

Researcher in materials science – 18-month postdoctoral position

LABORATORY / LABORATOIRE *: iLM institut Lumière Matière

IN COOPERATION WITH / EN COOPERATION AVEC : MATEIS Matériaux : Ingénierie et Sciences

TEAM(S) / EQUIPE(S) *: ENERGIE

WORK PLACE / LIEU DE TRAVAIL *: Villeurbanne

CONTRACT TERM / DUREE DU CONTRAT *: 18 months

EXPECTED START DATE / DATE DE PRISE DE POSTE PREVUE *: 06/01/2026

WORK QUOTA / QUOTITE DE TRAVAIL *: 100%

SALARY / SALAIRE *: 2,500 to 3,000 € gross per month, depending on experience

FUNDING / FINANCEMENT *: Auvergne-Rhône-Alpes Region

LEVEL / NIVEAU D'ETUDES *: PhD

CONTACT(S) *: Sylvie Le Floch

CONTACT(S) DETAILS *: sylvie.le-floch@univ-lyon1.fr ; 04 72 43 14 02

KEYWORD(S) / MOT(S) CLÉ(S) : sintering, high pressure, ceramics

SCIENTIFIC CONTEXT / CONTEXTE SCIENTIFIQUE *: The postdoctoral researcher will be based at the Lumière Matière Institute and will work in collaboration with the Mateis laboratory and a local manufacturing company as part of the Nanopol project, funded by the Auvergne-Rhône-Alpes region. He or she will work on the development of high-performance nanostructured materials using a new sintering process (SPS, Spark Plasma Sintering) at very high pressures (several GPa).

MISSIONS *: After training in high-pressure sintering techniques, he or she will be responsible for operating the high-pressure sintering equipment to independently optimize the manufacturing process for the target material. This involves:

- Pre-treatment and characterization of the initial powders
- Sintering tests and parameter optimization
- Characterization of materials (X-ray diffraction, Raman spectroscopy, electron microscopy, polishing, optical transparency measurements, hardness measurements)

He or she will analyze and synthesize the results to present them to the project partners. A weekly meeting will be held with the project leader and the academic partner, and a meeting every two months with the industrial partner.

OUTLOOKS / PERSPECTIVES : Most of the study will be subject to confidentiality and may lead to the filing of intellectual property rights. The partnership with the partner company may continue beyond 18 months for the exploitation of the results.

BIBLIOGRAPHY / BIBLIOGRAPHIE :

- 1- Cottrino, S., Gaudisson, T., Douillard, T., Blanchard, N., Meille, S., Gremillard, L., Mercury, M., Le Floch, S., **2025**. Effect of high pressure on microstructure and mechanical and optical properties of nano-structured MgAl₂O₄ spinel fabricated by High Pressure Spark Plasma Sintering. *Journal of the European Ceramic Society* 45, 117579. <https://doi.org/10.1016/j.jeurceramsoc.2025.117579>
- 2- Le Godec, Y., Le Floch, S., **2023**. Recent Developments of High-Pressure Spark Plasma Sintering: An Overview of Current Applications, Challenges and Future Directions. *Materials* 16, 997. <https://doi.org/10.3390/ma16030997>