

## **1. Preamble**

This charter presents the usage of the LG-SIMS-Nancy facility at the Centre de Recherches Pétrographiques et Géochimiques (CRPG) and defines the rules and procedures that must be respected by all users, internal or external, wishing to access the facility. By adhering to this charter, the user agrees to respect all rules and procedures cited hereafter. The user's agreement is indicated by signing this document, attesting that they have read and understand the rules and procedures herein.

## **2. Presentation of the facility**

### **2.1. Location**

The LG-SIMS-Nancy facility is located at the Centre de Recherches Pétrographiques et Géochimiques (CRPG), UMR 7358, Université de Lorraine–CNRS, 15 rue Notre Dame des Pauvres, 54500 Vandœuvre les Nancy.

### **2.2. Description**

This facility specializes in *in situ* elemental and isotopic analyses by secondary ion mass spectrometry (SIMS). This instrument is used to measure the concentrations and isotopic compositions of elements of the mass of hydrogen to the mass of uranium in solid materials (glasses, minerals, alloys, metals, etc.) for which appropriate reference materials are available. The analyses most often performed in this facility are isotopic analyses of stable elements, both traditional (hydrogen, carbon, nitrogen, oxygen, and sulphur) and non-traditional (lithium, beryllium, boron, magnesium, silicon, chlorine, calcium, iron, copper, lead), dating by U–Pb, Al–Mg, Mn–Cr, Rb–Sr, and K–Ca methods, and analyses of trace element (rare Earth elements, halogens) and volatile (CO<sub>2</sub>, H<sub>2</sub>O) concentrations.

The LG-SIMS-Nancy facility is equipped with two CAMECA large-radius secondary ion mass spectrometers (IMS 1270 E7 and 1280-HR2) and a sample preparation room dedicated to embedding samples in epoxy or indium and equipped with optical microscopes, polishing equipment, sample coating machines (Au and C), etc.

The LG-SIMS-Nancy facility is a national service of INSU (SN-INSU/CNRS) that hosts, in addition to the projects of “internal” users (CRPG researchers and their direct collaborators), projects of the French scientific community within the framework of the national service of INSU (about 35% of the usage time of the machines) and other “external” projects (foreign universities, industry, private sector). Access to the facility through the SN-INSU program is obtained after completing a form specifying the nature of the request, most often after contacting one of the facility staff in advance, especially in the case of a first demand (crpg-

lgsims@univ-lorraine.fr). Access for foreign universities, private users, and industry is obtained by directly contacting the facility's permanent staff (crpg-lgsims@univ-lorraine.fr).

### **3. Administration**

#### **3.1. Technician staff**

Four permanent engineers are dedicated to the LG-SIMS-Nancy facility.

Nordine Bouden, CNRS Project Engineer  
[nordine.bouden@univ-lorraine.fr](mailto:nordine.bouden@univ-lorraine.fr)

Clément Ferraina, CNRS Project Engineer  
[Clement.ferraina@univ-lorraine.fr](mailto:Clement.ferraina@univ-lorraine.fr)

Andrey Gurenko, CNRS Research Engineer  
[andrey.gurenko@univ-lorraine.fr](mailto:andrey.gurenko@univ-lorraine.fr)

Johan Villeneuve, CNRS Research Engineer (facility manager)  
[johan.villeneuve@univ-lorraine.fr](mailto:johan.villeneuve@univ-lorraine.fr)

#### **3.2. Steering committee**

The steering committee defines the functional rules of the facility and plans for its development. The committee decides how the facility is used, all expenses to be incurred, reparation and maintenance operations, and all protocols put in place to ensure the most efficient service; it takes stock of the operation of the instruments and plans their usage. The committee meets once a month and is composed of the following researchers and permanent technical staff of the LG-SIMS-Nancy facility:

Nordine Bouden, CNRS Project Engineer  
[nordine.bouden@univ-lorraine.fr](mailto:nordine.bouden@univ-lorraine.fr)

Clément Ferraina, CNRS Project Engineer  
[michel.champenois@univ-lorraine.fr](mailto:michel.champenois@univ-lorraine.fr)

Etienne Deloule, CNRS Senior Researcher  
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Evelyn Furi, CNRS Researcher  
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Andrey Gurenko, CNRS Research Engineer  
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Yves Marrocchi, CNRS Senior Researcher  
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Julien Mercadier, CNRS Researcher  
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Laurette Piani, CNRS Researcher (scientific manager)  
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Emilie Thomassot, Associate Professor, Université de Lorraine  
[emilie.thomassot@univ-lorraine.fr](mailto:emilie.thomassot@univ-lorraine.fr)

Johan Villeneuve, CNRS Research Engineer (facility manager)  
[johan.villeneuve@univ-lorraine.fr](mailto:johan.villeneuve@univ-lorraine.fr)

## **4. Conditions of access to the facility**

### **4.1. How to access the facility**

The LG-SIMS-Nancy facility is open to permanent members of the facility during the hours of 8:00–20:00 Monday–Friday and 8:00–14:00 Saturday. Users working alone from 8:00 to 9:00 and after 18:00 during the week and between 8:00 and 14:00 Saturday must carry a safety alarm device. For all other users, internal and external, the facility is accessible during the hours of 9:00–18:00 Monday–Friday, unless specific permission is granted by the permanent staff member assigned to monitor the session.

For CRPG researchers and students, requests for access to the instruments should be made to permanent facility members during monthly meetings or by email ([crpg-lgsims@univ-lorraine.fr](mailto:crpg-lgsims@univ-lorraine.fr)). For researchers and students in joint CNRS laboratories, access requests are made via the SN-INSU program using the form available at <http://www.cprg.cnrs-nancy.fr/Sonde/SN.html> or <https://sims.cnrs.fr/>. Other requests for access (universities not associated with the CNRS, private sector, industry) are addressed by email to permanent facility members ([crpg-lgsims@univ-lorraine.fr](mailto:crpg-lgsims@univ-lorraine.fr)).

Usage of the instruments is scheduled, and permanent staff assigned to monitor the sessions, during the monthly meetings of the steering committee. In most cases, requests are approved within 3–4 months after they are submitted. Once a session is scheduled, the monitor and user are put in contact to prepare the upcoming analytical session.

In the event of technical issues, scheduling adjustments are taken to the facility managers. In these cases, a member of the steering committee will contact the users and propose that the session be rescheduled during an alternative period.

### **4.2. Special cases**

To best organize the usage of the facility, it is asked that applicants present their desire to use the facility before beginning projects that require substantial machine-time or staff support (e.g., requests for doctoral theses or post-doctoral research, ANR or ERC projects...)

## **5. Reservation of equipment**

### **5.1. Feasibility of requests**

The steering committee studies the feasibility of analytical demands to ensure that they follow conditions of access described in sections 4.1 and 4.2. The committee informs the applicant of the compatibility of their request with the potentials of the facility and reserves the right to deny applications that are not within the prerogatives of the facility.

The facility is not equipped for the preparation of radioactive samples (artificial or natural), nor for the analysis of radioactive samples whose radioactivity exceeds the legal threshold ( $10^4$  Bq).

### **5.2. User training**

Regular users of the facility (CRPG personnel, doctoral students, post-doctoral researchers) receive training for the autonomous or semi-autonomous use of the instruments, provided by the permanent staff. This training is mandatory for students and post-docs whose projects require extensive use of the facility's instruments. Facility researchers are responsible for the technical and scientific training of their students and post-docs.

For occasional and non-autonomous users, the staff member assigned to monitor their analytical session is responsible for the instrumental settings and supervising the analyses.

### **5.3. Scheduling**

The facility manages applications in the order in which they arrive and as a function of availabilities and needs, both human and technical.

The schedule is updated during monthly meetings, or more frequently as required by technical and human issues.

In the event of a breakdown leading to the cancellation of a reservation, the reservation will be rescheduled in consultation with the user.

## **6. Rules for the use of equipment and responsibilities**

### **6.1. Rules for the use of equipment**

The facility provides all the necessary recommendations for the preparation of samples and the analytical session, as well as material assistance for the preparation of samples mounted in indium. Samples can be coated in gold or carbon within the facility. In return, the users must follow the recommendations of the facility's technical staff. The technical staff cannot be held responsible for poor sample preparation or the loss of a sample. The platform does not support the storage and tracking of users' samples.

Non-autonomous users are supported by the technical staff for the duration of their analytical session. None of the equipment in the facility can be used without the prior consent of the technical staff. The SEM may be used autonomously only after training during the time slots defined by the facility managers.

### **6.2. Data management**

Raw (ASCII format) and processed (XLS/CSV format) analytical data are stored at the acquisition station and backed up daily. Data are saved internally on backup hard drives. Nonetheless, the facility declines all responsibility in the case of lost data.

The LG-SIMS-Nancy facility implements a data management plan including the long-term backup of data and the guaranty of their reusability. To accomplish this, SIMS users must provide a description of the nature of their samples (including rock type and constituent minerals), their geographic provenance, and, if possible, their identification in the INSU reference sample database.

A laboratory folder recording the analytical parameters during each session, maintenance issues, and any problems encountered with the instruments is to be completed by the facility staff.

### **6.3. Distribution of results**

The processed data (XLS/CSV format) are given to each user at the end of their analytical session or within the following days. Afterward, they remain available, as do the raw data, upon simple request by the users.

### **6.4. Responsibilities**

The technical staff is responsible for maintaining the functionality of the instruments available to the users, and for monitoring analytical sessions. They are also to ensure that the instruments function optimally, in accordance with their specifications.

Autonomous users are responsible for any damages resulting from their use of the instruments that does not comply with the instructions given.

All users of the facility are responsible for any bodily harm or property damage that may occur during the use of the facility's equipment, if necessary through civil liability and individual accident insurance.

## **7. Hygiene and security**

All users of equipment and rooms in the LG-SIMS-Nancy facility must conform with the laboratory's rules of safety and proper conduct (internal rules of UMR 7358). They must also follow the rules specific to the facility, of which they will be informed beforehand. A non-exhaustive list of these rules is provided here:

- Wear hygienic and safety equipment specific to the facility, particularly when accessing the instruments (gloves, overshoes/dedicated shoes, lab coat, hair net, protective mask).
- It is prohibited to bring food and drink into the instrument control rooms.
- Access to the sample preparation room and the SEM must be obtained by request to one of the facility's technical staff. The facility staff reserves the right to deny access to anyone who does not respect the rules for using the room (compliant use of the instruments and tools, cleaning tools and benches, storing materials, ...).
- Inform the facility staff in the case that a breakdown or malfunction is observed on an instrument.
- Access to facility instruments is strictly prohibited outside the hours defined in section 4.1.

## **8. Pricing**

The prices for using the instruments of the LG-SIMS-Nancy facility are available upon request from the platform staff ([crpg-lgsims@univ-lorraine.fr](mailto:crpg-lgsims@univ-lorraine.fr)).

## **9. Publications**

All users of the facility are invited to provide a summary of their scientific objectives and obtained results, which will be integrated into the facility's annual activity report. If the data obtained using the instruments of the LG-SIMS-Nancy facility are the subject of a publication or report, the facility should be cited in the acknowledgements as "LG-SIMS-Nancy team".

The references of all such publications should be sent to the facility address so that they can be integrated into the general list of publications produced using data from the facility and for inclusion in the facility's annual activity report.

## **10. Signature of the usage charter**

By signing this document, the applicant attests that they have read and understood the usage charter of the LG-SIMS-Nancy facility, and will honour their responsibilities.

### **Applicant**

Name:

Date:

Signature: