SCHOOL OF SCIENCE



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ABOUT WESTLAKE UNIVERSITY

学校概况



WESTLAKE UNIVERSITY

西湖大学是一所社会力量举办、国 家重点支持的新型高等学校,前身 为浙江西湖高等研究院,于2018 年 2 月 14 日正式获教育部批准设 立,举办方是杭州市西湖教育基金 会,首任校长由施一公教授担任。 学校按照"高起点、小而精、研究 型"的办学定位,致力于集聚一流师 资、打造一流学科、培育一流人才、 产出一流成果,力争到 2026年,主 要学科的实力达到世界领先水平, 在基础科学研究、技术原始创新、 科技成果转化方面作出具有重大 影响力的贡献,成为一所设置合 理、定位清晰、发展潜力强劲、社会 声誉良好的新型国际化高水平研究 型大学。

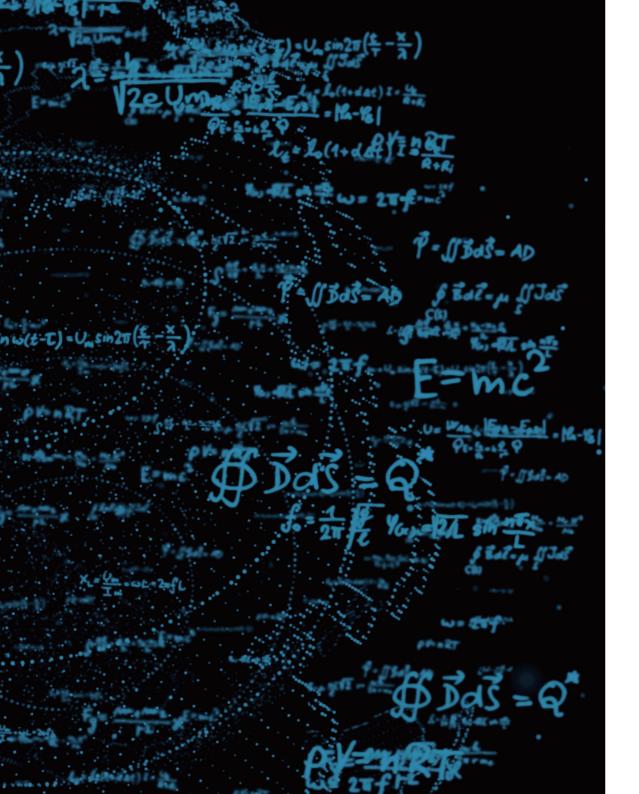
Westlake University is a new type of private non-profit university supported by public and private funding. Its predecessor is the Westlake Institute for Advanced Study. Westlake University was established with the approval of the Ministry of Education of China. The Westlake Education Foundation is the organizer and fundraiser of the university, and Prof. Yigong Shi was appointed as the first president.

'Excellence, Refinement, Research-Oriented', Westlake University aims to attract leading professors from around the world, develop state-of-the-art disciplines, cultivate world-class talent, and make fundamental discoveries. It strives to foster the country's development through science and technology, and make significant contributions to the nation's innovation-driven development strategy. The university aims to offer leading global research programs in selected disciplines and to be making significant contributions to fundamental research and technological innovation. Westlake will endeavor to become a pioneering world-class research institution with clear strategies, a great reputation, and infinite potential.



预计 2026 年,在校学生达到 5000 人左右(其中研究生 3000 人,本科生 2000 人);助理教授、副教授、教授(含讲席教授)约 300 人;研究人员、教学人员、技术支撑人员、行政服务人员约 600 人;博士后约 900 人。

By 2026, Westlake University is expected to have approximately 5,000 full-time students (including 3,000 postgraduate students and 2,000 undergraduate students), 300 assistant professors, associate professors, and full professors (including chair professors), 600 research, teaching, technical support and administrative staff, and 900 postdoctoral fellows.



ABOUT SCHOOL OF SCIENCE

学院介绍

SCHOOL OF 理学院 SCIENCE

理学院以"发现物质世界现象、阐述自然运行规律、拓展人类知识边界、培养一流人才"为使命,设有数学、物理、化学三大学科,研究领域涵盖数论、分析、代数、几何、凝聚态物理、量子物理、原子分子物理、光学、催化与合成、化学生物学、材料化学、新分析方法、理论与计算化学、超快激光光谱学等方向,致力于前瞻性和系统性的基础科学研究,培养造就具有较强创新能力的杰出人才,建设国际一流的创新研究平台。

秉承"优化、简约、互补"的原则,理学院统筹设置各学科初创岗位,根据国际发展趋势和学科建设情况形成人才的良性互动,凝聚起一支规模适度、结构合理、流动有序、代表中国相关领域创新能力并具有重要国际影响的联合研究队伍。

With the founding mission of "Discovering the phenomena of physical world, elucidating the principles of the nature, extend the repertory of knowledge, cultivating first-rate talents in innovation", the School of Science consists of faculties of Mathematics, Physics and Chemistry. Its research fields cover number theory, analysis, algebra, geometry, condensed matter physics, quantum physics, atomic and molecular and photo physics, catalysis and synthesis, chemical biology, materials chemistry, new analytical methods, theoretical/computational chemistry ultrafast laser spectroscopy, etc. Our school is committed to conduct forward-looking and systematic basic scientific research, cultivate outstanding talents with strong innovation capabilities, and build world-class innovative research platforms.





CENTERS AND LABORATORIES

创新平台与实验室



Center of Artificial Photosynthesis for Solar Fuels

(CAP for Solar Fuels @Westlake)

人工光合作用 与太阳能燃料中心

Director:

Licheng Sun

中心主任:孙立成

"西湖大学人工光合作用与太阳能燃料中心"为西湖大学校级研究中心,由中国科学院外籍院士、瑞典皇家工程院院士、人工光合作用领域专家、西湖大学理学院化学讲席教授孙立成博士组建,主要致力于太阳能燃料与太阳能电池科学前沿领域关键科学问题的基础研究和瓶颈应用技术的突破。中心的研究方向包括高效分解水制氢催化剂的设计以及关键器件的集成和应用、光/电驱动CO2还原制备清洁燃料、光/电驱动N2还原合成氨、利用水作为氧源和氢源光/电驱动有机底物氧化与还原制备精细化学品、新型太阳能电池与相关催化剂/电极的耦合关键技术研发、新型捕光半导体材料及光阳极/光阴极的开发、天然光合作用释氧酶水氧化机理揭示、材料智能设计等,并力求从分子、材料等多个尺度上优化催化剂性能、理解复杂的固-液、固-气和气-液界面现象、调控电荷分离与传输、设计开发新型材料和催化体系,实现高效太阳能转化和可再生绿色燃料及高端化学品的清洁制备。



The Center of Artificial Photosynthesis for Solar Fuels at Westlake University (CAP for Solar Fuels @Westlake) is a newly established research center dedicated to overcoming the challenges associated with solar energy utilization and storage. The director of the center is Prof. Licheng SUN, a foreign academician of the Chinese Academy of Sciences, an academician of the Royal Swedish Academy of Engineering Sciences (IVA), an expert in the field of artificial photosynthesis, and a chair professor of physical chemistry in the School of Science at Westlake University.

The researches in CAP for Solar Fuels @ Westlake mainly focus on the design of the state-of-the-art catalysts and devices to achieve efficient water splitting for hydrogen production, solar-driven CO2 and N2 reductions to produce fuels, ammonia and value-added chemicals, water as oxygen and hydrogen sources for solar-driven oxidation and reduction of organic substrates to prepare fine chemicals, the coupling of new generation solar cells and key catalysts/electrodes, the development of novel light-harvesting semiconductor materials and photoanodes/photocathodes, unraveling water oxidation mechanism on natural photosynthesis oxygen-releasing enzyme and artificial intelligence aided material design. The mission of CAP for Solar Fuels @ Westlake is to provide multiple-scale understandings of chemical processes at complex solid-gas, gas-liquid and solid-liquid interfaces, and eventually design the state-of-the-art materials to achieve high-efficient solar energy conversion for renewable fuels and value-added chemicals.

SCHOOL OF 理学院 SCIENCE

Institute for Theoretical Sciences

理论科学研究院

Director:

Gang Tian

院长:田刚

西湖大学理论科学研究院正式成立于2020年9月24日,田刚教授受聘为首任院长。 研究院旨在汇集全球理论基础研究顶尖人才,高水平开展数学、理论物理等领域基础理论研究, 并自主开展科研规划、项目研究和学科建设等相关工作。

The Institute for Theoretical Sciences was inaugurated at Westlake University on September 24th, 2020. Professor Gang Tian was appointed to be the founding director. The institute aims to marshal talent around the globe and pioneer in theoretical research in a range of fundamental disciplines, including mathematics, theoretical physics, etc. The institute also carries out scientific research plan, project research, discipline construction and other related work independently.





西湖数论会议嘉宾合影 GROUP PHOTO WITH GUESTS AT THE WESTLAKE NUMBER THEORY SYMPOSIUM



International Center for Polaritonics

国际极化激元研究中心

Director:

Alexey Kavokin

主任:ALEXEY KAVOKIN

西湖大学理学院国际极化激元研究中心由讲席教授Alexey Kavokin博士带领的理论组,副教授Pavlos Savvidis博士带领的量子光电实验室和研究员Stella Kutrovskaya博士带领的碳炔实验室组成,将着重于利用由光子和电子耦合得到的一种"准粒子"——极化激元——来研究包括超导和超流在内的物理现象及应用。

中心由三个研究小组构成:生长和构建组提供基于GaAs/AlGaAs和GaN/AlGaN异质系统的高Q值微腔样;光学组提供对微腔的低温(4K)光致发光的时间分辨、空间分辨、极化分辨和角度分辨测量以及时间分辨干涉测量、光子相关、法拉第旋转和克尔旋转实验;理论组为生长和构建组提供样本设计,对光学组进行光学和传导性实验进行建模。



The International Center for Polaritonics is designed as a world-leading research center that combines the expertise and resources of three major research groups: The Quantum Optoelectronics group headed by Dr. Pavlos Savvidis, the Carbyne Laboratory headed by Dr. Stella Kutrovskaya, and the Theory group headed by Professor Alexey Kavokin who also provides the overall leadership and strategic planning.

The Center will produce low-dimensional multilayer semiconductor structures for the research and applications in Polaritonics: the physics of strongly coupled light-matter systems. The crystal growth facilities will include the molecular beam epitaxy and chemical vapor deposition reactors as well as the laser ablation technology. The original semiconductor structures will be characterized by means of the ultrafast optical spectroscopy with high spatial resolution. The optical experiments will be performed at the liquid Helium temperature and in the presence of magnetic fields up to 7T. The anticipated results will include polariton lasing and superfluidity, polariton simulators, polariton based sources of non-classical light, polariton-induced superconductivity. The theoretical group will contribute to the design of new structures, modelling of their quantum optical properties, development of new device concepts. The theory-experiment cooperation will be conducted on an everyday basis with regular feedbacks from modelling to the experiment and vice-versa. The Center will serve as a platform for a wide-scale international cooperation. Every year it will host tens of scientists coming from the world-leading universities of the USA, EU, Russia and Asia. The Center will host international research meetings, conferences and schools.



Key Laboratory of Precise Synthesis of Functional Molecules of Zhejiang Province

浙江省 功能分子精准合成 重点实验室

Laboratory director:

Professor Li DENG

实验室主任:邓力教授

浙江省功能分子精准合成重点实验室于2019年11月正式由浙江省科学技术厅、浙江省发展和改革委员会、浙江省财政厅等部门批准成立。西湖大学讲席教授及理学院执行院长邓力教授担任实验室主任。重点实验室学术委员会成员由相关领域著名专家、学者担任。

研究方向和内容:

旨在通过合成方法学和合成策略创新的发展,实现生物活性功能分子库的建立和新型功能分子材料的合成,为药物和生医功能等分子的开发提供源头创新,从而成为功能分子精准合成研究领域的科技创新、人才培养和学术交流的世界一流基地。



The Key Laboratory of Precise Synthesis of Functional Molecules of Zhejiang Province was established with approval by the Science Technology Department of Zhejiang Province, the Zhejiang Provincial Development and Reform Commission and the Zhejiang Provincial Department of Finance, in November 2019. Li Deng, Xu Yiming Endowed Chair Professor and Executive Dean of School of Science at Westlake University, will be the director of the Key Laboratory. The academic committee consists of prominent educators and scholars from China and overseas, providing advise on major issues in decision making process such as the strategic planning of the Key Laboratory.

Focusing on the development of new synthetic methodology and innovative synthetic strategies, the Key Laboratory aims to achieve rapid construction of libraries of bioactive functional molecules and efficient synthesis of novel functional materials, thereby providing materials for the original discovery and development of novel functional molecules of medicinal and biomedical applications. By achieving these goals, the Key Laboratory will become a world-class center of excellence in fundamental research and education.



Key Laboratory for Quantum Materials of Zhejiang Province

浙江省 量子材料 重点实验室

Laboratory director:

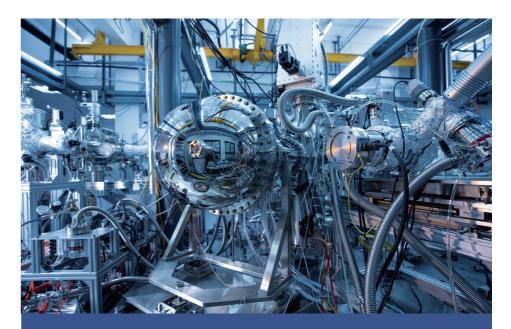
Dr. Ruihua HF

实验室主任:何睿华博士

浙江省量子材料重点实验室于2020年11月正式由浙江省科学技术厅批准培育建设。实验室依托理学院物质科学公共实验平台以及凝聚态物理相关课题组和实验室共同建立。

研究方向和内容:

集中西湖大学在量子材料制备、实验测量和理论与计算三方面的研究力量,发挥物质科学公共实验平台在量子材料合成表征方面的技术优势,在相关焦点和难点问题上寻求基础和技术层面上的突破,争取在国际量子材料研究领域早日展露头角。具体针对四个优先研究方向(利用拓扑态获得全新的表面性质,探索关联电子体材料中的新特性,调控低维纳米结构中的量子效应,开发前沿工具加快量子材料研发),抓住10个研究重点,在30个相关项目上开展前期研究,为更好地了解量子材料和利用其丰富的技术潜力奠定基础。



The Key Laboratory for Quantum Materials of Zhejiang Province was established in January 2020, with approval by the Science Technology Department of Zhejiang Province, as a consortium of multiple research groups and labs in condensed matter physics and the Instrumentation and Service Center for Physical Sciences of the University. By joining forces of Westlake University on fabrication, measurement, theory and computation of quantum materials, and taking advantage of the technical strength in quantum materials synthesis and characterization of the Instrumentation and Service Center for Physical Sciences, the Key Laboratory seeks for fundamental and technical breakthroughs on related foci and bottlenecks in quantum materials research. Specifically, four priority research directions are focused on (i.e., harnessing topological states for groundbreaking surface properties, exploring novel bulk properties of correlated electron materials, manipulating quantum effects in low dimensional nanostructures, developing cutting-edge tools to accelerate discovery and technological deployment of quantum materials), which include in total 10 key points and 30 projects for research in the early stage, paving the way to better understanding quantum materials and exploiting their rich technological potentials.



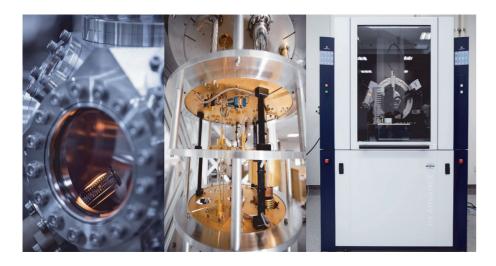
RESEARCH PLATFORMS

科研平台



Instrumentation and Service Center for Physical Sciences(ISCPS) 物质科学公共实验平台

物质科学公共实验平台依托理学院筹建,聚焦服务于物质科学前沿领域中量子、能源、环境、光电信息等材料及相关器件的研究,辅以大型共享设施与设备和资深专业人才,提供整体系统的表征分析技术支撑。目前平台下辖5个专业化的分析测试实验室,在X射线衍射、表面分析、低温测量、电子显微镜和物性测试等领域配备了大量尖端科研设备,并配有一批年轻的高水平专业技术人员,不但能够保障一般性研究的需求,更能够追踪前沿,不断进取,为西湖大学的前沿科学研究提供良好的支撑条件。





Initiated by the School of Science, the Instrumentation and Service Center for Physical Sciences (ISCPS) hosts state-of-the-art facilities not only to meet routine analysis needs, but also to collaborate with our faculty and researchers in developing novel instrumental technologies or methodologies that address problems emerging from dynamic, cutting-edge research. ISCPS has currently installed a series of instruments covering X-ray diffraction, surface physics analysis, cryogenic measurement, electron microscopy and physical property characterization, which together provide strong support for the development of Westlake University.



Instrumentation and Service Center for Molecular Sciences (ISCMS)

分子科学公共实验平台

分子科学公共实验平台依托西湖大学理学院筹建, 秉承"技术驱动创新"的理念, 以新工具促进新科学的发展, 在学校的大力支持下, 逐步建设以光谱、色质谱、磁共振波谱及X射线谱等各类谱学技术为核心的原位、高分辨分子科学表征体系, 服务功能分子合成、绿色催化、能源材料、环境生态及化学生物等前沿科研方向, 为西湖大学三大学院相关学科的蓬勃发展、Pl实验室的科研推进、学生实验素养及数据解析技能的不断提高而全力服务。





The Instrumentation and Service Center for Molecular Sciences (ISCMS) is a shared-use core facility at Westlake University to provide a collaborative multi-disciplinary research environment to support of the creation and evolution of world-class molecular sciences and technical expertise, for the Westlake research community as well as the larger community of external researchers both from academia and industry. ISCMS is composed of four professional analytical laboratories: Spectroscopy Lab, Magnetic Resonance Lab, Chromatography and Mass Spectroscopy Lab, In-situ Chemical Analysis Lab, focusing on the exploration of molecular structure, intra- and inter-molecular interactions and molecular dynamics. The characterization service covers organic and inorganic components and structures analysis, qualitative and quantitative measurements of drugs and polymers, determination of the structure of functional materials and the conformation of polypeptides and biomolecules, stability and dynamics analysis, metabolomics analysis of drugs or clinical markers, inspections of quality for water, food or drug, as well as detection of environmental pollutant etc. The focus of ISCMS technical team has been not only to serve a broad, diverse, international set of researchers who are focus on pioneering scientific innovations, but also to develop specialized methodologies, protocols, instrumentation, and expertise to help simulate, characterize, and analyze novel molecules, materials, and systems going beyond conventional approaches.

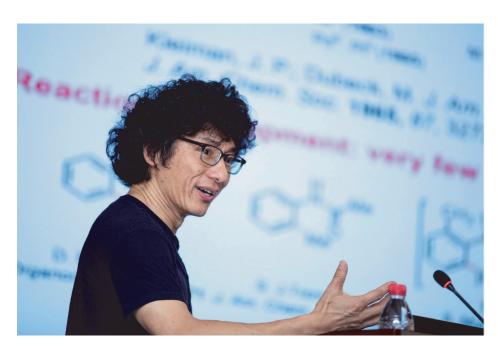


ACADEMIC EVENTS

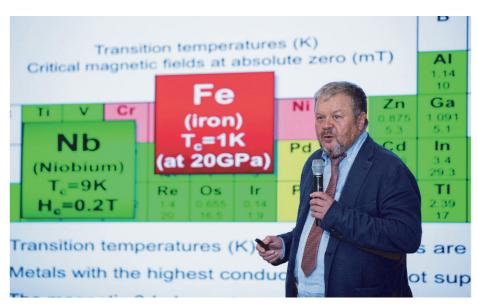
学术活动



理学院为师生提供丰富的数、理、化及 跨学科的学术交流平台,包括开展"西 湖名师论坛"、"理学院化学专题学术讲 座"、"理学院物理专题学术讲座"、 "西湖数学研讨会"等形式多样的学术 交流活动,促进学院师生与校内外学者 之间的学术交流和沟通。 School of Science continually develops various programs, platforms and workshops that not only focusing on fundamental sciences, but also fostering interdisciplinary collaborations including Westlake Master Forum, Chemistry Colloquium, Physics Colloquium and Westlake Mathematics Seminar, etc., to further improve academic exchanges and communication between students and faculty of the school and scholars inside and outside the university.



西湖名师论坛 余金权教授 PROF. JIN-QUAN YU, WESTLAKE MASTER FORUM



西湖名师论坛 安德烈·瓦尔拉莫夫教授 PROF. ANDREY VARLAMOV, WESTLAKE MASTER FORUM

理学院每年都会举办数理化各类学术研讨会议,来自世界各地的资深科学家和知名青年学者汇聚一堂,面向基础前沿,探讨新时代基础科学、尖端技术及其交叉学科发展的新动向、新问题和新启示,碰撞新的思想火花,以此促进西湖大学化学、物理、数学三大学科的建设与发展,增进多学科交叉与融合。

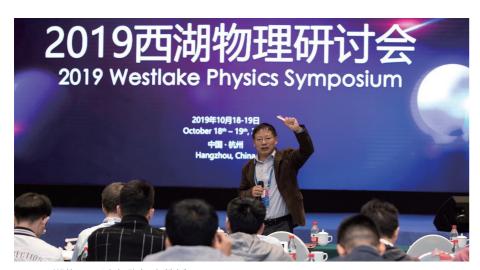
The School of Science successively holds series of academic conferences covering Mathematics, Physics and Chemistry. Senior scientists and well-known junior scholars from all around the world gather together, share knowledge and research findings, discuss existing challenges, and explore exciting new ideas and cutting-edge technologies. Focusing on the intellectual frontiers of fundamental sciences, the aim is to provide an open platform for communication and discussion, stimulate brainstorming, generate collision of the sparks of thought, and obtain inspiration to promote innovation in interdisciplinary directions.





西湖大学2019化学研讨会 谭仁祥教授

PROF. REN-XIANG TAN, 2019 CHEMISTRY SYMPOSIUM OF WESTLAKE UNIVERSITY



2019西湖物理研讨会 张振宇教授

PROF. ZHEN-YU ZHANG, 2019 WESTLAKE PHYSICS SYMPOSIUM



理学院化学专题学术讲座 CHEMISTRY COLLOQUIUM



理学院物理专题学术讲座(线上)
PHYSICS COLLOQUIUM (ONLINE)





西湖数论会议 THE WESTLAKE NUMBER THEORY SYMPOSIUM



化学合成方向联合课题组文献沙龙 CHEMISTRY JOINT-GROUP SEMINAR



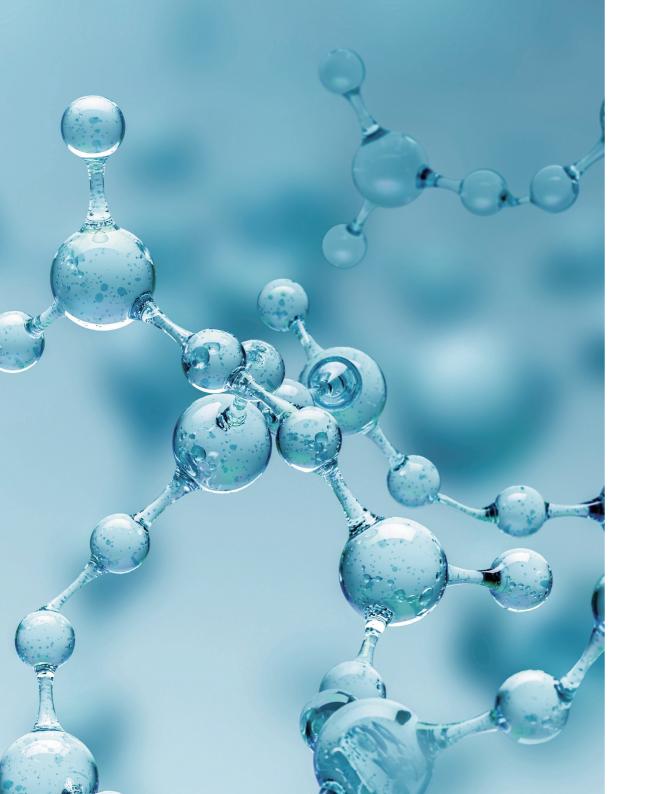
2021WE论坛-前沿合成与功能分子分论坛

WE FORUM - DISCOVERY, DESIGN AND SYNTHESIS OF FUNCTIONAL MOLECULES SYMPOSIUM



2021WE论坛-量子物质和量子信息分论坛

WE FORUM - QUANTUM MATTER AND QUANTUM INFORMATION SYMPOSIUM



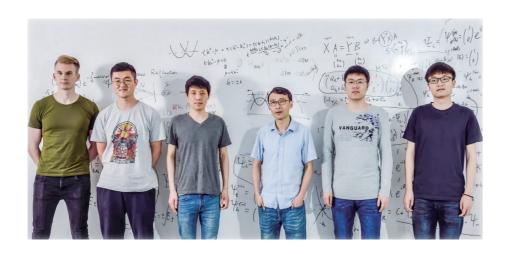
EDUCATION

学生培养



Ph.D. Programs 博士研究生项目

理学院致力于培养在数理化基础学科领域做出原创性、前瞻性工作、为生命科学和工程技术提供发展源头及具有宽广的国际视野、强烈的社会责任意识的拨尖创新型人才。博士研究生应掌握所在学科领域坚实宽广的基础理论和系统深入的专业知识,了解学科最前沿发展动态,具备独立开展科学研究的基本素养,以及独立思考的能力。经教育部批准,西湖大学与复旦大学、浙江大学相继于2017年、2018年开始实施联合培养博士研究生项目。;2022年起,数学、物理学两个学科继续与复旦大学实施联合培养博士生项目,化学独立招收培养博士生。联培项目学生注册复旦大学学籍,完成学业后,获发复旦大学学历学位证书;独立博士生培养项目学生注册西湖大学学籍,完成学业后,获发西湖大学学历学位证书。联合培养项目采取申请一考核制的招生方式,申请者不受现有学位、毕业年限和年龄的限制,本科及以上应往届人员均可提出申请,经过材料初审、面试选拔、双向选择后即可被录取。





The School of Science is committed to cultivating talents with innovative ideas and frontier insights engaged in their studies to propel the development of life sciences and engineering technologies, and having a broad international perspective and a strong sense of social responsibility.

With Westlake University's resource-rich-environment and enduring dedication to the pursuit of excellence in teaching, students are able to develop an in-depth understanding of solid and broad basic theories and systemic expertise in their subject field, grasp the most cutting-edge development trends of the subject and have the basic academic literacy to carry out independent scientific research.

Our doctoral students are studying in both independent program within Westlake University and joint programs with Fudan University which is a top-ranked, large-sized, long-established and comprehensive university, so we can offer all the advantages of studying at a small, dynamic and new university but at the same time students also get the advantage of studying at a large, established university. The Joint Doctoral Program with Fudan University offers PhD Programs in Mathematics, Physics, PhD Program in Chemistry will be offered by Westlake University independently.



Courses 课程体系

博士研究生的课程分为公共课程和专业课程,其中专业课程分为专业必修课及专业选修课。 Alexey Kavokin、邓力、孙立成、吴从军、王鸿飞等资深教授均在一线授课,其他年轻PI陆续根据学科发展和前沿研究需要,开设多样化课程。邓力教授开设的《分子结构与反应机理》、吴从军教授开设的《量子统计物理学》等学科基础课程,为博士研究生建立了坚实的理论基础;其他多样化的课程例如《凝聚态物理实验》、《高等量子力学》、《化学生物学》、《有机光谱分析》等也纷纷聚焦于学科最新发展,提升了博士研究生实验能力,扩展了学科交叉的科研思路。





Doctoral courses are divided into public courses and specialized courses. Specialized courses are divided into specialized-degree courses and specialized-elective courses. Doctoral students are supported by a world-class academic community with courses from Senior PIs such as Alexey Kavokin, Li Deng, Licheng Sun, Congjun Wu and Hongfei Wang, and diverse courses from junior PIs. Fundamental courses such as "Molecular Structure and Reaction Mechanism" offered by Prof. Li Deng and "Quantum Statistical Physics" offered by Prof. Congjun Wu have established a solid theoretical foundation for our doctoral students. Other diversified courses such as "Condensed Matter Physics Laboratory", "Advanced Quantum Mechanics", "Chemical Biology", "Spectroscopy of Organic Chemistry" also focus on the latest development of disciplines, enhance the experimental ability of doctoral students and expand their interdisciplinary scientific research ideas.



Summer Camp 夏令营

理学院每年暑期举办"西湖大学理学院夏令营"。夏令营一般招收营员100名左右,主要活动包括与讲席教授面对面、学术讲座、与PI零距离交流互动、与在校博士生师兄师姐交流、参观实验室及科研平台、体验杭州学习生活大环境、优秀夏令营营员选拔等。营员全程参与各项夏令营活动后,将获得"西湖大学理学院夏令营"结业证书,表现优异者将获得夏令营"优秀营员"荣誉证书。

The School of Science holds summer camp every summer. The summer camp offers about 100 vacancies to students. The main activities include academic lectures, face-to-face talk with chair professors, close interaction with PIs, meeting with current doctoral students, lab and research platform tours, the experience share of studying and living in Hangzhou, and the selection of outstanding participants. At the end of the summer camp, participants will receive a completion certificate from the School of Science. Those who get recognized as outstanding participants will receive the Certificate of Excellence.









Summer research internship 暑期科研实习

每年暑假,理学院的实验室将对外开放实习岗位,实习期一般为七月至八月(共4周)。实习期间学生可在选定的实验室参与实习,具体的实习计划由各实验室导师及学生一起制定。除了完成实习计划外,实习生也可参与到"WeMeet"、"WeSalon"、西湖名师论坛、专题学术讲座报告、Happy Hour等学校和学院的各类活动,加深对学校发展、学科建设、科研进展、校园文化等各个层面的认识和了解。

Each summer, the laboratories of School of Science will be open to the public for internships. The internship period is usually from July to August (a total of 4 weeks). During the internship, students can participate in the internship in the selected laboratory, the specific internship plan will be set by each laboratory's PI and students. In addition to completing the internship program, interns can also participate in all activities such as "WeMeet", "WeSalon", Westlake Master Forum, Chemistry and Physics Colloquiums, Happy Hour and so on to deepen the understanding of school development, discipline construction, scientific research progress, campus culture and other aspects.



Visiting student 访问学生

理学院课题组接收访问学生申请,并为访问学生提供一定的访问期间的生活保障。访问学生入校后需在遵守学校及学院的相关规定的前提下,在课题组内开展科研工作。

The research groups of School of Science will accept applications of visiting students and provide them with a certain living guarantee during the visit. Visiting students are required to conduct research in the research group under the premise of complying with the relevant regulations of the university and the school.





FACULTY AND STAFF

师资力量

SCHOOL OF 理学院 SCIENCE



Laboratory of Catalysis and Organic Synthesis 催化反应与有机合成实验室 Li Deng



The Sun Laboratory on Solar Fuels & Solar Cells 太阳能燃料与太阳能电池实验室 Licheng Shun 孙立成



PI IN CHEMISTRY

化学PI

Nonlinear Spectroscopy and Ultrafast Dynamics Laboratory 表面界面与凝聚相物理化学实验室 Hongfei Wang



Laboratory of Nanosynthesis 纳米合成实验室 Hongyu Chen 陈虹宇



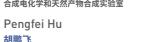
Laboratory of Biological Aggregates 生物聚集体实验室 Xin Zhang



Theoretical and computational chemistry Laboratory 理论计算化学实验室
Wenjie Dou



Laboratory of Synthetic Electrochemistry and Natural Product 合成电化学和天然产物合成实验室





Laboratory of Supramolecular Organic Functional Assemblies (SOFA LAB) 超分子有机功能组装体实验室 Zhichang Liu





The Laboratory of Natural Product Synthesis 天然产物合成实验室 Haihua Lu



Organometallic Methodology and Functional Molecules Synthesis Laboratory 金属有机方法学及功能分子合成实验室 Hang Shi



Laboratory of Transient Spectroscopy and Photoelectrochemical Conversion 时间分辨光谱与光电化学实验室
Wenxing Yang
杨汶醒



Biocatalysis Laboratory 酶催化有机合成实验室 Yuxuan Ye 叶宇轩



Laboratory of Molecular Quantum Devices and Quantum Information 分子量子器件和量子信息实验室

Lei Sun 孙磊

陆海华



Laboratory for Intelligent Functional Biomaterials 智能生物材料实验t





Molecular Catalysis and Molecular Materials Lab 分子催化与分子材料实验室 Biaobiao Zhang 张彪彪



Laboratory of Natural Products Bioengineering 天然产物化学生物学实验室 Lihan Zhang



Functional Polymeric Materials
Laboratory
有机功能高分子材料实验室
Pan Wang



Laboratory of Advanced Materials and Catalysis 理论催化与材料智能设计实验室

Tao Wang 王涛



Asymmetric Synthesis and Catalysis Laboratory 不对称催化合成实验室 Zhaobin Wang

王兆彬



Epigenetic Chemical Biology Laboratory 表观遗传化学生物学实验室 Mingxuan Wu



Professor LI DENG

邓力教授



- 徐益明讲席教授
- 理学院执行院长
- XU Yiming Endowed Chair Professor, Chemistry
- Executive Dean of School of Science

1987 获清华大学学士

1995 获美国哈佛大学博士

1995-1998 获美国哈佛大学博士后

1998-2018 历任美国布兰迪斯大学历任化学系助理教授,副教授(终身教授),正教授

2005 聘为首任 Orrie Friedman 讲席教授

2011-2014 担任美国布兰迪斯大学化学系主任

2018 任西湖大学理学院讲席教授、理学院执行院长

Professor Li Deng received his B.S. degree from Tsinghua University (1987), M.S. degree from University of Wisconsin-Milwaukee (1990), and Ph.D. degree from Harvard University (1995). He carried out his postdoctoral studies at Harvard with Professors George Whitesides and Gregory Verdine as an American Cancer Society Postdoctoral Fellow. He joined Brandies University as an Assistant Professor of Chemistry in 1998. He was promoted to Associate Professor with tenure in 2003, to Full Professor and was named the Orrie Friedman Distinguished Professor of Chemistry in 2005. He served as the Chair of the Chemistry Department at Brandies University from 2011 to 2014. He joined Westlake University as the Executive Dean of Science in July of 2018 and is currently XU Yiming Endowed Chair Professor.

研究成果:

邓力教授是世界著名有机化学家,是国际公认的不对称有机催化领域的开创者和引领者之一。他在有机催化领域开展了原创而系统性的研究工作,取得了一系列国际同行公认具有广泛影响力的奠基性学术成果。他所发明报道的催化剂和化学反应已被应用于工业界,很多催化剂已授权给知名试剂和大制药公司开发使用。邓力教授担任*Nature, JACS, Angewandte Chemie, Nature Chemistry*等多家国际著名学术期刊的审稿人和多家学术机构及基金评审专家,他所获的奖项包括美国Research Innovation Award (Research Corporation),美国New Investigator Award (The Medical Foundation),美国斯隆研究奖(Sloan Research Fellowship),日本科学促进会会士奖(Japan Society for the Promotion of Sciences Fellowship),陈氏有机化学奖(The Chan Memorial Award in Organic Chemistry),以及美国化学会亚瑟·柯普学者奖(Arthur C. Cope Scholar Award)。

RESEARCH ACHIEVEMENTS:

Professor Deng is widely recognized as a pioneer and leader in the field of organic catalysis. His research focuses on the invention and the development of new catalytic reactions of importance in synthetic organic chemistry. His studies have established new concepts and strategies that are utilized by laboratories around the world for the successful development of numerous new catalysts and reactions. A broad range of reactions invented in his own laboratories have been successfully applied in academic and industrial laboratories. Several of his catalysts have been licensed to pharmaceutical and chemical companies.

Professor Deng serves as consultants for pharmaceutical and chemical companies and as panel members for public and private funding agencies. He has been recognized by several honors and awards, including the Research Innovation Award (Research Corporation), the New Investigator Award (The Medical Foundation), the Sloan Research Fellowship, Japan Society for the Promotion of Sciences (JSPS) Fellowship, the Chan Memorial Award in Organic Chemistry, and the Arthur C. Cope Scholar Award from American Chemical Society.



Professor LICHENG SUN 孙立成 教授



- 化学讲席教授
- 人工光合作用与太阳能燃料中心主任
- 中国科学院外籍院士
- 瑞典皇家工程院院士
- 瑞典国家研究理事会瑞典杰出教授
- Chair Professor, Chemistry
- Director of Center of Artificial Photosynthesis for Solar Fuels at Westlake University (CAP for Solar Fuels @Westlake)
- Foreign Academician of the Chinese Academy of Sciences
- Member of the Royal Swedish Academy of Engineering Sciences (IVA)
- Distinguished Professor of the Swedish Research Council (VR Rådsprofessor)

1984 获大连理工大学学士

1987 获大连理工大学硕士

1990 获大连理工大学博士

1990~1992 任北京中科院原感光化学研究所助理研究员

1992~1993 德国马普辐射化学研究所博士后

1993~1995 德国柏林自由大学有机化学系洪堡学者

1995~2004 历任瑞典皇家工学院助理教授、斯德哥尔摩大学有机化学系副教授

2004~2020 任瑞典皇家工学院分子器件讲席教授、大连理工大学特聘兼职教授

2020 任西湖大学讲席教授、人工光合作用与太阳能燃料中心主任

Prof. Licheng Sun received his B.S. (1984), M.S. (1987) and Ph.D. (1990) degree from Dalian University of Technology (DUT). He performed postdoc research at Max-Planck-Institut für Strahlenchemie, Mülheim an der Ruhr, Germany, and Freie Universität Berlin as an Alexander von Humboldt fellow. He joined KTH Royal Institute of Technology, Stockholm, Sweden as an assistant professor in 1997, became an associate professor in 1999 at Department of Organic Chemistry, Stockholm University and appointed as a full professor in 2004 at Department of Chemistry, KTH Royal Institute of Technology.

He served as director of DUT-KTH Joint Education and Research Center on Molecular Devices since 2006, Swedish National Distinguished Professor (VR Rådsprofessor) since 2017. Prof. Sun joined Westlake University as a Chair Professor of Chemistry in April 2020, and serves as the Director of CAP for Solar Fuels @Westlake.

研究成果:

孙立成教授长期从事太阳能燃料与太阳能电池科学前沿领域应用基础研究,在人工光合作用关键科学问题即高效水氧化催化剂设计合成、氧-氧键形成机理,以及光解水制氢功能器件设计与材料制备等领域取得了令国际同行瞩目的科研成果。他是全球"高被引科学家",德国Wiley期刊 ChemSusChem编委会主席、荷兰Elsevier期刊Journal of Energy Chemistry副主编。曾在2017年入选瑞典国家研究理事会瑞典杰出教授(VR Rådsprofessor)、欧洲化学会士(Chemistry Europe Fellow);获瑞典皇家科学院沃尔玛克奖、国际先进材料协会智能能源技术奖、中华人民共和国国际科技合作奖等国际奖项及学术荣誉。

RESEARCH ACHIEVEMENTS:

Prof. Licheng Sun's research interests cover artificial photosynthesis, catalysts based on transition metal complexes and oxides/hydroxides/sulfides for water oxidation, hydrogen generation, CO₂ reduction and N₂ fixation, nano-materials and photoelectrochemical cells for water splitting, dye sensitized, quantum dot/rod sensitized solar cells, perovskite solar cells. Prof. Sun has made outstanding scientific contribution to the design and synthesis of molecular catalysts for water oxidation with the catalytic efficiency comparable to the OEC (oxygen evolution complex) in Nature (Photosystem II), and deep insight studies on the reaction mechanisms of O-O bond formation. Prof. Sun serves as editorial board chairman of *ChemSusChem*, associate editor of *J. Energy Chem.*, International Advisory Board Member of several scientific journals. He is the recipient of Ulla och Stig Holmquist Prize in Organic Chemistry (2013), Arrhenius Medal (2014), Smart Energy Technology Award (2016) from International Association of Advanced Materials, and Wallmark Prize (2016) from the Royal Swedish Academy of Sciences, Thomson Reuters/Clarivate Highly Cited Researcher 2014, 2017, 2018, 2019 and 2020. He was elected as Chemistry Europe Fellow, class 2016 /2017. Received International Science and Technology Cooperation Award of P. R. China 2018.





Nonlinear Spectroscopy and Ultrafast Dynamics Laboratory 表面界面与凝聚相物理化学实验室

PI: Hongfei Wang _{王鸿飞}

1988 年中国科学技术大学化学物理学士,1996 年美国 哥伦比亚大学物理化学博士,1996-1999 年美国宾夕法 尼亚大学化学系、物质结构研究实验室(LRSM)和杜邦公司 Marshall 研究所博士后; 1999-2009 年任中国科学院化学研究所分子反应动力学实验室研究员,入选中国科学院百人计划(1999-2003)及国家自然科学基金委杰出青年基金(2004),任分子反应动力学国家重点实验室副主任(2000-2004); 2009-2017 任美国能源部西北太平洋国家实验室(PNNL) Chief Scientist。2017年起任复旦大学特聘教授,开设新的《化学的观念》通识教育核心课程。2006-2009 年曾任中国物理学会《化学物理学报》执行副主编,2012 年入选美国物理学会会士(APS Fellow)。

Professor Hongfei Wang obtained his Bachelor degree in Chemical Physics in 1998 from University of Science and Technology of China (USTC), and received his PhD degree in Physical Chemistry from Columbia University in 1996. He did his postdoctoral research jointly at the Department of Chemistry and the Laboratory for the Research of the Structure of Matter (LRSM) at the University of Pennsylvania and the DuPont Marshall Laboratory at Philadelphia in 1996-1999. In 1999-2009, he was a professor at the Institute of Chemistry, the Chinese Academy of Sciences (ICCAS) in Beijing, during which he was a Hundred Talent Scholar of the CAS (1999-2002) and was awarded the Distinguished Young Scholar of the National Natural Science Foundation of China (NSFC) in 2005-2008. He also served as the director of the Laboratory of the Molecular Reaction Dynamics (MRDLab) at ICCAS and deputy director of the State Kev Laboratory of Molecular Reaction Dynamics (SKLMRD) in 2000-2004. In 2009-2017, he was a Chief Scientist at the Pacific Northwest National Laboratory (PNNL) of the Department of Energy (DOE), during which he was elected as the Fellow of the American Physical Society (APS Fellow) in 2012. Since January of 2017, he has been serving as a professor of Chemistry in the Fudan University. He served as the executive associate editor of the Chinese Journal of Chemical Physics in 2006-2009.

实验室概况:

实验室主要开展分子表面及界面和凝聚相相关的超快及非线性光谱和动力学研究。主要通过基于飞秒和皮秒激光的非线性光谱与动力学及成像手段,如表面和频振动光谱,表面二次谐波,超快飞秒拉曼及相干拉曼光谱等,研究与能源、材料、环境、及生命科学相关的表面及界面与凝聚相相关的分子及聚集体系的光谱测量方法与动力学过程。本实验室一直致力于系统发展表面及界面的非线性振动光谱及动力学准确定量测量手段和分析理论及方法,为研究生和本科学生提供全面与扎实的现代物理化学与化学物理相关的实验手段和理论方法的训练。

RESEARCH INTERESTS:

The Lab conducts researches on surfaces, interfaces and condensed phase related nonlinear spectroscopy and ultrafast dynamics. These researches use nonlinear spectroscopy ultrafast dynamics and imaging techniques, such as the surface sum-frequency generation vibrational spectroscopy (SFG-VS), surface second harmonic generation (SHG), ultrafast stimulated Raman and coherent Raman spectroscopy, etc., to study the structure and chemical processes of molecular and molecular assembly systems related to energy, materials, environment and biology relayed surfaces, interfaces and condensed phase. The lab has focused on developing nonlinear spectroscopy with quantitative measurement techniques and theoretical analysis methods that can be applied to surface and interfaces applications, and have been providing broad and solid trainings for graduate and undergraduate students in modern experimental and theoretical physical chemistry and chemical physics.

WESTLAKE UNIVERSITY 师资力量





Laboratory of Nanosynthesis 纳米合成实验室

PI: Hongyu Chen 陈虹宇

1976 年生, 浙江台州人, 入选英国皇家化学会会士。 1998 年获中国科学技术大学理学学士学位; 2004 年 在耶鲁大学(Yale University)获得博士学位;之后在 康奈尔大学 (Cornell University) 从事博士后研究。2006 年加入新加坡南洋理工大学 (Nanyang Technological University),开始独立科研工作; 2011年升为终身教职 副教授; 历任化学系副主任 (Deputy Head)、数理学院 副院长(Associate Chair)、理学部副主任(Associate Dean)。2016年加入南京工业大学,共同组建了先进化 学制造研究院,任执行院长。准备于 2021 年夏加入西 湖大学,任理学院教授。共发表论文130余篇,其中以 通讯作者发表在高影响力杂志 (IF>10) 的文章有 60 余 篇。主持国家自然科学基金面上和重大培育项目各 1 项、新加坡科研项目14项。其培养的博士、博士后中, 有 17 人成为国内外的教授 / 副教授 / 助理教授,包括 两名国家级青年人才。

Professor Hongyu Chen was born in 1976 in Taizhou, China. He obtained his B. Sc. from University of Science and Technology of China (USTC) in 1998, and then Ph. D. from Yale University in 2004. After working as a postdoctoral fellow in Cornell University, he joined Nanyang Technological University (NTU) in Singapore in 2006 as Assistant Professor. In 2011, he was promoted to Associate Professor with tenure. He served as Deputy Head of Division of Chemistry and Biological Chemistry (CBC); Assistant and then Associate Chair of School of Physical and Mathematical Sciences (SPMS); and Associate Dean of College of Science. In 2016, he moved back to China and joined NanjingTech University, where he co-founded the Institute of Advanced Synthesis (IAS) and served as Executive Dean. He is moving to College of Science, Westlake University in mid-2021 as a tenured

Professor Chen has published over 130 papers, with over 60 as the corresponding author in high-impact (IF > 10) journals. He was awarded 14 research grants in Singapore and 2 in China. Among the students and postdoctoral fellows trained in his laboratory, 17 have become professors in academia.

实验室概况:

本实验室致力于推进纳米合成的控制力,发展新的合成 方法(概念上类似有机反应),发现其背后的机理,并应用 这些工具拓展新颖的纳米结构,探索新型应用。主要发 (similar in concept to organic reactions), understanding 展的合成方法包括:1)通过固-固界面的构筑,连续调控 核 - 壳、偏心、Janus 等纳米结构; 2)纳米线的溶液操作 方法, 如盘旋成圈, 扭转成麻花, 编织成绳等; 3) 手性纳 米结构的构筑; 4)位点选择性的多步纳米合成; 5)新的 操控手段,如通过宏观载体的拉伸,超声造成弯折,外磁 场诱导变形等。

RESEARCH INTERESTS:

Professor Chen's research interest centers on the advancement of synthetic capability at the nanoscale, more specifically on the development of synthetic methods the underlying principles, and applying these tools for novel nanostructures and new applications. The research directions include: 1) Control of the solid-solid interface for continual structural modulation from core-shell to Janus nanostructures; 2) Solution manipulation of nanowires to coiled rings, twisted double helices, and braided ropes; 3) Construction of chiral nanostructures; 4) Site-selective multi-step nanosynthesis; and 5) Exploration of new synthetic handles, via sonication, external magnetic field, and matrix stretching.

WESTLAKE UNIVERSITY 师资力量





Laboratory of Biological Aggregates 生物聚集体实验室

PI: Xin Zhang 张鑫

2001 年毕业于中国科学技术大学化学物理系; 2004 年 获中科院大连化物所硕士学位,导师为韩克利研究员; 2010 年获加州理工学院化学系博士学位,导师为 Shu-ou Shan 教授,随后进入美国 Scripps 研究所做博 士后研究,导师为 Jeffery W. Kelly 教授。2015年,获聘 美国宾州州立大学化学系和生物化学与分子生物学系 助理教授; 2020年, 晋升长聘副教授, Paul Berg Early Career 讲席教授。2021 年加入西湖大学。目前担任 Aggregate (Wiley) 和 ACS Bio & Med Chem Au 顾问编 委, 并获得多个奖项, 包括2018 年美国斯降研究奖, 2018年美国研究基金会 Scialog 研究奖、2019年皮尤生 物医学奖, 2019年美国国立卫生研究院研究奖, 2020年 美国自然科学杰出青年基金, 2020年中美华人化学-化 学生物学教授协会杰出青年教授奖,2021年美国国家科 学院 Kavli Fellow, 2021 年宾州州立大学 Priestley 杰出 化学教学奖。

Prior to joining the faculty at Westlake in 2021, Prof. Xin Zhang was the Paul & Mildred Berg Early Career Professor and associate professor of chemistry and of biochemistry and molecular biology at the Pennsylvania State University. Zhang was a Helen Hay Whitney postdoctoral fellow at the Scripps Research Institute (La Jolla, California) with Professor Jeffery W Kelly. He earned a doctoral degree at the California Institute of Technology with Professor Shu-ou Shan, a master's degree at the Dalian Institute of Chemical Physics of the Chinese Academy of Sciences with Professor Ke-Li Han, and a bachelor's degree at the University of Science and Technology of China. Prof. Zhang's work has received multiple honors and awards, including Priestley Prize for Outstanding Undergraduate Teaching in Chemistry, Kavli Fellow of the National Academy of Sciences USA, CAPA Distinguished Junior Faculty Award, NSF CAREER award, NIH Maximizing Investigators' Research Award, Pew Scholar in the Biomedical Sciences, Scialog Fellowship of the Research Corporation, Sloan Research Fellowship, the Lloyd and Dottie Huck Early Career Award, the Burroughs Wellcome Fund Career Award at the Scientific Interface, and the ACS Nobel Laureate Signature Award for Graduate Education.

实验室概况:

物聚集体的化学原理、性质和功能三方面切入,在基础 前,很多蛋白质和 RNA 都被发现可以生成聚集体,且 大部分此类生物聚集体与神经退行性疾病相关。我国 现在神经退行性疾病的社会经济成本约 1.4 万亿元, 这给国家和社会造成极大负担。因此,探究并了解生物 聚集体与神经退行性疾病的关联机制,寻找能够诊断 以及干预神经退行性疾病的药剂的任务十分迫切。生 物聚集体的研究目前多集中在生物学科,而本课题组 将用独特的化学视角,在基础科学研究上阐释相分离 和相变聚集过程的化学原理、解析生物聚集体的微观 化学性质、揭示聚集体生物和化学功能的构效关系,以 上结果可以进一步揭示生物聚集体形成、性质和功能 之间的内在关系。在此基础上,课题组将在应用转化研 究上建立原创性的生物聚集体活性分子平台,产生有 独立知识产权的、能用于临床诊断和药物使用的备选

RESEARCH INTERESTS:

课题组专注于"生物聚集体化学"的研究方向,从生 Focused on the "Chemistry of Biological Aggregates", the Zhang lab aspires to develop enabling chemical methodologies and solve transformative biological questions. 研究和产业转化两方面开展化学生物学前沿探索。目 Biological aggregates play significant roles in various cellular pathways and human diseases. At present, the Zhang lab combines expertise from synthetic chemistry, biological chemistry, cellular biology and chemical biology to develop chemical tools that quantitatively report on the physicochemical changes of biomolecules during processes of phase separation and aggregation. These results have the potential to correlate the physicochemical properties of biological aggregates to their physiological or pathological functions. At present, we are focused on the following directions. (1) Develop novel chemical probes that enable super-resolution quantitive imaging, thus measuring the physicochemical properties of biological molecules in live cells at super-resolution. (2) Reveal the physical property-function relationship of membraneless organelles, with a focus on understanding how folding/aggregation of proteins affects the function of these organelles. (3) Develop novel RNA imaging technologies to enable quantitive imaging of RNA condensates, thus revealing how RNA phase separation affects their biological functions. (4) Develop chemical or genetic tools to regulate protein/RNA phase separation and protein aggregation in membraneless organelles, with a focus on RNA binding proteins.





Theoretical and computational chemistry
Laboratory
理论计算化学实验室

PI: Wenjie Dou 窦文杰

2013 年在中国科学技术大学取得物理学学士学位。2018 年在宾夕法尼亚大学取得化学博士学位,方向为理论计算化学。博士期间,与合作者发展了表面跃迁(surface hopping)和电子阻尼(electronic friction)的理论计算方法研究界面非绝热动力学(nonadiabatic dynamics)反应。之后在加州大学伯克利分校从事博士后研究。发展完善了随机轨(stochastic orbitals)与多体微扰格林函数(many-body perturbation theory, e.g. GW, second-order Green's function)相结合的方法高效计算大尺度多电子体系激发态特征。曾获 Dissertation Completion Fellowship, John G. Miller Graduate Fellowship, Finalist for Justin Jankunas Doctoral Dissertation Award in Chemical Physics (APS)等奖项。

实验室概况:

课题组围绕复杂体系激发态电子结构与动力学开展理论研究工作: 1) 分子与光子强耦合的化学动力学及(光腔中) 非线性超快光谱; 2) 量子材料中的激子动力学和量子干涉调控; 3) 非均相界面的 ab initio 非绝热动力学与电化学; 4) 量子计算与量子动力学。

Wenjie Dou earned a B.S. in physics from the University of Science and Technology of China in 2013 and a Ph.D. in theoretical chemistry from the University of Pennsylvania in 2018. His Ph.D. work focused on developing novel non-adiabatic dynamics methods for modeling electron and energy transfer near surfaces. From 2018, He is a postdoc at UC Berkeley working on stochastic implementation of electronic structure theory (stochastic many-body perturbation theory, Green's function method) for excited states. He has been awarded Dissertation Completion Fellowship, John G. Miller Graduate Fellowship, Finalist for Justin Jankunas Doctoral Dissertation Award in Chemical Physics (APS).

RESEARCH INTERESTS:

Wenjie is interested in electron and energy flow through complex molecular systems. At Westlake, his group will develop excited-state (stochastic) electronic structure theory (many-body perturbation theory, e.g. GW, Bethe-Salpeter equation) and nonadiabatic (quantum) dynamics (beyond Born-Oppenheimer approximation, e.g. surface hopping, electronic friction) to describe electron transfer, energy relaxation, exciton recombination, light-matter interaction, and coherence/quantum control in complex chemical systems, e.g. inside an optical cavity, within nanomaterials, and at molecule-metal interfaces.



Laboratory of Synthetic Electrochemistry and Natural Product 合成电化学和天然产物合成实验室

PI: Pengfei Hu 胡鹏飞

2011 年本科毕业于华东理工大学,2014 年 6 月获华东理工大学有机化学硕士学位,指导老师为童晓峰教授。当年 9 月至 2019 年 6 月在芝加哥大学 Scott A. Snyder 教授课题组攻读博士学位,期间独立或领导团队分别完成了两类天然复杂产物的高效合成,并提出了用季碳指导合成这一新理念。2019 年 9 月至今作为 Hewitt Foundation Fellow 在 Scripps 研究所的 Phil S. Baran 课题组进行电合成化学博士后研究。

Dr. Hu obtained his Bachelor's degree in 2011 and Master's degree in 2014 from East China University of Science and Technology. He then earned his his PhD degree in organic chemistry from the University of Chicago in 2019 under the supervision of Prof. Scott A. Snyder. He is currently a Hewitt Foundation postdoc fellow in The Scripps Research Institute with Prof. Phil

实验室概况:

实验室的研究领域主要包括: 1) 高活性天然产物的高效合成及药物化学研究; 2)利用电化学为工具,开发新型有机合成反应方法学。

RESEARCH INTERESTS:

The lab will focus on developing highly efficient synthesis of bioactive natural products and related medicinal chemistry, as well as inventing new synthetic methodologies using electrochemistry.





Laboratory of Supramolecular Organic Functional Assemblies (SOFA LAB) 超分子有机功能组装体实验室

PI: Zhichang Liu 刘志常

2003 年毕业于湖南科技大学,获得学士学位。2006 年 从湖南大学获得有机化学硕士学位。2010 年于中国科 学院上海有机所获得博士学位(导师:陆天尧教授)。 2010-2018 年在美国西北大学 J. Fraser Stoddart 教授 (2016 年诺贝尔化学奖得主)组从事博士后研究。共在 Nat Commun、JACS、Angew Chem、Chem、Science、 Chem Soc Rev 等权威期刊上发表论文 54 篇,总引用 1700 余次;H-Index 23。其中 IF>10 的论文 32 篇,包 括 JACS 20 篇、Angew Chem 5 篇、Nat Commun 2 篇。申 请国际和美国专利 10 项,已获授权 8 项。发明了基于 α-环糊精外层配位机理的黄金绿色提取新技术。依托 该技术,作为联合创始人和股东成立了一家公司。 Dr. Zhichang Liu received his PhD in polymer chemistry in 2010 with Professor Tien-Yau Luh from Shanghai Institute of Organic Chemistry, CAS. From 2010 to 2018, he joined Sir Fraser Stoddart's group at Northwestern University as a Postdoctoral Fellow. To date, he has published 54 high profile scientific papers and been an inventor of 10 patents. For his research into the isolation of gold, he was the co-recipient of two prestigious Awards—the North America Chemical Engineering Project of the Year Award and the Highly Commended in Sustainable Technology Award for Innovation & Excellence—from the Institution of Chemical Engineers. Dr. Liu is also the co-founder of a startup company—named Cycladex—which is focused on gold purification.

实验室概况:

实验室主要研究超分子有机功能拓扑组装体,具体分以下三个方向: 1. 机械键合的有机拓扑分子大环和笼的设计、合成与自组装及在能源转换和催化等领域的应用研究; 2. 通过超分子模版聚合的途径构筑一维、二维和三维的机械互锁拓扑聚合物,利用机械键的特性来制备新型刺激响应材料; 3. 设计合成新型大环主体分子和基于这些大环的聚合物,研究其在基于第二层配位原理的稀有金属以及重金属污染物的环保回收方面的应用。

RESEARCH INTERESTS:

Dr. Liu's current research focuses on the development of Supramolecular Organic Functional Assemblies (SOFA) by means of organic and supramolecular chemistry. Projects in the Liu's SOFA Group involve (i) synthesis and application of topological macrocycles and cages and (ii) rational construction of 1D, 2D, and 3D topological polymers through supramolecular-templated polymerization. Current application areas of interest include precisely-controllable and functional assembly of macrocycles, stimuli-responsive materials for eco-friendly settings, supramolecular catalysis, and energy conversion.



The Laboratory of Natural Product Synthesis 天然产物合成实验室

PI: Haihua Lu 陆海华

2003 年毕业于华中农业大学,获应用化学学士学位。2010 年毕业于华中师范大学,获有机化学博士学位(导师: 肖文精教授)。随后,进入药企从事药物合成工艺和抗癌新药的研发工作。于 2012 年荣获德国洪堡基金会资助,在德国汉诺威大学开展聚酮类化合物的合成和相关化学生物学研究工作(合作导师: Markus Kalesse 教授)。2014 年赴美国 Scripps 研究所(Ryan Shenvi 教授),从事萜烯类天然产物全合成及相关化学生物学的研究。

Dr. Hai-Hua Lu studied chemistry at the Huazhong Agricultural University (HZAU) and received his diploma in 2003. After earning his Ph.D. in 2010 with Professor Wen-Jing Xiao at the Central China Normal University (CCNU), investigating organocatalysis, he had an experience in pharmaceutical industry for one and a half years. He then continued his studies as a postdoctoral associate on natural product chemistry with Professor Markus Kalesse at the Leibniz Universität Hannover (LUH), supported by the Alexander von Humboldt foundation (AvH, 2012-2014), and later with Professor Ryan Shenvi at The Scripps Research Institute (TSRI, 2014-2016).

实验室概况:

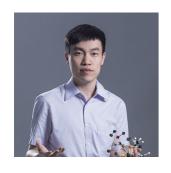
主要从事药用天然产物全合成和相关药物创制研究。迄今,先后完成了 paleo-soraphens (抗菌,抗癌等)、(-)-jiadifenolide (促神经生长)、(+)-diisocyanoadociane (抗疟疾)等具有重要生理活性及药物开发前景的复杂非天然及天然产物的全合成。部分成果,已先后在Nature Chemistry, Journal of American Chemical Society 和 Angewandte Chemie International Edition等化学期刊上发表。

RESEARCH INTERESTS:

Our lab is pursuing scalable complex molecule synthesis and drug development. The syntheses and biological studies of paleo-soraphens, (-)-jiadifenolide and (+)-diisocyanoadociane have been accomplished. And, partial results were published in *Nature Chemistry*, *Journal of American Chemical Society, Angewandte Chemie International Edition* etc.

WESTLAKE UNIVERSITY 师资力量





Organometallic Methodology and Functional Molecules Synthesis Laboratory 金属有机方法学及功能分子合成实验室

PI: Hang Shi 石航

2008 年毕业于湖南大学,获得学士学位,指导教师为尹双凤教授。2008–2013 年在北京大学攻读博士学位,师从杨震教授。2013–2015 年在美国 Harvard 大学 Tobias Ritter 教授(现任职于德国 Max-Planck-Institut für Kohlenforschung)课题组从事博后研究。其间在美国 Massachusetts General Hospital (MGH) 从事放射化学研究,合作老师为 Neil Vasdev 教授和 Steven H. Liang 教授。2015–2018 年在美国 Scripps 研究所 Jin-Quan Yu 教授课题组从事博士后研究。其研究领域涉及天然产物全合成、金属有机方法学、不对称催化及 F-18 放射化学。

Dr. Hang Shi graduated from Hunan University in 2008 with a bachelor's degree. His graduate studies were carried out at Peking University under the direction of Prof. Zhen Yang culminating in a Ph.D. degree in 2013. Then, he joined the group of Prof. Tobias Ritter at Harvard University, as a postdoctoral researcher. During that period, he also performed part of the research at Massachusetts General Hospital under the direction of Prof. Ritter, Prof. Neil Vasdev, and Prof. Steven H. Liang. In 2015, he moved to the Scripps Research Institute and joined Prof. Jin-Quan Yu's group. His expertise is in the field of organic total synthesis, organometallic methodology, asymmetric catalysis and ¹⁸F-labeling.

实验室概况:

研究领域包括以下两个方面: 1、探索过渡金属配合物及其催化的有机反应; 2、合成活性小分子探针及有机功能材料分子。

RESEARCH INTERESTS:

Research in Dr. Shi's laboratory focuses on the following two areas:

- 1. Exploration of transition metal (TM) complex and TM-catalyzed organic reactions;
- 2. Synthesis of small molecule probes and functional organic materials.



Laboratory of Molecular Quantum Devices and Quantum Information 分子量子器件和量子信息实验室

PI: Lei Sun 孙磊

2007年就读于南京大学化学化工学院,2009年加入左景林课题组开展大学生创新计划项目。2009年和2010年在德州农工大学(TAMU—College Station)化学系Kim R. Dunbar 课题组两度参加暑期科研交流项目。2011年获得学士学位后,赴美就读于麻省理工学院化学系,师从Mircea Dincā教授,于2017年获得博士学位。2017□2019年在美国西北大学化学系 Danna E. Freedman课题组从事博士后研究。2019年加入美国阿贡国家实验室纳米材料中心,在高级研究员 Tijana Rajh 的指导下开展博士后研究;同时攻读佐治亚理工学院计算机硕士学位,学习计算机感知和机器人学以及机器学习方向。曾获国家优秀自费留学生奖、MIT Davison Prize、Maria Goeppert Mayer Fellowship等奖项。

实验室概况:

实验室围绕分子量子器件和量子信息领域开展交叉学科研究,致力于设计分子材料以研究量子现象,并通过器件实现分子级别的量子操控。研究方向包括: 1. 制备单分子自旋电子学和量子信息器件; 2. 开发基于分子电子自旋量子比特的量子传感器,探索其在能源和生物领域中的应用; 3. 制备单层二维金属有机框架材料和以其为基础的范德华异质结,通过对其输运性质的表征探索量子现象。

Lei Sun attended School of Chemistry and Chemical Engineering at Nanjing University in 2007 for undergraduate education. He joined Prof. Jinglin Zuo's Laboratory in 2009 to conduct undergraduate research and worked with Prof. Kim R. Dunbar at Texas A&M University — College Station as an exchange student in the summers of 2009 and 2010. After receiving the B.S. degree in 2011, he went to Department of Chemistry at Massachusetts Institute of Technology, where he worked with Prof. Mircea Dincă for doctoral thesis. In 2017, he graduated with the Ph.D. degree, and then performed postdoctoral research with Prof. Danna E. Freedman in Department of Chemistry at Northwestern University. In 2019, he moved to Center for Nanoscale Materials at Argonne National Laboratory to work with Dr. Tijana Rajh; meanwhile, he attended Master of Computer Science program at Georgia Institute of Technology with the focus on computer perception and robotics as well as machine learning. He has been awarded the Chinese Government Award for Outstanding Self-financed Students Abroad, the Davison Prize (Best Inorganic Chemistry Thesis) from MIT, and the Maria Goeppert Mayer Fellowship.

RESEARCH INTERESTS:

Lei Sun is interested in molecular quantum devices and quantum information. He focuses on designing molecular materials to study fundamental quantum phenomena and using devices to realize molecular quantum manipulation. His research focuses on the following areas: 1) Fabricate single-molecule devices applicable for spintronics and quantum information science; 2) Develop quantum sensors with molecular electron spin qubits and explore their applications in energy storage devices and biological systems; 3) Examine transport properties of 2D MOFs and their van der Waals heterostructures to gain insight into fundamental quantum phenomena.





Laboratory for Intelligent Functional Biomaterials 智能生物材料实验

PI: Huaimin Wang 王怀民

2008年毕业于天津大学,获得学士学位;2009-2015年毕业于南开大学,获得博士学位。2015-2018年在美国布兰迪斯大学化学系从事博士后研究。在多肽生物材料应用于癌症治疗和疾病诊断等领域做出了杰出的工作。在本领域顶级和知名期刊共发表原创性论文63篇,包括30余篇在 J. Am. Chem. Soc., Angew. Chem. Int. Ed., Nano Letters, Chem. Soc. Rev, Adv. Funct. Mater, Acs Nano, Materials today, Biomaterials等发表的第一作者或通讯作者论文,论文引用2000余次(H-index=29)。并长期作为 Nature communications, Advanced materials, Advanced functional materials, Nanoscale等多种国际著名 SCI 期刊审稿人。曾获得"教育部学术新人奖","国家奖学金","南开十杰",南开大学优秀博士毕业论文,优秀毕业生等多种荣誉。

实验室概况:

研究方向包括生物材料、水凝胶、多肽组装、纳米医学、活性探针、蛋白质工程。研究领域涉及化学,生物学与医学的交叉学科,研究兴趣主要为设计并开发基于多肽、蛋白和核酸等分子的生物功能材料,并应用于材料化学,生物医学以及纳米科学。

After receiving his B.S. from Tianjin University, Huaimin obtained his PhD. in 2015 from Nankai University under the supervision of Professor Zhimou Yang. Before starting his independent research, he was a postdoctoral fellow with Prof. Bing Xu at Brandeis University. He has authored over 63 peer reviewed research articles, and many of them are on prestigious journals in chemistry such as *J. Am. Chem. Soc., Angew. Chem. Int. Ed., Nano Letters* and *Chem. Soc. Rev.* Dr. Wang has won a number of awards, including the Scholarship Award for Excellent Doctoral Student granted by Ministry of Education (2012), the Graduate National Scholarship (2013, 2015), and the Top Ten Outstanding Graduate Principal Scholarship.

RESEARCH INTERESTS:

Research in Dr. Wang's group integrates the knowledge and techniques in chemistry, materials science, biology, nanotechnology, and medicine to develop smart functional materials based on natural biomolecules (peptides, amino acid derivatives, protein and nucleotide), focusing on functions relevant to medicine. His research interests mainly focus on applying supramolecular assemblies of small molecules to explore and engineer living organisms; designing functional biomaterials for applications in materials chemistry and biomedicine (e.g., cancer therapy, imaging application, infectious diseases, and degenerative diseases).



Functional Polymeric Materials Laboratory 有机功能高分子材料实验室

PI: Pan Wang 王盼

2010 年毕业于中南大学, 获理学学士学位; 2015 年毕业于中国科学院上海有机化学研究所, 获博士学位(导师: 唐勇院士)。2016-2019 年, 在麻省理工学院MIT 从事博士后研究, 师从美国国家科学院、美国艺术与科学院双院院士 Timothy M. Swager 教授。

Dr. Pan Wang received her Bachelor's degree in 2010 from Central South University. She then moved to Shanghai and obtained her Ph.D degree from Shanghai Institute of Organic Chemistry (SIOC), Chinese Academy of Science (CAS), with Prof. Yong Tang in 2015. She then joined MIT and worked as a postdoctoral researcher with Prof. Timothy M. Swager since 2016. Dr. Wang joined Westlake University as an assistant professor in the November of 2019.

实验室概况:

本实验室未来将针对功能化的、具有外界磁、光等刺激响应的有机高分子材料展开基础研究及应用开发。 课题组将在有机合成化学和材料、能源化学交叉领域 开展工作,致力于设计和发展新材料,从分子水平对有 机高分子材料进行结构修饰及功能化,对其物理化学 性能进行调控,并应用于相关光电器件及穿戴设备中。

RESEARCH INTERESTS:

The interest of Dr. Pan Wang's research group will be mainly focused on the development of stimuli-responsive polymeric materials. The projects in the lab will explore the design of new monomers for the synthesis of functional polymeric materials, by applying the concepts in organic synthetic methodologies and developing new methods for the polymerization and polymer post-functionalization. The research group will work on the interplay between novel materials design, device application and fundamental aspects of understanding the intrinsic functional mechanisms.





Laboratory of Advanced Materials and Catalysis 理论催化与材料智能设计实验室

PI: Tao Wang 王涛

2009 年毕业于曲阜师范大学,2012 年于中国科学院山西煤炭化学研究所获硕士学位。2015 年博士毕业于德国莱布尼茨催化所,师从焦海军教授和德国科学院院士 Matthias Beller 教授。2015-2017 年在法国开展博士后研究,师从法国科学院院士、美国 UCLA 大学Philippe Sautet 教授。2017-2019 年在美国斯坦福大学开展博士后研究,师从美国工程院外籍院士、丹麦皇家科学院和工程院双院院士 Jens K. Nørskov 教授和丹麦科技大学 Thomas Bligaard 教授。2019-2020 年在 SLAC国家实验室开展博士后研究,合作导师为 SLAC 高级研究员 Frank Abild-Pedersen 教授和 SUNCAT 中心主任Thomas F. Jaramillo 教授。近年来在 Nat. Catal., Sci. Adv., Nat. Commun., J. Am. Chem. Soc., Angew. Chem. Int. Ed., Energy Environ. Sci., Adv. Mater., ACS Catal. 等期刊发表论文 50 余篇。

Dr Tao Wang received his PhD in 2015 under the supervisions of Prof. Haijun Jiao and Prof. Matthias Beller at Leibniz-Institute for Catalysis in Germany. Then, he worked with Prof. Philippe Sautet in France as a postdoc during 2015-2017. After that, he worked as a postdoc with Prof. Jens K Nørskov and Prof. Thomas Bligaard from 2017 to 2019 in SUNCAT center at Stanford university. From 2019, he worked as a post-doctoral researcher at SUNCAT center with Prof. Frank Abild-Pedersen and Prof. Thomas F. Jaramillo. He had more than 50 publications in worldwide prestigious academic journals such as Nat. Catal., Sci. Adv., Nat. Commun., J. Am. Chem. Soc., Angew. Chem. Int. Ed., Energy Environ. Sci., Adv. Mater., ACS Catal.

实验室概况:

实验室的研究方向将重点围绕可持续新能源领域的关键催化问题,基于量子力学多尺度模拟、微观动力学方法、高通量计算、人工智能和机器学习方法进行新型功能材料的理性设计开发和反应机理的微观层面理解,为实验室材料的集成和应用提供重要理论参考。研究课题将包括基于多相催化和分子催化的水氧化及 O-O 键形成机理、光电分解水制氢、光电催化二氧化碳还原制备高附加值化学品、光电催化氮气还原合成氨及基于传统催化的重要化学品合成等。

RESEARCH INTERESTS:

The lab will focus on the applications of multi-scale quantum mechanics simulations in atomic understandings of reaction mechanisms and rational design of advanced materials as catalysts for industrial processes in energy society. With the help of high-throughput computations, artificial intelligence and machine learning methods, research topics include water splitting for H₂, photo/electro- chemical reductions of CO₂ and N₂, production of useful chemicals based on thermal catalysis.



Asymmetric Synthesis and Catalysis Laboratory 不对称催化合成实验室

PI: Zhaobin Wang 王兆彬

2011 年毕业于南京大学,获得学士学位;2015 年毕业于香港科技大学,获得博士学位(导师: 孙建伟教授)。2016-2019 年在加州理工学院 Gregory C. Fu 教授课题组进行博士后研究。2019 年 10 月加入西湖大学,开展独立研究工作。研究领域主要涉及不对称有机小分子催化和过渡金属催化,以第一作者身份在 Nature、J. Am. Chem. Soc. 和 Angew. Chem. Int. Ed 等专业期刊发表多篇研究文章

Dr. Zhaobin Wang graduated from Nanjing University in 2011 with a bachelor's degree. He earned his PhD degree from the Hong Kong University of Science and Technology (HKUST) in 2015 with Professor Jianwei Sun, working on asymmetric organocatalysis. He then joined Professor Gregory C. Fu's group as a postdoctoral researcher at the California Institute of Technology (Caltech), working on nickel-catalyzed enantioconvergent cross-couplings. In October 2015, Dr. Wang joined the Westlake University to start his independent research career.

实验室概况:

主要围绕不对称催化开展相关研究,致力于新型高效 催化剂的开发与应用,并将进一步探索有机合成方法 学在生物化学和材料化学中的应用。

RESEARCH INTERESTS:

The Wang Lab is focused on asymmetric catalysis, with an emphasis on new catalysts design and their application in enantioselective reactions. We also aim to explore the application of our newly developed methodologies in Biochemistry as well as Material Science.





Epigenetic Chemical Biology Laboratory 表观遗传化学生物学实验室

PI: Mingxuan Wu 吴明轩

2004-2010 年就读于上海交通大学生命科学与技术学院基地班,先后获得学士和硕士学位,2015 年于普林斯顿大学化学系获得博士学位。2015-2019 年在约翰霍普金斯大学医学院和哈佛医学院布莱根妇女医院从事博士后研究。长期从事化学生物学交叉学科领域研究,在化学期刊 Angew. Chem. Int. Ed. 和 Chem. Sci. 以及生物医学期刊 eLife 和综合期刊PNAS上发表过对领域有重要影响的文章。

Dr. Mingxuan Wu graduated from Princeton University with chemistry Ph.D. in 2015. Before his study in the U.S., he was a student in the school of life science and biotechnology at Shanghai Jiao Tong University for a 6-year B.S.-M.S. program (2004-2010). He joined Phil Cole lab for postdoc training at Johns Hopkins University School of Medicine in 2015, and later moved to Harvard Medical School/Brigham and Women's Hospital in 2017.

实验室概况:

课题组通过有机小分子合成和蛋白质半合成等方法开发使用化学工具,研究蛋白翻译后修饰对蛋白功能和基因转录调控的分子机理、以及针对靶标开发分子探针。期待通过探索研究生物医学的基础问题,帮助研发新型药物治疗癌症等疾病。

RESEARCH INTERESTS:

The research focus on the molecular mechanisms of the regulations of gene transcriptions by histone modifications. We combine organic synthesis and protein semisynthesis to develop new chemical tools to tackle the challenges.



Laboratory of Transient Spectroscopy and Photoelectrochemical Conversion 时间分辨光谱与光电化学实验室

PI: Wenxing Yang 杨汶醒

2010 年本科毕业于武汉理工大学,2012 年硕士毕业于华南理工大学。2017 年博士毕业于瑞典乌普萨拉大学,师从 Gerrit Boschloo 教授和瑞典科学院、工程院院士Anders Hagfeldt 教授。2017-2018 年在英国帝国理工学院开展博士后研究,师从英国皇家学会院士 James R. Durrant 教授。2018-2021 年,赴美国埃默里大学开展博后研究工作,师从知名超快光谱专家 Tianquan Lian 教授。近年来在 Nat. Commun., J. Am. Chem. Soc., Nano. Lett. 等期刊发表论文 30 余篇。2017 年获瑞典乌普萨拉大学 Bjurzons premium 奖(杰出博士论文奖)。2018-2021 年独立主持瑞典基金理事会国际博后基金开展纳米晶在人工光合作用中的激发态动力学及电子转移研究。

Dr. Wenxing Yang received his B.S. degree in Wuhan University of Technology in 2010 and an M.S. degree from South China University of Technology in 2012. From 2013 to 2017, he pursued his Ph.D. degree in Uppsala University, Sweden, under the supervision of Prof. Gerrit Boschloo and Anders Hagfeldt. After graduation, he conducted a one-year postdoc stay at Imperial College London under the supervision of Prof. James R. Durant. In 2018, he received the prestigious Swedish International Postdoc Fellowship and began his second postdoc stay at Emory University, USA, under the supervision of Prof. Tianguan Lian. He has published more than 30 research articles, including in some prestigious journals such as Nat. Commun., J. Am. Chem. Soc., Nano Lett., etc. He was awarded an excellent Doctoral Dissertation Award (Biurzons premium) by Uppsala University in 2017.

实验室概况:

课题组致力于研究太阳能电池、电催化等关键绿色能源转化技术的关键机理问题。结合时间分辨光谱(超快光谱技术等)和原位光谱技术(表面增强拉曼等),开展"光-电"转化和"电-化学能"转化的过程机制和动态调控研究,促进太阳能转化和电催化关键技术的突破。目前研究课题包括:低维纳米晶材料的激发态动力学和电子转移机制;高效 CO2 还原催化剂的开发和"碳-碳"键成键机理研究;高效水氧化催化剂的开发和"蛋-氧"键成键机期等。

RESEARCH INTERESTS:

Dr. Wenxing Yang's research focuses on the mechanistic studies of critical processes in renewable energy-oriented techniques, e.g., solar cells and electrocatalysts. By combining time-resolved spectroscopic methods and in-operando techniques, the group investigates the microscopic processes involved in these "solar-to-electricity" and "electricity-to-fuel" conversion techniques and explores their effective control strategy. These efforts are aimed to provide rational design guidelines for further technical developments. The current research projects include (1) Excited-state dynamics of low-dimensional nanocrystals, (2) Development of CO2 reduction catalysts and the mechanism of "C-C" bond formation, and (3) Development of water oxidation catalysts and the mechanism of "O-O" bond formation.





Biocatalysis Laboratory 酶催化有机合成实验室

PI: Yuxuan Ye 叶宇轩

2013年在北京大学化学与分子工程学院获得学士学位,指导教师为王剑波教授。本科期间在美国加州大学洛杉矶分校 Neil Garg 教授课题组进行了暑期科研交流。2018年在美国麻省理工学院获得博士学位,指导教师为 Stephen Buchwald 教授。博士期间从事了钯催化的氟化反应和铜氢催化的不对称杂环烷基化反应。2019-2022年分别在美国普林斯顿大学和康奈尔大学开展博士后研究,合作教师为 Todd Hyster 教授。期间发展了第一个光酶催化定向进化平台,并用此实现了酶对高活性氮自由基的控制,发展了酶催化的不对称自由基氢胺化反应。近年来取得一些列进展和成果,共发表论文14篇,其中第一作者论文发表在 Nature Chemistry, JACS, Angew等。

Yuxuan Ye obtained his B.S. in Chemistry from Peking University, where he did his undergraduate research with Prof. Jianbo Wang. During his undergraduate studies, he also carried out summer research at the University of California, Los Angeles with Prof. Neil Garg. Ye received his Ph.D. degree in Organic Chemistry from the Massachusetts Institute of Technology under the guidance of Prof. Stephen Buchwald. He then worked as a postdoctoral researcher with Prof. Todd Hyster at Princeton University and Cornell University.

实验室概况:

课题组主要研究方向: 1.利用光化学,电化学,以及金属催化等技术解锁酶的非天然反应性,发展高效的新型酶催化反应; 2.借鉴生物体中独特的酶催化反应机理,实现新型仿生催化; 3.利用酶的非天然反应,发展新型生物传感器。

RESEARCH INTERESTS:

The lab will focus on the development of novel biocatalytic methods for organic synthesis and other applications: 1) the development of non-natural enzymatic transformations with the merger of photoredox catalysis, electroorganic chemistry, and metal catalysis. 2) bio-inspired catalysis using unique mechanism in biosynthesis. 3) novel biosensor development based on new-to-nature enzymatic reactions.



Molecular Catalysis and Molecular Materials Lab 分子催化与分子材料实验室

PI: Biaobiao Zhang 张彪彪

山东枣庄人。2009-2015 年在大连理工大学攻读工学博士学位,师从李斐教授。2015-2020 年在瑞典皇家理工学院化学系从事博士后研究,合作导师为中国科学院院士(外籍),瑞典皇家工程院院士,人工光合作用领域专家孙立成教授。研究领域涉及配位化学,催化化学,材料表界面与新能源的交叉学科。

Dr. Biaobiao Zhang received Ph.D. degree in Applied Chemistry from Dalian University of Technology in 2015 under the guidance of Prof. Fei Li. He then joined Prof. Licheng Sun's research group at KTH Royal Institute of Technology as a postdoctoral researcher between 2015 and 2020. His research field is artificial photosynthesis and solar fuels. He has conducted more than ten years of research on the development of high-efficiency water oxidation catalysts and device assembly.

实验室概况:

实验室围绕太阳能燃料领域瓶颈问题即催化水氧化反应,展开分子层面的前沿基础研究,开发新型分子催化材料以革新光/电解水技术(PEM 纯水电解、海水电解)。具体研究方向包括: 1. 水氧化分子催化剂开发与机理研究; 2. 分子催化剂多相化; 3. 基于分子催化理念单催化位点材料的设计与制备; 4. 自然界光系统 II 释氧中心氧一氧键形成机理的研究; 5. 光解水制氢分子器件设计与组装。

RESEARCH INTERESTS:

The Molecular Catalysis and Molecular Materials Lab will focus on the bottleneck problem of solar fuel production, namely, the catalytic water-oxidation reaction, and carry out scientific research and technological breakthroughs at the molecular level to develop the photo/electrochemical water splitting (such as PEM water electrolysis and seawater electrolysis). Specific research directions include: i) Development and mechanism research of water-oxidation molecular catalysts; ii) Heterogenization of molecular catalysts; iii) Design and preparation of single catalytic site materials based on the principles of molecular catalysis; iv) Studies on the mechanism of oxygen-oxygen bond formation by the oxygen-evolving complex in Photosystem II; v) Design and assembly of molecular devices for light-driven water splitting.



Laboratory of Natural Products Bioengineering 天然产物化学生物学实验室

PI: Lihan Zhang 张骊駻

2008-2017 年,于日本东京大学药学院分别获得学士、 Dr. Lihan Zhang obtained his B.S., M.S, and Ph.D degree 硕士及博士学位 (导师: Ikuro Abe 教授)。就读期间先 后受邀同中国科学院上海有机所及德国波恩大学开展 专项国际科研合作。2017-2019年,美国哈佛大学 Emily Balskus 教 授 组 从 事 博 士 后 研 究。曾 获 得"The University of Tokyo Fellowship", "JSPS Research Fellowship"、"JSPS Overseas Research Fellowship" 等荣誉。

from the University of Tokyo in 2012, 2014, and 2017, respectively under the supervision from Prof. Ikuro Abe. He then moved to Harvard University to conduct postdoctoral research at the laboratory of Prof. Emily Balskus. Dr. Zhang has received multiple awards including The University of Tokyo Fellowship and JSPS Overseas Research Fellowship.

实验室概况:

课题组将以生物信息学大数据分析为基础,研究天然 产物的生物合成、药物发现,以及组合生物合成与合 成生物学在医学和工业中的应用。主要研究方向包括 基于基因信息挖掘的天然药物发现、模版化生物合成 酶的功能改造和合成生物学应用。

RESEARCH INTERESTS:

Our research interest lies primarily in, but not restricted to, discovery and bioengineering of assembly line enzymes for natural product biosynthesis. By integrating large-scale genome sequence analysis, biotechnology, synthetic biology, and natural products chemistry, we aim to create novel small molecule therapeutics that contributes to our society.

SCHOOL OF 理学院 SCIENCE



International Center for Polaritonics 国际极化激元研究中心

Alexey Kavokin



Laboratory of New States of Matter and Their Organizing Principles 新奇物态及其组织原理实验室

Congjun Wu 吴从军



Advanced Surface Analysis & Physics (ASAP) Laboratory 先进表面分析与物理实验室

Ruihua He 何睿华



Condensed Matter Theory Group 凝聚态物理理论课题组

Jian Li 李牮



PI IN PHYSICS

物理PI

Cryogenic Lab for Thermal-Electric Transport Laboratory 极低温热电输运实验室

Xiao Lin 林效



Multiscale Materials Modeling 多尺度材料模拟实验室

Shi Liu 刘仕



Materials Laboratory 材料实验室

Zhi Ren 任之



Quantum Optoelectronics Laboratory 量子光电子实验室

Pavlos Savvidis



Synthesis and Characterization of Quantum Materials Laboratory 量子材料生长和表征实验室

Jie Wu ■ #≅



2D Materials and Quantum Transport Laboratory

二维材料与量子输运实验室

Shuigang Xu 徐水钢



Low Energy Electron Microscopy Laboratory 低能电子显微镜实验室

Changxi Zheng

郑昌喜



Strongly-correlated and Topological Condensed Matter Group 强关联和拓扑理论课题组

Wei Zhu



Professor ALEXEY KAVOKIN

Alexey Kavokin



- 物理讲席教授
- 国际极化激元研究中心主任
- Chair Professor, Physics
- Director of International Center for Polaritonics

1991 获俄罗斯圣彼得堡国立技术大学物理学学士与硕士

1995-1998 任俄罗斯科学院伊夫研究所初级研究员

1993 获俄罗斯科学院物理技术研究所物理与数学科学博士

1994-1997 任俄罗斯科学院伊夫研究所研究员

1998 任法国克莱蒙费朗第二大学教授

2005 任英国南安普顿大学纳米物理和光子学主任与物理与天文学系讲席教授

2018 任西湖大学理学院讲席教授和国际极化激元研究中心主任

Professor Alexey Kavokin received his master degree in physics with honor from St-Petersburg State Technical University and Ph.D. degree in Physical and Mathematical Sciences at A.F. Ioffe Institute, Russian Academy of Sciences in St Petersburg. From 1998, he was the University Professor at Université "Blaise Pascal" Clermont-Ferrand II in France. From 2005, he was the Chair of Nanoscience and Photonics and Professor of Physics and Astronomy School in University of Southampton. Prof. Kavokin accepted the offer to be the Director of the International Center of Polaritonics and Chair Professor of Physics at Westlake University in June, 2018.

研究成果:

Kavokin教授从事"光-物质"耦合及固体物理学的理论和实验研究,发表的论文超过450篇,获得众多国际奖项。他于1998年预测了多量阱中极化激元的垂直动生窄化效应,2000年在微腔中首次发现了极化激元玻色子散射,2001年预测了光的布洛赫振荡(2004年获实验验证),2003年率先预测了室温下GaN微腔中极化激元的玻色-爱因斯坦凝聚(2008年获实验验证),2005年预测了光学自旋霍尔效应(2007年获实验验证),促生了极化激元激光的发展。他因此被授予2020年国际量子器件奖,这是首次有人代表中国获奖。

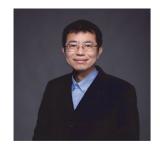
RESEARCH ACHIEVEMENTS:

Professor Kavokin's field of expertise is physics of light-matter coupling and solid state physics, both theoretical and experimental. In 1998, he predicted the vertical motional narrowing effect for exciton-polaritons in multiple quantum wells. This project achieved several groundbreaking results: for the first time, bosonic stimulation of scattering of exciton-polaritons in microcavities has been evidenced (2000). In 2007, polariton lasing at room temperature has been documented. Prof. Kavokin theoretically predicted new effects, including the Optical Spin Hall effect, Bloch oscillations of light, room temperature Bose-Einstein condensation of exciton-polaritons in GaN microcavities.



Professor CONGJUN WU

吴从军 教授



- 物理讲席教授

- Chair Professor, Physics

1997 获清华大学学士

2000 获北京大学硕士

2005 获美国斯坦福大学博士

2005-2007 美国加州大学圣芭芭拉分校 Kavli 理论物理所博士后

2007-2021 历任美国加州大学圣迭戈分校历任物理系助理教授,副教授,教授

2021 任西湖大学理学院物理讲席教授

Professor Wu received a Bachelor of Science degree from Tsinghua University in 1997, a Master of Science degree from Peking University in 2000, and a Ph. D. degree of Physics from Stanford University in 2005. From 2005 to 2007, he did postdoctoral research in Kavli Institute for Theoretical Physics at the University of California, Santa Barbara. He joined the Department of Physics at the University of California, San Diego in 2007 as an assistant professor. He was promoted to associate professor in 2011 and full professor in 2017. Now he has joined Westlake University fulltime and is employed as a chair professor of physics.

研究成果:

吴从军教授的研究处在凝聚态物理和冷原子物理的交叉前沿,其兴趣是探索新的物质状态及其深层次的组织原理,并追求数学的优美性和物理世界真实性的统一。他曾于2008年获Sloan Research Fellowship和海外华人物理协会(现名全球华人物理学会)杰出青年科学家奖;于2018年,当选为美国物理学会会士(APS Fellow)。

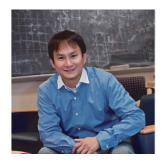
其代表性工作有: 1) 在动力学方面,提出了space-time group的概念,作为描写动力学体系晶体对称性的基础。2) 在拓扑物理方面,建立了高维Landau能级和四元数解析性的关系;提出了边缘态的helical Luttinger liquid的理论,是研究相互作用拓扑绝缘体的早期工作之一,后来在文献中被广泛采用。3) 在强关联物理方面,对巡游磁性和Curie-Weiss金属态做了非微扰研究,并将巡游磁性做了非常规对称性(比如p-波)的推广。4)在冷原子物理方面,提出从高对称性(SU(N)、Sp(N))的角度,来研究大自旋原子体系,这提供了一个和高能物理相联系的途径;他是开创光晶格中轨道物理方向的研究者之一,提出了"非常规玻色爱因斯坦凝聚",后来在实验中被观测到。5) 在数值方法方面,他研究量子蒙特卡洛的数学基础,提出了对符号问题的正定性判别法。

RESEARCH ACHIEVEMENTS:

Professor Wu, Congjun's research interest is the exploration of new states of matter and their deep-level organizing principles. His research is at the interdisciplinary frontier of condensed matter physics and cold atom physics, focusing on the core issues in strong correlation physics and topological physics. His research pursues the unification of the mathematical beauty and the physical reality. In 2008, he was awarded the Sloan Research Fellowship and the "Outstanding Young Researcher Award" of "Overseas Chinese Physics Association" (It was renamed "the International Organization of Chinese Physicists and Astronomers"). He was elected to a fellow of American Physical Society in 2018.

His representative works are: 1) Dynamics: His group proposed the concept of "space-time group" as the mathematical basis for the crystalline symmetry of dynamic systems; 2) Topological physics: He identified the correspondence between the high-dimensional Landau level and the quaternionic analytic function; he proposed the concept of "helical Luttinger edge liquid", which is one of the earliest studies of interacting topological states and is widely adopted in literature; 3) Strong correlation physics: He contributed to the non-perturbative studies of itinerant magnetism and the Curie-Weiss metal state, and generalized itinerant ferromagnetism to its unconventional symmetric counterparts (e.g. p-wave); 4) Cold atom physics: He pioneered the study of large-spin cold fermions from the perspective of high symmetries (SU(N), Sp(N)), building up a connection to high energy physics; he is one of the researchers who pioneered the study of orbital physics in optical lattices, and proposed the concept of "unconventional Bose-Einstein condensation (BEC)" which was later observed experimentally; he is also an early researcher of spin-orbit coupled BECs; 5) Numerical methods: He proposed the positive-definitive conditions for the quantum Monte-Carlo sign-problem based on symplectic symmetries.





Advanced Surface Analysis & Physics (ASAP) Laboratory 先进表面分析与物理实验室

PI: Ruihua He 何睿华

2001 (2004)年复旦大学学士(硕士),2010 年美国斯坦福大学应用物理学博士,2010-2012 年美国劳伦斯伯克利国家实验室先进光源博士后,2012 年起任美国麻省波士顿学院物理系助理教授,2015 年美国国家科学基金杰出青年学者(NSF CAREER),现兼任美国东北大学理学院外聘教授和英国自然出版集团旗下《科学报告》等杂志学术编委。

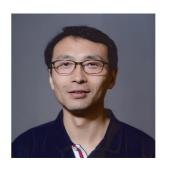
实验室概况:

实验室为开展以强关联电子材料为核心的实验凝聚态 物理研究而设立。主要研究内容包括非常规超导电性、 负电子压缩率、电荷/自旋有序及其他固体中的有趣 演生现象。已建设安装完成低温量子电容测量装置一 台和角分辨光电子能谱仪一台。前一设备用于测量材 料的电子压缩率,但至今很大程度上被忽略的材料物 理性质,有望从而促成相关研究前沿的建立;后一设 备用于测量材料的电子结构,其很大程度上决定材料 的许多物理性质。系统采取新颖设计方案,允许相关测 量在特殊实验条件下进行,以利于一系列以其它手段 无法实现、原创性的研究项目的开展; 并能实现跟其 它高级测量手段进行样品共享,从而增强数据可比性、 研究的系统性,实现设备有效共享以利于科研合作的 开展。本实验室兼物质科学公共实验平台辖下的表面 物理实验室, 其超高真空互联系统建成后将与角分辨 光电子能谱仪连接, 以实现对同一个样品多方面特性 更全面的原位测量。

Dr. Rui-Hua He obtained his Bachelor's degree in 2001 and Master's degree in 2004 from Fudan University, and received his PhD degree in Applied Physics from Stanford University in 2010. He had his postdoctoral training at the Advanced Light Source in Lawrence Berkeley National Lab between 2010 and 2012. From 2012 to 2017, he worked as an Assistant Professor in Physics at Boston College, USA. From 2019, he was appointed as an Affiliated Professor in Physics by the College of Science, Northeastern University, USA. He is a recipient of the National Science Foundation Faculty Early Career (CAREER) Award (2015) and an academic editor of the Scientific Reports journal.

RESEARCH INTERESTS:

The Lab conducts experimental condensed matter physics research with a focus on strongly correlated electron physics, mainly including unconventional superconductivity, negative electronic compressibility, charge/spin ordering and other interesting emergent phenomena in solids. A low-temperature quantum capacitance measurement device and an angle-resolved photoemission spectroscope have been set up. The former facility is used for measuring electronic compressibility of materials—a physical property of high importance to materials but so far largely ignored in research—which can hopefully facilitate establishment of a related research frontier. The latter facility is used for measuring electronic structure of materials, which largely determines their many physical properties. This system is constructed based on a novel design, which allows related measurements to be carried out under special experimental conditions in original, otherwise impossible research projects. The Lab is where the Surface Physics Analysis Lab (SPA Lab) operated by the Instrumentation and Service Center for Physical Sciences is currently situated. The ARPES system in the ASAP Lab will be attached to the all-in-one UHV connected system of SPA Lab upon the completion of its construction, which will enable more thorough, in-situ experimental studies of the same materials samples on their different properties.



Condensed Matter Theory Group 凝聚态物理理论课题组

PI: Jian Li 李牮

2002 年于西北大学获学士学位并保送进入中科院物理所;2004 年转入香港大学并于2008 年获得博士学位;2008 年底至2013 年在瑞士日内瓦大学从事博士后研究;2013 年至2017 年在美国普林斯顿大学从事博士后研究。李牮博士在包括石墨烯、拓扑绝缘体、拓扑半金属以及拓扑超导体在内的多个凝聚态物理前沿方向上都发表过具有广泛影响力的研究成果。李牮博士凭借在马约拉纳零能模体系中的一系列出色工作获得了2016美国 Blavatnik Regional Awards for Young Scientists物理和工程举最高奖。

Dr. Jian Li received his Bachelor's degree from Northwest University, China, in 2002, and Ph.D. degree in Physics from University of Hong Kong in 2008. He worked as a postdoc in University of Geneva, Switzerland, and in Princeton University, USA, before joining Westlake University in 2017. Dr. Li has published more than 30 research papers, among them 10 are in *Science, Nature Physics and Physical Review Letters*, on various condensed matter systems including graphene, topological insulators/semimetals/superconductors. The total number of citations is over 1700. Dr. Li received the 2016 Blavatnik Regional Awards for Young Scientists Winner for recognition of his theoretical insight and guidance to the experimental studies leading to the direct observation of Majorana fermions.

课题组概况:

主要从事凝聚态物理理论研究。现阶段的主要研究方向为拓扑物质态的电子性质,这些拓扑物质态包括:马约拉纳零能模体系(拓扑超导体)、拓扑绝缘体、石墨烯体系、外尔半金属、量子反常霍尔效应体系等。本研究组还同时关注拓扑量子计算相关的物理在凝聚态体系或冷原子体系中的实现。

RESEARCH INTERESTS:

The research field of Dr. Jian Li's group is theoretical condensed matter physics, focusing on condensed matter systems that exhibit nontrivial topological electronic properties. These include: topological superconductors and Majorana zero mode systems, topological insulators/semimetals, quantum anomalous Hall insulators, graphene systems etc. The current research interest of Dr. Jian Li's group is to solve problems towards realizing topological quantum computation in condensed matter or even cold atom systems.





Cryogenic Lab for Thermal-Electric Transport Laboratory 极低温热电输运实验室

PI: Xiao Lin 林效

2008年毕业于浙江大学,获得学士学位;2013年获得 浙江大学凝聚态物理博士学位; 2013-2015 年在法国 巴黎高科工业物理化学学院 从事博士后研究; 2016-2018年,以洪堡学者身份在德国科隆大学从事博 士后研究。迄今为止在 Science, Nature Physics, Annual Review of Condensed Matter Physics, Phys. Rev. X, Phys. Rev. Lett., Phys. Rev. B, npj Quantum. Materials B, etc., which are cited more than 2100 times. 等期刊上发表文章 40 余篇,总计引用次数 2100 余次。

Dr. Xiao Lin received his Bachelor degree in Physics in 2008 and Ph.D. in condensed matter physics in 2013 from Zhejiang University; He did Postdoctoral research in LPEM, ESPCI, Paris Tech, France from 2013 to 2015; and then became Humboldt Research Fellow in Cologne University, Germany from 2016 to 2018. He joined in Westlake University as principal investigator in March, 2018. He published about 40 papers including Science, Nature Physics, Phys. Rev. X, Phys. Rev. Lett., Phys. Rev.

实验室概况:

实验室主要利用极端条件热电输运手段研究固体材料 的物理性质, 如超导特性, 费米面性质, 载流子的量子 极限行为等,研究范围包括SrTiO;等氧化物超导体,有 机超导体, 拓扑量子材料, 热电材料等。主要测量手段 包括电阻, 霍尔效应, 热电势, 能斯特效应, 热导率, 热 霍尔效应等。测量温度范围: 10mK-800K; 磁场范围: 0T-14T

RESEARCH INTERESTS:

The lab aims to investigate solid state materials with intriguing physical properties, such as superconductivity, Fermi surface property, phenomena in quantum limits, etc., through extreme condition thermal-electric transport measurements. Research interests include oxide superconductors (SrTiO₃), organic superconductors, quantum topological materials, thermal-electric materials, etc.



Multiscale Materials Modeling 多尺度材料模拟实验室

PI: Shi Liu 刘什

2009年本科毕业于中国科学技术大学化学物理系, 2015年博士毕业于宾夕法尼亚大学化学系。博士毕业 后获得卡内基博士后奖学金,于2015年9月—2018年 1 月任职于华盛顿卡内基研究所,从事凝聚态功能材 料,能源材料,多尺度/跨尺度计算物理方法开发等方 面的研究。2017年荣获美国物理学会计算物理领域 Metropolis Award, 2018 年获得美国陆军研究所优秀博 士后奖学金。自2012年起,在一流学术杂志发表论文 共 40 篇,包括 3 篇 Nature, 2 篇 Phys. Rev. Lett., 1 篇 Nature Mater. 等。

U.S. Army Research Laboratory.

实验室概况:

多尺度材料模拟实验室的研究主要是开发和运用多尺 度计算材料模拟方法,将不同空间和时间尺度范围的计 算物理方法有机结合起来,实现微观-介观-宏观的跨 尺度材料模拟,进而揭示凝聚态物理中复杂功能材料 的结构-性能-效果关系。主要研究方向:1)开发新的 算法、软件、平台将量子力学、分子动力学、相场法等不 同尺度的方法与高通量计算结合,推动下一代计算材料 设计。2) 设计和开发基于铁电的新型能源材料和人造 突触材料。

RESEARCH INTERESTS:

Multiscale Materials Modeling Laboratory focuses on the development and application of multiscale computational framework that combines methods at different time/length scales to understand the structure-property-performance relationships of advanced functional materials in condensed matter physics. Main research areas: 1) Develop computational infrastructures to link electronic structure, statistical methods, and mean-field theory for high-throughput computing and next-generation computational materials by design; 2) Design and develop novel energy materials and synapse-like materials based on ferroelectrics.

Dr. Shi Liu graduated in 2009 with a B.S. from USTC,

before completing his Ph.D. in Chemistry at the Universi-

ty of Pennsylvania in 2015. Dr. Liu was then offered a

Carnegie Fellowship at the Carnegie Institution of

Washington, where he worked as a Carnegie Fellow from

2015 to 2018. His main research interest is the develop-

ment and application of multiscale computational

framework to understand the structure-property relation-

ships of complex functional materials (e.g., ferroelectrics

and photovoltaics) in condensed matter physics. He

received the American Physical Society 2017 Nicholas

Metropolis Award in Computational Physics. He was

recently awarded 2018 SEDD (Sensors and Electronic

Device Directorate) Distinguished Postdoc Fellowship at





Materials Laboratory 材料实验室

PI: Zhi Ren 任之

1999-2004年浙江大学理学学士; 2004-2009年浙江大学凝聚态物理博士; 2009-2012年日本大阪大学产业科学研究所特别研究员。2013-2017年瑞士日内瓦大学博士后。迄今共在知名学术期刊上发表论文超过50篇,总计被引用超过4700次。部分研究成果被Nature Physics News and Views, NPG Asia Materials 和 APS Physics 以亮点进行报道。申请人的博士论文入选2011年百篇优秀博士论文提名论文,并获得2012年教育部高等学校自然科学一等奖(排名第5)。

Dr. Zhi Ren received his Bachelor's degree in 2004 and his PhD degree in 2009, both from Zhejiang University. From 2009 to 2012, he worked at Osaka University as a specially appointed researcher. Dr. Ren performed is postdoctoral training at University of Geneva between 2013 and 2017. Dr. Ren has published 50 papers, with total citation over 4700 times. Some of these papers have been highlighted in *Nature Physics News and Views, NPG Asia Materials* and *APS Physics Synopsis*. Dr Ren's PhD thesis has been nominated for the National Excellent Doctoral Dissertation (2011), and he has been awarded the first prize in Natural Sciences of Chinese Universities (2012) by the Ministry of Education.

实验室概况:

实验室研究重点放在凝聚态前沿感兴趣的块体材料上,力争发现具有应用前景的超导体或拓扑量子材料,并通过化学掺杂或施加物理压力来改变其基态性质,以期最终实现对新奇量子态的宏观调控。

RESEARCH INTERESTS:

The research of Materials Lab focuses on bulk materials that are of interest to the condensed matter physics community. The lab strives to discover new superconductors and topological quantum materials that have potential application, and tune their ground state by chemical doping or applying pressure, with the ultimate goal to achieve a macroscopic control of the novel quantum states.



Quantum Optoelectronics Laboratory 量子光电子实验室

PI: Pavlos Savvidis Pavlos Savvidis

雅典大学理学学士,于 2001 年获得英国南安普顿大学博士学位并制作了第一台极化激元放大器。曾于加州大学 - 圣芭芭拉、克里特大学、希腊 Foundation for Research and Technology 和英国剑桥大学从事博士后研究工作。Pavlos Savvidis 在国际知名期刊 Nature, Science, Nature Physics, Nature Comm and PRLs 发表了多篇关于极化激元器件的研究成果并取得广泛影响力,其中有多篇成果分别在 Nature 和 Science 期刊的 News & Views 和 Perspectives 上发表。

Pavlos Savvidis has received the B.Sc. in Physics of the University of Athens. He obtained his PhD degree from the University of Southampton in 2001 creating the first polariton amplifier. He worked as a postdoc at University of California, Santa Barbara, University of Crete, FORTH and University of Cambridge, UK, before joining Westlake University in 2019. His work on polaritonic devices appeared in high impact journals such as Nature, Science, Nature Physics, Nature Comm and PRLs with the results of many of these works featured in News & Views and Perspectives sections of Nature and Science journals respectively.

实验室概况:

实验室主要研究光与物质的互相作用,尤其关注低维半导体纳米结构中基于基本原理而设计实现的光电器件。目前的研究方向包括:基于光电器件(激光二极管、晶体管、太赫兹测辐射热仪)的新型极化激元研究,极化激元量子流体和电路,用于量子模拟的极化激元凝聚晶格,有机,无机混合半导体微腔。

RESEARCH INTERESTS:

The Lab research activities are mainly focused on light mater interactions with special emphasis on low dimensional semiconductor nanostructures including the design and realization of optoelectronic devices based on fundamentally novel principles. The current research activities include: Novel polariton based optoelectronic devices: laser diodes, transistors, THz bolometers. Polariton quantum fluids and circuits, polariton condensate lattices for quantum simulation. Hybrid organic-inorganic semiconductor microcavities.





Synthesis and Characterization of Quantum Materials Laboratory

量子材料生长和表征实验室

PI: Jie Wu 吴颉

2001年和2004年获复旦大学理学学士和硕士学位,于2010年获得美国加州大学伯克利分校凝聚态物理博士学位。从2010至2012年在美国强磁场国家实验室从事博士后研究。2012年被聘为美国布鲁克海文国家实验室助理研究员,2014年晋升副研究员,2017年晋升为正研究员。

Dr. Wu received B.S. and M.S. from Fudan University at 2001 and 2004. He received Ph. D. on experimental condensed matter physics from University of California at Berkeley at the year of 2010. From 2010 to 2012, he was a postdoctoral fellow at National High Magnetic Field Laboratory of USA. He became an Assistant Physicist of Brookhaven National Laboratory of USA at 2012 and was promoted to be an Associate Physicist at 2014, and to be a Physicist at 2017. Dr. Wu joined the Westlake University at 2019 and now is a tenured associate professor at the Physics department.

实验室概况:

主要使用分子束外延、纳米微结构组装、低温输运测量、磁旋二色效应等多种实验手段去生长量子材料,组装纳米结构并研究强关联电子材料中的各种量子现象,如非常规超导电性,电荷向列性,电荷局域化,界面超导,纳米磁性,自旋电子输运等。

RESEARCH INTERESTS:

The goal of Dr. Wu's lab is to study the useful properties of quantum materials and emergent quantum phenomena by the combinations of state-of-the-art apparatus, such as molecular beam epitaxy, nanofabrication, low-temperature transport measurements, magnetic circular/linear dichroism. Targeted topics include the studies of unconventional superconductivity, electronic nematicity, charge localization, interface superconductivity, nano-magnetism, spintronics etc.



2D Materials and Quantum Transport Laboratory 二维材料与量子输运实验室

PI: Shuigang Xu 徐水钢

2009 年本科毕业于武汉大学物理科学与技术学院,获得学士学位。2013 年于香港科技大学物理系获得博士学位。博士毕业后继续留在香港科技大学从事博士后研究。于 2016 年转入英国曼彻斯特大学开展博士后研究工作,师从诺贝尔奖获得者、石墨烯之父 Andre Geim教授。主要从事基于石墨烯及二维半导体的量子输运特性研究。相关成果发表在 Science、Nature、Nature Electronics、Nature Communications、Science Advances、Physical Review Letters、Nano Letters 等国际著名期刊上。

Dr. Shuigang Xu received his B.S. degree from Wuhan University in 2009, and Ph.D. degree from the Hong Kong University of Science and Technology in 2013. After graduation, he worked as a postdoctoral fellow in the Hong Kong University of Science and Technology. In 2016, he moved to University of Manchester as a research associate, supervised by Nobel Laureate Andre Geim. His research focuses on the quantum transport of graphene and 2D semiconductors. His work has been published in top journals, including Science, Nature, Nature Electronics, Nature Communications, Science Advances, Physical Review Letters, and Nano Letter.

实验室概况:

课题组主要从事二维材料的生长、量子输运特性研究及基于范德瓦尔斯异质结的器件开发。结合材料生长技术探索新型二维材料。通过范德瓦尔斯转移技术和微纳米加工技术设计具有独特性质的量子器件,并以此探索低维物理中的奇异量子效应,如强关联性和拓扑性。同时课题组将为基于扭转电子学、谷电子学和自旋电子学的器件开发提供原理性的指导。

RESEARCH INTERESTS:

The research in Dr. Xu's group covers from material growths, device fabrications and quantum transport measurements based on 2D materials. The group will discover new kinds of 2D materials with unique properties by combining with the crystal growth techniques, explore the exotic low-dimensional quantum physics by using van der Waals assembly techniques and nano fabrication technologies, and develop new concepts of devices based on twistronics, valleytronics and spintronics.





Low Energy Electron Microscopy Laboratory 低能电子显微镜实验室

PI: Changxi Zheng 郑昌喜

本科毕业于兰州大学材料物理专业,硕士毕业于中山 大学材料物理与化学专业,博士毕业于澳大利亚莫纳 什大学凝聚态物理专业。2013年博士毕业后继续留在 莫纳什大学从事博士后研究,并于2014年转为独立博 士后,期间独立主持与完成2项科研基金(1项国家级, 1项校级)。 Dr. Changxi Zheng received his bachelor degree in Material Physics from Lanzhou University, master degree in Material Physics and Chemistry from Sun Yat-sen University, and Ph.D in Condensed Matter Physics from Monash University, Australia. Since 2013, he worked as a research fellow in School of Physics and Astronomy, Monash University. In 2014, supported by his own research funds, he became an independent research fellow. Changxi Zheng currently is a Principle Investigator at Westlake University, leading a group working on low energy electron microscopy, condensed matter physics and surface science.

实验室概况:

低能电子显微镜 (LEEM) 一般采用动能小于 50eV 的电子束对样品表面进行反射式高分辨成像,该成像方法对样品的辐照损伤非常小甚至可以忽略不计,非常适用于对材料表面的原位实时动力学成像研究。本实验室研究方向为最新 LEEM 技术的开发与在表面/界面物理中的应用。

RESEARCH INTERESTS:

The Lab's research focuses on surface dynamics and the development of novel low energy electron microscopy (LEEM) techniques. LEEM can image surface dynamics at real-time with high resolution, since the electron energy using for surface imaging is < 50 eV. These slow electrons can provide not only the surface morphology evolution during epitaxial growth but also the picture of electronic structures such as unoccupied bands and work function fluctuations.



Strongly-correlated and Topological Condensed
Matter Group
强关联和拓扑理论课题组

PI: Wei Zhu 朱伟

2003 年考入中国科学技术大学物理系,2007 年获得理学学士学位。2007-2012 年在中国科学技术大学合肥微尺度物质科学国家实验室攻读博士学位,从事单层石墨体系电子结构及量子输运性质的理论研究。2012 年起,分别在美国加州州立大学北岭分校、普林斯顿大学、洛斯阿拉莫斯国家实验室从事博士后研究工作,主要研究强关联体系中的拓扑有序相、量子纠缠在多体物理中的应用等方向。朱伟博士曾获中国科学院朱李月华优秀博士生奖(2010),中国科学院院长奖(2012),美国洛斯阿拉莫斯国家实验室 Director's Fellow (2016)。

Dr. Wei Zhu received his BS in applied physics and his PhD in physics, both from the University of Science and Technology of China. After getting his PhD degree, he performed the postdoctoral research at California State University Northridge, Princeton University and Los Alamos National Lab

课题组概况:

强关联和拓扑理论课题组主要从事凝聚态物理学相关的理论研究,致力于研究凝聚态物理学中的诸多关键问题。相关领域包括:1)强关联体系中的拓扑有序相,研究潜在的分数化激发和任意子统计,并探索实现量子计算的可能性;2)二维阻挫量子磁性系统中的物性和物态,例如量子自旋液体和各种新奇的磁有序状态等;3)强磁场下的分数量子霍尔效应,以及相关的晶格模型实现;4)量子临界行为,并发展独特的场论方法用以刻画量子相变;5)发展研究强关联体系的有效数值方法,并应用这些新概念和新方法系统地研究量子功能材料的物性,提高我们对材料反常或新奇行为的理解;6)探索量子多体体系中强关联与量子纠缠的深刻联系,发展基于量子纠缠理论研究强关联体系的系统理论框架。

RESEARCH INTERESTS:

Topology and Strongly-Correlated Condensed Matter Group focuses on quantum mechanical aspects of condensed matter systems in the areas of strongly-correlated and mesoscopic physics, as seen by the entangled electrons or spins. We are working on many aspects of the theoretical condensed matter physics, with a particular focus on topology, fractionalization and correlation in quantum many-body systems. The prospective goal of our research is to exploit quantum effects to enable quantum computation and/or quantum communication in next-generation electronics.





Homotopy Theory and Algebraic Topology Group 同伦论与代数拓扑课题组

Xing Gu 古星



Lie Groups and Homogeneous Dynamics Group 李群和齐性动力系统课题组 Lifan Guan

关力凡



PI IN MATHEMATICS

数学PI

Differential Geometry Group 微分几何课题组 Jiyuan Han



Harmonic Analysis 调和分析课题组 Zipeng Wang 王子鹏



Hodge Theory and Biration Geometry Group 霍奇理论和双有理几何课题组 Chuanhao Wei



Number Theory and Algebraic Geometry 数论和代数几何课题组 Yigeng Zhao 赵以庚



Quantum Optoelectronics Laboratory 数论与算术几何课题组 Yongqiang Zhao



Homotopy Theory and Algebraic Topology Group 同伦论与代数拓扑课题组

PI: Xing Gu 古星

2010 年毕业于南开大学数学科学学院,获理学学士学 位,2013年毕业于南开大学数学科学学院,获基础数学 硕士学位,2017 年毕业于美国伊利诺伊大学芝加哥分 校, 获博士学位。2017年11月-2020年1月于澳大利亚 墨尔本大学担任博士后,2020年2月-2021年1月在德 国马克斯普朗克数学研究所从事博士后研究工作,2022 年 4 月加入西湖大学。

Dr. Xing Gu was awarded a Bachelor's degree in science in 2010 by Nankai University, a master degree in theoratical mathematics in 2013 by Nankai University, and a PhD degree in mathematics in 2017 by the University of Illinois at Chicago. He subsequently worked as a postdoc at the University of Melbourne from November 2017 to January 2020, and at the Max Planck Institute from Febuary 2020 to January 2021. He joined the Wesklake University in April 2022.

课题组概况:

课题组主要研究方向: 同伦论以及李群和代数群的示 性类理论。

RESEARCH INTERESTS:

Dr. Xing Gu's primary research interests are homotopy theory and the theory of characteristic classes of Lie groups and algebraic groups.

WESTLAKE UNIVERSITY 师资力量





Lie Groups and Homogeneous Dynamics Group 李群和齐性动力系统课题组

PI: Lifan Guan 关力凡

2009 年毕业于北京林业大学数学系,获得理学学士学 位,2015年毕业于北京大学数学科学学院,获得基础数 学博士学位。从 2015 年至 2021 年,分别在北京国际数 学研究中心,约克大学以及哥廷根大学从事博士后研究 工作。任职理论科学研究院特聘研究员。

Dr. Lifan Guan received a Bachelor degree in Science from Beijing forestry university in 2009, and a Ph.D degree in Science from Peking University in 2015. From 2015 to 2021, he was doing postdoctoral research in BICMR, University of York and University of Goettin-

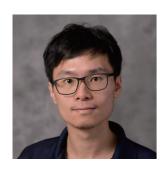
课题组概况:

课题组主要研究方向: 李群, 算术群以及相关的齐性 Dr. Lifan Guan's primary research interests are in Lie 动力系统和数论方面的问题。

RESEARCH INTERESTS:

groups, arithmetic groups and related problems in homogeneous dynamics and number theory.





Differential Geometry Group 微分几何课题组

PI: Jiyuan Han 韩骥原

2013 年毕业于威斯康星大学麦迪逊分校,获数学学士、计算机学士。2018 年毕业于威斯康星大学麦迪逊分校,获数学博士。2018-2021 年间在普渡大学担任 Golomb 访问助理教授。任职理论科学研究院特聘研究员。

Dr. Jiyuan Han received his Bahelor degrees in Mathematics and in Computer Science from University of Wisconsin Madison in 2013, and a Ph.D degree in Mathematics in 2018. He then worked at Purdue University as Golomb Visiting Assistant Professor of Mathematics from 2018-2021. He joined Westlake University in September 2021.

课题组概况:

课题组主要研究方向: 凯勒几何。

RESEARCH INTERESTS:

Dr. Jiyuan Han's primary research interests are in Differential Geometry, especially in Kähler Geometry.



Harmonic Analysis 调和分析课题组

PI: Zipeng Wang 王子鹏

2015年于剑桥大学获得数学博士学位。自2012年7月起,同时在美国普林斯顿大学开始博士课题研究,师从 Elias M. Stein, 并在其指导下完成博士论文。

Dr Zipeng Wang obtained his Ph. D degree from University of Cambridge in 2015. Since July 2012, he simultaneously studied at Princeton University and completed his doctoral thesis in the direction of professor Elias M. Stein.

课题组概况:

研究课题包括乘积空间上的分数次积分,分数次积分的离散形式,多系数傅里叶积分和震荡积分等。

RESEARCH INTERESTS:

Current research objectives include fractional integrals on product spaces, discrete analogue of fractional integrals, multi - parameter Fourier integrals and oscillatory integrals.





Hodge Theory and Biration Geometry Group 霍奇理论和双有理几何课题组

PI: Chuanhao Wei 魏传豪

2013 年获上海交通大学理学学士学位,2018 年获美国 犹他大学博士学位,之后入职美国石溪大学,任职西蒙 斯讲师(Simons Instructor)至2021 年。

Dr. Chuanhao Wei received his Bachelor's degree from Shanghai Jiao Tong University in 2013, and Ph.D. in Mathematics from the University of Utah. He then worked at Stony Brook University as Simons Instructor from September 2018 to May 2021.

课题组概况:

研究课题包括高维复代数簇的几何和分类,以及霍奇 理论的推广和应用。

RESEARCH INTERESTS:

Research interests are in the geometry and classification of higher-dimensional complex algebraic varieties; generalizations of Hodge theory and their applications.



Number Theory and Algebraic Geometry 数论和代数几何课题组

PI: Yigeng Zhao 赵以庚

本科就读于青岛大学, 2011 年获首都师范大学基础数学硕士学位, 2016 年毕业于德国雷根斯堡大学数学系。 之后在雷根斯堡大学从事博士后研究教学工作。 Dr. Yigeng Zhao completed his bachelor's program at Qingdao University. He received his master's degree in pure mathematics from Capital Normal University in 2011 and doctorate at the University of Regensburg in 2016. After that, he was a postdoc there.

课题组概况:

以代数几何为工具研究数论中的问题,特别是高维类域论和几何分歧理论。

RESEARCH INTERESTS:

Using algebraic geometry to solve arithmetic problems. More precisely:

- 1) Higher dimensional class field theory;
- 2) Geometric ramification theory.



Quantum Optoelectronics Laboratory 数论与算术几何课题组

PI: Yongqiang Zhao 赵永强

1999年毕业于山东大学数学学院,获理学学士学位; 2003年毕业于北京大学数学科学学院, 获理学硕士学 位。2003-2006年任教于山东大学数学学院,其中2003 年下半年赴新疆喀什师范学院支教。2013年毕业于美 2013-2016年于加拿大滑铁卢大学和Centre de 2016年-2017年4月,为德国波恩马克斯普朗克数学研 究所访问学者。

Dr. Yongqiang Zhao is a principal investigator of the School of Science at Westlake University and of the Institute of Science, Westlake Institute for Advanced Study. He was a visiting research fellow at Max Planck Institute for Mathematics, Germany, from 2016 to April, 2017. From 2013 to 2016, he worked as the Postdoctoral 国威斯康星大学麦迪逊分校数学系,获博士学位。 Fellow at University of Waterloo and Centre de Recherches Mathématiques in Canada. He was a lecturer at School of Mathematics, Shandong University, from 2003 to Recherches Mathematiques 研究所进行博士后研究。 2006, during which he volunteered to teach at Kashi Normal University, Xinjiang, in 2003. He holds a PhD. degree from University of Wisconsin-Madison in 2013, a M.A. degree from Peking University in 2003 and a B.S. degree from Shandong University in 1999.

课题组概况:

- 1. 算术统计,有限域上代数曲线计数,数域类群 torsion 子群的上界;
- 2. 代数簇上有理点和整点的计数问题, Manin 猜想;
- 3. 代数曲线的 Syzygy 理论,数的几何;
- 4. 解析数论。

RESEARCH INTERESTS:

- 1) Arithmetic statistics, counting algebraic curves over finite fields, upper bounds of torsion subgroups of the class groups of number fields;
- 2) Counting rational points or integral points on algebraic varieties, Manin's conjecture;
- 3) Syzygy theory of algebraic curves, geometry of numbers;
- 4) Analytic number theory.

SCHOOL OF 理学院 SCIENCE



Executive Dean 执行院长 Li Deng 邓力



Associate Dean for Administration 行政副院长

Guochang Zhang 张国昌



Assistant Dean, Office Director 院长助理、办公室主任

Hanghang Lan 兰行行



ADMINISTRATION

行政团队

Human Resources Assistant 人事秘书

Lingli Chen 陈伶俐



Scientific Assistant 科研秘书

Qiuyan Yang 杨秋艳



Academic Services and Student Affairs Assistant 研究生秘书

Xiangyi Xiao 肖向一



Financial Assistant 财务秘书

Sai Jiang



Administrative Assistant 行政秘书

Keyu Chen 陈柯宇



Scientific Assistant 科研秘书

Xiaolin Wu 吴晓琳



Lab Support Assistant 实验室管理秘书

He Zhang



Graduate Student Counselor 研究生辅导员

Chunlu Zhu 朱春鹭



TALENT RECRUITMENT

人才招聘



Faculty Recruitment 学术人才招聘

理学院计划在未来几年内招聘约90名长聘和准聘教职人员。我们致力于在全球范围内寻找具有创新思维的教师和学者,通过学术研究、跨学科合作和创新教育的结合,推动人类知识前沿的进步,促进人类生活条件的可持续改善。

The School of Science plans to recruit around 90 tenure-track and tenured faculty within the next few years. We seek teachers/scholars around the world with innovative ideas to advance the frontiers of human knowledge and to promote sustainable improvement of human living conditions. The pursuit of these ideas through scholarly research, interdisciplinary collaboration and innovative education is the focus of our mission.

招聘学科方向

欢迎数学、物理和化学方向的杰出学者申 请相应职位。

招聘岗位

- 1. 长聘教职/Tenured Faculty: 主要包括副教授、教授、讲席教授
- (1)应聘人应在国际一流高校、科研院所担任终身副教授以上或相当职务,具有国际一流的学术水平;
- (2)承诺通过评选后全职来西湖大学工作。

Your Opportunity and Qualifications

Faculty Positions are open at four distinct ranks: Assistant Professor, Associate Professor, Full Professor, and Chair Professor.

Tenured faculty: Associate Professor, Full Professor, or Chair Professor

- The applicant should have world-class academic achievements and hold tenured Associate Professorship (or above) or equivalent positions in world-class universities or research institutes.
- The applicant promises to work full time at Westlake upon acceptance of the offer.

2. 准聘教职 /Tenure-Track Faculty: 主要包括助理教授、副教授

- (1)具有博士学位;
- (2) 应聘人学术水平和资历应达到担任国际 知名高校助理教授或副教授职务的相应标 准:
- (3)承诺通过评选后全职来西湖大学工作,首聘期5年。

薪酬福利与其他待遇

1. 薪酬和福利待遇

西湖大学将参照国际一流大学相应职位,根据具体情况,为入选者提供有国际竞争力的、能够使其安心学术的协议薪酬和福利待遇。对于已获得国际一流大学教职职位的申请人,将提供同样或更优越的薪酬福利待遇。

2. 科研保障

西湖大学将参照国际一流大学相应职位提供 充足的科研启动经费;同时,将视引进人才 的实际科研工作需要,在实验室空间、团队配 备、博士生招生指标等方面给予充分支持。

3. 安家补助

协助解决住房问题,或提供相应的住房补贴。

4. 其他待遇

西湖大学将为引进人才及其配偶、未成年子 女购买高端商业医疗保险,协助解决子女入 学入托问题,为引进人才解决后顾之忧。 Tenure-track faculty: Assistant Professor or Associate Professor

- The applicant should have a doctorate degree.
- The applicant should have academic achievements equivalent to those of the Assistant Professor or Associate Professor in world-class universities.
- The applicant promises to work full time at Westlake upon acceptance of the offer. The first appointment will be five years.

Salary, Benefits and Start-up package

Each faculty member will receive an internationally competitive salary and a fringe benefits package that includes a generous housing option, a high-end medical care plan for the entire family, etc. These benefits have been designed with references to those of the research private universities in the US.

Each faculty member is provided with an internationally competitive start-up package that includes long-term and sufficient research funds, ample laboratory space, excellent equipment and research support. Stable financial support safeguards every research project that is designed to push the envelope of human knowledge.

WESTLAKE UNIVERSITY 人才招聘

申请方式

1. 请将个人简历、研究内容、研究计划(3-5页)等材料(请使用PDF格式)发至西湖大学学术人才招聘邮箱:

talents@westlake.edu.cn

邮件主题请标明"姓名+应聘学院+学科方向";申请人请三位推荐人将推荐信直接发送至上述邮箱。

- 2. 建议应聘者建立个人"谷歌学术"主页并在个人简历中标注。
- 3. 我们会通过学术人才招聘邮箱及时解答 应聘问题和相关政策咨询。

西湖大学全球学术人才招聘常年进行中, 诚邀海内外各层次杰出学术人才加盟!

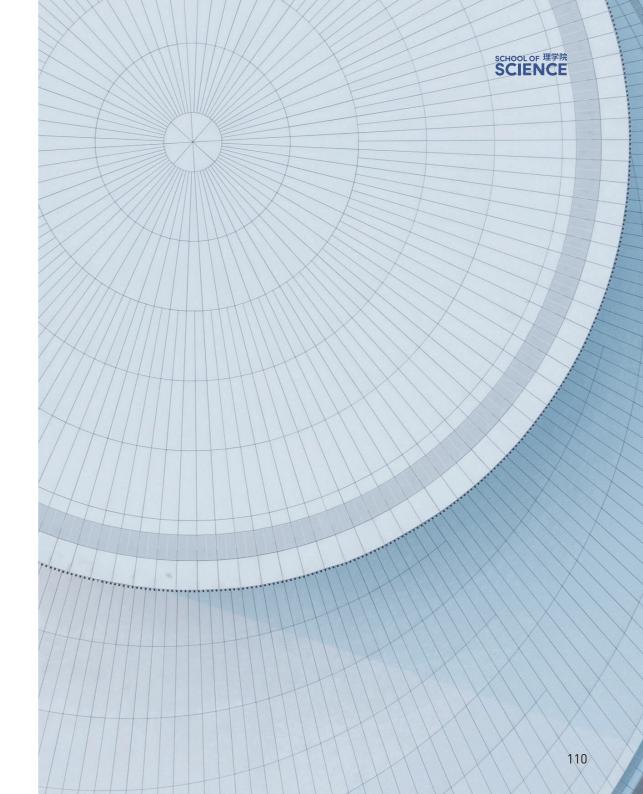
How to apply

Please submit your complete application package including the following materials as a single pdf. file in English to

talents@westlake.edu.cn

In the subject line please indicate "Name +School + Department + Research field".

- Cover letter
- Up-to-date CV with a publication list and Google Scholar profile link
- Statement of Research Summary and Research Proposal (3-5 pages)
- Arrange for 3 letters of reference (to be sent by referees directly to the above email address)





CAMPUS LIFE

学院生活





西湖大学2019化学研讨会志愿者(2019年9月)

VOLUNTEERS AT THE 2019 CHEMISTRY SYMPOSIUM OF WESTLAKE UNIVERSITY (SEPTEMBER 2019)



理学院物理方向开放日活动(2020年10月)
PHYSICS OPEN DAY, SCHOOL OF SCIENCE (OCTOBER 2020)



理学院HAPPY HOUR学术交流活动(2019年11月) HAPPY HOUR, SCHOOL OF SCIENCE (NOVEMBER 2019)



理学院教职工冬游·乌镇(2019年12月) FACULTY WINTER OUTING, WUZHEN (DECEMBER 2019)





国际极化激元中心秋游活动(2020年10月)

INTERNATIONAL CENTER FOR POLARITONICS AUTUMN OUTING (OCTOBER 2020)



理学院工会春游·巧克力小镇(2021年5月) FACULTY SPRING OUTING, CHOCOLATE TOWN (MAY 2021)



理学院党支部活动·千岛湖龙山岛(2021年6月)
THE PARTY BRANCH EVENT, LONGSHAN ISLAND (JUNE 2021)



西湖大学新年晚会·DANGEROUS PROBLEM (2020年1月)
WESTLAKE UNIVERSITY NEW YEAR GALA, DANGEROUS PROBLEM (JANUARY 2020)





国际象棋一对十车轮战(2021年6月)

"1 VS 10"SIMULTANEOUS CHESS EVENT (JUNE 2021)



足球爱好者欧洲杯观赛活动(2021年6月)

FOOTBALL FANS WATCHING EURO CUP (JUNE 2021)



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CONTACT US

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Website: https://www.westlake.edu.cn/academics/School_of_Science/



学院公众号

