City University of Hong Kong Summer Research Internship Programme 2025 (in-person)

Programme Overview

City University of Hong Kong (CityU) Summer Research Internship Programme allows students to have a hands-on experience in conducting scientific research related to their field of study. It aims to provide students with the opportunity to conduct a research project to widen their horizons and apply their knowledge practically. Cultural activities and industrial visits will be organised to give participants a brief understanding of industrial establishments in Hong Kong, as well as have a taste of Chinese culture.

Requirements

Refer to CityU's Inbound Summer Exchange Programme page for more information on the programme.

The list of projects available can be found at the end of this document.

Location

This programme takes place in Hong Kong.

Dates

16 June – 8 August 2025 (8 weeks)

Credit Transfer

This programme may be mapped to a 4-unit UROPS course code or a 4-unit FoS dummy exchange course code (counts towards unrestricted electives).

More information on course mapping and credit transfer will be released to students accepted into the programme.

Do note that additional assessment may be required from the student by the NUS department for transferring of credits to a UROPS course. Not all UROPS course code can be counted towards major requirements. Please check what requirements the UROPS will count towards and if you are unsure, please check with your department.

Students can transfer a total of 12 units from a maximum of 2 overseas summer/winter programmes without having to pay NUS tuition fee during their course of study. Any additional units mapped will be subjected to NUS Special Term fees.

Eligibility Criteria

NUS students must:

- Be a full-time Faculty of Science student, with a primary major in science
- Have a clean disciplinary record
- Have completed 2 – 6 semesters in NUS by the start of the programme (i.e. current Year 1, Year 2 and Year 3 students)
- Have a minimum GPA of 3.0
- Not be intending to graduate at the end of AY2024/2025 Semester 2
- Not be called up for National Service during the programme dates. A deferment letter will not be provided.

Number of places

There are 6 places available.

Programme Cost

Students do not need to pay NUS Special Term fees or tuition fees to CityU if they do not exceed the credit transfer limit stated under the section "Credit Transfer" above. However, students are responsible for their own airfare, accommodation, meals, personal expenses, etc.

Estimated cost (*Please note that the figures provided are only estimates*)

Item	Cost
Return Airfare	SGD400
Accommodation	SGD2,000
Food, Transportation and other Expenses	SGD1,500

Please visit the SRO website for further information regarding on-campus lodging. On-campus residence will be arranged for successful applicants, subject to availability of hostel places.

Financial Assistance

Click here to find out more about the various financial assistance schemes offered by FoS. This programme is eligible for the NASA Enhancement Bursary and the Science Student Overseas Exposure Fund (SSOEF).

Information on financial aid application will be sent to students accepted into the programme later.

Other financial assistance schemes offered by NUS can be found here.

Programme Application Procedure and Deadline

Login to EduRec and submit your application under External Study Type "Research Attachment/Internship/ Industrial Attachment", External Study Setup ID: **03066**. Please refer to the Guide for Student Programme Application before starting your application.

Application Deadline: **Monday, 23 December 2024, 11:59pm Singapore Time**

Documents required (upload into your online application in EduRec):

1. Latest NUS unofficial transcript
2. Curriculum Vitae – Highlight any prior research experience that you may have to support your application
3. Personal Statement – Indicate your 5 project choices in order of preference, including your area of research interest and why you are interested in the mentioned projects

Note:

- Students who receive an offer from NUS are required to submit a separate application to CityU
- Admission into the programme is at the discretion of CityU
- Allocation of project is done by CityU

If you face difficulties uploading the documents, submit the required documents via SCI UG Queries (category: SAP) by **23 December 2024, 11:59pm Singapore Time**.

Applications would be **deemed incomplete if the required documents are incomplete or not submitted** by the stipulated deadline, and therefore disqualified from the application.

To be fair to students who abide by the deadline, incomplete or late application will strictly not be considered.

Insurance

All students travelling overseas for activities or purposes approved, endorsed, organised, sponsored or authorised by NUS will be covered by the NUS Student Travel Insurance Policy. Click here for more information.

Exclusions to the NUS Student Travel Insurance may apply. Students are to ensure that they have sufficient travel insurance coverage and may consider purchasing additional travel insurance if required.

Contact

If you have any questions, please submit your enquiry via SCI UG Queries (category: SAP).

Updated: 16 December 2024

CityUHK College of Science - Summer Exchange Programme 2025
Project list

Department	Project Title	Project Description	No. of Vacancy	Supervisor information
				Name
Chemistry	Photoredox and Metallaphotoredox Catalysis	Students will be exposed to organic synthesis and homogeneous catalysis based on photoredox and/or metallaphotoredox methods. Students will also learn continuous flow synthesis.	1	Prof. FU Wai Chung Stephen
	Using computers to study organic reactions	This project utilizes computational methods to explore organic reactions and molecular structures. By leveraging advanced software and algorithms, we aim to gain insights into the mechanisms of reactions and the geometry of molecules, enhancing our understanding of chemical behavior and properties.	1	Prof. LAU Kai Chung
	Using computers to study the structures of molecules	This project utilizes computational methods to explore organic reactions and molecular structures. By leveraging advanced software and algorithms, we aim to gain insights into the mechanisms of reactions and the geometry of molecules, enhancing our understanding of chemical behavior and properties.	1	Prof. LAU Kai Chung
	Iron-catalyzed asymmetric hydrogenation	Asymmetric hydrogenation is a hihgly efficient method to rapidly construct various kinds of chiral motifs that can be applied in chiral pharmaceutical synthesis. Iron catalyst is an cost-effective, sustainable and less toxic substitution of the traditional noble metals.	1	Prof. TAN Xuefeng
	Development of the test kits for the detection of counterfeit drugs	Depending on the counterfeit drug, students will be exposed to organic synthesis and analytical chemistry or development of aptamers and investigation of their binding to the target molecules.	1	Prof. Maria BABAK
	Development of novel anticancer drugs for the treatment of "undruggable" cancers	This project involves either the synthesis of anticancer drug candidates or their testing in cancer cell culture and investigation of their mechanism of action.	2	Prof. Maria BABAK
	Development of the novel database for the AI prediction of anticancer drugs	This project is the most flexible and can be done both from the lab or from home and requires the preparation of the scientific database and subsequent AI prediction of the properties of anticancer drugs. Coding skills are preferred but not necessary.	1	Prof. Maria BABAK
Mathematics	Sensitivity of complex systems to random forces	Sensitivity analysis explores how uncertainty in the outcomes of a mathematical model or system can be distributed among various sources of uncertainty in its inputs. It involves estimating sensitivity indices to quantify the impact of each input parameter. This project focuses on such analyses for complex systems, which comprise multiple interacting components. The objective is to compute a set of sensitivity indices related to complex systems constrained by rigid boundaries.	1	Prof. Laurent MERTZ
	Neural Networks for solving partial differential equations	Neural networks, particularly deep learning models, are increasingly being utilized to solve partial differential equations (PDEs) by approximating the solution functions that satisfy the equations. These data-driven approaches, such as Physics-Informed Neural Networks (PINNs), incorporate the PDEs directly into the network's loss function, enabling the network to learn the relationship between inputs (like spatial coordinates and time) and outputs (the dependent variables) while respecting the underlying physical laws. The major objective is to explore neural network to solve fluid flow equations and understand the underlying mechanisms.	1	Prof. Lina ZHAO
	Deep Learning and Scientific Computing	This project is in general about the exploration of data science, AI and computational math. The specific task will be assigned based on the interests and strengths of the students. The topics could be solving high dim PDE, generative modelling or mathematics of transformer, as well as computational chemistry and AI. The student is expected to have a solid foundation of continuous and numerical mathematics, as well as basic background of machine learning and Python programming. The math or physics major is welcomed. The student is expected to wrap up for a publication after the summer program.	2	Prof. Xiang ZHOU
	Mathematical Properties of Neural Network Representations	Understanding mathematical properties of neural network representations from the perspectvies of operators. We aim for providing mathematical interpretations for well-known empirical evidences including spectral bias, sharp extrema, double-descending, etc.	1	Prof. Roy HE

	Data-driven Modeling: Theory and Algorithm	Develop both theoretical frameworks and fast algorithms for identifying mathematical models from noisy observations of a system. This involves important techniques including sparse regression, model selection, model validation, and regularization.	1	Prof. Roy HE
	Mean field game and its applications	This project is to use mean field game setup to model financial mathematical problems in real life. The objectives: -To let the students understand one of the new trends in financial mathematics: the applications of the theory of mean field game in financial systematic risk, pricing, etc; -To help the students equip the basic mathematical knowledge on the theory of mean field game; -To encourage students to apply the theory of mean field game on mathematical models derived from finance. Main requirements: Have a good knowledge of probability and financial mathematics. Significance and the procedure of undertaking the project: -Literature review on the theory of mean field game. -Understand the advantages and necessity of using the mean field theory to construct the models in financial mathematics. -Attempt to conduct numerical algorithms to solve the models.	1	Prof. Chenchen MOU
	Numerical Methods of PDEs by Neural Networks for 1D Problems	We plan to develop numerical methods for partial differential equations by neural network for simple 1D models. The goal is to have a mathematically solid and computationally efficient method for a class of one dimensional problems including differential equations and variational inequalities.	1	Prof. Shun ZHANG
	Distributed high-dimensional lasso regression	In modern days, more and more data sets arise in various applications with data stored at multiple nodes/agents and communication of information between agents is constrained by bandwidth limits as well as privacy protection concerns. We will explore a popular regression problem and design simple gradient-based algorithm to reach a consensus solution. Student will implement the distributed algorithm in R.	1	Prof. Heng LIAN
	Unique continuation in elliptic PDEs	This project focuses on quantitative uniqueness in elliptic boundary value problems, a fundamental topic in PDEs with intriguing applications in areas like geometric analysis and inverse problems. Students will gain hands-on experience with essential concepts and techniques in analysis and PDEs, as well as their applications. This project is ideal for undergraduates with basic knowledge of analysis and PDEs who are eager to further explore these areas in their future studies.	1	Prof. Zongyuan LI
	Efficient implementation of some high-order partial differential equations	In this project, we will work on the design of some numerical method for some high-order partial differential equation (for example, mTh order Laplace equation). The key feasure of the design is that it can be easily implemented in several well-kown open source software like FEniCS.	1	Prof. Weifeng QIU
	Application of Partial Differential Equations	Partial differential eqiations have applications in shape optimization, imagining processing, physics, chemistry, biology and enginnering. This project will be on certain applications.	1	Prof. Tao LUO
Physics	Mapping the Titans: Creating a Catalog of Supermassive Black Holes	This project aims to compile a comprehensive catalog of supermassive black holes with masses exceeding 10,000 solar masses by collecting data from recent literature and databases, including the latest discoveries from JWST and other telescopes. It involves recording key details for each black hole—such as names, coordinates, mass, redshifts, distances, angular sizes, luminosities, discovery channels, instruments used, and references—and organizing this information into a user-friendly format for researchers. Additionally, you will learn and apply different methods for estimating black hole masses, luminosity and distances, ultimately providing a valuable tool that aids future research on these cosmic titans.	1	Prof. ZHONG Yiming
	Manipulate small particles by using Star Trek inspired tractor beams	In the popular Star Trek movies, the starship can emit a beam to attract objects from a distance. A similar phenomenon has been realized by physicists in the microscopic scale with laser beams. In this project, we will theoretically and computationally investigate what types of microscopic particles can be manipulated by optical tractor beams and how to achieve a strong pulling force on the particles.	2	Prof. WANG Shubo



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City Uniersity of Hong Kong

SUMMER EXCHANGE PROGRAMME 2025

16 JUNE - 8 AUGUST 2025

Looking for an overseas learning experience blended with research internship?
City University of Hong Kong is the right place for you!

APPLICATION DEADLINE: 15 February 2025


RESEARCH EXPERIENCE


INDUSTRIAL VISITS


CULTURAL ACTIVITIES

For enquiry:

College of Science
Janice Lam
Email: jan.lam@cityu.edu.hk
Phone: (852) 3442-6175
Address: City University of Hong Kong
Tat Chee Avenue
Kowloon, Hong Kong SAR
Website: www.cityu.edu.hk/csci