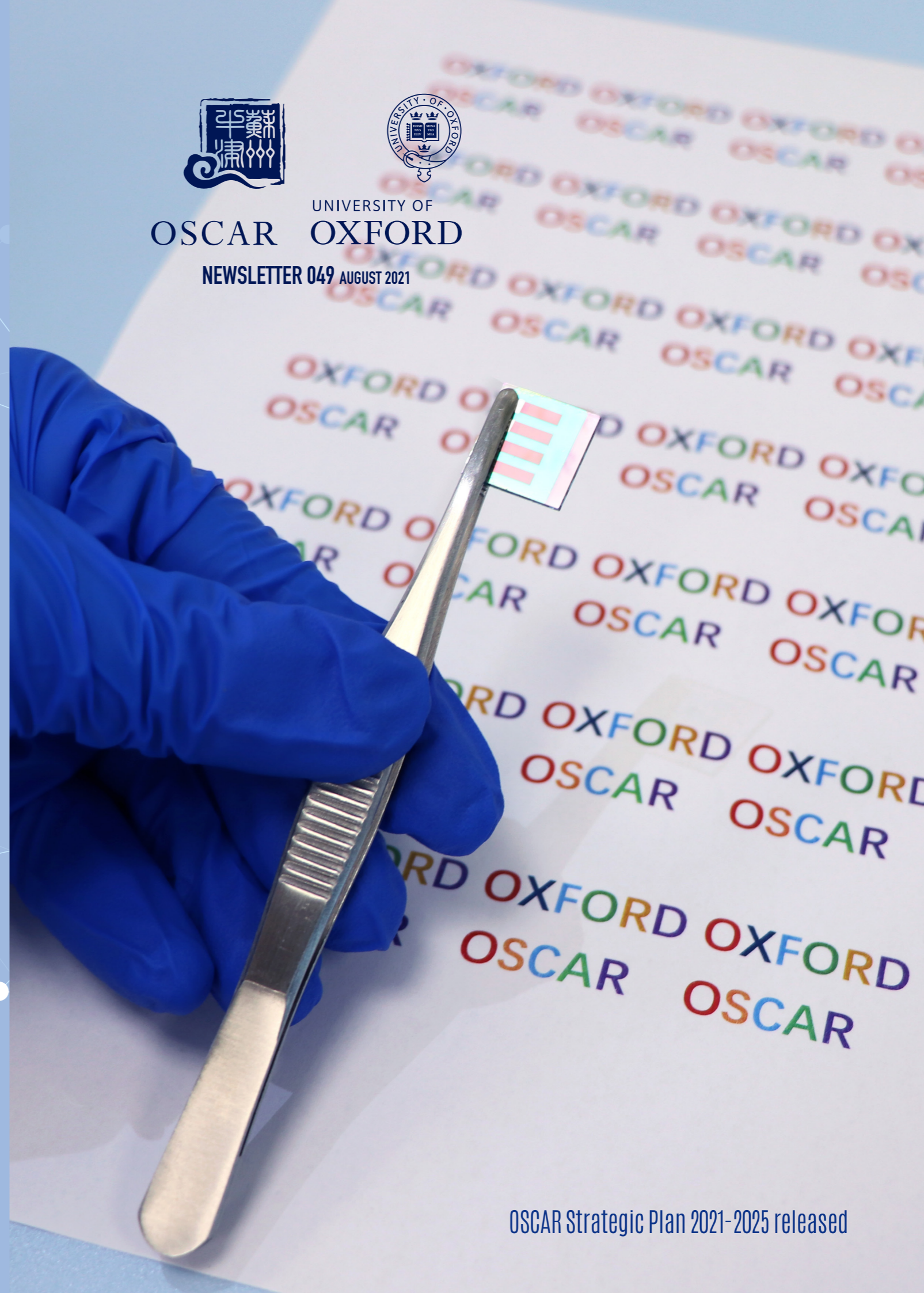




UNIVERSITY OF  
**OSCAR OXFORD**

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OSCAR Strategic Plan 2021-2025 released



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# OSCAR STRATEGIC PLAN 2021-2025 RELEASED

## Mission

OSCAR, the Oxford Suzhou Centre for Advanced Research, is the University of Oxford's first and only engineering and physical sciences research institute located in China. Its mission is to create a long-term international collaboration between the UK and China, combining academic research, technological development, and commercial exploitation via a mutually beneficial partnership with Suzhou Industrial Park's expert manufacturing base, to bring innovative technologies of global benefit to market. OSCAR leads research in modern biotechnology, advanced materials, computational approaches and manufacturing techniques to provide innovative solutions to current global healthcare, energy, environmental and financial challenges. Locating Oxford research in China enables our researchers to work closely with business sectors and partners not readily accessible in the UK, and to define and solve

interesting research problems of benefit globally. OSCAR will further the University of Oxford's mission to promote and enable ambitious research of exceptional quality and of global benefit to all people.

## Vision

OSCAR will conduct internationally-leading research and development, accelerate the commercial adoption of new technologies, foster interactions between academia and industry, nurture next generation researchers and promote international research co-operation for the benefit of local, regional, national, and international societies. OSCAR's core belief is that the future of science is global.

## Objectives

The overall objective of this strategic plan is to create a roadmap to make OSCAR financially and environmentally sustainable, while advancing and

protecting Oxford University's global reputation for rigorous academic standards and world-leading research of global value.

The plan comprises a series of twelve priorities that will allow OSCAR to achieve its goals with integrity, mirroring practices at the University.

## Research and development

OSCAR builds on the University's long tradition of conducting world-leading research and transferring its outputs to applications, through industrial collaborations, licensing, and the creation of spin-out companies, for the benefit of society. In less than two years of operation, OSCAR has already generated IP, filed patent applications, and launched its first spin-off, OXSED, in collaboration with the University and Oxford University Innovation (OUI). Over the next five years OSCAR will continue this trajectory through innovative

research and close working relationships with allied industrial partners.

### PRIORITY 1

To enhance Oxford University's reputation in China by delivering outstanding scientific research and technological breakthroughs in the core areas of Mathematics, Physical and Life Sciences, and their applications in cutting-edge fields with potential for societal benefit, such as environmental and sustainable development, healthcare and biomedical engineering, biotechnology, and advanced functional materials research.

### PRIORITY 2

To generate impactful research through world-leading disruptive technologies. OSCAR will achieve this by aligning research outputs with real-world applications through strategic industrial and commercial partnerships.

### PRIORITY 3

To foster technology acceleration, leading to the faster adaption of new research outcomes by end-users through close interaction with industry to accelerate the impact of research.

## Actions

1. To capitalise on and enhance existing research and innovation activity, and to prioritise impactful research to address global societal challenges.
2. To identify and engage in innovative new activities and lead work in breakthrough research areas.
3. To promote dissemination of research output through high profile publications, high quality conferences and world class seminars.
4. To promote innovative activities through identifying, protecting and commercialising IP arising from OSCAR research.

5. To establish innovation and technology centres that will increase technology readiness levels of the outputs of research at OSCAR, to accelerate technology transfer and commercialisation, enabling technology demonstration, prototype construction and pilot manufacturing inhouse.

## Collaboration and Partnership

Engagement between OSCAR and eminent industrial, academic, commercial and government partners in allied fields is vital to strengthen OSCAR's research impact and its ability to generate meaningful change to the research and technology landscape. Collaboration is essential for diversifying resources, skills and knowledge and accelerating advances. Dissemination through a range of channels will promote both OSCAR and Oxford University's research presence in China.



Partnership between Oxford University and Suzhou Industrial Park is key to continuing OSCAR's success.

**PRIORITY 4**

To expand OSCAR's collaborative work with both local and international universities and academic research institutes. Collaboration agreements with strategic external partners will allow OSCAR to carry out more varied and diverse projects of wide global value.

**PRIORITY 5**

To work with industrial partners on key projects to address end user needs, and to establish externally funded research centres and projects to deliver such close-to-market work.

**PRIORITY 6**

To continue to establish and consolidate OSCAR as Oxford University's base in China, providing connection and a point of contact for the

University and Colleges, taking proactive steps to protect and advance Oxford's reputation for integrity and academic excellence.

**Actions**

1. To set up externally funded joint laboratories and research centres with partners from related industries across China and internationally.
2. To establish an OSCAR Technology Accelerator (OTA) that will focus on the incubation of OSCAR's own spin-out companies, but also provide Oxford spin-out companies in the UK the opportunity to explore Chinese markets and commercial opportunities from within an Oxford University-run facility.
3. To initiate the "OSCAR Training Camp" to provide tailored learning with a mixture of on-line and on-site training programmes to postgraduates, university and school students, working with the departments and colleges

in Oxford.  
4. To organise regular international conferences and seminars to showcase research and technologies developed by OSCAR and strategic partners.

5. To promote OSCAR's 'Visiting Scientist' and 'Visiting Student' schemes to host researchers from other institutions in China and beyond.

**People**

OSCAR will put people first and create more channels to attract and retain eminent global leaders, research stars and young talents. OSCAR will continue to foster a skilled, innovative, dynamic, motivated, and contented workforce.

**PRIORITY 7**

To create a people-centred working environment to attract, recruit and retain world leading researchers capable of innovative thinking.

An inclusive and dynamic workplace will continue OSCAR's forward trajectory.

**PRIORITY 8**

To foster a talented international team by creating a research environment mirroring Oxford University's core values and practices. OSCAR will endeavour to make its staff from all over the world feel at home and supported.

**PRIORITY 9**

To support and nurture research staff by providing opportunities for career and professional development.

**Actions**

1. To attract new Oxford PIs to increase the research base and breadth of expertise. This will allow OSCAR to cover a wider range of research disciplines and form a critical mass.
2. To develop an international working environment, modelled on Oxford practices, by recruiting full-time

researchers from across the globe. OSCAR will provide attentive logistic support to non-Chinese staff to assist with visa application and relocation to enable staff to settle into a new country and culture.

3. To increase the total number of research staff to 100, to further enhance research capability and diversify expertise. OSCAR will support young scientists by providing more opportunities to work with world leading PIs and professional groups, and encourage research staff to participate in international academic conferences, workshops, and seminars.
4. To recruit and train additional support staff to increase effectiveness and modernity of the administrative department and to increase and promote quality, efficiency, reliability, and integrity within OSCAR.
5. To continue recruitment of eminent international Visiting

Academicians and Visiting Professors to initiate and lead new research projects allied with core themes. OSCAR will establish an Academician cluster, comprising at least 10 eminent foreign experts in relevant areas, to strengthen OSCAR's international reputation and to provide opportunities for outstanding young researchers to work with globally eminent leaders.

6. To establish a dedicated support function for the commercialisation of technologies developed within OSCAR.

**Resources**

As Oxford's first overseas research centre, OSCAR is a new and experimental project. OSCAR's governance and legal structure have been carefully planned to ensure effective and transparent resource management to drive innovative research and successful projects. The key priority for the next five years is to continue this success, expanding multi-source





funding to secure OSCAR's longevity and making it financially and environmentally sustainable, and to become a net contributor to the University.

**PRIORITY 10**

To secure funding from national, provincial, and regional funding agents, as well as from industrial and commercial sources.

**PRIORITY 11**

To manage funding, core finances and project-specific finances with integrity and responsibility to enable effective research management and delivery. OSCAR adheres closely to Oxford University's governance structure and complies with Chinese regulations.

**PRIORITY 12**

To enhance OSCAR's public relations locally, domestically, and internationally through reception of high-level

governmental delegations, links to renowned universities and established research institutions, as well as through interaction with media and the Press. A good reputation will enhance OSCAR's credibility and reliability which will allow OSCAR to better access resources to meet its inward and outward facing goals.

**Actions**

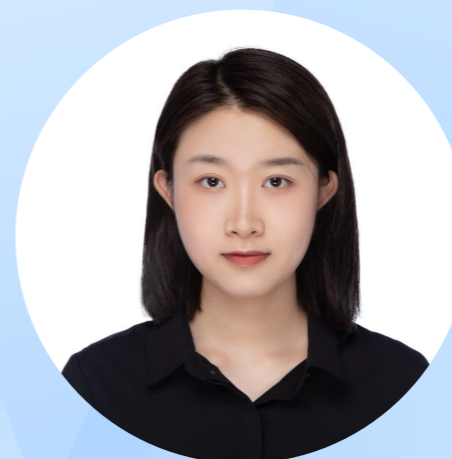
1. To provide a world-class institute with advanced equipment, effective lab management and IT support, to support research efforts in innovative technologies and, where appropriate, transfer to market.
2. To increase the scale and scope of resources by developing links and funding opportunities with industry and organisations in China and internationally.
3. To liaise with Chinese funding agents to promote Oxford University's presence in China and specifically in the

Suzhou area of Jiangsu.

4. To embed an Oxford University governance system and procedures for financial management and control of day-to-day operation and research and development activities.



# Meet OSCAR's New Researcher



**Dr. Henan Zhan**

**Research Scientist in Prof. Cathy Ye's group**

Dr. Henan Zhan joined OSCAR in August 2021 as a Research Scientist in Prof. Cathy Ye's group. She was awarded her PhD in 2020 at Radboud University, Nijmegen. Her previous research focused on bio-inspired hydrogel composites for 2D and 3D cell culture. She is familiar with peptide synthesis, purification, and functionalization.

After finishing her PhD study, Henan worked in Innovent Biologics as a researcher for almost a year. During her work there, Henan focused mainly on the capillary electrophoresis testing of various antibodies and also optimized the procedure of amino acid hydrolysis to shorten the reaction time and simplify the operation.

"I feel so honoured to join Prof. Cathy Ye's group at OSCAR," Henan says, " OSCAR is not only a great research environment which can incubate various applied research, but also a big harmonious family who always supports and helps you." Henan had been working on bio-functionalized hydrogel composites for cell culture during her PhD research and electrospun nanofibers as a drug-release mechanism during her master's study. At OSCAR, Henan will use natural polymers as a hydrogel base matrix for various regenerative applications. "After years of study with synthetic materials in tissue engineering, I am excited to carry on the research in a new direction and solve practical problems. Although synthetic polymers exhibit superior mechanical properties, they still need other functionalization to gain the biocompatibility in biomedical and allied fields. In contrast, natural polymers are more beneficial to cell interactions due to their similarity to the physiological environment. OSCAR is a wonderful platform since there are many professional scientists working in different research fields, which will offer me great help both in theoretical and practical aspects. I am confident of the upcoming years at OSCAR and willing to contribute my effort to this big family." says Henan.





## Meet OSCAR's Visiting Student



### Chenyang Wang

**DPhil student, Department of Engineering Science, University of Oxford**

Chenyang is a visiting student from Prof David Clifton's Computational Health Informatics (CHI) Lab at the University of Oxford. His DPhil focuses on predicting drug resistance of Tuberculosis (TB) using genetic data from bacteria, and he aims to develop various kinds of machine learning models to improve our understanding of complex drug resistance.

Antibiotic resistance is rising to dangerously high levels around the world, and rapid diagnostic methods for identifying drug-resistant bacteria are urgently needed. Nowadays, the time and cost required for whole-genome sequencing (WGS) are continuously reducing, providing the

possibility of using bacterial DNA to determine phenotypes. "By developing multiple deep learning models on this problem, not only can we make better predictions of drug resistance, but we can also find more resistance-associated genes and mutations, contributing to the WHO's End TB Strategy," Chenyang explained.

"It's a fantastic experience in OSCAR," says Chenyang, "the equipment never disappointed me as we have powerful clusters to train different complex models. The interdisciplinary cooperation in OSCAR also impressed me because many social activities are organised for scientists in different fields to communicate, greatly advancing the process of scientific research in new areas."



## OSCAR Impact and Collaboration

### OSCAR awarded General Programme of National Natural Science Foundation of China

Dr. Jingsong Huang, Co-PI and Head of OSCAR's Optoelectronic Technology Laboratory (OeTL), is to work with Jilin University under a joint application for the General Programme of Natural Science Foundation of China, which was approved on 18 August. The granted project focuses on "Polyoxometalate complexes as cathode interlayers in organic solar cells" and will be led by Prof. Fenghong Li from Jilin University and her research teams. Input from OSCAR's OeTL will also play a part in the delivery of the project.

### About the project

Large area roll to roll production of thin film photovoltaics (PVs), such as organic and perovskite solar cells, has attracted great attention due to its enhanced power conversion efficiency. However, the lack of printable interfacial materials holds back the commercial progress of thin film PVs from lab to real-world fabrication. To solve this bottleneck problem, it is essential to develop environmentally friendly, low-cost and conductive interfacial materials for fundamental and applied research in thin film PVs.

In this project, researchers propose a series of organic-inorganic hybrid interfacial materials, namely surfactant-encapsulated polyoxometalate complexes (SEPCs). Various properties of the SEPCs, including solubility, film formation, energy level, charge numbers, and self-assembly, will be studied via changing the numbers, length and functional groups of alkyl chains, and the metal atoms, heteroatoms, vacant number and structural type of the polyoxometalate. Researchers will also work to improve the conductivity of SEPCs using the method of controlled doping. Particularly, researchers will investigate the influence of electron density on materials' conductivity due to N-type doping and thereby reveal the doping mechanism of SEPCs. Effective doping of interfacial material can eliminate the film thickness sensitivity. The doped SEPCs will be applied to highly efficient large-area thin film PVs.



### Dr. Jingsong Huang

Dr. Jingsong Huang is Co-PI and Head of the Optoelectronic Technology Laboratory (OeTL) at OSCAR. Trained as a physicist and an engineer, his research relies primarily on the science and application of new semiconductor materials and devices, focusing on the fields of energy efficient displays and lighting, photovoltaic energy generation, large-area electronics and bio-medical sensors, among others. His track record includes developing creative solutions and delivering products from concept to manufacturing across a range of industries.



## “When Scientist meets OSCAR”: an interview with Dr. Yun Hu

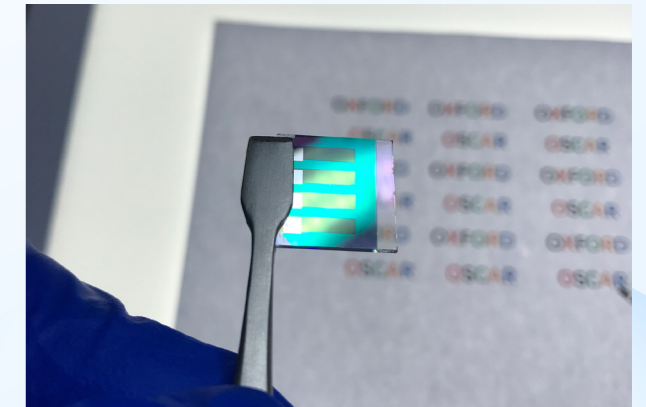


### Dr Yun Hu

**Research Scientist in Prof. Paul Stavrinou’s group**

#### 1. Can you tell us about your academic background and your research work at OSCAR?

I received my PhD from the Functional Nano & Soft Materials Laboratory (FUNSOM) of Suzhou University in July 2020. During my master's and doctoral study, my research focused on the field of organic optoelectronic light-emitting devices. After earning my PhD, I joined the Optoelectronic Technology Laboratory (OeTL) at OSCAR and continued to study light-emitting devices, especially microcavity devices. You'll find the most important application of light-emitting devices in all kinds of electronic screens. My research project at OSCAR in this field is completed now.



*Organic optoelectronic device with integrated total reflective film*

Starting in September, I began to study optical thin film devices, that is, fabricating thin films with optical properties via solution methods. Optical films have plentiful applications in the real world; they can be used in almost all building glass facades and agricultural greenhouses, where they can regulate the conversion of light into heat. For example, if optical films are used on the glass facades of buildings, they can "filter out" some of the heat coming into the building due to strong sunlight, limiting the rise of indoor temperatures. In winter, they can reduce the heat radiation outwards, so that more heat is kept inside.

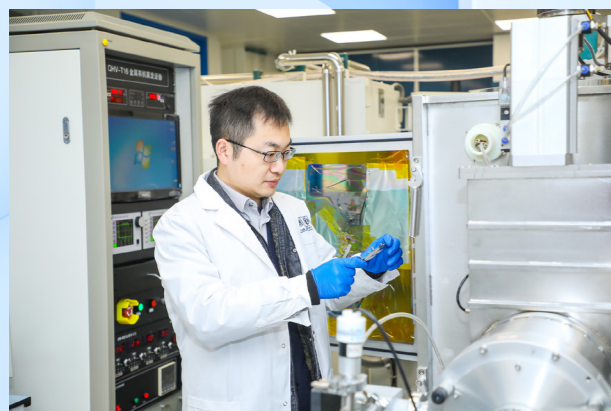
#### 2. They say that scientists are committed to solving real-world problems. What solution do you think your research can offer? What impact will it have?

Our goal is to move towards application. One

example is to develop an optical film solution to help deal with the problem of photo-thermal regulation. Take glass facades on building for instance, the use of optical film can help reduce the use of air conditioning, so less energy is consumed and less emissions are produced. Similar technologies currently available are not mature and the cost is high. My hope is to provide a lower-cost and easier-to-operate solution for practical application, and to get the technology off the ground through cooperation with industry.

**3. How would you describe yourself as a researcher? What do you think is the best thing about doing scientific research?**

I think I would describe myself as focused, patient and a bit “compulsive”. I align everything that’s misaligned! I think being “compulsive” may be a common trait among researchers. Every laboratory item must be kept in good order, otherwise it would eat up much of my time. I think the best thing about doing scientific research is that I have enough time to explore and really crack a problem.



*Dr Yun Hu and his colleagues at OSCAR*

**4. What is it like to be a Research Scientist at OSCAR? What do you identify with the most?**

I chose to join OSCAR because I wanted to do something “useful”, that is, something with practical applications, and OSCAR’s market-oriented scientific research is a perfect fit with my ideals. OSCAR has an inclusive and free research environment.

The one thing that I identify with the most is probably that you don’t have to punch a clock, ha-ha. This actually comes back to when I said OSCAR provides a free environment. At OSCAR, researchers enjoy a high level of autonomy in their research work and selection of research topic, but this does not mean that we can go recklessly creative with our research. With keen insight, our PI will be exercising sound judgement in the selection of research questions and methods for approaching the work, and practical relevance is a key factor in deciding which research question we want to go with.



SIP News in August

**SIP’s development continues to gain momentum from innovation**

The Suzhou Industrial Park (SIP) is enjoying increasing “dividends” from its expanding innovation matrix, which consists of co-locating a large number of industry-leading tech companies and innovative talents.

SIP’s endeavour to promote innovation-driven development continues this year. In April, SIP authorities announced plans for the construction of the National Biotechnology Innovation Centre, National Third-generation Semiconductor Technology Innovation Centre and National Pilot Zone for Innovation and Development of New-generation Artificial

Intelligence. In the following month, authorities unveiled a revamped policy system, dubbed “1+8+X”, which is designed to channel support and resources into SIP’s innovation and entrepreneurship ecosystem.

Efforts have paid off already. In the first half of this year, the high-tech park in SIP saw 3,169 small-and-medium-sized enterprises included in the National High-Tech Enterprise Programme, with 7 of them being publicly listed. SIP’s talent pool is also expanding, welcoming 362 foreign talents to work in SIP during the first six months of 2021.

