

Open position : Associate professor in data science and numerical geosciences.

The University of Lorraine, a leading institution dedicated to the education of 60,000 students and characterised by a strong research focus, is recruiting a Senior Lecturer in Digital Geosciences and Data Science to take up the position in September 2027. The successful candidate will join the *École Nationale Supérieure de Géologie*, a leading institution providing training for 300 engineering geology students, as well as the *GeoRessources* Laboratory, which focuses on the sustainable management of natural resources and possesses extensive expertise and numerous partnerships in the mathematical and computational modelling of the subsurface.

NB : As with all posts in French higher education, candidates who do not already hold an equivalent position must apply for and obtain accreditation (*qualification*) from a section of the *Conseil National des Universités* (preferably sections 27 and/or 35). Information on the accreditation procedure is available at https://www.galaxie.enseignementsup-recherche.gouv.fr/ensup/CNU_qualification_Odysee.htm

Teaching Profile

The successful candidate will contribute to the engineering degree programme at the ENSG (École Nationale Supérieure de Géologie) throughout its three-year duration, covering both the core curriculum and the Digital Geology specialisation. By integrating into the existing digital sciences modules at ENSG and developing new courses, the successful candidate will be responsible for training geological engineers in the digital tools of the future (HPC, AI, big data) and the major challenges associated with their use. Emphasis will be placed on integrating AI into various fields of the geosciences, in both initial and continuing education, within the framework of the ENACT cluster at the University of Lorraine. One of the key educational objectives will be, in particular, to demystify the main mechanisms of AI and to equip students with the tools they need to adapt to and contribute to future developments.

He or she will need to incorporate the concepts of digital transformation applied to the field of engineering geology, and to take into account the specific characteristics of ENSG engineering students, some of whom have a background in natural sciences (60 per cent of ENSG students come from BCPST preparatory classes with equal base training in mathematics, physics, chemistry and earth and life sciences). In particular, he or she will need to be able to make the connection between the often vast amounts of data in the geosciences (petrophysical, remote-sensing, structural, geophysical, etc.), their processing using principled digital tools, and their interpretation.

As part of the core curriculum, the successful candidate will be responsible for teaching the fundamentals of algorithms and programming in Python, preferably incorporating geoscientific examples. They may also be involved in teaching statistics and geostatistics. Finally, they will incorporate an introduction to machine learning and the challenges associated with the digital transition into the core curriculum.

Within the Numerical Geology specialisation, the successful candidate can, depending on their skills, contribute to teaching on the management and exploration of large-scale geoscientific databases, cloud computing and the C++ programming language, or on the modelling of mineral deposits or reservoirs. New modules, incorporating in particular the challenges of digital transition and energy transition in the geosciences, may be developed.

Finally, the successful candidate will help supervise research projects undertaken by ENSG students. They will also mentor students on work placements and contribute to the ENSG's collective educational management tasks.

Those wishing to apply are invited to consult the ENSG course syllabus to prepare their teaching proposal (<https://wiki.univ-lorraine.fr/bin/view/interne/comp/ensg/ensgdir/>).

Teaching Department : École Nationale Supérieure de Géologie (<https://ensg.univ-lorraine.fr>)

Teaching keywords: Programming, Data Science, Artificial Intelligence, Modelling and inversion of geoscientific data, Geostatistics, Geological modelling, Numerical analysis.

Research Profile:

The successful candidate will be responsible for developing a bold and innovative methodological research programme that addresses both digital challenges (in, for example: the processing of heterogeneous, multimodal and multi-scale data; knowledge representation; the quantification of uncertainties; explainability; causality; etc.), and geoscience challenges (in, for example: the quantification of natural hazards; the mining of multimodal geoscientific data; the understanding of geological, hydrological or geophysical processes; optimising or minimising the impacts of geoengineering activities; etc.). Closely connected to advances in artificial intelligence and data science, he or she will work on effective (or even resource-efficient) digital approaches to, as appropriate, better describe the geometry and properties of the subsurface, understand and predict the processes taking place within it, or assess the robustness or resilience of natural underground systems.

In carrying out their work, the successful candidate will benefit from the environment and dynamic atmosphere of the RING team (Integrative Numerical Geology, <https://www.ring-team.org>) at the GeoResources laboratory (<https://georessources.univ-lorraine.fr>), and, more broadly, from the dynamics of the ENACT cluster (<https://cluster-ia-enact.ai/>). The RING team works on the development of methods for modelling the subsurface, with a particular focus on the integration of geological concepts and physical models, and the management of uncertainties. The team is currently supported by a consortium of 10 industrial partners and 89 academic partners, and it is also involved in several national research programmes (PEPR, ANR, etc.). The team members view this recruitment as an opportunity to explore themes and/or approaches that are complementary to, or new compared with, those currently being developed, and which may lead to new collaborations within the geoscience and computing communities in Nancy, across France and internationally.

Applications from candidates with little or no experience in geosciences but a strong background in digital technology, AI, and the processing or inversion of complex data are very welcome. In all cases, the proposal for integration into the laboratory will be a key factor in the recruitment process. Those wishing to apply are therefore encouraged to consider potential synergies and to contact members of the team and the GeoResources laboratory well in advance of officially submitting their application.

Research Laboratory : UMR7359 GeoResources, <https://georessources.univ-lorraine.fr>

Research keywords: Data Science, Artificial Intelligence, Data Mining, Numerical Analysis, Uncertainty Quantification, Geoscientific Modelling, Inverse Problem, Digital Twin.