OCE Postdoctoral Fellowship - Multiscale Material Model Developer

(CSIRO Division of Manufacturing and Materials Technology, Clayton, Victoria, Australia)

Advertisement

With the advent of techniques for producing bulk nano-materials for use in structural applications, the need for modelling tools capable of describing both the manufacture and the mechanical response of nanomaterials has become a real necessity. We have an opportunity for a scientist to take part in moving the team into this new area of research; to collaborate with experienced scientists; and help develop a key resource to support the outstanding research of CSIRO. You will carry out research aimed at developing models at various length scales, starting from molecular dynamic simulations that will inform the next level of modelling, particularly grain boundary and dislocation dynamics simulations and FE simulation.

The materials of interest for this are Al, Mg and Ti alloys. You will have a Ph.D. in metallurgy, materials science, materials engineering or physics and have experience in constitutive modelling, metal deformation mechanisms, finite element modelling and a willingness to work in a multi-disciplinary area. Experience in some of the following areas is highly desirable: nano-crystalline materials, physical metallurgy, electron microscopy techniques and mathematical modelling. Excellent communication skills and strong interpersonal skills are also essential.

Position Description

CSIRO is Australia's premier research body, delivering innovative science for the benefit of Australians.

Description of the Research/Busines Group

The Division of Manufacturing & Materials Technology, with a staff of 270, develops innovative technology solutions that support Australia’s manufacturing and infrastructure industries operating from major sites in Clayton and Highett in Victoria, and smaller sites in suburban Sydney and Brisbane. One of the major programs involves the division working closely with industry to develop light metal alloys and better ways of processing them to increase productivity, maximise efficiencies, and build global competitiveness.

The Position:

The successful applicant will form part of a larger team engaged in light metals research. The position will involve the development of computer models to simulate the macroscopic deformation of metal forms based on plasticity mechanisms that operate on different length scales. The calibration of the modelling elements will require the use of data determined form experimental investigations which may be performed or directed by the successful applicant.

Key behaviours

1. Willingness and ability to work effectively in a multi-disciplinary team and in collaboration with other research teams.
2. Willingness and ability to share/communicate ideas of complex (adaptive) systems to other team members.
3. Strong interpersonal skills
4. Excellent ability to communicate complex issues to a range of audiences
5. Compliance with CSIRO's OHS&E policies and requirements

Key relationships

Internal

- Research Program Manager, Supervisor, Project Leader, Program colleagues, Deputy Chief, other CMMT PDFs

External

- Australian and International science colleagues.

Selection Criteria

Primary Job Purpose:

To undertake research aimed at developing models at various length scales, starting from dislocation dynamics and microstructural interactions through to grain, grain boundary and macroscopic plasticity scales.

Role Overview and Key Responsibilities:

- Develop plastic deformation models for polycrystalline metals, particularly ultra fine grained and nano-structured ones.
- Bridge the deformation models of different length scales into a FE model for predicting macroscopic deformation behaviour.
- Conduct experimental investigations to elucidate deformation mechanisms and to calibrate model predictions.
- Collaborate with other CSIRO researchers involved in plasticity and modelling activities.
- Undertake an active role in writing journal, conference papers and technical reports.

Selection Criteria

Applicants must address the selection criteria. Applicants that do not address the selection criteria will not be considered. To assist you prepare your application please read the information available at 'Guidelines for Applicants' on the CSIRO website: http://recruitment.csiro.au/asp/job_details.asp?RefNo=2007%2F281

Prerequisite

- A PhD in metallurgy, materials science, materials engineering or physics

Essential

1. Demonstrated experience in constitutive modelling and finite element modelling
2. Demonstrated knowledge of metal deformation mechanisms
3. Demonstrated willingness to work in cross- disciplinary areas
4. Demonstrated excellent oral and written communication skills
5. Demonstrated strong interpersonal and team skills

Desirable

1. Experience in some of the following areas is highly desirable: nano-crystalline materials, physical metallurgy, electron microscopy techniques and mathematical modelling.

More Information

CSIRO prefers applications be lodged online via its careers site.

You are required to include two documents (1) “A document Addressing the Selection Criteria” and (2) a “Resume or CV” including the names of at least two professional referees. Note: Applications that do not address the selection criteria will not be considered.

If you experience difficulties applying online call 1300 301 509 and someone will be able to assist you. Outside business hours please email: csiro-careers@csiro.au

If you are unable to lodge your application online you can fax your application (quoting reference number 2007/281) to + 61 2 6246 4068 or alternatively post to:

CSIRO Careers Online

PO Box 225

Dickson ACT 2602

If after reading the selection documentation you have any questions specifically relating to this position, please contact Dr Rob O'Donnell on telephone + 61 3 9545 2733 or email rob.o'donnell@csiro.au

Further information relating to this position can be provided by Prof Yuri Estrin (yuri.estrin@csiro.au)