

## Laboratory Information

The Tsinghua Global Research Program focuses on cutting-edge interdisciplinary research, include Carbon Neutrality & Energy System Transformation, AI for Science and Intelligent Computing, Intelligent Manufacturing & Smart Systems, Life Sciences & Health Innovation, and Interdisciplinary Innovation & Global Collaboration. Currently, 42 laboratories across 25 schools and departments are open for applications from international students. Students may explore the research focuses of each laboratory thoroughly and make suitable selections based on their own research interests and academic backgrounds.

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## School of Architecture

### 1. Rural Revitalization Center

Rural revitalization, Rural building, Green building design, Low carbon rural building

Supervisor: ZHANG Hong

Email: zhanghong@mail.tsinghua.edu.cn

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## Department of Civil Engineering

### 2. 4S Cross-Disciplinary Research Laboratory (4S = Structure + Soil + Solid + Sensing)

Our laboratory focuses on the application of distributed fiber-optic sensing technologies for monitoring natural hazards and human activities, the integration of AI with physics-based simulation and inversion, and the development of game-engine-driven digital twin systems.

Supervisor: GU Chen

Email: guchch@mit.edu

Website: <http://chenguatmit.com/>

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## School of Environment

### 3. Aerosol Lab

Air Pollution and Climate Change; Aerosol Science and Technology; Environmental Monitoring

Supervisor: JIANG Jingkun

Email: jiangjk@tsinghua.edu.cn

Website: <https://www.tsinghua.edu.cn/enven/info/1036/1572.htm>

### 4. Solid Waste Management and Resource Recovery Laboratory

Recycling of Emerging Solid Wastes in the New Energy Industry (power batteries, photovoltaic modules, etc.)

Supervisor: LI Jinsui

Email: jinhui@tsinghua.edu.cn

Website: <https://www.bcrc.cn/ceum/web/index>

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## Department of Mechanical Engineering

### 5. Additive Manufacturing Futures Group

Metal additive manufacturing; Defects; Interfaces; X-ray imaging

Supervisor: ZHAO Cang

Email: cangzhao@tsinghua.edu.cn

Website: <https://me.tsinghua.edu.cn/en/info/1284/1896.htm>

## **6. The SG Lab**

Soft robotics, collective robotics, and lifelike robotics

Supervisor: LI Shuguang

Email: [lisglab@tsinghua.edu.cn](mailto:lisglab@tsinghua.edu.cn)

Website: [www.lisglab.com](http://www.lisglab.com)

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## **Department of Energy and Power Engineering**

### **7. Heat transfer and thermal system group**

The Laboratory of Heat Transfer and Thermal System is affiliated with the Department of Energy and Power Engineering at Tsinghua University. This research group has long been dedicated to the theoretical and key technological research on heat and mass transfer under extreme conditions, and has significant influence in fields such as low-carbon energy, aerospace power, and carbon neutrality. Its research interests include: heat transfer mechanisms in porous media and micro/nano-structures, flow and heat transfer laws of supercritical fluids, active thermal protection technologies for high-temperature surfaces, transcritical carbon dioxide heat pump systems, thermal management of high heat flux devices, and thermal scientific issues in renewable energy such as solar energy and geothermal energy.

Supervisor: JIANG Peixue

Email: [jiangpx@tsinghua.edu.cn](mailto:jiangpx@tsinghua.edu.cn)

### **8. Tsinghua-BP Clean Energy Research and Education Centre**

The Tsinghua-BP Clean Energy Research and Education Center (THCEC) was officially founded at July 23, 2003. The aim of the centre is to build a world-class research center of China's energy strategy by integrating the research capabilities on energy technology, energy system, energy strategy and energy policy in Tsinghua University and also other domestic and foreign organizations. Currently, the academic research in THCEC mainly includes two directions: one is energy technology, and another is energy system and energy strategy.

Supervisor: MA Linwei

Email: [malinwei@tsinghua.edu.cn](mailto:malinwei@tsinghua.edu.cn)

Website: <https://www.depe.tsinghua.edu.cn/depeen/info/1487/1045.htm>

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## **School of Vehicle and Mobility**

### **9. The Emerging Transportation Solutions Laboratory of the School of Vehicle and Mobility**

The Intelligent Transportation Research Group at Tsinghua University's School of Vehicle and Mobility is dedicated to advancing cutting-edge research in transportation and artificial

intelligence. Research areas include, but are not limited to, intelligent transportation systems, air-ground collaborative logistics and mobility, three-dimensional transportation systems, future public transit systems, vehicle-city interconnected systems, large-scale optimization, uncertainty optimization, data-driven decision-making, machine learning, transportation digital twins, engineering BIM technology, drone mapping, traffic microsimulation, intelligent vehicle development, and smart transportation detection.

Supervisor: QU Xiaobo

Email: xiaobo@tsinghua.edu.cn

Website: <https://www.ets.svm.tsinghua.edu.cn/en/index>

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## **Department of Electrical Engineering**

### **10. DC Research Center of Energy Internet Research Institute**

Key device and equipment for DC power transmission and distribution

Supervisor: XU Zhanqing

Email: yzq@tsinghua.edu.cn

Website: <https://dc.eiri.tsinghua.edu.cn/>

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## **Department of Electronic Engineering**

### **11. Nanoscale Integrated Circuits and Systems Lab (NICS)**

The research area is nanoscale integrated circuit chip design, mainly including design and automation techniques of high-performance data converters, emerging memory and AI accelerators.

Supervisor: LI Xueqing

Email: xueqingli@tsinghua.edu.cn

Website: <https://nics.ee.tsinghua.edu.cn/people/Xueqing/>

### **12. Laboratory for Information Theory and Its Applications**

In this lab, we focus on information theory and its applications in communication networks, AI, networked control, and distributed optimizations, with particular interests in the theoretical problems of these interdisciplinary research topics. Our recent research interests include the capacity of communication networks, delay-constrained capacity, theoretical performance limits of networks for AI (NET4AI) and networked control, as well as, bandwidth-constrained distributed optimizations.

Supervisor: CHEN Wei

Email: wchen@tsinghua.edu.cn

Website: [https://web.ee.tsinghua.edu.cn/chenwei/zh\\_CN/index.htm](https://web.ee.tsinghua.edu.cn/chenwei/zh_CN/index.htm)

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## Department of Computer Science and Technology

### 13. Theory and Blockchain Lab

Our team are interested in a broad range of problems from a theoretical aspect, such as algorithmic game theory, mechanism design, algorithms, blockchain consensus protocols, blockchain economics, blockchain security, smart contracts, etc.

Supervisor: CHEN Jing

Email: jchen@tsinghua.edu.cn

Website: <https://theory.cs.tsinghua.edu.cn/> (under construction)

### 14. Information Retrieval Lab at Tsinghua University

Theories, Algorithms, and Applications of Intelligent Information Retrieval and Recommendation Systems

Supervisor: ZHANG Min

Email: z-m@tsinghua.edu.cn

Website: <https://www.thuir.cn>

### 15. Conversational AI, CoAI

Natural Language Processing (NLP), Large Language Model (LLM), Affective Computing, Reinforcement Learning, Information Retrieval

Supervisor: HUANG Minlie

Email: aihuang@tsinghua.edu.cn

Website: <https://coai.cs.tsinghua.edu.cn>

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## Department of Automation

### 16. The laboratory of imaging and intelligent technology

Computational optics; Intravital mesoscopy; AI for Science; Optoelectronic computing

Supervisor: DAI Qionghai

Email: daiqh@tsinghua.edu.cn

Website: <https://media.au.tsinghua.edu.cn/>

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## School of Aerospace Engineering

### 17. Multiscale Interfacial Transport Laboratory

Microscale fluid mechanics and heat mass transfer; Thermo-fluid-solid transport in porous media; Complex fluid and interfacial transport; multiscale modeling; heat physics and thermal management

Supervisor: WANG Moran

Email: mrwang@tsinghua.edu.cn

Website: [www.wanglab-tsinghua.com](http://www.wanglab-tsinghua.com)

## **18. Learning and Neural Systems Group**

Machine Learning, Neural Engineering, Robotics

Supervisor: SUI Yanan

Email: [ysui@tsinghua.edu.cn](mailto:ysui@tsinghua.edu.cn)

Website: <https://lsgroup.cc/>

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## **Department of Chemical Engineering**

### **19. Laboratory of Photon-Phonon Co-driven Catalysis**

Our group has established a new concept of photon-phonon co-driven catalysis which is employed to achieve efficient conversion of small molecules. Our main research projects include: ammonia synthesis, hydrogen production, biomass conversion, plastic depolymerization, natural gas conversion and multi-scale ultrafast spectroscopy.

Supervisor: TANG Junwang

Email: [jwtang@tsinghua.edu.cn](mailto:jwtang@tsinghua.edu.cn)

Website: <https://tanggroup-thu.com>

### **20. Design and Applications of Functional Porous Materials Towards Carbon Neutrality**

functional porous materials, microreaction technology

Supervisor: LIU Zhendong

Email: [liuzd@tsinghua.edu.cn](mailto:liuzd@tsinghua.edu.cn)

Website: <https://zhendongliu.lab.org/>

### **21. Ordos Lab**

Engineering Energy & Fuels Chemistry Science & Technology - Other Topics

Environmental Sciences & Ecology

Supervisor: WANG Xiaonan

Email: [wangxiaonan@tsinghua.edu.cn](mailto:wangxiaonan@tsinghua.edu.cn)

Website: <https://www.webofscience.com/wos/author/record/T-1102-2017>

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## **Department of Physics**

### **22. Condensed Matter Theory Group**

Prediction of novel quantum states of matter and materials design; First-principle artificial intelligence; AI Physics, AI for Science

Supervisor: XU Yong

Email: [yongxu@mail.tsinghua.edu.cn](mailto:yongxu@mail.tsinghua.edu.cn)

Website: <https://www.thu-cmt.group/index.html>

### **23. Electrochemical Energy Storage & Ionic Device Laboratory**

Prof. Zhang's group is dedicated to exploring applications of nanomaterials in next-generation batteries, electronic and ionic neuromorphic devices. By using advanced in-situ

characterization methods such as electron microscopy and synchrotron radiation spectroscopy, we investigate real-time evolution of atomic and electronic structures of materials under operando conditions. Combining AI-driven computational methods (DFT, molecular dynamics) with experimental measurements, we investigate the fundamental charge and ion transport mechanisms in novel functional materials, which will guide materials design for high performance energy storage and electronic/ionic devices.

Supervisor: ZHANG Yuegang

Email: yuegang.zhang@tsinghua.edu.cn

Website: <https://info.phys.tsinghua.edu.cn/ygzhang/en/index.html>

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## Department of Chemistry

### 24. Functional Organic Supramolecular Chemistry Laboratory

Molecular Carbons and Their Properties; Supramolecular Regulation of Chemical Reactions; Molecular and polymer Nanotopology

Supervisor: GUO Qinghui

Email: guoqh@tsinghua.edu.cn

Website: <https://guo-group.net>

### 25. Organometallic Chemistry and Synthesis Lab

Organometallics, Main-group chemistry, organic synthesis

Supervisor: ZHANG Shaoguang

Email: sgzhang@tsinghua.edu.cn

Website: <https://shaoguang-thu.top/>

### 26. YLGroup

Molecular electronics

Supervisor: LI Yuan

Email: yuanli\_thu@mail.tsinghua.edu.cn

Website: <http://www.yuanligrouphthu.com/default.aspx>

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## School of Life Sciences

### 27. Laboratory of Cell Biology and Biophysics

Our laboratory focuses on the fields of cell and developmental biology, aiming to investigate the principles of biological self-organization from the molecular to the tissue level. Our goal is to uncover the universal regulatory mechanisms of cellular dynamics and provide new insights into the fundamental principles of life. By integrating a range of cutting-edge techniques—including high-resolution optical/electron microscopy, Single-molecule Biophysical techniques, genetic manipulation, and biochemical analysis—we systematically study the structural features, functional mechanisms, and dynamic assembly processes of cytoskeletal complexes during development. In selected research projects, we collaborate

with theoretical physicists in an interdisciplinary manner, employing multi-scale modeling approaches for quantitative analysis of biological systems.

Supervisor: LIANG Xin

Email: [xinliang@tsinghua.edu.cn](mailto:xinliang@tsinghua.edu.cn)

Website: <https://life.tsinghua.edu.cn/info/1048/1393.htm>

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## Department of Earth System Science

### 28. Global Change Hydrology Lab

Global change, Hydrological extremes, Water-related hazards, Water cycle imbalances, Climate resilience

Supervisor: TANG Qihong

Email: [water\\_dess@tsinghua.edu.cn](mailto:water_dess@tsinghua.edu.cn)

### 29. Lab of Plant Interaction: Climates, Ecosystems and Atmosphere

LPICEA people study the interactions of plants with their surrounding abiotic and biotic environments. We are aiming to understand the mechanisms of plants acclimation and adaptation and the feedbacks of plants to climate and atmosphere. To achieve this goal, we have been developing quantitative theories from optimality principles, testing our theories against various data sets (e.g. functional traits, eddy-covariance, remote sensing) from in-situ field studies and manipulation experiments, and eventually implementing the theories to vegetation and land surface models to access the large-scale impacts of plants.

Supervisor: WANG Han

Email: [wang\\_han@tsinghua.edu.cn](mailto:wang_han@tsinghua.edu.cn)

Website: [www.lpicea.com](http://www.lpicea.com)

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## Institute for Interdisciplinary Information Sciences

### 30. Dr. Tao Du's group at Tsinghua IIIS

Our group studies intriguing computational design problems at the intersection of computer graphics, artificial intelligence (AI), and robotics. For instance, our recent work has developed AI and computational tools to facilitate the scientific discovery of novel biomimetic swimmers and flyers that outperform their natural or engineered counterparts.

We are an interdisciplinary team with students from diverse undergraduate backgrounds in mathematics, physics, computer science, and mechanical engineering. Our group also actively participates in global academic exchanges and has hosted exchange students from, or sent students to, leading research labs at institutions such as Stanford, CMU, UCSD, and Georgia Tech.

Supervisor: DU Tao

Email: [taodu@tsinghua.edu.cn](mailto:taodu@tsinghua.edu.cn)

Website: <https://people.iis.tsinghua.edu.cn/~taodu/>

### **31. Computer Systems Lab**

AI Safety, AI frameworks, Agentic Applications

Supervisor: XU Wei

Email: [weixu@tsinghua.edu.cn](mailto:weixu@tsinghua.edu.cn)

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## **School of Social Sciences**

### **32. Center for Data Governance**

Founded in May 2015, the Center for Data Governance at Tsinghua University is dedicated to advancing interdisciplinary research and education by integrating the social sciences, data science, and computational science. The Center promotes the comprehensive development and application of government open data, socio-economic data, and social media data. With a distinctive emphasis on computational social science, its research agenda is structured around three core dimensions: governance of data, governance for data, and governance through data. By engaging with both academic frontiers and practical challenges, the Center focuses on the systematic collection, analysis, and interpretation of large-scale data to support the modernization of national governance and socio-economic development.

Aligned with cutting-edge academic developments and national strategic priorities, the Center organizes interdisciplinary research teams to undertake major projects. It brings together experts from a wide range of fields, including social sciences, public administration, economics and management, law, journalism, computer science, and architecture. The Center conducts forward-looking research, provides policy consultation, and trains professionals to support the digital transformation of governance. It has developed notable academic and policy influence in key areas such as data governance, digital government, data legislation, and intelligent social governance.

The Center's research outputs have been submitted to central and local governments through national and Beijing municipal high-end think tank platforms, as well as through policy briefs related to Beijing's "Respond Immediately to Public Appeals" reform initiative. These outputs have received formal endorsements and written instructions from Party and state leaders, as well as from provincial- and ministerial-level officials, on more than 20 occasions, and have been adopted by relevant authorities. Collectively, they provide substantive support for the development of digital government, the governance of data as a production factor, and the refinement of governance in mega-cities.

Supervisor: ZHANG Kaiping

Email: [kaipingz@tsinghua.edu.cn](mailto:kaipingz@tsinghua.edu.cn)

Website: <https://www.dps.tsinghua.edu.cn/xsjs/yjjg/bjdqythyjzx.htm>

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## Vanke School of Public Health

### 33. Global Health Intelligence & Innovation Lab

Focusing on global health with AI application as the core, our key research directions: Develop cutting-edge AI-based primary medical architectures; Evaluate AI medical devices in Africa and Southeast Asia; Actively participate in global health's key decision-making and top-level construction, engage in WHO guidelines formulation, and help build an equitable and inclusive global health governance system.

Supervisor: TANG Kun

Email: tangk@mail.tsinghua.edu.cn

Website: <https://vsph.tsinghua.edu.cn/info/1010/1448.htm>

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## School of Education

### 34. "Education and Sustainable Development" Research Group

This research group focuses on the theoretical construction and practical innovation of education for sustainable development, pursuing two complementary research pathways. The first adopts an international comparative perspective to explore theoretical frameworks and practical models for sustainability competence cultivation and interdisciplinary educational innovation. The second draws upon indigenous Chinese educational traditions, reinterpreting Ma Yuehan's theory of transfer value in physical education through the lens of contemporary learning sciences. Together, these pathways aim to nurture globally competent individuals equipped with sustainability literacy.

Supervisor: ZHONG Zhou

Email: zhongzhou@mail.tsinghua.edu.cn

Website: <https://se.tsinghua.edu.cn/en/info/1236/1058.htm>

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## School of Pharmaceutical Sciences

### 35. Chen Ligong Laboratory

Focusing on the physiological and pharmacological functions of the solute carrier (SLC) transporters, utilizing modern biological and chemical-biology approaches to elucidate their molecular and pathogenic mechanisms, and exploring their potential as drug targets.

Supervisor: CHEN Ligong

Email: ligongchen@tsinghua.edu.cn

Website: <https://www.sps.tsinghua.edu.cn/info/1011/1395.htm>

### 36. Laboratory of chemical biology

Live-cell fluorescence imaging; drug discovery

Supervisor: CHU Ling

Email: lingchu@mail.tsinghua.edu.cn

Website: <https://chu-lab.org/>

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## School of Software

### 37. Intelligent Media and Cognition Lab

Artificial Intelligence, Hypergraph Computation, Computer Vision, Medical Image Analysis

Supervisor: GAO Yue

Email: [gaoyue@tsinghua.edu.cn](mailto:gaoyue@tsinghua.edu.cn)

Website: <https://www.gaoyue.org>

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## School of Biomedical Engineering

### 38. Lab for Living Bioelectronics-Tsinghua University

Our lab is interested in establishing seamless structural integration and functional signal coupling between bioelectronics and living tissues/animals, where challenges arise from their intrinsic distinction in physical, chemical, mechanical dimensions. To bridge the aforementioned gaps, development of cutting-edge bioelectronic toolsets (1) with tissue-scaffold-mimicking topology and rigidity, (2) capable of modulating or interrogating biological entities and variations in a spatiotemporally multiplexed, chronically stable, biologically specific and synergistic multimodal manner, is of utmost importance. Such bioelectronics will eventually lead to engineered cyborg systems as unprecedented platforms for drug screening or physiochemical investigation as well as implantable biostealthy circuits used for interpreting/altering how brain functions.

Supervisor: DAI Xiaochuan

Email: [xcdai@tsinghua.edu.cn](mailto:xcdai@tsinghua.edu.cn)

Website: <http://daigroup.org>

### 39. Tsinghua AI for Medicine at Scale (AIMS) Laboratory

Our laboratory is centered on patient-centric medical AI, aiming to build trustworthy and clinically meaningful systems that directly improve patient outcomes. Our research integrates three complementary layers. At the ecosystem level, we design intelligent health systems that support longitudinal health management, personalized interventions, and patient empowerment. At the modeling level, we develop generalist medical decision-making models capable of transferring medical knowledge and clinical reasoning across specialties and care settings. At the foundation level, we advance next-generation medical imaging models based on weakly supervised and self-supervised representation learning to reduce reliance on costly annotations and ensure robustness and transferability in real-world environments. Together, these efforts aim to make high-quality medical AI broadly accessible and genuinely beneficial to every patient.

Supervisor: ZHOU Hongyu

Email: [hyzhou@tsinghua.edu.cn](mailto:hyzhou@tsinghua.edu.cn)

Website: <https://zhouhy.org>

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## **Tsinghua Shenzhen International Graduate School**

### **40. TREES-future Ecosystems Lab**

Ecosystem dynamics, intelligence, and ecohydrologic engineering design

Supervisor: Matteo Convertino

Email: [matteo@sz.tsinghua.edu.cn](mailto:matteo@sz.tsinghua.edu.cn)

### **41. Smart Communication and Computing (SCC) Laboratory**

Wireless Communication and Networking, Machine Learning and Optimization, Artificial Intelligence and Applications

Supervisor: DONG Yuhan

Email: [dongyuhan@sz.tsinghua.edu.cn](mailto:dongyuhan@sz.tsinghua.edu.cn)

Website: [https://www.sigs.tsinghua.edu.cn/dyh\\_en/main.htm](https://www.sigs.tsinghua.edu.cn/dyh_en/main.htm)

### **42. The Innovation Lab for Digital & Intelligent Offshore Floating Systems**

Floating solutions for marine renewable energy; Digital and Intelligent design and optimization; Intelligent unmanned operation and maintenance

Supervisor: LI Binbin

Email: [libinbin@sz.tsinghua.edu.cn](mailto:libinbin@sz.tsinghua.edu.cn)

Website: <https://www.sigs.tsinghua.edu.cn/lbb/main.psp>