



陕西师范大学  
SHAANXI NORMAL UNIVERSITY



化学化工学院  
School of Chemistry & Chemical Engineering

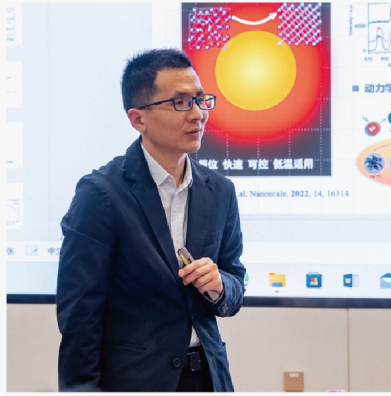
10 / 2023

# 光子鼻与分子材料团队

## Photonic Nose and Molecular Materials Group

# 简报

## Newsletter



## The Third Workshop on *Frontiers of Applied Surface and Colloid Chemistry* Film-Based Fluorescent Sensors and Molecular Materials



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与伊万诺沃国立化工大学开展双边合作交流论坛

Attending bilateral cooperation and exchange forum at Ivanovo State University of Chemical Engineering

## 房喻院士团队一行访问俄罗斯 Fang Yu heads SNNU delegation to Russia

应莫斯科国立大学化学系、伊万诺沃国立化工大学、俄罗斯科学院东方文献研究所等俄罗斯科研院所的邀请，陕西师范大学新概念传感器与分子材料研究院房喻院士带领副院长丁立平教授、刘凯强教授、刘太宏副教授以及外国语学院俄语翻译孟霞教授、俄籍外教娜塔莎教授代表团一行六人，从2023年9月26日开始先后赴俄罗斯莫斯科、伊万诺沃、圣彼得堡等地进行了为期8天的学术交流访问。

在9月27日抵达莫斯科后，代表团先后访问了莫斯科国立大学化学系的实验室及科技博物馆、伊万诺沃国立化工大学、俄罗斯科学院东方文献研究所等地，参加了由莫斯科国立大学、伊万诺沃国立化工大学、俄罗斯科学院东方文献研究所举办的学术交流活动。房喻院士作了题为 Film-based Fluorescent Sensors: From Sensing

Materials to Hardware Structures 的学术报告，报告阐述了研究院成立前后的20多年间，团队在薄膜荧光传感理论与技术方面作出的开拓性贡献。报告反响热烈，与会俄罗斯学者纷纷与房喻院士展开了讨论与互动。

丁立平教授、刘太宏副教授分别作了题为 Cross-reactive Fluorescent Sensors and Discriminative Applications 和 Tunable Excited-State Fluorescence and Sensing Applications 的学术报告，分别从交互动应荧光传感和双光子技术及理论方面进行了概括性阐述，体现了团队在荧光领域研究的传承与创新。刘凯强教授就功能凝胶材料创制、性能调控及其限域结晶的挑战与作用机制，作了题为 Controlled Crystallization in Supramolecular Gel 的学术报告。报告引起俄罗斯学者的极大兴趣和关注。

此次访问，代表团全体成员秉承着“敬业爱国、科学严谨”的工作作风，与俄罗斯科研院校单位就未来双边合作意向及合作模式，开展了多次深入具体的讨论与互动，初步达成意向由房喻院士和伊万诺沃化工大学奥斯卡·考夫曼院士牵头成立双边联合研究中心，并在明年初举办中俄双边研讨会，为今后长期性跨国界深度合作学术合作奠定了基础。

From September 26, 2023, at the invitation of the Department of Chemistry of Moscow State University, Ivanovo State University of Chemical Engineering, and the Institute of Oriental Literature of the Russian Academy of Sciences, a six member Shaanxi Normal University delegation headed by Prof. Fang Yu of the Institute of New Concept Sensors and Molecular Materials, along with vice dean Prof. Ding Liping, Prof. Liu Kaiqiang, and





与莫斯科国立大学化学系领导和教师座谈并合影  
Meeting with officials and teachers of Chemistry Department of Moscow State University



房喻院士在伊万诺沃国立化工大学签字留念  
Fang Yu signing guest book at Ivanovo State University of Chemical Engineering

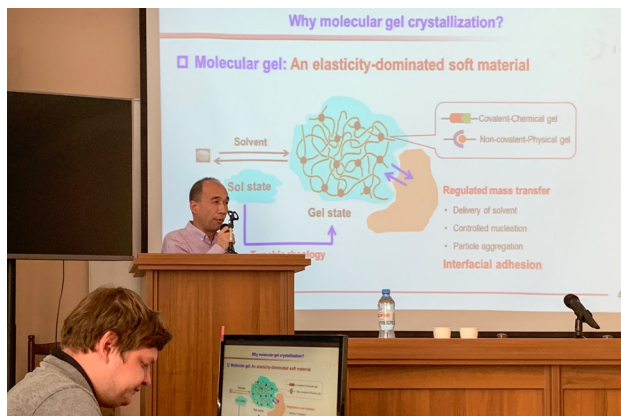
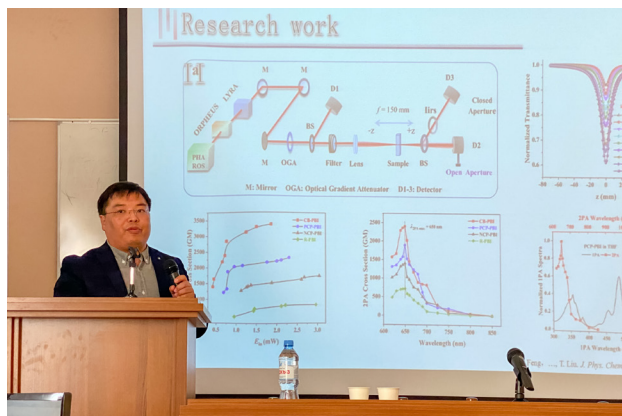




参观访问伊万诺沃化工大学  
Visiting Ivanovo University of Chemical Engineering



与伊万诺沃国立化工大学和俄罗斯科学院溶液化学研究所的教师学术交流  
Exchange with teachers of Ivanovo State University of Chemical Engineering and the Institute of Solution Chemistry, RAS



Assoc.Prof. Liu Taihong, as well as Prof. Meng Xia and Prof. Natasha, Russian interpreter and Russian teacher from the School of Foreign Languages, visited Moscow, Ivanovo and St. Petersburg in Russia for an eight-day academic exchange.

After arriving in Moscow on September 27, the delegation visited the laboratories of the Department of Chemistry and the Science and Technology Museum of Moscow State University, Ivanovo State University of Chemical Technology, and the Institute of Oriental Literature of the Russian Academy of Sciences, and took part in the academic exchanges organized by Russian hosts. Prof. Fang Yu gave a report titled “Film-based Fluorescent Sensors: From Sensing Materials to Hardware Structures”, in which he elaborated the

pioneering contributions made by his group in the theory and technology of film fluorescent sensing during the 20 years before and after the establishment of the INCSMM. The report was warmly received by Russian scholars, who had discussions and interactions with Fang Yu.

Prof. Ding Liping and Assoc. Prof. Liu Taihong gave presentations titled “Cross-reactive Fluorescent Sensors and Discriminative Applications” and “Tunable Excited-State Fluorescence and Sensing Applications”, respectively, presenting a general exposition of the interactive response fluorescence sensing and two-photon technology and theory, reflecting the group’s heritage and innovation in the field of fluorescence research. Prof. Liu Kaiqiang gave a report titled “Controlled Crystallization in Supramolecular Gel”, expounding on the

challenges and mechanisms of creation, performance regulation and domain-limited cry-stallization of functional gel materials. The reports aroused great interest and attention from Russian scholars.

During this visit, the delegation carried out discussions and interactions with Russian institutions on the future bilateral cooperation intentions and modes of cooperation, and preliminarily reached an agreement to set up a bilateral joint research center, which is to be led by Prof. Fang Yu and Academician Oskar Kaufman of Ivanovo University of Chemical Technology, and to hold a bilateral symposium between China and Russia at the beginning of next year, thus laying the foundation of the long-term transnational in-depth academic cooperation in the future.







## 第三届应用表面与胶体化学前沿论坛举行 The Third Workshop on Frontiers of Applied Surface and Colloid Chemistry held

2023年10月28日上午,为期三天的第三届应用表面与胶体化学前沿论坛在陕西师范大学新概念传感器与分子材料研究院报告厅举行了开幕式。来自中国、英国、澳大利亚和新加坡的专家学者、团队全体教师和研究生及国际来华留学生约100余人参加了此次论坛,开幕式由副院长丁立平教授主持。

开幕式上,研究院院长房喻院士与陕西师范大学科技处处长、化学化工学院院长薛东教授分别致辞,对与会嘉宾与广大师生表示欢迎,并祝愿论坛圆满成功。

论坛报告分两个时段,上午第一时段英国巴斯大学化学系 Tony D. James 教授、香港理工大学黄维扬教授、澳大利亚新南威尔士大学赵川教授、新加坡技术与设计大学刘晓刚教授分别作了题为 Fluorescent Chemosensors: The Past, Present and Future、Recent Advances of 2D Metal-Complex Nanosheets、Single-Atom Catalysts for Electroreduction of CO<sub>2</sub> 与 Descriptors for Intramolecular Bending and Hydrogen Bonding-Induced Quenching in Functional Fluorescent

Materials 的学术报告,报告内容涵盖了荧光化学传感器的发展概括与发展、二维金属石墨缺的研究新进展、单原子催化及其应用以及功能荧光材料中非共价键效应等方向,各具特色的报告吸引与会师生与报告人进行了互动与交流。最后,ACS出版部编辑李萌博士作了题为 Mastering the Art of Scholarly Publishing with ACS Journals 的报告,讲解了撰写英文稿件时需要注意的关键点,提供了稿件处理、应对编辑与审稿人等实用技巧,并就新颖性彰显、文章申诉等进行了答疑解惑,提出了建议。第一时段的报告先后由丁立平教授与彭浩南教授主持。

下午第二时段的报告,俄罗斯科学院的 Nugzar Mamardashvili 教授、莫斯科国立大学的 Mikhail K. Beklemishev 教授、俄罗斯科学院克雷斯托夫溶液化学研究所的 Antina Lyubov Anatolevna 高级研究员及伊万诺沃国立化学技术大学 Usacheva Tatyana 教授和 George Gamov 博士五位学者,以线上会议的形式分别作了题为 Design of Tetrapyrrole Architectures with Well-Defined Geometries and Optimization

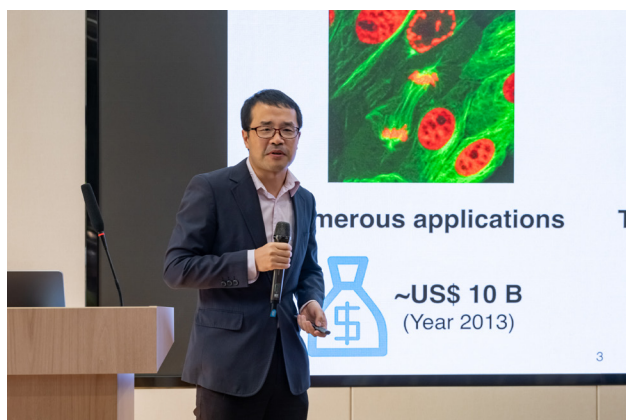
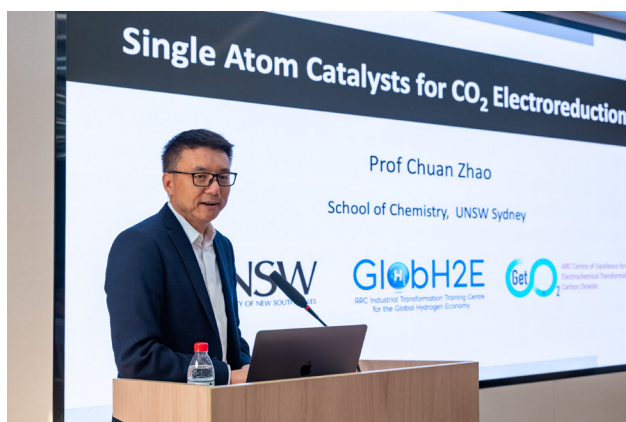
of the Process of Thin-Film Structures Formation by Them、Reaction-Based Optical Sensing Strategy: Use of Aggregation and Redox Reactions of Carbocyanine Dyes、BODIPY-Based Fluorescence Materials、Selective Host-Guest Complex Formations of Crown Ethers and Cyclodextrins with Biologically Important Molecules and Ions in Mixed Solvents、Fluorescence of Pyridoxal 5'-Phosphate Hydrazones in Solid Phase: Shedding Light on the Differences in Emission of Substituted Heterocyclic Derivatives 的学术报告,报告内容主要集中于分子组装及其荧光传感行为的研究。第二时段的报告先后由刘凯强教授、刘太宏副教授主持。

报告结束后,与会专家学者还进行了自由讨论交流等学术活动,并参观了研究院实验室和师大校园。

此次研讨会由应用表面与胶体化学学科创新引智基地、应用表面与胶体化学教育部重点实验室、陕西师范大学新概念传感器与分子材料研究院和化学化工学院联合主办。







On October 28, 2023, the Third Workshop on Frontiers of Applied Surface and Colloid Chemistry was held in the lecture hall of the Institute of New Concept Sensors and Molecular Materials at Shaanxi Normal University. More than 100 experts and scholars from China, UK, Australia, Singapore and Russia, INCSMM faculty members, graduate students and foreign students participated

in the workshop.

At the opening ceremony anchored by INCSMM vice dean Prof. Ding Liping, INCSMM dean Prof. Fang Yu, and Prof. Xue Dong, director of SNNU Department of Science and Technology and dean of the School of Chemistry and Chemical Engineering, delivered speeches respectively, welcoming the guests, teachers and students, and wishing the

workshop success.

The presentations were divided into two sessions. In the first session in the morning, Prof. Tony D. James from Department of Chemistry, University of Bath, UK, Prof. Wai-Yeung Wong of Hong Kong Polytechnic University, Prof. Chuan Zhao of University of New South Wales, Australia, and Prof. Xiaogang Liu of Singapore University







of Technology and Design, presented reports on “Fluorescent Chemosensors: The Past, Present and Future”, “Recent Advances of 2D metal-complex Nanosheets”, “Single-Atom Catalysts for Electroreduction of Metal CO<sub>2</sub> and Descriptors for Intramolecular Bending” and “Hydrogen Bonding-Induced Quenching in Functional Fluorescent Materials”, respectively. The reports cover the development of fluorescence chemical sensors, new research progress of two-dimensional metal graphite deficiency, single atom catalysis and its application, and non-covalent bond effect of functional fluorescent materials, etc. The speakers interacted with the teachers, students present after the reports. Finally, ACS Publications editor Dr. Meng Li gave a presentation titled “Mastering the Art of Scholarly Publishing with ACS Journals”, explaining the key points to pay attention to when writing English manuscripts. She also provided practical skills for manuscript processing, dealing with editors and reviewers, and answered

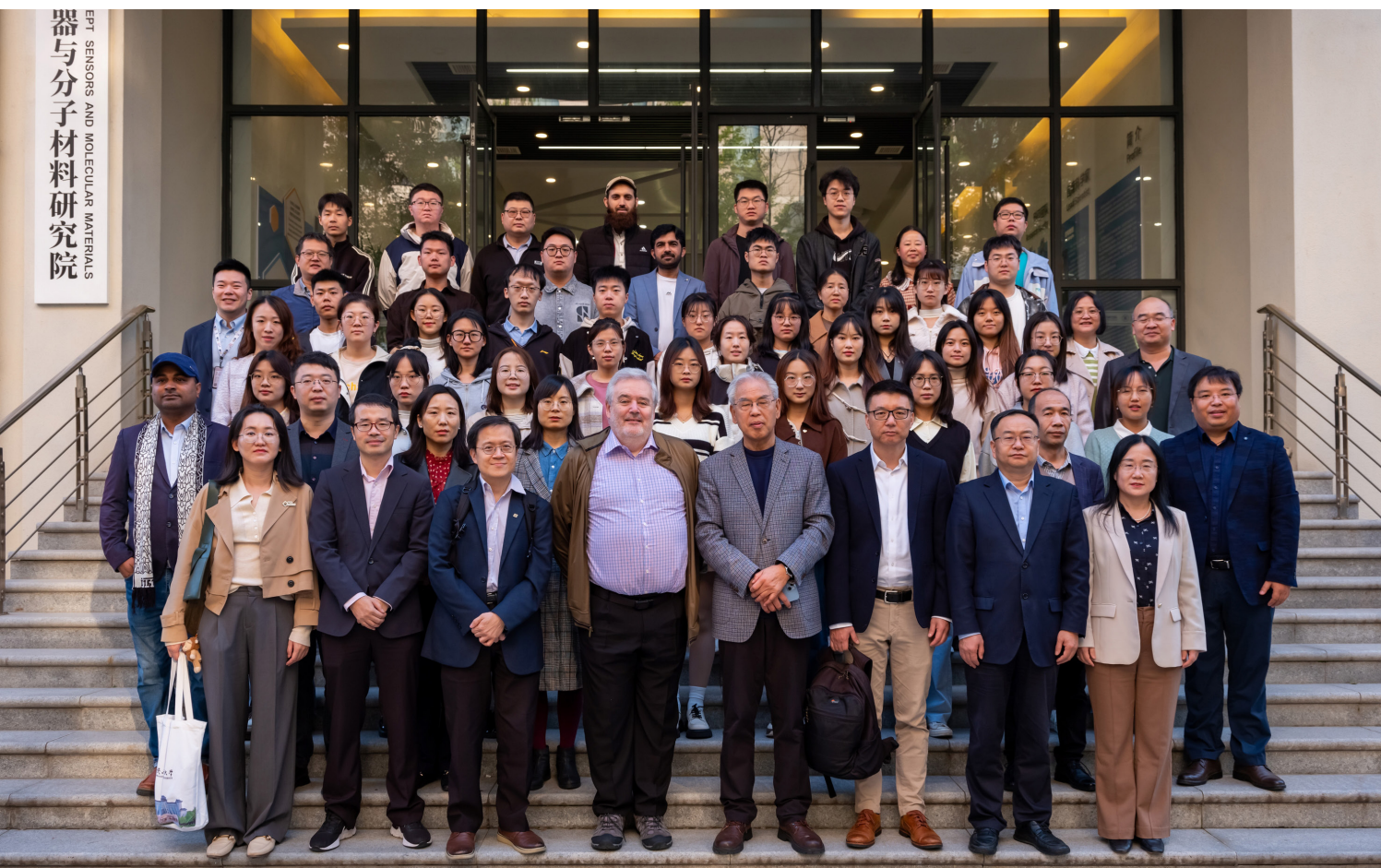
questions about novelty and appeals, and put forward suggestions. The first session of the presentation was moderated by Prof. Ding Liping and Prof. Peng Haonan.

For the second session in the afternoon, Prof. Nugzar Mamardashvili of Russian Academy of Sciences; Prof. Mikhail K. Beklemishev of Moscow State University; Senior Researcher Antina Lyubov Anatolevna of Krystov Institute of Solution Chemistry, Russian Academy of Sciences, and Prof. Usacheva Tatyana and Dr. George Gamov of Ivanovo State University of Chemical Technology presented reports on “Design of Tetrapyrrole Architectures with Well-Defined Geometries and Optimization of the Process of Thin-Film Structures Formation by Them”, “Reaction-Based Optical Sensing Strategy: Use of Aggregation and Redox Reactions of Carbocyanine Dyes”, “BODIPY-Based Fluorescence Materials”, “Selective Host-Guest Complex Formations of Crown Ethers and Cyclodextrins with Biologically Important Molecules

and Ions in Mixed Solvents”, and “Fluorescence of Pyridoxal 5'-Phosphate Hydrazones in Solid Phase: Shedding Light on the Differences in Emission of Substituted Heterocyclic Derivatives”. Their reports focus on molecular assembly and its fluorescence sensing behavior. The second session was moderated by Prof. Liu Kaiqiang and Assoc. Prof. Liu Taihong.

After the reports, the participating experts and scholars also engaged in academic activities such as free discussion and exchange, and visited the INCSMM laboratories and SNNU campus.

The workshop was jointly sponsored by the Overseas Expertise Introduction Center in Applied Surface and Colloid Chemistry, the Ministry of Education Key Laboratory of Applied Surface and Colloid Chemistry, the Institute of New Concept Sensors and Molecular Materials and the School of Chemistry and Chemical Engineering of Shaanxi Normal University.





## 中国科学院西安光机所与陕西师范大学超快分子科学联合实验室揭牌

Xi'an Institute of Optics and Precision Mechanics, CAS and Shaanxi Normal University Ultrafast Molecular Science Joint Laboratory inaugurated

2023年10月31日上午，“中国科学院西安光学精密机械研究所-陕西师范大学超快分子科学联合实验室”揭牌仪式在陕西师范大学新概念传感器与分子材料研究院报告厅举行。

研究院院长、中国科学院院士房喻教授，西安光机所所长马彩文研究员，光子科学与技术部副部长、阿秒科学与技术中心常务副主任付玉喜研究员，陕西师范大学副校长杨祖培教授，科学技术处处长、化学化工学院院长薛东教授及双方相关部门负责人

出席揭牌仪式。仪式由化学化工学院党委书记高玲香教授主持。

揭牌仪式上，杨祖培、马彩文分别致辞。房喻、马彩文共同为联合实验室揭牌。联合实验室聘任房喻院士、马彩文研究员为学术顾问；聘任西安光机所付玉喜研究员、陕西师范大学丁立平教授为主任；聘任付玉喜研究员为陕西师范大学兼职教授。双方负责人分别为联合实验室相关人员颁发聘书。

超快分子科学联合实验室以中国科学院西安光学精密机械研究所阿秒

科学与技术研究中心和陕西师范大学新概念传感器与分子材料研究院的现有条件为基础合作组建，模拟实体化运行，将主要围绕飞秒-阿秒超快动力学探测、荧光传感和荧光分子光物理过程、光催化和光化学动力学机理、表界面材料控制制备与功能应用动力学过程等领域联合开展基础研究、关键技术攻关及科技成果转化。

揭牌仪式结束后，付玉喜研究员和陕西师范大学边红涛教授分别作了题为“阿秒光源-分子的‘高速照相机’



和“受限体系的结构和超快红外光谱研究”的学术报告。

On October 31, 2023, the inaugural ceremony of the Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences - Shaanxi Normal University Joint Laboratory for Ultrafast Molecular Science was held in the lecture hall of the Institute of New Concept Sensors and Molecular Materials, Shaanxi Normal University.

INCSMM dean Prof. Fang Yu, XIOPM director Researcher Ma Caiwen, Photon Science and Technology Department vice director and Attosecond Science and Technology Center executive vice director Researcher Fu Yuxi, SNNU vice president Prof. Yang Zupei, Department of Science and Technology director and School of Chemistry and Chemical

Engineering dean Prof. Xue Dong, and heads of relevant departments of both sides attended the unveiling ceremony. The ceremony was presided over by SCCE Party Committee secretary Prof. Gao Lingxiang.

At the ceremony, Yang Zupei and Ma Caiwen delivered speeches respectively. Fang Yu and Ma Caiwen jointly unveiled the plaque of the joint laboratory. The joint laboratory appointed Fang Yu and Ma Caiwen as academic advisors; Fu Yuxi and Ding Liping were appointed as directors; Fu Yuxi was also appointed as a part-time Professor of Shaanxi Normal University. Other personnel of the joint laboratory were also presented letters of appointment.

The Ultrafast Molecular Science Joint Laboratory was established based on the existing conditions of XIOPM's

Attosecond Science and Technology Research Center and SNNU's Institute of New Concept Sensors and Molecular Materials. It will jointly carry out basic research, key technology research and scientific and technological achievements transformation mainly in the fields of femtosecond-attosecond ultrafast kinetic detection, fluorescence sensing and photophysical processes of fluorescence molecules, photocatalysis and photochemical kinetic mechanism, surface interface material control preparation and functional application kinetic processes.

After the ceremony, Fu Yuxi and SNNU Professor Bian Hongtao presented academic reports titled "Attosecond Light Source - 'High-speed Camera' for Molecules" and "Structure of Constrained Systems and Ultrafast Infrared Spectroscopy Studies" respectively.





# 陕西师范大学杨祖培副校长为房喻院士、 马彩文研究员颁发联合实验室学术顾问聘书





## 房喻院士出席 2023 年国际光化学技术与产业大会并作报告

### Fang Yu presents at 2023 International Conference on Photochemistry and Industry



2023 年 10 月 11 日，房喻院士出席了在武汉举办的 2023 年国际光化学技术与产业大会，并作题为“薄膜荧光传感器——从概念到实际应用”的主旨报告。

会议以“光耀未来——赋能绿色产业发展”为主

题，诺贝尔奖获得者 David W. C. Macmillan、Benjamin List，吴骊珠院士、冯小明院士和 Munetaka Akita 穗田宗隆教授分别作大会主旨报告。来自中国、美国、德国、英国、瑞士、法国、加拿大、荷兰、日本、新加坡等 15 个国家和地区的 800 余名代表参加了会议。

On October 11, 2023, Prof. Fang Yu attended the 2023 International Conference on Photochemistry and Industry held in Wuhan, and delivered a keynote speech titled “Film-based Fluorescent Fluorescent Sensors - From Concepts to Real-Life Applications”.

At the conference themed “Enlighten the future - Empowering the development of green industry”, Nobel Prize laureates David W. C. Macmillan and Benjamin List, CAS Academicians Wu Li Zhu and Feng Xiaoming and Prof. Munetaka Akita delivered keynote speeches. More than 800 delegates from 15 countries and regions, including China, United States, Germany, United Kingdom, Switzerland, France, Canada, the Netherlands, Japan and Singapore, attended the conference.

## 房喻院士做客河北师范大学科技大讲堂并作专题报告

### Fang Yu presents at S&T Lectures of Hebei Normal University

2023 年 10 月 17 日上午，房喻院士应邀赴河北师范大学做客“科技大讲堂”，为河北师大师生作了题为“基础科学与可持续发展”的专题报告。房喻院士从基础科学的价值展开报告，结合世界发达国家对基础研究的重视程度及自己在化学领域的研究经历，强调了基础研究的重要性。他从老一辈科学家的家国情怀谈到教育的重要性，指出教育对提高人民综合素质、促进人的全面发展、增强中华民族创新创造力、实现中华民族伟大复兴具有决定性意义。

同日，房喻院士还出席了河北师范大学“2023 化学学科建设与学术前沿研讨会”，并作为大会主席致开幕辞。

On October 17, 2023, Prof. Fang Yu presented a report titled “Basic Science and Sustainable Development” at the Science and Technology Auditorium at Hebei Normal University for HNU teachers and students.

Starting from the value of basic science, Fang Yu combined the importance of basic research in developed countries with his own research experience in the field of chemistry, and emphasized the importance of basic research. He talked about the importance of education from the patriotic feelings of the older generation of scientists, and highlighted the decisive significance of education



to improving the comprehensive quality of the people, promoting the all-round development of people, enhancing the innovation and creativity of the Chinese nation, and realizing the great rejuvenation of the Chinese nation.

On the same day, Fang Yu also attended the 2023 Chemistry Discipline Construction and Academic Frontier Seminar of Hebei Normal University, and delivered an opening speech as the chairman of the seminar.

## 房喻院士出席西安市“弘扬科学家精神”重点活动启动仪式

Fang Yu attends launch ceremony of “Carrying Forward the Spirit of Scientists” activity

2023年10月19日上午，西安市科学技术协会主席、中国科学院院士房喻教授出席了在西安科学家博物馆举办的2023年西安市“弘扬科学家精神”重点活动启动仪式，并为西安科学家博物馆题写寄语。

房喻院士与西安市科学技术协会党组书记、常务副主席耿占军等嘉宾共同启动了2023年西安市“弘扬科学家精神”朗诵大赛及“未来科学栋梁成长计划”项目，并为西安交通大学陈学俊院士纪念馆、西安工业大学兵器小镇科普中心、中科玩芯科技馆西安总馆、西安九号宇宙科技馆授牌，及为西安交通大学附属中学等二十一所“西安科学家博物馆基地校”学校授牌。

房喻院士还为西安科学家博物馆题写了寄语：“弘扬科学家精神是促进快速发展、可持续发展的必须。祝西安科学家博物馆在弘扬科学家精神中发挥更大作用。”

此次活动由西安市科学技术协会主办，西安市学会科技服务中心、沣东新城先进制造产业园发展中心联合承办。来着西安市科学技术协会、西安电子科技大学、长安大学、市教育局、市科技局相关领导及各区县科协代表，科学家精神教育基地、科普教育基地负责人，及交大附中等34所中小学校领导等共150余人出席。

On October 19, 2023, Prof. Fang Yu, president of Xi'an Science and Technology Association and academician of Chinese Academy of Sciences, attended the launch ceremony of 2023 Xi'an "Carrying Forward the Spirit of Scientists" key activities held in Xi'an Scientists Museum, and wrote a message for the Museum.

Fang Yu and XSTA party secretary, executive vice president Geng Zhanjun and other guests jointly launched the 2023 Xi'an "Carrying Forward the Spirit of Scientists" recitation contest and

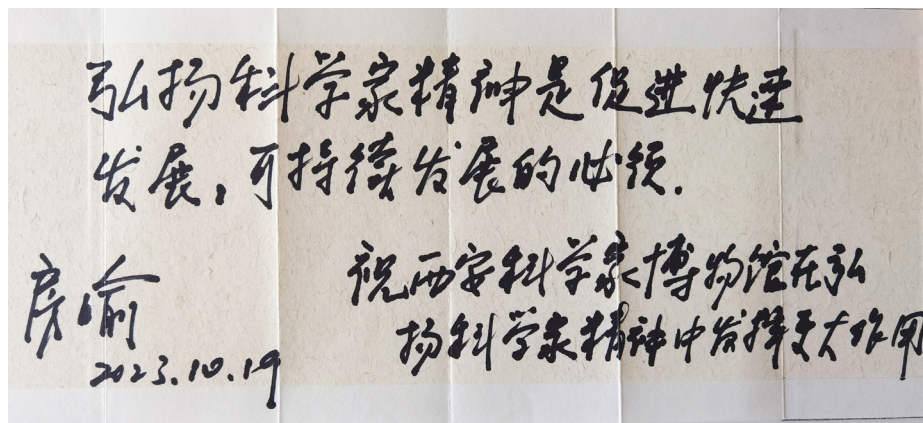


the “Future Scientists Growth Plan” project, and awarded plaques to the Memorial Hall of Academician Chen Xuejun of Xi'an Jiaotong University, the Science Popularization Center of Weaponry Town of Xi'an Technological University, the Xi'an Hall of CAS Metavas Technology Museum, Xi'an No. 9 Space Science and Technology Museum, and to 21 schools which are named “Xi'an Scientist Museum Base School” such as the Affiliated High School of Xi'an Jiaotong University.

Fang Yu also wrote a message for Xi'an Scientist Museum: “Carry forward the spirit of scientists is necessary for promoting rapid and sustainable development. May the Xi'an Scientists Museum play a greater role in promoting the spirit of scientists.”

More than 150 officials and representatives from XSTA, Xidian University, Chang'an University, Xi'an Municipal Education Bureau, Xi'an Municipal Science and Technology Bureau, district and county Science and Technology Associations, Scientists Spirit Education Bases, Science

Popularization Education Bases, and 34 primary and secondary schools attended the event, which was sponsored by Xi'an Science and Technology Association and jointly hosted by Xi'an Society Science and Technology Service Center and Fengdong New City Advanced Manufacturing Industrial Park Development Center.





# 房喻院士应邀出席陕西理工大学校庆大会并作报告

## Fang Yu speaks at anniversary celebration conference of Shaanxi University of Technology



2023年10月20日上午，房喻院士应邀出席陕西理工大学庆祝建校65周年暨高质量发展大会，并作了题为“从基础研究的作用看教育与人才培养的重要性”的专题报告。

房喻院士从基础研究的作用着手，对比中外国家对教育和科技的重视程度，从四个角度分析了教育与人才培养的重要性。一是基础研究是技术创新的源头；二是基础研究需要在鼓励创新、包容失败的科研环境下开展；三是提高公众对科学重要性的理解是建设创新型国家、实现中华民族伟大复兴的必须；四是科学教育、人才培养事关创新文化营造和科技土壤培育，需要全社会给予更多关注和支持。

On October 20, 2023, Prof. Fang Yu attended the Celebration of the 65th Anniversary and High-quality Development Conference of Shaanxi University of Technology, and gave a report titled “The Importance of Education and Talent Cultivation --- from the Role of

Basic Research”.

Starting from the role of basic research, Fang Yu compared the importance given to education and science and technology in China and abroad, and analyzed the importance of education and talent cultivation from four perspectives. First, basic research is the source of technological innovation; Second, basic research needs to be carried out in an environment that encourages

innovation and tolerates failure. Third, improving the public’s understanding of the importance of science is necessary to build an innovative country and realize the great rejuvenation of the Chinese nation; and Fourth, science education and talent cultivation are related to the creation of an innovative culture and the building of scientific and technological foundation, which requires more attention and support from the whole society.



## 团队师生参加第九届陕西省物理化学发展研讨会

### Fang Group participate in 9th Seminar on Shaanxi Province Physical Chemistry Development

2023年10月20至22日，团队房喻院士、丁立平教授、刘静教授、边红涛教授、马佳妮教授、刘太宏副教授和刘忠山副研究员参加了在陕西理工大学举行的“第九届陕西省物理化学发展研讨会”。

马佳妮教授作了题为“有机分子光化学反应机制研究”的邀请报告。博士后郭燕和博士研究生崔凯翔分获优秀墙报一等奖和二等奖。

陕西师范大学物理化学团队负责人房喻教授作总结发言，希望通过此次交流活动，学习和吸收成功经验，促进陕西省物理化学和相关学科的发展和建设。

此次会议主题为“展物化研学特色·促学科交叉融合”，由陕西省化学学会物理化学专业委员会主办、陕西理工大学化学与环境科学学院、应用

表面与胶体化学教育部重点实验室、教育部西部高校化学(师范)专业建设虚拟教研室、陕西省催化基础与应用重点实验室共同承办。

From October 20 to 22, 2023, Prof. Fang Yu, Prof. Ding Liping, Prof. Liu Jing, Prof. Bian Hongtao, Prof. Ma Jiani, Assoc. Prof. Liu Taihong and Dr. Liu Zhongshan participated in the 9th Seminar on Shaanxi Province Physical Chemistry Development held at Shaanxi University of Technology.

Prof. Ma Jiani gave an invited report titled “Research on the Mechanism of Photochemical Reaction of Organic Molecules”. Postdoc researcher Guo Yan and doctoral student Cui Kaixiang won the first and second prize of excellent poster.

Prof. Fang Yu, head of the Physical

Chemistry team of Shaanxi Normal University, gave a concluding speech, hoping to learn and absorb successful experience through this event, and promote the construction and development of physical chemistry and related disciplines in Shaanxi Province.

Themed “Presenting characteristics of Physical Chemistry research, Promoting interdisciplinary fusion and integration”, the seminar was sponsored by the Committee of Physical Chemistry of Shaanxi Chemical Society, and co-organized by SUT College of Chemistry and Environmental Science, Ministry of Education Key Laboratory of Applied Surface and Colloid Chemistry, Ministry of Education Virtual Teaching and Research Section of Chemistry (Normal) Major in Western Universities, and Shaanxi Province Key Laboratory of Basic and Application of Catalysis.





## 房喻院士做客成都理工大学“珠峰大讲坛”

Fang Yu speaks at Mt. Qomolangma Forum of Chengdu University of Technology



2023年10月23日，房喻院士应邀做客成都理工大学“珠峰大讲坛”系列高端学术讲座，并作题为“基础科学与可持续发展——以化学学科为例”的学术报告。

房喻围绕习近平总书记在中共中央政治局第三次集体学习时强调要切实加强基础研究，夯实科技自立自强根基的指示，从基础科学的价值和化学学科的作用两方面展开报告。

房喻以近代欧美国家走向快速发展的背后逻辑指出，国家不断地加大对教育、对科技的投入是国家强大、民族复兴的根本所在。房喻强调了基础研究的重要性，认为只有经过系统基础科学研究训练，具有专业知识扎实，才能在国家需要时发挥攻坚克难的作用。最后，房喻向青年学者提出了三点忠告：一是要学会欣赏，习惯欣赏；二是要懂得尊重，习惯尊重；三是做人得有点情怀，有点格局。

报告会由成都理工大学校长许强

教授主持。成理工生态环境学院、国家环境保护水土污染协同控制与联合修复重点实验室师生及珠峰科学研究报告团队成员聆听了报告。

On October 23, 2023, Prof. Fang Yu was invited to give a report titled “Basic Science and Sustainable Development - Taking Chemistry as an Example” at the Mt. Qomolangma Forum series of high-end academic lectures of Chengdu University of Technology.

Starting from General Secretary Xi Jinping’s instructions during the third collective study of the Political Bureau of the CPC Central Committee, which emphasized the need to effectively strengthen basic research and consolidate the foundation of scientific and technological self-reliance and self-improvement, Fang Yu unfolded his report on the value of basic science and the role of the discipline of chemistry.

Using the logic behind the rapid development of modern European and

American countries, Fang Yu pointed out that a country’s increasing investment in education and science and technology is fundamental to its strength and national rejuvenation. Fang Yu emphasized the importance of basic research, saying that only through the systematic basic scientific research training, with solid professional knowledge, can a person play a definite role in overcoming difficulties. Finally, Fang Yu put forward three pieces of advice to young scholars: first, learn to appreciate and get used to appreciating; second, know how to respect and get used to respecting; and third, be a little more patriotic and broad-minded person.

CUT Teachers and students from School of Ecology and Environment, National Key Laboratory of Coordinated Control and Joint Restoration for Environmental Protection and Soil and Water Pollution, and members of the Mt. Qomolangma Research Program attended the session, which was moderated by CUT president Prof. Xu Qiang.

## 房喻院士做客北京师范大学化学院“杏坛大讲堂”

Fang Yu speaks at Xingtan Lectures of Beijing Normal University's School of Chemistry

2023年10月15日，房喻院士应邀做客北京师范大学化学院“杏坛大讲堂”，并作了题为“基础科学与可持续发展——以化学学科为例”专题

报告。

On October 15, 2023, Prof. Fang Yu gave a lecture titled “Basic Science and Sustainable Development: Taking

Chemistry as an Example” at the Xingtan (Apricot Altar) Lectures of the School of Chemistry, Beijing Normal University.

## 团队师生参加第三届全国超快振动光谱会议

Fang Group participate in Third National Symposium on Ultrafast Vibration Spectroscopy

2023年10月13日至15日，光子鼻与分子材料团队边红涛教授和马佳妮教授参加了在安徽省芜湖市召开的“第三届全国超快振动光谱会议”。边红涛教授作了题为“基于主客体作用的离子识别及超快红外光谱研究”

的邀请报告。博士后郭燕获“优秀墙报奖”。

From October 13 to 15, 2023, Prof. Bian Hongtao and Prof. Ma Jiani of the Photonic Nose and Molecular Materials Group participated in the Third National Symposium on Ultrafast

Vibration Spectroscopy held in Wuhu, Anhui Province. Bian Hongtao gave an invited presentation titled “Host-guest Interaction-based Ion Recognition and Study on Ultrafast Infrared Spectroscopy”. Postdoctoral researcher Guo Yan won the Excellent Poster Award.

## 房喻院士在中国科学院学部第七届科学教育论坛上发表主旨演讲

Fang Yu delivers keynote speech at CAS Faculty 7th Science Education Forum

2023年10月16日，受中国科学院学部邀请，房喻院士在国家会议中心举办的中国科学院学部第七届科学教育论坛上以“从基础研究的重要性看科学教育与人才培养”为题发表主旨演讲。

本次论坛由中国科学院科技战略咨询研究院承办，《科学与社会》编辑部协办。中国科学院院士、中小学校长与教师、一线科普工作者、科学教育专家、科技政策专家，以及来自

教育部和中国科学院的管理工作者共60余人参加了论坛。

On October 16, 2023, Prof. Fang Yu delivered a keynote speech titled “On Science Education and Talent Cultivation --- From the Perspective of the Importance of Basic Research” at the Seventh Science Education Forum of the Faculty of Sciences of the Chinese Academy of Sciences, held at the China National Convention Center.

The forum was organized by CAS

Institute of Science and Technology Strategy Consulting and co-organized by the editorial board of Science and Society. More than 60 participants attended the forum, including academicians from the Chinese Academy of Sciences, principals and teachers of primary and secondary schools, frontline science popularization workers, science education experts, science and technology policy experts, and administrative staff from the Ministry of Education and the Chinese Academy of Sciences.



## 薛东旭教授参加 2023 年中西部地区无机化学化工学术研讨会 Xue Dongxu presents at 2023 Central and Western China Inorganic Chemistry and Chemical Engineering Symposium

2023 年 10 月 21 至 23 日，团队薛东旭教授参加了在河南开封举行的中国化学会 2023 年中西部地区无机化学化工学术研讨会，并作题为“新型金属有机骨架材料的可控合成与气体存储与分离”的邀请报告。

本次会议以“中西部地区无机化学化工新发展”为主题，来自全国近百所高校和研究机构的一线科学家、

知名专家、中青年学者以及研究生等近 500 人参加了会议。

From October 21 to 23, 2023, Prof. Xue Dongxu participated in the Chinese Chemical Society's 2023 Central and Western China Symposium on Inorganic Chemistry and Chemical Engineering held in Kaifeng, Henan Province, and gave an invited report titled "Controlled Synthesis and Gas Storage and Separation of Novel

Metal-organic Skeleton Materials".

Themed "New Development of Inorganic Chemistry and Chemical Engineering in Central and Western China", the event was participated by nearly 500 first-line scientists, well-known experts, young scholars and graduate students from about 100 universities and research institutions across the country.

## 团队老师参加第六届胶体与界面化学青年学者论坛 Fang Group teachers attend 6th Young Scholars Forum on Colloid and Interface Chemistry

2023 年 10 月 27 至 29 日，光子鼻与分子材料团队刘静教授、边红涛教授、刘小燕副研究员和刘忠山副研究员参加了在大连举行的“第六届胶体与界面化学青年学者论坛”。刘小燕副研究员作了题为“纳米颗粒与生物膜的相互作用”的报告。

本次论坛由中国化学会胶体与界面化学专业委员会主办，大连理工大学化学学院承办，旨在展示本领域青年学者的最新研究成果，促进青年学者之间的学术交流，进一步提高胶体与界面化学领域的研究水平。

From October 27 to 29, 2023, Prof. Liu Jing, Prof. Bian Hongtao, Associate Researcher Liu Xiaoyan and Associate Researcher Liu Zhongshan of the Photonic Nose and Molecular Materials Group participated in the Sixth Young Scholars Forum on Colloid and Interface Chemistry held in Dalian. Liu Xiaoyan Liu gave a presentation titled "Interaction Between

Nanoparticles and Biomembranes".

Sponsored by the Colloid and Interface Chemistry Committee of the Chinese Chemical Society and hosted by the School of Chemistry, Dalian University of Technology, this forum

aims to showcase the latest research achievements of young scholars in this field, promote academic exchanges among them, and further improve the research level in the field.



## 3-Substituted 2-Aminonaphthalene Photocages for Carboxylic Acids and Alcohols; Decaging Mechanism and Potential Applications in Synthesis

Vilma Lovrinčević, Yan Guo, Dragana Vuk, Irena Škorić, Jiani Ma,\* and Nikola Basarić\*

Cite This: <https://doi.org/10.1021/acs.joc.3c01678>

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## 对羧酸和醇保护的 3-取代 2-氨基萘光掩蔽基：机理研究及合成中应用

光笼 (Photocages) 控制活性分子的释放具有实时、原位、精准、快速的优势，在生物学中被广泛应用于激活生物活性分子或调控生物学过程。因此，亟需开发具有优异的生理稳定性和光化学反应性的新型光笼分子。

在前期研究中，我们开发了 N, N-二甲氨基萘光笼，其吸收在近可见区域，可结合苯胺光笼实现对离去基团的正交脱保护。然而，该类光笼的光脱保护量子产率较低，且光脱保护反应机理尚不明确。

为解决上述问题，我们基于 3-取代 2-氨基萘衍生物设计合成了新型光笼，并对其光化学反应性和反应机理进行了研究。在近可见光激发下，光笼释放羧酸和醇的量子产率比先前报道的 N, N-二甲氨基萘光笼的脱保护量子产率高 10 倍。此外，光化学实验表明，3-取代 2-氨基萘光笼可成功释放非甾体抗炎药物布洛芬和酮洛芬，证明其在生物医学中的潜在应用。时间分辨吸收光谱和密度泛函理论计算结果表明，3-取代 2-氨基萘光笼受光激发生成其激发单线态后 (340, 480 nm)，在 1 ns 内发生 C-O

键均裂反应，得到一个自由基对 (340, 400, 500 nm) (图 1)。随后，水溶剂中的自由基对经历电子转移，产生氨基萘碳正离子和离去基的阴离子 (图 2)。设计合成的 3-取代 2-氨基萘新型光笼，在近可见光照下可实现对脂肪族、芳香族醇和羧酸的有效释放 (图 3)，且与苯胺光笼具有正交相容性，这确保了该类光笼在有机合成

或生物学中的应用。

第一作者: Vilma Lovrinčević, University of Zagreb

通讯作者: 陕西师范大学马佳妮教授, Ruđer Bošković 研究所 Nikola Basarić 教授

全文链接: <https://doi.org/10.1021/acs.joc.3c01678>

Photocages control the release of active molecules with the advantages of real-time, in situ, precise and rapid, and are widely used in biology to activate

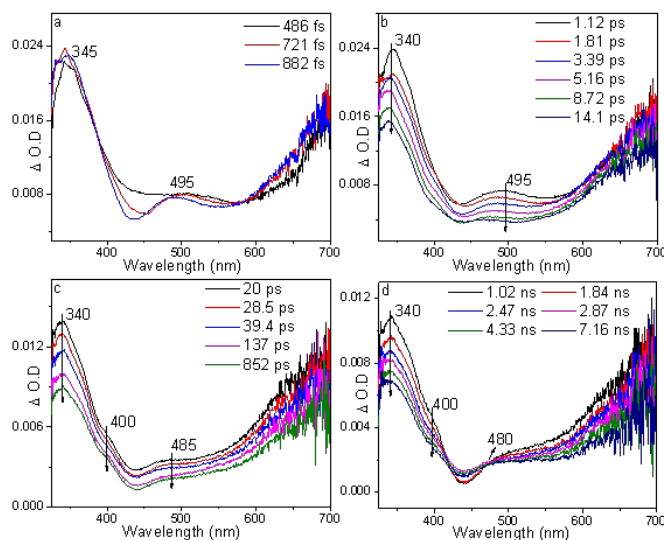


图 1. 5a 在 CH<sub>3</sub>CN-H<sub>2</sub>O 中的 fs-TA 谱图

Figure 1. fs-TA spectra of 5a in CH<sub>3</sub>CN-H<sub>2</sub>O.



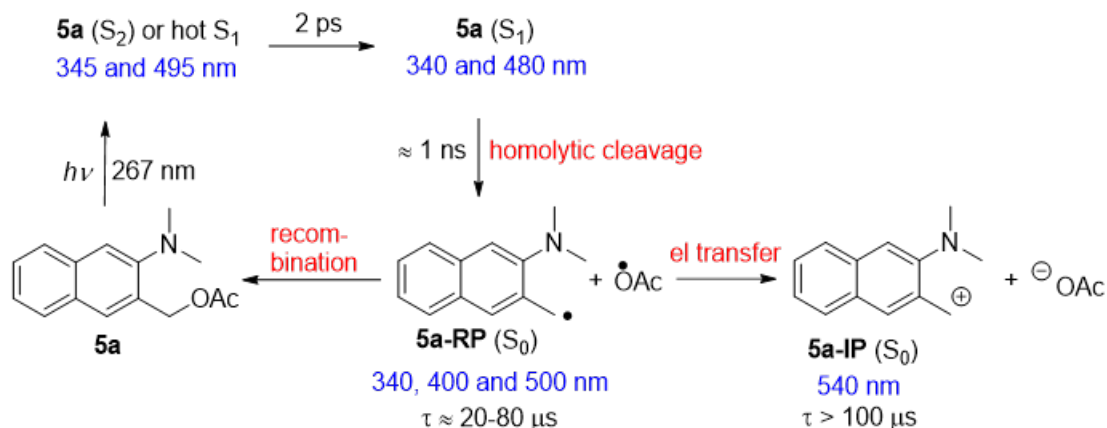


图 2. 5a 的光脱保护反应机理

Figure 2. Probable photochemical reaction mechanism for decaging of 5a.

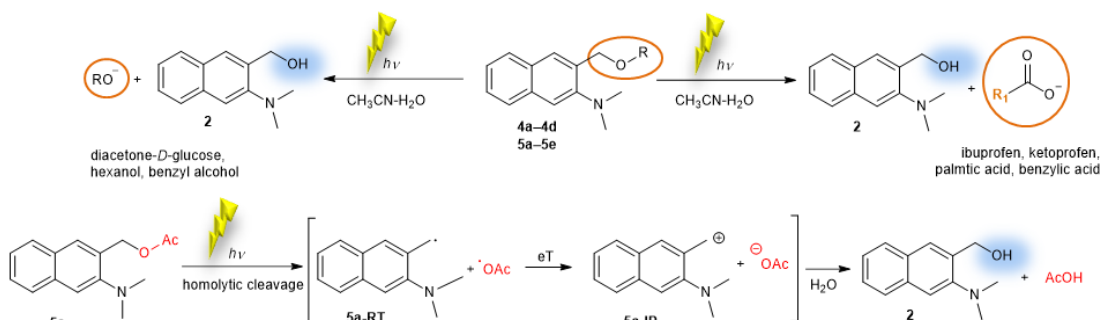


图 3. 取代-2-氨基萘光笼的光脱保护反应

Figure 3. Photodecaging reactions of 3-substituted-2-aminonaphthalenes photocages.

different biological molecules or regulate biological processes. Therefore, there is an urgent need to develop novel photocages with superior physiological stability and photochemical reactivity.

In a previous study, we developed *N,N*-dimethylaminonaphthalene photocages which absorb at near-visible region and can be used together with anilines for chromo-orthogonal deprotection. However, this type of photocages suffered from the low quantum yield of photodeprotection, and the photodeprotection reaction mechanism is still unclear.

To address the above problems, we report the synthesis and investigation of the photochemical reactivity and mechanism for new photocages that

are derivatives of 3-substituted-2-aminonaphthalenes. Their performance is better compared to the published aminonaphthalenes, as the decaging proceeds with ten times higher efficiency. The photochemical experiments demonstrated potential applications of 3-substituted-2-aminonaphthalenes photocage in biomedicine as we managed to photorelease nonsteroidal anti-inflammatory drugs ibuprofen and ketoprofen. The decaging photochemical reaction mechanism was investigated experimentally by transient absorption techniques with time scales from femtoseconds to seconds and computationally on the TD-DFT level of theory. The photoelimination of carboxylates takes place directly in the

singlet excited state (340, 480 nm) by a homolytic cleavage producing a radical pair (340, 400 and 500 nm) within 1 ns (Figure 1). The subsequent electron transfer gives rise to aminonaphthalene carbocation and the carboxylate (Figure 2). A wide scope of substrates that can be decaged relatively efficiently with near-visible light and the chromo-orthogonal compatibility of aminonaphthalene and aniline derivatives render these photocages potentially applicable in organic synthesis or biology (Figure 3).

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# Polynuclear Rare-Earth Cluster-Directed Self-Assembly of Highly Porous Zeolite-like Metal–Organic Frameworks with Methane Storage Property

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## 多核稀土簇导向的高孔类沸石金属有机骨架的组装与甲烷存储性能

金属有机骨架 (MOF) 由于其固有的结构特性以及在气体存储、分离等领域的巨大潜力, 在过去的二十多年里取得了巨大成就。但是, 其气体储存 (同时高的气体重量和体积工作能力) 和分离 (同时高的吸附量和选择性) 等性能仍远低于预期目标。因此, 设计合成新型 MOF 材料仍然是化学家的长期目标。类沸石金属有机骨架 (ZMOF) 是 MOF 大家庭中的比较独特的一类, 其集无机沸石与 MOF 的优点于一身, 从而引起了大家的极大关注。目前构筑 ZMOF 的策略主要分为三种。一是由单金属离子与功能化咪唑或咪唑衍生物构筑, 该策略可构筑具有丰富的已知 / 未知沸石拓扑的 ZMOF, 但是由于结构孔隙率以及灵活性的限制, 使其在气体存储与分离方面应用受限。二是由三核金属簇与二 / 三齿羧酸配体形成超四面体 TBU, 超四面体以角共享的方式连接构筑 ZMOF, 不过该策略组织的 ZMOF 仅呈现单一的 mtm 拓扑。三是由具有四面体构型的无机金属簇 / 体和线性连接体 / 四面体构型金属离子或金属簇组装, 该策略可以获得少量 ZMOF 结构, 并且面临稳定性和孔隙率问题。因此,

寻求设计合成 ZMOF 的新策略是非常必要的, 但目前仍然面临巨大的挑战。

鉴于以上想法, 结合本课题组前期在稀土 MOF 以及角度型配体 ( $H_2TZDB$ , 4,4'-(4H-1,2,4-三氮唑-3,5-二苯基)二苯甲酸) 方面的研究, 本文以  $Tb(NO_3)_3 \cdot 6H_2O$  为金属源, 角度型二齿羧酸  $H_2TZDB$  为桥连配体, 采用溶剂热法, 成功地制备了两类具有新分子筛拓扑的稀土 ZMOF 化合物, 即  $Tb-ZMOF-2$  和  $Tb-ZMOF-3$ 。单晶结构分析表明, 在  $Tb-ZMOF-2$  中 (图 1), 九核稀土簇呈现 D6R 次级结构单元, 并形成一种新的分子筛笼 ( $[4^46^48^2]$ ); 在  $Tb-ZMOF-3$  中 (图 2), 同时具有六核与九核稀土簇, 并分别呈现 D4R 和 D6R 次级结构单元, 这在稀土 ZMOF 结构中也是首次出现; 最终两例稀土 ZMOF 均呈现全新的沸石分子筛拓扑。其中  $Tb-ZMOF-3$  已成功申请注册新拓扑代号, 即 *lhx*。此外,  $Tb-ZMOF-2$  也是为数不多的具有高比表面积的 ZMOF。基于  $Tb-ZMOF-2$  较高的 BET 比表面积和合适的孔尺寸, 该材料具有同时高的甲烷重量和体积存储工作能力。这项工作利用角度型二羧酸配体与可原位生成 D6R/D4R 次

级结构单元的稀土离子结合构筑类沸石晶态多孔材料的策略为设计合成具有丰富新拓扑结构的 ZMOF 及其广泛应用提供了创新性方向。

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Metal-organic frameworks (MOFs) as emerging crystalline porous materials have witnessed great achievements in the last more than two decades due to their intrinsic structural features and diverse potential applications including gas storage, separation and catalysis et al. Nevertheless, the performances of MOF materials are far below expected ones, e.g., high methane storage working capacity; simultaneously high selectivity and high uptake for selective target. Design and synthesis of new MOF materials is, therefore, still long-term goals for synthetic chemists.

Zeolite-like metal-organic frameworks (ZMOFs), a subset of metal-organic frameworks, have attracted great scientific attention given their unique pore system, distinctive cage-like cavities and various applications. Generally, there are three avenues to access the deliberate



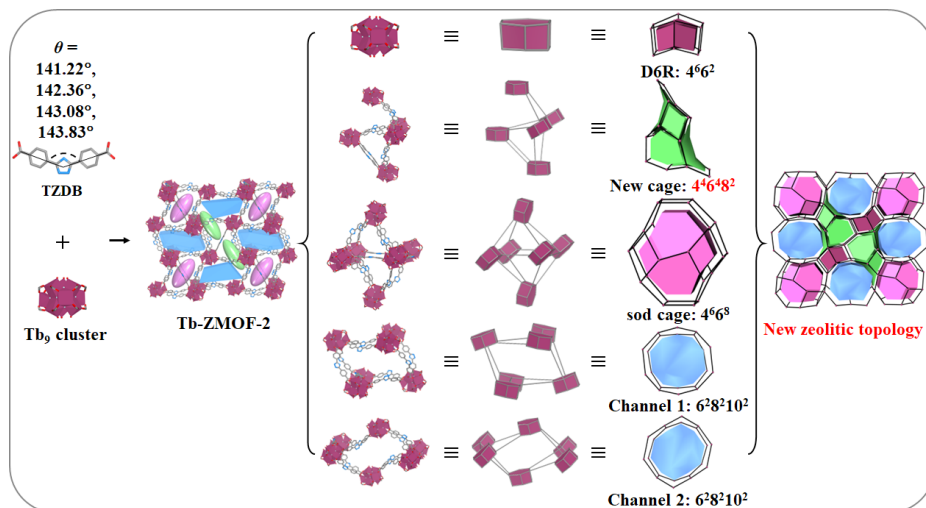


图 1. Tb-ZMOF-2 的组装与结构示意图

Figure 1. Schematic representation of the assembly and structure of Tb-ZMOF-2.

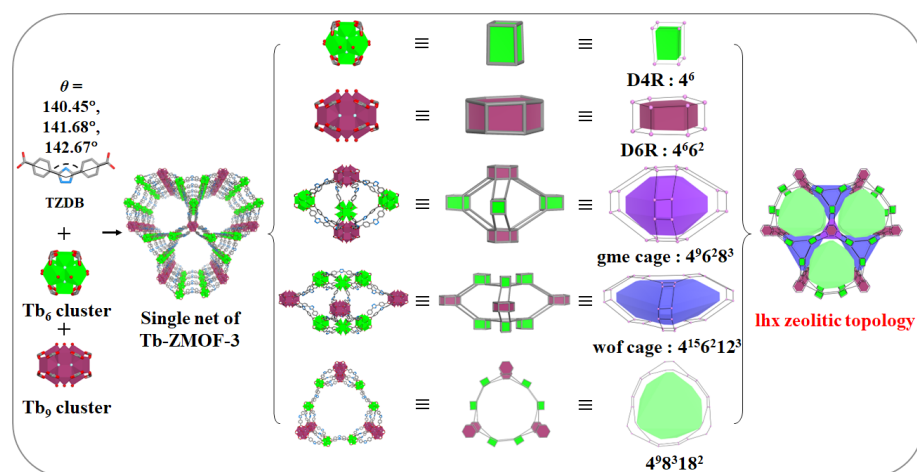


图 2. Tb-ZMOF-3 的组装与结构示意图

Figure 2. Schematic representation of the assembly and structure of Tb-ZMOF-3.

construction of ZMOFs. Firstly, the combinations of single-metal ions with functionalized imidazole or imidazole-derivatives, which demonstrates plentiful known/unknown zeolitic topologies along with limited porosities for gas storage under high-pressure and structural flexibility detrimental to gas separation. Secondary, the utilization of corner sharing super-tetrahedra building blocks constructed from trinuclear metal clusters with di-/tri-carboxylates, which exhibits merely mtn topology. Thirdly, the combinations of tetrahedral inorganic clusters/organic linkers with linear linkers/

tetrahedral metal ions or clusters, which results in a few types of ZMOFs suffering from stability and porosity issues.

Due to their intrinsic structural features, the design and synthesis of a new type of ZMOFs is highly desirable but challenging. Herein, solvothermal reactions between an angular dicarboxylate linker and rare-earth (RE) ions afforded two RE-MOFs, namely, Tb-ZMOF-2 and Tb-ZMOF-3, respectively. Structural analyses reveal that b-ZMOF-2 encompasses a novel  $[4^6 4^8 2]$  cage, while Tb-ZMOF-3 contains nonanuclear (i.e., D6R) and hexanuclear (i.e., D4R) RE

clusters simultaneously, subsequently resulting in two new zeolitic topologies. Thanks to its high surface area and pore volume, Tb-ZMOF-2 demonstrates considerably high gravimetric and volumetric methane storage working capacities.

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## 西安市经开区科创与新经济局一行来访

Xi'an ETDZ S&T Innovation and New Economy Bureau visitors received



2023年10月9日，房喻院士在新概念传感器与分子材料研究院与来访的西安市经济技术开发区科技创新与新发展局局长郭哲文一行会谈，商讨科技成果转化相关事宜。

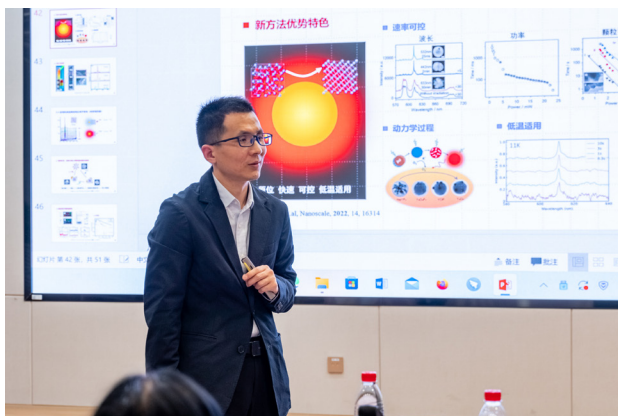
经开区科创局招商主管周颜和经开金控项目经理袁小娜陪同来访。研究院副院长丁立平教授、办公室主任杨小刚、彭军霞副教授等参加会谈。

On October 9, 2023, Prof. Fang Yu met with Guo Zhewen, director of the Bureau of Science and Technology Innovation and New Economy Development of Xi'an Economic and Technological Development Zone, at the Institute of New Concept Sensors and Molecular Materials, to discuss matters related to the transformation of scientific and technological achievements.

S&T Innovation and New Economy Development Bureau Investment Promotion Supervisor Zhou Yan and Financial Control Project Manager Yuan Xiaona accompanied Guo in the visit. INCSMM vice dean Prof. Ding Liping, Administrative Office director Yang Xiaogang, and Assoc. Prof. Peng Junxia attended the meeting.

## 物理学与信息技术学院张正龙教授应邀作学术报告

School of Physics and Information Technology's Zhang Zhenglong invited to give a presentation



2023年10月9日下午，光子鼻与分子材料团队在新概念传感器与分子材料研究院报告厅举行学术交流会，陕西师范大学物理学与信息技术学院张正龙教授作了学术交流报告。团队全体教师和研究生参加了此次交流会，会议由刘静教授主持。

首先，张正龙教授介绍了表面增强荧光的研究进展，提出了三个科学问题，即如何实现稀土纳秒量级的超快超

强发光、如何实现稀土发光频率域、空间域光场分布的精细调控以及如何实现稀土纳米体系的结构优化。接着他就从近场调控稀土纳米体系发光、从等离激元近场调控稀土纳米体系态结构和发光性质两个策略来解决这些问题进行了详细讲解，指出该方法具有原位、快速、可控和低温适用的优势特色，具有一定的普适性。

房喻院士在总结讲话中肯定了张正龙教授的工作成果和科研态度，教诲团队教师和学生做事态度要积极向上。

最后，张正龙教授回答了在场师生的提问，并与参会老师合影留念。

On October 9, 2023, the Photonic Nose and Molecular Materials Group held an academic meeting and invited Prof. Zhang Zhenglong of Shaanxi Normal University's School of Physics and Information Technology to give a presentation at the Lecture Hall of the Institute of New Concept Sensors and Molecular Materials. All faculty members and graduate students of the group attended the meeting, which was moderated by Prof. Liu Jing.

Firstly, Zhang Zhenglong introduced the research progress of surface-enhanced fluorescence, and raised three scientific



questions, namely, how to achieve ultrafast and ultra-intense luminescence of rare earths in nanosecond scale, how to achieve fine tuning of rare earth luminescence frequency domain and spatial domain light field distribution, and how to achieve the optimization of the structure of rare earth nanosystems. Then he gave a detailed explanation on two strategies to solve these problems, namely,

the near-field modulation of luminescence of rare-earth nanosystems from near-field modulation, and the near-field modulation of physical structure and luminescence properties of rare-earth nanosystems from equi-excitations, pointing out that the method has the advantageous features of in-situ, fast, controllable, and low-temperature applicability, and a certain degree of universal applicability.

Fang Yu affirmed Zhang Zhenglong's work results and research attitude in his concluding remarks, and called upon the group teachers and students to have a positive attitude towards their work.

Zhang Zhenglong answered the questions from the teachers and students present, and took a photo with the participating teachers.

## 凯豪达氢能源与陕西师范大学签署氢能技术开发战略合作协议 Kohoda Hydrogen Energy and SNNU Strategic Cooperation Agreement on Technology Development signed

2023年10月31日下午，深圳市凯豪达氢能源有限公司与陕西师范大学在陕师大长安校区签署氢能技术开发战略合作协议。

签署仪式在陕师大新概念传感器与分子材料研究院会议室举行，凯豪达氢能源董事长陈凯家、总裁欧阳剑，陕师大化学化工学院王增林教授、马佳妮教授、刘凯强教授、薄鑫副研究

员及研究院办公室主任杨小刚等出席。仪式由新概念传感器与分子材料研究院副院长丁立平教授主持，并特邀澳大利亚新南威尔士大学赵川教授共同见证。欧阳剑和薄鑫作为双方代表签署协议。

签约仪式上，双方分别就企业情况、氢能技术发展、签约项目情况、合作基础等作相关介绍，并进行了座

谈交流。

氢能作为能量密度高、环境友好的理想能源，对推进能源结构转型、构建多元化清洁能源体系意义重大，是中国实现“碳达峰”“碳中和”目标的关键能源技术，双方将围绕高效电解水制氢催化剂开发，开展电解水制氢核心技术攻关，构建“底层设计-基础研发-应用验证-稳步放大”创







新纽带，在科研学术、技术创新、应用示范等方面资源共享、优势互补、联合攻关，以实现新型制氢技术自主化和绿氢规模化应用。

On October 31, 2023, Shenzhen Kohoda Hydrogen Energy Co., Ltd. and Shaanxi Normal University signed a Strategic Cooperation Agreement on Hydrogen Energy Technology Development in Shaanxi Normal University Chang'an Campus.

The signing ceremony was held in the conference room of SNNU's Institute of New Concept Sensors and Molecular Materials. Kohoda chairman Chen Kaijia and president Ouyang Jian, SNNU Prof. Wang Zenglin, Prof. Ma Jiani, Prof. Liu Kaiqiang, Associate Researcher Bo Xin

and INCSMM Administrative Office director Yang Xiaogang attended the ceremony. The ceremony was presided over by INCSMM vice dean Prof. Ding Liping, and witnessed by Prof. Chuan Zhao from the University of New South Wales, Australia. Ouyang Jian and Bo Xin signed the agreement as representatives of both sides.

At the ceremony, the two sides had a discussion and exchange on the enterprise situation, hydrogen energy technology development, cooperative project, and cooperation basis, etc.

As an ideal environment-friendly energy source with high energy density, hydrogen energy is of great significance to promoting the transformation of energy structure and building a

diversified clean energy system, and is a key energy technology for China to achieve the goal of Carbon Peak and Carbon Neutrality. The two sides will focus on the development of efficient catalysts for producing hydrogen by water electrolysis, and carry out research on core technologies for hydrogen production by electrolytic water, build an innovation link of "bottom design - basic R&D - application verification - steady expansion", and share resources, complement advantages, and jointly solve key problems in scientific research, technological innovation, and application demonstration, so as to realize the autonomy of new hydrogen production technology and the large-scale application of green hydrogen.

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