

Co-organisers:

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E2TEC015T
(Not-token required)



The Hong Kong Young Academy of Sciences
(YASHK) talk series

**Talk Series on Emerging Technologies —
Science, Opportunities and Challenges 2023:**

Diamond as next-generation semiconductor

Prof. LU Yang

HKU-100 Scholar Professor, Department of Mechanical Engineering,
The University of Hong Kong



Application Deadline

5 January 2023

12:00 noon

Intended Learning Outcomes

Upon completion of the programme, participants should be able to:

1. understand the outstanding mechanical and electrical properties of nanoscale diamond;
2. know the current status and challenges for diamond being used into semiconductor industry;
3. obtain a preliminary idea of what “elastic strain engineering” is, and how it can make diamond an important semiconductor material in the future.

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Holistic Talk
Series



◆ Introduction

Not only the hardest material in nature, diamond is also a promising semiconductor material with an ultrawide bandgap, ultrahigh carrier mobility and thermal conductivity. Unlike silicon, however, doping diamond has been always difficult which limits its microelectronics application. Our recent research shows that elastically stretching diamond can potentially address this grand challenge, and push its extreme figures-of-merit for future electronic device applications. We firstly demonstrated that, by reducing dimension into the nanoscale, diamond nanoneedles can be bent with ultralarge elastic deformation (Science 2018), opening up the possibility for diamond “elastic strain engineering”. We then show that, through advanced microfabrication and in situ uniaxial tensile loading, large uniform elastic straining can be achieved in microfabricated diamond bridge arrays (Science 2021). Such ultralarge elastic strains can substantially change the electronic properties of diamond and make them more desirable for various semiconductor applications. These observations are an early step in potentially achieving diamond deep strain engineering for unprecedented electronic, optoelectronic, and even quantum information technologies.

◆ Schedule

Session	Date	Time	Venue
1	20 January 2024	10:00 a.m. – 12:00 noon	Zoom Meeting

◆ Target Participants

- S1 – S6 in 2023/24 school year.
- Class size: 100
- * First-come-first-served.

◆ Certificate

E-Certificate will be awarded to participants who have attended the talk.

◆ Medium of Instruction

English

◆ Remark

Starting from the 2023/24 school year, after the first review period, ALL student members must complete the following requirements in each school year in order to maintain their membership:

- Attend One Talk; AND
- Participate in One programme or activity of any kind

◆ Enquiry

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✉ programme@hkage.edu.hk

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Holistic Talk
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This talk is one of the items in the four domains of the Holistic Talk Series. The objective is to facilitate the all-round development of student' gifted potential.



The Hong Kong Young Academy of Sciences (YASHK) talk series

Talks are about emerging technology to inspire students' motivation in pursuing knowledge in specialized areas.



Academic Introductory Talk Series

Introduce trendy topics to widen the students' horizons.



Celebrities Talk Series

Celebrities share their life-changing moments to enhance students' aspirations for life.



Future Insight Talk Series

Professionals explain the latest trend in their industry to give students an insight to plan their future.