

## Development of TEM preparation samples methods for irradiated materials used in nuclear applications



<b>Laboratory / Team</b>	Center for Nuclear Sciences and Material Sciences (CSNSM) Materials and Irradiation team <a href="https://www.csnsm.in2p3.fr/Materiaux-et-Irradiation">https://www.csnsm.in2p3.fr/Materiaux-et-Irradiation</a>
<b>Contacts</b>	florian.pallier@csnsm.in2p3.fr aurelie.gentils@csnsm.in2p3.fr
<b>Main topics</b>	Preparation of samples (cutting, thinning, polishing, etc.), characterization by transmission electron microscopy (TEM @ JANNuS-Orsay).
<b>Objectives/context</b>	Development of adapted methods for TEM thin foil preparation on multilayers materials (ceramics) used for nuclear applications
<b>Equipment / tools / software used</b>	Equipment for preparation of thin samples (mechanical and ionic polishers, chemical compounds, etc.) ; transmission electron microscope (TEM)
<b>Level / Duration / Period</b>	Master 1 / 1 to 3 months / April-July 2019
<b>Number of trainees</b>	Possible as a pair
<b>Course description / main tasks</b>	
<ul style="list-style-type: none"> <li>• Control the techniques already used for the samples preparation.</li> <li>• Develop and adapt different preparation processes for the new multilayers materials studied.</li> <li>• Image the samples on TEM and analyze the results (defects, artefacts, etc.).</li> <li>• Improve the methods to limit the defects induced by the preparation and understand the effects of irradiations.</li> </ul>	
<b>Skills acquired on completion of the course</b>	
<ul style="list-style-type: none"> <li>• Theoretical and experimental tools for materials preparation and thin films studies.</li> <li>• Knowledge of vacuum, ion accelerator and transmission electron microscopy techniques.</li> <li>• Knowledge of crystallography, defects in materials and ion irradiation mechanisms.</li> <li>• Writing a procedure for the users.</li> </ul>	