课题列表

Project Title	Suggested Applicant Academic Background
Analysis of Chemicals in Drinking Water	Chemistry, biochemistry, environmental engineering.
Application of Plasma-Activated Water for Microbial Inactivation	Food engineering, food science, food microbiology.
Approximate Circuits and Computing Systems for Machine Learning	Electronics, computer engineering, information systems, VLSI.
Biolasers	Science or engineering.
Construction of Symmetric Tight Wavelet Frames	Applied mathematics, electronic engineering, computer sciences.
Controlling the Dust Hazard of Minerals	Mining engineering, safety engineering, or other mining-related backgrounds.
Controlling the Self-Heating Hazard of Minerals	Mining engineering, safety engineering, or other mining-related backgrounds.
Deep Learning as a Tool for Identifying Wildlife from Audio Recording	Computing science and/or wildlife biology.
Design of Boronic acid Catalysts for Direct Transformations of Alcohols: Toward a Catalytic Leaving Group for Elimination and Substitution Reactions	Chemistry.
Developing an Interactive Knowledge Base to Examine the Relationship Between Participation and Research Impact in Participatory Health Research	Information science; social science; some knowledge of web programming would be an asset.
Developing Applications for Mass Spectrometry-Based Imaging	Preference for a strong background in biochemistry and ideally to some experience with mass spectrometry.
Developing Efficient Algorithms for the Statistical Modelling of Neuroscience Data	Computer Science, engineering, statistics.
Ecological Stoichiometry Modeling	One of the following: applied mathematics, ecology, biochemistry, or computer science.
Electrodes for Metal-Air Batteries	Materials science/engineering.
Energy-Efficient Design of Deep Neural Networks	Electronics, computer engineering, VLSI, information systems.
Experiments on Laser Cladding for Composite Materials	Chemical engineering, mechanical engineering, materials engineering, mathematics, physics, computer science or engineering. Other fields welcome.
Field and Laboratory Investigation on Pavement Performance in Cold Regions	Civil engineering.
FPGA/GPU-Based Modeling and Numerical Solvers in Energy Systems	Electrical and computer engineering, computer science.
Going Viral: The Dynamics of Belief Diffusion	Mathematics, computer science.
Graphene-Biopolymer Nanocomposite	Materials engineering or electrical engineering or polymer-based major.
Gravity Current Flow in Density-Stratified Media	Mechanical engineering, engineering physics or physics.

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Heavy Metal Retention in a Boreal Peat Bog Near a Former Uranium Mine	Any of the following fields are preferred: biogeochemistry, inorganic chemistry, environmental sciences, environmental engineering, toxicology.
Image-Segmentation and Registration in Medicine	The candidate should have background in electrical engineering, computer sciences, biomedical engineering or similar; good computer skills in Matlab; knowledge in image processing; good organization, verbal/writing communication skills in English; last but not the least, good attitude to learn and be flexible.
Improve Trenchless Geotechnics	Civil engineering, geological engineering, geotechnical engineering or related discipline.
Improving Care at the End of Life of Nursing Home Residents	Health and social sciences (e.g. nursing, psychology, medicine, gerontology, sociology, public health, etc).
Improving Nursing Home Care Through Feedback on Performance Data (INFORM)	Health and social sciences (e.g. nursing, psychology, medicine, gerontology, sociology, public health, etc).
Influence of Water Activity on Thermal Resistance of Salmonella in Low-Moisture Foods	Food microbiology, food science, food engineering, food safety.
Machine-Learning and Data-Mining Applications in Process Systems Engineering	Chemical engineering and/or computer science.
Mathematical Modelling and Scientific Computing for Real Problems	Solid mathematical background with computing experience.
Modeling and Optimization of the CO2 Transportation Pipeline Design in Alberta	Engineering, or applied mathematics, or computer science.
Modeling Fecal Microbial Transplant in Clinics	One of the following: applied mathematics, computer science, microbiology, ecology, or medicine.
Modeling of Laser Cladding for Composite Materials	Chemical engineering, mechanical engineering, materials engineering, mathematics, physics, computer science or engineering. Other fields welcome.
Modeling the Effects of Centriole Engagement on Genome Instability	Strong background in molecular genetics, experience with microscopy.
Modelling Membrane Proteins	Physics, chemistry, physical chemistry.
Molecular Control of Pancreatic Beta-Cell Mass	Biology, biochemistry, or any relevant background.
Non-Agricultural Employment for Migrant Workers and their Willingness to Stay in City	Agricultural economics/rural sociology. Must have knowledge of econometrics and data analysis skills along with good command of written and spoken English.
Nutrient Fluxes in Fechnosols	Environmental engineering or environmental science.
Patient Specific fMRI-based Psychiatric Diagnosis and Treatment	Computing science/computer engineering -- preferably including machine learning, (medical) imaging and statistics. Knowledge of biology and/or medicine is useful (but not essential).
Pipeline Ground & Underground, Aerial and Marine Monitoring by Unmanned Robotic Devices	Mechanical engineering, robotics, electrical engineering, aerospace engineering, computer science.
Polymer-Based Particles for Drug-Delivery Applications	Chemical engineering, chemistry, bioengineering, biochemistry, polymer science and engineering, oncology.
Products of Uranium (U) and Chromium (Cr) Reduction by Biochar-Supported Biofilm Composites	Geology, geochemistry, chemistry and civil/environmental/chemical engineering.

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Regulation of Heat Resistance in Salmonella	Microbiology or food microbiology.
Renewable Bionanocomposites	Chemistry, chemical and materials engineering
Responsive Polymer-Based Artificial Muscles and Actuators	Any, ideally senior student of chemistry or chemical engineering.
Restoration of Riparian Wetland Areas Degraded by Off-Highway Vehicles	Experience in biology - ideally plant biology - and experience having collected data in a lab or field setting would be ideal, although a willingness to learn is okay too. There will be work outdoors in inclement weather, and the student must be willing to work in a non-traditional field-based setting collecting data.
RF Spectrum Survey Using SDRs	Computer science, computer engineering, telecommunications engineering.
Role of Eicosanoids in Protecting Mitochondria from Injury	Applicants should have a basic understanding of cellular and molecular biology as well as biochemistry. Some coursework in pharmacology would be beneficial.
Screening of Novel Anticancer Therapies Based on Selective Targeting of the FOXM1 Transcription Factor	Cell culture, western blotting.
Signal Processing and Extraction of Elastic Parameters Relevant to Ultrasound Measurement in Human Tibiae	Physics, mechanical engineering, electrical engineering, biomedical engineering or similar.
Southern Singer Songwriters	English, cultural studies, American studies
Spline Multiwavelets	Mathematics, applied mathematics.
Staff Burnout and Resident Outcomes in Nursing Homes	Health and social sciences (e.g. nursing, psychology, medicine, gerontology, sociology, public health, etc).
Studies on the Mechanism by which MMP-7 Modulates Cholesterol Metabolism	Biochemistry, molecular biology, cell culture, proteomics.
Study of Novel Micro-Porous Layer Architectures for Polymer Electrolyte Fuel Cells	Mechanical or chemical engineering.
Subdivision Schemes with Linear-Phase Moments	Computer sciences, applied mathematics, mathematics.
Synthesis of Novel Viral Carbohydrates	Chemistry, including organic chemistry.
Synthesis of Pentacene Dimers for Solar Energy Energy Captions via Singlet Fission	Organic synthesis laboratory experience, with spectroscopic characterisation.
The Determinants of Social Mobility in Rural China	Agricultural economics/economics with good command of econometrics and data analysis skills.
Understanding the Molecular Mechanism of Progressive Familial Intrahepatic Cholestasis-2	Life sciences.
Urban Youth Cultures: Youth Centres and Sign-In Systems Impacts on Adolescent Identities and Social Spaces	Urban planning, architecture, social science, social theory.
Video Analysis for Smart Travel Safety	Image/video processing and relating programming skill; efficient English communication.
Visual Serveying of Unmanned Vehicle Systems	Control systems, embedded systems, computer programming, mobile robotics.
Voltammetric Determination of Antioxidants in Foods	Analytical chemistry, food chemistry, senior undergraduate chemistry courses.