Research Assistant Position Available – Design and Modelling of Metal Matrix Composite Overlay Systems (Post-doctoral Fellow Opportunity)

The Position
Dr. André McDonald and Dr. James Hogan of the Department of Mechanical Engineering at the University of Alberta, in collaboration with Dr. Gary Fisher of InnoTech Alberta, invite applications and queries for a 16-month Post-doctoral Fellow (PDF) position in the area of Design and Modelling of Metal Matrix Composite Overlays. This position will be open to candidates who possess either a Doctoral degree in Mechanical Engineering or Materials Science. Applicants with expertise and experience in fracture mechanics, materials science, particulate-reinforced composite materials, or welded overlays are highly encouraged to apply. The successful candidate will be required to work independently and must communicate well in English. The successful candidate will be financially supported. This position is available to Canadian citizens, permanent residents of Canada, and international applicants. It is expected that the successful candidate will take up the position anytime between September and November 2019. Interested candidates may wish to visit https://sites.ualberta.ca/~andre2/ to learn more about the Advanced Heat Transfer and Surface Technologies Laboratory, https://sites.ualberta.ca/~jdhogan/index.html to learn more about the Centre for Design of Advanced Materials, and http://www.albertatechfutures.ca to learn more about InnoTech Alberta.

The Project
The proposed research project seeks to develop the necessary fundamental understanding of wear failure in carbide-reinforced metal matrix composite (MMC) overlays through a modelling exercise. The outcome of the project will be to produce a basic model that accurately represents the abrasion (preferred) or erosion resistance of tungsten carbide MMC overlays. This can then be further developed as a design tool. The composites of interest are: (i) Overlays deposited by plasma-transferred arc welding (PTAW) and gas metal arc welding (GMAW); (ii) Macro, eutectic and spherical carbides at 50 to 180 μm and 50 vol.% in the overlay; and (iii) Ni-based self-fluxing matrix alloys with hardness 30 to 60 HRC.

Training and Professional Development Opportunity
The training of research assistants and fellows is paramount. The selected candidate will receive formal training in the following practical areas: (i) surface preparation, (ii) high-quality overlay development, (iii) modelling, and (iv) safety. The successful candidate will work directly with research staff at InnoTech Alberta and at the University of Alberta. The PDF will have opportunities to participate in national and international conferences and receive exposure to the expansive professional network of Dr. McDonald, Dr. Hogan, and Dr. Fisher.
Application Procedure
Candidates are asked to submit complete applications, which include: (i) a cover letter; (ii) a detailed curriculum vitae highlighting career achievements, areas of research, a list of publications, awards and honours, and a list of three professional references; (iii) a statement of research interest, expertise, and experience (maximum 1 page); and (iv) three samples of the candidate's most significant scholarly work. Additional documents may be requested upon submission of the aforementioned documents.

The review of applications will begin immediately and applications will be accepted until the position has been filled.

Interested candidates should send their completed application packages and direct queries to Dr. James Hogan by email at jdhogan@ualberta.ca or, in the alternative, Dr. André McDonald at andre.mcdonald@ualberta.ca.