

# *In situ Transmission Electron Microscopy with He ion implantation of HEA at IJCLab*

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**HerHEA** 

HerHEA project, EUROfusion, ENR-MAT.02.VTT-T001  
2024-2025



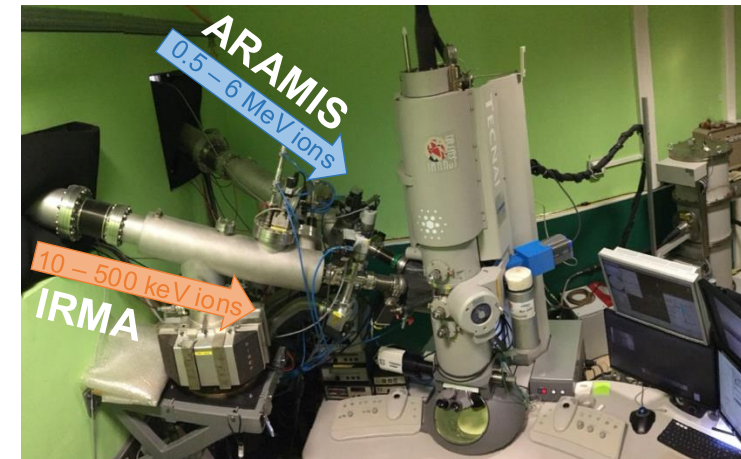
## What was done in 2024 :

- thin foil preparation dev. / optimization
  - ✓ Literature review
  - ✓ Waiting for the materials (1<sup>st</sup> test will be done by FIB)
- preliminary choice of ions parameters (comparable with *ex situ* experiments + using results obtained by simulation)
  - Helium, 10 to 20 keV, up to the maximum fluence in one day
  - Temperature : RT and 500°C
- Review of the existing literature
  - ✓ Several papers
  - ✓ Help us to choose properly all experimental conditions



mosaic

<https://mosaic.ijclab.in2p3.fr>



*In situ* TEM coupled to 190 kV IRMA ion implanter and 2 MV ARAMIS accelerator



# Future work planned at CNRS-IJCLab

Material fabrication at VTT



## Cutting of the bulk as-fabricated material

(subcontractor found in France for EDM cutting – not initially in our task ; cost to be validated)



Materials will be sent to CNRS-CEMHTI and UHEL for ex situ ion implantation and characterizations



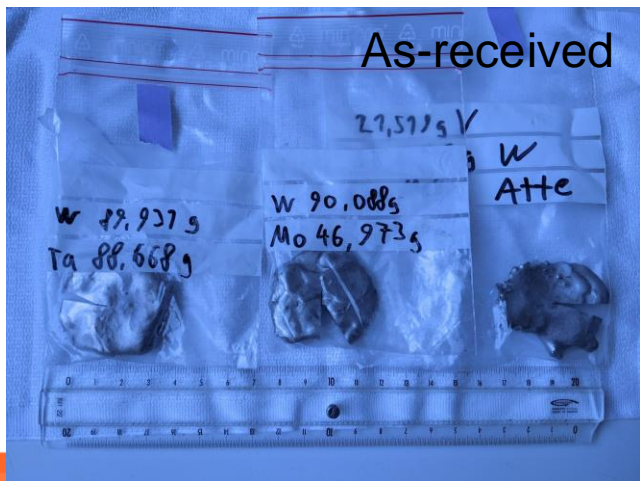
In situ TEM at IJCLab

Select the material(s) to be studied (depending on availability + inputs from literature + modelling + ex situ He implantations)

W, W-Ta, W-Mo, W-V

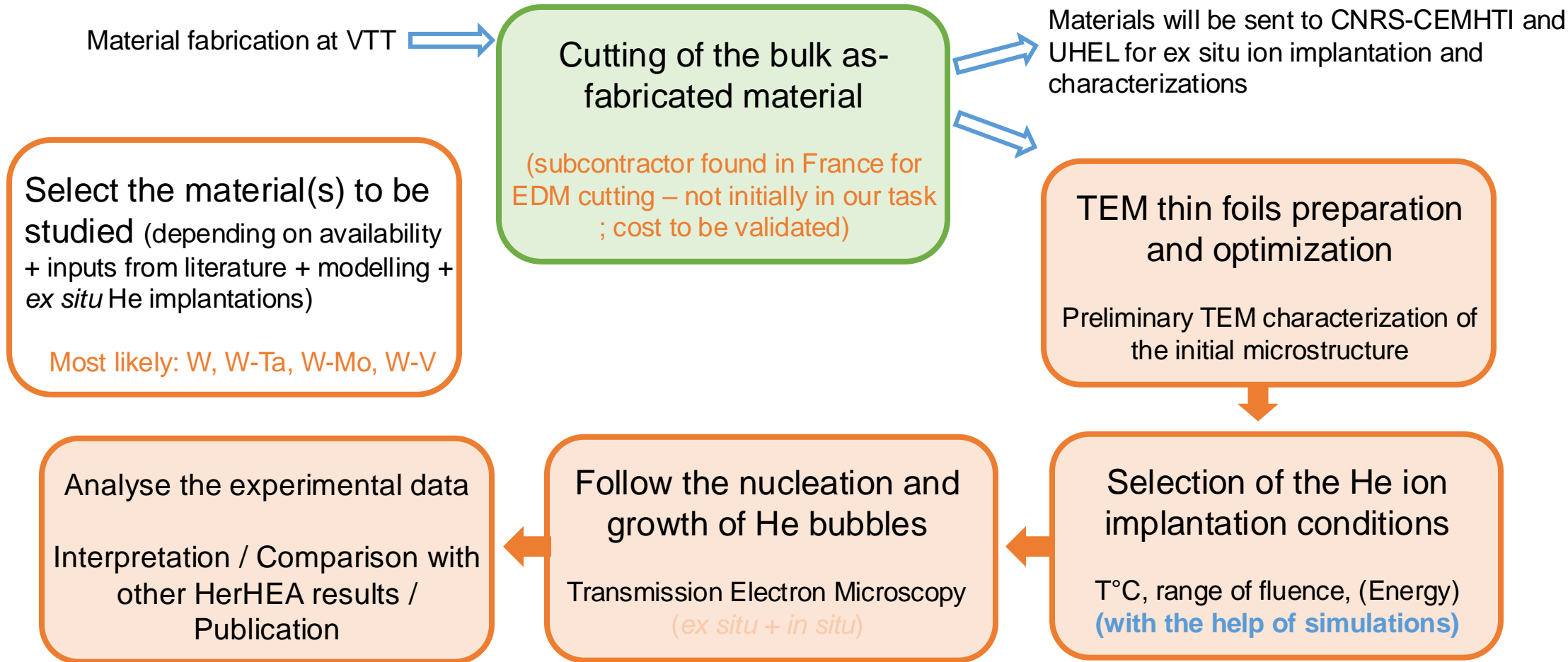
## On-going EDM cutting Delivery expected end of March

Electrical Discharge Machining





# Future work planned at CNRS-IJCLab



M3.1 *In situ* TEM experiments performed (Links to D3.1) June 2025 → will be delayed