12 RESPONSIBLE CONSUMPTION AND PRODUCTION

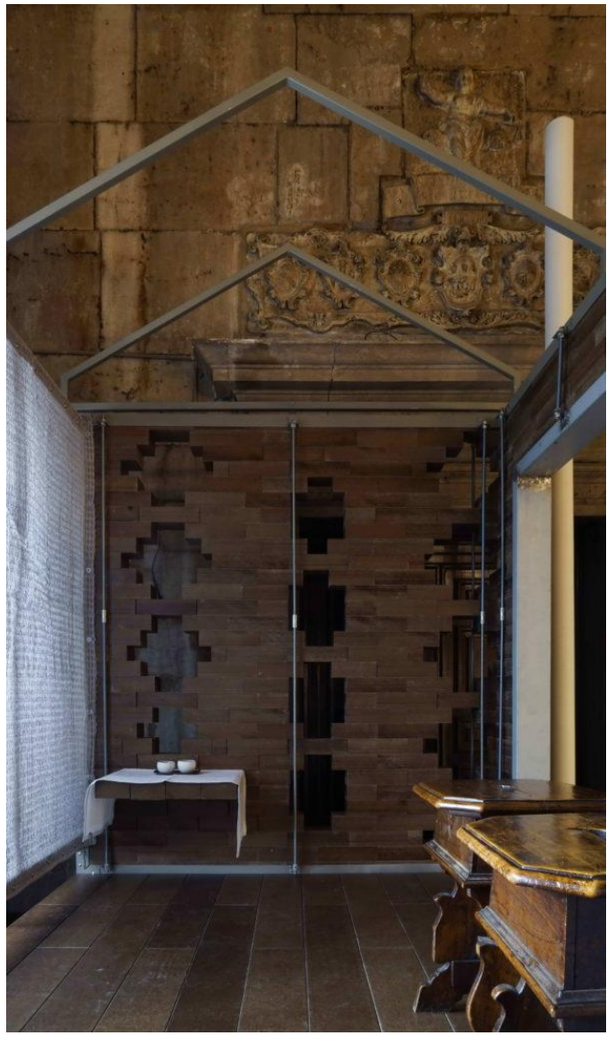
In 2019, NCTU offered

146 related courses.

The number of publications is growing year by year.

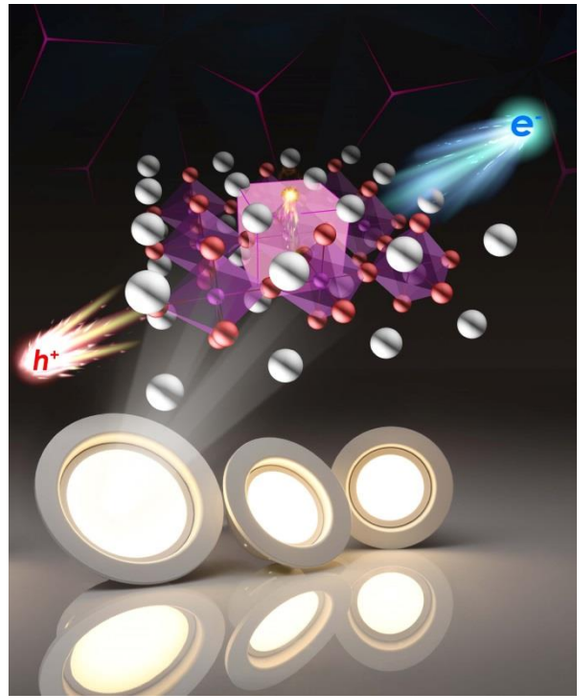
The publications in 2019 was

1.7 times more than that in 2015.



Using innovative materials to lead a new revolution in architecture

NCTU's Transdisciplinary Design Innovation Shop (TDIS) created a green building " Nest Dwelling" by using boards and bricks produced using innovative nPulp technology. The nPulp technology is developed by Yong Feng Yu, a famous paper manufacturing company in Taiwan. "Nest Dwelling" demonstrates the possibility of utilizing novel materials in construction applications and it can be viewed as a realization of environmental justice and social justice. To achieve "zero waste" and "free heavy pollution chemistry", the nPulp technology uses a large quantity of rice and wheat straw left in the fields after harvest as raw materials and adopts a biological manufacturing process to produce pulp and paper without adding any strong-acid or strong-alkali chemical raw materials. This technology transforms the seemingly useless straw into a new eco-friendly material by recycling and reusing it, which can not only increase farmers' incomes, but also realize the circular economy.



Employing newly-emerging perovskite materials to make photovoltaic modules for energy saving and carbon reduction

Since interior lighting has always been a major source of household electricity consumption, how to reduce the power consumption of indoor lighting or recycle energy consumption become critical issues when it comes to the development of future architecture with low carbon and carbon balance. The silicon solar cells, which are commonly used today, do not perform well in low light or indoor lighting. Thus, scientists around the world are constantly looking for sustainable solutions for household electricity and Internet of Thing (IoT) applications. The team of Professor Fang-Chung Chen from the Department of Photonics of NCTU used photovoltaic modules made from newly-emerging perovskite materials to recover the indoor lighting energy. After theoretical calculation and evaluation, the team found that up to 60% of indoor lighting energy could be recovered, and that the high-efficiency and low-cost characteristics of perovskite photovoltaic modules could also be applied to low-power sensors or actuators in IoT, indicating the explicit direction for achieving the goals of energy conservation and carbon reduction.