

Open post-doctoral scientist position

Mechanics of shape memory alloys under multi-axial stresses

An open post-doctoral position is available in the area(s) of experimental mechanics and dynamic behavior of materials, within the [Solid Mechanics Laboratory \(LMS\)](#), [École Polytechnique](#), Palaiseau, France.

About our team – [Mechanics and Materials under Extremes](#)

The team, led by Prof. Vignesh Kannan, studies the mechanics of materials and structures under large stresses, multi-physical fields and short time scales. We use mechanical design, electronic and optical instrumentation to push the cutting edge of experimental mechanics down to nano-second time scales, and μm length scales. Our experiments are motivated by theoretical foundations, with the goal of understanding fundamental mechanisms that govern the multi-physical response of materials. We continuously seek to develop a collaborative, supportive and international group of scientists who enjoy the pursuit of exciting problems, and each other's company!

Scientific overview for the position

Shape Memory Alloys (SMAs) are a class of active materials which exhibit “pseudo/super elastic” mechanical response, elasto/baro-caloric cooling, and mechanically-driven magnetic flux (for a special class of magnetic SMAs) — with applications ranging from impact damping to power generation. At the microscopic length scales, these phenomena occur due to spatially-heterogeneous structural changes in the atomic lattice — phase transformations — driven by mechanical, thermal and magnetic fields.

You will lead an effort to study phase transformations under multi-axial stress states across a wide range of strain rates – spanning quasi-static to high-strain-rate dynamic loading conditions. This will involve the development of multi-axial quasi-static, and dynamic compression-tension-torsion experiments across length scales. Experiments will be instrumented with high-resolution optical and thermal instrumentation to extract phase transformation kinetics. Depending on the progress of experiments, you will be involved in developing a modeling framework to discover phase transformation kinetics.

Your profile

- A PhD degree in mechanical engineering, materials science, or a related field
- Strong background in continuum mechanics (or materials science) and experimental mechanics
- Experience in mechanical characterization of materials, optics and instrumentation
- Experience with high-strain-rate experiments is an advantage, but not a necessity
- You like working in multi-disciplinary environments at the interface of mechanics and materials science.
- You are comfortable communicating in English, and enjoy working in an international environment.

Finally and most importantly, if you are passionate and eager to study mechanics, develop rigorous experiments, and enjoy spending many hours in an experimental lab, you are eligible to apply!

Application documents

- Curriculum vitae (max. four pages)
- Letter of motivation (max. two pages)
- PhD degree certificate (if available)
- Name, designation and contact details of at least three referees

Send your application via e-mail to Prof. Vignesh Kannan (vignesh.kannan@polytechnique.edu).

Documents must be sent as a **single .zip file**, with the subject

"Application-PostDoc-lms-mmxtm2025" (applications without the subject may not be considered).

Deadline: September 26, 2025 at 1800 hrs (Central European Time).