Report on the outcomes of a Short-Term Scientific Mission[1]

Action number: CA21126

Grantee name: Saoud BAOUCHE

Details of the STSM

Title: **Production of dust samples for astrochemical experiments**

Start and end date: 12/08/2024 to 16/08/2024

Description of the work carried out during the STSM

This report outlines the outcomes of the Short-Term Scientific Mission (STSM) conducted in the Analytical Mineralogy Group, Institute of Geosciences, Friedrich Schiller University Jena. The mission was carried out between 12/08/2024 and 16/08/2024 under the supervision of Alexey POTAPOV. The primary objective of the STSM was to produce amorphous carbon grains, analogues of carbonaceous cosmic dust grains for their further investigation at LERMA, CY Cergy Paris Université.

The other specific objectives of the STSM were:

1. **Skill Development:** To acquire practical skills in; dust deposition by pulsed laser ablation, supersonic molecular beam experiment and the use of an FTIR spectrometer in the transmission mode.
2. **Research Collaboration:** To contribute to the future research on the fundamental processes of adsorption, diffusion, and desorption of astrophysical relevant molecules on model surfaces, analogues of cosmic dust grains.
3. **Knowledge Exchange:** To facilitate the exchange of knowledge and ideas between the home institution and the host institution.

[1] This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the GH for payment of the Grant.

During the STSM, the following activities were carried out:

- **Laboratory Work:**
    - **Training Session (1st day):** Participation in hands-on training session on dust deposition by pulsed laser ablation under the guidance of Alexey POTAPOV.
    - **Data Collection:** Conduction of experiments on the production of amorphous carbon grains with various grain layer thicknesses.
    - **Data Analysis:** Analysis of the collected data using the integration tools included in the Opus Bruker software.

Description of the STSM main achievements and planned follow-up activities

Description and assessment of whether the STSM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the STSM. Agreed plans for future follow-up collaborations shall also be described in this section.

(max. 500 words)

The STSM resulted in several significant outcomes:

- **Skill Acquisition:** Developed advanced skills in samples preparation, which will be beneficial for ongoing and future research projects at the home institution.
- **Research Progress:** Produced samples will be used in diffusion experiments at LERMA. Results of the experiments will serve as a basis for a joint publication.
- **Network Expansion:** Established professional relationships with researchers at Friedrich Schiller University, leading to potential future collaborations.
- **Knowledge Transfer:** The exchange of ideas and methodologies between the home and host institutions will enhance research capabilities at both institutions.

The Short-Term Scientific Mission at the Analytical Mineralogy Group of the Friedrich Schiller University in Jena was highly successful in achieving its objectives. The mission provided valuable hands-on experience, facilitated fruitful research collaboration, and expanded professional networks. The knowledge and skills acquired during this period will significantly contribute to the ongoing research efforts at the home institution. Future collaborations with the host institution are anticipated, fostering continued scientific exchange and innovation.

I would like to express my gratitude to Alexey POTAPOV and the team at the Analytical Mineralogy Group for their support and guidance throughout the STSM. I also thank COST Action NanoSpace, CA21126, supported by COST (European Cooperation in Science and Technology) for providing the financial support necessary to undertake this mission.