

6 months internship position

CONTEXT

Titanium alloys are widely used in biomedical, energy and aerospace applications because of their unique combination of strength, lightness, and resistance to heat. These properties are strongly linked to the phase transformations that take place when titanium is heated or deformed. In this project, we are interested in a particular transformation between two crystal structures, known as the α (hexagonal-closed packed) to β (body centred-cubic) transformation. More specifically, the project focuses on the effect of external deformation on phase equilibrium and phase transformation kinetics at high temperature ($\sim 1000^\circ\text{C}$). Although this transformation has been observed for many years, the exact conditions that trigger it are still not fully understood.

The internship will take place in CEMEF, a research institute of Mines Paris PSL located in Sophia-Antipolis, on the French Riviera. We are looking for a motivated student with an interest in academic research. The internship can be extended into a fully funded PhD position for the right candidate.

INTERNSHIP OBJECTIVES

INFLUENCE OF DEFORMATION ON $\alpha \rightarrow \beta$ PHASE TRANSFORMATION IN TITANIUM

The goal of this internship is to study how deformation at high temperature affects phase transition in titanium. To do this, hot compression tests will be carried out on titanium samples, followed by rapid cooling (quenching). These experiments will make it possible to trigger and observe a phase transformation that occurs under specific thermomechanical conditions.

By comparing deformed samples with reference samples that only experienced the same heating and cooling, the intern will be able to identify which changes are truly caused by deformation. The amount of transformed phase will then be characterised using optical microscopy.

During the internship, the student will:

- Prepare titanium samples and perform hot compression tests under controlled conditions, followed by immediate quenching.
- Compare deformed samples with reference samples to confirm the effect of deformation.
- Use optical microscopy to observe and characterise the phase transformations.
- Analyse experimental results in collaboration with the research team.

INTERNSHIP DETAILS

Location: CEMEF, Mines Paris PSL, Sophia-Antipolis (06)

Net salary: ~ 1420 €/month (SMIC)

Duration: 6 months

Starting date: Early 2026

PROFILE

Master (M2) or last year engineering student with background in materials science or mechanics and some knowledge in metallurgy. The internship can be followed directly by a PhD, for which funding is already secured.

CONTACT

To apply, please send an email to the addresses below:

✉ CEMEF
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