

## Concept:

# The JCNS MBE system as user facility at the Heinz Maier-Leibnitz Zentrum (MLZ) in Garching

### 1. Objective

The objective of the JCNS thin film laboratory is to offer the preparation of thin films to users who do not have a thin film fabrication system at hand and want to perform neutron experiments at the MLZ with these samples.

Two operation modes are offered:

1. For **remote access**, the thin film laboratory scientist will fabricate the sample. This is only possible in cases where the JCNS staff has experience in.
2. Alternatively, in the **collaborative access** the user will fabricate the sample under the supervision of the thin film laboratory scientist in the laboratory in Garching. This access mode will be necessary, if research on the proper growth conditions for sample preparation is required.

In addition, the JCNS thin film laboratory provides access to an Atomic Force Microscope (AFM).

### 2. Proposal submission

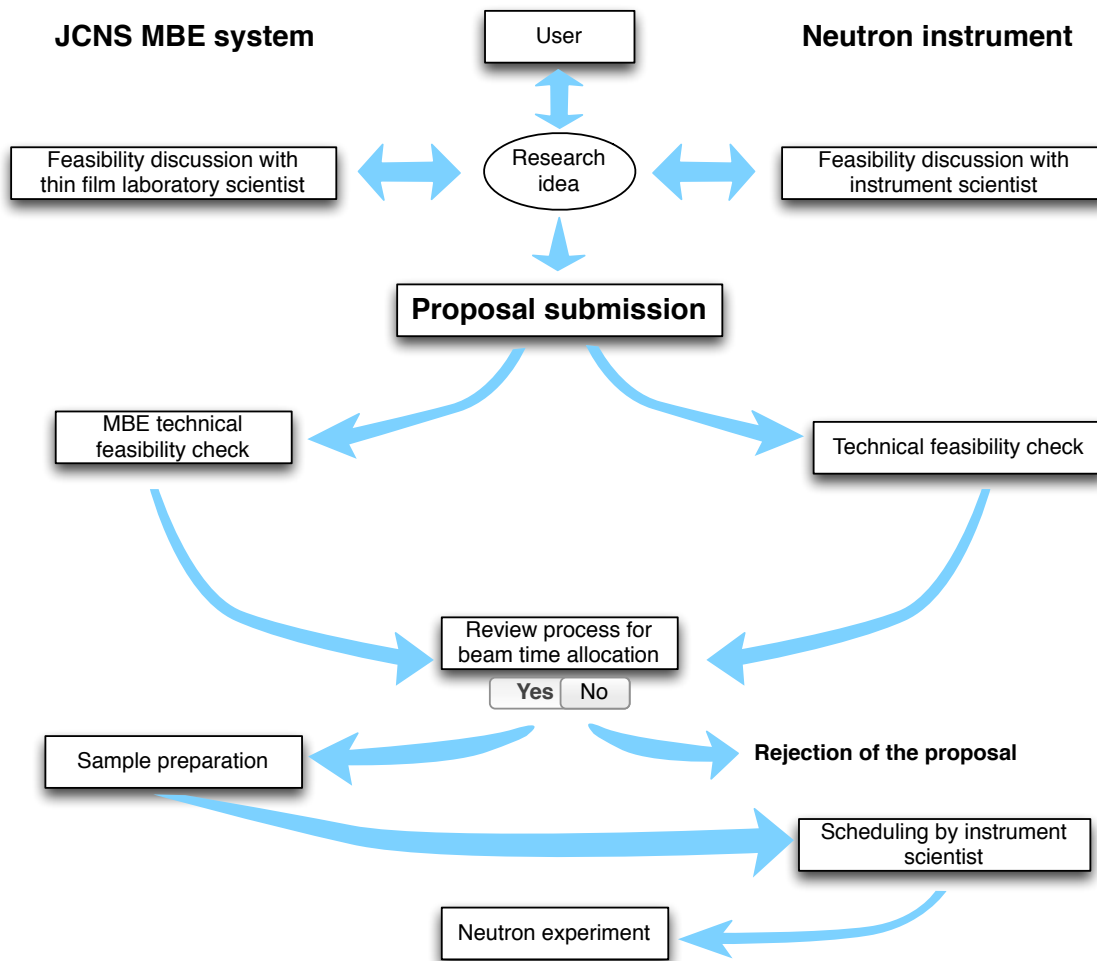
Access to the JCNS thin film laboratory is granted upon proposal submission for external beam time at MLZ instruments, i. e. as an option for e.g. MARIA or N-REX<sup>+</sup>. The user has to fill in an additional proposal form which asks for all relevant information on sample preparation.

Fig. 1 shows the submission procedure for MLZ proposals including the thin film laboratory option. Before proposal submission it is mandatory for the user to contact the thin film laboratory scientist in order to discuss the feasibility of the research idea and the required time for sample fabrication. Proposals submitted without this consultation will not be considered. The thin film laboratory proposal undergoes a technical feasibility check, see below. Before starting any sample fabrication in the thin film laboratory, the proposal for the beam time at the neutron instrument has to be accepted by the review panel. However, the fact that the sample is not ready upon proposal submission or review should not be seen as a handicap for the review. Neutron scattering experiments will be scheduled by the instrument scientist only, when the sample fabrication is completed.

Before integration of the JCNS thin film laboratory in the MLZ proposal system in 2015 the concept of the MBE as user facility should be revised according to the experiences during the commissioning phase.

### 3. MBE technical feasibility check

The thin film preparation part of the proposal is thoroughly checked with respect to its technical feasibility. The check includes the capability of the MBE system to satisfy the sample preparation requirements, a time estimation for preparing the samples, the extent of complementary sample characterization prior to the measurement at the neutron scattering instrument, safety and further technical details. The technical feasibility check is performed by the thin film laboratory scientist with support of a second experienced scientist. The result of the technical feasibility check is reported to the review panel.



**Fig. 1** Submission procedure for MLZ instrument proposals including thin film laboratory option

#### 4. Liability

The JCNS thin film laboratory disclaims any liability.

#### 5. Non-proprietary research

The users of the JCNS thin film laboratory are expected to be academic or industrial scientists and engineers. Their research is expected to be in the public domain and thus the research performed with the samples fabricated in the JCNS thin film laboratory is expected to be disseminated by publication in the open literature. There is no cost to the user to access JCNS thin film laboratory capabilities to perform non-proprietary research.

It is expected that the user informs the thin film laboratory scientist about all the research performed with the samples fabricated in the JCNS thin film laboratory and the achieved results.

#### 6. Commissioning phase of the JCNS thin film laboratory

During the commissioning phase only SrTiO<sub>3</sub> is accepted as substrate. There may be exceptions if the user is experienced in the substrate preparation and provides the thin film laboratory scientist with the knowledge of the preparation procedure.

## **7. Financial support**

During the commissioning phase financial support for traveling is not given. When the JCNS thin film laboratory is integrated in the MLZ proposal system users from German universities can be financially supported.

## **8. Safety, orientation and training**

In case of collaborative access the JCNS thin film laboratory users have to learn about the safety and the operation regulations and alarms of the FRM II. This is realized by watching the briefing film at the Radiation Safety Office on site.

In addition the user will be instructed about the JCNS thin film laboratory safety rules.

## **9. Sample properties sheet/user report**

For each sample a fabrication and property sheet is created by the thin film laboratory scientist. In case of collaborative access a user report has to be written by the user.

## **10. Terms of reference**

The Terms of Reference: Publication and acknowledgement rules of the MLZ apply also to the JCNS thin film laboratory. That means:

The MLZ expects that the local contact in charge of the proposal is involved as co-author in publications mainly dealing with the results of the experiment.

Furthermore users are obliged **to notify** their local contacts about any publication of the results achieved at the MLZ. Please keep in mind, that without his/her help during the measurement and providing the instrument the experiments would not be possible.

The following acknowledgement statement is required at the end of the publication:

"This work is based upon samples fabricated at the thin film laboratory operated by the JCNS at the Heinz Maier-Leibnitz Zentrum (MLZ), Garching, Germany."