SKLMP NEWSLETTER

VOL. 4
JAN 2023

Colochirus quadrangularis and *Pseudobiceros bedfordi* in Hong Kong. Photo by: Mr. Jeffery Tzu Hao Chung

Director's message

“我們要像保護自己的眼睛一樣保護生態環境，像對待生命一樣對待生態環境。”
— 習近平總書記的話

“We should protect the environment like we protect our eyes, and treat the environment like we treat our lives.”
— A remark by President Xi Jinping

In October 2022, the 20th National Congress of the Communist Party of China was successfully organized, and President Xi Jinping had made the report to the Party (https://bit.ly/3jXZRzl). In his report, there were a number of sections emphasizing the importance of environmental protection, pollution prevention and control, and ecological conservation in China. In particular, it highlights “*we will make concerted efforts to improve aquatic environments, water resources, and aquatic ecosystems, strengthen ecological conservation of major rivers, lakes, and reservoirs, and generally eliminate black, malodorous water bodies in cities.*” We are very pleased that SKLMP will play a part in these concerted efforts, and make contributions to cleaner waters and protection of the marine ecological environment. In spite of the COVID pandemic, SKLMP has been making a good progress in basic research, innovation and science outreach over the past six months. Some of our accomplishments are highlighted in this newsletter. As a PEMSEA Regional Centre of Excellence, SKLMP fruitfully delivered our first online training workshop on monitoring and assessment of microplastics which was well attended by 130 participants from governments, NGOs and academia in Asia region. We will organize more regional training events and create collaborative research opportunities in near future. As the end of 2022, may I wish you a Happy, Healthy and Productive Year of 2023!

Kenneth Leung
Director of SKLMP
December 2022

Activities

Distinguished Lecture 3 - Prof. Bing Chen “Marine Oil Spills: Lessons, Challenges and New Advances”

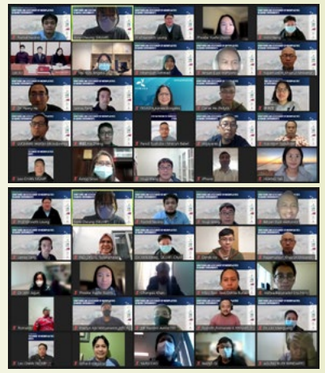
Prof. Bing Chen gave a distinguished lecture entitled “Marine Oil Spills: Lessons, Challenges and New Advances” on 29 July 2022 which was well attended by 70 audiences. Prof. Chen is from the Department of Civil Engineering at Memorial University of Newfoundland, Canada. He is also a Fellow of Canadian Academy of Engineering and a Member of Royal Society of Canada (College) and European Academy of Sciences and Arts. The risk of marine oil spills is increasing globally, causing significant long-term negative impacts on ecological, social and economic systems. Prof. Chen provided an overview of past lessons, current practices, challenges and opportunities in marine oil spill response, and introduced frontier researches in response decision-making and related advanced clean-up technologies.

Congratulation to SKLMP for its designation as RCOE and a member of the PNLC

SKLMP is proud to be a Regional Center of Excellence (RCOE) of the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) and a member of the PEMSEA Network of Learning Centers (PNLC). To officially mark the inauguration of both designations, SKLMP and PEMSEA successfully held a virtual signing ceremony on 13 September 2022, attended by Dr. Keita Furukawa, Vice Chair of the PEMSEA Executive Committee, Ms Aimee Gonzales, Executive Director, other PNLC officers and the PEMSEA Resource Facility staff as well as representatives of SKLMP. SKLMP will provide training in areas such as underwater habitat mapping, marine ecosystem restoration, pollution monitoring and control, and environmental risk assessment as well as creation of more research collaboration opportunities and contribution to the achievement of a ‘clean ocean’ in the region.

PEMSEA and SKLMP Co-organised: East Asia Regional training workshop on monitoring and assessment of microplastics in marine environments

As the PEMSEA Regional Centre of Excellence in Marine Pollution, SKLMP took the lead in organising the East Asia Regional training workshop on monitoring and assessment of microplastics in marine environments on 9 December 2022. The workshop was delivered online via Zoom and well attended by 130 participants from governments, NGOs and academia in the region. More than ten speakers were invited to give lectures on various topics related to microplastics monitoring and assessment. A summary of the current status of microplastics in the seas of East Asia and worldwide was also presented by the workshop chairman, Dr. James Fang, together with two discussion sessions on monitoring approaches for microplastics in marine environments, and methods for toxicity assessment. This training workshop had succeeded in updating information on microplastics-related research, and also facilitating a closer collaboration between SKLMP members and scientists from the region.



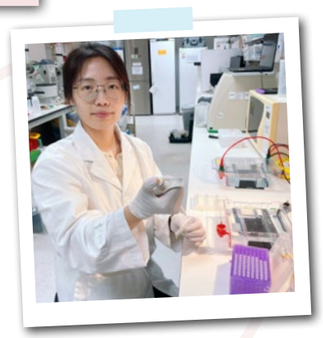
3 Strategic Research Theme Meetings

For the three Strategic Research Themes (SRT) of SKLMP, annual SRT Meetings were successfully held on 14 and 28 December 2022. In each meeting, our Director, Prof. Kenneth Leung delivered the opening speech and warmly welcomed the new members to join SKLMP. He gave a brief introduction to SKLMP and highlighted our major achievements since its inception. Afterwards, Prof. Leung explained some of the new funding initiatives and the goals for the next stage of the laboratory’s development. Each new member presented their research interests and potential contribution to the SRT during the meeting. SKLMP will double the funding allocation to each SRT in 2023. Collaborations on impactful research projects among members that can lead to a large-scale funding or an innovation are highly encouraged.

Meet our team

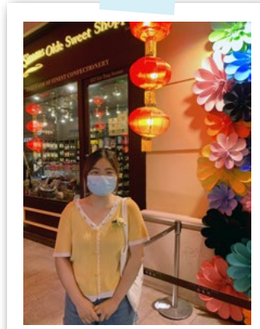
Dr. Rongjie ZHAO
Postdoc at SKLMP

Dr. Zhao’s research concerns marine ecology and biodiversity in marine ecosystem. She is currently working on marine fish biomonitoring through utilizing environmental DNA with the next- and third-generation sequencing technology. She comments “SKLMP is dedicated to marine eco-safety and protection, and thus is a perfect place to conduct marine ecological research”.



Miss Ying WANG
Research Assistant at SKLMP

Miss Wang’s research mainly concentrates on assessing the toxicity of emerging chemicals and culturing diverse model organisms, such as animals and algae from marine water or freshwater. She believes that SKLMP is a welcoming place because the lab not only has a strong culture of learning but also contains a lot of cutting-edge and fascinating research facilities.



Miss Veronica LAM
Research Assistant at SKLMP

Miss Lam is an experienced Research Assistant in SKLMP. Her research topics include harmful algae and fishery studies, and has performed various experiments to evaluate the toxicity of different algal species in Hong Kong waters. Her research interests also include microbiomes. She likes SKLMP because it is led by many distinguished world-class scientists and experienced researchers. It always inspires her to become an elite scientist.

Mr. Shiwen ZHOU
PhD Student at SKLMP

Shiwen’s research focuses on toxicity and toxins of benthic and epiphytic toxic algae (BETA). He is currently working on the establishment of a systematic BETA culture collection for Hong Kong, aiming to facilitate marine environmental and ecological investigations. He enjoys working at SKLMP because the institute has many outstanding researchers and advanced instruments.

Research highlights

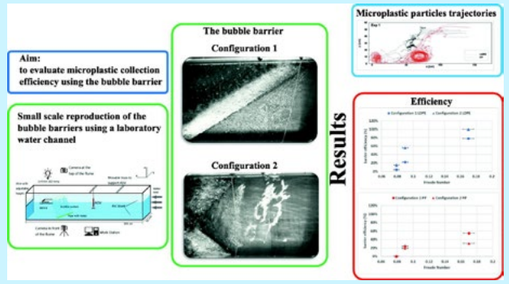
Dr. James FANG
Assistant Professor,
Department of Applied Biology and Chemical Technology, PolyU

Dr. Alessandro STOCCHINO
Associate Professor,
Department of Civil and Environmental Engineering, PolyU

Performance assessment of bubbles barriers for microplastic remediation

***Science of The Total Environment*, 844, 157027 (2022). (Impact Factor: 10.75)**

Microplastics are polymer substances that have a strong ability to adsorb pollutants and can cause considerable damage to the marine environment. As an innovative device, the bubble barrier generates bubble curtains of upward natural flows by using an air pump to push microplastic particles into the catchment devices in the water so as to reduce microplastic pollution. The research team performed velocity measurements and particle tracking visualization in their experiments, where two bubble configurations with three flow conditions and two types of particles were tested. The results indicate that the bubble barrier is effective in blocking microplastic particles, while its system performance is closely related to the combination of the bubble generator configuration and main features of the flow.



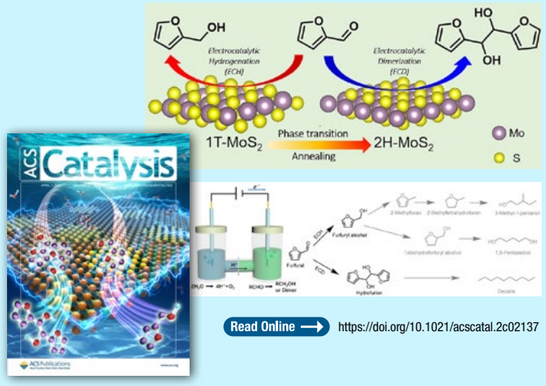
Read Online https://doi.org/10.1016/j.scitotenv.2022.157027

Dr. Jason LAM
Assistant Professor,
School of Energy and Environment, CityU

The structural phase effect of MoS_2 in controlling the reaction selectivity between electrocatalytic hydrogenation and dimerization of furfural

***ACS Catalysis*, 12, 18, 11340–11354 (2022). (Impact Factor: 13.7)**

Global dependence on petroleum resources has promoted an excessive release of fossil CO_2 into the atmosphere and marine environment. The catalytic valorization of biomass for renewable carbon-neutral chemical and biofuel production has thus become increasingly important. Dr. Jason Lam's team recently developed an electrocatalytic method to control the conversion of furfural (a biomass-derived chemical) to either furfuryl alcohol (a valuable chemical precursor) or hydrofuroin (a jet fuel precursor) as main products by controlling the structural phase of a transition metal dichalcogenides (TMDs) catalyst, MoS_2. The reaction operates in an aqueous environment at room temperature and atmospheric pressure, and does not generate any harmful byproducts. The result of this project helps to expand the product outcomes from renewable feedstock and to protect our environment from the consequences of fossil resources overuse.



Read Online https://doi.org/10.1021/acscatal.2c02137

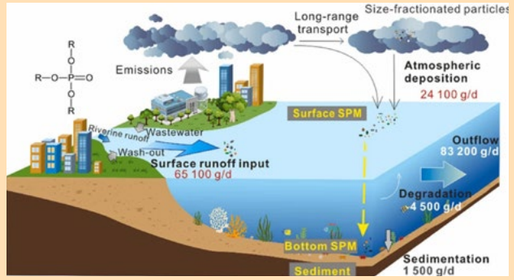
Prof. Paul LAM
President,
President's Office, HKMU

Dr. Phoebe RUAN
Research Assistant Professor,
SKLMP, CityU

Significant input of organophosphate esters through particle-mediated transport into the Pearl River Estuary, China

***Journal of Hazardous Materials*, 438, 129486 (2022). (Impact Factor: 14.224)**

Most organophosphate esters (OPEs) enter the marine environment through atmospheric deposition and surface runoff. In this study, samples of size-segregated atmospheric particles, suspended particulate matter in seawater, and sediments in the Pearl River Estuary (PRE) were collected and analyzed for OPEs. Concentrations of atmospheric particulate OPEs showed a decreasing trend with increasing offshore distance in the PRE. Sediment in the region close to Modaomen outlet was subject to relatively high OPE concentrations. The input and environmental fate of particulate OPEs were dependent on sources, particulate media, and chemical species. The present study calls for more concern on anthropogenic impact on the estuary.



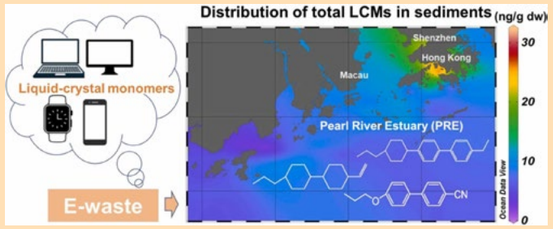
Read Online https://doi.org/10.1016/j.jhazmat.2022.129486

Dr. Henry HE
Assistant Professor,
School of Energy and Environment, CityU

Widespread occurrence of emerging E-waste contaminants – Liquid crystal monomers in sediments of the Pearl River Estuary, China

***Journal of Hazardous Materials*, 437, 129377 (2022). (Impact Factor: 14.224)**

Liquid crystal monomers (LCMs) can accumulate in fatty tissues of animals and affect the health of marine life and humans. SKLMP member Dr. Yuhe He and his team have detected LCMs in the waters off Stonecutters Island and Tuen Mun in Hong Kong. He postulated that the LCMs detected off Tuen Mun may have been released from damaged LCDs in the West New Territories Landfill. Most Hong Kong households today have more than one mobile phone or tablet computer, so when they clean these electronic devices, domestic sewage with LCMs is discharged to the Stonecutters Island Sewage Treatment Works. Sewage treatment probably fails to remove all LCMs, resulting in contamination of inshore waters.



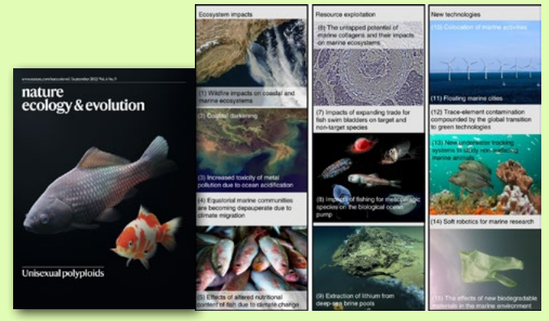
Read Online https://doi.org/10.1016/j.jhazmat.2022.129377

Dr. Moriaki YASUHARA
Associate Professor,
School of Biological Sciences, HKU

A global horizon scan of issues impacting marine and coastal biodiversity conservation

***Nature Ecology & Evolution*, 6, 1262–1270 (2022). (Impact Factor: 19.1)**

Marine and coastal ecosystems are undergoing new problems that still lack scientific research and understanding, and can have an impact on biodiversity. In the inaugural Marine and Coastal Horizons Scan by experts, 15 horizon issues of three categories were ultimately identified, including large-scale alterations to marine ecosystems, changes to resource use and extraction, and emergence of new technologies. The scan is held to confirm potential emerging issues that could significantly affect the functioning and conservation of marine and coastal biodiversity in the next 5-10 years. It strongly contributes to raising public awareness, promoting relevant marine research, and pressing policymakers to take appropriate actions.



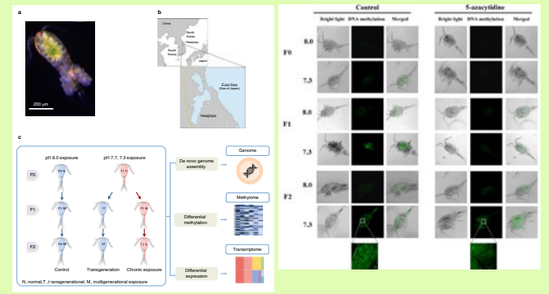
Read Online https://doi.org/10.1038/s41559-022-01812-0

Prof. Rudolf WU
Advisor (Environmental Science),
Department of Science and Environmental Studies, EduHK

Epigenetic plasticity enables copepods to cope with ocean acidification

***Nature Climate Change*, 12, 918–927 (2022). (Impact Factor: 28.862)**

Copepods are planktonic crustaceans that are widely distributed in marine, fresh and brackish waters. They can indicate the health of the nature, but increasing ocean acidification is affecting their reproductive rates in many ways. SKLMP member Prof. Rudolf Shiu-Sun Wu and a research team from Sungkyunkwan University in South Korea jointly discovered that copepods can adapt to ocean acidification through epigenetic changes. When copepods were exposed to acidified water across generations, there were epigenetic changes in genes related to reproduction which enhanced the adaptability of copepods and helped them to recover their reproductive capacity in the adverse environment. This important finding has been published in the international journal *Nature Climate Change*.



Read Online https://doi.org/10.1038/s41558-022-01477-4

New species discovery

SKLMP Biologists Discover 3 New Coral Species in Hong Kong Waters

3 new species of hard coral were discovered in Hong Kong waters by SKLMP member Prof. Jianwen Qiu and SKLMP research assistant Mr. King-fung Yiu. These species were proved not to have been identified in other parts of the world. It has been around 20 years since the last time a new hard coral species was discovered and named in Hong Kong.

The coral samples were collected from the survey of coral-eating nudibranchs at Sung Kong and Waglan Island in the eastern waters of Hong Kong by Prof. Qiu's team. After analysis, the researchers believed that these rare sun corals were all new species of the genus *Tubastraea* and named them *Tubastraea dendroida*, *Tubastraea chloromura* and *Tubastraea violacea* according to their shapes and colors. Besides, as non-reef-building corals, the 3 new species have no symbiotic algae that produce energy through photosynthesis, and they live in deeper waters at depths of between 10 and 30 meters. They gain nutrients by capturing zooplankton from seawater with their tentacles.

Tubastraea chloromura is characterized by an olive green skeletal wall and a circle of yellow tentacles surrounding its mouth. Prof. Qiu pointed out that based on the coral gene sequences recorded in public database, the only known habitat of it is Hong Kong waters. While *Tubastraea dendroida* and *Tubastraea violacea* are potentially distributed in Japan and the western Pacific ocean. This discovery has increased the number of known species in the *Tubastraea* genus from 7 to 10. Prof. Qiu also said that it demonstrates the high marine biodiversity in Hong Kong waters, and the team is encouraged to further explore the diversity of marine animals in the future.

Photo source: https://bit.ly/3XL7Dfb

Community service and public education

Rotary Carbon Reduction and Ecology Summit


Dr. Leo Chan delivered a guest lecture entitled "Marine Environmental Protection and Conservation in Hong Kong" in the "Rotary Carbon Reduction and Ecology Summit" jointly organized by the Preserve Earth Planet Committee of the Rotary District 3450 and the Imagine Rotary on 30 October 2022. The Summit was intended to arouse our awareness to the environmental problem and issues. The other invited speakers included Mr Kam Sing Wong, a former Secretary for the Environment of the HKSAR Government.

Mangrove Plantation and Ecological Tour



On 5 November 2022, SKLMP co-organized a "Mangrove plantation and ecological tour" activity along with Preserve Earth Planet Committee of the Rotary District 3450 and the Ocean Citizenship at the coastal mangrove stand and mudflat area of Sha Tau Kok Sea. More than 60 of Mangrove seedlings were planted during the activity. Participants also cleaned up the rubbish in the mangrove stand and mudflat areas during the mangrove plantation.

Outreach activities of Oysters Save Our Seas



To raise public awareness of the importance of marine conservation, our staff of SKLMP have supported the Oysters Save Our Seas (Oyster SOS) initiative with community partners. In 2022, Oyster SOS conducted a number of activities, ranging from talks to hands-on fabrication workshops, and on-site deployment. Over 500 expressions of interest have been received in joining the program in the past four months. Till November, we reached 171 youths, including cadets from Civil Aid Service, secondary schools, and university students, and over 100 oyster shell strings were fabricated for ecological restoration.

News updates

19 SKLMP Members Ranked as World's Top 2% Most Cited Scientists

Congratulations to the 19 members of SKLMP who have been listed among the World's Top 2% Most Cited Scientists by Stanford University in 2022. Based on bibliometric information contained in the Scopus database, the ranking is considered as the most prestigious one around the world, demonstrating the global academic influence of the scientists.

Dr. Chun Kit Kwok and Dr. Celia Schunter Won the NSFC Excellent Young Scientist Award

Congratulations to SKLMP members, Dr. Chun Kit Kwok and Dr. Celia Marei Schunter, for winning the Excellent Young Scientist Award from the National Natural Science Foundation of China (NSFC) in 2022. This award encourages highly qualified young scientists to continue their innovative research and is open to young scientists under the age of 38 for men and under the age of 40 for women from universities in Hong Kong and Macau.

RTHK Hong Kong Connection Featuring Members of SKLMP

We are grateful the filming team of RTHK Hong Kong Connection for specially featuring a documentary on marine plastics debris, and interviewing our Director Prof. Kenneth Leung and our SKLMP members, Dr. Jianlin Chen and Dr. Brian Kot. In this documentary, Prof. Leung introduced how marine plastic litters becomes microplastics, and how microplastic harm marine life and human health after they enters into the marine ecosystem and the food chain. Dr. Chen introduced how he used the drones and AI technology to survey the trash in the coastal area and built a database to help clean up the marine litter. Dr. Kot also witnessed that the health and survival rate of large wild marine animals such as porpoises, Chinese white dolphins and sea turtles were greatly affected by the marine litter due to accidental ingestion of the litter. We hope that everyone can "join hands to reduce plastic waste and protect the ocean!"

Project Led by Prof. Xiangdong Li Awarded Theme-based Research Scheme 2022/23

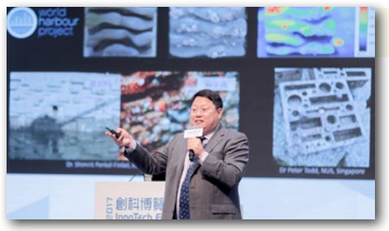
Air pollution is the biggest environmental health risk factor for premature death around the world, and $PM_{2.5}$ is one of the greatest focuses among air pollutants today. As $PM_{2.5}$ is a long-term threat to public health, SKLMP member Prof. Xiangdong Li led his team to propose the research project "Unraveling the Black Box between Air Pollution and Public Health for Transformative Air Quality Management" to identify the toxic components and their associated sources responsible for $PM_{2.5}$ health effects. This research was supported by the Research Grants Council's Theme-based Research Scheme 2022/23, with an approved budget of of HK$44.5 million. Prof. Li and his team expect this research to provide more efficient and economical methods to contribute to the development of future air quality policies worldwide.

NerOcean was selected by CityU as one of the "HK Tech 300" Startups

SKLMP greatly supports researchers and alumni to develop innovative technology of commercial and industrial values. *NerOcean*, a startup company co-founded by SKLMP members Prof. Rudolf Wu and Dr. Vincent Ko has developed a novel technology for monitoring dissolved oxygen in the aquatic environment based on the principle of photo-oxidation, that overcomes the longstanding problems of dissolved oxygen measurement and monitoring. The new dissolved sensor developed can provide real time oxygen measurements in remote areas and also a permanent record of the dissolved oxygen overtime. Coupled with remote sensing, the team aims to build a marine monitoring network "Nerve of the Ocean", to provide a cost-effective solution for monitoring dissolved oxygen over large areas, which is not practical at present. *NerOcean* was awarded CityU HK Tech 300 Seed Fund in June, 2021 and won a Silver Medal in the Innovation Geneva this year. *NerOcean* has also received angle funds from CityU and other venture capitals.

Winning International Innovation Awards

Congratulations to SKLMP members, Prof. Rudolf Wu and Dr. Vincent Ko, for winning several international innovation awards for their novel dissolved oxygen sensor based on replaceable photo-sensing film in 2022. The awards included a silver medal at the 48th International Exhibition of Inventions of Geneva; the Top 10 Best Invention Award, Gold Medal and also a Special Award at the 7th International Invention and Innovation Competition in Canada (iCAN) in 2022.



Prof. Kenneth Leung conferred with the President's Award of CityU

Congratulations to our SKLMP Director, Prof. Kenneth Leung for being conferred with the President's Award of City University of Hong Kong in November 2022. This award recognizes outstanding professoriate staff who have made exemplary contributions to research and professional education that have helped CityU achieve local and global distinction. In this year, four senior professors received this honor in form of a cash prize.

3 Members were awarded Named Chair Professorship

Congratulations to 3 SKLMP members, Prof. Michael Yang, Prof. Wenxiong Wang and Prof. Michael Leung, who have been awarded Named Chair Professorships, one of the highest honours given to academics by the City University of Hong Kong. Prof. Michael Yang Mengsu was honoured with Yeung Kin Man Chair Professorship in Biomedical Sciences. Prof. Wang Wenxiong was bestowed with TUYF Chair Professorship in Oceanography. Prof. Michael Leung Kwok-hi was awarded Shun Hing Education and Charity Fund Professorship in Energy and Environment.

Call for contributions

To better capture the news, updates and great work of the SKLMP members and community, we are now calling for contributions for the next issue of our newsletter. Please email us your contributions (up to 100 words) to sklmp.info@cityu.edu.hk by 31 May 2023. Ideas of contributions include your new publications or projects, received awards, and conferences or meetings that are of particular interest to the SKLMP members. We look forward to your contributions!