JANNuS-Orsay TEM

The JANNuS-Orsay TEM and samples holders for irradiations

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mosaic

Sept 2024

JANNuS-Orsay TEM

mosaic

cnrs

université PARIS-SACLAY

JANNuS

JANNuS-Orsay Experiments : Progress

USERS

Details about the experiment

LOCAL CONTACT

USERS

Proposal Submission

Laboratoire de Physique des 2 infinis Irène Joliot-Curie

emir&a
Réseau national d'accélérateurs pour l'irradiation et l'analyse des molécules et matériaux

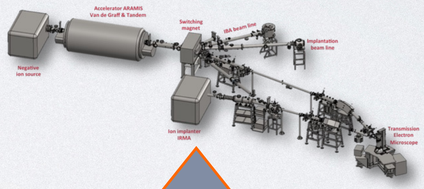
USERS

Evaluation by scientific committee and Validation

LOCAL CONTACT & MOSAIC STAFF

Technical preparation for the experiment

Technical checking of the TEM and accelerator *(generally on Friday)*



LOCAL CONTACT & MOSAIC STAFF

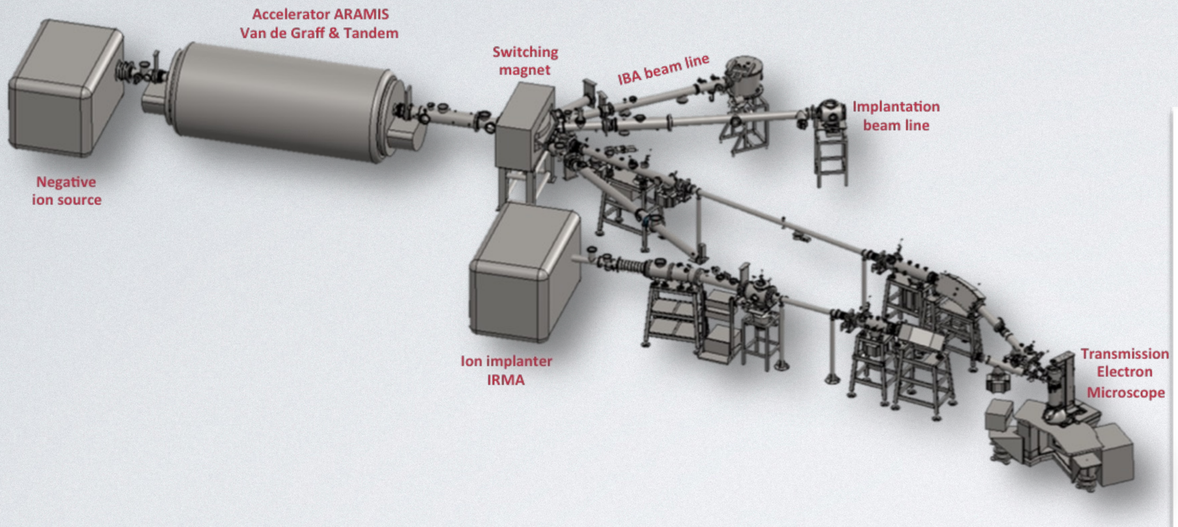
USERS

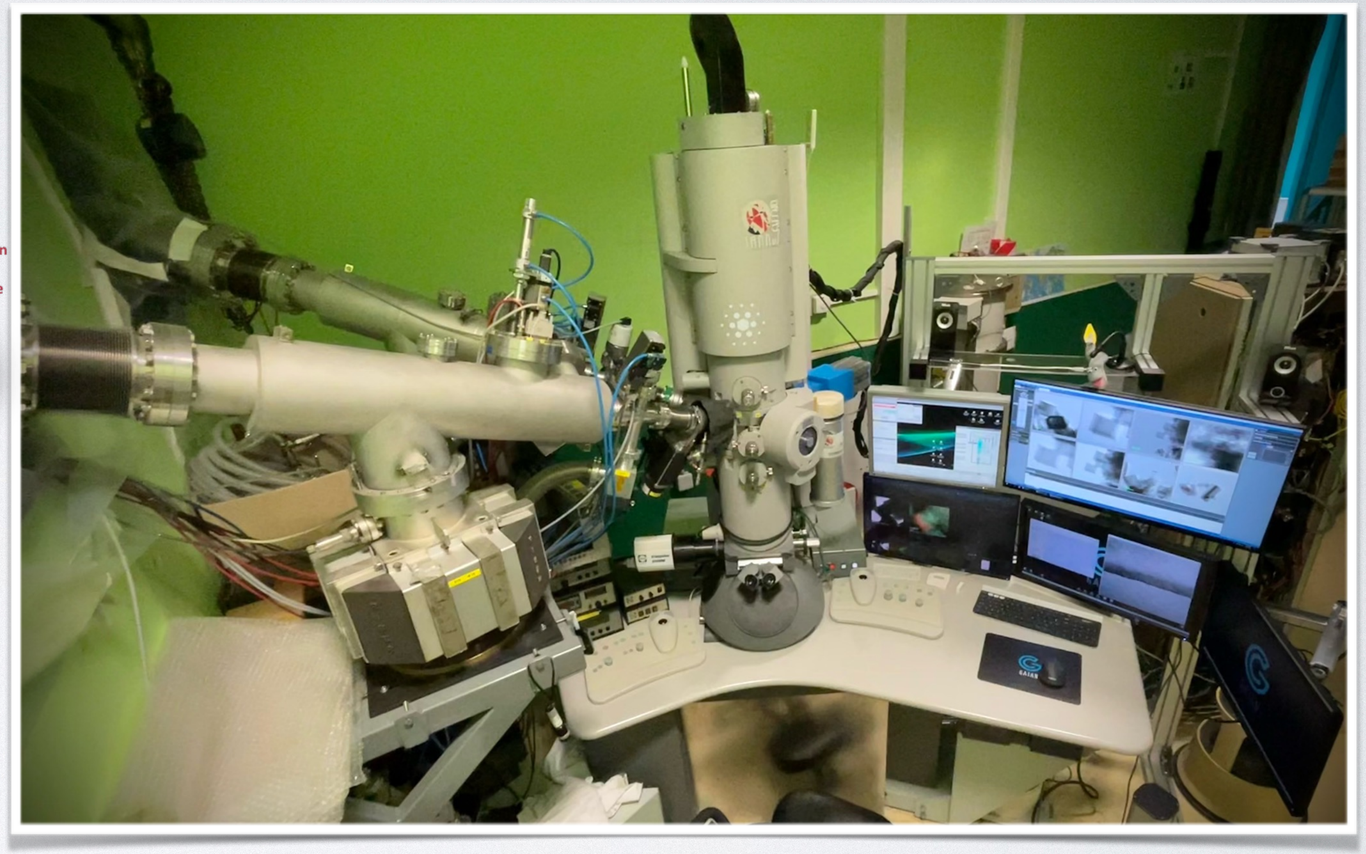
WEEK of Experiment

LOCAL CONTACT & MOSAIC STAFF

STEP 1 STEP 2 STEP 3 STEP 4 STEP 5

JANNuS-Orsay TEM





Tecnai G²20 with a custom made polar piece

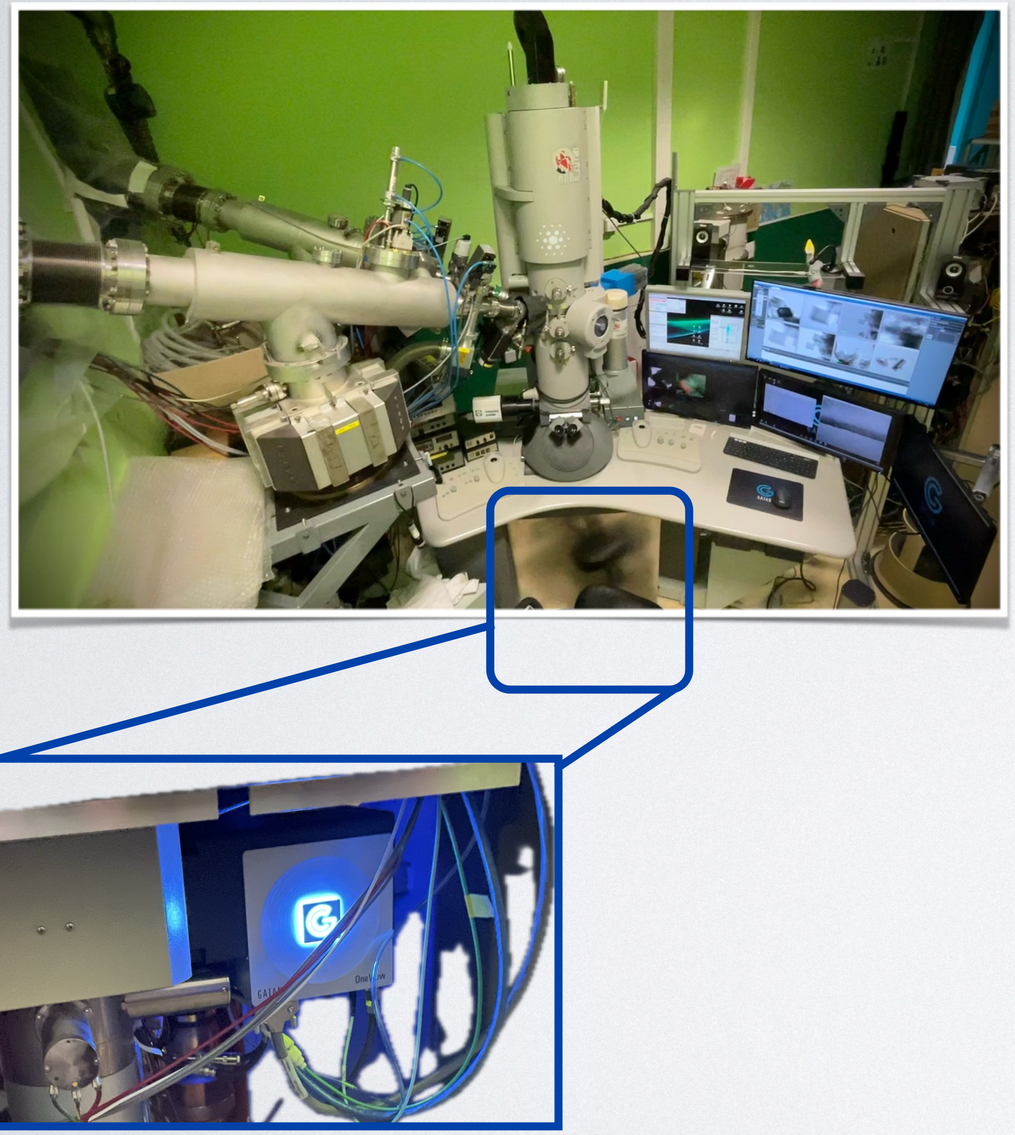
Tension: **200kV**

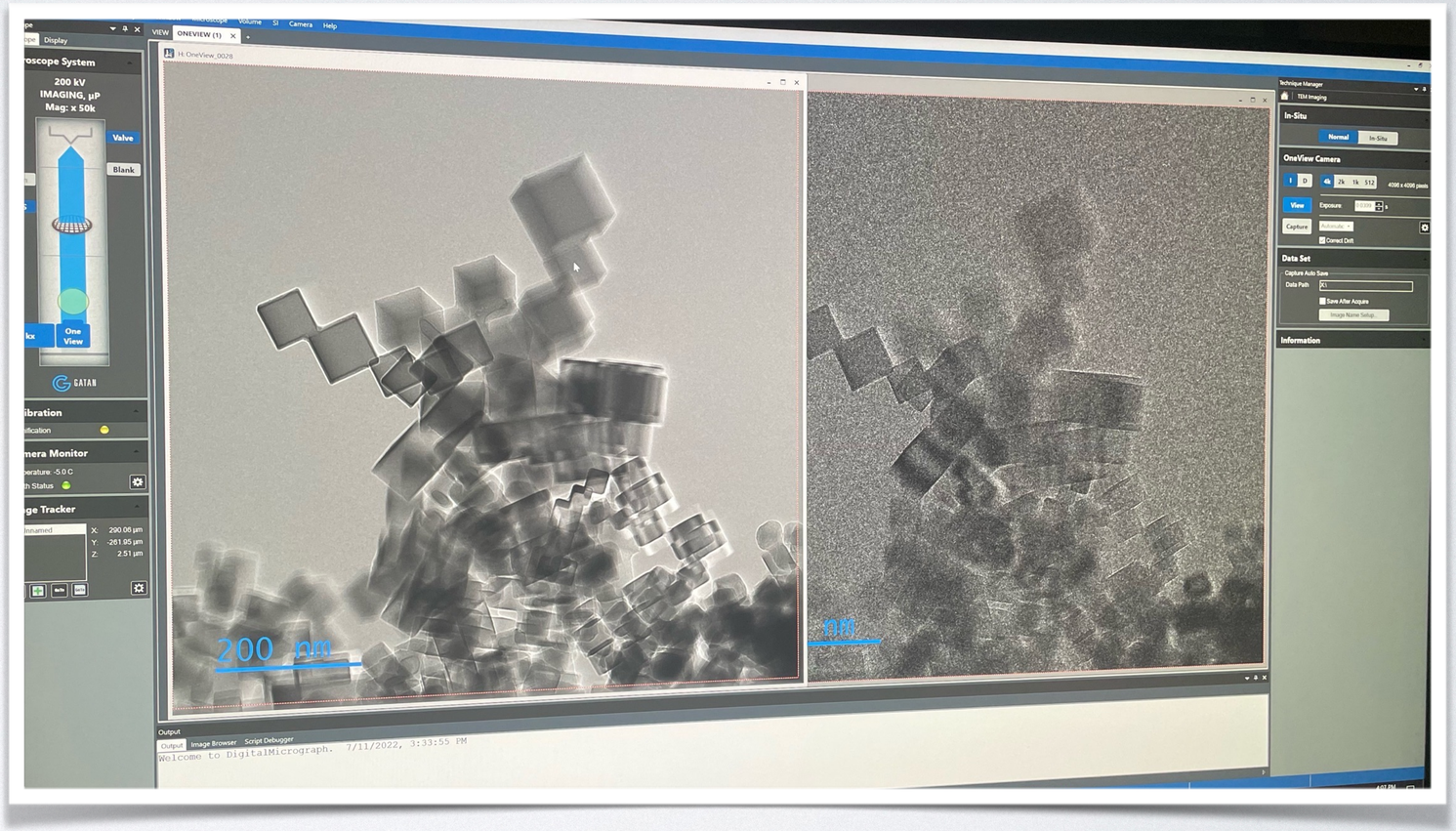
Spatial resolution: **0,26nm**

α tilt : **± 70°**

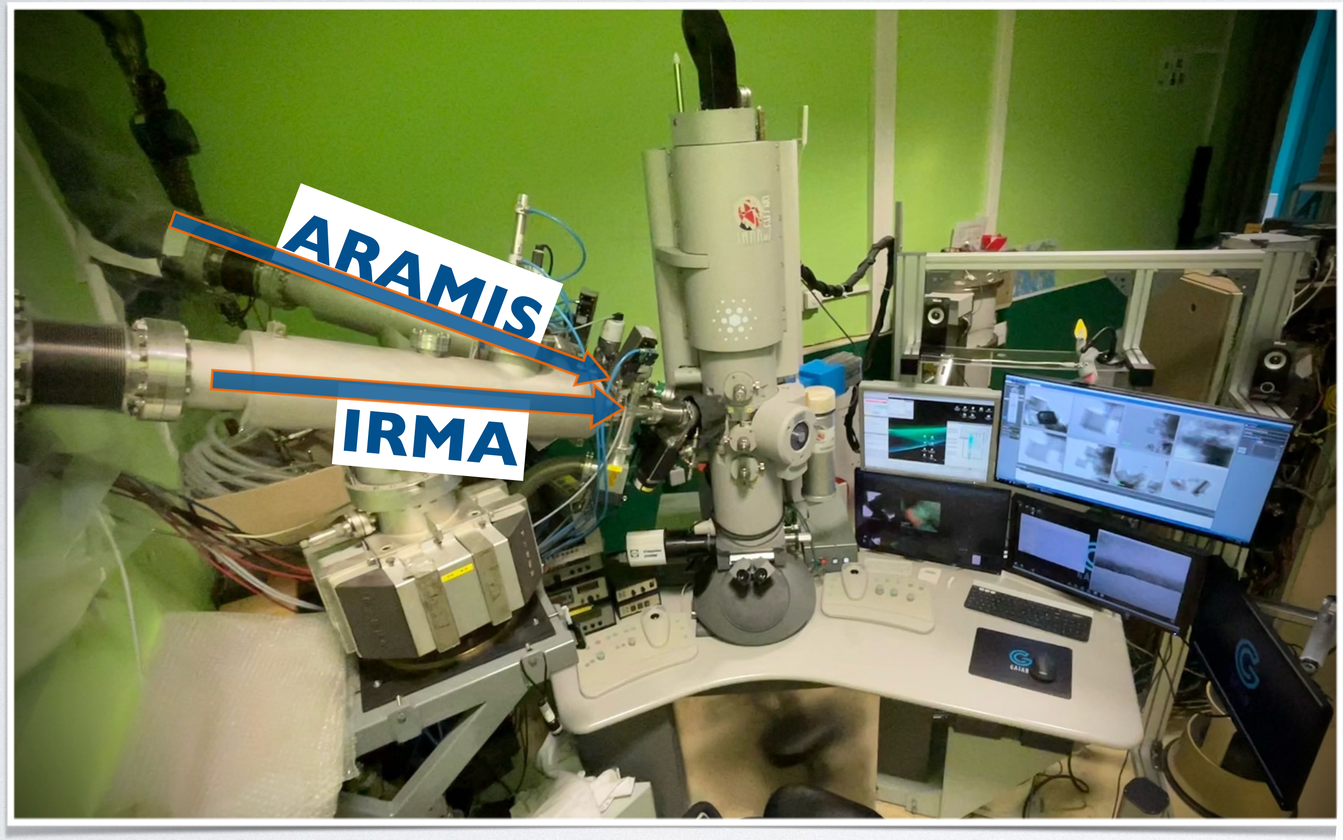
Detectors : **STEM,HAADF, GIF(EELS, EFTEM),EDX, ES500 Large view camera,**
***in situ* OneView camera (4D-STEMx)**

Gatan Camera : Oneview *in situ*



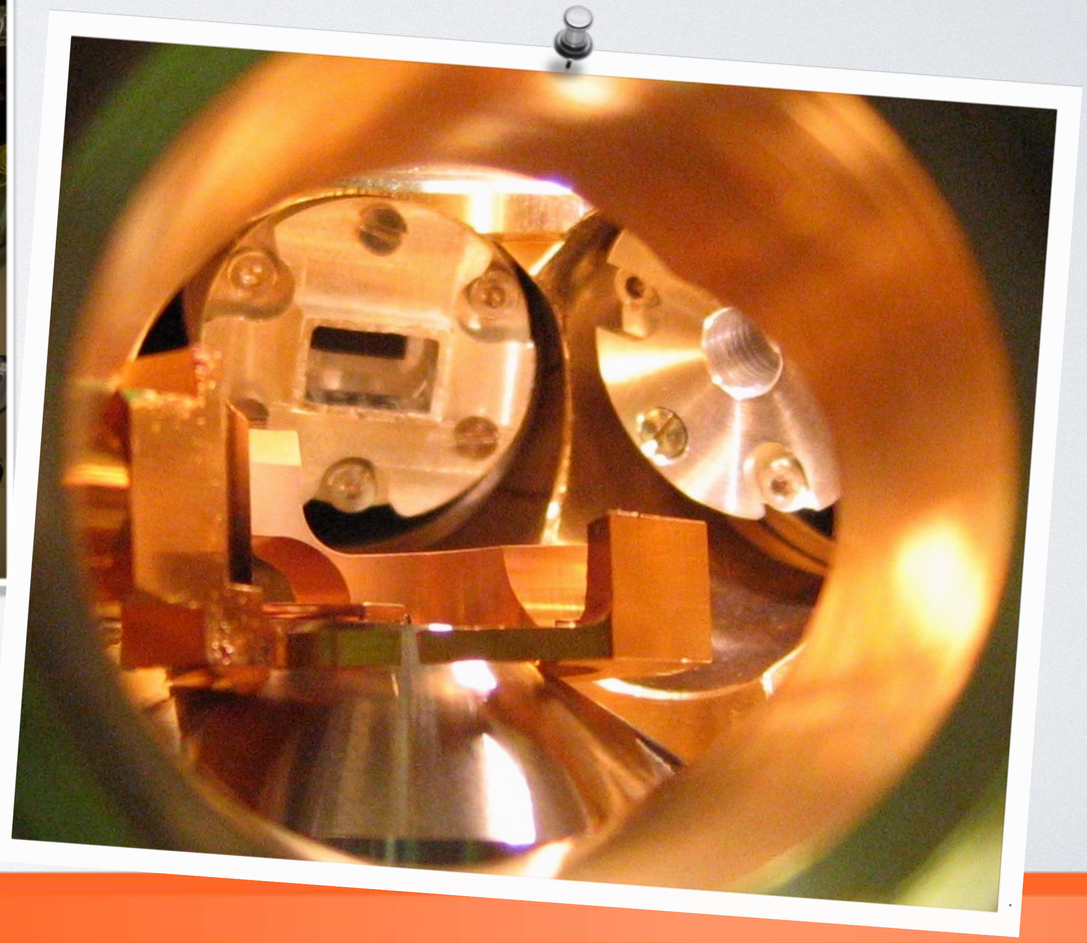


JANNuS-Orsay TEM



Tecnai G²20

- **Connected to 2 ion beam lines**
- **Direct measurement of the flux**



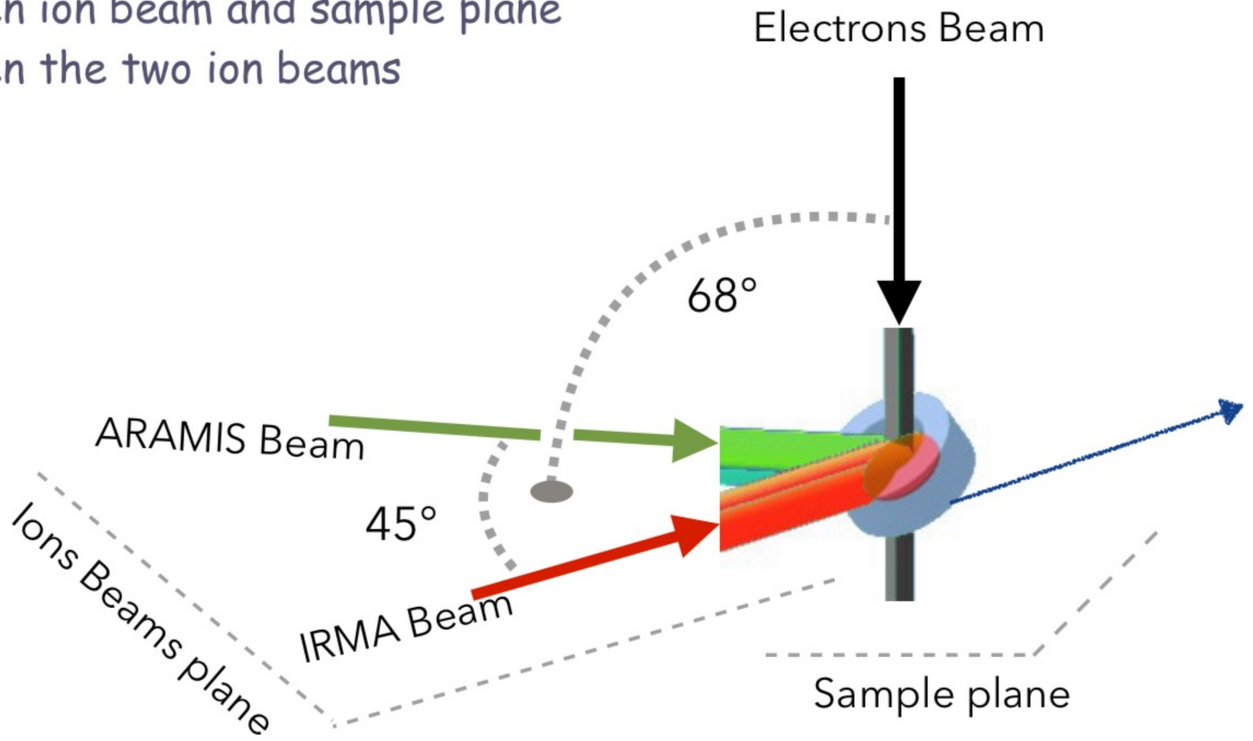
JANNuS-Orsay TEM

Ion beam geometry, and sample environment :

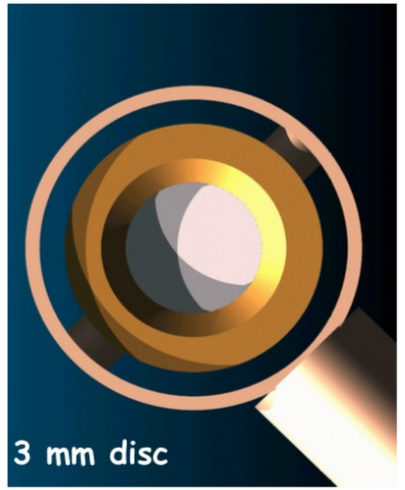
2 beam entries

22° between ion beam and sample plane

45° between the two ion beams

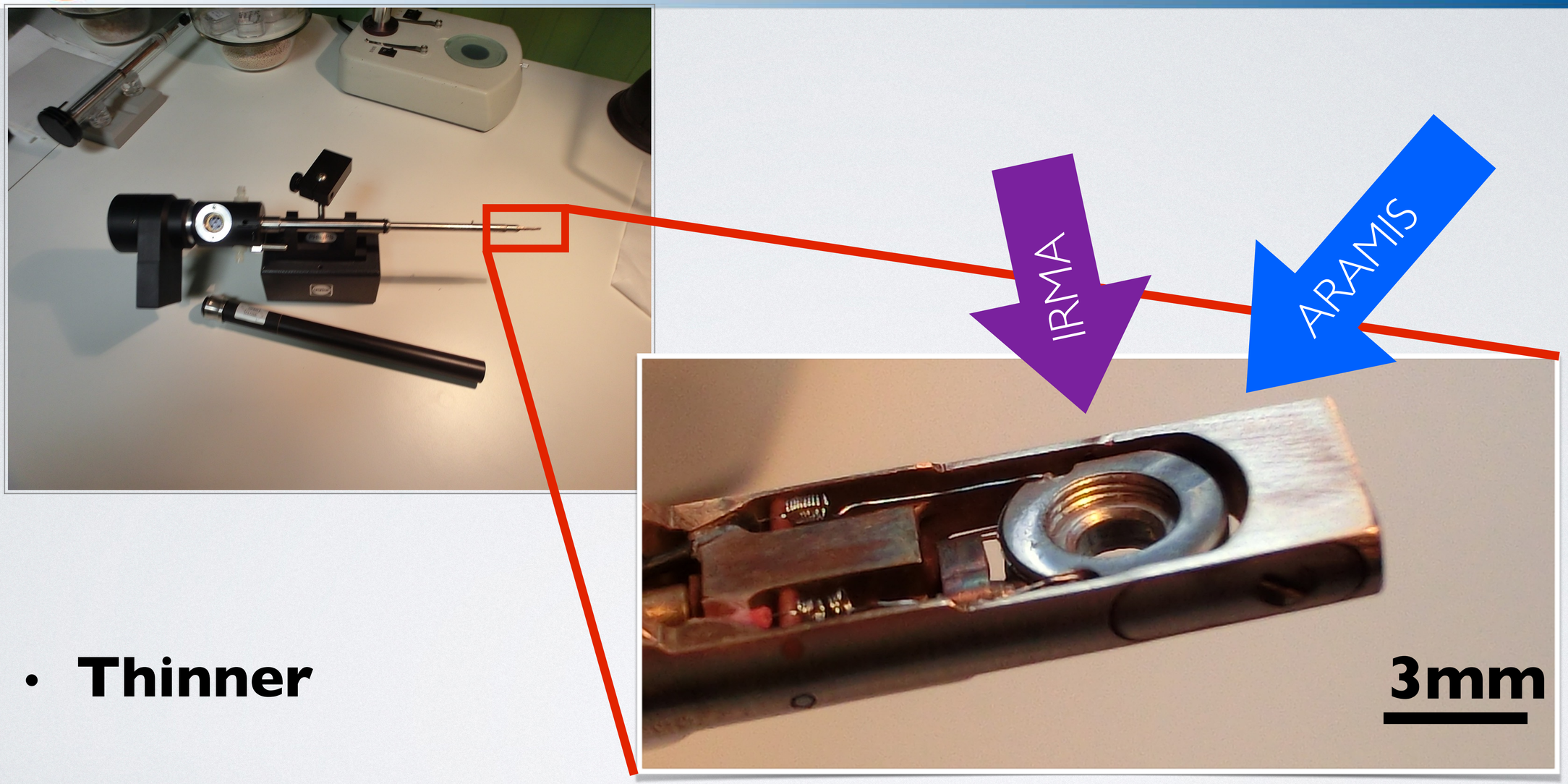


zone of the coincidence of the 3 beams



with the sample holder shadow effect

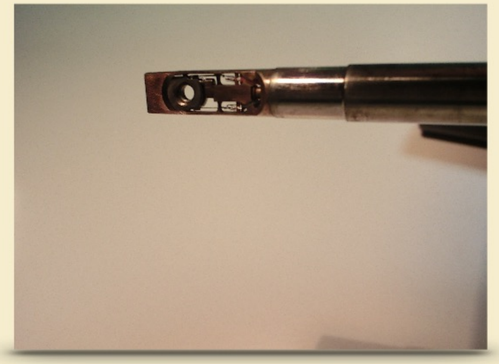
GATAN' SAMPLE HOLDER



- **Thinner**
- **Inverted to protect the furnace and the thermocouple**

GATAN' SAMPLE HOLDER

The list of the available sample holder for ***in situ*** irradiation with the JANNuS-Orsay TEM

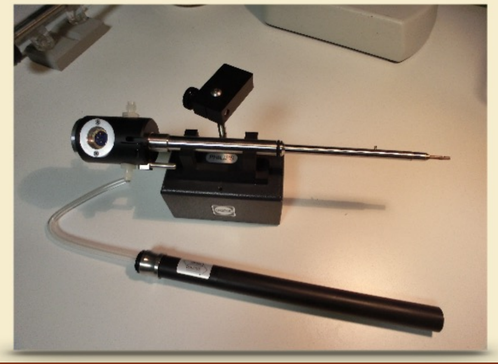


Sample holder 800
tilt: alpha & Beta,
heating : 25°C to 800°C
Ultra-thin for Irradiation
and
EDX analysis

Sample holder double-tilt
tilt: alpha &
Beta 0.2° of precision
Adapted for EDX analyse

Sample holder 1000
tilt: alpha & Beta,
heating : 25°C to 1000°C
Ultra-thin for Irradiation
and
EDX analysis

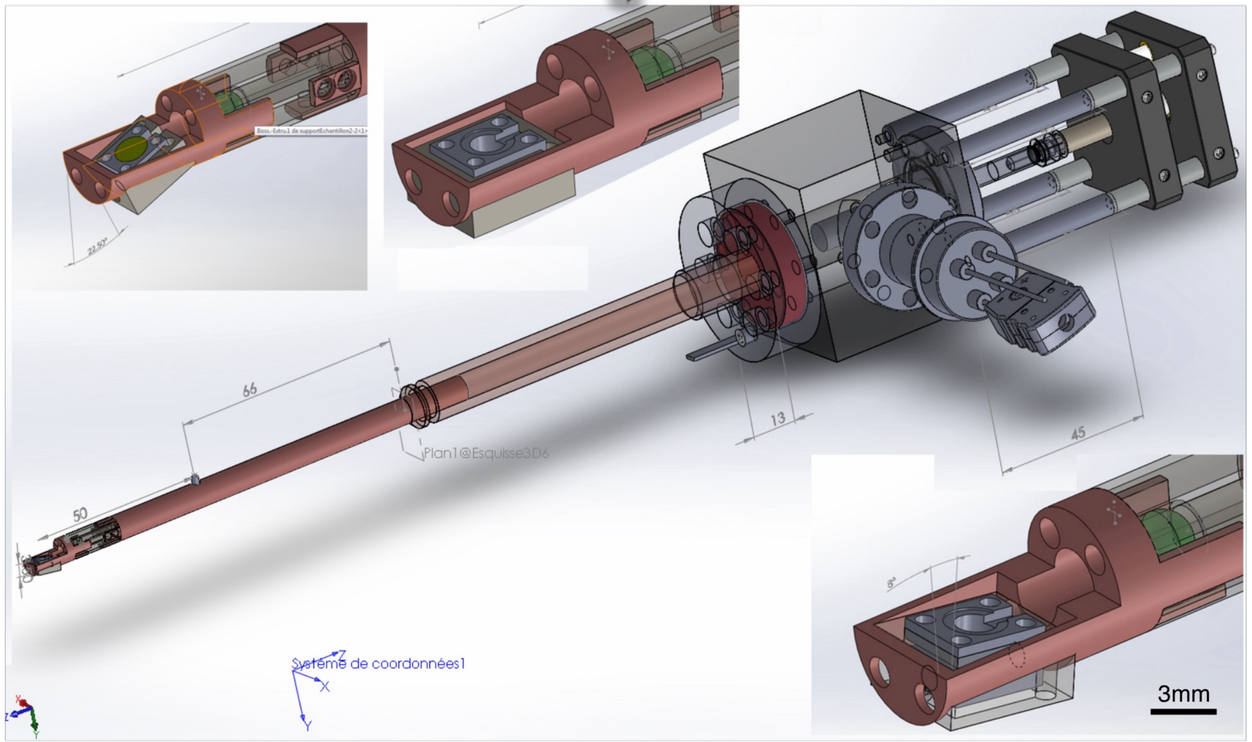
Sample holder Rotation
tilt: alpha & Theta
Adapted for Irradiation
and
EDX analysis



Sample holder 1300
tilt : alpha
heating: 25°C to 1300°C
Ultra-thin for
EDX analysis

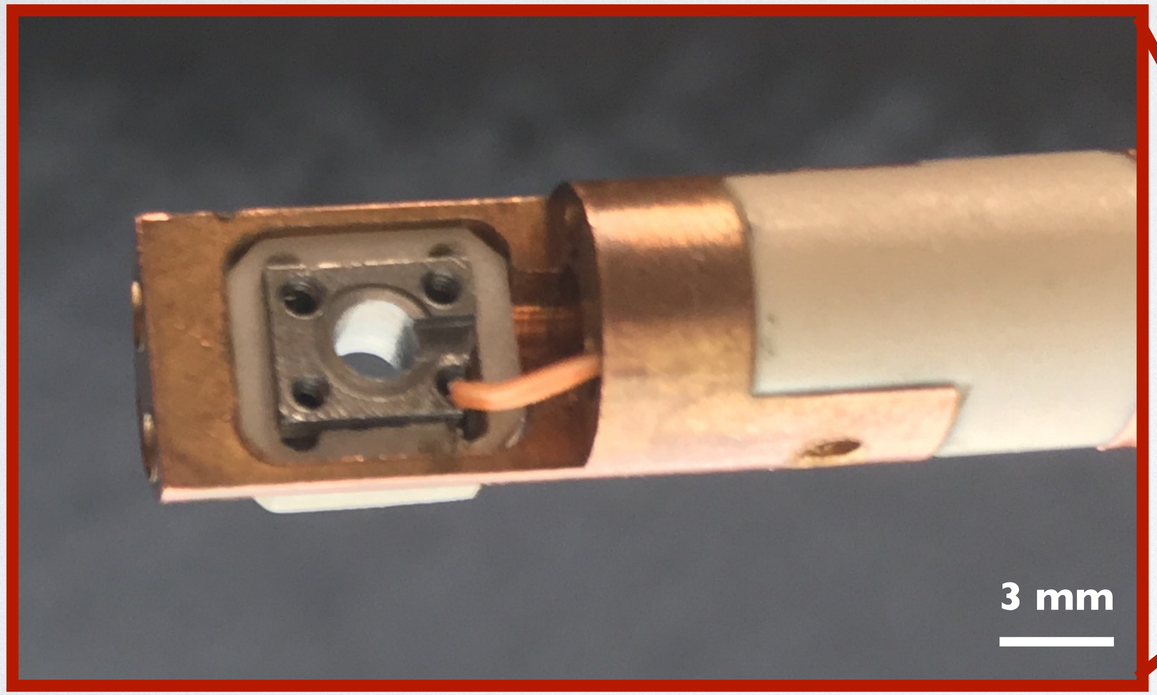
Sample holder LN2
tilt: alpha & Beta, cooling:
25°C to -80°C
Adapted for Irradiation
and
EDX analysis

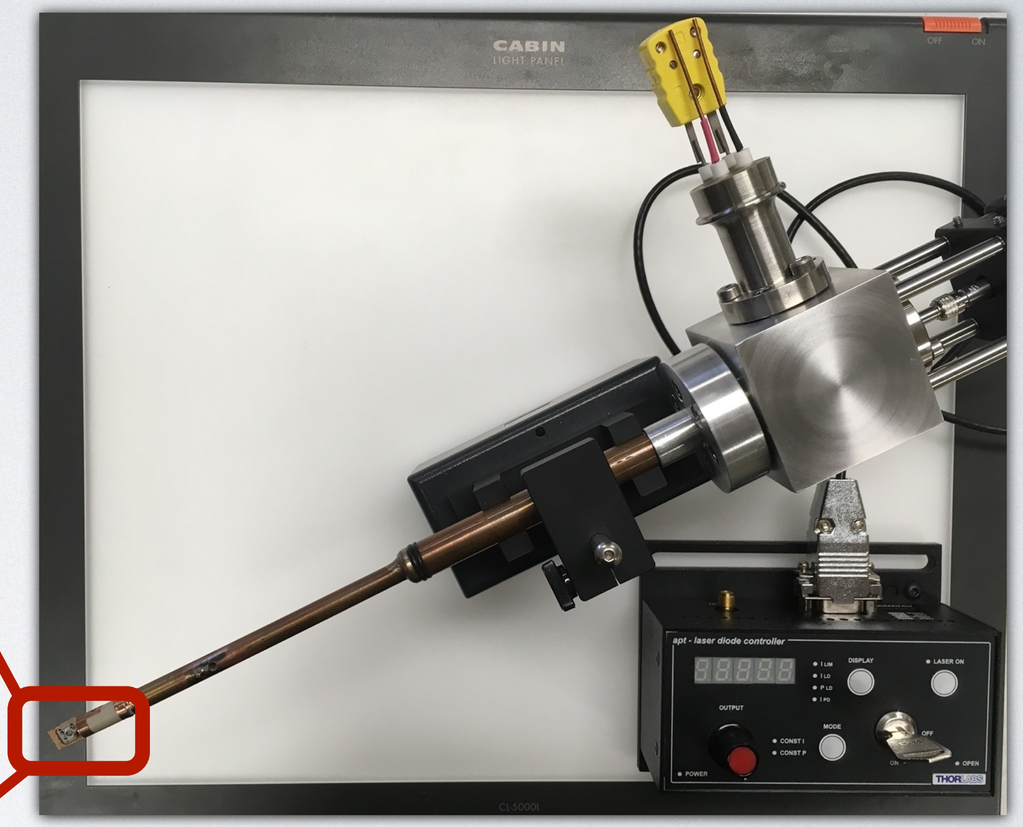
POMETILAT PROJECT



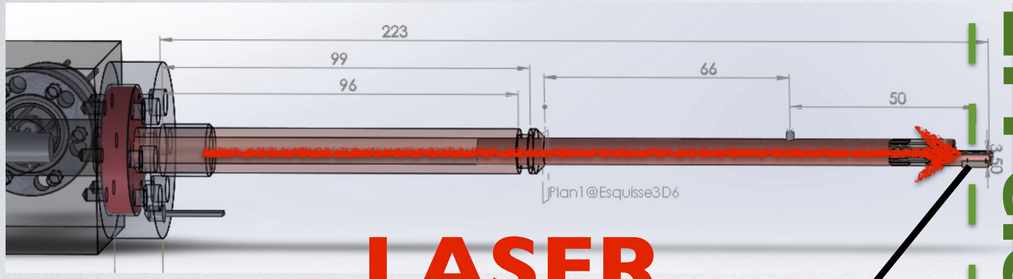
- Not enough port in the column ?
- We passed the laser by the sample holder !

POMETILAT PROJECT



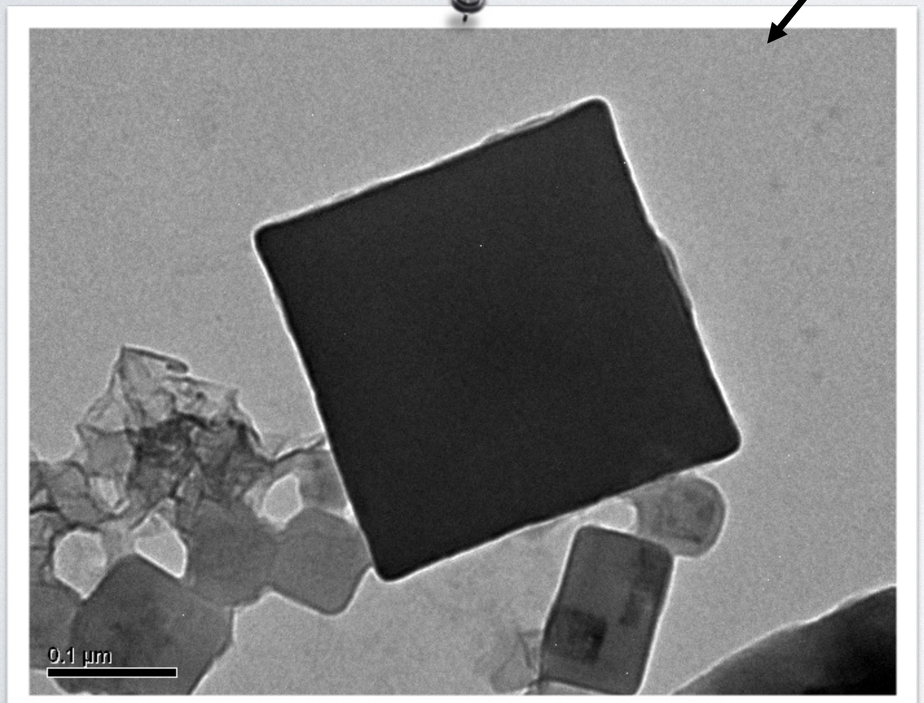


FIRST RESULTS OF THE POMETILAT PROJECT

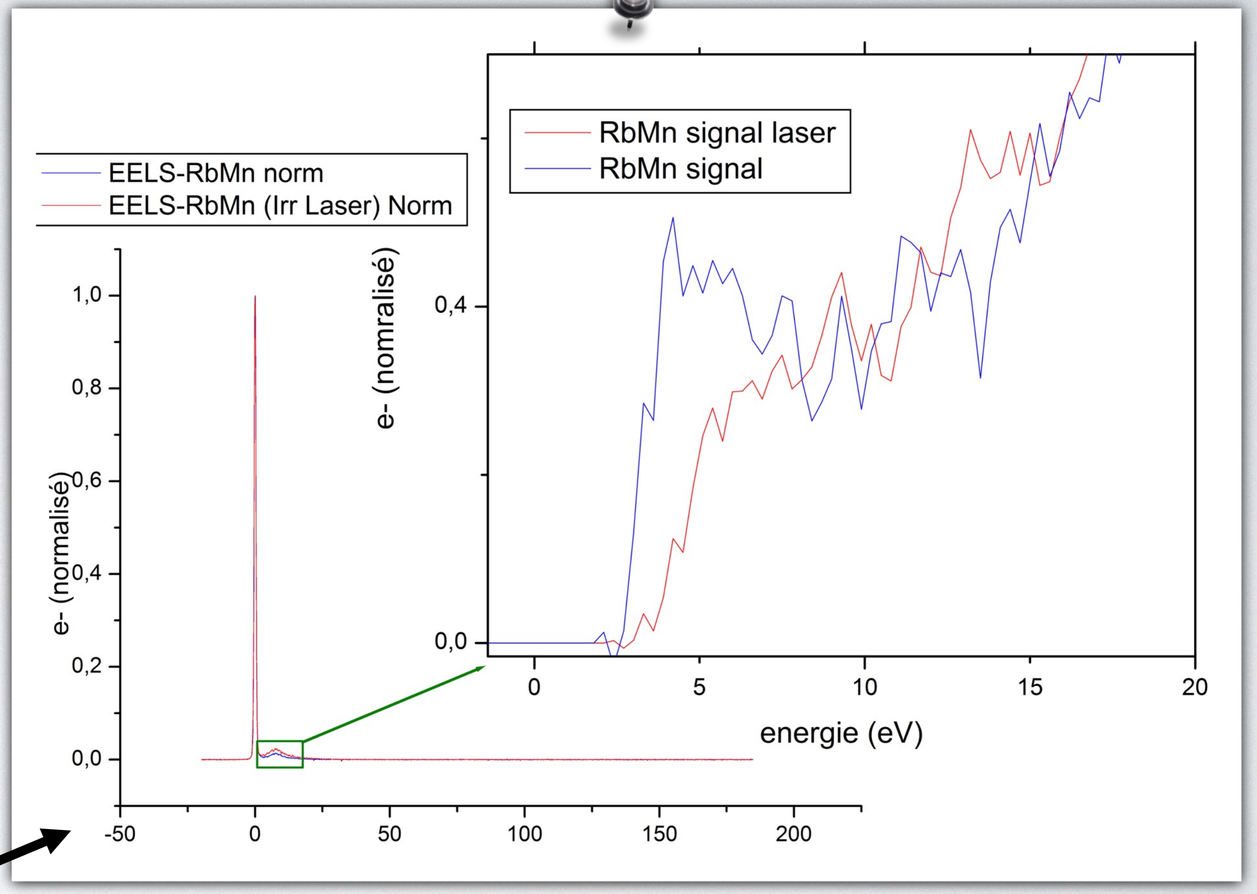


LASER

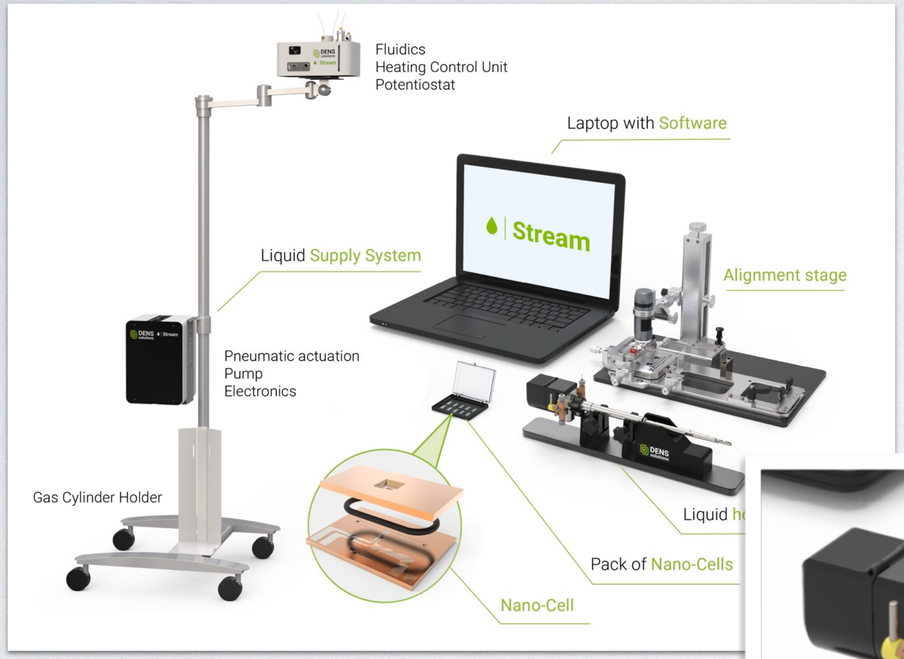
TEM electrons



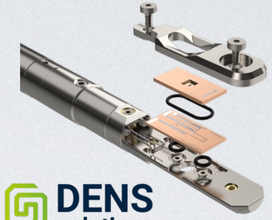
GIF

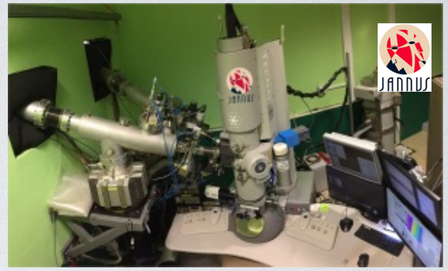


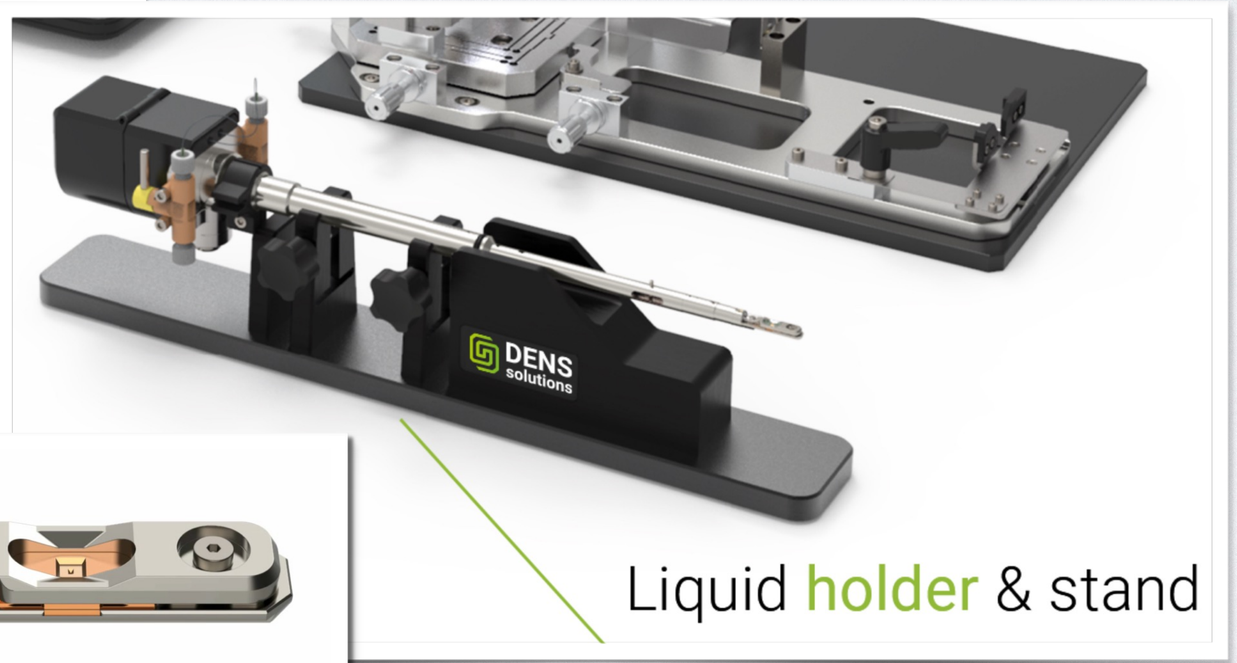
ELOISE SARL PARTNER FOR LIQUID ENVIRONMENT

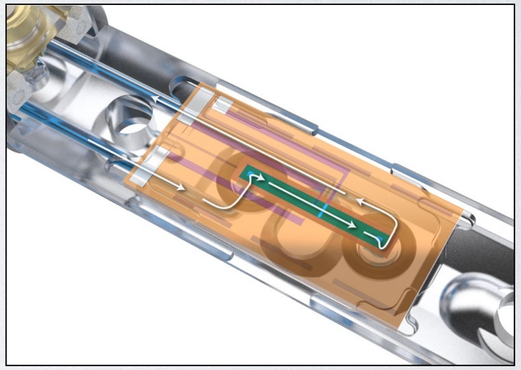


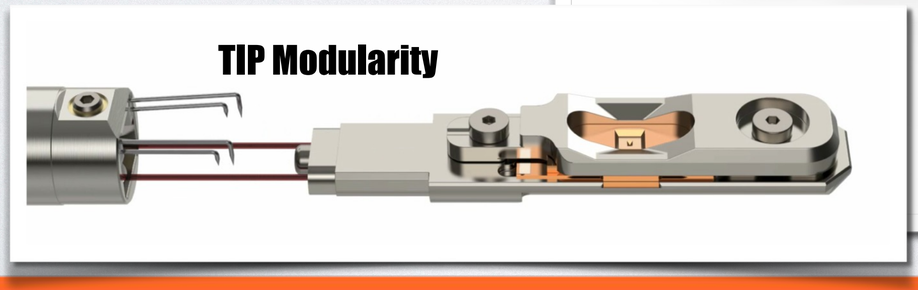
For 2025









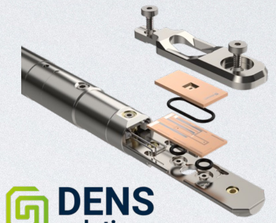


Liquid under ion irradiation and
in situ TEM studies

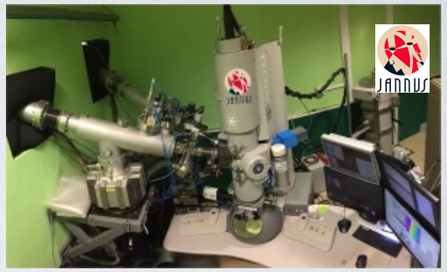
ELECTRON OPTICS éloïse INSTRUMENT SERVICE

IJCLab Irène Joliot-Curie Laboratoire de Physique des 2 Infinis

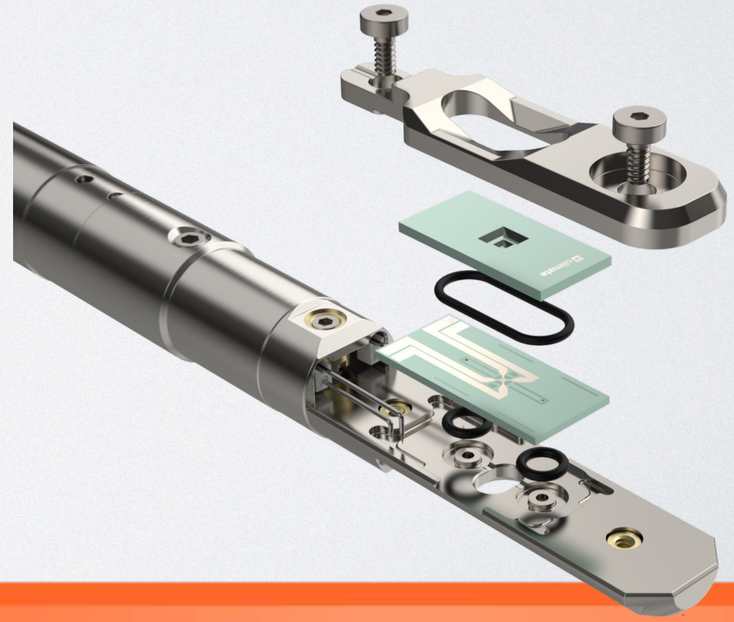
mosaic



DENS solutions



- Ionotherapy
- Corrosion under irradiation
- Battery for space
- Biomechanism under irradiation…
- Etc…



REMERCIEMENTS

- MOSAIC team and local contacts

Cyril Bachelet, Cédric Baumier, Philippe Benoit-Lamaitrie, Jérôme Bourçois, Bryan Bragance, François Daubisse, Laurent Delbecq, Aurélie Gentils, Silvin Herve, Stéphanie Jublot-Leclerc, Florian Pallier, Sandrine Picard, Isabelle Ribaud

- Internship Master student : Marianne Brau

- ICMMO team

Amelie Bordage, Anne Bleuzen

- Eloise Sarl company (Nathalie Jean)