LCC Term Research Internship Program 2026

Introduction

Shanghai Jiao Tong University (SJTU) is a higher education institute in China that enjoys a long history and a world-class reputation. China-UK Low Carbon College (LCC) was established by SJTU with the joint efforts of the University of Edinburgh (UoE) and Shanghai Lin-gang Government. As the first low carbon college in China, LCC aims to become a world-class innovative higher education and research institute with international influence, which provides graduate education, scientific research, executive training, and innovation.

Drawing on expertise from the SJTU advanced research in energy, environment, finance and management, combined with the knowledge and experience from world-class universities such as the University of Edinburgh and University College London, LCC intends to promote the creation of a low-carbon community and contribute to the sustainable development of China and the world.

The LCC Research Internship Program aims to promote international research collaboration with research facilities available at China-UK Low Carbon College of Shanghai Jiao Tong University. It offers the opportunity for excellent students from around the world to spend a summer or a semester working in a world-class research laboratory alongside prominent research professors. It will prepare students for further studies through intensive research experience with faculty mentors and enrichment activities.

What will participants receive?
- Knowledge of the top research projects in China
- The opportunity to work with top Chinese professors, fellows, and students
- A good foundation for a career in academic research
- The opportunity to co-author a scientific paper
- Exposure to Chinese language and culture
- A rewarding and unforgettable experience in China

Eligibility Requirements
- Students from overseas (Non-Chinese Citizens), Hong Kong, Taiwan, and Macao are eligible to apply.
- Undergraduate students must have completed at least one year of an undergraduate program (graduate students have no such limitation).
- Hold at least a 3.0 GPA on a 4.0 scale or equivalent.
- Students from non-English speaking countries must provide an English language proficiency certificate: an IELTS with a score of no less than 6.0 or a TOEFL with a score of no less than 78 points. If you are studying in a fully English-taught program, you must provide the relevant certificates.
- Additional requirements vary according to the laboratory.

Duration

Term research internship (May 1, 2026 – October 31, 2026)

Academic Information

Credit	● 3 SJTU-LCC Credits
Program duration	● In-Lab Hours: 20 hours/week
Assessment	There are three grading sections in this program: ● Attendance ＝ 30% ● Midterm presentation ＝ 30% ● Final written report ＝ 40%

Timeline Overview

Date	Event
January – March 2026	Online Application
March 31, 2026	**Application Deadline**
April 29-30, 2026	**Registration Day**
May 1, 2026	Opening Ceremony
May 1 – October 31, 2026	Program Period
October 2026	Transcript Delivery

Application Procedure

Phase 1: Online Application

Step 1: Access the Application System

Application Portal: https://wj.sjtu.edu.cn/q/sBHunJVA
Application Period: January – March 2026
Application Deadline: March 31, 2026

Eligibility Requirements

1. **Nationality:** Non-Chinese citizens, or students from Hong Kong, Taiwan, and Macao
● **Academic Standing:** Undergraduate students must have completed at least one year of an undergraduate program (graduate students have no such limitation).
2. **GPA Requirement:** GPA ≥ 3.0/4.0 or equivalent
3. **Language Requirements (for non-native English speakers):**
   • IELTS ≥ 6.0, or

- TOEFL ≥ 78, or
- Enrolled in a fully English-taught program (certificate required)

⚠ **IMPORTANT:** Your name on the application must match your passport
EXACTLY. Any discrepancy will affect your visa application and enrollment
registration.

Phase 2: Document Submission

Required Application Documents

No.	Document	Notes
1	A scan of the identication page of your passport	The passport must be valid for at least 6 more months for the visa application
2	ID photo	similar to a passport photo
3	Curriculum Vitae (CV)	In English
4	Copy of your most recent academic transcript	Official copy with stamp
5	Motivation Letter	Explain your goals
6	Recommendation Letter	Signed by professor/advisor
7	Report of your past research experience	if available
8	Language prociency certicate	if available

Fees

- **Tuition Fee:** As stated in the Admission Notice

Application Result Notification

- You will be notified of the results through our website and receive an email confirming the receipt of your application within two weeks of submission.
- Admission results will be announced: April 2026
- Check your application status via the online portal or email

Phase 3: Visa Application & Entry

⚠ **MANDATORY:** All SJTU international students MUST enter China with a valid
X1 visa (for programs > 6 months) or X2 visa (for programs ≤ 6 months). Entry with
any other visa type will result in FAILED ENROLLMENT!

Visa Types Comparison

Item	X1 Visa	X2 Visa
Applicable For	Study period > 6 months	Study period ≤ 6 months

Item	X1 Visa	X2 Visa
After Entry	Apply for Residence Permit within 30 days	No Residence Permit required
Required Form	JW201 / JW202 Form	DQ Form

Visa Application Documents

Submit the following to the Chinese Embassy/Consulate in your country:
1. **Valid passport** (valid for ≥ 6 months from entry date, with at least 2 blank visa pages)
2. **SJTU Admission Notice** (printed copy)
3. **Visa Application Form** (X1: JW201/JW202 Form; X2: DQ Form)
4. **Medical Examination Report** (if required by the embassy)

⚠ **IMPORTANT:** After receiving your visa, immediately verify that the embassy has returned ALL your original documents—especially the Admission Notice and JW202 Form. These are REQUIRED for your Residence Permit application in Shanghai!

Entry Procedures

Customs Declaration

Items requiring declaration:
- Valuables worth over USD 5,000 (e.g., laptops, cameras)
- Prescription medications (carry a doctor's note in English)
- More than 200 cigarettes or 1 liter of alcohol

Immigration Check:
- Present your passport, visa, and Admission Notice
- Complete fingerprint scanning as instructed
- If asked, you may say: "I am here to study at SJTU"

Transportation from Airport to LCC

Option	Details	Cost
Official Taxi	Use the authorized taxi stand at the airport	120–300 CNY
Didi (Ride-hailing)	Download Didi app before departure; link international credit card	150–350 CNY

Transportation between SJTU to LCC

Option	Details	Cost
Official Taxi	Taxi service	150–300 CNY
Didi (Ride-hailing)	Download Didi app before departure; link international credit card	120–350 CNY

Transportation between LCC to dormitory

A college-operated shuttle bus is provided between the student apartment and the campus to support daily commuting during the exchange period.

Phase 4: Campus Registration

⚠ **CRITICAL:** Registration dates are specified in your Admission Notice. If you need to arrive late, submit a Late Arrival Request via the ISC portal at least 7 days before the registration start date. Failure to register without approval will result in ENROLLMENT CANCELLATION!

Registration Process (4 Steps)

Step 1: Accommodation Check-In (Off-Campus Housing)
Location: The college will arrange accommodation uniformly.
Required: Passport, Admission Notice, Housing Confirmation Email
Process: Submit documents → Receive room key and temporary campus card → Check room facilities

Step 2: Fee Payment
Payment Methods: Bank transfer, credit card (Visa/Mastercard), cash (CNY)
Fees to Pay: Accommodation Fee (200-400 CNY/day, the accommodation fee you pay depends on actual accommodation conditions).

💡*TIP: Keep the payment receipt—it is required for visa extension and Residence Permit applications!*

Step 3: Student Status Registration
Location: International Student Center (Minhang Campus: Building 8, Administrative Area)
Required Documents:
- Passport (visa page + entry stamp page) — Original + 2 copies
- Admission Notice — Original + 2 copies
- JW201/JW202 Form or DQ Form — Original + 2 copies
- Passport-sized photos (white background, 35mm × 45mm) — 4–6 copies
- Medical Examination Report (X1 visa holders only)

Process: Submit documents → Staff verification → Activate SJTU student account

Step 4: Mandatory Medical Insurance Purchase
Location: Same as Student Status Registration
Insurance Cost: Approx. 800–1,200 CNY/year
Coverage: Outpatient care up to 5,000 CNY/year; Hospitalization up to 100,000 CNY/year
Process: Choose coverage level → Pay → Receive insurance card and policy document

Residence Permit Application (X1 Visa Holders)

⚠ **URGENT:** The X1 visa is only valid for 30 DAYS after entry! You MUST apply for a Residence Permit within this period. Late applications result in fines of 500–2,000 CNY per day and a record of illegal residence.

Application Process:
1. **Obtain SJTU Application Letter:** Visit SJTU Exit-Entry Service Center (Minhang: Room 203, ISC Building)
2. **Prepare Documents:** Passport, SJTU Application Letter, Medical Certificate, Accommodation Registration Form, Photo, Tuition Receipt, JW Form
3. **Submit to Exit-Entry Bureau:** Minhang Branch: 1500 Meilong Road (Metro Line 1, Meilong Station, Exit 5)
4. **Collect Passport:** Processed within 7 working days. Pick up in person or by courier (20 CNY)

Emergency Contacts

Service	Contact
Program Inquiry Email	xuzheng-2004@sjtu.edu.cn
Foreign Service Inquiry Email	shiqing@sjtu.edu.cn
Accommodation Arrangement	niulinlin@sjtu.edu.cn
Visa/Residence Permit Hotline	+86-21-12367 (English available)
Shanghai Foreigner Service	+86-21-12345 (Press 2 for English)
Public Hospital (24/7 Emergency)	+86-21-6436-9181

Official Links

- **Online Application:** https://wj.sjtu.edu.cn/q/sBHunJVA
- **International Student Center:** https://isc.sjtu.edu.cn
- **Visa Information:** https://isc.sjtu.edu.cn/en/content.aspx?info_lb=236&flag=5
- **Exit-Entry Service Center:** https://global.sjtu.edu.cn/cgcj
- **Shanghai Exit-Entry Bureau:** https://gaj.sh.gov.cn/crj/
- **Shanghai Int'l Travel Healthcare Center:** https://sithc.shhgtsc.org.cn
- **SJTU Student Portal:** https://my.sjtu.edu.cn

Attachment (The List of Internship program)

Project Information

Low Carbon Energy

Project 1: Implementing a Machine-Learning WSGG Radiation Model for Ammonia Combustion in CFD (OpenFOAM / Fluent)

Contact Information

Associate Prof. Tao Ren

Email: tao.ren@sjtu.edu.cn

Project Description

Ammonia is emerging as a promising carbon-free fuel for future power and industrial applications. Accurate radiative heat transfer modelling is essential for predicting flame structure, thermal loading, and pollutant formation in ammonia-fueled systems. Traditional gray-gas or classical WSGG models often fail to capture the complex spectral behaviour of NH_3-containing mixtures, while high-fidelity spectral models are prohibitively expensive in full CFD. In this project, the student will embed our newly developed machine-learning-based WSGG radiation model into OpenFOAM or ANSYS Fluent, and perform radiation-only verification followed by ammonia combustion simulations to evaluate the model's performance against standard radiation models.

Objectives

- Implement a pre-developed ML-based WSGG model inside OpenFOAM or Fluent.
- Validate the ML radiation model using canonical radiative heat transfer cases.
- Assess its impact on ammonia combustion simulations by comparing temperature fields, radiative source terms, and wall heat fluxes.

Eligibility Requirements

- Students with interest in combustion, radiation modelling, and CFD are welcome.
- Basic experience with OpenFOAM or ANSYS Fluent, and programming in C++/UDF and Python, is recommended.

Main Tasks

- Embed the provided ML-based WSGG model into OpenFOAM or Fluent via tabulation or model functions, and verify it using benchmark radiative transfer cases.
- Run an ammonia combustion configuration with both the standard radiation model and the ML-based WSGG model.
- Compare predicted temperature fields, radiative heat fluxes, and source terms, and summarize the improvements and differences.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1161
School: https://lcc.sjtu.edu.cn/En

Project 2: Developing Key Materials for Redox Flow Batteries

Contact Information

Prof. Ya Ji
Email: jiya@sjtu.edu.cn

Project Description and Objectives

Redox flow batteries are promising technology for long-duration energy storage due to their intrinsic safety and high cycle life. This project will develop key materials such as electrode and membrane, aiming for high-performance redox flow batteries. Study on electrode will involve with electrocatalysts to improve redox reaction kinetics in vanadium redox flow batteries. Study on membrane will focus on porous composite membrane to enhance membrane selectivity and capacity retention in redox flow batteries. Students can choose project either on electrode or membrane.

Eligibility Requirements

- Interested students should have experience in chemical experiment in lab.

Main Tasks

- Finish a research report.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/2483

School: https://lcc.sjtu.edu.cn/En

Project 3: Machine-Learning-Based Total Emissivity Model for CO_2–H_2O–CO–NH_3–CH_4 Mixtures

Contact Information

Associate Prof. Tao Ren

Email: tao.ren@sjtu.edu.cn

Project Description

Next-generation low-carbon and carbon-free combustion systems often involve multi-component fuel mixtures containing CO_2, H_2O, CO, NH_3 and CH_4. Accurate gas radiation modelling for such mixtures is crucial for predicting flame temperature, heat transfer, and pollutant formation, but high-fidelity spectral methods are too expensive for routine use. In this project, the student will generate a pre-computed reference database to develop a fast machine-learning surrogate model for the total emissivity of CO_2–H_2O–CO–NH_3–CH_4 mixtures over practical temperature, pressure, and composition ranges.

Objectives

- Build a consistent reference database for total emissivity of five-component gas mixtures.
- Construct a compact, fast surrogate model for total emissivity.
- Quantify accuracy against a high-fidelity reference database.

Eligibility Requirements

- Students with interest in thermal radiation, combustion modelling, or machine learning are welcome.
- Good Python skills (NumPy, pandas; experience with scikit-learn or PyTorch is a plus).
- Basic understanding of heat transfer and thermal radiation is desirable.

Main Tasks

- Use existing in-house codes to generate and organize a reference emissivity database over selected temperature, pressure, and composition ranges.
- Train and tune a machine-learning surrogate model for total emissivity using the generated database.
- Validate the surrogate against the high-fidelity results and package the final model into a documented Python function or notebook.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1161

School: https://lcc.sjtu.edu.cn/En

Energy and Power Engineering

Project 4: Research on geological adsorption of H_2 and CO_2 using AI

Contact Information

Prof. Lei Hou

Email: leihou@sjtu.edu.cn

Project Description and Objectives

Utilizing geological structures to store CO_2 and H_2 is currently the most promising method for large-scale storage. Understanding the adsorption processes of these two gases in the geological material is a prerequisite for the widespread application of this technology. This research will employ a combined approach of machine learning and experiments to investigate the adsorption capabilities of these two gases in geological materials such as coal. Provide insights for fields such as geological hydrogen storage, underground crude hydrogen purification, and carbon dioxide storage.

Eligibility Requirements

- Interested students are required to be able to use English or Chinese fluently.
- It is necessary to have good computer skills and be able to use at least one of the following computer languages: Python, MATLAB, R.
- Having a good understanding of adsorption or being able to conduct adsorption experiments is an bonus, but it is not a mandatory requirement.

Main Tasks

- Build an adsorption database.
- Build an adsorption prediction AI model.
- Finish a research report.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/3373

School: https://lcc.sjtu.edu.cn/En

Project 5: Photocatalytic water splitting for hydrogen production

Contact Information
Prof. Lin Yao
Email: yaol@sjtu.edu.cn

Project Description and Objectives
Photocatalytic water splitting is developing rapidly and has shown great potential for sustainable hydrogen production. This project will develop photocatalysts with high solar-to-hydrogen conversion efficiency and investigate their underlying mechanisms through theoretical calculations.

Eligibility Requirements
- Interested students should have a background in one of the following fields: chemical energy, materials, or environmental science, and should have taken relevant coursework.

Main Tasks
- Finish a research report.

Website
Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/3119
School:https://lcc.sjtu.edu.cn/En

Project 6: Thermochromic Hydrogel Materials for Energy-Adaptive Building Applications

Contact Information
Prof. Lin Yao
Email: yaol@sjtu.edu.cn

Project Description and Objectives
This project explores thermochromic hydrogel materials capable of dynamically regulating solar transmission, enabling temperature-responsive optical modulation for

smart building applications. It aims to develop energy-efficient window systems that autonomously adjust to environmental conditions and significantly reduce heating and cooling demands.

Eligibility Requirements

- Interested students should have a background in one of the following fields: chemical energy, materials, or environmental science, and should have taken relevant coursework.

Main Tasks

- Finish a research report.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/3119
School:https://lcc.sjtu.edu.cn/En

Project 7: Turing Pattern Design for Efficient Evaporative cooling

Contact Information

Prof. Yaoxin Zhang
Email: zhangyaoxin@sjtu.edu.cn

Project Description and Objectives

Turing-pattern design are an emerging technology with broad application prospects in evaporative cooling. This project will leverage a combination of laser fabrication, CFD simulations, and experimental characterization to systematically investigate the fabrication and performance of Turing pattern evaporator.

Eligibility Requirements

- Interested students should be proficient with CFD or MATLAB, and have basic knowledge of heat and mass transfer.

Main Tasks

- Material preparation.
- Numerical simulation.
- Finish a research report.

Project 8: Building energy demand under extreme weather

Contact Information

Dr Kai Wang

Email: kai.wang@sjtu.edu.cn

Project Description and Objectives

Building energy demand accounts for more than one third of the global energy consumption, and is anticipated to rise as a result of global climate change, including increasing temperatures and more frequent extreme weather events. This project aims to investigate the impact of climate change and extreme weather on building energy demand. Physics-based or data driven models will be developed to study the building's energy use, peak demand, indoor environmental quality, heat exposure etc. under various weather conditions. The insights gained will guide building energy management and inform climate adaptation strategies.

Eligibility Requirements

- Interested students should have a basic knowledge of building physics/atmospheric physics, and familiar with programming language such as python.

Main Tasks

- Develop physics-based or data driven models, and conduct case studies for selected building/city
- Finish a final report.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/3095

School: https://lcc.sjtu.edu.cn/En

Mechanical Engineering

Project 9: Research on the Coordinated Control of SOFC/GT Hybrid System Based on Safety Margin

Contact Information

Assoc. Prof. Xiaojing Lv

Email: lvxiaojing@sjtu.edu.cn

Project Description and Objectives

The Solid Oxide Fuel Cell/Gas Turbine (SOFC/GT) hybrid system has the advantages of high efficiency, low emissions and fuel flexibility. It is one of the most important development directions of power generation technology for the future.

However, the safe and stable operation and high-performance controls have always been the difficult technology question that restricts the development of hybrid systems because of its complexity. This project intends to establish a dynamic mathematical model of SOFC/GT hybrid systems with a safe boundary, reveal the coupling mechanism of the safety margin, operation characteristics, electrochemical reaction characteristics, develop a coordinated control method of performance indicators and multi-dimensional safety margin, and obtain the safe and efficient operation trajectory of the hybrid system from start-up to load regulation to shut-down. The results will be beneficial for providing theoretical and experimental support and data base for the optimization design, safety warning setting, and efficient control strategy formulation of hybrid systems, which has vital theoretical significance and practical value for promoting the process development of the hybrid system from theoretical research to actual application.

Eligibility Requirements

- Knowledge of laboratory safety is necessary.
- Basic knowledge/coursework in advanced energy systems, thermodynamics, or electrochemistry engineering.
- Students who have experience in labs are preferred.

Main Tasks

- Propose a new idea to improve the hybrid system performance based on the theory and

experiment work.

- Make a presentation of the simulation or experimental study.
- Complete a final report of this program.

Website
Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1160
School: http://lcc.sjtu.edu.cn/En

Project 10: Preparation of Biodegradable Plastics from Waste Shells

Contact Information
Assoc. Prof. Xi Chen
Email: chenxi-lcc@sjtu.edu.cn

Project Description and Objectives
Waste resources utilization is a pivotal topic for the sustainable development of the society to promote carbon circulation and reduce carbon emission. "Waste-to-wealth" is the idea to transform the waste materials generated in industrial activities and daily life activities into valuable products such as chemicals, materials, etc. This internship program focuses on the manufacturing of biodegradable plastics and other value-added chemicals from waste crab/shrimp shells or woody biomass such as wheat straws. Some tools that may be applied to solve problems in the projects mainly include catalytic techniques and simple machine learning skills to deal with the data. The objectives are to reinforce the awareness of the students on waste utilization, equip them with some frontier techniques to change the waste into useful products, and enable them to command basic skills in experimental design, data processing, and critical thinking so that they can contribute to relevant fields in the future to protect the environment and mitigate carbon emission.

Eligibility Requirements
- Have a relevant background (Environment, Chemistry, Engineering, etc.).

Main Tasks
- Establish a feasible process to transform waste shell-derived chitosan into biodegradable plastic bags with good properties.

Website
Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1097
School: http://lcc.sjtu.edu.cn/En

Project 11: Plasma-Assisted Catalytic Green Ammonia Production

Contact Information
Assoc. Prof. Chong Cheng Tung
Email: ctchong@sjtu.edu.cn

Project Description and Objectives
Due to the potential role of ammonia in energy storage and fuel, ammonia production has received much attention. However, the Haber-Bosch process, which is widely used in industrial ammonia production, has consumed 2% energy in the world and released a significant amount of CO_2. To solve these problems caused by the Haber-Bosch process, many novel ammonia production methods have been proposed, with the plasma-assisted ammonia production emerging as one of the most promising methods. As the 4th state of matter, the plasma has many unique physical and chemical properties which could be helpful for ammonia production. This project focuses on the ammonia production mechanism during the complex plasma-assisted ammonia process. The complex plasma-assisted ammonia process includes not only the reactions between catalyst and reactant, but also the interactions between plasma and catalyst and the interactions between plasma and reactant. The main goal of this project is to explore the reaction mechanism during the plasma-assisted ammonia process. Also, a series of experiments and simulations will be conducted to validate the proposed reaction mechanism.

Eligibility Requirements
- Have sufficient knowledge in chemistry.
- Prior experience with chemistry experiments.
- Good working attitude and self-learning ability.
- Good team spirit.

Main Tasks
- Review literature on the development of plasma-assisted green ammonia production in the past few years.
- Design and synthesize one type catalyst suitable for plasma-assisted ammonia production.

- Explore the ammonia production mechanism during the plasma-assisted ammonia process.

Website
Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1096
Lab: https://netzerocarbon.sjtu.edu.cn/
School: https://lcc.sjtu.edu.cn/En

Project 12: WASTE TO ENERGY: Biological Systems Towards Energy and Environmental Sustainability

Contact Information
Assoc. Prof. Jingxin Zhang
Email: lcczjx@sjtu.edu.cn

Project Description and Objectives
With the rapid urbanization and population explosion in the past decades, an increasing number of people are congregating in big cities, hence generating a massive amount of municipal solid waste (MSW) and consuming more energy than ever before. The major focus of this project is to develop a novel sustainable waste management system and energy recovery solutions suitable for energy and environmental sustainability. This project will examine a coupled problem at the nexus of energy and waste, accelerate waste recycling and reduce energy reliance on traditional fossil fuel sources and their emission of pollutants, at the same time.

Eligibility Requirements
- Proficient English skills.
- Major in Environment, Biology, Chemistry, or other relevant subjects.

Main Tasks
- Propose a research plan to improve the performance of a biological system for the conversion of organic wastes into energy/resources.
- Literature review and experimental work
- Prepare a final report

Website
Personal Homepage:https://lcc.sjtu.edu.cn/En/Data/View/1165
School: https://lcc.sjtu.edu.cn/En

Project 13: Design of Anti-Reverse Current Coatings for Alkaline Electrolyzer Cathodes: In-situ Protection Mechanisms

Contact Information

Prof. Xia Long

Email: x.long@sjtu.edu.cn

Project Description and Objectives

Intermittent renewable energy (solar/wind) causes frequent on/off cycles in water electrolyzers. During shutdowns, a damaging "reverse current" can flow, forcing the cathode to act as an anode. This leads to irreversible oxidative dissolution of the standard nickel-based cathode substrate, causing catastrophic failure. This project addresses this critical industrial challenge by developing and testing simple, conductive protective coatings for cathodes. The key objectives are to develop conductive protective coatings for electrolyzer cathodes to mitigate irreversible damage caused by reverse currents during intermittent operation, and to evaluate their effectiveness by comparing the hydrogen evolution activity and stability of coated versus uncoated cathodes under simulated reverse-current conditions. This work aims to identify the most promising coating and propose a mechanism for how it provides protection.

Eligibility Requirements

- Interested students should be familiar with electrochemistry, material science, chemical engineering or related field.
- Students who have meticulous attention to detail, a strong commitment to lab safety, and the ability to work effectively both independently and as part of an international team are highly desirable.

Main Tasks

- Collect experimental data and analyze the results
- Finish a research report.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/2909

School:https://lcc.sjtu.edu.cn/En

Prebiotic Chemistry

Project 14: Carbon Dioxide Reaction Networks Under Extreme Conditions

Contact Information

Prof. Daoping He

Email: hedaoping@sjtu.edu.cn

Project Description and Objectives

The nonenzymatic synthesis of organics from H_2–CO_2 redox couple forms the foundational basis for prebiotic carbon metabolism. This project will focus on the construction of hydrothermal CO_2 reaction networks across several carbon sequestration pathways, including but not limited to acetyl-CoA, reductive tricarboxylic acid, 3-hydroxypropionate-4-hydroxybutyrate, dicarboxylate-4-hydroxybutyrate, and ethylmalonyl-CoA pathways under simulated extreme geochemical conditions analogous to those found in hydrothermal systems. This project aims to uncover the thermodynamic and kinetic feasibility of these pathways, as well as their potential for generating key metabolic intermediates under prebiotically plausible conditions, providing insights into the origins of autotrophic carbon metabolism and the chemical evolution of life.

Eligibility Requirements

- Applicants should have a basic understanding of chemistry. This project is open to students from October to December 2026.

Main Tasks

- Perform computational or laboratory-based analysis of reaction networks under hydrothermal conditions
- Prepare a research report summarizing findings and implications

Website

Personal Homepage:https://lcc.sjtu.edu.cn/En/Data/View/3616

School: https://lcc.sjtu.edu.cn/En

Chemical Engineering

Project 15: Fuel Production from Waste Plastic Pyrolysis Assisted by Microwave and Non-Thermal Plasma

Contact Information

Prof. Yuan Xue

Email: yuan.xue@sjtu.edu.cn

Project Description and Objectives

Pyrolysis of waste plastics into fuel, hydrogen, and value-added carbon materials are promising pathways for waste valorization. However, due to the intrinsic recalcitrance of plastics, conventional pyrolysis still faces the problems of heat & mass transfer limitation, long reaction duration, high energy consumption, and complex product composition. To solve aforementioned problems, novel pyrolysis technologies, such as Joule heating, non-thermal plasma, and microwave, should be developed.

Eligibility Requirements

- The applicants should hold an education background in applied chemistry, chemical engineering or similar.
- The position is highly laboratory based and experience developing hypothesis, designing experiments, undertaking experiments and developing analytical methods are essential.
- Experience in catalyst design, chemical analysis (GC/MS, NMR etc.), and material characterizations (XRD, XPS, SEM, TEM) would be highly desired.

Main Tasks

- Finish a research report.
- Develop low-tempera-plasma or microwave assisted pyrolysis processes.
- Assist in scientific publication.
- Undertake necessary lab management.

Website

Google scholar:

https://scholar.google.com/citations?user=l_7mQeMAAAAJ&hl=zh-CN

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1162

Electrical Engineering

Project 16: Advanced Control and Hardware Design for Reconfigurable Battery Systems

Contact Information
Prof. Weiji Han
Email: w.han@sjtu.edu.cn

Project Description and Objectives
Reconfigurable Battery Systems (RBS) represent a cutting-edge technology in the field of energy storage and electric vehicles. Unlike traditional fixed-topology battery packs, RBS utilizes power electronic switches to dynamically reconfigure the connection (series/parallel) of battery cells. This project aims to solve the "barrel effect" caused by cell inconsistency and improve system fault tolerance. Students will model the RBS, design control strategies for active balancing, and simulate the system to optimize energy efficiency and extend battery cycle life.

Eligibility Requirements
- Be proficient in MATLAB/Simulink or Python for simulation and data analysis.
- Have basic knowledge of Power Electronics, Circuit Design, or Automatic Control Principles.
- Experience with embedded programming (C/C++ on STM32/DSP/MCU) is a plus.

Main Tasks
- Establish a mathematical model for the Reconfigurable Battery System.
- Develop and simulate control algorithms (e.g., SOC estimation, voltage balancing).
- Finish a research report and (optional) assist in hardware debugging.

Website
Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/2888
School: https://lcc.sjtu.edu.cn/En

Interdisciplinary

Project 17: AI assisted medical image analysis

Contact Information

Prof. Xue Dong

Email: xue.dong@sjtu.edu.cn

Project Description and Objectives

AI-assisted Diagnostic Algorithms and Clinical Deployment for Medical Images (Ultrasound/Endoscopy/Pathology Slides/X-ray/CT/MRI). The research directions are multimodal medical imaging AI-assisted diagnostic algorithms based on deep learning. The algorithm development is developing algorithms for lesion detection, segmentation, classification, and quantitative analysis of images such as ultrasound, endoscopy, pathology slides, X-ray, CT, and MRI. This clinical deployment mainly researched on algorithm lightweighting, edge computing deployment.

Eligibility Requirements

- Interested students should be very proficient in python programming and have basic knowledge of medical image analysis.

Main Tasks

- Finish a research report.
- Develop software.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1094

School: https://lcc.sjtu.edu.cn/En

Project 18: Development of Smart Wearable Devices

Contact Information

Prof. Xue Dong

Email: xue.dong@sjtu.edu.cn

Project Description and Objectives

Flexible Sensor Design and Real-Time Physiological Signal Analysis Technology. Wearable diagnostic and therapeutic devices for chronic disease management and early warning. Flexible sensor design that developing high-performance flexible and stretchable sensors capable of monitoring physiological parameters such as ECG, EEG, blood glucose, blood pressure, and blood oxygen levels. The embedded algorithms are developing edge AI algorithms for real-time, low-power analysis of physiological signals (e.g., arrhythmia detection, sleep staging, epilepsy warning). And the system integration is designing comfortable, aesthetically pleasing, and medical-grade wearable devices, alongside developing patient-side and physician-side management platforms.

Eligibility Requirements
- Students should be interested in python programming electronic engineering.

Main Tasks
- Finish a research report.
- Develop software, and perform some experiments on the existing hardware.

Website
Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1094
School: https://lcc.sjtu.edu.cn/En

Carbon Management

Project 19: Application of community-wide infrastructure-based carbon footprinting approach to cities

Contact Information
Associate Professor Kangkang Tong
Email: kk.tong@sjtu.edu.cn

Project Description and Objectives
This project aims to develop a city-level GHG inventory applying the community-wide infrastructure-based carbon footprinting approach to multiple cities, evaluating the key sectors for carbon mitigation, and comparing the emission patterns. This

project would help cities to identify key action areas for mitigation, as well as revealing the fundamental drivers for different emission patterns.

Eligibility Requirements

- Have basic understanding on climate change and urban development/planning. Have skills in excel software or python/R.

Main Tasks

- Collect cities' data on key infrastructure supply and use
- Implement the approach to conduct analysis
- Finish a report

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/2687

School: https://lcc.sjtu.edu.cn/En

Project 20: Urban net-zero carbon mitigation pathway analysis

Contact Information

Associate Professor Kangkang Tong

Email: kk.tong@sjtu.edu.cn

Project Description and Objectives

This project aims to model cities net-zero pathways' carbon mitigation pathways in a couple of cities. In this project, students can choose one key emission sector and implement a set of actions to reduce this city's carbon emissions for getting to net-zero status. This project could help students gain deeper understanding of how to get to net-zero. In this process, students can gain deeper understanding of net-zero carbon transitions.

Eligibility Requirements

- Have basic understanding on climate change and urban development/planning. Have skills in excel software or python/R.

Main Tasks

- Literature review, collect data, and conduct analysis
- Finish a report.

Project 21: Assessment of carbon-pollution-water for papermaking industries

Contact Information

Assoc. Prof. Yuquan Zhang

Email: yqwzhang@sjtu.edu.cn

Project Description and Objectives

Papermaking may involve heavy water pollution, carbon emissions, and other types of pollutants. Facilitating the transition towards circular economy and low carbon may help alleviate the environmental problem. This project will gather and compile the data. Assess the status of carbon-pollution-water interconnectedness of papermaking industries across the world, with AI assistance. Develop optimization model(s) to identify co-governance strategies of carbon-pollution-water control for papermaking industries under varying future scenarios.

Eligibility Requirements

- Interested students should be very proficient in R/python/GAMS programming and have basic knowledge of optimization.

Main Tasks

- Finish a research report.
- Develop analytical tools.

Website

Personal Homepage: https://lcc.sjtu.edu.cn/En/Data/View/1166

School:https://lcc.sjtu.edu.cn/En

Project 22: Sustainable supply chains for the Twin Transition: Recycling critical raw materials - Analyzing barriers and enablers in EU27 and China

Contact information

Prof. Darius Corbier

Email: dariuscorbier@sjtu.edu.cn

Project description and objectives

The digital and environmental transitions, known as the "twin transition", rely on (critical) material-intensive technologies, creating tension between climate change mitigation goals and resource constraints. A growing body of literature emphasizes the importance of material-efficiency measures, such as recycling, to meet the 1.5°C target of the Paris Agreement. Recycling critical raw materials (CRMs) is also essential to ensuring enough material supplies for the technologies needed for the twin transition without expanding mining, but it faces technical, economic, and regulatory barriers. By analysing barriers and identifying policy levers, it aims to identify trade-offs between economic costs, technology readiness, environmental benefits, and policy feasibility in scaling CRM recycling for the twin transition, with a focus on climate change mitigation vs. resource security. This will provide insights to policymakers for sustainable CRM supply chains and net-zero emission pathways.

Eligibility requirements

- Interested students should have a background in materials or environmental science.
- Good command of English (Chinese is a plus).

Main tasks

- Understanding the value chain of recycling critical raw materials in the EU27 and China.
- Mapping recycling technologies from patent data and the literature, to explore innovation gaps and technology readiness.
- Exploring main enablers and barriers (technical, economic, regulatory) for recycling of CRMs based on policy reports and the literature.

Websites

Personnal Homepage: https://dariuscorbier.com/

School: https://lcc.sjtu.edu.cn/En/Data/View/4438