

User regulation for Center of Spintronic Materials and Devices **(CSMD):**

Proposal submission, proposal approval and accessing facilities are website based under <http://www.physik.uni-bielefeld.de/experi/d2/research/CSMD.html> and the approval progress can be monitored at any time. All regulations are obligatory for all users.

Section 1: The CSMD's instrumentation and services

1.1 Instrumentation for thin film deposition:

Three deposition tools for magnetron sputtering and e-beam deposition and one MBE tools can be applied:

- One with base pressure of about 1×10^{-7} mbar with seven static sputtering sources (five dc and two rf) designated for multilayer stacks of single element or depositing alloys from an alloyed target.
- Second with base pressure of about 1×10^{-9} mbar and eight sputter sources (six dc and two rf), designated for co-sputtering from four sources to realized complex alloys in thin film form. Substrate cooling or heating in the range from 100K to 1200K.
- Third with base pressure better than 1×10^{-9} mbar and four sputter sources for co-deposition (substrate temperature between 300K and 1000K).
- Combination of MBE and magnetron sputtering. Four sputtering sources (three dc and one rf) can be combined with five Knudsen cells and two electron beam evaporators.
- The operational process of all deposition tools is controlled by script protocols and allows for designing individual stacking sequences of thin films.

1.2 Instrumentation for thin film patterning:

E-beam lithography:

One e-beam facility (Zeiss Gemini microscope with a Raith ELPHY plus) including laser interferometer stage for stitching fields of lithography with individual sizes up to $50 \times 50 \mu\text{m}^2$ with a precision of 10nm to larger areas with a complex layout.

Nanoscale workbench:

A Helios Dual Beam FIB consisting of a scanning electron microscope (SEM), which is additionally equipped with a Ga-ion beam, a micro-manipulator and a gas deposition system and can be used as a nanoscale workbench with an optical resolution down to 0.8 nm supporting and complementing the e-beam lithography.

Laser-beam lithography:

A DWL 66 of Heidelberg Instruments with a solid state laser diode can be additionally utilized.

1.3 Instrumentation for material- and thin film-characterization:

Microstructural characterization of bulk materials and thin single or multilayered films in terms of composition and structure:

- X-ray diffraction (Euler cradle and a supplementary for SAXS measurements)
- X-ray fluorescence system
- Phi scanning Auger system for determination of concentration depth profiles.

Upon request, also analysis of the resistivity and the magnetic properties are available:

- Resistivity
- Hall Effect
- Magnetometer (AGM, VSM)
- Vector-MOKE system

1.4 Services:

Besides operating within joint projects, the CSMD can be used following two different approaches:

(1)User A: All working packages of approved proposals will be accomplished by staff members of CSMD.

(2)User B: Users themselves will do all necessary work to accomplish the goals of an approved proposal and will be assisted and supported in all aspects by staff members of CSMD.

Section 2: Submitting proposals

Proposal submission is website based for all users. For details and assistance on how to write a successful proposal, go to:

<http://www.physik.uni-bielefeld.de/experi/d2/research/CSMD.html>

Section 3: Selection procedure of submitted proposals

Deadlines for new proposals are January 15th and July 15th. Access to CSMD is granted to researchers whose proposals are accepted by the CSMD proposal review committee consisting of Prof. Dr. G. Reiss, Prof. Dr. Th. Hellweg, Prof. Dr. A. Gölzhäuser, Prof. Dr. A. Hütten and Jun.-Prof. Dr. M. Meinert (CEO). CSMD will confirm the receipt of each proposal by Email with a notification of the expected evaluation term. Normally this will be 30 days but can be extended in case of overbooking, see section 3.1. The proposals will be ranked after the following criteria:

(1)Scientific merit under considerations of technical feasibility.

(2)Availability of CSMD resources and instrumentation time needed to support the proposed work.

(3)Potential for further development of the CSMD Know-how.

Proposals are either accepted for a period of 6 months or they are rejected. After this time period, a new proposal must be submitted for evaluation by the CSMD proposal review committee.

CSMD will notify approved users about the time period in which all task of their proposal will be accomplish by staff members of CSMD (User A) or will contact approved users (User B) to schedule instrument time in close contact to the assigned staff advisor associated with your intended facility. Notification by e-mail associated with an allocation of a proposal number and the assigned staff member.

Proposals for proprietary work will be reviewed by CSMD 's Proposal Review Committee and be evaluated based on the same criteria as non-proprietary proposals. If approved, there will be an instrument user fee and an additional charge for technical support by CSMD 's staff members. For actual user fees please refer to section 7.

For general questions please contact:

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Section 3.1: Policy avoiding an overbooking of CSMD

In case of an imminent overbooking following actions will be effective:

- (1) The expected evaluation term will be reasonably expanded from 30 days up to 90 days so as to steer the workload at CSMD.
- (2) Very experienced PhD-students of the Bielefeld group will temporarily reinforce the staff of CSMD.
- (3) Instrumentation time, which is normally during office hours will temporarily be extended to "after hours".

Section 4: Accessing facilities and performing research for User B

Upon approval of your proposal, you will receive an Email with instructions concerning safety regulations, a safety control form and contact information of your assigned staff advisor. It is required to contact your advisor so as to discuss and specify the logistics, technical details of your project and your arrival date. Turn in your completed safety controls form to your advisor by Email no later than 2 weeks prior to your visit to CSMD.

Upon your arrival at CSMD instrument qualification is required and consists of following stages:

- (1) Demonstration of specific instrument characteristics.
- (2) Each instrument has sign-up rules and training on the instrument to become a qualified user is required. Different levels of access apply based on demonstration of competence.
- (3) Each instrumental assignment is approved by the advisor in charge.
- (4) An additional authorization is required for "after hours" building access.

All published work resulting from use of CSMD must include an acknowledgement to CSMD as follows:

This work was performed at the Center for Spinelectronic Materials and Devices (CSMD).

All published work resulting from use of CSMD must be reported to CSMD.

Section 5: Data security and data archiving

All design and scripting protocols necessary for executing the approved proposal in addition with all results acquired in form of images, graphs and quantifications are stored password protected under the assigned proposal number on the CSMD's server and can be assessed by appropriate users at any time. After completion of the proposal all relevant data will be archived for three years. Upon that period of time the appropriate users will be notified and requested to collect their data entirely. Thereafter all data will be deleted from the CSMD's server.

Section 6: Accommodations for User B

CSMD will assist in organizing accommodation in guest or student houses at the lab site or at hotels in the city of Bielefeld.

Section 7: Prices for proprietary work:

All fees listed below are based on the costs for maintenance and replacement parts needed (taken from the average of the last two years):

- Training on deposition or lithography tools € 250 per hour (a typical training will be eight hours)
- Deposition of thin film systems for user A: € 300 per hour of instrument operation (typical time for a set of samples: 3 hours)
- Lithography of thin film systems for user A: € 250 per hour of instrument operation (typical time for a set of samples: 5 hours)
- Deposition of thin film systems for user B: € 250 per hour of instrument operation (typical time for a set of samples: 3 hours)
- Lithography of thin film systems for user B: € 150 per hour of instrument operation (typical time for a set of samples: 5 hours)

Prof. Dr. Günter Reiss

Jun.-Prof. Dr. Markus Meinert