陕西师范大学 SHAANXI NORMAL UNIVERSITY

化学化工学院 School of Chemistry & Chemical Engineering

06 / 2023

光子鼻与分子材料团队 简 报

Photonic Nose and Molecular Materials Group Newsletter

高等学校科学研究优秀成果奖
（科学技术）

证 书

项目名称：爆炸物/毒品薄膜荧光传感器关键技术及便携式探测装备

奖励类别：技术发明奖

奖励等级：一等奖

获 奖 者：房喻

中华人民共和国教育部

2023年6月6日

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Fang Group achievement wins First Prize of Outstanding Achievement Award for Scientific Research of Ministry of Education


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证书编号：2022-301-R01

日前，教育部颁发了 2022 年度高等学校科学研究优秀成果奖（科学技术）获奖成果证书，房喻院士主持的成果“爆炸物 / 毒品薄膜荧光传感器关键技术及便携式探测装备”荣获 2022 年度技术发明奖一等奖，这也是陕师大首次获得此项荣誉。

“爆炸物 / 毒品薄膜荧光传感器关键技术及便携式探测装备”成果由陕西师范大学和深圳砺剑防卫技术有限公司共同申报，其中我校为第一完成单位，主要完成人分别为房喻院士、何刚教授、辛云宏教授、刘太宏副教授、彭浩南教授、许亮工程师。

薄膜荧光传感是国际公认的新一代微痕量物质超灵敏探测技术，在事关公共安全、国家安全保障能力建设的危险有毒有害化学品快速、灵敏、便携组网探测领域具有独特的优势和巨大的应用潜力。

针对敏感材料高性能化难，传感

器结构被国外公司专利技术垄断，设备研制门槛高、技术难度大等突出问题，团队围绕薄膜荧光传感核心技术开展“敏感薄膜⟷传感器⟷探测装备”的全链条研究，通过二十多年努力，实现了爆炸物 / 毒品探测技术和装备研制的重大突破，形成了具有完全自主知识产权的薄膜荧光传感技术体系。经国际纯粹与应用化学联合会（IUPAC）严格评审与遴选，薄膜荧光传感器成功入选 2022 化学十大新兴技术。

依托该技术体系，2014 年创立的深圳砺剑防卫技术有限公司已成长为在业界具有重要影响的化学传感器公司，其产品在党的十九大、G20 峰会、首长专列、乌干达总统府等重大活动、重要场所安保中发挥了重要作用，2019 年开始批量列装部队。

高等学校科学研究优秀成果奖（科学技术）是由教育部设立的用以鼓励在推动科学技术进步中做出突出贡献的高等学校教师、科技工作者和科研组织的奖项，是仅次于国家自然科学奖、国家技术发明奖和国家科技进步奖三大奖的重要科技奖项。其评审面向全国高等院校，由全国同行专家审议选定，竞争激烈。

Recently, the Ministry of Education issued the certificates for Outstanding Achievement Award for Scientific Research in Higher Institutions (Science and Technology) in 2022, and Prof. Fang Yu's research achievement of "Key Technologies and Portable Detection Equipment for Explosive/Illicit Drug Film Fluorescence Sensors" won the first prize of the 2022 Technological Invention Award, and it is the first time that Shaanxi Normal University has won this honor.

The achievement was jointly submitted by Shaanxi Normal University and Shenzhen SRED Security and Surveillance Technology Co., Ltd., with SNNU as the first responsible institution, and the main participants are Prof. Fang Yu, Prof. He Gang, Prof. Xin Yunhong, Assoc. Prof. Liu Taihong, Prof. Peng Haonan and Engineer Xu Liang.

Film fluorescence sensing is a new generation of ultra-sensitive detection technology of micro-trace substances recognized internationally. It has unique advantages and great application potential in the field of rapid, sensitive and portable network detection of dangerous, toxic and harmful chemicals that are related to public safety and national security capacity building.

In view of the obstacles such as the difficulty in achieving high performance of sensitive materials, the monopoly of sensor structure by foreign companies' patented technology, the high threshold in equipment development, and the high technological difficulties, the team carried out the whole chain research of "sensitive film ⟷ sensor ⟷ detection equipment" around the core technology of film fluorescence sensing, and have achieved a major breakthrough in the development of explosive/illicit drug detection technology and equipment through more than 20 years of efforts, developing a film fluorescence sensing technology system with complete independent intellectual property rights. After rigorous review and selection by the International Union of Pure and Applied Chemistry (IUPAC), film fluorescence sensors were selected as one of the top ten emerging technologies in chemistry in 2022.

Shenzhen Security and Surveillance Technology Co., Ltd., founded in 2014 on the basis of this technology system, has grown into a chemical sensor company with major influence in the industry, and its products have played an important role in the security of major events and important places such as the 19th CPC National Congress, the G20 Summit, the Commander’s Train, and the Ugandan Presidential Palace, and have been deployed as a military gear since 2019.

The Outstanding Achievement Award for Scientific Research in Higher Institutions (Science and Technology) is an award established by the Ministry of Education to encourage teachers, scientific and technological workers and research organizations in higher institutions who have made outstanding contributions to the promotion of scientific and technological progress. It is an important science and technology award with fierce competition second only to the National Prize for Natural Sciences, the National Award for Technological Invention and the National Prize for Progress in Science and Technology, which evaluation is open to all higher education institutions in China, and reviewed and selected by peer experts across the country.

六月大事记 Events in June

房喻院士当选陕西省科普作家协会第七届理事会理事长

Fang Yu elected chairman of 7th Council of Shaanxi Popular Science Writers Association

2023 年 6 月 7 日，陕西省科普作家协会第七次会员代表大会在西安召开，房喻院士当选协会第七届理事会理事长。

房喻院士表示，连任陕西省科普作协理事长是一份光荣，更是一份责任。他指出，陕西省科普作家协会要以繁荣科普创作、发展科普事业和提高科普作品水平为己任，发挥自身优势，加强协会自身建设，促进协会健康发展；加强科普创作队伍建设，提高科普创作服务能力；拓宽科普创作领域，创新科普创作方式，开拓创新，锐意进取，推动我省科普创作工作再上新台阶。

陕西省科协常务副主席李肇娥出席会议并讲话。著名科幻作家王晋康分享科普创作经验。会议审议表决通过了《陕西省科普作家协会第六届理事会工作报告》，全省 60 余名会员代表参加此次会议。

On June 7, 2023, the seventh general meeting of the Shaanxi Popular Science Writers Association was held in Xi’an, and Prof. Fang Yu was elected as the chairman of the seventh council of the association.

Fang Yu said that it is an honor and more of a responsibility to be re-elected as the council chairman. He said that the association should take the responsibility to accelerate the creation of popular science works, develop the science popularization cause and improve the level of popular science works, give full play to its own advantages, strengthen its own construction and promote its healthy development, strengthen the construction of popular science writers’ team and improve the service capacity of popular science creation. He also urged the members to expand the scope of popular science creation, innovative the methods of popular science creation, dare to pioneer and innovate, forge ahead with determination, and promote the Shaanxi province’s popular science creation work to a new level.

Li Zhao’e, executive vice chair of Shaanxi Provincial Science Association, attended and spoke at the meeting. Wang Jinkang, a famous science fiction writer, shared his experience in popular science creation. The meeting reviewed and voted on the “Work Report of the Sixth Council of Shaanxi Popular Science Writers Association”, and more than 60 members from across the province attended the meeting.

2023 年 6 月 8 日下午，西安锦园中学 100 多名高一年级同学在樊锁强校长和六位老师的带领下前来新概念传感器与分子材料研究院进行科普参观学习。

丁立平副院长向同学们介绍了研究院的发展沿革与科研团队，解读了“绿色、跨界、融合、对接”理念的内涵，并带领同学们参观了成果展厅，讲解了房喻院士科研团队研发的爆炸物探测仪、毒品探测仪等科研成果转化产品。

接下来，在研究院报告厅，彭浩南教授和刘凯强教授为同学们作了两场科普讲座。彭浩南教授以狗的嗅觉系统为例，形象地介绍了传感器的基本工作原理，展示了房喻院士领衔的研究团队近年来在荧光薄膜传感器研究方面取得的成果及应用，让同学们感受到科学的力量对社会经济发展的巨大作用。刘凯强教授阐述了国际国内凝胶的发展现状及房喻院士团队在小分子凝胶推进剂、高能量密度燃料、凝胶乳液及其高强低密度材料等方面做出的重要贡献，建议同学们要紧跟时代步伐，不要偏科，认真学好各门课程，为祖国科技发展而努力奋斗。

讲座结束后，锦园中学师生与研究院老师合影留念，结束了此次科学探索之旅。

On June 8, 2023, about 100 senior high school freshmen from Xi'an Jinyuan Middle School, led by Principal Fan Suoqiang and six teachers, visited the Institute of New Concept Sensors and Molecular Materials in a science popularization tour.

Vice dean Prof. Ding Liping introduced the development history of the Institute and the research faculty to the students, explained the connotation of the Institute’s concept of "Green-oriented, interdisciplinary, fusing and docking", and led the students to visit the achievement exhibition room, presenting the explosive detector, drug detector and other commercialized products developed by Prof. Fang Yu's research group.

In the lecture hall, Prof. Peng Haonan and Prof. Liu Kaiqiang gave two lectures for the students. Taking the olfactory system of a dog as an example, Peng introduced the basic principle of the sensor in a vivid way, and showed the results and applications of film-based fluorescent sensors achieved by the research group led by Prof. Fang Yu, letting the students feel the great role of the power of science in social and economic development. Liu briefed about the development status quo of gels at home and abroad and the important contributions made by Fang group in the fields

of small molecular gel propellants, high energy density fuels, gel emulsions and high strength and low density materials, etc. He suggested that students should keep up with the pace of the times, earnestly learn all subjects and courses, and strive for China’s development of science and technology.

After the visit, Jinyuan teachers and students took a group photo with INCSMM teachers, ending their journey of scientific exploration.

INCSMM building renovation project completed and accepted

On May 31, 2023, the renovation project of the Institute of New Concept Sensors and Molecular Materials building passed examination and acceptance by Shaanxi Normal University after its completion.

On the basis of the original three-floor building, the integrative project was carried out according to the functional positioning of the institute, renovating the building's hardware and software facilities including the building facade, roof waterproof, water, electricity, heating, network, security and surveillance facilities, as well as cultural construction and internal and external environment.

The 1500 square-meter floor space project began on January 31, 2023, and was initially completed and put into trial use on April 27, and was officially operative after passing examination and acceptance on May 31. The project includes 1 reception room (69 m^2), 1 outdoor reception area (58 m^2), 1 multifunctional lecture room (114 m^2) that can accommodate 80 people, 1 academic exchange/conference room (59 m^2) that can accommodate 40 people, 1 achievement exhibition room (69 m^2), 1 reference room (30 m^2), 1 machining workshop (270 m^2), 2 research staff lounges (53 m^2), and the Academician's Office, Vice Dean's Office, Liaison and Administrative Office, PostDoc Office, Student Office, and seven Research Assistant Laboratories.

六月大事记 Events in June

研究院楼宇装修改造项目完工并通过验收

2023 年 5 月 31 日，新概念传感器与分子材料研究院楼宇装修改造项目完成并通过验收。

在原化工小三层的基础上，按照研究院的功能定位，对原楼宇外立面、屋面防水、水电暖、网络、安防设施等硬软件设施及文化建设、内外环境进行了一体化装修改造。工程于 2023 年 1 月 31 日开工，4 月 27 日初步完成并开始试运行，5 月 31 日通过工程验收后正式投入使用。

建成学术接待室 1 个（69 m^2），室外接待区 1 个（58 m^2），可容纳 80 人的多功能学术报告厅 1 个（114 m^2），可容纳 40 人的学术交流 / 会议室 1 个（59 m^2），成果展厅 1 个（69 m^2），资料室 1 个（30 m^2），机加工车间 1 个（270 m^2），专职科研人员休息室 2 个（53 m^2），及院士办公室、副院长办公室、访问学者办公室、对外联络与行政办公室、博士后学习室、学生学习室、7 个专职科研人员实验室等，面积共约 1500 平方米。

六月大事记 Events in June


“应用表面与界体化学创新引智基地”
第七次专家委员会会议

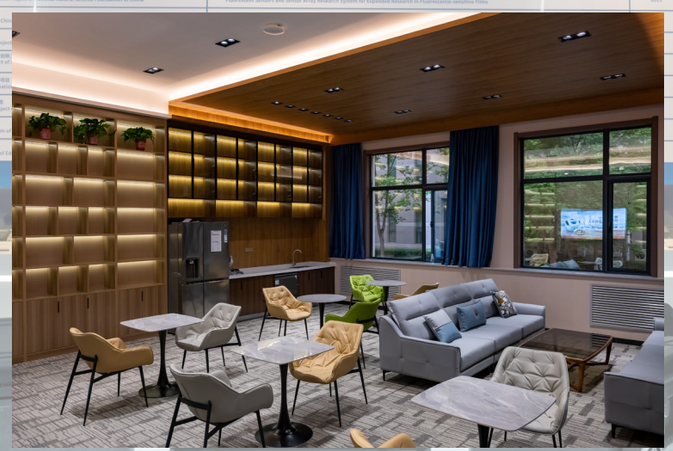

科研助理
Research Assistants
科研团队
Research Faculty
首席科学家
Lead Scientist
简 介
Profile


INDUSTRIALIZATION AND APPLICATION OF RESEARCH ACHIEVEMENT
ACHIEVEMENTS & HONORS


ACHIEVEMENTS & HONORS
RESEARCH OVERVIEW


Classification of Sensors
Science Popularization Activities


Basic Knowledge of Sensors, MEMS Sensors and Applications
Schematic Diagram of MEMS Sensors



房喻院士做客中国石油大学黄岛讲坛

Fang Yu speaks at Huangdao Forum of China University of Petroleum

2023 年 6 月 16 日，房喻院士应邀赴青岛市做客中国石油大学第 76 期黄岛讲坛，作题为“薄膜荧光传感器——从敏感材料到硬件结构”的学术报告。

房喻表示，目前各国鼓励支持传感器的研发制造，其中美国将“先进传感技术”列入《关键和新兴技术清单》，传感器技术作为物联网的一项关键技术而备受关注，但是其研发面临的机遇和挑战共存。他指出，传感器领域的中国企业面临着艰巨问题，“未来，谁能支配传感器，谁就可以领航新时代。”

房喻介绍说，目前国产传感器技术水平不断进步，逐步缩短了与发达国家的差距，正向着智能化、网络化、规模化的方向发展，但难度大、体系平台建成耗资多等问题仍客观存在，希望广大科研工作者能够持之以恒，有所突破。

围绕传感器硬件结构，房喻详细介绍了活性层（adlayer）效应及叠层式传感器结构。相比于传统硬件结构，叠层结构有结构紧凑、稳定性能强、能量消耗低的突出优势，对于打破美国垄断传感器技术的局面，以及创建薄膜荧光传感器研发平台具有深远意义。

房喻对薄膜荧光传感过程进行了讲解，指出传感性能的检测是通过传感单元、传感结构辅助进行的，其本质要求仍为分子设计的多样性。他对薄膜荧光传感器在爆炸物等方面探测过程的应用充满信心，并以致死率为 25% 的单核增生李斯特菌为例，介绍了传感器的跨界应用。他同时强调，“绿色、跨界、融合、对接”是新一代科研工作者应该秉持的作风。

报告结束后，房喻院士与现场师生进行了探讨交流并合影留念。

On June 16, 2023, Prof. Fang Yu was invited to the 76th Huangdao Forum of China University of Petroleum on its Qingdao Campus, and gave a report titled "Film-based Fluorescence Sensors - From Sensitive Materials to Hardware Structure".

Fang Yu said that many countries have been encouraging and supporting the research and development of sensors, of which the United States included "Advanced Sensing technology" in the "List of Key and Emerging Technologies". The research and development of sensor technology, which has been a focus of attention as a key technology of the Internet of things, faces opportunities as well as challenges. He said that Chinese enterprises in the sensor field are facing difficult problems, and "in the future, those who dominate the sensors lead the new era."

Fang Yu said that at present, China’s sensor technology continues to improve, gradually shortening the gap with developed countries, and is developing in the direction of smart, networking and large-scale sensors, but the problems such as difficult and costly system platform construction still exist, so he hoped that Chinese researchers can persevere and make breakthroughs.

Speaking of sensor hardware structure, Fang Yu introduced the adlayer effect and the stacked layer sensor structure in detail. Compared with the traditional hardware structure, the stacked layer structure has the outstanding advantages of compact structure, high stability performance and low energy consumption, which is of far-reaching significance in breaking the monopoly of the US sensor technology and creating a platform for R&D of film-based fluorescent sensors.

Fang Yu explained the process of film fluorescent sensing, in which the detection of sensing performance is assisted by sensing units and sensing structures, and its essential requirement is still the diversity of molecular design. He was confident about the application of film fluorescent sensors in the detection process of explosives and other substances, and introduced the cross-disciplinary application of the sensors with the example of Listeria monocytogenes, which has a 25% lethality rate. He also maintained that the concepts of "green-oriented, interdisciplinary, fusing, and docking" are what the new generation of Chinese researchers should uphold.

After the report, Fang Yu discussed and exchanged with the teachers and students present and took a group photo with them.

团队师生参加中国化学会第 33 届学术年会

Fang Group participate in the 33rd Chinese Chemical Society Congress

2023 年 6 月 17 至 20 日，团队师生参加了在山东省青岛市举办的以“新征程 · 新使命”为主题的中国化学会第 33 届学术年会。

6 月 18 日，房喻院士在高等化学教育分会作了题为《基础的重要性——以化学学科为例》的特邀报告，同日在 CCS Chemistry 新兴前沿交叉化学论坛上作了题为《薄膜荧光传感器——从敏感材料到硬件结构》的特邀报告。

丁立平、刘静、薛东旭、马佳妮、刘太宏等五位老师均做了分会邀请报告。团队近 40 名研究生参加了会议，部分研究生作了墙报展讲。

From June 17 to 20, 2023, the teachers and students of Fang Group participated in the 33rd Chinese Chemical Society Congress themed "New Journey • New Mission" held in Qingdao, Shandong Province.

On June 18, Prof. Fang Yu gave a report titled "The Importance of Foundation - Taking Chemistry as an Example" at the Higher Chemical Education Session, and on the same day, he gave a report titled "Film Fluorescence Sensors - from Sensitive Materials to Hardware Structures" at the Emerging Frontiers of CCS Chemistry Cross Chemistry Forum.

Prof. Ding Liping, Prof. Liu Jing, Prof. Xue Dongxu, Prof. Ma Jiani, and Assoc. Prof. Liu Taihong gave reports at parallel sessions. About 40 graduate students of Fang Group participated in the meeting, and some of them made wall poster exhibition and presentation.

房喻院士获聘咸阳市科技顾问

Fang Yu appointed S&T Consultant of Xianyang City

2023 年 6 月 20 日，咸阳市第二届“人才兴咸”大会举行，房喻院士出席大会并获聘咸阳市科技顾问。

On June 20, 2023, Prof. Fang Yu attended the second "Talents Promoting Xianyang Development" conference held in Xianyang, Shaanxi province, and was appointed as a Science and Technology Consultant of Xianyang City.

房喻院士参加院士专家及青年教师学生座谈会

Fang Yu attends symposium of academician, experts, young teachers and students

2023 年 6 月 21 日，房喻院士应邀赴西安科技大学参加由戴彬彬副省长召集的院士专家及青年教师学生座谈会，并就科技创新与成果转化、高素质人才培养等方面发言，对陕西省省高等教育高质量发展提出意见建议。

On June 21, 2023, Prof. Fang Yu was invited to attend the symposium of academician, experts, young teachers and students convened by vice governor Dai Binbin at Xi'an University of Science and Technology, and spoke on scientific and technological innovation and achievement transformation, and high-quality talent training, putting forward opinions and suggestions for the high-quality development of higher education in Shaanxi Province.

团队成果亮相第十一届陕西高等教育博览会

Fang Group achievements exhibited at 11th Shaanxi Higher Education Expo

2023 年 6 月 24 日至 26 日，第十一届陕西高等教育博览会暨第七届陕西高校科技成果陕西研究生创新成果展在西安国际会议中心举行，团队隐藏爆炸物探测仪、透气不透水缓释材料等成果亮相陕西高校科技成果展暨校企对接洽谈会成果展览。

From June 24 to 26, 2023, the 11th Shaanxi Higher Education Expo and the 7th Shaanxi University Scientific and Technological Achievements and Shaanxi Graduate Student Innovation Achievement Exhibition was held in Xi'an International Convention Center. Fang Group's hidden explosive detector, and breathable and impermeable controlled-release materials were displayed in the Scientific and Technological Achievement Exhibition and School-Enterprise Docking Fair.

成都理工大学裴向军教授应邀作报告

Chengdu University of Technology Prof. Pei Xiangjun invited to give a report

2023 年 6 月 3 日下午，成都理工大学生态环境学院院长裴向军教授应邀在新概念传感器与分子材料研究院一层报告厅作了题为“生态修复与碳汇”的专题报告。团队教师和研究生参加了此次交流会，会议由丁立平教授主持。

裴向军教授完成了长江三峡、金沙江溪洛渡、雅砻江锦屏等 13 个水电站高边坡，及拉萨贡嘎空港新区、若尔盖草原、西藏墨竹工卡等多地生态修复示范，主持完成的“8.8” 九寨沟地震震损火花海修复得到联合国教科文组织和世界自然保护联盟的肯定。

裴向军教授分别从西部生态地质环境问题、地质环境扰损区生态修复关键技术和典型生态修复实例三方面进行了报告。在报告中，他指出我国实现碳中和时间紧、任务重、压力大，实现碳达峰、碳中和必须持续巩固提升碳汇能力。地质灾害以及重大工程对地质环境产生很大影响，开展生态保护修复对提升陆地碳汇能力具有重大贡献。裴向军教授用多种修复案例介绍了材料科学与生态环境学的交叉应用，重点介绍了糯米灰浆在九寨沟火花海修复中的应用。

报告结束后，裴向军教授与在场师生就相关问题进行了讨论，并与参会老师合影留念。

On June 3, 2023, Prof. Pei Xiangjun, Dean of the School of Eco-Environment of Chengdu University of Technology, was invited to give a report titled "Ecological Restoration and Carbon Sinks" in the lecture hall of the Institute of New Concept Sensors and Molecular Materials. Teachers and graduate students of the institute attended the meeting, which was chaired by Prof. Ding Liping.

Prof. Pei has completed the high slopes of 13 hydropower stations such as the Three Gorges on the Yangtze River, Xiluodu on the Jinsha River, and Jinping on the Yalong River, as well as ecological restoration demonstrations in Lhasa's Gongga Airport New Area, Ruoergai Grassland, Tibet Mozhu Gongka, etc., and presided over the restoration of the "8.8" Jiuzhaigou earthquake-damaged Huohuahai Lakes, which was recognized by United Nations Educational, Scientific and Cultural Organization and the International Union for Conservation of Nature.

Prof. Pei presented his report from three aspects: ecological geological environment problems in western China, key technologies of ecological restoration in geologically and environmentally disturbed or damaged areas, and typical ecological restoration examples. In the report, he said that as there are difficulties of tight schedule, heavy task and high pressure for China in achieving carbon neutrality, we must continue to consolidate and improve carbon sink capabilities in order to achieve carbon peak and carbon neutrality. Geological disasters and major engineering projects have a great impact on geological environment, and ecological protection and restoration have made significant contributions to improving the capacity of terrestrial carbon sinks. Pei introduced the interdisciplinary application of materials science and ecological environment science with a variety of restoration cases, focusing on the application of glutinous rice mortar in the restoration of Huohuahai Lakes in Jiuzhaigou.

After the report, Prof. Pei discussed relevant issues with the teachers and students present, and took a group photo with the participating teachers.

观点视角 Opinions and Perspectives

房喻院士谈加强新时代中小学科学教育工作

Fang Yu talks about strengthening science education in primary and secondary schools in the new era

近日，教育部等十八部门联合印发《关于加强新时代中小学科学教育工作的意见》，深入贯彻习近平总书记在二十届中共中央政治局第三次集体学习时的重要讲话精神。房喻院士围绕“统筹拔尖创新人才项目，探索选拔培养长效机制”谈了自己的体会，提出要加强体系化建设，形成创新人才培养新格局。

房喻院士讲到：我一直认为创新人才的培养不是高等教育的专利，在某种意义上讲，基础教育在创新人才培养中发挥着更为重要的作用。这是由于在历史上，大凡能够在科学研究上做出重要贡献的人，一定是除了天分，更多的是因为热爱和能够坚持，这就必然涉及科学兴趣的培养、人生观和价值观的塑造。中小学阶段是兴趣培养、人生观和价值观形成的关键时期，高水平大学、科研院所具有丰富的科学资源和人力资源，因此，从制度上进行设计，鼓励有条件的高校和科研院所参与中小学科学教育工作、科学课程建设和实施对于创新人才培养，落实二十大报告提出的“要着力造就拔尖创新人才”具有重要的现实意义。

Recently, China’s Ministry of Education and other 17 government departments released their Opinions on Strengthening Science Education in Primary and Secondary Schools in the New Era, as a move to implement the spirit of important speech by CPC general secretary Xi Jinping at the third collective study session of the Political Bureau of the 20th CPC Central Committee. In an interview, Prof. Fang Yu shared his opinion of "Coordinating top-notch innovative talent projects and exploring long-term mechanisms for selection and training", and proposed to strengthen systematic construction and form a new pattern of innovative talent training.

Fang Yu said, “I have always believed that the training of innovative talents is not the patent of higher education, and in a sense, basic education plays a more important role in the training of innovative talents. This is because in history, those who made important contributions to scientific research were more because of their love and persistence, in addition to their talent, and this inevitably involves the cultivation of scientific interest, outlook on life and values. Primary and secondary school stage is the key period of interest cultivation, outlook on life and value formation, whereas high-level universities and research institutes have rich scientific and human resources, therefore, it is of great practical significance to design the system and encourage qualified universities, colleges and research institutes to participate in the science education of primary and secondary schools and the construction and implementation of science curriculum for the training of innovative talents and the implementation of the "Focus on cultivating top-notch innovative talents" proposed in the report of the 20th CPC National Congress.

黄蓉蓉：绝知此事不相负，荆棘翦除梨栗秋

Huang Rongrong: I know my hard work will not be in vain, and there will be a harvest after clearing thorny obstacles

黄蓉蓉，陕西师范大学化学化工学院物理化学专业2022届博士毕业生，汉族，中共党员，曾获2022年研究生国家奖学金、第二十一届“东方胶化”杯全国胶体与界面化学优秀研究生一等奖等。她立足基础科学研究，专注学科前沿，围绕构建高性能薄膜荧光传感器展开工作，近年来，以第一作者身份在Angew. Chem. Int. Ed., Anal. Chem.与Aggregate等国际高水平期刊发表研究论文4篇，以共同第一作者身份发表研究论文2篇；参与申请国家自然科学基金项目2项，主持研究生创新基金课题一项。

在走完自己学生生涯的最后一站，顺利取得理学博士学位后，回顾六年多的求学路，黄蓉蓉坦言自己的科研之路并非一帆风顺，其中也充满了坎坷与挫折，可以以一句时下比较流行的用语“痛并快乐着”来形容。然而，这种所谓的“痛”是成长所必须经历的，而“快乐”则来源于对所从事工作的喜欢与热爱。至今，黄蓉蓉依然清晰地记得2016年春天第一次见到房喻老师，聊天时房老师提到的“化学的本质是创造新物质、发现新物质”，自那之后，黄蓉蓉在Fang Group这个大家庭中开启了自己与化学有关的那些故事。

2017年年底，面临第一个课题不太顺利而需要调整方向的时候，她确实感觉到沮丧，但后来在导师房喻教授的引导下，积极调整心态，虚心向师兄师姐请教，奋力追赶，最终在研二暑假投出了自己的第一篇文章。科研初期所经历的些许挫折并没有让黄蓉蓉轻易自我否定，相反，在这一过程中，她对房老师所常说的“办法总比困难多”有了更深的体会与认识，也感受到运用所学解决问题所带来的成就感，这也进一步坚定了想要继续从事科研的决心。因此，在2018年5月，了解到学校硕博连读申请的通知时，黄蓉蓉毫不犹豫地递交了申请。

选择继续攻读博士学位，除了源于自己对科研的热爱，也是由于在这两年的时间里，她深深地感受到Fang Group这个大家庭的温暖，深深被大家长房老师的科研与人格魅力所折服，也深深受组里浓厚的学术氛围所熏陶。让她印象深刻的是在无数个晚上房老师下班回家前，都会来到学生休息室和大家讨论最近所遇到的难题，当她身处讨论的氛围中，有许多个瞬间让她觉得“这就是科研的一种样子，思想的碰撞，灵感的迸发，我喜欢这样”。

除了实验中所遇到的问题，科研工作者们也常常会在文章发表的过程中受挫，这对于黄蓉蓉也不例外。她的第三项工作，从开展到准备投稿，历经整整两年时间，而文章的投稿过程也充满坎坷。但是，在经历了前期工作的磨练，此时投稿的不顺也并没有让黄蓉蓉轻言放弃，而是想办法提升工作，解决问题。在漫长的一遍又一遍稿件修改、补充实验数据以及与审稿人“周旋”的过程中，她的科研能力与抗打击能力也得以进一步提升。经过好几番投稿、修改与完善，黄蓉蓉的工作最终成功发表于国际著名期刊Angew. Chem. Int. Ed.，并得到相关领域众多研究人员的高度评价。

回想起收到文章接收邮件的那天，对于黄蓉蓉来说，除了激动，更多的是无以言表的感动与感恩。她清楚地记得，房老师在收到文章终于顺利接收的消息后，很是高兴地拍了拍她的脑袋，短短的一句“女子，不容易啊”便让她眼中泛出泪花；亦记得，合作的一位新加坡老师在当天给她发来信息，表达了对她一路走来坚持不懈的肯定与赞赏。感恩师长、感谢朋友与同学，亦感谢自己从未言弃。漫漫长途，终有回转，余味苦涩，终有回甘。黄蓉蓉相信，无论顺境还是逆境，我们应始终保有一颗感恩的心。

除了无惧失败与挫折，科研人员还应具备良好的科研品质与习惯。黄蓉蓉同学提到以下几点：（1）天下大事必作于细。严谨求实，注重细节，在实验中善于观察，不轻易放过实验中遇到的反常现象，做科研中的有心人。（2）Stay foolish, stay hungry. 要虚怀若谷，善于向他人学习或请教。黄蓉蓉感慨，身边许多真正优秀的人们都有一个特点，那就是，无论他们的成就有多大，待人总是那么平易近人，也总是能看到他人身上的闪光点。向身边优秀的人学习，这也是房老师经常教导黄蓉蓉以及其他同学的；另一方面，始终保持对新鲜事物的好奇心，敏锐发现问题。（3）业精于勤。最近正值第七个全国科技工作者日，植物化学家孙汉董院士提到“八小时出不了科学家”，这也是许多科技工作者的座右铭。黄蓉蓉讲到，她的导师房喻院士只要不出差，几乎全年无休地坚持每天早早地来到办公室工作，这也潜移默化地影响着实验室的许多同学们，有许多人在早上七点多便开始做事情。黄蓉蓉坦言，榜样的力量也激励着自己不断向前成为更为优秀的人。（4）了解学科发展前沿动态，同时多关注其他相关学科的发展，做到深度与广度并重。这一点很难，但这是自我提升所必须的。（5）最后一点，也是最重要的，即树立做对社会有用的人这一思想认识。黄蓉蓉说，房老师经常和学生们讲“我们花的是纳税人的钱，要做一些对这个国家、这个社会有用的事情，要能真正解决国家、社会所面临的问题”。诚然，作为未毕业或者刚毕业的学生，可能还无法真正达到造福社会这样的高度，但是每个人在自己的位置上做好自己的事情，这就是在为社会做贡献。假以时日，相信不断成长的这一代年轻人终将成为社会主义现代化建设的中流砥柱。

人物访谈 Featured Interview

Huang Rongrong is a class of 2022 PhD graduate of School of Chemistry and Chemical Engineering, Shaanxi Normal University, majoring in physical Chemistry. She has won the 2022 National Scholarship for postgraduate students, the 21st "Oriental Gelation" Cup National Colloid and Interface Chemistry Outstanding postgraduate prize. Based on basic science research, she focuses on the forefront of disciplines and works around the construction of high-performance film fluorescence sensors, and published 4 research papers as the first author, and 2 research papers as co-first author in high-level international journals such as Angew. Chem. Int. Ed., Anal. Chem. and Aggregate; she also participated in 2 National Natural Science Foundation projects and presided over one graduate innovation fund project.

After finishing the last stop of her student career and obtaining a doctorate of science, looking back on the road of more than six years of study, Huang Rongrong admitted that her research road was not smooth sailing, which was actually full of frustrations and setbacks, and can be described by a popular phrase "suffering while enjoying". However, this so-called " suffering" is necessary to grow up, while " enjoying" comes from the like and love of the pursued course. Today, Huang Rongrong still clearly remembers the first time she met Prof. Fang Yu in the spring of 2016, when Prof. Fang said that "The essence of chemistry is to create new substances and discover new substances" during the chat. Since then, Huang Rongrong has begun her own chemistry-related story in the big family of Fang Group.

At the end of 2017, when her first research project was not going well and she needed to adjust the direction, she really felt frustrated, but later under the guidance of her mentor Prof. Fang Yu, she adjusted her mentality, consulted senior students, struggled to catch up, and finally submitted her first article in the summer vacation of her second year of postgraduate study. The setbacks experienced in the early stage of scientific research did not let Huang Rongrong easily deny herself. On the contrary, in this process she had a deeper understanding of the words "Solutions are always more than difficulties" frequently said by Prof. Fang. She also felt the sense of achievement brought by using what she learned to solve problems, which further strengthened her determination to continue to engage in scientific research. Therefore, in May 2018, when learning about the notice of the application for successive postgraduate and doctoral program, Huang Rongrong did not hesitate to submit her application.

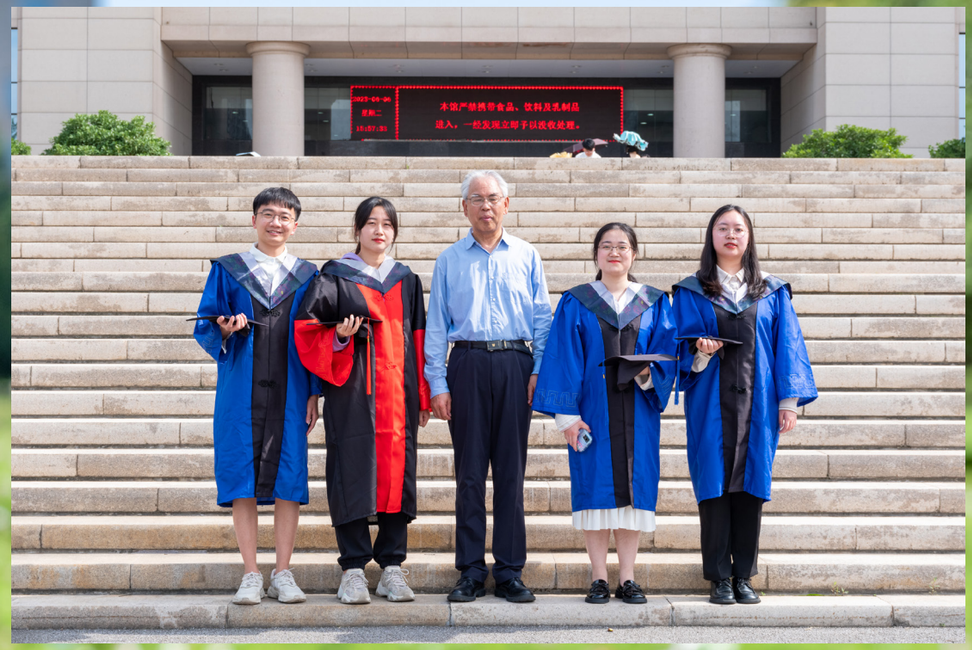
She chose to pursue a doctoral degree not only because of her love for scientific research, but also because in the past two years, she had felt the warmth of the big family of Fang Group, deeply impressed by Prof. Fang's charisma in research and personality, and influenced by the strong academic atmosphere in the group. What impressed her most was that on countless nights, before returning home from work, Prof. Fang would come to the student office to discuss with everyone the problems they had recently encountered. When she was immersed in the atmosphere, there were many moments when she felt "This is what scientific research looks like, the collision of ideas and the burst of inspiration, and I like it".

In addition to the problems encountered in experiments, researchers are often frustrated in the process of publishing their articles, and Huang Rongrong is no exception. Her third work, from the beginning to the preparation of submission, lasted two years, and the submission process was also full of setbacks. However, after experiencing and overcoming setbacks in previous work, Huang Rongrong did not give up easily, but found ways to solve the problems and improve her work. In the long process of repeated manuscript revising, supplementing experimental data and "dealing" with reviewers, her research ability and pressure-resistant ability were further improved. After several submissions, revisions and improvements, Huang Rongrong's work was finally published in the internationally renowned journal Angew. Chem. Int. Ed., and was highly praised by researchers in related fields.

Looking back on the day when she received the acceptance letter in the email, Huang Rongrong, in addition to excitement, was filled with unspeakable emotion and gratitude. She clearly remembers that after receiving the news that the article was finally accepted, Prof. Fang happily patted on her head, and his words "Kid, this is no easy work!" made her burst into tears. She also remembers that the Singaporean teacher who collaborated with her sent her a message on the same day, expressing his affirmation and appreciation for her perseverance along the way. She was grateful to her teachers, friends and classmates, and for never giving up. Along a long journey, there will be a turning; Through a bitter experience, there will be sweetness in the end. Huang Rongrong believes that no matter in favorable circumstances or adversity, one should always maintain a grateful heart.

In addition to not being afraid of failure or setbacks, researchers should also have good research quality and habits. Huang Rongrong mentioned the following points: (1) Great things start small. Be an observant and conscientious person in the experiment: Rigorous and realistic, paying attention to details, observant during experiment, and never letting go of the abnormal phenomena encountered in the experiment. (2) Stay foolish, stay hungry. Be humble and good at learning from or consulting others. Huang Rongrong claims that many outstanding people have a characteristic, that is, no matter how big their achievements are, they are always so approachable, and they can always see the bright spots on others. Learning from the outstanding people around them is what Prof. Fang often tells Huang Rongrong and other students. On the other hand, always be curious of new things and keen to find problems. (3) Excellence in work is possible only with diligence. Recently, on the seventh National Science and Technology Workers' Day, CAS Academician Sun Handong, a plant chemist, said that "Working only eight hours a day cannot make a scientist", which is also the motto of many science and technology workers. Huang Rongrong said that Prof. Fang Yu comes to the office early every day to work almost all the year round, as long as he is not on a business trip. This who influences many students and many of them are coming to the laboratory and begin work around seven o'clock in the morning. Huang Rongrong admitted that this power of example also inspires herself to continue to become a better person. (4) Understand the frontier trends of development in the discipline, and pay close attention to the development of other related disciplines, so as to expand one's vision in both depth and breadth. This is not easy, but it is necessary for self-improvement. (5) The last but also the most important point is to establish the idea of being a useful person to the society. Huang Rongrong said that Prof. Fang often told students that "We spend taxpayers' money, so we should do something useful for this country and this society, and we should be able to really solve the problems facing the country and society." It is true that as a student who has not graduated or just graduated, he or she may not be able to stand in a position to truly benefit the society, but everyone doing their own work in their own position is to contribute to the society. In due course, it is believed that this generation of progressing young people will eventually become the mainstay of China's socialist modernization.

毕业相册 Graduation Album



平生护念笑磋跎

Do good not evil all your life without wasting time

刘凯强

Liu Kaiqiang

今闻游子唱离歌，
夜望流星渡银河。
步入师门修正业，
如今好似跨山车。
长安总在客中过，
雨过天晴向晚多。
莫忘师承授业真，
平生护念笑磋跎。

Today I hear graduating students sing parting songs,

Like watching meteors crossing the nightly Milky Way.

Following mentors to pursue academic excellence,

Scaling mountains to reach places higher and faraway.

Chang'an has always been a home for passengers,

As days and nights pass no matter rain or shine.

Forget not teaching and preaching of your advisors,

Do good but not evil all your life without wasting time.

总策划：房喻教授
Producer & Editor-in-Chief: Prof. Fang Yu
责任编辑：刘太宏　冯伟
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校对：团队全体老师
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Designed by Changle Yangji, FanForm Art Space

地址：陕西省西安市长安区西长安街 620 号
陕西师范大学长安校区
Chang'an Campus, Shaanxi Normal University,
620 West Chang'an Avenue, Chang'an District, Xi'an, Shaanxi, P. R. China
联系电话 (Tel): 86-29-81530726
电子邮箱 (Email): incsmm@snnu.edu.cn