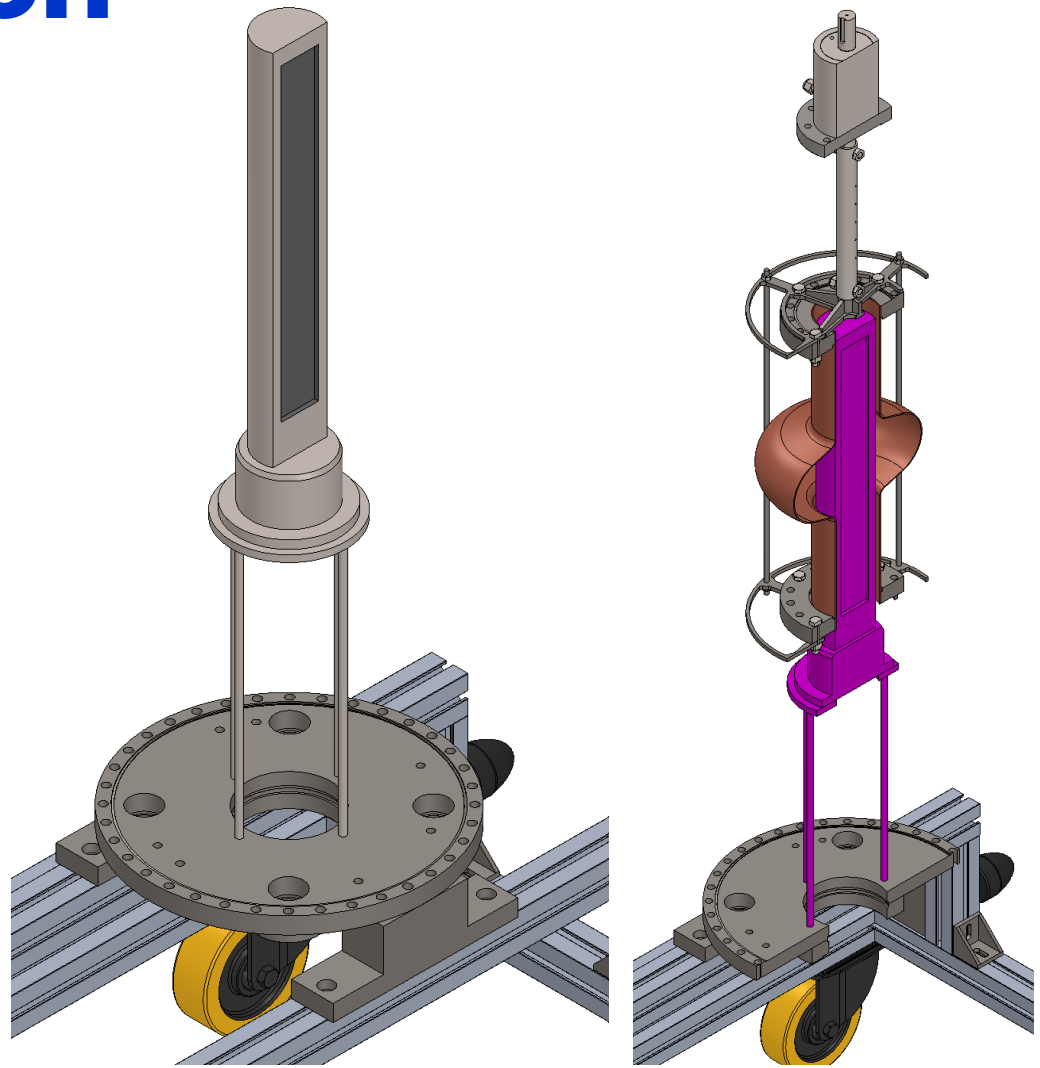



**Room T** → ***x* hours @ deposition T** → **Room T**

# Rectangular magnetron

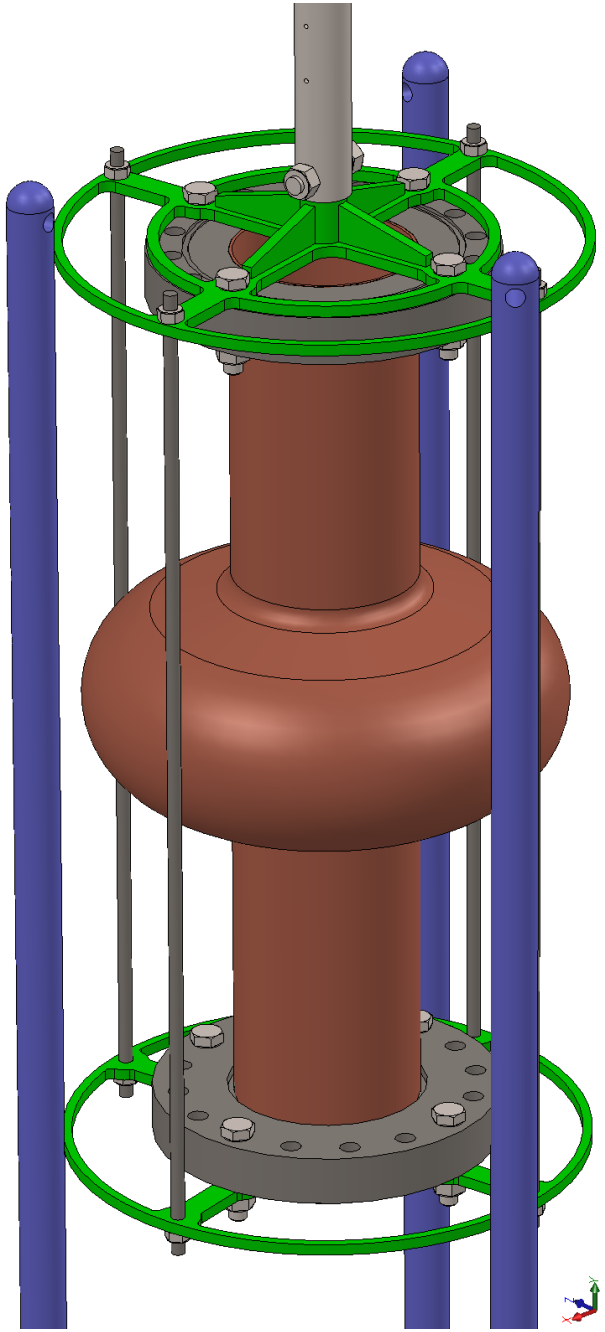
- Magnetron fixed on the lower flange
- Design still ongoing





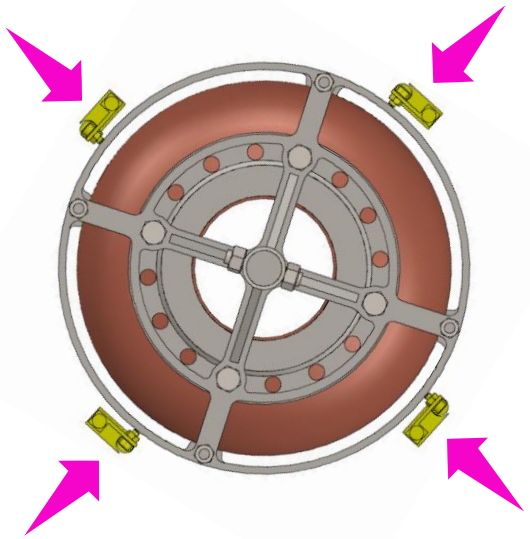
# Centering system

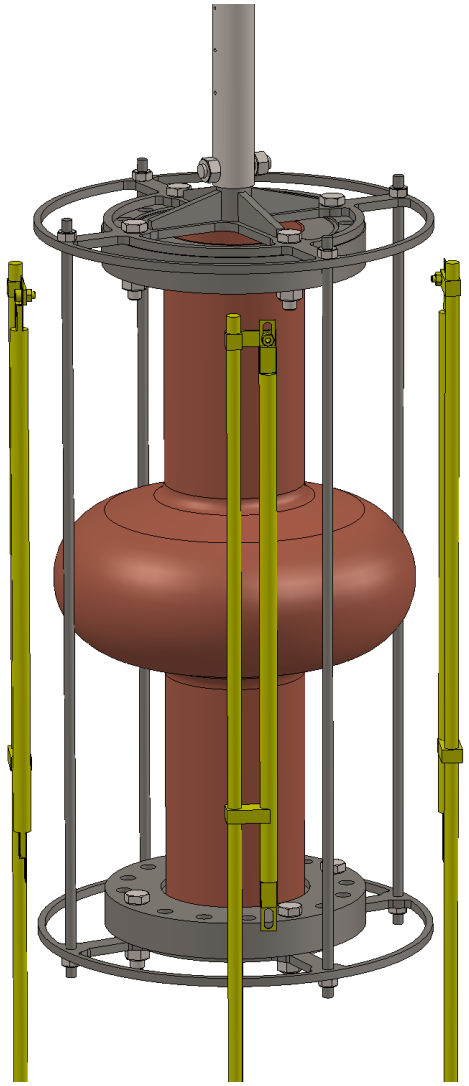
- Magnetron and cavity will be aligned on the same axis by means of centering system: two **disks** tangent to three vertical **rods** with small tolerance

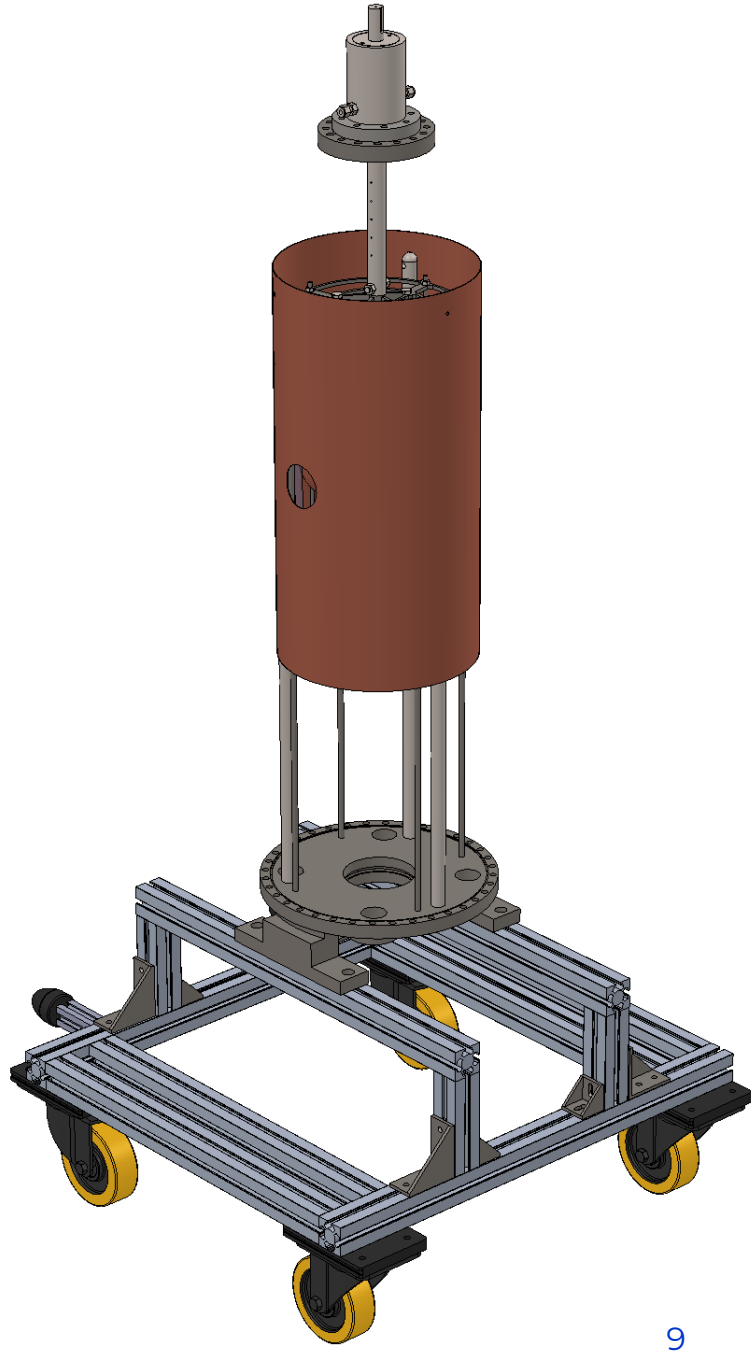


# Heating system

- 4 **IR lamps** (max)
- Copper shield will reduce the heat-up of the chamber





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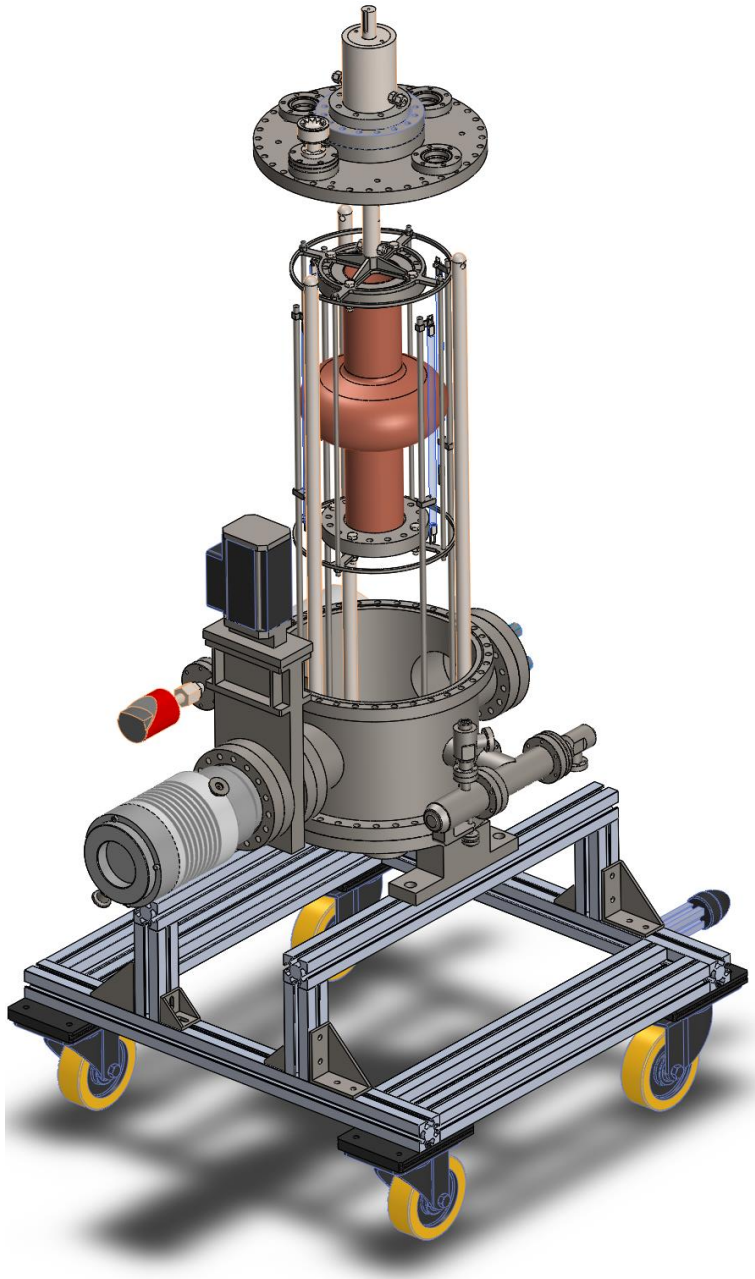
# Next steps

- Assemble vacuum system ASAP
- Commission Magnetron

*In the meantime*

- Test vacuum components already available
- Test thermal cycle of the cavity

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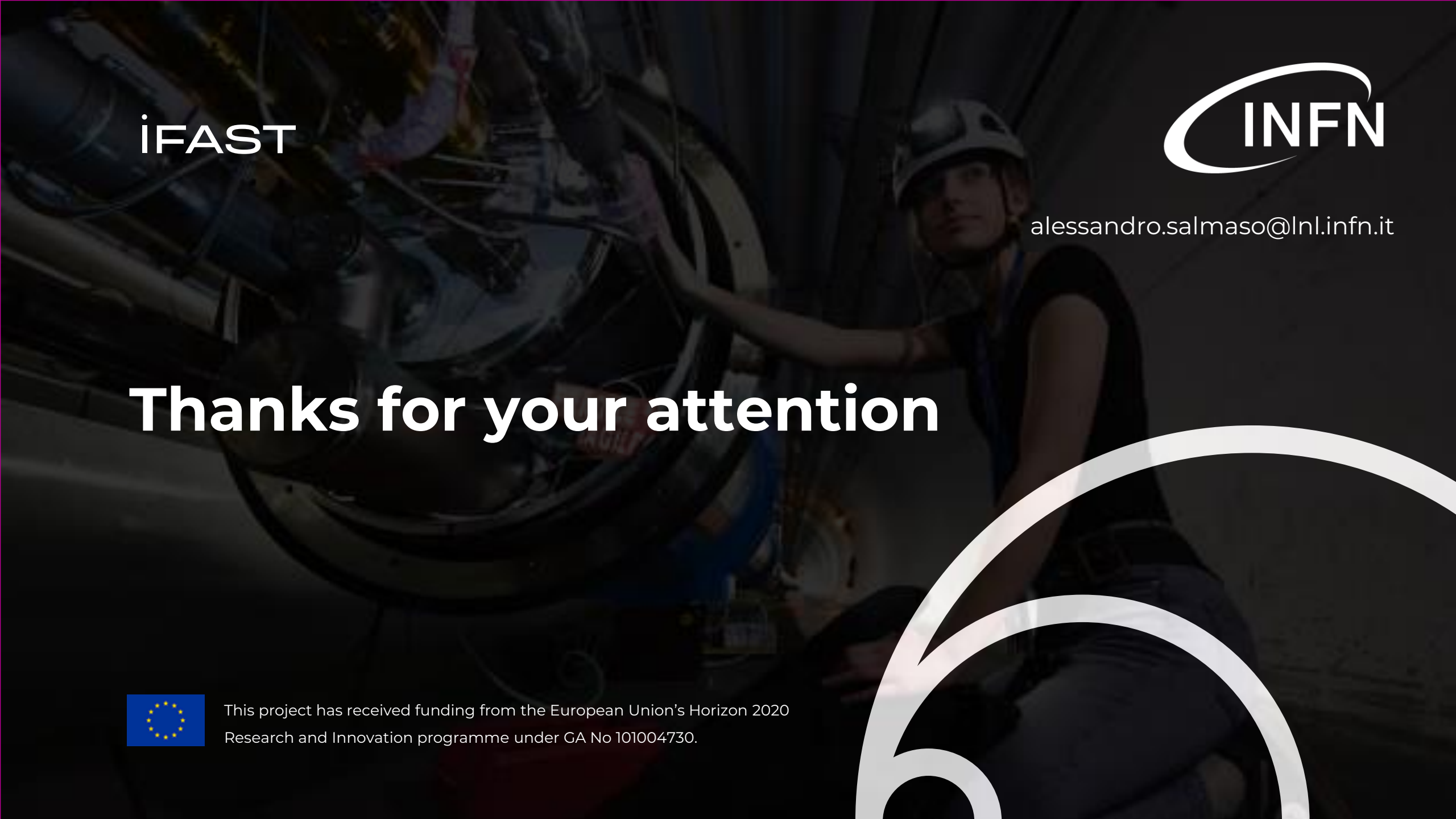

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# Thanks for your attention

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