

Career Prospects

Physicists/Engineers for Semiconductor/Material Development, Material/Manufacture Process, Process Technical Development, Microelectronics, IC Design, Optimized Operations, Packaging, Validation and Applications

Non-local graduates are eligible to apply Immigration Arrangements for Non-local Graduates (IANG) to stay and work in the HKSAR.

Relevant Companies



Alumni Sharing



LIANG Jiajun

Data Analyst
Aifin Technology Co., Limited
Graduate of MSc in Microelectronics Technology & Materials

Hong Kong stands out as a unique international hub, and PolyU is well-known around the world for its exceptional faculty, cutting-edge laboratory facilities, and valuable learning experiences. This combination gives my classmates and I a competitive advantage after graduation, equipping us with the skills and knowledge to excel in our careers. As a result, I have decided to pursue my master's degree in Microelectronics Technology and Materials in the Department of Applied Physics at PolyU. This programme will not only provide me with a solid foundation in the technical aspects of microelectronics but also expose me to the latest advancements and trends in the industry. Furthermore, I anticipate that studying here will lead to higher starting salaries, better working environments, and clearer paths for career advancement compared to my peers in mainland China. Overall, I view this journey as an important step toward reaching my long-term career goals in the fast-changing field of microelectronics.



WANG Xianhan

Senior Engineer,
Huawei technologies Co Ltd
Graduate of PhD in Applied Physics

Microelectronics is an exciting field affecting almost every aspect of our daily life. It has become the spine of the modern world that one can hardly imagine the life without mobile phones, computers, TVs and other electronic devices. Yet the field is still developing fast, enabling more and more functions and applications, and of course, with a lot of opportunities for career. To enter such a field, you will need a good guide providing sound knowledge but also fostering interest.

I was lucky to meet the remarkable the Department of Applied Physics in PolyU. They not only have strong expertise in the related fields, but also a strong emphasis on innovation and research. The professors are willing to provide support and advices to students anytime. They inspired me the interest on the field, which I found beneficial in my later endeavor. I have learnt not only practical knowledge and physical nature, but also analytical thinking, communication, and interpersonal skills. It was a great practice as the beginning of my career.

Enquiry : Programme Leader: Prof. Jiong Zhao Email: apdept@polyu.edu.hk

Website & Social media: [Polyuap](#) [Polyuap](#) [PolyU Applied Physics](#)
[Department of Applied Physics, PolyU](#) [PolyU_AP](#)



Programme website

PHYSICS Foundation
for an Intelligent FUTURE

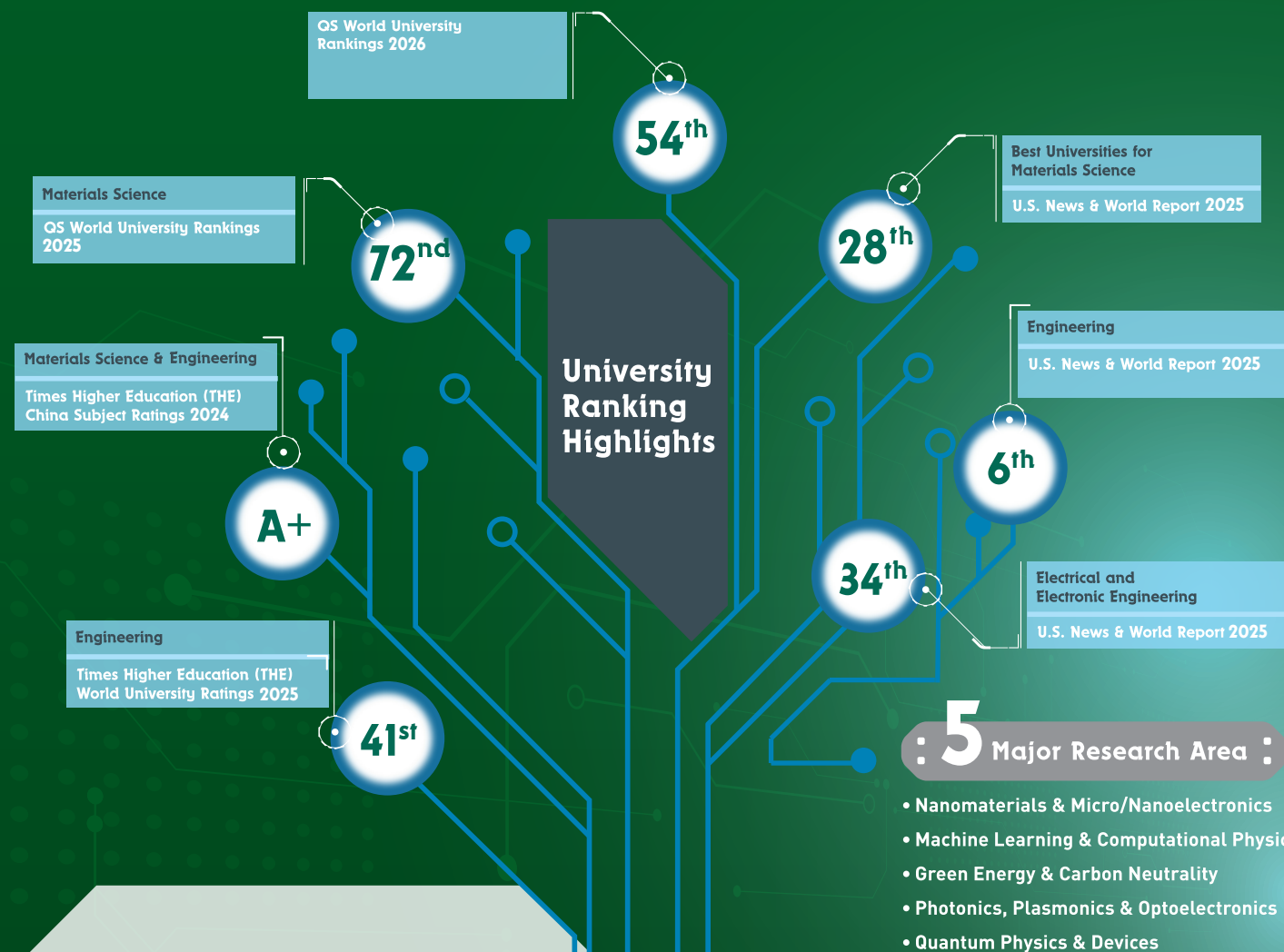
Master of Science in:

Microelectronics Technology & Materials



THE HONG KONG
POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF
APPLIED PHYSICS
應用物理學系



About Department of Applied Physics

The Department of Applied Physics (AP) was founded in 1987, and we are devoted to become a world-class physics department. We brought in high-caliber scholars and researchers with diverse expertise to enrich our curriculum and scientific innovations, with a strong focus on the development of cutting-edge technologies such as new materials, artificial intelligence, big data and optoelectronics. Over the years, AP has nurtured talents with fundamental and applied scientific knowledge, skills, and innovative mindset. Our graduates are welcomed by employers and have made significantly contributions to the industries and the community. We achieved remarkable results in various university rankings.

5 Major Research Area

- Nanomaterials & Micro/Nanoelectronics
- Machine Learning & Computational Physics
- Green Energy & Carbon Neutrality
- Photonics, Plasmonics & Optoelectronics
- Quantum Physics & Devices

Impactful Research

AP is dedicated to advancing the field of microelectronics through innovative research and education. A notable example of our research excellence is the groundbreaking work in two-dimensional (2D) ferroelectrics led by Prof. Jiong Zhao and Prof. Ming Yang. They have developed a pioneering method for the large-scale synthesis of 2D ferroelectric materials, significantly advancing technologies in microelectronics, artificial intelligence, and quantum information. Another major achievement comes from Prof. Kian Ping Loh, Prof. Kathy Leng, and Prof. Jun Yin, who successfully synthesized all-organic 2D perovskites—an important milestone for emerging 2D electronic devices. Prof. Yang Chai has spearheaded innovation in in-sensor computing for machine vision using 2D materials, while Prof. Daniel Lau has discovered ferroelectricity in untwisted heterobilayers of 2D transition metal dichalcogenides. In parallel, Prof. Jianhua Hao has achieved large-scale growth of few-layer 2D black phosphorus and demonstrated high-performance field-effect transistor arrays. Meanwhile, Prof. Songhua Cai has led advancements in the synthesis and application of new structures of perovskite solar cells. Together, these breakthroughs open new avenues for transformative applications in next-generation 2D electronics.

Research and Innovation

AP is well-equipped with more than 30 world-class research laboratories for teaching and research purpose, including a joint AI laboratory with Huawei, University Research Facility in Materials Characterization and Device Fabrication, as well as Cleanroom facilities. Our researchers are also actively involved in industrial collaborations and consultancy projects, contributing to the technological development locally, regionally and internationally.

Master of Science in Microelectronics Technology & Materials Programme Objective:

The MSc programme is designed to nurture high-calibre talents with knowledge and hands-on skills to contribute to the booming integrated circuits industry's development.

Based on the expertise of the Department of Applied Physics in device physics and materials science research, the one-year programme provides students with unique and professional-oriented education in the process flow of microelectronics and integrated circuit design, simulation, fabrication and processing, characterization, and inspection.

Programme code: 11044	Mode of Study: 1-year full time	Credit requirement: 31	Tuition fee: HK\$ 228,000
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Learning Outcomes

Professional Competence

Possess knowledge and skills in microelectronics technology and materials, and be able to apply their knowledge and contribute to professional leadership.

Lifelong Learning Capability

An enhanced capability for continual professional development through inquiry and reflection on professional practice.

Versatile Problem Solvers

- Think holistically and analytically in dealing with complex problems and situations.
- A good mastery of critical and creative thinking skills, and can generate practical and innovative solutions.

Subject List

Total 31 credits require for graduation. (3 credits for each subject, except Academic Integrity and Ethics in Science)

Compulsory subjects (19 credits)

- Advanced Materials Analysis and Characterization
- Integrated Circuits Design
- Integrated Circuit Processing and Laboratory
- Semiconductor Devices and Systems
- Semiconductor Materials and Processing
- Statistics and Data Analytics
- Academic Integrity and Ethics in Science

Elective Subjects (12 credits)

- Artificial Intelligence for Materials Science
- Elective project (6 credits)
- Emerging Memory Technologies
- Machine Vision for Semiconductor Manufacturing and Inspections
- MEMS (microelectromechanical systems) and Sensors
- Microelectronics Packaging and Reliability
- Thin Film Materials and Preparation Technologies

Admission Requirements

- A Bachelor's degree with honours in science, engineering or equivalent qualifications
- Fulfill the English language requirements of PolyU postgraduate programme
- Preference will be given to applicants with relevant work experience in microelectronics industries.