JKU-NCHU-SAS Joint Webinar: Functional Materials and High-performance Devices
July 8, 2022
(A/S) Linz, Austria (AU)/Bratislava, Slovakia (SK): 8:30-11:20
(TW) Taichung city, Taiwan: 14:30-17:20
Program – {**20 min presentation (1 ring: 5 min left/2 rings: 1 min left) + 5 min Q&A}**
(Online link: https://meet.google.com/vxu-yoje-kcq)

Time		Topic
(A/S) 8:30-8:40 (TW) 14:30-14:40		**Welcome speech**
Chairman: Prof. Han-Yu HSUEH (MSE, NCHU)		
(A/S) 8:40-9:05 (TW) 14:40-15:05	1	**Prof. Yen-Fu LIN** (yenfulin@nchu.edu.tw) Institute of Nanoscience and Department of Physics, NCHU **Explore Ultrasensitive Van Der Waals Materials to Develop Potential Electronics** (Personal link: https://www.linyf.nchu.edu.tw/dr-yen-fu-lin)
(A/S) 9:05-9:30 (TW) 15:05-15:30	2	**Assoc. Prof. Uwe MONKOWIUS** (uwe.monkowius@jku.at) Institute of Inorganic Chemistry, JKU, Linz, Austria **Supramolecular Ruthenium-based Gels Responsive to Visible/NIR Light** (Personal link: https://www.jku.at/linz-school-of-education/abteilungen/abteilung-fuer-mint-didaktik/team/monkowius-uwe/)
Chairman: Prof. Ian TEASDALE (Dep Chem, JKU)		
(A/S) 9:30-9:55 (TW) 15:30-15:55	3	**Assoc. Prof. Han-Yu HSUEH** (hyhsueh@nchu.edu.tw) Department of Materials Science and Engineering, NCHU **Fabrication of Frog-Skin-Inspired Slippery Antibiofouling Coatings Through Degradable Block Copolymer Wrinkling** (Personal link: http://hyhsueh.wix.com/apigroup)
(A/S) 9:55-10:20 (TW) 15:55-16:20	4	**Prof. Juraj KRONEK** (upolkron@savba.sk) Department for Biomaterials Research, Polymer Institute of the Slovak Academy of Sciences, Slovakia **Functional Poly(2-oxazolines) as a Toolbox for Synthesis of Hybrid Materials in the Context of Biomedical Application** (Personal link: https://www.sav.sk/?lang=en&doc=user-org-user&user_no=1642&action=projects)
Chairman: Prof. Chih-Feng HUANG (CHE, NCHU)		
(A/S) 10:20-10:45 (TW) 16:20-16:45	5	**Assoc. Prof. Ian TEASDALE**(ian.teasdale@jku.at) Department of Chemistry, Institute of Polymer Chemistry, JKU, Linz, Austria **Phosphorus-based Smart Polymers** (Personal link: http://www.jku.at/icp/teasdale)
(A/S) 10:45-11:10 (TW) 16:45-17:10	6	**Prof. Kun-Yi (Andrew) Lin(**linky@nchu.edu.tw**)** Department of Environmental Engineering, NCHU *i*-Center for Advanced Science and Technology(*i*CAST), NCHU **Metal-Organic Frameworks (MOFs) and Derivatives for Environmental Catalysis: Development and Design of Functionality** (Personal link: https://sites.google.com/site/nchusent/)
(A/S) 11:10-11:20 (TW) 17:10-17:20		**Closing remarks**

Dr. Yen-Fu LIN

Institute of Nanoscience and Department of Physics, National Chung Hsing University (NCHU), Taichung city, Taiwan
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EDUCATION

- **Ph.D.** in Department of Electrophysics, National Chiao Tung University (NCTU), Hsinchu city, Taiwan (2010)
- **B.S.** in Department of Physics, Tunghai University (THU), Taichung city, Taiwan (2005)

WORK EXPERIENCE

- Professor, Institute of Nanoscience and Department of Physics, NCHU, Taiwan (2021/08-now)
- Associate Professor, Department of Physics, NCHU, Taiwan (2017/02-2021/07)
- Assistant Professor, Department of Physics, NCHU, Taiwan (2014/02-2017/01)
- Postdoctoral Research Associate, WPI MANA, NIMS, Japan (2013/01-2014/01)
- Postdoctoral Research Associate, Department of Electrophysics, NCTU, Taiwan (2010/08-2013/12)

AWARDS AND HONORS

Awards:

- 2019 MOST Ta-You Wu Memorial Award
- 2017 TCUS-Yong Researcher Award: Excellent Work
- 2017-2018 NCHU-Excellent Junior Research Investigator Grant

Service:

- 2022-now: Early Career Advisory Board in Materials Today Electronics.
- 2017-now: Editorial Board Member in Scientific Reports.
- 2018/01-2019/12: Editorial Board Member in Physics Bimonthly.

SPEECH TITLE

Explore Ultrasensitive Van Der Waals Materials to Develop Potential Electronics

Yen-Fu LIN
Department of Physics and Institute of Nanoscience, National Chung Hsing University, Taichung 40227, Taiwan
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ABSTRACT

Most van der Waals-based electronics have confronted with severe oxidation, discernible surface morphological variations, disturbed carrier transport, and subsequently significant performance degradation under ambient atmosphere owing to their acknowledged environmental-sensitivity, including black phosphorus, indium selenide (InSe), hafnium sulfide, and molybdenum ditelluride. Lots of pioneering works have been devoting in passivation engineering to achieve both good air-stability and electrical performance. In this talk, layered InSe materials have been explored. In the first part, layered InSe electronics with superior controlled stability are reported and demonstrated by depositing an In doping layer. And the optimized InSe electronics can deliver an unprecedented high electron mobility up to 3700 cm^2 V^{-1} S^{-1} in vacuum at room temperature. The related flexibilities in both logic-circuit and triboelectric applications have been further done, such as inverter, NAND, NOR, and touch devices.[1] In the second part. it is found that if our InSe electronics are stored under ambient conditions, a 2-nm-thick native InO_x, located at the bottom of the layered InSe channel, can boost the charge trapping events in the InSe electronics. Such the innate charge trapping layer with charge-controllable capability empowers this simplified configuration to perform reliable memory operations with outstanding durability and multilevel storage characters. The native oxide-boosted InSe electronic is employed to imitate the essential synaptic functions from short-term plasticity of paired-pulse facilitation to long-term plasticity of spike-timing-dependent plasticity in device level, as well as the system-level pattern recognition of the designed artificial neural network.[2] In the end part, through a substrate-tunable trapping effect, we further develop a unique synaptic behavior, i.e. inverse paired-pulse facilitation, in our layered InSe electronics.[3] In all of our experimental results, we believed that our new findings pave a significant avenue for developing next-generation electronics using 2D InSe materials..

References:
[1] Adv. Mater., 30 (2018) 1803690 and Adv. Funct. Mater., 29 (2019) 1809119.
[2] Nat. Commun., 11 (2020) 2972.
[3] Nano Energy, 77 (2020) 105258 and NPJ 2D Mater., 5 (2021) 60.

Assoc. Prof. Dr. Uwe Monkowius

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EDUCATION

1994–2001, Study of chemistry at the Friedrich-Alexander-University Erlangen/Nürnberg and Technical University Munich; **2001–2003** Dissertation at the Institute of Inorganic Chemistry, TU Munich (supervised by Prof. Dr. H. Schmidbaur); **07/2013** Venia docendi ("Habilitation") in Inorganic Chemistry

WORK EXPERIENCE

11/2003–08/2004 Chemist in the R&D department, Prisman GmbH, Germany; **10/2004–08/2006** Post-Doc in the group of Prof. Dr. H. Yersin at the Institute of Physical Chemistry, University Regensburg, Germany; **9/2006–now** Group leader, Johannes Kepler University Linz, Austria; **2009–7/2017** Deputy Head of the Institute of Inorganic Chemistry; **10/2013–7/2017** Assoc. Prof., Institute of Inorganic Chemistry; **8/2017–now** Assoc. Prof., School of Education, STEM Didactics - Chemistry.

SPEECH TITLE

Supramolecular Ruthenium-based Gels Responsive to Visible/NIR Light

Ian Teasdale[1] and Uwe Monkowius[2]

[1] Institute of Polymer Chemistry, Johannes Kepler University Linz, 4040 Linz, Austria;

[2] School of Education – Chemistry, Johannes Kepler University Linz, 4040 Linz, Austria

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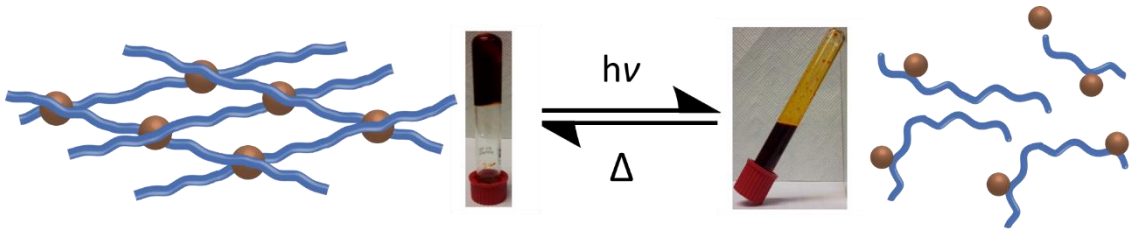
ABSTRACT

Functional polymers which can be photochemically manipulated by exogenous light have immense promise in materials science due to the possibility for spatiotemporal control, with applications ranging from drug delivery to photolithography. For many applications, for example patterning of cellular microenvironments, materials are required which are sensitive to longer wavelength, i.e. visible and near-infrared (NIR) irradiation, owing to its deeper penetration and lower risk of damage to biological tissue compared to UV irradiation. To meet these requirements, Ru-based polymeric materials containing the complex [(bpy)2RuL2]2+ (with byp = 2,2'-bipyridine, L = pyridine-type ligand) were developed. The ruthenium complexes function as cross-linker forming organo- and hydrogels. Upon visible or near-infrared irradiation (in a two-photon process), the pyridine ligand is photo-cleaved which leads to a liquefaction of the gel [1]. When poly(4-vinylpyridine) is used as photo-cleavable ligand, the process is thermally reversible, hence self-healing gels are obtained [2].



References:

[1] S. Theis, A. Iturmendi, C. Gorsche, M. Orthofer, M. Lunzer, S. Baudis, A. Ovsianikov, R. Liska, U. Monkowius, I. Teasdale, *Angew. Chem. Int. Ed.* **2017**, *56*, 15857-15860.

[2] I. Teasdale, S. Theis, A. Iturmendi, M. Strobel, S. Hild, J. Jacak, P. Mayrhofer, U. Monkowius, 2019, *Chemistry - A European Journal* **2019**, *25*, 9851-9855.

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EDUCATION

2007–2011: Ph.D. in Department of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan

2005–2007: M.S. in Department of Material Science and Engineering, National Taiwan University, Taipei, Taiwan

2001–2005: B.S. in Department of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan

WORK EXPERIENCE

2021–now: Associate Professor in Department of Material Science & Engineering, National Chung Hsing University, Taichung, Taiwan

2016–2021: Assistant Professor in Department of Material Science & Engineering, National Chung Hsing University, Taichung, Taiwan

2015–2016: Principal Engineer in Advanced Technology Module Division (ATMD), Taiwan Semiconductor Manufacturing Company. Ltd. (TSMC)

2011–2014: Visiting Scholar in Department of Polymer Science & Engineering, University of Massachusetts Amherst, USA

AWARDS AND HONORS

2022 Y. Z. Hsu Scientific Award Technology & Innovation - Green Science & Technology

2021 The National Innovation Award of Taiwan Government) The 18th National Inn. Outstanding Young Polymer Technology Award, The Polymer Society

2018 "Taiwan Comprehensive University System Regulations Governing the Selection of Innovative Research and Development Results by Young Scholars" Masterpiece award

2016-2017 MOST Special Outstanding Talent Award

SPEECH TITLE

Fabrication of Frog-Skin-Inspired Slippery Antibiofouling Coatings Through Degradable Block Copolymer Wrinkling

Han-Yu Hsueh[1]
[1]Department of Material Science and Engineering, National Chung Hsing University (NCHU), Eng Bld 3, 145 Xingda Rd, South Dist, Taichung 40227, Taiwan
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ABSTRACT

Marine biofouling is a severe problem with a wide-reaching impact on ship maintenance, the economy, and ecosystem safety, among others. Inspired by complex multifunctional frogskins, wrinkled slippery coatings are created that exhibit remarkable antifouling, anti-icing, and self-cleaning properties through a combination of degradable di-block copolymer self-assembly [i.e., polystyrene-*b*-polylactide (PS-*b*-PLA)] and hydrolysis-driven dynamic release-induced surface wrinkling. Microwrinkled patterns can generate curved surfaces that are resistant to biofouling. Gyroid-forming PS-*b*-PLA can be used to produce nanoporous templates with cocontinuous nanochannels, which generate strong capillary forces for trapping and storing infiltrated lubricants. In this study, block-copolymer-derived hierarchically wrinkled slippery liquid-infused nanoporous surfaces (i.e., micro wrinkles with nanochannels infused with slippery fluids) are successfully fabricated after silicone oil infiltration. The antibiofouling performance of these surfaces is examined against different foulers under various conditions. The produced coatings exhibited flexible, stable, transparent, and easily tunable antibiofouling characteristics. In particular, the formation of an eco-friendly silicon-based lubricant layer without the use of fluorinated compounds and costly material precursors is an advantage in industrial practice that can be adopted in various applications, such as fuel transport, self-cleaning windows, anticorrosion protection, nontoxic coatings for medical devices, and optical instruments.

References:

1. H.-Y. Hsueh *et al. ACS Appl. Mater. Interfaces* **2019**, *11*, 23741.
2. H.-Y. Hsueh *et al. Adv. Funct. Mater*. **2021**, *31*, 2104173.
3. H.-Y. Hsueh *et al. Adv. Mater. Interfaces*, **2022**, *9*, 2102144.

Dr. Juraj Kronek

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EDUCATION

- 1997 - 2001, **Ph. D.** in Department for Biomaterials Research, Polymer Institute of the Slovak Academy of Sciences, Bratislava, Slovakia
- 1992-1997, **M.Sc.** in Faculty of Natural Sciences, Comenius University, Bratislava, Slovakia

WORK EXPERIENCE

- 2007- present, Senior research scientist, Department for Biomaterials Research, Polymer Institute of the Slovak Academy of Sciences, Bratislava, Slovakia
- 2011-present, Deputy Head of Department for Biomaterials Research, Polymer Institute of the Slovak Academy of Sciences, Bratislava, Slovakia
- 2003-2007, Head of Department of Monomer and Polymer Synthesis, Polymer Institute of the Slovak Academy of Sciences, Bratislava, Slovakia
- 2005-2006, Post-Doc, Institute of Carbon and Polymer Chemistry, Polish Academy of Sciences, Gliwice, Poland
- 2002-2003, Post-Doc, Leibnitz Institute for Polymer Research Dresden, Germany

AWARDS AND HONORS

- 2021-2025, member of Commission of chemical sciences, Slovak Grant Agency, Slovakia
- 2018-present, Chair of Scientific Board, Polymer Institute of the Slovak Academy of Sciences, Bratislava, Slovakia
- 2002, Young scientist in Slovakia for 2001, Journalist Studio, Slovakia

SPEECH TITLE

Functional Poly(2-oxazolines) as a Toolbox for Synthesis of Hybrid Materials in the Context of Biomedical Application

Juraj Kronek[1*], Zuzana Kronekova[1], Monika Majerčíková[1], Alžbeta Minarčíková[1], Zuzana Vargová[1], Paul Strasser[2], Ian Teasdale[2]

[1] Department for Biomaterials Research, Polymer Institute of the Slovak Academy of Sciences,
[2] Institute of Polymer Chemistry, Johannes Keppler University, Altenberger Str. 69, 4040 Linz, Austria, ian.teasdale@jku.at

ABSTRACT

Poly(2-oxazolines) represent promising type of biomedical grade polymers for different biomedical applications. They have been used as various drug and gene delivery systems, hydrogels, 3D bioprinting materials, or tissue engineering applications. [1] Their major advantages lay in the good control

From the plethora of 2-oxazoline based polymers, poly(2-isopropenyl-2-oxazoline) (PIPOx) represents a universal platform for the preparation of biomaterials for various biomedical applications. Pendant 2-oxazoline groups allow to introduce in post-polymerization modifications different moieties such as hydrophobic groups, fluorencent labels or prepare biocompatible hydrogels. [2,3] PIPOx was tradionally prepared by free-radical polymerizations resulting to poor control of molar mass and dispersity. Recently we published synthesis of PIPOx by aqueous ATRP polymerization, that enables to prepare polymers with low dispersity and wide range of molar masses. [4] Moreover, we have demonstrated the high biocompatibility and immunomodulation activity of PIPOx providing possibility of various biomedical applications, especially as drug delivery systems. [5,6]

Here, we prepared the library of PIPOx with molar masses ranged from 3000 to 50000 g/mol with narrow dispersity using aqueous ATRP. Prepared polymers were used for preparation of hybrid materials through addition reaction with carboxylic units containing substances. Modification of PIPOx with non-steroidal anti-inflammatory drugs (NSAIDs) can lead to preparation of drug conjugates effective as anti-cancer drug systems.

Similarly, poly(2-oxazolines) containing 2-butenyl units can be used for further functionalization through thiol-ene click reaction. In such manner, different hybrid materials can be designed, too.

This work was supported by Slovak Grant Agency VEGA in the project No. 1/0602/19 and in the frame of the bilateral project APVV-SK-AT-20-0025.

References:

[1] O. Sedláček et al. *Macromol. Rapid Commun.* **2012**, *33*, 1648.
[2] F.A. Jerca et al. *Polym. Chem.*, **2018**, *9*, 3473.
[3] B. Kopka et al. M. *Soft Matter*, **2021**, *17*, 10683.
[4] V. Raus et al. *Macromolecules*, **2020**, *53*, 2077.
[5] Z. Kroneková et al. *Macromol. Biosci.*, **2016**, *16*, 1200.
[6] E. Paulovičová et al. *Materials*, **2021**, *14*, 1371.

Assoc. Prof. Dr Ian Teasdale
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12/03/1982, Manchester, UK
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Current research interests

degradable polymers, stimuli responsive polymers, polymer therapeutics, high performance materials, inorganic polymers, polymer synthesis,

Appointments

Jul 2015- present	**Associate professor**, Institute of Polymer Chemistry, JKU Linz, Austria
Nov 2015- present	**Deputy head** of Institute of Polymer Chemistry, JKU Linz, Austria
Oct 2016-present	**Chief Scientific Officer and Cofounder** NP Lifescience KG Spin out for commercialization of degradable polyphosphazenes http://www.nplifescience.com/
May 2020-present	**Co-Editor of Materials Today Communications.** Elsevier
Jul 2011-Jul 2015	**Assistant professor** (tenure track), Institute of Polymer Chemistry, JKU Linz, Austria
Nov 2008-Jul 2011	**Postdoctoral research assistant**, Institute of Polymer Chemistry, JKU Linz, Austria
Aug 2005-Aug 2008	**Research assistant.** Organic Materials Innovation Centre, University of Manchester, UK and Victrex Plc, Fleetwood, Lancashire, UK

Education

Jul 2015 **Habilitation** in Polymer Chemistry, JKU Linz, Austria
Title: Poly(organo)phosphazenes for Medical Applications
Aug 2005- Aug 2008 **PhD in Chemistry**
The University of Manchester, UK. Supervisor: Prof M. L. Turner
Title: High performance polyaryletherketones.
Sept 2000 – Jun 2000 **Master of Chemistry, MChem**: Chemistry with study in Europe
The University of Sheffield, UK
Sept 2002 – Aug 2003 **Visiting Student,** The University of Heidelberg, Germany.

Selected Awards

Kardinal Innitzer Prize 2016; Theodor Körner Prize April 2012; SCI Leverhulme award 2008; Macro group UK; DH Richards award 2008; Edison Business award 2017 (co-recipient with business partners K. Schröder and O. Brüggemann), Best of Biotech phase 1 award 2017 (co-recipient).

Professional memberships

Member of the Royal Society of Chemistry UK, MRSC**,** Macro Group UK**,** GÖCH (Austrian Chemical Society); GÖCh Chemical Monthly editorial board.

Reviewer activities (selected)

RSC Polymer chemistry, ACS Biomacromolecules, European Polymer Journal, ACS Macromolecules, Angewandte Chemie, Macromolecular rapid Communications, ACS Biomaterials, , Science, ERC. Guest Editor MPDI Materials.

Selected recent Publications

- P. Strasser, M. Russo, P. Stadler, P. Breiteneder, G. Redhammer, M. Himmelsbach, O. Brueggemann, U. Monkowius, P. Klán, I. Teasdale, Green-light photocleavable meso-methyl BODIPY building blocks for macromolecular chemistry. *Polym. Chem.* **2021**, *12*, 6927-6936 DOI: 10.1039/D1PY01245B.
- Fiedler, C.; Ulbricht, C.; Truglas, T.; Wielend, D.; Bednorz, M., Groiss, H.; Brüggemann, O.; Teasdale, I.; Salinas, Y., Reversible speed regulation of self-propelled Janus micromotors via thermoresponsive bottle brush polymers. *Chem. Eur. J.* **2020**. 10.1002/chem.202004792.
- Teasdale, I.; Theis, S.; Iturmendi, A.; Strobel, M.; Hild, S.; Jacak, J.; Mayrhofer, P.; Monkowius, U., Dynamic Supramolecular Ruthenium-Based Gels Responsive to Visible/NIR Light and Heat. *Chem. Eur. J.* **2019,** *25* (42), 9851.
- Sabrina Theis, Aitziber Iturmendi, Christian Gorsche, Marco Orthofer, Markus Lunzer, Stefan Baudis, Aleksandr Ovsianikov, Robert Liska, Uwe Monkowius, and Ian Teasdale, Metallo-Supramolecular Photocleavable Gels Sensitive to Visible and near Infrared Irradiation, *Angew. Chem. Int. Ed.*, **2017**, 56, 15857
- Ian Teasdale, Stimuli-Responsive Phosphorus-Based Polymers. *Eur. J. Inorg. Chem.* **2019**, 11-12 1445 (selected as VIP paper)
- Rothemund, S. and I. Teasdale*, Preparation of polyphosphazenes: a tutorial review. *Chemical Society Reviews*, 2016. 45(19): p. 5200-5215
- A. Iturmendi, U. Monkowius, and I. Teasdale, Oxidation Responsive Polymers with a Triggered Degradation Via Arylboronate Self-Immolative Motifs on a Polyphosphazene Backbone, *ACS Macro Lett.* **2017**, 150

Full list of publications ttps://orcid.org/0000-0001-5953-9084

SPEECH TITLE

Phosphorus-based Smart Polymers

Ian Teasdale[1]

[1] *Ian Teasdale, Institute of Polymer Chemistry, Johannes Kepler University Linz, Austria- Ian.teasdale@jku.at*

While polymer-based materials are ubiquitous in the modern world, the vast majority are based solely on combinations of carbon, nitrogen and oxygen. Our group works on expanding this to metals and p-block elements and thus open the door to mechanical and chemical properties that go above and beyond those achievable with traditional organic polymers. Herein we describe our work on the controlled synthesis of novel phosphorus-based polymers with a wide variety of properties. Biomedicine places high demands on the materials used. Herein we describe some examples of the design and synthesis of phosphorus-based polymers as smart, biodegradable materials for vaccines, cancer therapy, and tissue engineering.

Kun-Yi (Andrew) Lin, PhD'

Distinguished Professor,
Department of Environmental Engineering,
National Chung Hsing University, Tawian

Joint Appoinment Professor,
i-Center for Advanced Science and Technology,
National Chung Hsing University, Tawian

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Education:

Ph.D., Environmental Engineering, ***Columbia University***, USA (2012)
M.Phil., Earth & Environmental Engineering, ***Columbia University***, USA (2010)
M.S., Environmental Engineering and Sciences, ***National Taiwan University***, Taiwan (2005)
B.S., Civil Engineering, ***National Chi Nan University***, Taiwan (2003)

Academic Experiences:

Distinguished Professor, Dept. of Environmental Engineering, National Chung Hsing University (2020.08 - present)
Joint Appoinment Professor and Section Chief, *i*-Center for Advanced Science and Technology, National Chung Hsing University
Professor, Dept. of Environmental Engineering, National Chung Hsing University (2019.02 - present)
Associate Professor, Dept. of Environmental Engineering, National Chung Hsing University (2016.02 - 2019.01)
Assistant Professor, Dept. of Environmental Engineering, National Chung Hsing University (2013.02 - 2016.01)
Postdoc, Center for Sustainable Energy, University of Notre Dame (2012 - 2013)
Research Assistant, Lenfest Center for Sustainable Energy, Columbia University (2008 - 2011)

Research Interests:

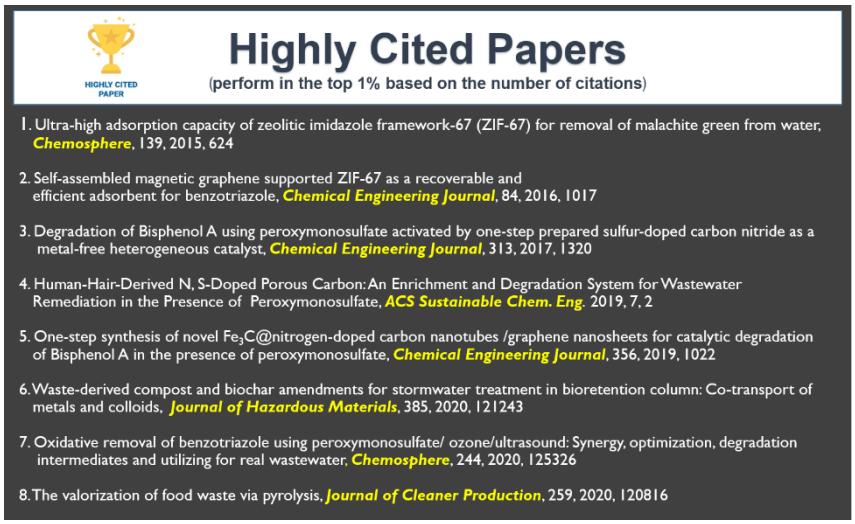
- Functional materials for Sustainable Energy and Environment
- Heterogeneous Catalysts for Advanced Wastewater Treatments
- Air Pollution Control: Catalytic Oxidation and Reduction of Gaseous Pollutants
- Biomass Valorization: Catalytic Depolymerization of Biomass and Catalytic Oxidation
- Fabrication and Applications of Metal Organic Frameworks and Nanocomposites
- Fuel Processing: Catalytic Production and Release of Hydrogen

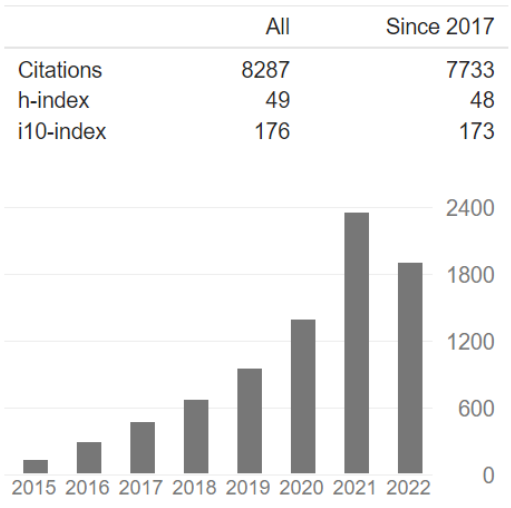
Awards:

2021 World's Top 2% Scientists (Career-Long) by Stanford University and Elsevier
2021 World's Top 2% Scientists for Single Year 2021 by Stanford University and Elsevier
2020 ***Outstanding Young Engineer Award***, The Chinese Institute of Environmental Engineering
2019 ***World's Top 2% Scientists*** for Single Year 2019 by Stanford University
2019 Ministry of Science and Technology (MOST) ***Young Scholar Fellowship Award***
2018 ***Distinguished Associate Professor***, National Chung Hsing University
2017 ***World's Top 2% Scientists*** for Single Year 2017 by Stanford University
2017 ***Distinguished Young Scholar Award***, National Chung Hsing University
2017 ***Outstanding Paper Award***, Material Research Society-Taiwan (MRS-Taiwan)
2016 ***Reviewer Excellent Award*** for Chemosphere
2016 TCUS, ***Young Scholar Innovation Award***
2016 NCHU, ***Distinguished Young Scholar Award***
2016 MOST, Outstanding ***Young Scholar Grant Award***
2014 NCHU College of Engineering, ***Distinguished Young Scholar Award***

Editorial Services:

1. Associate Editor, ***Frontiers in Environmental Science*** (IF:4.581)
2. Associate Editor, ***Korean Journal of Chemical Engineering*** (IF:3.309)
3. Associate Editor, ***Energy & Environment*** (IF: 2.945)
4. Associate Editor, ***Materials Science for Energy Technologies*** (Elsevier)
5. Topic Editor, ***Catalysts* (MDPI)** (IF: 4.146)
6. Guest Editor, ***Chemical Engineering Journal*** (IF: 13.273)
7. Guest Editor, ***Journal of Environmental Chemical Engineering*** (IF: 5.909)
8. Guest Editor, ***Journal Water Process Engineering*** (Elsevier) (IF: 5.485)
9. Guest Editor, ***Catalysts* (MDPI)** (IF: 4.146)
10. Associate Editor, ***Frontiers in Nanotechnology***
11. Associate Editor, ***Frontiers in Chemical Engineering***
12. Associate Editor, ***Frontiers in Catalysis***
13. Editorial Board Member, ***Environmental Advances*** (Elsevier)
14. Editorial Board Member, ***Journal of Nanostructure in Chemistry*** (IF: 6.391)





Total Publications > 290 SCI papers as of June, 2022.

Abstract

Metal-Organic Frameworks (MOFs) and Derivatives for Environmental Catalysis: Development and Design of Functionality

Kun-Yi Andrew Lin, PhD
Department of Environmental Engineering, NCHU

The presentation would provide an overview of development and applications of Metal-Organic Frameworks (MOFs) and their derivatives (including transformative derivatives, composites, and hierarchical hybrids) as heterogeneous catalysts for environmental catalysis (including aqueous reactions involved with purification and remediation, air pollution-related control processes, and upgrading of bio-derived molecules). Through illustrations, characterizations, analyses, unique and superior properties of MOFs and their derivations would be revealed, and the structure-property relationship of MOFs and their derivatives would be also discussed to provide insights into their catalytic behaviors in environmental catalysis. Specifically, a unique class of MOFs, called Zeolitic Imidazolate Frameworks (ZIF), would be exemplified for demonstrating catalytic behaviors of ZIF, and how ZIF would be further developed into functional derivatives and composites for heterogeneous catalysis in environmental applications.