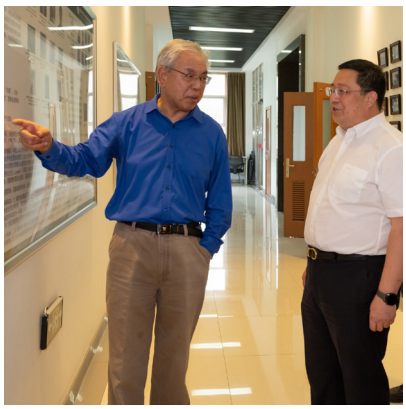
光子鼻与分子材料团队简报

Newsletter of Photonic Nose and Molecular Materials Group

5 / 2022



陕西省基础学科（表界面化学）研究中心获批立项建设

Surface Chemistry Basic Discipline Research Center approved

近日，陕西省科学技术厅下发了《陕西省科学技术厅关于组建首批陕西省基础学科研究中心的通知》，依托陕西师范大学建设、由房喻院士担任中心主任的陕西省基础学科（表界面化学）研究中心获批立项建设。

陕西省基础学科（表界面化学）研究中心将依托我校化学学科优势，以学科前沿、国家和地区经济发展重大需求为牵引，构建多学科交叉集成平台，围绕敏感表界面材料与传感器件、功能软物质创制与应用、新能源材料创制与应用、绿色催化和合成、材料性能评价与原型设备研制等领域的关键科学与技术问题，开展创新性基础研究，产出高水平成果，促进产业技术革新，输送高素质专门人才。中心将着力突出表界面化学研究特色，力争建设成为高层次化学人才培养和科学研究基地，为提升我国表界面化学相关基础学科研究水平，加快实现高水平科技自立自强贡献力量。

省科技厅首批依托西安交通大学、西北工业大学、西北农林科技大学、空军军医大学、陕西师范大学、西北大学分别试点建设力学、液体物理、农业生物学、细胞与分子生物学、表界面化学、地球科学等 6 个陕西省基础学科研究中心。

According to a recent notice on constructing the first Shaanxi Provincial Basic Discipline Research Centers released by Shaanxi Provincial Department of Science and Technology, Shaanxi Provincial Basic Discipline (Surface Chemistry) Research Center has been approved for construction at Shaanxi Normal University with Academician Fang Yu as the director.

The Basic Discipline (Surface Chemistry) Research Center, taking advantage of SNNU's chemistry discipline and oriented toward research frontier and major national and regional needs in economic development, strives to build a multi- and interdisciplinary platform, conduct innovative basic research on key sci-tech issues in the fields of the development and application of sensitive interface materials and sensing devices, functional soft matter, new energy materials, green catalysis and synthesis, material performance evaluation and prototype equipment development, in an effort to produce high level results, promote industrial and technological reform, and train high caliber professionals.

The center aims to build itself into a base for training high level talents and conducting research in chemistry, so as to improve China's research level in surface chemistry-related disciplines and contribute to the accelerating of China's self-independence and self-reliance in high technology.

The other five basic discipline centers of Dynamics, Liquid Physics, Agrobiology, Cell and Molecular Biology and Geoscience are approved to be constructed at Xi'an Jiaotong University, Northwest Polytechnic University, Northwest University of Agriculture and Forestry, Air Force Medical University and Northwest University.

首批陕西省基础学科研究中心名单

序号	省学科中心名称	依托单位	负责人
1	陕西省基础学科（力学）研究中心	西安交通大学	王铁军
2	陕西省基础学科（液体物理）研究中心	西北工业大学	魏炳波
3	陕西省基础学科（农业生物学）研究中心	西北农林科技大学	康振生 张涌
4	陕西省基础学科（表界面化学）研究中心	陕西师范大学	房喻
5	陕西省基础学科（细胞与分子科学）研究中心	空军军医大学	陈志南
6	陕西省基础学科（地球系统科学）研究中心	西北大学	赵国春

GPM 材料文化创意作品大赛举行颁奖仪式

GPM Materials Creative Contest Award Ceremony held

5 月 14 日，由共青团陕西师范大学委员会联合应用表面与胶体化学教育部重点实验室、共青团陕西省师范大学化学化工学院委员会共同主办的“GPM 材料文化创意作品大赛”颁奖仪式在致知楼 1668 报告厅举行。中国科学院院士房喻教授、化学化工学院党委书记吴晋峰教授、化学化工学院党委副书记贾颖辉、副院长丁立平，应用表面与胶体化学教育部重点实验室副主任严军林，以及化学化工学院光子鼻与分子材料科研团队部分师生参加了颁奖仪式。颁奖仪式由团委副书记王蓓蓓主持。

贾颖辉副书记宣读了 14 个获奖团队名单，房喻院士、吴晋峰书记、丁立平教授、彭军霞副教授分别为一等奖、二等奖、三等奖获奖团队颁奖，随后吴晋峰书记发表讲话对获奖同学表示了祝贺。一等奖、二等奖获奖团队代表分享了他们此次参赛的心得和体会。最后，房喻院士对此次大赛的创意、组织背景等进行了介绍，并希望将来能开拓更多创意项目，为学生们提供更多参与锻炼的平台以提升综合素养。

GPM(Gas Permeable Monolith) 是迄今为止尚未见诸报道的高强透气有机材料，是由房喻院士领衔的光子鼻与分子材料科研团队经多年努力研制而成。

大赛于 2021 年 12 月开始征稿，共收到 43 件参赛作品，经过专家评审，22 件参赛作品入围决赛。4 月 23 日，入围参赛团队在新勇学生活动中心举行的决赛上进行了现场答辩，最终美术学院贺雪、童琳的参赛作品《“喔 O 狗”创意香薰摆件》获得一等奖，地理科学与旅游学院杨雨欣、张正方、王心语的参赛作品《山河印象——创意等高线地形模型系列》、化学化工学院刘永浩、李胜的参赛作品《便携式“擦睛布”蒸汽眼疗仪》、美术学院童琳、陈滢博的参赛作品《“唱诗娃娃”香薰氛围灯》分获二等奖，化学化工学院王秋恒等人的 10 件参赛作品分获三等奖，其余参赛作品获得入围纪念奖。

On May 14, the awarding ceremony of GPM Materials Creative Contest, organized by the Communist League Shaanxi Normal University Committee,

五月份大事记 Events in May, 2022

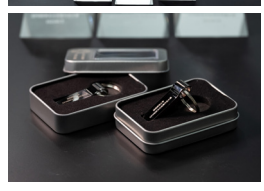
Ministry of Education Key Lab of Applied Surface and Colloid Chemistry and Communist League SNNU School of Chemistry and Chemical Engineering Committee, was held at the Lecture Hall on No. 1688, Zhizhi Building.

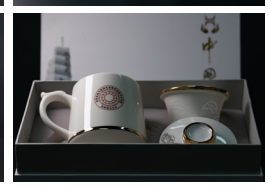
Chinese Academy of Science academician Fang Yu, SCCE CPC Committee secretary Wu Jinfeng, vice secretary Jia Yinghui, vice dean Ding Liping, ASCC Lab vice director Yan Junlin, joined teachers and students from the Photonic Nose and Molecular Material group at the event, which was anchored by Communist League SNNU Committee vice secretary Wang Beibei.

Following the announcement of the winners by Jia Yinghui, Fang Yu, Wu Jinfeng, Ding Liping and Peng Junxia presented the awards and certificates to the winning teams, who were congratulated and encouraged by Wu Jinfeng. The first award winner and one of the second award winners shared their stories and reflections on stage. In the end, Fang Yu recounted the background and purpose of the contest, called for more creative events for students, and hoped the students would take these opportunities to participate more and improve themselves.

Gas Permeable Monolith, a proprietary strong breathable organic material, is developed by the photonic nose and molecular material group led by academician Fang Yu after years of R&D efforts.

The submission of the contest began in December 2021 and 22 out of all 43 entries were shortlisted. At the final competition held on April 23 at Xinyong Students Activities Center, the “Wa-O Dog Aroma Ornament” by School of Fine Arts’ He Xue and Tong Lin won the first award, the “Impression of Mountain and River — Isoheight Terrain Model” by School of Geoscience and Tourism’s Yang Yuxin, Zhang Fangzheng and Wang Xinyu, the “Portable Steam Ophthalmical Device” by SCCE’s Liu Yonghao and Li Sheng, and the “‘Singing Baby’ Aroma Ambient Lighting” by SFA’s Tong Lin and Chen Yingbo won the second award, and other ten entries won the third award.





团队 2022 届毕业生完成毕业论文答辩

Class ’22 graduates finish dissertation/thesis defense

5 月 28 日下午，光子鼻与分子材料团队 2022 届 2 名博士研究生和 19 名硕士研究生毕业生分四组在致知楼完成了论文答辩。

王朝龙和吴颖两位博士研究生分别进行了题为“非平面结构芘二酰亚胺多分体的设计合成、激发态性质和功能应用”和“荧光纳米薄膜的界面可控制备及其传感应用”的毕业论文陈述。

李晶、艾静雯、藏建阳和王照娟等的 19 位硕士研究生也分别进行了毕业论文陈述。

在同学们进行了毕业论文陈述之后，由来自于西安交通大学的蒋庄德院士为代表的 13 位校外专家和 7 位校内专家组成的答辩委员会的各位专家老师对同学们进行了提问，与同学们讨论了相关问题，并对毕业论文的进一步完善提出了修改意见。

五月份大事记 Events in May, 2022

经过各位委员老师讨论，答辩委员会一致认为 21 位同学研究内容充实，回答问题清楚，逻辑合理，同意通过答辩并建议授予相应的博士和硕士学位。

5 月 31 日下午，团队 2022 届本科毕业生曾琳琳、张文慧、白巧巧等 23 位同学也完成了本科毕业论文答辩。

On May 28, two doctoral candidates and 19 master's candidates of the Photonic Nose and Molecular Materials Group finished their dissertation/thesis defense in four separate sessions at the Zhizhi Building.

Doctoral candidates Wang Zhaolong and Wu Ying presented their dissertations under the titles of Non-Planar Perylene Bisimide-Based Polyads: Design, Synthesis, Excited State Processes and Applications and Interfacial Controlled Preparation and Sensing Application of Fuorescent Nanofilms respectively.

Li Jing, Ai JIngwen, Zang Jianyang and Wang Zhaojuan and 15 other master's candidates also presented their graduation theses.

After their presentation, they defended their works by fielding questions raised by the members of four dissertation/thesis committees, consisting of 13 professors from other institutions and 7 SNNU teachers and chaired by CAS academician Jiang Zhuangde of Xi'an Jiaotong University, who discussed the questions with the students and gave suggestions for revising their dissertations or theses.

After conferring privately, the committees unanimously agreed that the candidates had passed their dissertation/thesis defense and recommended the conferment of doctoral or master's degrees to them.

On May 31, Zeng Linlin, Zhang Wenhui, Bai Qiaoqiao and other 20 Class '22 undergraduate students also finished their graduation thesis defense.

From the journal:
Chemical Communications

A persistent radical anion derived from a propeller-shaped perylene bisimide-carbazole pentad†

Check for updates

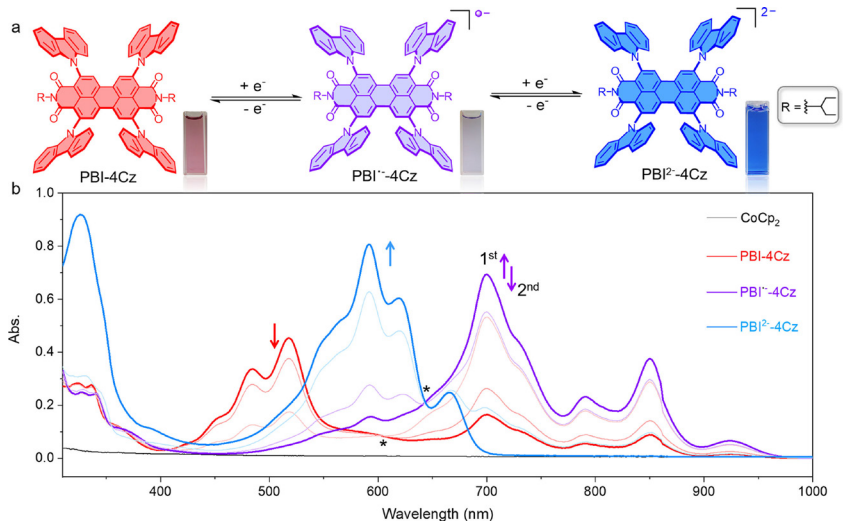
Zhaolong Wang,[a] Xinyu Gou,[a] Gang Wang,[a] Xingmao Chang,[a] Ke Liu,[a] Taihong Liu,[a]* Gang He[b] and Yu Fang[a]*

苝二酰亚胺 – 咔唑五分体稳定自由基负离子的形成和电致变色应用

自由基和自由基离子在合成化学、有机光电和能量存储等领域扮演着重要角色。由于结构上存在未成对电子，导致该物种性质非常活泼，难以分离和表征，阻碍了其实际应用。因此，获得稳定的自由基和自由基离子具有重要意义。

苝二酰亚胺自由基负离子（$PBI^{\cdot -}$）在近红外区具有强烈的特征吸收，是一类优异的光催化剂和光热转换材料。已有研究表明，在苝核上共价连接卤素原子或者氰基等强吸电子基团可以获得高度缺电子的苝二酰亚胺（PBI）衍生物，产生稳定的$PBI^{\cdot -}$。原则上，电子给受体型分子中的强推拉电子效应有助于电子自旋耦合与离域化，降低未成对电子活性，从而起到稳定自由基的作用。然而，基于推拉电子型 PBI 衍生物获得稳定 $PBI^{\cdot -}$ 的案例还未见报道。

本工作中，我们报道了一种新型苝二酰亚胺 – 咔唑五分体自由基负离子（$PBI^{\cdot -}$–4Cz），其在惰性氛围下能稳定存在，正常条件下寿命长达一周以上。连接



图一 . (a) 化合物 PBI−4Cz 及其不同还原态间转化过程示意图和对应照片；(b) 向化合物 PBI−4Cz 的 DMF 溶液中加入二茂钴后的光谱变化。

Figure 1. (a) Transformation between PBI-4Cz and its successive one-electron-reduced species. Inset: Photographs of neutral state PBI-4Cz, corresponding radical anion ($PBI^{\cdot -}$-4Cz) and dianion (PBI^{2-}-4Cz) under daylight; (b) Spectral changes upon treatment of the DMF solution of PBI-4Cz with addition of $CoCp_2$ in small increments.

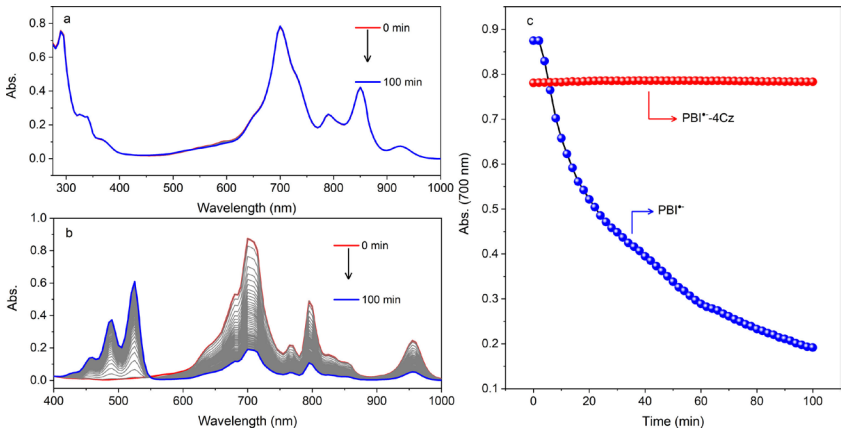
于芘核的四个吡唑单元有效扩大了中心 PBI 共轭面，增加了电子亲和力。与此同时，该分子特有的螺旋桨形结构阻碍了自由基负离子发生二聚。在两种因素协同作用下，PBI˙⁻–4Cz 表现出优异的稳定性。基于该五分体中性态、自由基负离子和二负离子的颜色差异及电学活性，初步实现了电致变色应用。该工作为通过理性分子设计与合成获得稳定的开壳层物种提供了新策略。

第一作者：陕西师范大学博士研究生王朝龙
通讯作者：陕西师范大学房喻院士、刘太宏副教授
全文链接：https://pubs.rsc.org/en/content/articlelanding/2022/cc/d2cc02042d

Derivatization of conjugated organic molecules into open-shell radicals, especially radical ions, is an efficient way to extend their applications in a plethora of fields including synthetic organic chemistry, organic optoelectronics, energy storage materials, etc. Nevertheless, the inherent instability stemming from the incompletely satisfied valency delivers the transient nature of the radical ions, veiling their isolation and characterization, and thus impeding the convenient processing of corresponding materials.

Among the reactive radical ions, of special interest is perylene bisimide (PBI)-based radical anion (PBI˙-) featuring strong absorption in near-infrared region, which have been widespreadly utilized as photocatalysts, photothermal materials, etc. As revealed, PBI˙- is generally stabilized by introducing strong electron-withdrawing groups into PBI core to modulate molecular electronic structure. In principle, strong intramolecular push-pull electronic effect in donor-acceptor-type molecules is conducive to improving spin coupling and delocalization, causing enhanced stability of the associated radicals. However, stable PBI˙- in donor-acceptor-type polyads has not yet been reported and is therefore highly desirable.

In this work, we firstly report a persistent radical anion (PBI˙--4Cz) derived from a propeller-shaped electron-deficient perylene bisimide-based pentad (PBI-4Cz). Detailed investigations confirm that PBI˙--4Cz could intactly exist under inert conditions, and its lifetime is sufficiently prolonged up to more than one week under ambient atmosphere. Such exceptional stability is ascribed to the synergestic effect of high electron-affinity and structural shielding originated from the compact spatial arrangement of PBI-4Cz. Furthermore, an electrochromic device demo using PBI-4Cz as the active component is fabricated, depicting color changes from red to light violet, and further to navy blue with enhancing reduction potential. This work contributes to rational design and appropriated chemical construction of stable open-shell species.



图二 . (a) 化合物 PBI−4Cz 基自由基负离子和 (b) 未经修饰芘二酰亚胺自由基负离子在惰性气氛下的吸收光谱变化；(c) 化合物 PBI−4Cz 基自由基负离子和未经修饰芘二酰亚胺自由基负离子 700 nm 处的吸光度值随时间变化趋势。
Figure 2. Time-dependent UV-Vis-NIR spectra of PBI˙⁻-4Cz (a) and of PBI˙- (b) in DMF under inert atmosphere; (c) Monitored absorbance value at 700 nm of PBI˙⁻-4Cz and PBI˙⁻ within 100 min.

First Author: doctoral candidate Wang Zhaolong, Shaanxi Normal University
Correspondence Authors: Prof. Fang Yu and Assoc. Prof. Liu Taihong, Shaanxi Normal University
Full Text Link: https://pubs.rsc.org/en/content/articlelanding/2022/cc/d2cc02042d

陕西金融资产管理公司理事长李忠民一行来访

Meeting held with Shaanxi Financial Asset Management visitors

5 月 12 日下午，陕西金融资产管理股份有限公司理事长李忠民一行在校党委副书记、教育基金会理事长卢胜利陪同下来到光子鼻与分子材料科研团队，拜访房喻院士并商讨合作事宜。

房喻院士对李忠民理事长一行表示了欢迎，介绍了团队的愿景理念和科研历程，概括了团队在基础研究到产业应用方面取得的重要成绩，包括从荧光传感到高端爆炸物、毒品检测仪的诞生，从试管实验的凝胶化学到凝胶推进剂、凝胶云爆弹、低密度高强度材料等领域的重要拓展，并展望了团队研发的新技术和新材料的推广和应用。

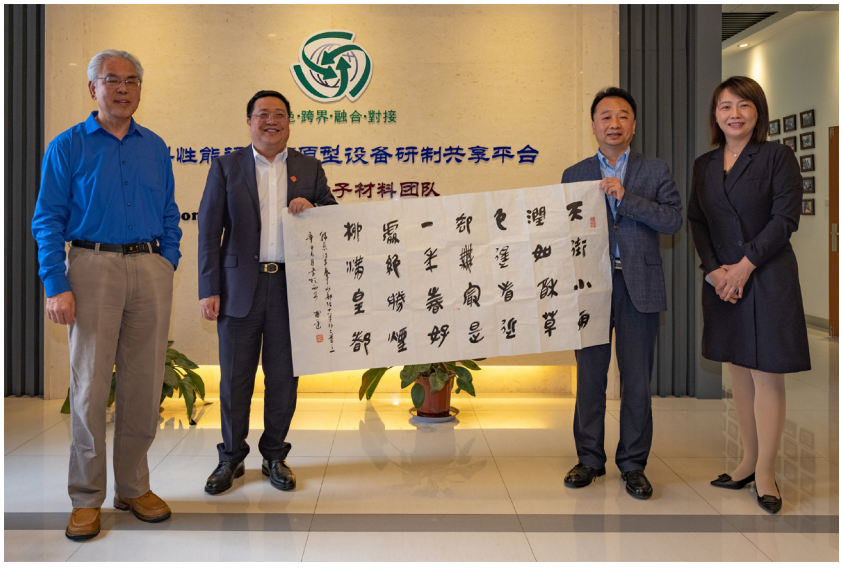
李忠民介绍了陕西金融资产管理股份有限公司及其基金管理公司的基本情况，对团队取得的成绩表示祝贺，希望能凭借其资产管理优势搭建科研成果转化的桥梁，与团队开展实质性合作。他还回顾了当年在师大担任国际商学院首任院长时的往事，表示非常高兴再次回到师大，愿意为师大发展出一份力。

陕西金资副总经理陈威、陕西金资基金管理公司总经理万程、陕西金资综合办公室主任李恒、陕西金资战略规划部总经理任海燕、业务副经理张云子、陕西金资基金管理公司投资业务一部副总经理任宇嘉、投资业务二部副总经理袁青青，陕西师范大学校友会办公室主任刘洪超、化学化

工学院院长薛东、副院长刘成辉、丁立平、肖新军及刘凯强研究员、彭军霞副教授、刘太宏副教授、苗荣副教授等参加了会谈。

On May 12, Shaanxi Financial Asset Management Co., Ltd. director general Li Zhong Min and his colleagues, accompanied by CPC Shaanxi Normal University Committee vice secretary and SNNU Educational Foundation director general Lu Shengli, visited the Photonic Nose and Molecular Materials Group and held a meeting with CAS academician Fang Yu.

Fang Yu, after welcoming Li Zhongmin and his colleagues, briefed them about the group's vision and research progress, summarized the group's important achievements in basic research and industrial application, including development from fluorescent sensing to high capacity explosives and narcotics detector, and from gel chemical tests in tubes to gel propellant and low-density and high-strength material, and also envisioned the promotion and commercialization of new technologies and new materials developed by the group.



Li Zhongmin briefed about SFAM and its subsidiary Shaanxi Jinzi Fund Management Co., Ltd., congratulated Fang Yu and his group on their achievements, and vowed to use their advantage in asset management to build a bridge of commercializing research findings and initiate substantial cooperation with the group. He also recounted the days when he was the first dean of SNNU's International Business School, and said he was delighted to come back to the university and do his share to contribute to its development.

SFAM vice general manager Chen Wei, Shaanxi Jinzi's general manager Wan Chen, and their colleages Li Heng, Ren Haiyan, Zhang Yunzi, Ren Yujia and Yuan Qingqing, joined SNNU Alumni Association Office director Liu Hongchao, School of Chemistry and Chemical Engineering dean Xue Dong, vice deans Ding Liping and Xiao Xinjun, research fellow Liu Kaiqiang, associate professors Peng Junxia, Liu Taihong and Miao Rong at the meetin

刘成辉教授应邀作学术报告

Liu Chenghui invited to presents his research

为加强团队学术研究与其他相关领域的交叉融合发展，应团队邀请，化学化工学院副院长刘成辉教授于 5 月 20 日下午在致知楼 1668 报告厅为团队师生作了题为“单颗粒分析与数字式生物传感”的学术报告。房喻院士、丁立平教授、刘静教授、刘凯强研究员、刘太宏副教授、彭浩南副教授、苗荣副教授、刘忠山副教授及团队全体博士、硕士研究生聆听报告。报告由刘静教授主持。

此次报告中，刘成辉教授围绕单颗粒分析与数字式生物传感等内容对其课题组近期的科研进展作了详细介绍，并对早期疾病诊断面临的困难和相关领域的发展机遇进行了系统分析，同时还介绍了相关研究产业化现状。报告结束后，刘成辉教授与在座师生进行了热烈讨论，对师生的积极提问给予了详细深入的解答。

On May 20, the group invited Prof. Liu Chenghui, vice dean of the School of Chemistry and Chemical Engineering, to present his research on single particle analysis and digital biosensing, in an effort to promote the interdisciplinary development between the Photonic Nose and Molecular Materials Group and other fields of research.

CAS academician Fang Yu, Prof. Ding Liping, Prof. Liu Jing, research fellow Liu Kaiqiang, associate professors Liu Taihong, Peng Haonan, Miao Rong, Liu Zhongshan joined doctoral and masters' students at the lecture.

Liu Chenghui presented a detailed account of the his group's recent work progress on single particle analysis and digital biosensing, analyzed the difficulties of early disease diagnosis, discussed the development opportunities in related areas, and briefed about the situation of commercialization of related research.

After the report, he answered questions raised by teachers and students, and they discussed issues of common interest.

京博控股集团一行来访

Meeting held with Chambroad Holding Group visitors

5 月 21 日上午，山东京博控股集团有限公司董事、黄河三角洲京博化工研究院执行董事兼总经理蔡颖辉及技术团队一行受邀对光子鼻与分子材料研究团队共享平台进行了参观访问，并与光子鼻与分子材料研究团队房喻院士及团队成员进行了座谈。

座谈会上，房喻院士介绍了团队分子材料的研发情况。蔡颖辉董事介绍了京博控股集团有限公司的研发和生产情况，以及近两年来企业的发展状况。随后，双方就分子材料可能的合作研发机遇和合作方式进行了重点交流。

通过深入交谈，双方均表示具有良好的合作前景，希望尽快建立校企合作协议，加快光子鼻与分子材料研究团队分子材料的技术研发推广，促进企业的创新发展，从而更好地服务地方经济发展。

刘凯强研究员、彭军霞副教授、刘太宏副教授、刘忠山副教授和科研助理何怡楠参加了座谈。

On May 21, Shandong Chambroad Holding Group's Cai Yinghui and his technical team visited the Sharing Platform of Photonic Nose and Molecular Materials and held a meeting with CAS academician Fang Yu and his group.

Cai Yinghui is a director of Shandong Chambroad Holding Group Co., Ltd. and the executive director and general manager of the Yellow River Delta Chambroad Institute Co., Ltd.

At the meeting, Fang Yu briefed about the group's progress in molecular materials. Cai Yinghui briefed about Chambroad's R&D and production, as well as its development in the recent two years. They explored the possibilities and methods of research collaboration in molecular materials.

After extensive and friendly discussion, the two parties agreed that there were good prospects for cooperation, and vowed to work together toward a university-enterprise cooperation agreement, in an effort to speed up the commercialization of the group's research findings and technologies in molecular materials, facilitate Chambroad's innovative development, and better promote local economic development.

Research fellow Liu Kaiqiang, associate professors Peng Junxia, Liu Taihong and Liu Zhongshan, and research assistant He Yinan attended the meeting.

十年师大求学路

Ten Years of Pursuing My Studies at SNNU

王朝龙 / Wang Zhaolong

今年是我来到师大的第 10 个年头。此刻回首，站在吴家坟公交站欣喜望着对面师大校门的一幕仿佛发生在昨天。从迈进校门那一刻，我与师大缘起，这里见证了我青春的欣喜与愁绪、拼搏与踌躇。芳华缱绻，沉淀了人生最宝贵的回忆。我常戏称自己是师大的“老人”，这条路上同行者颇多，有已在本校执教的老师，已经毕业的师兄师姐，还有正在奋斗中的师弟师妹们。在师大我们度过了二十岁生日，开始奔三。在我国传统中，三十而立有规可循，所以二十多岁的年纪总是与奋斗挂钩，挥洒汗水，付出心血，每个人都想给自己的三十岁一个满意的交代，这段岁月也因为奋斗而更加绚烂和弥足珍贵。

提交完博士学位论文后，我开始有更多的空闲去“胡思乱想”，有时也会打开微信通讯录，翻看着，回忆着，过往的画面一帧帧扑面而来。十年间，不断上演着相遇与别离的故事，迎来送往，却都泛着七彩的光。如今，即将告别学生生涯，特撰写此文以感谢过往所有的相遇。

细细数来，与房喻老师的相遇也有十个年头了。初见房老师（校长）是在 2012 年入学典礼上，万众瞩目下老师向包括我在内的新生们致以热烈的欢迎并提出殷殷期望，台下的我陷入了对自己本科美好生活的憧憬与向往。

后来，我与老师的距离越来越近，一堂与时俱进的化学前沿讲座，一场指引人生的入院交流报告，座位上青年人心中理想与志向澎湃激荡产生的共鸣如今依旧清晰，那是来自博学严谨、厚德笃行的长者对后来人的教诲点拨与精神传承。

从有幸加入老师实验室开始，我们之间的交集日益增多。“男孩子要对自己严格要求，有远大的追求”，这是初次见面老师拍着我的肩膀所说；“希望你们在未来能积极承担起对个人和家庭的责任，如果有余力，也请主动承担起对社会和国家的责任，永远不要做一个不负责任的人”，这是老师在师兄结婚答谢宴上的发言；“办法总比困难多，遇见困难要多请教，多讨论，要学会把自己练得皮实一些”，这是当我们遇到实验瓶颈时来自老

本科毕业答辩时王朝龙与房老师的合影
A photo of Wang Zhaolong with Prof. Fang at the time of undergraduate thesis defense

师的安慰与鼓励。

即便在周末和节假日，老师办公室的门也敞开着，那扇门里透出的光对学生们有种莫名的吸引力，尤其是对遇到困难陷入沮丧的学生，我常常思忖这就是学生们的“解忧杂货店”吧。讨论实验恰逢饭点的“工作餐”，夏季的降暑西瓜，师母做的肉夹馍……都会成为毕业多年学生们的美好回忆。**坦言之，房老师是我 22 年学生生涯中遇见的最好的老师。毛主席说过：“人是要有一点精神的”。老师心里盛装着家国情怀、科学研究、教书育人，虽年岁已至花甲，依旧踔厉奋发，是我需要永远学习的榜样。**

我于 2015 年 9 月加入 Fang Group 大家庭，老师将我“托付”给一个头发卷卷的师兄，从基本实验操作练起，到后来学习光物理基础知识和参加课题讨论，更重要的是师兄身上那种对科研近乎执着的热爱传染给了我，让我也“入了坑”。此外，实验室里其他兄弟姐妹对我也照顾有加，在我们相聚的日子里，有着最珍惜的情谊，在我们年轻的岁月中，有着最真挚的相知。记得在实验室里的第一个生日，我被涂成了“奶油小生”一般；春日的周末，一起相约去踏青；落雪后的师大，一起体验“不高山滑雪场”的速度与激情……

进入实验室 7 年，看着一届届师兄师姐毕业，也迎来了一批又一批年轻的小萌新，我也慢慢在成长，成长为我自己眼中的“高年级”。时常觉得自己是个幸运的人，总是可以遇见一群可爱又努力的人，感谢你们的一路陪伴！

再长的路，一步步也能走完，再短的路，不迈开双脚也无法到达，希望时光下的我们仍可以轰轰烈烈向前奔去！

This is the tenth year since I first came to Shaanxi Normal University. Looking back, I feel as if it was only yesterday when I happily looked at the SNNU gate from across the Chang'an South Road at the Wujiafen bus stop. My SNNU story began with the first steps into that gate, inside which my youthful happiness, anxiety, struggle and hesitation take place, becoming the most precious memories. I often jokingly call myself a “SNNU Veteran”, and is privileged to have many fellow travelers on this journey --- some of them have become SNNU faculty members, some have left after graduation, and some are still working hard in labs. At SNNU, we had our twentieth birthday and are now turning thirty. In Chinese tradition, “One should stand firm at thirty”, so the age of twenties is always linked with hard work. Sweat and toil in twenties make it possible for one to deliver an satisfactory answer when they turn thirty, and this period of life has thus become brighter and more unforgettable.

After submitting my doctoral dissertation, I finally had some moments to indulge in flights of fancy. I browsed my WeChat contacts and pictures of the past sprang up. In these ten years, I experienced so many encounters and separations, welcomes and farewells, but all illuminated in halos in my memory. Now, I am writing this to commemorate my ten years of pursuing studies at SNNU, and express my gratitude to all the beautiful encounters.

It has been ten years since I first met Prof. Fang Yu. Ten years ago in 2012, Prof. Fang spoke as SNNU president at the opening ceremony to class '2016, of whom I was a freshman. He welcome us to the university and spoke about his expectation of us, leading to my yearning for the undergraduate life.

The distance between Prof. Fang and me became shorter as I met him at various occasions, such as a lecture of the frontier of chemical research and an orientation for freshmen of the School of Chemistry and Chemical Engineering. I still remember the resonance of ideals and aspirations of the young audience echoed from his speech, which is the inspiring guidance and spiritual inheritance from an erudite, rigorous and upright senior.

I had more contacts with Prof. Fang after joining his lab. “A young man should be stricter with himself and have ambitious pursuit”, this are the words he told me as he patted on my shoulder.

“I hope you can all shoulder your responsibilities to your family and yourself, and if you still have strength to spare, please voluntarily shoulder the responsibilities to the society and the nation --- never will you be an irresponsible person”, these are the words he spoke at the wedding reception of one of my upperclassmen. “There are always more solutions than difficulties. Seek help and discuss with others when you meet a difficulty. Learn to make yourselves more resilient and sturdy”, these are the words of consolation and encouragement when we were stuck at a bottleneck of our experiments.

王朝龙正在进行博士毕业论文答辩
Wang Zhaolong at his doctoral disser-tation defense

Even during weekend or holidays, the door of Prof. Fang’s office is always open, and the light inside is so intriguing, especially to troubled or depressed students. I often think of his office as a “Worries Relieving Grocery Store” for students. A working lunch during discussion of experiments, watermelons in hot summer days, Roujiamo or the marinated meat in baked buns made by his wife ... all have become the wonderful memories of students even years after their graduation. A**ll in all, Prof. Fang is the best teacher in my 22 years as a student. Chairman Mao Zedong said, “Man should be strong willed.” Prof. Fang, though already in his sixties, is still a patriotic scientist and educator in high fighting morale, and is always a role model for me to learn from.**

When I joined the Fang Group in September 2015, Prof. Fang assigned me to a curly-haired senior fellow student, asking me to begin with learning basic experimental operations from him. Later, I began to learn Photophysics and participate in group discussions, and more importantly, I also devoted myself heart and soul to research after being influenced by his zest and passion for research. Other fellow students have also been so kind to me, surrounding me with the most valuable and sincere friendship a young man could ever have. I became a “cream-faced” man when I had my first birthday after joining the lab; we went for an outing during the weekend in the spring; and we tried snow skiing down the slope of Bugaoshan (Not Tall Hill) on Chang’an campus on a snowy day .....

During the seven years at the lab, I have witnessed many departures of upperclassmen upon graduation and many arrivals of new students, and I have also gained my own growth and become an upperclassman myself. I often consider myself a lucky man, who have met and befriended with a group of lovable and hardworking people. Thank you for riding along with me.

A long way can be completed step by step, but a short road can not be reached without moving your feet. Let’s stride vigorously together toward the road ahead!

硕士研究生毕业论文致谢摘录
Excerpt from the acknowledge of a master's graduation thesis

行文至此，意味着学生时代即将结束。感谢恩师丁立平教授这么多年给予的教导、关爱与照顾，本科教与我专业知识，研究生授与我实验、做人与做事，与我而言，您至关重要，不可或缺。在科研上，您思维活跃，给过我很多指导和帮助，让我明白努力的意义。在生活中，老师像对待家人一样对待我们，给予了我们足够的柔软与关爱，去老师家里吃火锅、海南出差的椰子糖、日本出差的唇膏、好吃的海鲜自助、各种水果、日常好吃的、去珠海参加年会……您在用您的方式尽可能地让我们去看世界。

在此，衷心地祝愿丁老师和刘老师身体健康，工作顺利，祝愿一丁一宁快乐的长大，做最幸福的小人儿！衷心地希望 1652 的第一位小伙伴都学有所用，不负韶华！愿大组乘风破浪，再创辉煌！

——王照娟

As I come to this part of my dissertation, my time as a student at Shaanxi Normal University will soon end. I would like to take this opportunity to thank my dear advisor Prof. Ding Liping, for all those years' instruction, care and support. She taught me professional knowledge when I was an undergraduate, and she taught me how to conduct experiments, and more importantly how to be a human and how to do things right, when I was a graduate student. You have been vitally important and indispensable in my growth. In research, you gave me numerous guidance and help with your agile thinking, making me understand the meaning of hard work. Outside research work, you treat us as your family with your kindness and care: having hotpot at your home, eating seafood buffet together, bringing us gifts from your trips - coconut candy from Hainan Island and lipsticks from Japan, attending conference with you in Zhuhai, and all the fruits and snacks you shared with us ..... You use your method to let us open our eyes to more of the world.

Here I present my sincere wishes for the good health of Prof. Ding and her husband, as well as the happy childhood of their children - Yiding and Yining. I wish everyone from our dorm No. 1652 could apply what we have learned and live up to our dreams! I also wish for greater achievements for the Fang Group!

—— by Wang Zhaojuan

答辩结束后王照娟（右）与丁立平老师（中）合影留念
Wang Zhaojuan (Right) poses for a photo with Prof. Ding (Center) after thesis defense

本科生感想摘录
Excerpts from reflections of undergraduate students

日子在指尖流过，四年的大学生活马上就要结束了。我会永远珍惜、感谢我遇到的所有帮助过我的同学、老师。经历过毕业答辩之后，我深刻地认识到做科研不是一蹴而就的，需要大量的前期文献查阅铺垫以及足够的耐力和耐心，还需要有一丝不苟的精神。无论是在实验上还是论文撰写的格式上，都需要发挥这种严谨的匠人精神。这次分别，不知道何时再能相见，祝大家都能在自己的道路上，走出一道靓丽的风景线。（陈金有）

As days slip through the fingers, my four-year university life will soon come to an end. I will always cherish and thank my teachers and fellow students who have rendered help to me. The thesis defense experience taught me that doing research is no easy task, which requires a great amount of literature reading, sufficient endurance and patience, as well as meticulousness. This rigorous craftsmanship is a must in every step of research, in conducting experiments or formating a paper. I don't know when we can meet again once we part, but I wish each of us could find their own beautiful landscape on the paths ahead. (by Chen Jinyou)

答辩就这么结束啦！虽然很忙碌但是真的很充实。在这段日子里学到了好多东西，非常感谢老师的指导与师兄师姐的帮助。（薛鑫玉）

The thesis defense has finished. It has been a busy but rewarding experience and I have learned a lot recently. I'm very grateful to my advisor for the guidance and to my upperclassmen for their help and support. (by Xue Xinyu)

大学四年生活在答辩结束的瞬间仿佛也要走向倒计时，青春最美好的时光在陕西师范大学度过，收获很多，它将是我最宝贵的经历回忆。现在我想说：过去再见，未来你好。（王钰莹）

The thesis defense is like a countdown to the end of the four-year university life. These youthful days at Shaanxi Normal University are the best in my life, with so much rewarding experiences and so many precious memories. Now, I tell myself to say farewell to the past and say hello to the future. (by Wang Yuying)

心绪感悟 Thoughts and Reflections

毕业设计是一次非常好的锻炼机会，在这里学到了知识，学到了实验技能，更学到了化学实验的严谨与认真。感谢所有帮助过我们的老师与师兄师姐。这是最宝贵的经历，将会使我们受益终生。（徐旭）

Graduation project design has been a great opportunity to steel ourselves, acquiring knowledge, learning experimental skills, and more importantly learning the preciseness and rigorousness of chemical experiment. I am grateful to all the teachers and upperclassmen who have helped me. I believe this precious experience will be beneficial to us for our whole life. (by Xu Xu)

论文完成了，也意味着我们即将毕业了。在这个过程中我确实学到了很多东西，真心地感谢彭老师以及各位实验室的小伙伴。这段时光是人生路上的一处风景，愿大家都有光明的未来。（曹阐尹）

The completion of thesis also means we are about to graduate from SNNU. I have learned a lot during this process and I am grateful to Prof. Peng and my dear friends at the lab. This period of time was one scenic attraction along our life's journey, and I would like to wish everyone of us a bright future. (by Cao Chanyin)

毕设过程当中既有快乐的时光，亦有忙碌的时候，这些点点滴滴汇聚成了满满的回忆。感谢四年来师大和化院对我的培养，我会牢记老师们对我的教导与关爱，并努力在未来的科研路上发光发热。（薛洁滢）

All the happy moments and busy times during the graduation project design process have come together and become our memories. I would like to thank my SNNU and School of Chemistry and Chemical Engineering for the instructing and nurturing, and I will always remember what teachers have taught me and strive to shine on the road of research. (by Xue Jieying)

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