



“We-Safety” is a newsletter aimed at providing PolyU staff and students with safety information and news about how the University is working to keep our community safe.

May **We** work together to achieve **Safety** on campus.

## Laser Safety

### What is Laser?

The letters in the word “LASER” stand for “**L**ight **A**mplification by **S**timulated **E**mission of **R**adiation”.

Both ordinary light from a light bulb or a flashlight and laser are a form of electromagnetic radiation but they differ in that ordinary light is generated by spontaneous emission whilst laser is generated by stimulated emission. Ordinary light is visible but laser, on the other hand, is monochromatic, coherent and directional, and can be visible or invisible.

Lasers are distinguished from ordinary light sources by their coherence. Spatial coherence allows a laser beam to be focussed on a very tiny spot and achieving a very high irradiance. These properties enables applications of lasers, like laser cutting and lithography.

### Where we may find Laser?

The unique properties of lasers allow their varied and widespread applications. Nowadays, lasers have become ubiquitous.



*Laser effect from singer Yoga Lin's concert "Idol"*  
Photo Source: Facebook of Yoga Lin

You may find so many laser products at your home or workplace, such as compact disc player, laser printer, laser pointer, etc. You may also notice other laser applications, like laser light shows in entertainment, laser therapy for musculoskeletal disorder in physiotherapy, LASIK in vision correction, cancer treatment by shrinking or destroying tumors in medicine.

Lasers are also commonly used in industrial sector, such as for material processing, like laser cutting, welding & engraving, for surveying and in communication systems. Last but not least, you can find indefinite examples of applications of lasers in advanced research institutions, like our University.

### What are the Hazards and Typical Control Measures?

Laser hazards can be divided into 2 main types, namely, beam hazards and non-beam hazards.

**Beam hazards** are the hazards associated with the exposure to the laser beam. The resulting injuries depend on a number of factors, including the wavelength (which will affect the penetrating distance and may have photochemical effects for certain wavelengths) and the intensity of the laser beam, duration of exposure and the nature of the exposed tissue.

Direct or indirect (through specular or diffuse reflection) eye exposure to a high-power laser beam (typically class 3b or above) may cause irreversible damage to the retina resulting in loss of vision. Skin exposure to a class 4 laser may result in serious burn.

In particular, eye exposure to infrared laser may be of the most dangerous. Human lens can focus both visible light and infrared light onto the retina. The intensity (= power/unit area) of the laser beam will be amplified by about 100,000 times after the focusing. Hence, even a low power IR laser which poses no risk to skin exposure may cause very serious damage to the retina of the eyeball. Furthermore, we cannot see infrared light. Thus, the aversion response of our eyes cannot protect us against infrared lasers.

**Non-beam hazards** are hazards other than from the exposure to the laser beam. They may be even more hazardous than the beam hazards. For examples, target materials shined by the laser beam may vaporize or generate toxic/hazardous fumes; flammable solvents or combustible materials hit by the laser beam may start a fire; leak of highly toxic lasing gas (e.g. fluorine in excimer laser) may result in deaths. As a matter of fact, non-beam hazards represent most reported deaths.

Examples of typical control measures are:

<b>Engineering Control</b>	<b>Administrative Control</b>	<b>Personal Protective Equipment</b>
<ul style="list-style-type: none"> <li>❖ Installation of interlocked beam enclosure/shutter for full enclosure of the laser beam</li> <li>❖ Installation of Localized Exhaust Ventilation (LEV) for removal of toxic/hazardous gas</li> <li>❖ Provision of fire extinguisher</li> </ul>	<ul style="list-style-type: none"> <li>❖ Mandatory safety training for users of high-power lasers</li> <li>❖ Establishment of Safe Operating Procedures (SOP)</li> <li>❖ Display of warning signs, notices and light boxes</li> <li>❖ No storage of flammable substances</li> </ul>	<ul style="list-style-type: none"> <li>❖ Provision of laser goggles</li> <li>❖ Provision of clothing/long-sleeve gloves to prevent skin exposure</li> </ul>

### How PolyU Staff Members Manage Laser Safety in Department?

The Institute of Textiles and Clothing (ITC) is one of the departments which has been employing many high-power lasers for teaching and research purposes. For examples, ITC has a CO2 laser (GFK Marcetex Flexi-150; 10.6µm; IR) at a maximum power of 150W for engraving fabrics and a He-Cd laser (Kimmon Koha; 325nm; UV) with a power of 80mW for photoluminescence.

In this issue, we are happy to have Dr Kevin Hui, Scientific Officer of ITC, to share with us his insights and experience on laser safety management. Dr Hui is the laboratory-in-charge of the Laser Engraving Laboratory of ITC. He has many years of experience in managing laser safety.

#### Specific Laser Safety Training is Crucial

As noted from Dr Hui, safety training for laboratory users is the most crucial. Most new students of ITC do not have experience of using high-power laser equipment with exposure risks. Some of them even do not have any science background. Hence, provision of proper safety training which covers specific safety concerns of the concerned laser and the corresponding laboratory environment is very important.



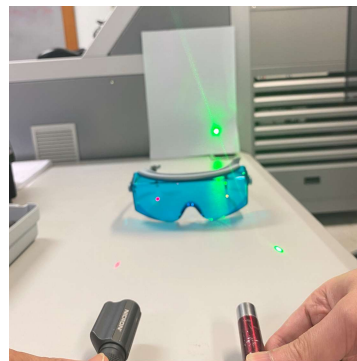
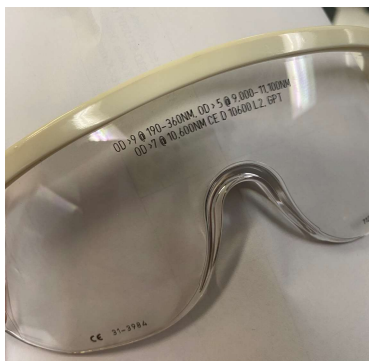
**ITC Students' Works – Materials after Laser Engraving**

“In our safety training, attendees will be given to learn the properties (e.g. wavelength, power, etc.) and specific hazards of the laser as well as the information of PPE required (e.g. optical density (OD) of the laser goggles, etc.) so that they could take proper safety precautions and pick the right protective eyewear,” Dr Hui said.

“On the other hand, we have good communication with Health, Safety & Environment Office (HSEO) and strictly follow their ‘Guidelines for Laser Safety’. In addition to the laser safety training provided by HSEO, all laser users must have received safety

training specific to the concerned laser equipment by the supervisor before they are allowed to operate it,” Dr Hui added.

### **Wear Laser Goggles and Protective Clothing**



**(Left) Information of wavelength and recommended OD marked on laser goggles; (Right) Demonstration on goggles reacting to laser with different wavelength**

It is a must for ITC’s laser users to wear proper laser goggles and protective clothing. In the laboratories of ITC, various types of laser goggles are available. Users can pick the right ones in accordance with the safety information (e.g. wavelength, recommended OD) given in the training and on the laser equipment.

Dr. Hui went on saying that he would require users of the Laser Engraving Laboratory not to wear any accessories or items with reflective surface, such as watches. “Reflective materials can cause reflection of the laser beam and may

result in accidental exposure leading to injury. Therefore, wearing of these accessories is prohibited,” Dr Hui stated.

### **Safety Knowledge for Today and the Future**

Dr. Hui has been managing laser safety in laboratories for many, many years. He firmly believes that the knowledge and awareness of laser safety do not only help students out regarding the safe use of laser equipment for their current study, it also helps them to stay safe in the future.

“The safety knowledge the students received at this stage will surely help them when they go to work after their graduation. Regardless of which textiles and clothing design houses or factories they will join, safety awareness and knowledge would help them to stay out of work injury. The safer and smoother works progress, the better the work output,” Dr Hui concluded.

If you need further information about laser safety, please check our website:

- ❖ Code of Practice for Laser Equipment <https://polyu.hk/ISNZS>
- ❖ Guidelines for Laser Safety <https://polyu.hk/OqeTL>

## We – People

### Peter To, School of Design

Mr Peter To, Audio & Video Production Officer of School of Design (SD), has been the Departmental Health & Safety Officer of SD since 2005. Over the years, in addition to monitoring and maintaining a safe and healthy working and studying environment for SD staff and students, Peter has led the related departmental promotion.

#### Monitor the Safety Arrangement for the School Event

Peter always puts SAFETY at the first priority. Peter's working positions prior to joining PolyU also requested him to have high attention to the work safety arrangement. It made Peter to have the same standard on health and safety requirement for the projects and events of SD. Peter works closely with staff members of SD and introduces them safety principles regularly. As the SD always organises various exhibitions on campus, Peter would liaise and work closely with Campus Facilities and Sustainability Office, HSEO, the event contractor and the SD staff member-in-charge for the risk assessment and safety measures and arrangements. "I work as a coordinator for the safety issues of every project and to make sure the event contractor understand the safety requirements of the University and the actual on-site implementation of safety measures. We would suspend the item if we found it violate the safety requirement of the University, followed by liaising with the contractor for correction," Peter said.



Safety signages are clearly shown at the machines/equipment and in the workshops at in Jockey Club Innovation Tower

#### Same Safety Goal for All School Members

Working together to reach the same goal on health and safety issue is important. Peter thanked the support from the senior management of SD and appreciated the safety measures carried out by the frontline staff members. The Departmental Health and Safety Committee of SD is composed of academic staff, administrative staff, technical staff and staff members of workshop-in-charge and meeting is held regularly. "Members of the Committee are feel free to express their ideas / concerns on health and safety issues of SD. Members supported carrying out safety measures to protect and benefit SD staff and students. For example, the Committee approved the budget for purchasing anti-epidemic items immediately with the outbreak of COVID-19. As students would also stay at the workshops to work on their projects throughout the epidemic period, partition was suggested to set up in the workshops to lower the risk of transmission," Peter added.



Peter also works closely with the workshop-in-charge and other frontline staff members on reviewing the health and safety arrangements in Jockey Club Innovation Tower (JCIT). In case of any safety issues, relevant supporting staff members would work together to investigate the causes and suggest solutions to prevent it to happen again. Peter said, “workshop-in-charge and frontline staff members know the situation of the workshop well, they may provide safety advice for students who work at the relevant workshops. All of us working together and aim at providing students a safe workshop environment”.

Peter also disseminates health and safety information to all current staff and students. For new students, health and safety information are also shared at SD’s New Students’ Orientation Day every year. In addition, Peter also keeps attending different health and safety seminars or lessons to enhance his health and safety knowledge so as to add value to himself and his related work. “I think it is my responsibility to provide SD members a safe working and studying environment in JCIT. I am glad that I have the opportunity to take up this role,” Peter smiled.

## We – Update

### Joyful@Healthy Workplace Best Practices Award (Enterprise/Organization)–Excellence Award

In June 2021, PolyU scooped the Excellence Award of “Joyful@Healthy Workplace Best Practices Award (Enterprise/Organization Category)” of Occupational Health Award 2020-21. The award recognized organizations that make significant efforts to promote and enhance occupational health.



保健處網上互動健康講座系列 (八)

題目: 宅男宅女痛症自救手冊 2.0  
常見痛症的中醫治療

簡介: 宅男宅女痛症自救手冊推出後, 業醫們希望大家多拉筋多運動, 從此不再“宅深人淨”。由於上屆解答提問時間過短, 常見痛症的中醫治療亦未有詳述, 業醫們希望能夠透過網上平台再次解答大家的疑問。增設「上綱問中醫」環節: 參加者可於報名時提交相關健康問題, 一經抽中, 中醫將會在直播時段親自解答。

講者: 保健處康偉建中醫師  
講者介紹:  
香港大學中醫藥學士  
香港大學中醫藥學碩士(針灸)  
香港大學專業進修學院中醫藥學院深遠文憑(中醫學)  
香港大學專業進修學院中醫藥學院深遠文憑(藥科學)

日期: 2020年4月29日 星期三  
健康講座: 1:00-1:30 pm  
「上綱問中醫»: 1:30-2:00 pm

授課語言: 廣東話  
歡迎參加者, 可電郵至 cyjoey.lam@polyu.edu.hk 特別安排

網上授課平台: Blackboard

報名方法: 請點擊這裡 [立即報名](#)

成功登記並且參與講座的參加者, 將獲得業醫編寫的“杜仲巴戟強筋湯”電子食譜。參加者也可以向保健處申請電子講座出席證書。

報名截止日期為 2/4/2020 中午12時正。參加者會收到電郵確認, 及登入Blackboard上傳的連結。建議參加者在擁有穩定Wi-Fi的環境下, 以智能手機或電腦登入Blackboard準時收看講座。

如有查詢, 請致電 3400 2528 或電郵至 cyjoey.lam@polyu.edu.hk

During the epidemic period in 2020, departments/units, such as, Human Resources Office, Student Affairs Office, University Health Service (UHS) and HSEO, continued implementing and providing various health and safety programmes and organising numerous activities for the University community with hybrid mode.

## Poster Collaboration

With the success of previous collaborations with UHS and School of Optometry, HSEO continues to collaborate with departments / units of the University to share health and safety information with the University community.

With Department of Rehabilitation Sciences’ support, HSEO prepared a poster series on topic of “Wellness in the Workplace” to introduce the signs and symptoms of burnout, to share how to be wise at work and the following tips:

- ❖ Self-awareness about job burnout
- ❖ Points to prevent burnout
- ❖ Work planning
- ❖ Wellness activities
- ❖ Communication and attitude



You may visit HSEO’s Instagram (@polyuhseo) or website (<https://www.polyu.edu.hk/hseo/>) to view and download the posters.

## We – Learn

### Occupational Safety and Health e-Quiz

The Labour Department has launched an Occupational Safety and Health e-Quiz (in Chinese) for the public’s access. In the e-Quiz, general knowledge of occupational safety and health, common hazards and safety measures relating to construction, office, catering, etc. are introduced. It helps you enhance the occupational safety and health knowledge and work safely and healthily.

在本港最普遍的工作環境中，

- 被移動的物件或設備擊中的物件碰撞
- 滑倒、絆倒或在同一高度跌閉
- 撞擊或壓傷物件時受傷
- 與固定或不動的物件碰撞
- 被手提工具所傷
- 觸及灼熱表面或物質

小心地氈濕滑

此外，不適當的操作機器、從梯子墜下、接觸化學品或工作環境生火警等也可引致傷員嚴重受傷。本常設問卷會針對以下幾個行業/工作場所的職業安全(「職業安全」)問題作專題探討。

- 導題一：總建築
- 導題二：餐飲服務業
- 導題三：工業及貨倉
- 導題四：零售業及辦公室
- 導題五：一般工作安全

參加者請填妥下列個人資料，並選擇有興趣的課程組別，回答14條「電子問卷」，以測試自己對所選擇的資料的內容的了解程度。當對10條或以上的參加者，可獲得一張由勞工處職業安全及健康部經理上發給參加者的成績證明書。

[進入下頁](#)

You may visit <https://www.info.gov.hk/equiz/introduction.htm> to test how much occupational safety and health knowledge you acquired. A certificate will be given if you got 10 or more correct answers.

### Occupational Health Public Talks

In addition to the e-Quiz, the Labour Department also offers occupational health public talks (to be conducted in Cantonese) this summer on the following topics:

- ❖ Prevention of Heat Stroke at Work in a Hot Environment
- ❖ Occupational Health Hints for New Recruit Young Employees
- ❖ Manual Handling Operations and Prevention of Back Injuries
- ❖ Infection Control in the Workplace



All health talks should be registered in advance. To minimize the health risk of contracting COVID-19, infection control measures will be adopted at the talk venues. You may visit the website of the Labour Department at <https://www.labour.gov.hk/tc/osh/content11.htm> for details.

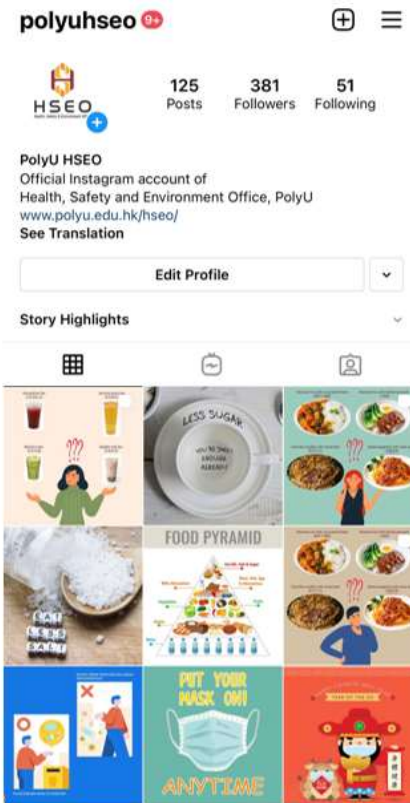
## We – Listen

We value your opinions and **We always Listen.**

With the epidemic situation in the first half of 2021, HSEO liaises with user departments in hybrid mode to meet with safety personnel of departments and exchange health and safety views and information. In addition to the regular outreaching meeting and health and safety inspection, safety personnel may also approach the HSEO Coordinator of their department on the health and safety issues/concerns. It is expected to organise health and safety talks with hybrid mode in the coming semester.

HSEO would continue communicating with the University community through the following e- channels and social media to provide health and safety information:

- ❖ Mass Email
- ❖ Instagram (<https://www.instagram.com/polyuhseo/>)
- ❖ E-poster
- ❖ Newsletter
- ❖ HSEO Website (<https://www.polyu.edu.hk/hseo/>)



## Contact Us

### HEALTH, SAFETY & ENVIRONMENT OFFICE

Office Address:  
Room Z402, 4/F, Block Z  
The Hong Kong Polytechnic University

Tel:  
3400 8396

Fax:  
2764 0421

Email:  
[hosafety@polyu.edu.hk](mailto:hosafety@polyu.edu.hk)