水環境国際招聘賞（いであ招聘賞）（JSWE-IDEA Water Environment International Exchange Award）授賞に関して

本会では，水環境分野の国際交流・国際協力の促進を目的として，いであ株式会社からのご出捐により，水環境国際招聘賞と水環境国際活動賞を設けております。水環境国際招聘賞は本会年会で研究発表を行う海外在住外国人会員に対して，来日費用等の助成を行う制度です。COVID-19の影響でオンライン開催となった第55回年会では，中国から2名，インドネシアから1名，アイルランドから1名を招聘し，オンラインにて研究発表を行っていただきました。そこで，受賞者に研究内容や抱負等についてご執筆いただきましたのでご紹介します。なお，今年度の水環境国際招聘賞の募集案内は秋頃に本誌会告に掲載する予定です。（水環境国際活動賞・招聘賞選考委員会）

JSWE-IDEA Water Environment International Exchange Award

Professor, School of Environmental and Municipal Engineering,
Xi'an University of Architecture and Technology（西安建筑科技大学，教授）
Pengkang Jin（金鵬康）

Firstly, I would like to give my gratitude to the Committee on Overseas Member Invitation Program and Awards Committee of Japan Society on Water Environment for awarding me the JSWE-IDEA Water Environment International Exchange Award for the 55th JSWE Annual Conference. I am also honored to be invited to attend the 55th JSWE Annual Conference held online from March 10–12, 2021.

I obtained my doctoral degree of Environmental Engineering from Xi'an University of Architecture and Technology in June, 2005. Then, I continued my work in Xi'an University of Architecture and Technology. I have been engaged in wastewater treatment and reclamation for more than 20 years. My research focused on enhanced coagulation, sewer networks, advanced biological treatment and catalytic ozonation. I have developed the prediction methods for sediments and hazardous gas accumulation, enhanced biological nitrogen removal processes, and dissolved ozone flotation techniques. These developed techniques have been applied in many projects including oil and gas field wastewater treatment and reclamation, printing and dyeing wastewater treatment and recycling, and municipal wastewater treatment and reuse.

For this conference, I submitted my recent research work related to printing and dyeing wastewater treatment and recycling titled "How can accumulated organics and salts deteriorate the biological treatment unit in the printing and dyeing wastewater recycling system?". This work was based on an actual project in a printing and dyeing enterprise in Zhejiang province, China, who wanted to increase the wastewater recycling rate to obtain decreased pollutant discharge. However, wastewater recycling will inevitably lead to the accumulation of inorganic ions and organic pollutants, which will result in the deterioration of upstream wastewater treatment and reclamation systems and in turn restrict the further increase in the recycling rate. In this study, a closed-loop printing and dyeing wastewater (PDWW) recycling system was established aiming at investigating the mechanism of biological treatment system deterioration due to pollutant accumulation and giving strategies for removal of the accumulated pollutants. It was found that organic matter accumulation especially intermediate products of added dyes and auxiliaries was crucial for the biological treatment unit deterioration during the beginning of PDWW recycling. In addition, inorganic salt accumulation can make it even worse afterwards. The proposed dissolved ozone flotation process together with reverse osmosis can mitigate the accumulation of organic and inorganic pollutants, respectively.

Again, it is very grateful for me to attend the 55th JSWE Annual Conference, and share my works with other scholars. As the JSWE international associate member, I hope the conference could obtain greater achievements in the future, and I am really looking forward to attending the 56th JSWE Annual Conference in Japan.

JSWE-IDEA Water Environment International Exchange Award

Assistant Professor, Department of Environmental Engineering
Universitas Pertamina Ari Rahman

First of all, I would like to convey my sincere gratitude to the Japan Society on Water Environment (JSWE) for awarding me the JSWE-IDEA International Exchange Award. It is my great honor to receive this award at the 55th Annual Conference of JSWE, held online on March 10–12, 2021. I would like to thank you for all your attention and support from the JSWE organizing committee.

I earned my doctoral degree (Doctor of Engineering) from the Department of Environmental Solution Technology, Ryukoku University, in 2015. I was supported by Monbukagakusho Scholarship to complete my master's and doctoral course at Ryukoku University. I have been focusing on developing an integrated pollution treatment system to counter the problem of colored wastewater and sludge treatment from textile industry activity. I have tried to conduct a comprehensive analysis on how to proposed an alternative treatment system framework for the textile waste problem through the recycling concept approach.

Since joining the Department of Environmental Engineering, Universitas Pertamina in 2016, I have been involved in various studies related to pollution treatment systems, especially in energy and the environment. My recent research topics are related to waste to energy, decolorization through ozonation, and other environmental engineering topics.

In the 55th Annual Conference of JSWE, I submitted paperwork entitled "Preparation of textile sludge-based activated carbon using physical activation with carbon dioxide for textile dyes adsorption." In this research, we used textile sludge as a raw material for the activated carbon production, which was carbonized before. Physical activation by carbon dioxide was performed to improve the surface area of carbonized sludge. BET analysis showed an increased surface area from 97.6 $m^2\ g^{-1}$ in raw carbonized sludge to 179.9 $m^2\ g^{-1}$ for the producing activated carbon. Furthermore, we did the batch adsorption test to investigate potential adsorbent feasibility for color removal treatment. We used two types of dyes. Methylene Blue Trihydrate (C.I. Basic Blue 9 Trihydrate) represented cationic dye and Procion Brilliant Red H-EXGL (C.I. Reactive Red 231) of anionic dye. The adsorption test showed that activated carbon's adsorption capacity was 47.4 mg g^{-1} for methylene blue and 24.2 mg g^{-1} for brilliant red removal. The result showed that the recycling of textile sludge could be proposed as an alternative adsorbent to solve colored wastewater problems that indirectly provide a benefit by reducing the sludge disposal problem.

The JSWE conference was a special event for research dissemination, exchanging ideas, and expanding the network. Again, I really appreciate to this opportunity and very grateful to all those who have supported me. I hope my participation in this event can advance Indonesia and Japan's cooperation, especially in the water and environment sector. Finally, I am looking forward to contributing to future conference activities.

JSWE-IDEA Water Environment International Exchange Award

Professor, Civil Engineering, School of Engineering,
National University of Ireland Galway, Ireland
Xinmin Zhan（占新民）

It is a great honour to be awarded with the JSWE-IDEA Water Environmental International Exchange Award and to be invited to participate in the 55th JSWE annual conference in 2021. First, I want to thank the selection committee. Even though this annual conference was held online, it was a great conference.

My presentation is *NEO-GREEN concept: towards next-generation wastewater treatment*. Municipal wastewater treatment is currently facing three big challenges: (1) high material and energy inputs; (2) large amounts of waste sludge generation; and (3) increasingly stringent treatment standards (for example nutrients) and lack of recovery of resources (for example phosphorus). To address these challenges, future wastewater treatment must adopt revolutionary approaches to harness the energy embedded in wastewater, incorporate nutrients recovery, and minimize waste sludge production while meeting increasingly stringent criteria of effluent quality.

Anaerobic digestion (AD) has been widely regarded as an essential part of sustainable wastewater treatment, due to its capacity in recovering bioenergy from wastewater and minimizing sludge generation. To harness its benefits, efficient and cost-effective removal or recovery of nutrients (nitrogen and phosphorus) from AD effluent must be taken into account due to the reduced organic matter concentrations. Autotrophic denitrification processes (hydrogen-based; sulphur-based; anammox) appear to be the most natural option to couple AD for sustainable wastewater treatment, owing to their intrinsic features such as eliminating the need for organic-carbon, and very little sludge production. Iron sulphides (Fe_xS_y), mainly in the form of pyrrhotite ($Fe_{1-x}S$, $0 < x < 0.125$) and pyrite (FeS_2), are nontoxic, earth-abundant sulphide minerals. In recent years, iron-sulphides-driven autotrophic denitrification has emerged as a promising alternative for nitrogen removal from organics-deficient water and wastewater streams. Furthermore, the reaction product Fe^{3+} can act as an efficient phosphate scavenger via adsorption and precipitation (forming $FePO_4$). My team has developed and studied a natural iron sulphide (pyrrhotite) based biofilter (PADB) technology as a polishing unit for urban WWTPs. This simple, cost-effective technology ensures efficient total-nitrogen removal, indicating its immense potential in advanced wastewater purification. Therefore, we propose a NEO-GREEN (Natural iron sulphidEs based biOtechnoloGy towaRds nExt generatioN wastewater treatment) concept for future sustainable wastewater treatment towards energy and P recovery, nitrogen removal, and minimized sludge production.

In the NEO-GREEN concept, organic matter is converted into biogas with AD technology, which can potentially allow net energy recovery. Then, the anaerobic effluent is nitrified in a nitrifying biofilter so that NH_4^+ is oxidized to NO_2^-/NO_3^- before being removed as N_2 in the iron sulphides bioreactor. PO_4^{3-} is precipitated or adsorbed in the bioreactor and then recovered.

Finally, thank JSWE again! I wish that there will be more and more active research collaborations in the water area between Ireland and Japan.

Annual Conference of JSWE: A Window into Research Frontiers of Environmental Science and Technology in Japan

School of Environmental Science and Engineering
Southern University of Science and Technology（南方科技大学）
Yu Xiaolong（余暁龍）

It is a great honor to be invited to attend the 55th Annual Conference of JSWE. I appreciate all the JSWE members and the Committees on Overseas Member Invitation Program for awarding me the JSWE-IDEA Water Environment International Exchange Award.

I got my M.S. in Bioresource Science from Ehime University and Ph.D. in Environmental Engineering from Kyoto University. When I studied in Japan, my supervisors supported me to give presentations at the JSWE conferences. It was a wonderful chance to share new ideas and gain inspiration. This year, due to the COVID-19, the conference was held online. Thanks to the JSWE staff and members, because of their dedication to the organization, we can exchange insights on research works under serious epidemic situations. During the conference, I joined several sessions and got familiar feelings. The presenters reported the latest experimental results and the audiences provided constructive comments. Although the online meeting made it convenient for us to talk through the microphone and shift sessions by clicking the mouse, I prefer face-to-face communication and expect to visit Japan in the future.

I returned to China in 2018 and worked as a doctoral researcher at the Southern University of Science and Technology. My research interests focus on removing pollutants via biological processes, whereas microbial treatment alone sometimes cannot efficiently solve the problems. I, therefore, devote to research on developing methods that can enhance the performance of microbial treatment. At this conference, I reported my research work entitled "Zirconium-loaded chitosan beads for enhanced removal of perchlorate". I considered combining the adsorption and biodegradation to treat perchlorate, which is a toxic and mobile contaminant in waters. In the first place, I developed the gel sorbents based on using the biopolymer of chitosan. After surficial modification by zirconium, the sorbents' adsorption capacities and efficiencies to perchlorate were significantly improved, outperforming most of the reported materials. The further goal for this research is to use the low-cost biomaterials both as sorbents to concentrate the pollutants like perchlorate from waters and as carriers for supporting the growth of specific microorganisms that biodegrade the adsorbed pollutants.

Facing the increasingly complex environmental problems, the close cooperation between researchers from different countries is more demanding than ever before. I hope that JSWE will continue to improve its international influence and contribute to promoting international cooperation. I think the JSWE annual conference has become a window into research frontiers of environmental science and technology in Japan. Everyone who attends this meeting can get valuable information. As a former student member and now an international associate member of JSWE, I would like to keep on participating in the activities organized by JSWE and dedicating to advancing the communication and cooperation between China and Japan. Finally, I express my sincere thanks to my supervisors, professors Shinsuke HARUTA and Fumitake NISHIMURA, for their kind and continuous support.