TWO-YEAR POSTDOCTORAL POSITION IN FRANCE

INVESTIGATION OF COMPACTION AND SINTERING BEHAVIOUR OF NANO POWDERS USING DISCRETE ELEMENT METHOD (DEM) SIMULATIONS


Research Project: To keep pace with the rapid developments in the synthesis of nano powders, the focus now needs to be on the densification of nano powders to form parts. It is indeed a challenge to consolidate nano powders while maintaining their nano grain size. The high surface energy associated with nano-sized particles leads to agglomeration, which retards compaction. Computer simulations provide an efficient tool to systematically address these issues. Recently, Discrete Element Method (DEM) simulations have been used to model powder compaction and sintering. They provide an improved means (as compared to Finite Element Methods) to capture the intrinsic particulate nature of powders while the increase in computing power allows practical conditions to be tackled with DEM.

In the above context, the present research project consists of the development of an existing DEM code to treat the compaction and sintering of nano powders. The code, dp3D, is already in use at INPG as well as in other research institutions. It is mainly intended to model particulate materials that are used for engineering applications such as powders (see http://www.gpm2.inpg.fr/perso/doc_cm/dem_animations.html). The post-doc research position (for a 24-month duration) is part of a 3-year project and will also involve some interaction with the International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI: http://www.arci.res.in), located in Hyderabad, India. INPG and ARCI are partners in this project sponsored by the Indo-French Centre for the Promotion of Advanced Research (IFCPAR). The project will commence from 1 April 2008. The selected candidate will be paid a salary of 1850 Euros/month.

Qualifications/Experience: The candidate should necessarily have a Ph.D. degree, with a solid training in numerical simulation in the field of materials science (with preferably some knowledge of discrete approaches). Some experience in particulate materials and/or sintering-compaction modelling would be highly desirable.

How to Apply: Interested candidates should electronically send a letter of application accompanied by a detailed resume, including a publications list and contact details/e-mails of three references to Dr Christophe Martin (E-mail: christophe.martin@inpg.fr) at INPG AND Dr Shrikant Joshi (E-mail: svjoshi@arci.res.in) at ARCI by 15 December 2007.