



Faculty Position in Image Guided Neurostimulation

The Department of Radiology (<https://www.ucalgary.ca/radiology/>) and the Hotchkiss Brain Institute (HBI; <http://www.hbi.ucalgary.ca/>) have joined forces to invite applications for a full-time academic position (tenure track), at the Assistant Professor level in the Division of Image Science.

This is a key position within the University priority in Brain and Mental Health. The ideal candidate will have expertise in MR brain imaging, image-guided brain stimulation (e.g. TMS, tDCS), image-guided neurosurgery, or focused ultrasound; we are particularly interested in candidates with a desire to collaborate with researchers with related interests. The successful candidate will have the opportunity to be part of a prolific and diverse research environment in the HBI and Cumming School of Medicine, with access to state of the art core infrastructure.



The **University of Calgary** is a young and ambitious comprehensive research institution. Established in 1966, it is guided by a clear strategic direction – *Eyes High* – to become one of Canada’s top five research universities. This plan aims to establish the University of Calgary as a global intellectual hub in Canada’s most enterprising city. University President, Dr. Elizabeth Cannon, and her leadership team have established a roadmap through the University’s Academic and Research Plans to achieve this goal. They are leading almost 4,700 faculty members across 14 faculties and 53 teaching departments. The student body includes 25,000 undergraduate and 6,000 graduate students enrolled across more than 200 undergraduate, graduate or professional degree programs.

Six strategic research themes have been named representing the university’s greatest research strengths, bringing together scholars from across a number of faculties. The University of Calgary’s six strategic research initiatives are:

- **Brain and Mental Health**
- Engineering Solutions for Health: Biomedical Engineering
- Infections, Inflammation and Chronic Diseases
- Energy Innovations for Today and Tomorrow
- Human Dynamics in a Changing World
- New Earth-Space Technologies

The University of Calgary has already created a rich environment for research in brain and mental health, and has developed strong partnerships with the external community to translate and integrate the knowledge generated into meaningful outcomes for society.

This exciting research strategy is being led by the HBI and is bringing together more than 150 faculty members from the Faculties of Arts, Kinesiology, Nursing, Science, Social Work, and Veterinary Medicine, the Cumming School of Medicine, the Schulich School of Engineering, and the Werklund School of Education. Building on their respective expertise, these researchers are collaborating to identify new ways to accelerate research and translate this knowledge into meaningful outcomes in the areas of brain and mental health. As leaders of the Brain and Mental Health research strategy, the Hotchkiss Brain Institute (HBI) seeks to i) focus and coordinate brain and mental health activities university-wide; ii) promote interdisciplinary research excellence; iii), enhance research funding competitiveness; iv) increase and accelerate the impact of research through knowledge generation and translation; v) increase collaboration and awareness internally between faculties, departments and groups in brain and mental health to achieve meaningful outcomes; and vi) present a unified voice in communication and fund development for brain and mental health research activities directed to the community.

About the Cumming School of Medicine: Departments and Institutes

The Cumming School of Medicine has recently been named in honour of Geoffrey Cumming whose donation of \$100 million to further research and innovation is being matched by the Government of

Alberta. The donation is meant to build on the School's internationally recognized strengths, particularly in the two priority areas of brain and mental health, and infections, inflammation and chronic diseases.

Led by Dr. Jon Meddings, the School is comprised of 19 departments, with responsibility for the academic, clinical, and educational missions of the Faculty. The School also has seven research institutes which emphasize its research priorities:

- Alberta Children's Hospital Research Institute for Child and Maternal Health (ACHRI)
- Calvin, Phoebe and Joan Snyder Institute for Chronic Diseases
- **Hotchkiss Brain Institute (HBI)**
- O'Brien Institute for Public Health
- Libin Cardiovascular Institute of Alberta
- McCaig Institute for Bone and Joint Health
- Arnie Charbonneau Cancer Institute

Institute members are drawn from across the School's 19 departments as well as from other university faculties. This matrix-style organization ensures that high quality, interdisciplinary research programs that span the continuum from laboratory bench to health care delivery are developed. The institutes are joint ventures and partnerships between the Cumming School of Medicine and Alberta Health Services - Calgary Zone.

ABOUT THE DEPARTMENT OF RADIOLOGY

Members of the Department of Radiology have academic, clinical and administrative roles in the Cumming School of Medicine at the University of Calgary and the Alberta Health Services, Calgary Zone, Department of Diagnostic Imaging. Under the direction of Dr. Robert Sevick, Department Head, the mission of the Department of Radiology is to promote the highest quality care, research and training in medical diagnostic and interventional imaging. Much of the department's research is based on solving clinically focused issues and problems, with the goal of providing radiologists and other healthcare providers with valuable information to diagnose and treat their patients. The department has over 100 regular, clinical and adjunct faculty from across the following subspecialty and research divisions: Body Imaging, Cardiac Radiology, Emergency Radiology, Image Science, Interventional Radiology, Musculoskeletal Radiology, Neuroradiology, Nuclear Medicine, and Thoracic Radiology. These individuals work across five inpatient sites, including an innovative South Health Campus site, which opened in September 2012. The Department also has developed an extensive outpatient program with specialized services in the community.

The vision of the Department of Radiology is to integrate innovative research programs with clinical services in order to advance our applications of diagnostic imaging technologies to improve our understanding of the origins and underlying mechanisms of disease. This knowledge will lead to the development of novel and specific tests and treatments to improve outcomes in our patients. Central in achieving this vision are the collaborative links with complementary cross-disciplinary research through participation in the ACHRI, the HBI, the Libin Cardiovascular Institute of Alberta, and the McCaig

Institute for Bone and Joint Health. Research mentorship and evidence-based care position the Department of Radiology as an emerging leader in creating and disseminating new knowledge. We have a Royal College-accredited Residency Training Program and offer body, body interventional, cardiac, chest, musculoskeletal, neuroradiology, neuro-interventional and pediatric fellowship training. Additional information about the department can be found at <https://www.ucalgary.ca/radiology/>.

A key academic component of the Department of Radiology is the Division of Image Science, which brings together ten full-time, research-intensive, faculty members under the leadership of the Division Head, Dr. Bruce Pike. Members of the division conduct research primarily at the Experimental Imaging Centre (<http://www.ucalgary.ca/eic/>) within the Faculty of Medicine, the Child and Adolescent Imaging Research centre (<https://www.ucalgary.ca/ach-mri-research-centre>) at the Alberta Children's Hospital, and the Seaman Family MR Research Centre (<https://mrcentre.ca/>) at the Foothills Medical Centre. The department, through Divisional membership, also runs the NSERC CREATE International and Industrial Imaging Training (I3T) Program (www.ucalgary.ca/i3t) and operates a Graduate Specialization in Medical Imaging offered across seven graduate programs in the faculties of Arts, Science, the Cumming School of Medicine, and the Schulich School of Engineering.

ABOUT THE HOTCHKISS BRAIN INSTITUTE

Driven by the vision “healthy brains for better lives”, the mission of the HBI, under the leadership of Dr. Samuel Weiss, is to inspire discovery and apply knowledge towards innovative solutions for neurological and mental health disorders. To achieve this goal, the HBI's “NeuroDiscovery Framework” aligns research within three broad themes of Brain & Behaviour, Neural Injury & Repair, and Healthy Brain Aging, which span the life cycle (<http://www.hbi.ucalgary.ca/strategic-plan>).

The HBI's over 135 full members, which include clinician-scientists, researchers, and physicians from across the University, are dedicated to advancing neurological and mental health research and education. While HBI members have numerous and varied interests within the field of neurological and mental health, many of their interests converge in HBI's identified priority NeuroTeam and NeuroTechnologies programs. By integrating the research of foundational scientists, clinicians who work with patients, technical experts and population health researchers, the HBI is going beyond scientific discoveries to improving lives.

Each theme is composed of a number of “NeuroTeams” organized in a translational continuum, which includes basic, clinical, population and public health researchers. NeuroTeams take a multidisciplinary approach to brain and mental health research questions, and align the HBI's primary areas of research strength (<http://www.hbi.ucalgary.ca/our-research>).

There are currently nine NeuroTeams in: Stress, Epilepsy, Mental Health, Multiple Sclerosis, Spinal Cord/ Nerve Injury & Pain, Traumatic Brain Injury, Stroke, Dementia & Cognitive Disorders, and Movement Disorders. The teams build on a springboard environment of NeuroTechnologies, Core Facilities and support programs that elevate their pursuit of innovative research goals. The successful candidate's

research program will be based in one or more of the nine “NeuroTeams” of the HBI (<http://www.hbi.ucalgary.ca/neuroteams>).

The HBI has an impressive track record of philanthropic support, having raised over \$140 million in support of brain and mental health research and education in the past ten years. These funds are used to support the NeuroTeams, to provide leverage and matching support for the acquisition of research infrastructure, to establish and outfit new research space, to provide funding for faculty and trainees and to support an enhanced research and education environment. The HBI has established a number of support programs for its members, including the Rebecca Hotchkiss International Scholar Exchange program, competitive funding programs for students and fellows, and subsidized core resources such as the Regeneration Unit in Neurobiology (RUN), which houses advanced microscopy and behavioural testing facilities, the HBI Molecular Core Facility, the NeuroImaging Research Unit, and the HBI Advanced Light and Optogenetics (HALO) facility (<http://www.hbi.ucalgary.ca/our-research/core-facilities>).

Further information about the HBI and these support programs are described within the pages of the HBI website: www.hbi.ucalgary.ca.

The HBI, and the Department of Radiology have joined collaboratively in support of this position. Leading researchers associated with our new image-guided neurostimulation effort include:



Bruce Pike, PhD is the recently appointed Campus Alberta Innovates Program Chair in Healthy Brain Aging and brings to Calgary a focus on quantitative structural and functional neuroimaging. He is the Deputy Head of Radiology and the Head of the Division of Image Science. Dr. Pike is a member of the HBI and also a Professor of Clinical Neurosciences. He also leads the school’s MR guided Focused Ultrasound NeuroTechnologies platform program.



Richard Frayne, PhD is the Hopewell Professor of Brain Imaging, a Canada Research Chair in Image Science, and the Scientific Director of the Seaman Family MR Research Centre. Dr. Frayne investigates the imaging of vascular diseases, with a particular focus on stroke and vascular dementia. He is also a member of the Department of Clinical Neurosciences and the HBI, and an associate member of the Libin Cardiovascular Institute of Alberta.



Oury Monchi, PhD is the Clinical Research Director of the Department of Clinical Neurosciences, the Research Director of the Movement Disorders Program, and the Tourmaline Oil Chair in Parkinson's Disease. He is a member of the HBI and a Professor in the departments of Clinical Neurosciences and Radiology. He also co-leads the HBI Movement Disorders NeuroTeam. Dr. Monchi's lab has been a pioneer in using different neuroimaging techniques to study the origins and evolution of cognitive deficits in Parkinson's disease with the ultimate goal of the early prediction of dementia in the disease. Non-medication therapies such as transcranial magnetic stimulation and cognitive training are also being explored, as well as methods including functional and anatomical MRI, TMS, PET, neuropsychological evaluations, and genotyping.



Bradley Goodyear, PhD is an Associate Professor also appointed in Clinical Neuroscience and Psychiatry and a member of the HBI. He directs the HBI NeuroImaging Research Unit. His research focuses on functional imaging of stroke, epilepsy, multiple sclerosis, and Parkinson's disease. His imaging studies include understanding how functional connections in the brain change in the presence of these neurological conditions.



Adam Kirton, M.D., FRCPC founded and directs the Calgary Pediatric Stroke Program, Alberta Perinatal Stroke Project, ACH Pediatric Non-Invasive Brain Stimulation Laboratory, and is program leader of the Non-Invasive Neurostimulation Network (N3) (<http://hbi.ucalgary.ca/research/neurotechnologies/non-invasive-neurostimulation-network>). His research focuses on perinatal stroke with two major aims. One is to understand why such strokes occur and develop means to prevent them. The other uses advanced technologies including neuroimaging and non-invasive brain stimulation to measure the response of the developing brain to early injury and generate new therapies.



Jeffrey Dunn, PhD is the Director of the Cumming School of Medicine's Experimental Imaging Centre. His work involves understanding how tissues respond to low oxygen through a range of mechanisms - from genetic to behavioural. He has developed and applied a range of technologies to study oxygen levels in disease processes. Dr. Dunn is also a member of HBI and the Departments of Clinical Neurosciences, and Physiology and Pharmacology.



Ashley Harris, PhD is an Assistant Professor in the Department of Radiology and a member of the HBI. Her work focuses on the brain, using MR to understand both clinical and healthy conditions. Most recently, Dr. Harris has been working on methods development of MR spectroscopy to measure brain metabolites, specifically GABA.



Roberto Sotero-Diaz, PhD is an Assistant Professor in the Department of Radiology and a member of the HBI. His primary research interest is the development and identification of computational models of brain activity (electrical, metabolic and hemodynamic) in order to clarify how the signals recorded in Neuroimaging (fMRI, PET, DWMRI) and Electrophysiology (EEG) are generated. Additionally, he is interested in the study of the statistical properties of anatomical (using DWMRI data) and functional brain networks (using EEG data).



Nils Forkert, Dr. rer. nat is an Assistant Professor in the Department of Radiology and a member of the HBI. The focus of his research is to develop and evaluate new image processing methods, algorithms and software tools for the analysis of medical images. This includes the image-based extraction of clinically relevant parameters and biomarkers describing the morphology and function of organs.

THE POSITION AND OPPORTUNITIES IN PLACE FOR THE FACULTY POSITION IN IMAGE GUIDED NEUROSTIMULATION

The successful candidate for this position will have expertise in MR imaging in one or more areas, including image-guided brain stimulation (e.g. TMS, tDCS), image-guided neurosurgery, or image-guided focused ultrasound. The candidate will be a key member of new research programs in MR guided focused ultrasound and MR guided neurostimulation. Emphasis will be placed on research excellence and the ability to collaborate with a diverse team of researchers with related interests. The successful candidate will join one or more of the nine NeuroTeams described above.

The position provides up to 75% protected time for research, and will include expectations to contribute to undergraduate and graduate level teaching. This is an excellent opportunity to develop an independent externally-funded research program within a highly collaborative environment.

Appointment: Qualifications of the applicants include a PhD and at least two years of postdoctoral training. An appointment will be made at the Assistant Professor level in the Department of Radiology with a competitive salary, as well as a start-up funding provided by the HBI and laboratory space in the Seaman Family MR Research Centre. Candidates must show evidence of ability to develop an

independent research program that will integrate with and complement one or more of the nine HBI NeuroTeams.

Focus on Research: This position offers an excellent opportunity to develop a strong and independent research program within a dynamic, collaborative, and multidisciplinary environment. With up to 75% of time protected for research, the successful candidate will be able to commit most of his or her time to focus on the development of a vibrant program.

Space: Laboratory and office space for the successful candidate will be provided by the Seaman Family MR Research Centre, which is adjacent to the Foothills Medical Centre.

Infrastructure: The successful candidate will have access to a number of excellent core research facilities within the HBI and the Cumming School of Medicine; please see <http://www.hbi.ucalgary.ca/our-research/core-facilities> and <http://cat.ucalgary.ca/> for a full list of available resources and facilities.

Access to a Diverse Set of Trainees: There are numerous training and education initiatives from across the Department, Institute, and Cumming School of Medicine. The HBI is committed to supporting their members and trainees in a number of ways: through competitive funding streams for graduate students and fellows; through an innovative program called **REALISE** that personalizes the graduate program experience with the goal of maximizing professional development alongside their research training; and through international exchange opportunities via the Rebecca Hotchkiss International Scholar Exchange program.

Provincial partners in research: **Campus Alberta Neuroscience (CAN)** is a provincial network which links research professionals from all areas of neuroscience across the Universities of Alberta, Calgary and Lethbridge. CAN's aim is to establish the province of Alberta as a centre of neuroscience excellence, impact and innovation on the international stage. The successful candidate will have an immediate community and point of collaboration with fellow researchers across the province.

Living in the Calgary Area: Calgary is a multicultural and vibrant city of more than 1 million people. Situated near the Rocky Mountains, Banff National Park and Lake Louise, Calgary offers great quality of life and outstanding recreational activities. Further information can be found on Calgary attractions, sports and recreation, and arts and culture on the official website of Tourism Calgary at: <http://www.visitcalgary.com/>

Please also follow the link below to watch a YouTube video highlighting some of the fantastic views and activities that can be enjoyed across the province of Alberta.

<http://www.youtube.com/user/TravelAlbertaCanada>

JOIN THE UNIVERSITY OF CALGARY TO ACHIEVE ITS GOALS IN NEUROSCIENCE RESEARCH AND EDUCATION

Taken together, the opportunities in place for the Neuromodulation Image Science Faculty position at the University of Calgary are significant and tangible. This document summarizes key relationships and provides an overview of points of interest to a prospective candidate for this position, but this is no substitute for visiting the Hotchkiss Brain Institute and the Department of Radiology to truly appreciate the collegial, collaborative, and innovative environment in place at the University of Calgary.

Review of applications for this position will begin August 1st, 2016 and will continue until the position is filled. We encourage you to consider this opportunity and 1) forward a curriculum vitae, a summary of research interests, and reprints of your 5 most relevant publications, and 2) arrange to have three letters of reference sent directly to:

Dr. Bruce Pike,
Deputy Head – Research
Department of Radiology
Cumming School of Medicine
University of Calgary
3330 Hospital Drive NW
Calgary, AB, Canada T2N 4N1

Email: ccollie@ucalgary.ca