

# POST-DOCTORAL RESEARCH ASSISTANT

## ADDITIVE MANUFACTURING OF FUNCTIONALLY GRADED MATERIALS

**Keywords:** Architected materials, experimental mechanics, high-strain rate

**Department:** ISAE-SUPAERO / ICA CNRS 5312 Toulouse France

### JOB DESCRIPTION:

In relation to accidental events (collision, crash, impact of debris, etc.) or related to the context of the mission (military or terrorist aggression, etc.), the sensitive and functional areas of land, aeronautical and space vehicles, as well as ships and submarines, require protection systems combining ballistic performance and lightness.

The numerical optimization of such protection systems has long been hampered by the problem of their manufacturing. This limitation is partly overcome by the continuous development of additive manufacturing techniques, which now allow the development of functional materials with complex architecture. Often evaluated in static or under low-speed impact, there are still gaps in the performance of these materials under high-speed impact.

The work consists of developing by metal additive manufacturing materials with gradient properties and evaluating their performance for energy absorption applications in ballistics.

### MISSIONS:

The missions notably consist in

- identifying the promising material solutions,
- selecting the materials and the additive manufacturing techniques,
- developing by additive manufacturing the functionally graded materials,
- characterizing the materials under low and high-loading rates,
- carrying out pre and post-mortem micrographic observations,
- evaluating the energy absorption capabilities of the functionally graded materials under impact loading.

#### REQUIRED PROFILE:

PhD diploma holder, or near to be (thesis defense date defined) in Materials Science, Mechanics of Materials or Mechanical Engineering.

Experience in (metallic or/and ceramic) additive manufacturing, not necessarily under high-strain rate.

European citizen

**COMPENSATION:** >3300€ gross / month (depending on professional experience)

**DURATION:** 15 months

**LOCATION:** September 1<sup>st</sup> 2025

#### PROJECT SUPERVISORS:

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TÉL. :

**APPLICATION PROCESS:** To be sent by e-mail: Motivation letter + detailed CV

**REFERENCES:** PhD advisors coordinates