



Press Release

For Immediate Release

May 26, 2019

HKU engages students in reducing and promoting adverse effects of light pollution using STEM knowledge

Light pollution is a severe environmental problem in a crowded metropolis like Hong Kong. In addition to conducting light pollution research, HKU researchers organised the "**Dark-sky-friendly Lighting Fixture STEM Competition**" to raise public awareness of the severe light pollution problem in Hong Kong. Students and teachers were engaged to show how STEM (Science, Technology, Engineering, Mathematics) knowledge can be applied to reduce the adverse effects of light pollution. The winning team members also presented their entries in person to the public during the HK SciFest 2019.

In the Competition, students worked on outdoor lighting fixture products which can minimise or reduce impacts of light pollution using STEM knowledge. The winning entry came from Fanling Kau Yan College titled "Smart Sensing Lamps Array with progressive intensity change." The team visited Sheung Shui Wai and learnt how residents there suffered from light trespass originated from lamp posts. By applying multiple technologies such as 3D printing, programmable microcontrollers, displacement and ultrasound sensors, the students created a smart sensing street lamp array with adjustable light intensity based on the flow of pedestrian traffic, thus leading to a reduction in the intensity and the number of lighting fixtures required.

Regarding the competition entries, one of the judges, Ir Dr Roger Ng Tsz Ho, Vice Chairman of CIE (Hong Kong) Limited, commented: "The student works are of very high quality. I can truly feel their enthusiasm for science and their strong dedication for environmental conservation." Mr Leung Kam Cheung, National Outreach Coordinator of Hong Kong, China of the International Astronomical Union, suggested: "Dark-sky-friendly lighting fixture prevents unnecessary spilling of light which ruins our dark sky, and restores our spectacular and beautiful starry night. This would no doubt lead to more of our youngsters being inspired to explore the mysteries of the universe." Mr Edwin Lau, MH, Founder and Executive Director, The Green Earth, remarked: "Students participating in this competition are aware of light pollution and have come up with simple ideas and innovative solutions to reduce such problems. Some of their ideas, if implemented, would be far more effective than simply relying on the government's *Charter on External Lighting* alone."

Winning entries of the Competition were showcased at the "STEM x SCM" event of the HK SciFest 2019 organised by the Hong Kong Science Museum between April 19 and 22, 2019. The event was a large-scale outdoor fair and exhibition showcasing STEM project outcomes. Over the weekend, students and teachers introduced their winning entries and promoted light pollution reduction in person to thousands of members of the public, fully achieving the aim of knowledge exchange. Furthermore, light pollution research conducted by the Hong Kong Light Pollution Research Project Team of HKU Department of Physics was also highlighted.

The "Dark-sky-friendly Lighting Fixture STEM Competition" was co-organised by HKU Department of Physics, HKU Department of Electrical and Electronic Engineering, the Ho Koon Nature Education cum Astronomical Centre (Sponsored by Sik Sik Yuen), in association with the Hong Kong Space Museum. The project was supported by the HKU Knowledge Exchange Fund granted by the University Grants Committee. Entries from 8 teams were received. Each team is required to submit an outdoor lighting fixture (real size or scaled model) which can minimise light pollution for demonstration, along with a written technical report. The oral presentation and the award ceremony of the competition was held at the Hong Kong Space Museum on April 14, 2019. A judging panel comprising renowned experts in lighting science, environmental protection and S&T disciplines convened to select the winners based on criteria including the quality and originality of works, and the execution of STEM knowledge.

Details of competition can be found in <http://nightsky.physics.hku.hk/STEM/>. For event photos please visit <https://www.scifac.hku.hk/press>. For press enquiry, please contact Ms Cindy Chan, Assistant Director of Communications of Faculty of Science, at 3917 5286 / 6703 0212 or by email at cindycst@hku.hk, or Dr Jason Pun, the project leader of the competition, by email at jcspun@hku.hk.

Sharing from students of the champion team:

Chan Ka Fai, Chan Pok, Chong Chun Kei, Tang Yan Yee, Tsang Yuk Kuen (Form 5, Fanling Kau Yan College):

“By joining this competition, we learnt that light pollution is all around us. That got us to wonder why there are so many lamp poles which generate severe light pollution all around Hong Kong. Inspired by this, we decided to design our lighting fixture to enter the competition. Through numerous revisions of the design and modifications of the competition entry model, and practicing our presentation, we are excited for winning the competition.

We feel fortunate to have a firsthand experience to present our winning entry to the general public during HK SciFest 2019. During this time, we talked to a wide segment of the public and listened to their opinions. Many want to learn more about the STEM knowledge applied behind our work. We are amazed by their curiosity for knowledge, which is no less than that from school-aged youngsters. People want these science and technology knowledge to improve and bring more convenience to their daily lives.”

Sharing from supervising teacher and alumnus of the champion team:

Cheung Hoi Yan, Samuel Fung (Fanling Kau Yan College):

“In addition to guiding the students to use STEM knowledge to solve practical daily problems effectively, we are most grateful to see the students had excellent team work, effectively dividing the tasks and actively collaborating with each other. We are gratified that our students had the opportunities to present their works to the general public of different age groups and in different languages during HK SciFest 2019. They learnt to listen to questions and suggestions from the public in a humble manner. Through this experience, we believe the students understand much better the light pollution problem in Hong Kong and will continue to contribute to the society by improving the environment.

We plan to meet with relevant government departments so that the students can introduce their works to professionals and get their opinions in order to design smart lighting devices that are more effective in reducing light pollution.

We would like to thank Dr Andy H.P. Chan, Associate Professor of the Department of Electronic Engineering at the City University of Hong Kong, by giving us valuable insights on the design of our work and inspiring us to think and solve problems from different perspectives.”

Results of the “Dark-sky-friendly Lighting Fixture STEM Competition”:

Champion - Fanling Kau Yan College (topic: Smart Sensing Lamps Array with progressive intensity change)

First runner up - SKH Bishop Baker Secondary School (topic: The White Lampshade)

Second runner up - CNEC Christian College (topic: Light sensitive elevating lampshade)

Honorary mention (in alphabetical order):

- Hong Kong Taoist Association The Yuen Yuen Institute No. 3 Secondary School (topic: Reducing light machine)
- St. Mary's Canossian College (topic: Dark-sky-friendly Lighting Fixture)
- United Christian College (Kowloon East) (topic: Road Side Light Reducing Device)

Members of the judge panel (in alphabetical order):

Mr Kwok Chi Tai

Principal, Ho Koon Nature Education cum Astronomical Centre
(Sponsored by Sik Sik Yuen)

Mr Edwin Lau, MH

Founder and Executive Director, The Green Earth

Mr Leung Kam Cheung

National Outreach Coordinator of Hong Kong, China, International
Astronomical Union

Ir Dr Roger Ng Tsz Ho

Vice Chairman, CIE (Hong Kong) Limited

Ir Dr Bryan M.H. Pong

Associate Professor, HKU Department of Electrical and Electronic
Engineering

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Photos and Captions



Figure 1: Group photo



Figure 2: Champion of **Dark-sky-friendly Lighting Fixture STEM Competition**: Fanling Kau Yan College (from left to right: Tsang Yuk Kuen, Chong Chun Kei, Chan Pok, Chan Ka Fai, Tang Yan Yee and the judge Associate Professor Ir Dr Bryan M.H. Pong from HKU Department of Electrical and Electronic Engineering)

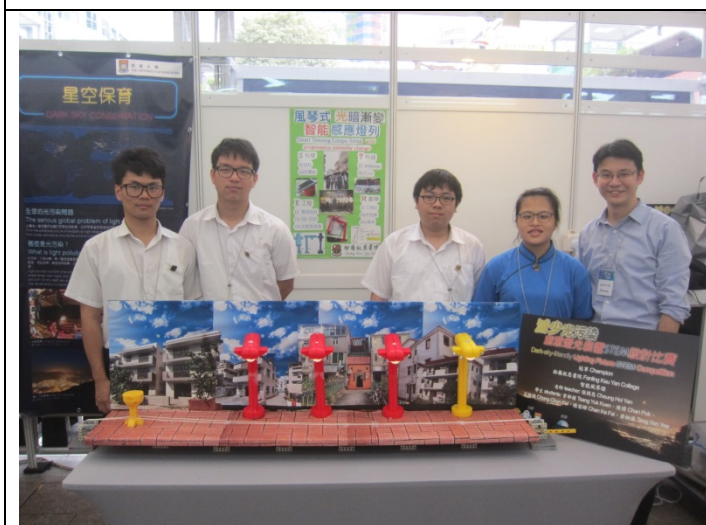


Figure 3: Champion team entry from Fanling Kau Yan College: "Smart Sensing Lamps Array with progressive intensity change"





Figures 4, 5: Winning entries were showcased in the “STEM × SCM” event of HK SciFest 2019 in which students and teachers introduced their works in person to the general public.