

# Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website [www-csc.utt.fr](http://www-csc.utt.fr))

Supervisor's name :  Given names :

Status (prof., assistant prof., ...):

Laboratory :  Website address :

Institution :  Website address :

Scientific competence of the supervisor:

A major part of the supervisors' activities in the last 20 years has been dedicated to analysing the plasticity of polycrystals with a full-field numerical approach and has led to large number of papers and citations. This topic has become strategic in the last three years in the context of bimodal polycrystals (supervision of ongoing PhD, 1 recent article in Mater Sc Engng A, a chapter in D. Jeulin's tribute book, numerous conferences). This long-standing experience is in the core of the proposed thesis project. Complementary competences will be provided by Romain Quey, with whom privileged and fruitful collaborations are established.

Two major publications in the field proposed for the PhD :

1.
2.

Website address of the personal page :

Supervisor's email :

Description of the research work proposed for a PhD Topic # (see list) :

Title :

Subject :

The study of architected microstructures of polycrystalline materials has gained much interest in the last years for the enhancement of properties that they can provide when combining size effects and spatial distributions of elementary heterogeneities such as grains or particles. Recent advances in the control of elaboration processes such as sintering, severe plastic deformation combined to heat treatments, additive manufacturing,... open new routes for the development of materials whose properties will be controlled from a bottom-up approach: the challenge is to set process parameters according to a prescribed architecture which itself will be defined from desired properties. To this respect, full-field polycrystal plasticity modeling provides an efficient and low-cost mean to establish the relationships between microstructure and properties and hence to guide material processing: as highlighted in the supervisors' bibliography, microstructures with large varieties of morphological characteristics and specific architectures can be obtained from a material descriptor and then be considered in virtual mechanical testing with a full-field numerical method. The subject of this PhD proposal is specifically the determination of these microstructure-properties relationships from a statistical ground: what correlations arise between morphological characteristics and properties on a wide range of architectures such as bimodal polycrystals, gradient structures.

Keywords :

Expected collaborations :

Background required from the applicant :

Existence of a PDF file detailing the proposal ("yes" or "no") :

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