Annual Report 2019 / 2020

Department of Mechanical Engineering

The Hong Kong Polytechnic University

Hung Hom, Kowloon, Hong Kong

website: www.polyu.edu.hk/me

The Hong Kong Polytechnic University

Department of Mechanical Engineering

THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

DEPARTMENT OF MECHANICAL ENGINEERING
機械工程學系

Department of MECHANICAL ENGINEERING

Annual Report 2019-2020

ANNUAL REPORT

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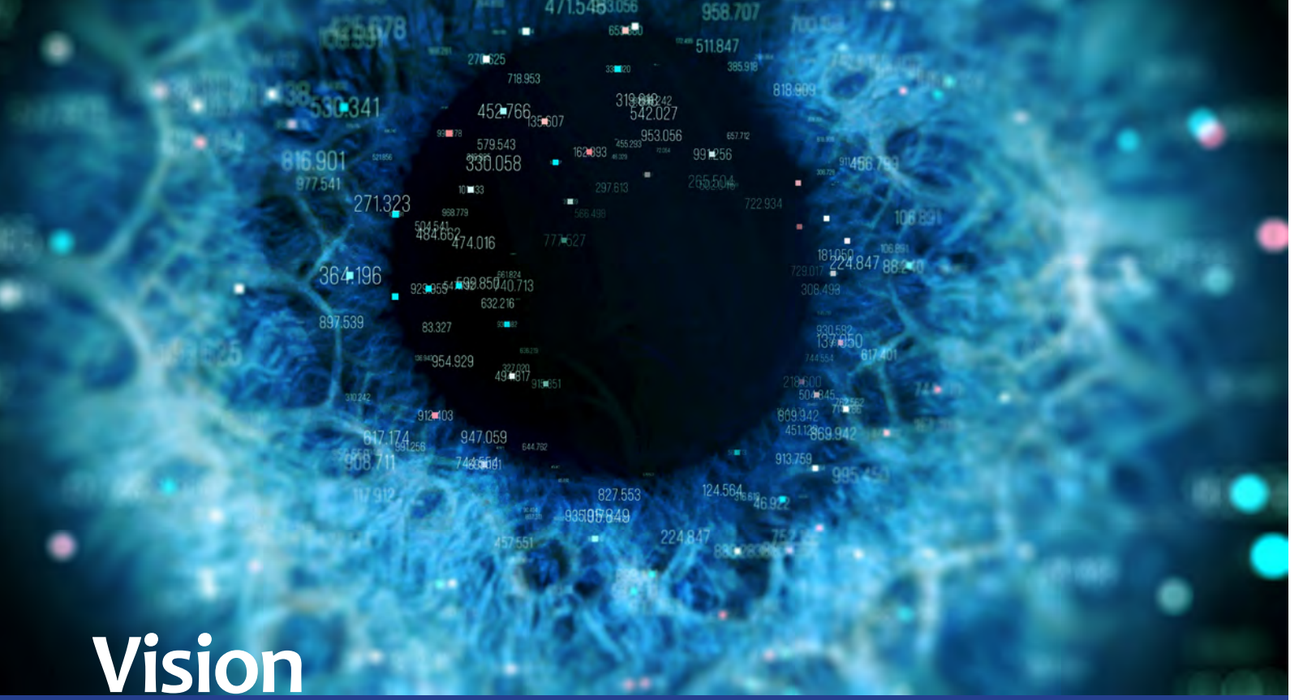
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Contents



Vision

To achieve excellence in education and research in the discipline of mechanical engineering with global outreach and impact.

Mission

To train future leaders, with creativity, broad vision, global outlook, and professional ethics for industry, academia, government and communities, who have sound knowledge in mechanical engineering with effective communication, analytical, and problem-solving skills.

To create knowledge and technologies through fundamental research and its applications in mechanical engineering to serve societal needs.

Department of Mechanical Engineering

As one of the founding departments of The Hong Kong Polytechnic University since 1937, the Department of Mechanical Engineering has been the forerunner of the vast evolvement of its field. Over the years, the Department has pioneered the rapid development in the following research areas:

- Advanced Materials and Processing
- Aerospace Engineering
- Clean Energy and Energy Storage
- Robotics and Control
- Sound and Vibration
- Thermofluids and Combustion

Enhancing and maintaining excellent teaching quality has always been the major goal of the Department. With the elite teaching team, students will gain professionally recognized qualifications at different levels from the training of programmes offering by the Department, including Doctorates, Master Degrees, and Bachelor Degrees in Mechanical Engineering, and Product Analysis and Engineering Design.

Strategically emphasize on applied research, the Department firmly believes that research is an integral part of academic life. It informs teaching and advances the frontiers of knowledge and technology. The Department's efforts in research contribute to lifting the competitiveness of industry and to provide possible solutions towards a better living in Hong Kong and in the world.

The Department is famous for its international focus and actively encourages collaborations with overseas institutions. To foster international collaboration, the Department has been very active in inviting internationally well-known academic figures to participate as guest lecturers and in organizing international conferences. The Department has also published numerous research reports on world-renowned publications. The Department facilitates international exchange programmes for students through a strong network with various partner institutions all over the world and provides a platform for students to acquire global horizons and invaluable experiences in their university lives.

Major Laboratories

Acoustic Laboratory
Acoustic Wind Tunnel Laboratory
Advanced Materials for Energy Conversion and Storage Laboratory
Aeronautical Laboratory
Anechoic Chamber
Biological Mechanics and Materials Laboratory
Computational Aeroacoustics Structural Interaction Laboratory
Corrosion and Surface Technology Laboratory
Design Analysis Centre
Dynamics Laboratory
Fluid Mechanics Laboratory
Fundamental Combustion Research Laboratory
Heat Transfer and Combustion Laboratory
Materials and Mechanics Technology Laboratory
Measurement and Control Laboratory
Micro Air Venicle Laboratory
Nano- and Micro-Mechanics Laboratory
Nanoscale Energy Conversion Devices and Physics Laboratory
Nano Fiber Fabrication Laboratory
Product Testing and Analysis Centre
Project Laboratory
Smart Structures and Products Laboratory
Thermal Science Laboratory
Thermodynamics Laboratory
Undergraduate Computing Laboratory
Water Tunnel Laboratory
Wind Tunnel Laboratory

Head's Message

The Department of Mechanical Engineering is committed to providing a comprehensive and enjoyable learning experience for our students and a harmonic and stimulating environment for our faculty members to excel in their discovery and innovation. Underlying this mission is a prolonged effort to engage in education need and research growth. This report highlights a few of the many accomplishments of our faculty members and students in teaching and learning, and research over the academic year of 2019/20 under the unprecedented difficulties such as campus riots occupation in later 2019 and COVID-19 pandemic in 2020.

Teaching and Learning

The Department established a new educational initiative – the Cooperative Education (Co-op) option – in the revised curriculum of her BEng (Hons) in Product Analysis and Engineering Design (PAED) programme. The initiative aims to help PAED students master key PAED knowledge in engineering analysis, design and business through real-world experiential learning in professional setting. The option is facilitated through an internship covering summer weeks before final year PAED study and the subsequent semester-long PAED capstone project. We are thrilled that the first Co-op option was launched successfully in 2020. ME greatly appreciates the keen support gained from a number of participating industrial partners, namely Jardine Engineering Corporation, Dongguan Hong Da Electric Products Co. Ltd. – Miele DG, Panasonic Life Solutions (Hong Kong) Co., Ltd., Raymond Industrial Ltd., Time Medical Limited, The Hong Kong and China Gas Company Limited (Towngas), Wilson Acoustics Limited, etc. The Department also revamped her BEng (Hons) in Mechanical Engineering (ME) programme to provide 4 clusters of study in Aerospace Engineering, Robotics & Autonomous Systems, Environmental & Energy Engineering, and Mechanics & Materials.

While we are having more co-op relationships with industrial entities and engaging in more product development trial projects for the students, we need resources to gear up our students before setting off on the Co-op working. The department is very grateful to have received a generous donation of HK$1.5 million from Philip K. H. Wong Foundation for supporting the Co-op initiative.

Research and Consultancy

Our relentless efforts have retained the highest quality in a tremendous profound research outputs including journal/ conference articles, books /book chapters and patents. Many of our research papers have been constantly cited and selected as featured highlights in prestigious international journals. Dr Jie Zhu's research team revealing important physical phenomenon in acoustics was published in high impact journal "Nature Physics". Dr Peng Zhang's research team discovering universality of droplet coalescence published in "PNAS" (Proceedings of National Academy of Sciences).

Our research reputation is further evidenced by the success in securing a number of highly competitive research grants. In the 2020/2021 results of grants from the Research Grants Council's General Research Fund (GRF) announced in June 2020, ME's success rate for the GRF was 36% in 2020/21 exercise. Eight of our GRF proposals were funded. Moreover, we have attained other external competitive funding e.g. Innovation and Technology Fund (ITF), National Science Foundation of China (NSFC), and RGC-NSFC Joint Research Scheme (JRS). The total external fund secured by the Department in 2019/2020 was over HK$27 million. Amongst them, Dr RUAN Haihui was awarded the prestigious RGC-NSFC Joint Research Scheme funding of over HK1.1 million. Prof. CHEN Guohua was funded over HK$3.3 million by the China Projects 深圳市科技計劃 - 深港創新圈 . Dr JING Xingjian secured a funding over HK$3.6 million from ITF. Dr ZHENG Guangping was funded over HK$3.8 million by the China Projects 先進能源科學與技術廣東省實驗室佛山分中心暨佛山仙湖實驗室開放基金重大 / 重點項目 .

We continued to be recognized for our dedicated work as a partner with other institutions in the education, private and public sectors. Our research teams in a wide spectrum continued to build valuable links in Hong Kong, mainland China and overseas via consultancy work, industry collaborations and research collaborations, to further our goals in knowledge transfer.

Accomplishments and Highlights

In this academic year, our students and staff were awarded in various national and international competitions. Dr Dawei Zhang, a PhD graduate, won the Young Investigator Award in the 11th Asia-Pacific Conference on Combustion held in Sydney, Australia. A PhD student Omar Zahra awarded in the Best Student Poster in the prestigious 20th TAROS (Towards Autonomous Robotic Systems) Conference in Queen Mary University of London. Two ME PhD students Liang Yu and Liu Lili won the Student Competition Awards in the 32nd International Symposium on Shock Waves (ISSW32) held in National University of Singapore. A PhD student Quankun Li received the 14th HKIE Outstanding Paper Award for Young Engineers/ Researchers. A MPhil student Man Ho TSOI was elected to be the awardee of IEEE MTT-S Undergraduate/Pre-graduate Scholarship 2020. A team of undergraduate students won the 2nd Runner-up in the 2019 American Society of Mechanical Engineers (ASME) Student Design Competition Finals held in USA. A year 3 undergraduate student JIANG Jiacong won the CIC award in the HKIE-Safety Specialist Committee Student Project Competition.

Prof. Li Cheng was awarded the 2019 Second Prize of the Science and Technology Progress Award by the People's Government of Guangdong Province, China. The prestigious prize is the fruit of long-term collaboration that Prof. Cheng and his team have been undertaking with Midea Ltd, the largest domestic product company in China. According to the company's report, the MPP-based technology has been successfully implemented in a total of 1.6 million Midea's domestic products, which has up to now secured a net additional income amounting to 1.93 billion RMB.

Prof. Wallace Leung Woon-Fong has transferred nanofiber technology to develop highly protective facemasks. Avalon Nano-Biotech (HK) Limited provided a donation of 3 million HK dollars to support Prof. Leung in further developing and commercializing advanced air filtration nanofiber technologies to capture airborne pollutants and viruses. This is especially vital during the current COVID-19 pandemic.

Looking Ahead

The new academic year comes with opportunities and challenges. While many challenges remain, the opportunities seem equally bright.

Looking ahead, we will continue to capitalize on our strengths in teaching, research, knowledge transfer and service to the community.

Prof. SQ SHI

Head
Department of Mechanical Engineering

Our People

Our professional and passionate staff members, under the support from Departmental Advisory Committee and Academic Advisors, play a vital role in the substantial contributions made both individually and collectively towards the continuous development of the Department, the University and the community.

Department Structure

Advisory Committee — **Head of Department** — **Academic Advisor**

Departmental Committees

- Departmental Staffing Committee
- Departmental Management Committee
- Departmental Research Committee
- Departmental Learning and Teaching Committee
- Departmental Learning Outcomes Assessment Committee
- Departmental Publicity Committee
- Space Allocation Committee
- Programme Committees
  - Departmental Undergraduate Programmes Committee
  - Departmental Postgraduate Programmes Committee
  - MSc in ME Award Committee
- Work-Integrated-Education Committee
- Departmental Health and Safety Committee

Research Centres/ Consortiums

- Research Centre for Fluid-Structure Interactions
- Consortium for Advanced Materials Research
- Consortium for Combustion and Pollution Control
- Consortium for Sound and Vibration Research

Discipline Areas

- Control, Acoustics and Dynamics
- Materials and Solid Mechanics
- Thermofluids and Combustion

Support Groups

- Administrative Support
- Technical Support

Advisory Committee

Chairman

Ir Dr Angus HW Cheung
Chief Executive Officer
Aerovision Technology Limited

Ex-officio Members

Prof SQ Shi
Chair Professor & Head
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Prof HC Man
Dean
Faculty of Engineering
The Hong Kong Polytechnic University

Members

Mr Richard CW Chan, JP
Assistant Director
Engineering Services Branch 3
Electrical & Mechanical Services Department, HKSAR

Mr Chan Hing Keung
Deputy General Manager - Train Services & Systems Engineering
MTR Corporation Limited

Ir Chris KC Cheung
Chief Operating Officer - China
CLP Power Hong Kong Limited

Mr Dave TY Ho, JP
Assistant Director (Air Policy)
Environmental Protection Department, HKSAR

Mr Edmond Lai
Chief Digital Officer
Hong Kong Productivity Council

Dr MY Li
Assistant Professor
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Mr Banting WP Sze
Chairman and Chief Executive Officer
Freetech Road Recycling Technology (Holdings) Limited

Prof ZQ Su
Professor & Associate Head
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Dr GP Zheng
Associate Professor
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Overseas Members

Prof Bing Li
Professor
Dean of School of Mechanical Engineering and Automation
Harbin Institute of Technology, Shenzhen

Dr Chengmao Xu
President of the Corporate Research Center
Midea Group

Prof Vigor Yang
Regents Professor
Daniel Guggenheim School of Aerospace Engineering
College of Engineering
Georgia Institute of Technology

Student Representatives

Mr Chan Yan Kit Jeffrey
Full-time BEng Student
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Mr Andre Eccel Vellwock
Full-time PhD Student
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Secretary

Ms Lily Tam
Senior Executive Officer
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Assistant Secretary

Ms Joanne Cheng
Executive Officer
Department of Mechanical Engineering
The Hong Kong Polytechnic University

Academic Advisor

Departmental Academic Advisor

Prof. Teik C. Lim
Provost and Vice President for Academic Affairs
University of Texas at Arlington

Departmental Committee Chairman

	Chairman
Departmental Staffing Committee	Prof. SQ Shi
Departmental Management Committee	Prof. SQ Shi
Departmental Research Committee	Dr H Tang
Departmental Learning and Teaching Committee	Prof. ZQ Su
Departmental Learning Outcomes Assessment Committee	Prof. ZQ Su
Departmental Publicity Committee	Dr YS Choy
Space Allocation Committee	Prof. SQ Shi
Programme Committees	
• Departmental Undergraduate Programmes Committee	Prof. ZQ Su
• Departmental Postgraduate Programmes Committee	Dr P Zhang
• MSc in ME Award Committee	Dr P Zhang
Work-Integrated-Education Committee	Prof. TL Chan
Departmental Health and Safety Committee	Dr Curtis Ng

Research Centre/ Consortium Director

	Director
Research Centre for Fluid-Structure Interactions	Dr H Tang
Consortium for Advanced Materials Research	Prof. MW Fu
Consortium for Combustion and Pollution Control	Prof. TL Chan
Consortium for Sound and Vibration Research	Prof. L Cheng

Discipline Areas Group Leader

	Group Leader
Control, Acoustics and Dynamics	Prof. L Cheng
Materials and Solid Mechanics	Prof. MW Fu
Thermofluids and Combustion	Prof. TL Chan

Academic Staff (as at 30 June 2020)

Head and Chair Professor of Mechanical Engineering

SHI Sanqiang (Prof.) 石三強教授 *BSc; MSc (USTB, China); PhD (McMaster); MHKSTAM; MMRS; MTMS; FHKIE*	Metallic materials; Nuclear materials; Nanotechnology; Environmental degradation of materials; Computational materials design and modeling

Emeritus Professor

SO Ming Cho Ronald (Prof.) 蘇銘祖教授 *BSc(Hons); MEng; MA; PhD; DSc; Hon DEng; FWIF; FIMechE; FASME; MIAA; FRAeS; FAIAA*	Turbulence modeling; Fluid-structure interaction; Flow-induced vibration; Direct aeroacoustics simulation; Lattice Boltzmann-type equation
TONG Timothy W. (Prof.) 唐偉章教授 *BSc; MSc; PhD; FASME; FHKEng; JP*	High performance computing of radiative heat transfer; Heat transfer in porous media; Energy conservation; Thermal insulation systems; Thermal control of aerospace systems; Thermal radiation; Heat transfer in fuel cells

Otto Poon Charitable Foundation Professor in Smart and Sustainable Energy, and Chair Professor of Energy Conversion and Storage

CHEN Guohua (Prof.) 陳國華教授 *B.Eng. (Dalian University of Technology), M.Eng.; PhD (McGill), FHKIE, Fellow AIChE*	Advanced electrode materials for energy storage; electrochemical technologies for energy and environmental applications; drying of high value products

Chair Professor of Mechanical Engineering

CHENG Li (Prof.) 成利教授 *BSc (Xi'an Jiaotong Univ.); DEA; Ph.D. (INSA, Lyon, France); FASA; FASC; FHKIE; FHKIOA; FIIAV; FIMechE*	Noise and vibration control; Fluid-structure interaction; Damage detection and smart material/structure/products

Visiting Chair Professor of Advanced Materials for Clean Energy under the Distinguished Chair Professor Scheme

CHEN Zhongwei (Prof.) *PhD; MSChE; BS*	Nanostructured Materials; Electrochemistry; Electro-catalysis; Fuel cells; Zinc-air batteries, Lithium-sulfur batteries; Lithium-ion batteries; Solid electrolyte batteries; Aqueous flow batteries; Electrochemical Sensors

Visiting Chair Professor of Mechanical Engineering under the Distinguished Chair Professor Scheme

ZHANG Tongyi (Prof.) 張統一教授 *Master (USTB); PhD (USTB)*	Materials science and engineering, and solid mechanics

Distinguished Honorary Professor of Materials Science and Engineering

XU Qiang (Dr) *Ph.D. (Osaka University); FRSC; Member of European Academy of Sciences (EURASC)*	Materials chemistry; Energy storage and conversion; Porous materials (MOFs, carbons, etc); Nanoparticles; Catalysis; Fuel cells; Batteries; Supercapacitors; Hydrogen generation and storage

Associate Head and Professor

SU Zhongqing (Prof.) 蘇眾慶教授 *BSc (BUAA); MEng (BUAA); PhD (Syd.,)*	Structural Health Monitoring (SHM); Wave Propagation; Sensors and Sensor Network; Non-destructive Evaluation (NDE); Smart Materials and Structures; Advanced Composite Materials

Associate Head and Associate Professor

TANG Hui (Dr) 唐輝博士 *BEng(Tsinghua); MEng (Tsinghua); PhD (Manchester)*	Aerodynamics; Hydrodynamics; Active flow control; Fluid-structure Interaction; Multiphase flow

Professor

CHAN Tat Leung (Prof.) 陳達良教授 *BSME; MSME; PhD; Ir; Eur Ing; CEng; RPE; FASME; FHKIE; FIMechE; FSAE*	Multiphase and multi-component complex systems with micro- and nanoscale; Aerosol science & technology; Transport and formation of nano/microparticles and gaseous pollutants; Combustion & emissions formation; On-road vehicle emission measurement, control and modelling techniques; Thermal-fluids science & engineering.
FU Mingwang (Prof.) 傅銘旺教授 *BEng; MEng (Xi'an Northwestern PolyU); PhD (National Univ. of Singapore)*	Product design and development; CAD and CAE; Manufacturing technologies; Nano-processing of bulk materials and micro-realization of micro product/systems
WEN Chih-Yung (Prof.) 溫志湧教授 *BEng (National Taiwan University); MSc (Caltech, U.S.A.); PhD (Caltech, U.S.A.); AFAIAA; FHKIE*	Aerodynamics of hypersonic vehicles; Supersonic combustion; Active flow control; Magnetic fluid flows; Fuel cell technologies

Associate Professor

CHOY Yat Sze (Dr) 蔡逸思博士 *BEng; PhD (HK PolyU); MIOA*	Sound induced vibration; Duct noise control; Building and room acoustics; Environmental noise measurement and control; Aeroacoustics; Sound Sources identification; Sound quality of product and its assessment; Soundscape study, planning and design
JING Xingjian (Dr) 景興建博士 *Bsci (Zhejiang); MPhil & PhD (CAS); PhD (Sheffield)*	Frequency domain methods for nonlinear systems; Nonlinear system identification and signal processing; Nonlinear sound and vibration control; Robotic systems—Analysis, Design & Control; Robust learning/ control methods; Intelligent computing and optimization
LEUNG Chi Kin Randolph (Dr) 梁志堅博士 *PhD; Senior MAIAA; MASME; MIED; MIOA; MHKIE; MHKIOA*	Computational aeroacoustics and gas dynamics; Wind turbine aerodynamics; Flow-induced sound and structural vibration; Aviation science; HVAC compressor and system design; Product sound and vibration quality

LIU Yang (Dr) 劉陽博士 *BSc(USTC); MEng(BUCT); PhD(Syd.); MHKIE*	Biomechanics; CFD; Flow-induced vibration and thermal management
WONG Wai On (Dr) 黃偉安博士 *BEng; MSc; PhD (HK PolyU); MIMechE; CEng; MHKIE*	Laser diagnostics; Structural dynamics; Signal processing
YAO Haimin (Dr) 姚海民博士 *BEng, MEng (Tsinghua); Dr.rer.nat.(Universitat Stuttgart)*	Solid Mechanics (specialized in Fracture Mechanics and Contact Mechanics); Bio-inspired Mechanics and Materials; Advanced Energy Materials; Nanomechanics
ZHANG Peng (Dr) 張鵬博士 *BSc (USTC); MSc (IMCAS); PhD (Princeton)*	Theoretical and numerical combustion; Chemical kinetics; Droplet and spray dynamics; Rarefied gas dynamics
ZHENG Guangping (Dr) 鄭廣平博士 *BBS., MS. (Sun Yat-sen); Ph.D. (Johns Hopkins)*	Computational materials science; Mechanical properties of nanomaterials; Applications of nanomaterials in energy conversion and storage
ZHU Jie (Dr) 祝捷博士 *BSc, MSc (Nanjing); PhD (Pennsylvania State)*	Structured acoustic materials and metamaterials; Acoustic imaging technology and system; Piezoelectric material and acoustic transducers; Experimental acoustics

Assistant Professor

AN Liang (Dr) 安亮博士 *PhD (HKUST)*	Thermofluid; Energy conversion and storage technologies; Advanced materials
CHU Kar Hang Henry (Dr) 朱嘉行博士 *BASc (Waterloo); MASc and PhD (Toronto)*	Robotic manipulation; Vision-based control and automation; Micro-system design and Tissue engineering
JIAO Zengbao (Dr) 焦增寶博士 *BSc (CUGB), MEng (USTB); PhD (CityU)*	Advanced structural materials; High-temperature and high-strength alloys; Nanostructured alloys; Mechanical properties; 3D atom probe tomography
David NAVARRO-ALARCON (Dr) 毛大衛博士 *PhD (CUHK)*	Robotics
RUAN Haihui (Dr) 阮海輝博士 *PhD (HKUST)*	Solid Mechanics; Plasticity; Constitutive modeling; Amorphous Materials; Nanomaterials; Impact; Collision and Crashworthiness

Research Assistant Professor

LIU Qiang (Dr) 劉強博士 *PhD (HKUST)*	Conformal polymer coating, polymer chemical vapor deposition, conducting polymers, energy-storage materials, lithium-ion batteries
LIU Tuo (Dr) 劉拓博士 *PhD (HK PolyU)*	Physical acoustics, Acoustic metamaterials, Non-Hermitian acoustics

Senior Teaching Fellow

TAM Wai Yin Eunice (Dr) 譚慧賢博士 *BEng (HK PolyU); MEng (HK PolyU); PhD (UNO)*	Composite and application; Composite manufacturing; Nanocomposite (carbon nanotube/polymer) structure

Teaching Fellow

Anand VYAS (Dr) 阿倫韋華斯博士 *BSc; MSc (R.D.V, India); MPhil (HKU); PhD (CityU HK)*	Thin film; Nanomaterials materials; Materials characterization; Hard multilayer coatings and their mechanical & tribological properties; High temperature superconductivity

Senior Instructor

TANG Wai Fong Elsa (Ir) 鄧慧芳工程師 *MSc (HKU); MSc (Liverpool); BEng (Liverpool); MHKIE, CEng, MIMechE*	Computer aided design; Computer aided engineering; Product design and management; Basic scientific computing; Supply chain management

Administrative Support Staff

TAM Man Yee, Lily (Ms)	Leader, Senior Executive Officer
CHO Sau Yung, Karen (Ms)	Assistant Marketing Manager
CHENG Sze Ting, Joanne (Ms)	Executive Officer
YUEN Man Hei, Hilary (Miss)	Assistant Officer
LEUNG Lap Pun, Eric (Mr)	Executive Assistant
CHAN Bik Ki, Packy (Ms)	Clerical Officer II
LAI CHAN Sin Fan, Michelle (Mrs)	Clerical Officer II
NGAI Oi Ling, Irene (Miss)	Clerical Officer II
WONG Sin Hing, Merlin (Ms)	Clerical Officer II
WONG Kam Yan (Ms)	Clerk

Technical Support Staff

NG Chun, Curtis (Ir Dr)	Leader, Senior Technical Officer
CHAN Hau Tsang, Raymond (Mr)	Scientific Officer II
LEUNG Chi Kuen, Benny (Mr)	Technical Officer
NG Chun Hung, Stephen (Dr)	Technical Officer
TSANG Kwong Shing (Mr)	Technical Officer
WONG Kwok Wai (Mr)	Technical Officer
YUEN Ka On (Mr)	Technical Officer
TANG Kam Keung (Mr)	Technician
TSE Kwai Wa (Mr)	Assistant Scientific Officer
CHAN Cho Yan (Mr)	Assistant Technical Officer
MAN Ka Fung (Mr)	Assistant Technical Officer
YAN Chiu Hang (Mr)	Assistant Technical Officer

Staff Movement (1 July 2019 – 30 Jun 2020)

Concurrent Appointment
Prof. CY Wen was appointed as Interim Head, Interdisciplinary Division of Aeronautical and Aviation Engineering
Dr H Tang was appointed as Associate Head

Promotion
Dr Eunice Tam was promoted to Senior Teaching Fellow

New Appointment
Dr Q Liu, Research Assistant Professor
Dr T Liu, Research Assistant Professor

Retirement
Prof. Wallace Leung, Chair Professor
Prof. CS Cheung, Professor
Mr WC Woo, Senior Artisan

Staff Departure
Prof. LM Zhou, Professor

Research Personnel

Senior Research Fellow (Full-time)

CHEN Shuo (Dr) 陈硕	PhD, Xi'an Jiaotong Univ, China

Research Fellow (Full-time)

HU Jun (Dr) 胡军	PhD, Univ of Sci & Tech of China, China
LAM Chi Yan Garret (Dr) 林志欣	PhD, The Hong Kong Polytechnic Univ, HK
LIU Shuyuan (Dr) 劉殊遠	PhD, The Hong Kong Polytechnic Univ, HK
LIU Yang (Dr) 刘洋	PhD, Dalian Univ of Tech, China
QIN Xusong (Dr) 覃旭松	PhD, The Hong Kong Univ of Sci and Tech, HK
YU Yaoguang (Dr) 于耀光	PhD, Harbin Inst of Tech, China

Postdoctoral Fellow (Full-time)

BAI Zhaowen (Dr) 白肇文	PhD, The Hong Kong Univ of Sci and Tech, HK
CHENG Junye (Dr) 程俊業	PhD, City Univ of Hong Kong, HK
DONG Haowen (Dr) 董浩文	PhD, Beijing Jiaotong Univ, China
GAO Pengfei (Dr) 高鹏飞	PhD, Northwestern Polytechnical Univ, China
HAN Zhuo (Dr) 韩卓	PhD, Univ of Shanghai for Sci & Tech, China
HAO Jiaao (Dr.) 郝佳傲	PhD, Beihang Univ, China
LIU Tuo (Dr) 劉拓	PhD, The Hong Kong Polytechnic Univ, HK
LIU Yu (Dr) 刘宇	PhD, Central South Univ, China
QIN Xianying (Dr) 秦显营	PhD, Donghua Univ, China
REN Feng (Dr) 任峰	PhD, Northwestern Polytechnical Univ, China
WANG Kai (Dr) 王凯	PhD, The Hong Kong Polytechnic Univ, HK
WANG Zhibo (Dr) 王志博	PhD, The Hong Kong Polytechnic Univ, HK
XIE Dan (Dr) 谢丹	PhD, Northwestern Polytechnical Univ, China
XU Wei (Dr) 徐伟	PhD, Northwestern Polytechnical Univ, China
ZHANG Fei (Dr) 张菲	PhD, Dalian Univ of Tech, China
ZHU Jiaming (Dr) 朱家明	PhD, The Hong Kong Univ of Sci and Tech, HK
ZHU Yanan (Dr) 朱亚楠	PhD, Univ of Chinese Academy of Sciences, China

Postdoctoral Fellow (Part-time)

LIU Qiang (Dr) 刘強	PhD, The Hong Kong Univ of Sci and Tech, HK

Research Associate (Full-time)

ANSARI, Talha Qasim (Dr)	PhD, The Hong Kong Polytechnic Univ, HK
DING Zhiyi (Dr) 丁志义	PhD, Univ of Sci & Tech Beijing, China
FAN Ka Heng (Dr) 范嘉興	PhD, The Hong Kong Polytechnic Univ, HK
GAO Chuanqiang (Dr) 高传强	PhD, Northwestern Polytechnical Univ, China
GAO Yao (Dr) 高尧	PhD, The Hong Kong Univ of Sci and Tech, HK
GU Zhongming (Dr) 顾仲明	PhD, Nanjing Univ, China
LI Kaikai (Dr) 李鍇鍇	PhD, The Hong Kong Univ of Sci and Tech, HK
LI Qian (Dr) 李倩	PhD, Tongji Univ, China
LIN Chen (Dr) 林晨	PhD, Xi'an Jiaotong Univ, China
LIU Wenbo (Dr) 劉文博	PhD, Sichuan Univ, China
LU Bo (Dr) 陸波	PhD, The Hong Kong Polytechnic Univ, HK
SHAN Shengbo (Dr) 单胜博	PhD, The Hong Kong Polytechnic Univ, HK
Tian Wenlong (Dr) 田文龙	Doctor, Northwestern Polytechnical Univ, China
TANG Xuefeng (Dr) 唐学峰	PhD, Univ of Sci & Tech Beijing, China
YANG Bin (Dr) 杨斌	PhD, Harbin Engg Univ, China
YIN Sha (Dr) 殷莎	PhD, Harbin Inst of Tech, China
ZHANG Menghua (Dr) 张梦华	PhD, Shandong Univ, China

Research Assistant (Full-time)

CAI Zhongyang (Dr) 蔡正阳	PhD, Beihang Univ, China
CAO Yupeng (Dr) 曹宇鹏	PhD, Jiangsu Univ, China
CHEN Huiqiang 陈辉强	MSc, Zhejiang Univ, China
FANG Jieyichen 方洁怡晨	MSc, The Hong Kong Polytechnic Univ, HK
FU Jin 傅进	MEng, Northestern Polytechnical Univ, China
GAO Chuanqiang (Dr) 高传强	PhD, Northwestern Polytechnical Univ, China
GOMEZ DOMINGUEZ, Domingo	Bachelor, Escuela Tecnica Superior de Ingenieria, Spain
HU Luyin 胡鲁印	BEng, The Hong Kong Polytechnic Univ, HK
HU Zhongyu (Dr) 胡中雨	PhD, The Hong Kong Polytechnic Univ, HK
JIANG Guoqing (Dr) 蒋国庆	PhD, Beijing Univ of Tech, China
JIANG Yazhong (Dr) 姜亞中	PhD, Beihang Univ, China
LAM Kah Cheng 林嘉政	BEng, The Hong Kong Polytechnic Univ, HK
LEI Yuanpeng 雷源鹏	Master, Chongqing Univ, China
LI Yehai (Dr) 李葉海	PhD, The Hong Kong Polytechnic Univ, HK
LI Yun (Dr) 李云	PhD, The Hong Kong Polytechnic Univ, HK
LI Zhengchao (Dr) 李正超	PhD, The Hong Kong Polytechnic Univ, HK
LIANG Yu 梁煜	Bachelor, Shandong Univ, China
LIU Jinan 刘津安	MSc, The Hong Kong Polytechnic Univ, HK
LIU Yang 刘洋	Master, Harbin Engineering Univ, China
LO Wing Chong 盧穎昶	MSc, The Hong Kong Polytechnic Univ, HK
LUO Jiannan (Dr) 罗建南	PhD, Univ of Bristol, UK
NG Kwok Leung 吳國良	BSc, CityU of HK, HK
NIU Mengchao 牛梦超	BS, Northeastern Univ, China
PAN Shaopeng (Dr) 潘少鹏	PhD, Shandong Univ, China
PENG Rui 彭锐	Master, Wuhan Univ, China
QIN Mengxiao 秦梦晓	Bachelor, Xi'an Jiaotong Univ, China
SUN Xiaofeng (Dr) 孙晓峰	PhD, Northeast Petroleum Univ, China
TAI Junfei 邰俊飞	BEng, Nanjing U of Aeronautics and Astronautics, China
WEI Anran 危安然	MSc, Shanghai Jiaotong Univ, China
WONG Sing Long 黃升朗	BEng, CityU of HK, HK
XUE Xiaopeng (Dr) 薛晓鹏	PhD, Nagoya Univ, Japan
ZENG Li (Dr) 曾立	PhD, Chinese Academy of Sciences, China
ZHANG Hao (Dr) 張浩	PhD, The Hong Kong Polytechnic Univ, HK
ZHANG Mao (Dr) 張茂	PhD, Huazhong Univ of Sci & Tech, China
ZHAO Rui (Dr) 趙瑞	PhD, Beihang Univ, China
ZHENG Xiucheng (Dr) 鄭修成	PhD, Nankai Univ, China
ZHOU Qi 周齐	BEng, Shenyang Aerospace Univ, China

Research Assistant (Part-time)

CHOI Ka Yuk 蔡家鈺	Bachelor, The Hong Kong Polytechnic Univ, HK
CHOW Man Kiu 周文翹	BEng, The Hong Kong Univ of Sci and Tech, HK
JIANG Bailun 姜百倫	BEng, The Hong Kong Polytechnic Univ, HK
YU Ho Man 余浩文	BEng, The Hong Kong Polytechnic Univ, HK

Project Assistant (Part-time)

BAI Jiafeng 白佳峰	Master, The Education Univ of HK, HK
KWOK Siu Lun 郭肇麟	Master, The Hong Kong Polytechnic Univ, HK
YIN, Jason Dean-chen 尹定晟	Master, The Education Univ of HK, HK

Intern (Full-time)

AL-RAMIDHI Muhannad Nasser Mohammed Hammed	Student, Sultan Qaboos Univ, Omani
HODGSON Ethan Mark	Student, Queen's Univ Belfast, UK
KOSTOV Stephan Roumenov	Student, Univ of Strathclyde, UK
MOMIROVSKI Marin	Student, Univ of St. Cyril and Methodius, Skopje
PREMKUMAR Manjunath Anand	Student, Techinical Univ of Kosice, Slovakia
SKORUPKA Katarzyna Zofia (Ms)	Student, Wroclaw Univ of Sci and Tech Poland

PhD Student (Full-time)

AI Chunhui 艾春晖	MSc, Shanghai Jiaotong Univ, China
AKHTAR Awais	MSc, Dalian University of Technology, China
AN Shuowei 安烁威	MEng, Harbin Engineering University, China
ANSARI Talha Qasim	MEng, North China Electric Power Univ, China
ARIF Muhammad Irsalan	MSc, Air Univ, Pakistan
BIAN Jing 边菁	MEng, Tongji Univ, China
CHEN Long 陳龙	MSc, The Hong Kong Polytechnic Univ, HK
CHEN Shengyang 陈晟洋	Master, Universitat Siegen, Germany
CHI Tianxi 迟天玺	MSc, Univ of Sheffield, UK
CHI Yicheng 池奕承	MEng, The Hong Kong Polytechnic Univ, HK
CUI Jingyu 崔婧渝	MEng, Zhejiang Sci-Tech Univ, China
CUI Zhenxi 崔珍钖	MSc, The Hong Kong Polytechnic Univ, HK
DUONGTHIPTHEWA Anchalee	MEng, Xi'an Jiaotong Univ, China
ECCEL VELLWOCK Andre	MSc, Politecnico di Milano, Italy
ESAN Oladapo Christopher	MSc, Cranfield Univ, UK
FAN E 范锷	MSc, Univ of Chinese Academy of Sciences, China
FAN Lei 范磊	MEng, Yanshan Univ, China
FANG Jieyichen 方洁怡晨	MSc, The Hong Kong Polytechnic Univ, HK
FU Jin 傅进	MEng, Northwestern Polytechnical University, China
FU Yu 傅宇	Master, East China Univ of Sci & Tech, China
GAO He 郜贺	Master, Nanjing Univ, China
GAO Lihao 高立豪	MEng, Northwestern Polytechnical University, China
GAO Yang 高陽	MEng, Beihang Univ, China
GUO Zhenbin 郭鎮斌	MEng, The Hong Kong Polytechnic Univ, HK
HAMEED Imran	BSc, Univ of Engg & Technology, Lahore, Pakistan
HE Chengming 何成明	MEng, Huazhong Univ of Sci & Tech, China
HU Jing 胡菁	MEng, Central South Univ, China
HU Zhongyu 胡中雨	MSc, The Hong Kong Polytechnic Univ, HK
HUANG Guangyuan 黃光遠	BEng, Tongji Univ, China
HUANG Kaicheng 黃凱程	MSc, The Chinese Univ of HK, HK
JIANG Qinghong 江庆红	MEng, Harbin Institute of Technology, China
JIANG Xiao 蒋潇	MEng, Wuhan Univ of Sci & Tech, China
LABAZANOVA Luiza	Master, The Skolkovo Institute of Science and Technology, Russian

LAI Jiewen 賴捷文	BEng, Wuhan Univ of Sci & Tech, China
LI Dongfang 李東方	MSc, The Hong Kong Polytechnic Univ, HK
LI Guangzhe 李广喆	Master, Harbin Inst of Tech, China
LI Jie 李洁	MEng, Tianjin Univ, China
LI Jingying 李晶莹	Master, Harbin Inst of Tech, China
LI Meng 李蒙	MEng, Beijing U of Tech, China, China
LI Quankun 李全坤	MEng, Northwestern Polytechnical U, China
LI Tian 李添	MSc, The Hong Kong Univ of Sci and Tech, HK
LI Ying 李颖	MEng, Central South University, China
LI Zhengchao 李正超	MEng, Harbin Inst of Tech, China
LI Zhengtong 李政桐	MEng, Huazhong Univ of Sci & Tech, China
LIAO Yaozhong 廖耀仲	MSc, The Hong Kong Polytechnic Univ, HK
LIN Dongmei 林冬梅	Master, Beijing Univ of Chemical Tech, China
LIU Jinan 刘津安	MSc, The Hong Kong Polytechnic Univ, HK
LIU Mingran 劉銘然	MSc, The Hong Kong Polytechnic Univ, HK
LIU Shuhong 劉書泓	MSc, The Univ of Sheffield, UK
LO Kin Shing, Kenneth 盧健誠	BS, Colorado School of Mines, US
LONG Tiehan 龙铁汉	MEng, Univ of Sci & Tech, China
LYU Linlong 吕林龙	MSc, The Hong Kong Polytechnic Univ, HK
MA Li 馬丽	MEng, Wuhan Univ of Tech, China
MA Wanyu 马婉玉	MEng, Harbin Inst of Tech, China
MUDDASSIR Muhammad	MSc, Beijing Inst of Tech, China
PAN Zhefei 潘哲飞	MEng, Harbin Inst of Tech, China
RAZA Hassan	MSc, University of Engineering and Technology , Lahore, Pakistan
SHI Xingyi 石星逸	Bachelor, Univ of Electronic Sci & Tech of China, China
SU Xiangyu 苏翔宇	MSc, The Hong Kong Univ of Sci and Tech, HK
SU Yiyin 苏义印	MSc, The Hong Kong Polytechnic Univ, HK
SUN Qiangqiang 孫強強	ME, South China Normal Univ, China
SUN Ruqi 孙汝奇	MEng, China Univ of Petroleum (East China), China
SUN Xiang 孙祥	MEng, Xi'an Jiaotong University, China
TIAN Xudong 田旭东	MEng, Univ of Chinese Academic of Science, China
TIAN Yishen 田一申	BEng, Harbin Institute of Technology, China
ULLAH Sana	MSc, Univ of Peshawar, Pakistan
UY Chun Kit 黃駿傑	BEng, The Hong Kong Univ of Sci and Tech, HK
WANG Jianbiao 王建彪	MEng, Lanzhou Univ, China
WANG Jingwei 王静威	Doctorate, Harbin Inst of Tech, China
WANG Qian 王騫	MSc, The Hong Kong Polytechnic Univ, HK
WANG Shu 王庶	MSc, Peking Univ, China
WANG Yafeng 王亚峰	Master, Harbin Inst of Tech, China
WANG Zhaokun 王兆坤	MEng, Beijing Univ of Technology, China
WEI Long 魏龙	MSc, The Hong Kong Polytechnic Univ, HK
WEN Fuzhen 温福祯	MSc, The Hong Kong Polytechnic Univ, HK
WEN Weisong 文伟松	MEng, China Agricultural Univ, China
XIAO Biao 向彪	MEng, Beihang Univ, China
XIONG Jie 熊杰	MSc, The Hong Kong Polytechnic Univ, HK
XU Lei 许磊	Master, Nanjing Univ of Aeronautics and Astronautics, China
YANG Jianwei 杨建伟	MEng, Xiamen Univ, China
YANG Juntan 楊君坦	MEng, Beihang Univ, China
YANG Weiping 杨维平	MEng, Xiamen Univ, China
YANG Xiongbin 杨雄斌	MEng, Xi'an Jiaotong Univ, China
ZAHRA Omar Ibn Elkhatab Abdallah Abdelkader Elkelany	MSc, Egypt-Japan Univ of Sci & Tech, Egypt
ZHANG Linli 張林立	MSc, The Hong Kong Polytechnic Univ, HK
ZHANG Xioaqi 張晓奇	MEng, Tianjin Univ, China
ZHAO Fuwang 赵福旺	MEng, Beijing Univ of Tech, China
ZHAO Liangjing 赵梁婧	MSc, The Univ of Sheffield, UK
ZHAO Qingxiang 赵清祥	MEng, Sichuan University, China
ZHENG Junyuan 郑钧元	MSc, The Hong Kong Polytechnic Univ, HK
ZHOU Bingchen 周冰晨	MEng, Univ of Sci & Tech Beijing, China
ZHOU Peng 周鹏	MEng, Tongji University, China
ZHOU Pengyu 周鹏宇	Bachelor, Harbin Inst of Tech, China
ZHOU Quan 周全	MSc, The Hong Kong Polytechnic Univ, HK
ZHOU Tong 周桐	MSc, The Hong Kong Polytechnic Univ, HK
ZHOU Weifeng 周伟峰	MEng, Univ of Toronto, Canada
ZHOU Zeqi 周泽齐	MSc, Tianjin Univ, China

PhD Student (Part-time)

CHAN Ying Ngai 陳英毅	MSc, The Univ of Hong Kong, HK
LAM Ka Hei 林家熙	BEng, The Hong Kong Polytechnic Univ, HK
LI Yun 李云	MEng, South China Normal Univ, China
LIANG Shanjun 梁善军	MEng, Harbin Engineering Univ, China
LIU Yao 劉垚	MSc, The Hong Kong Polytechnic Univ, HK
TSE Kwai Wa, Sky 謝桂華	MSc, The Hong Kong Polytechnic Univ, HK
WU Wai Hung 鄔偉雄	MSc, University of London, UK

MPhil Student (Full-time)

CHANG Ching Wei 張晉瑋	BSc, Yuan Ze Univ, Taiwan
CHEN Zongnan 陳宗南	MSc, The Hong Kong Polytechnic Univ, HK
LIU Yutong 刘雨桐	Bachelor, China Univ of Geosciences (Wuhan), China
ZHU Yinggang 朱迎港	BEng, Southern Univ of Sci & Tech, China

MPhil Student (Part-time)

HOU Ruoyang 侯若洋	BEng, The Hong Kong Polytechnic Univ, HK
HU Luyin 胡魯印	BEng, The Hong Kong Polytechnic Univ, HK
TSOI Man Ho 蔡民豪	BEng, The Hong Kong Univ of Sci and Tech, HK
YUEN Tsz Wai 袁子威	BEng, The Hong Kong Polytechnic Univ, HK

Honours & Awards

(1 July 2019 – 30 Jun 2020)

Prof. CHENG Li
- Second Prize of the Science and Technology Progress Award 2019 by the People's Government of Guangdong Province, China

Dr TAM Wai Yin, Eunice
- Faculty of Engineering Merit Award in Services 2018/2019

Ir TANG Wai Fong, Elsa
- Faculty of Engineering Merit Award in Services 2018/2019

Professional Services

Prof. CHAN Tat Leung
- Chairman cum Editor-in-Chief, The Hong Kong Institution of Engineers Transactions Committee
- Member, Appeal Board Panel under Builders' Lifts and Tower Working Platforms (Safety) Ordinance (Chapter 470), Development Bureau, The Government of the Hong Kong Special Administrative Region
- Member, Appeal Board Panel under Gas Safety Ordinance (Chapter 51), Environment Bureau, The Government of the Hong Kong Special Administrative Region
- Honorary Chair, Society of Automotive Engineers International - Hong Kong Section
- Section Chair, American Society of Mechanical Engineers - Hong Kong Section
- Ex-officio Member, Learned Society Board of The Hong Kong Institution of Engineers

Prof. CHEN Guohua
- President, Asia-Pacific Confederation of Chemical Engineering
- Vice President, World Chemical Engineering Council
- Associate Director, Drying Division, The Chemical Industry & Engineering Society of China
- Executive Committee Member, The Chemical Industry & Engineering Society of China
- Member, Energy Storage Division, The Chemical Industry & Engineering Society of China
- Member, International Advisory Panel, The 10th World Congress of Chemical Engineering, Barcelona

Prof. CHENG Li
- President, Hong Kong Society of Theoretical and Applied Mechanics
- Director, International Institute of Acoustics and Vibration (IIAV)
- Director, International Institute of Noise Control Engineering (I-INCE)
- Member, The International Steering Committee, Asia-Pacific Vibration Conference
- Member, Future Congress Technical Committee, International Institute of Noise Control Engineering (I-INCE)
- Member, Scientific Advisory Board, Research Center for Metropolitan Environmental Noise and Vibration Control, Shanghai Academy of Environmental Sciences, China
- Advisor, The AMSS-PolyU Joint Research Institute for Engineering and Management Mathematics
- Member, The Panel on Engineering and Science, The University of Macau
- Member, The Noise Control Appeal Board Panel, Secretary for the Environment, HKSAR
- Member, The Noise Technical Briefing Group, Airport Authority Hong Kong
- Member, Expert Panel, Automotive Parts and Accessory Systems R&D Centre

Prof. CS Cheung
- Member, Air Pollution Control Appeal Board Panel
- Member/Advisor, Steering Committee for Pilot Green Transportation Fund, HKEPD
- Member, Electric Bus Task Force, HKEPD
- Member, Hybrid Bus Task Force, HKEPD
- Member, International Organizing Committee of the International Conference on Combustion and Energy Utilization (Formerly known as Asia Pacific International Symposium on Combustion and Energy Utilization)

Prof. FU Mingwang
- Advisory Board Member, The International Journal of Advanced Manufacturing Technology

Prof. LEUNG Woon Fong Wallace
- Engineering Panel Member (specialize in Mech. & Environmental), The Research Grants Council
- Chairperson, International Delegation on Filtration

Prof. WEN Chih-Yung
- Vice Chair, Technical Committee of Fluid Mechanics, Fluid Engineering Division (FMTC, FED), ASME
- Member-at-large of EC, HKSTAM

Prof. SU Zhongqing
- Secretary General, The Hong Kong Society of Theoretical and Applied Mechanics
- Vice President, Equipment Structural Health Monitoring and Prognostics Branch of China Instrument and Control Society (CSHMP)
- Steering Committee Member, European Workshop on Structural Health Monitoring
- Scientific Committee Member, Asia-Pacific Workshop on Structural Health Monitoring
- International Organizing Committee Member, SPIE Conference Series on Smart Structures/NDE (Health Monitoring of Structural and Biological Systems)
- International Technical Committee Member, American Society of Mechanical Engineers (ASME) Conference Series on Non-destructive Evaluation, Diagnosis, and Prognosis Division
- International Scientific Committee Member, International Conference Series on Structural Health Monitoring and Integrity Management (ICSHMIM)

Prof. ZHOU Limin
- Vice President of Chinese Society for Composite Materials and a member of Engineering Panel, Hong Kong Research Grants Council
- Engineering Panel Member (specialize in Materials Sciences and Engineering), The Research Grants Council

Dr CHOY Yat Sze
- Member, Energy Efficiency Appeal Board Panel, Electrical and Mechanical Services Department, HKSAR

Dr LEUNG Chi Kin Randolph
- Advisory Committee Chair, American Society of Mechanical Engineers – Hong Kong Section

Dr WONG Wai On
- Member, Pressure Equipment Advisory Committee, Boilers and Pressure Vessels Authority, HKSAR

Dr YAO Haimin
- EC member, Hong Kong Society of Theoretical and Applied Mechanics
- Vice-chair, 2019 Gorden Research Conference on Nano-mechanical Interface

Dr David NAVARRO-ALARCON
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE)

Fellowships

Prof. CHAN Tat Leung
- Fellow of American Society of Mechanical Engineers (FASME)
- Fellow of The Hong Kong Institution of Engineers (FHKIE)
- Fellow of The Institution of Mechanical Engineers (FIMechE)
- Fellow of Society of Automotive Engineers International (FSAE)

Prof. CHENG Li
- Fellow of Acoustical Society of America (FASA)
- Fellow of Acoustical Society of China (FASC)
- Fellow of International Institutes of Acoustics and Vibration
- Fellow of The Hong Kong Institute of Acoustics (FHKIOA)
- Fellow of The Hong Kong Institution of Engineers (FHKIE)
- Fellow of The Institution of Mechanical Engineers (FIMechE)

Prof. LEUNG Woon Fong Wallace
- Fellow of Hong Kong Academy of Engineering Sciences (FHKAES)
- Fellow of American Society of Mechanical Engineers (FASME)
- Fellow of American Institute of Chemical Engineers (FAICHE)
- Fellow of The Hong Kong Institution of Engineers (FHKIE)
- Fellow of American Filtration & Separations Society (FAFS)

Prof. SHI Sanqiang
- Fellow of The Hong Kong Institution of Engineers (FHKIE)

Prof. SU Zhongqing
- Fellow of The Hong Kong Institution of Engineers (FHKIE)

Prof. WEN Chih-Yung
- Associate Fellow of The American Institute of Aeronautics and Astronautics (AFAIAA)
- Fellow of The Hong Kong Institution of Engineers (FHKIE)

Journal Editorships

Prof. CHAN Tat Leung
- Editor: Aerosol and Air Quality Research, Taiwan Association for Aerosol Research
- Editor-in-Chief: The Hong Kong Institution of Engineers Transactions, HKIE
- Editorial Advisory Board Member: Flow, Turbulence and Combustion, Springer

Prof. CHEN Guohua
- Editor, Separation and Purification Technology, Elsevier
- Associate Editor, Chinese Journal of Chemical Engineering, Elsevier
- Subject Editor, Process Safety and Environmental Protection - Official Journal of the European Federation of Chemical Engineering: Part B, Elsevier

Prof. CHENG Li
- Deputy Editor-in-Chief and Receiving Editor, Journal of Sound and Vibration, Elsevier
- Associate Editor: The Journal of the Acoustical Society of America, IOP publishing
- Associate Editor: Structural Health Monitoring, An international Journal. SAGE Ltd. Science
- Editorial Board Member: International Journal of Applied Mechanics, Imperial College Press
- Editorial Board Member: Advances in Aircraft and Spacecraft Science, An International Journal. Techno Press
- Editorial Board Member: International Journal of Mechanics and Solids
- Editorial Board Member: Vibration, MDPI, Switzerland
- Editorial Board Member: Acoustics, MDPI, Switzerland
- Editorial Board Member: International Journal of Dynamics of Fluids
- Editorial Board Member: ACTA ACUSTICA SINICA
- Editorial Board Member: Chinese Journal of Acoustics
- Advisory Board Member: ASME Transactions: Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems

Prof. FU Ming Wang
- Editorial Board Member: International Journal of Plasticity, Elsevier
- Editorial Board Member: Materials & Design, Elsevier
- Editorial Board Member: International Journal of Damage Mechanics, SAGE
- Editorial Board Member: International Journal of Advanced Manufacturing Technology, Springer
- Editorial Board Member: Chinese Journal of Mechanical Engineering-English, Springer
- Editorial Board Member: Manufacturing Review, EDP Sciences
- Editorial Board Member: Advances in manufacturing, Springer
- Editorial Board member: Chinese Journal of Mechanical Engineering-Chinese, Springer
- Editorial Board member: International Journal of Lightweight Materials and Manufacture, Ke Ai
- Editorial Board member: International Journal of Computer Aided Engineering and Technology, Inderscience Publishers

Prof. LEUNG Woon Fong Wallace
- Editorial Board Member: Journal of Separation and Purification Technology, Elsevier

Prof. SHI Sanqiang
- Associate Editor: Science of Advanced Materials, American Scientific Publishers
- Associate Editor: Journal of Nanoscience and Nanotechnology, American Scientific Publishers
- Associate Editor: Journal of Computational and Theoretical Nanoscience, American Scientific Publishers
- Editorial Board Member: International Journal of Minerals, Metallurgy and Materials, Elsevier

Prof. SU Zhongqing
- Editor-in-Chief: Ultrasonics, Elsevier
- Subject Editor: Journal of Sound and Vibration, Elsevier
- Associate Editor: Structural Health Monitoring: An International Journal, SAGE
- Associate Editor, ASME Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems, ASME
- Associate Editor: Structural Engineering and Mechanics: An International Journal, Techno-Press
- Associate Editor: Coupled Systems Mechanics, Techno-Press
- Associate Editor: Structural Monitoring and Maintenance: An International Journal, Techno-Press
- Editorial Board Member: Aerospace

Prof. WEN Chih-Yung
- Associate Editor: The American Institute of Aeronautics and Astronautics (AIAA) Journal, SCI
- Editor: Shock Waves - An International Journal on Shock Waves, Detonations and Explosions

Prof. ZHOU Limin
- Editor-in-Chief: Composites Communications, Elsevier

Dr CHOY Yat Sze
- Editorial Board Member: Journal of Acoustics

Dr JING Xingjian
- Associate Editor & Editorial Board Member: Mechanical Systems and Signal Processing, Elsevier
- Technical Editor: IEEE/ASME Transactions on Mechatronics, IEEE
- Editorial Board Member: The Scientific World Journal, Hindawi Publishing Corporation
- Editorial Board Member: International Journal of Mechanic Systems Engineering, American V-King Scientific Publishing
- Editorial Board Member: Modern Mechanical Engineering, Scientific Research Publishing Inc., Scientific Research Publishing Inc.

Dr LEUNG Chi Kin Randolph
- Associate Editor in Chief: Journal of Technical Acoustics
- Editorial Board Member: Engineering Applications of Computational Fluid Mechanics
- Editorial Board Member: Advances and Applications in Fluid Mechanics

Dr David NAVARRO-ALARCON
- Associate Editor: Frontiers in Robotics and AI, Specialty Section on Soft Robotics

Dr WONG Wai On
- Associate Editor: The Hong Kong Institution of Engineers (HKIE) Transactions
- Editorial Board Member: The Scientific World Journal, Hindawi Publishing Corporation
- Editorial Board Member: ISRN Mechanical Engineering, Hindawi Publishing Corporation
- Editorial Board Member: The International Journal of Mechanical Systems Engineering, American V-King Scientific Publishing

Distinguished Lecture / Keynote Speech at International Conference / Symposium

Prof. CHENG Li

"Flexural wave manipulations through Acoustic Black Hole design for vibration and sound control applications", 3rd International Conference on Acoustics and Vibration, March 16-18, 2020, Hammamet, Tunisia.

"Noise and Vibration Mitigations for Aeronautical and Aerospace Applications", 10th Asia-Pacific Conference on Aerospace Technology and Science & 4th Asian Joint Symposium on Aerospace Engineering, August 28-31, 2019, Hsin Chu, Taiwan.

Prof. FU Mingwang

"Damage and fracture in multi-scaled and deformation-based processing of materials", 8th Annual World Congress of Advanced Materials (WCAM 2019), 22-24 Jul 2019, Osaka, Japan

"Design and Development of Multi-Scaled Metal Forming Products Aided by Finite Element Simulation", Asia Pacific Society for Materials Research 2019 Annual Meeting, 26-29 Jul 2019, Sapporo, Japan

"Damage and fracture in multi-scaled deformation and manufacturing", 12th Asia Workshop on Micro-Nano Forming Technology and the 2nd Asian Pacific Symposium on Tech. and Plasticity, 31 Jul – 3 Aug 2019, Tokyo, Japan

"Size effects in Micro-manufacturing", 3rd World Congress on Micro and Nano Manufacturing, 8-13 Sep 2019, Raleigh NC, USA

"Damage and fracture in multi-scaled deformation and manufacturing", 2nd International Conference on Lightweight Materials and Manufacture, 9-12 Oct 2019, Changsha, China

"Deformation, Damage and Fracture in Multi-scaled Manufacturing", 16th Annual Conference of the National Plasticity Engineering Society of the Mechanical Engineering Society of China, 19-20 Oct 2019, Taiyuan, China

"Damage and fracture in multi-scaled deformation and manufacturing", The 22nd Inter Symposium on Advances in Abrasive Technology, 6-9 Dec 2019, Shenzhen, China

Prof. SU Zhongqing

"In situ condition monitoring of high-speed rail tracks using diffuse ultrasonic waves", The 2nd World Congress on Condition Monitoring, 2-5 Dec 2019, Singapore

Prof. ZHOU Limin

"Facing the challenges in rechargeable batteries – volume expansion and Low-temperature performance", 7th International Conference on Smart Materials and Nanotechnology in Engineering, 20-24 Sep 2019, Harbin, China

Distinguished Lecture / Keynote Speech at International Conference / Symposium

Dr YAO Haimin

"Combat marine biofouling with biomimetric surface morphologies", Biomimetics in Bioengineering Conference 2019, 4-6 Aug 2019, Brisbane, Australia

"Structure matters in natural biomaterials", 8th International Conference on Mechanics of Biomaterials and Tissues, 15-19 Dec 2019, Hawaii, USA

Dr ZHANG Peng

"Viscous Dissipation, Enstrophy and Helicity of Binary Bouncing Droplets", Workshop on Knotted Field Theory with Applications in Physical & Biological Sciences, 7-12 Sep 2019, Beijing, China

Teaching & Learning

At ME Department, education is not only imparting knowledge and skills with excellent teaching quality but also nurturing all-round future leaders with creativity, global outlook and professional attributes by providing a holistic and fruitful learning experience.
Enhancing and maintaining excellent teaching quality has always been the major goal of the Department. The Department takes every effort to continuously improve teaching and learning performance to ensure the knowledge and skills students learnt in classrooms are up-to-date and applicable in real life.

Programmes Offered

The Department offers Doctorates, Master Degrees, and Bachelor Degrees. Students gain professionally recognized qualifications at different levels from the vibrant teaching and learning approach.

Undergraduate Programmes

Programme Title	Mode of Study
BEng(Hons) Scheme in Mechanical Engineering	Full-time (UGC funded)
BEng(Hons) in Mechanical Engineering	Full-time (UGC funded)
BEng(Hons) in Product Analysis and Engineering Design	Full-time (UGC funded)
BEng(Hons) in Mechanical Engineering	Part-time (Self-financed)
BEng(Hons) in Product Analysis and Engineering Design	Part-time (Self-financed)

Postgraduate Programmes

Programme Title	Mode of Study
MSc in Mechanical Engineering Four specialisms: • MSc in Mechanical Engineering (Product Development and Analysis) • MSc in Mechanical Engineering (Air/Noise Pollution Management) • MSc in Mechanical Engineering (Aeronautical Engineering) • MSc in Mechanical Engineering (Aviation)	Mixed-mode (Self-financed)
Engineering Doctorate	Mixed-mode (Self-financed)

Student Enrollment

Programme	Year 1 Intake 2019/20	Total no. of Students 2019/20
Full-time BEng(Hons) Scheme in Mechanical Engineering	75	158
Full-time BEng(Hons) in Mechanical Engineering (including Double Degree students)	N/A	206
Full-time BEng(Hons) in Product Analysis and Engineering Design	N/A	49
Part-time BEng(Hons) in Mechanical Engineering	N/A	154
Part-time BEng(Hons) in Product Analysis and Engineering Design	N/A	81
MSc/PgD in Mechanical Engineering	89	163
Part-time Engineering Doctorate	0	1
Total	164	812

Performance Indicators

Student Feedback Questionnaire (SFQ)

The student feedback questionnaires provide one of the major indicators to assess the effectiveness of teaching.

Items	ME Average	FENG Average
Subjects		
Clear understanding of what I am expected to learn	4.1	4.0
Teaching & learning activities helped me to achieve the subject learning outcomes	4.1	4.0
Assessments require demonstration of knowledge/ skills/ understanding of subject	4.2	4.1
Able to understand the criteria for grading	4.1	4.0
Staff		
Teaching was well-organized	4.1	4.1
Staff member was helpful	4.2	4.1
Useful and timely feedback	4.1	4.0
Encouraged students to ask questions/ discuss ideas	4.2	4.1
Encouraged students to learn independently	4.2	4.1
Overall view about the teaching of the staff member		
Provided me with a valuable learning experience	4.1	4.0
Overall, staff member is an effective teacher	4.1	4.1
Grand mean of item on Overall View	4.1	4.1

First Class Honours / Distinction

The following students in the Department of Mechanical Engineering were graduated with the first class honours / distinction in the 2019/2020 academic year.

Study Programme	BEng(Hons) in Mechanical Engineering
Student Name	CHENG Haoran +
	DUAN Yufei +
	HUO Xiaoyu +
	KWAN Kai Lok +
	LOONG Cheng Sheng +
	XU Xinrui +
	ZHOU Siyang +

Study Programme	BEng(Hons) in Product Analysis and Engineering Design
Student Name	ZHANG Weiyi +

Study Programme	MSc in Mechanical Engineering
Student Name	CHAN Po Nam *
	GO Stanley *
	MA Yining *
	MAI Weiqi *
	SONG Yang *
	WANG Hao *
	WONG Kwok Leung *
	WONG Ting Yui *
	XIE Jifeng *
	ZHOU Hanmo *

+ First Class Honours

** Distinction*

Dean's Honours List

The following students in the Department of Mechanical Engineering have satisfied the criteria (based on outstanding academic performance) for being included in the Dean's Honours List in the 2019/2020 academic year.

Recipient		
AU Ka Wai Christopher	FUNG Ting Shun	NG Ting Keung
CHAN Chi Yung	GU Zhengping	POON Tak Ming
CHAN Chung Wai	HE Bingzhi	RASHID Sameer
CHAN Hoi Yi	HU Yuntao	SHAGATAY Maral
CHAN Ka Ho	HUANG Haihuai	SIN Ching Yin Billy
CHAN Ka Yiu	HUANG Ka Chung	SUM Cheuk Shing
CHAN Kam To	IP Tsz San	SUNG Po Wai
CHAN Lit Keung	JIANG Jiacong	TANG Long Kit
CHAN Pak Kan	KAN Wing Sze	TO Yip Sum
CHAN Sui Hin Christ	KOK Wai Lok	TONG Tsz Chung
CHEONG Kai Lun	KWAN Kai Lok	TSANG Wing Lok
CHEUNG Chung Ki	LAI Kai Fung	WAN Chak Fai
CHEUNG Hiu Ching	LAM Ka Chun	WAN Kwok Wai
CHEUNG Man Fung	LAM Ka Yip	WONG Ting Sen
CHIU Kai Chung	LAM Yuen Yik	XU Xinrui
CHOI Man Wai	LAU Wai Man	YAO Jichen
CHOW Fu Ho	LAW Christopher	YEUNG Ka Yu
CHOY Yik Ching	LAW Chung Kwan Nicholas	YUEN Chi Fai
CHU Sheung Yam Ivan	LEE Cheuk Him	YUEN Shing Nok
CHU Tsz Fai	LEE Ka Yip	ZHANG Renyi
DAI Yichen	LEUNG Ka Wa Brad	ZHANG Wen
DING Yuxin	LI Chun Cheung	ZHAO Jingyuan
DUAN Yufei	LO Tsz Yuen	ZHOU Siyang
FUNG Man Lik	LOO Ka Po	
FUNG Sin Yi	LOONG Cheng Sheng	

Prizes, Scholarships and Bursaries

Prizes and scholarships are honors, and serve to motivate and recognize the performance and contributions of students. Bursaries provide assistance to needy students so that they can concentrate on their studies.

Prize / Award	Recipient
Outstanding Student Award 2019, Department of Mechanical Engineering	XU Xinrui
HKSAR Government Scholarship Fund - Endeavour Merit Award	CHEUNG Hiu Ching
	FUNG Man Lik
	SHAM Wai Kit
Scholarship	**Recipient**
BEA Inspiring Student Scholarship	CHEUNG Hiu Ching
CLP Scholarship in Mechanical Engineering	CHAN Hon
Chiang Chen Industrial Charity Foundation Scholarship	SO Ho Lun
Cobelco Industrial Supplies Ltd. Scholarship	WONG Ho Hin
Dr Y.K. Ching Memorial Scholarship	HU Yuntao
	JIAO Shiyu
HAESL Scholarship	LO Tsz Yuen
HK Electric Scholarship	WAN Kwok Wai
HKCC Scholarship for PolyU Articulation	YAN Ka Cheung
HKSAR Government Scholarship	CHENG Haoran
	LUK Yi Hang
	XU Xinrui
HKSAR Government Scholarship Fund - Reaching Out Award	CHAN Hon
	CHAN Yan Kit Jeffrey
	SHEK Chun Hei
	TAHIR Abdullah
	YUEN Shing Nok
HKSAR Government Scholarship Fund - Talent Development Scholarship	CHEUNG Hiu Ching
	HUNG Chun Sing
	WONG Enoch
HSBC Hong Kong Scholarship	FUNG Man Lik
Hong Kong Plastics Manufacturers Association Scholarship	LAM Yuen Yik
Mitsubishi Electric (Hong Kong) Limited Scholarship	FUNG Man Lik
Outstanding Graduates Scholarship	CHAN Po Nam
	GO Stanley
	MA Yining
	MAI Weiqi
	SONG Yang
	WANG Hao
	WONG Kwok Leung
	WONG Ting Yui
	XIE Jifeng
	ZHOU Hanmo
President Emeritus Professor Poon Chung-kwong Scholarship	YUEN Shing Nok
REC Engineering Company Limited Scholarship	HO Sung Lai Sidney
Rexroth Industry 4.0 Scholarship	CHAN Hou Tong
	IP Sheung Shing
	LAI Chun Man
	LAU Hiu Fung
	LEE Hoi Yin
	TSUI Chan Sum
The Hong Kong Jockey Club Scholarship	CHEUNG Hiu Ching
The Hong Kong Polytechnic University Scholarship	DING Yuxin
	DUAN Yufei
The Professional Validation Council of Hong Kong Industries Scholarship	ZHOU Siyang
VTech Group of Companies Scholarship	DING Yuxin

Wong Tit-shing Student Exchange Scholarship	CHAN Hon
	CHAN Siu Wing
	CHAN Yan Kit Jeffrey
	HOO Shi Xiong
	KHALID Farhan
	TAHIR Abdullah
Targeted Scholarship Scheme - Belt & Road Scholarship (Indonesia)	WAHYONO Darren Anthony
Targeted Scholarship Scheme - Belt & Road Scholarship (Research Postgraduate)	LABAZANOVA Luiza
The Hong Kong Polytechnic University Entry Scholarship (Academic)	ASHRAFI Andalib
	CHU Sheung Yam Ivan
	GONDAL Ahmad Hassan
	JIA Lumeng
	KASSYMKHANOV Shyndaulet
	KHALID Farhan
	KHAN Hamad
	PASHA Jabed
	RASHID Sameer
	SAFIULLAH Saad Bin
	SHAGATAY Maral
	TAHIR Abdullah
	ZHANG Wen
The Hong Kong Polytechnic University Entry Scholarship (Academic) and Faculty of Engineering Undergraduate Scholarship	AKHMET Dias
The Hong Kong Polytechnic University-APEC Entry Scholarship	CHEONG Kai Lun
	DELA CRUZ Xavier Roi Mangulabnan
	KWEON Tae Hyeon
	LOONG Cheng Sheng
	PANGURIPAN Theodor
	WONG Ting Sen

Bursary
Bursary for Belt and Road (B & R) Scholarship Awardees
Delong Bursary
HK Electric Bursary
Madam Lau Ip Sok Wun Memorial Bursary
Zheng Ge Ru Foundation Bursary

Work-Integrated Education (WIE)

To echo with the University's Work-Integrated Education (WIE) programme, the Department has established a close partnership with both local and overseas industrial / educational partners to offer a wide variety of placement opportunities to students who are always encouraged to acquire real world working experience before graduation.

Offshore Placement

Organization	Country
Beijing Electric Vehicle CO. LTD.	China
College of Electromechanical Engineering, Qingdao University of Science & Technology	China
Deep Origin Lab	China
Delval Flow Controls	China
EuroACE / Fabspace	Spain
Gudeng Precision	Taiwan
Japan Tokyo City University	Japan
Miele DG, Dongguan Hong Da Electric Products Co.Ltd	China
Occidental of Oman, Inc	Oman
PT Denso Indonesia	Indonesia
Raymond Industrial Limited	China
Shanghai Electric Wind Power Group Co., Ltd	China
Southern Gas Corridor Closed Joint-Stock Company	Azerbaijan
Xi'an Jiaotong University	China
上海諾格傳動控制技術有限公司	China
北京中航智科技有限公司	China
深源科技文化中心	China

Local Placement

Organization
AUDI MOBILE SERVICE CO.
ASM Pacific Ltd
ATAL Engineering Limited
Car Super (Hong Kong) Limitted
CLP Power Hong Kong Limited
Covestro (Hong Kong) Limited
Cummins Inc.
Electrical and Mechanical Services Department, HKSAR
Environmental Protection Department, HKSAR
Excel Pathways Learning Center
FSE Engineering Group Limited
Gammon Construction Limited
HEATMAP ENGINEERING CONSULTANTS LIMITED
Hong Kong Aircraft Engineering Company Limited
Hong Kong Airlines Limited
Hong Kong Jockey Club
IAGO Limited
Kent's Construction & Engineering Company

Organization
Marine Department, HKSAR
Meinhardt (M&E) Limited
New World Facilities Management Company Limited
Otis Elevator Company (HK) Limited
PAK TUNG ENGINEERING COMPANY LIMITED
Paul Y. Management Limited
PENTA-OCEAN CONSTRUCTION
Pure Living Inc Limited
REC Engineering Company Limited
SC Consultants Limited
SHI YI HANG
Stratasys APJ Ltd.
The Hong Kong and China Gas Company Limited
Transport Department, HKSAR
Wai Wah Machinery Factory Ltd.
Water Supplies Department, HKSAR
Wilson Acoustics Limited
Wise Ally International Holdings Limited

Student Exchange Programme

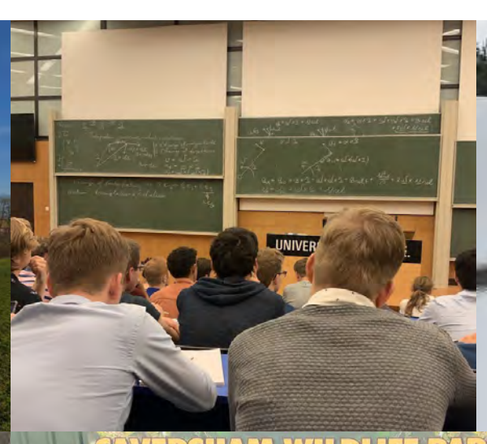
With strong commitment to cultivate global outlook, the Department offers student exchange opportunities to enhance students' cultural knowledge, languages skills and personal development. Every year, the Department arranges students to go on exchanges while outstanding students from the mainland and overseas are also recruited to its academic programmes.

Inbound

University	Country	No. of students
Hochschule Konstanz University of Applied Sciences	Germany	5
Institut National Des Sciences Appliquees De Lyon	France	1
Institut Polytechnique Des Sciences Avancees	France	4
Lucerne University Of Applied Sciences And Arts	Switzerland	1
McGill University	Canada	1
Technical University Of Munich	Germany	1
University of Florida	USA	1
University Of Technology Of Troyes	France	6
University Of Twente	Netherlands	1
Zurich University Of Applied Sciences	Switzerland	1
		Total: 22

Outbound

University	Country	No. of students
Cardiff University	United Kingdom	1
Comillas Pontifical University	Spain	1
Curtin University	Australia	1
Harbin Institute Of Technology	China	2
Institut Polytechnique Des Sciences Avancees	France	1
Jonkoping University	Sweden	1
Lucerne University Of Applied Sciences And Arts	Switzerland	3
McGill University	Canada	1
Mci Management Center Innsbruck	Austria	2
Nanyang Technological University	Singapore	1
Technical University Of Munich	Germany	2
University Of Twente	Netherlands	2
University Of Waterloo	Canada	1
		Total: 19



Student Achievements

To maintain the competitiveness of students, the Department has been encouraging its students to actively participate in a wide range of local and international activities and competitions in order to showcase their talents and creativity as well as to build up their skills and confidence. In the reporting year, ME students shined in many international and national competitions and awards. Their accomplishments offer concrete proof that the Department has succeeded in nurturing students who not only excel in academic areas, but also demonstrate great leadership and problem-solving skills.

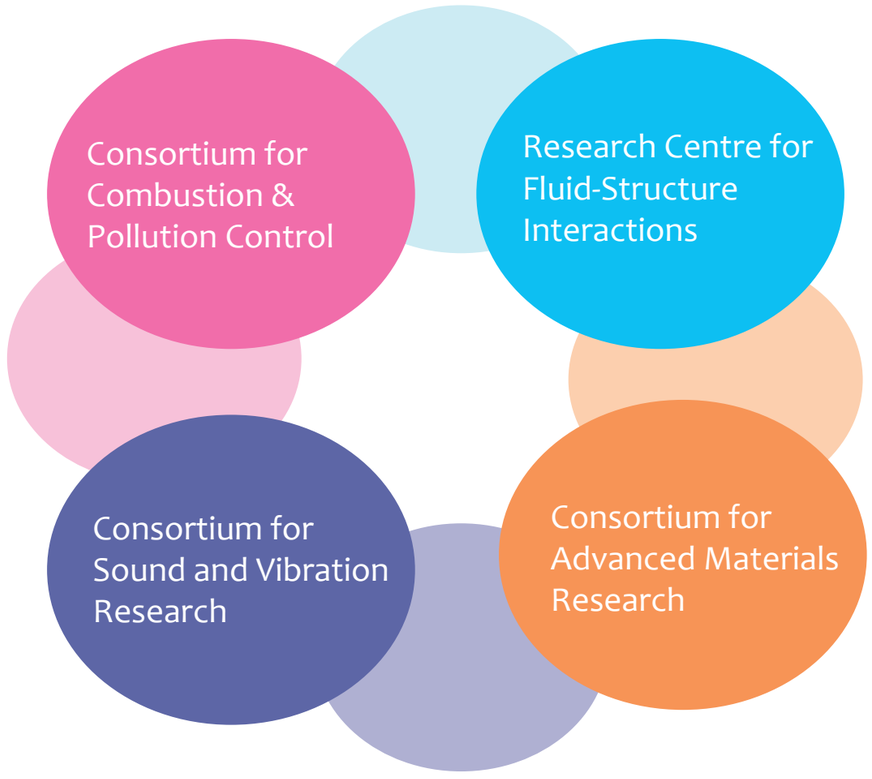
Competition	Award
20th TAROS (Towards Autonomous Robotic Systems) Conference	Best Student Poster
The 11th Asia-Pacific Conference on Combustion (ASPACC 2017) held in Sydney, Australia	Young Investigator Award
32nd International Symposium on Shock Waves (ISSW32)	Student Competition Awards
The HKIE Outstanding Paper Award for Young Engineers/Researchers 2019	Outstanding Paper Award
The 5th China College Students "Internet Plus" Innovation and Entrepreneurship Award	Silver Prize
2019 Greater Bay Area Design Competition	2nd Class and the Most Collaboration Awards
2019 American Society of Mechanical Engineers (ASME) Student Design Competition (SDC) Finals in Salt Lake City, Utah, USA	2nd Runner-up
2019 IEEE International Conference on Robotics and Biomimetics (IEEE-ROBIO 2019) in Dali, China	Best Paper Finalist award
The Chinese National Engineering Research Centre for Steel Construction (CNERC) Annual Technical Symposium 2020	Young Research Award
The HKIE-SSC Student Project Competition	CIC award
IEEE MTT-S Undergraduate/Pre-graduate Scholarship 2020	2020 Cycle 1 Awardee

Research & Consultancy

The Department continues to push the frontiers of knowledge and applications in the discipline of Mechanical Engineering. With the spirit of driving innovation for a better future, members of the Department are playing an significant role in making high-impact contributions to the profession by engaging in fundamental and applied research development; high level consultancies for local and international organizations; and provision of knowledge and technologies to the industry.

Research Centre/ Consortiums

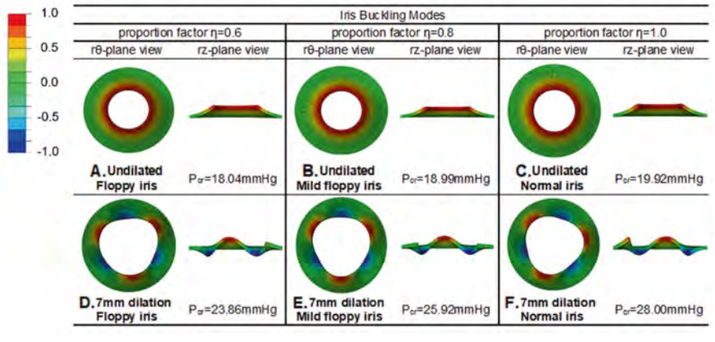
With different objectives and targets, the Department aims at all-rounded research efforts that could provide possible solutions towards a better living for the human race. In order to establish better synergy in research, four research centre and consortiums where a critical mass of experts is available in each have been identified.



Research Centre for Fluid-Structure Interactions

With rapid economic and industrial development in China, India and elsewhere, fluid-related structural vibration and noise problems are widely encountered in many fields, just as they are in the more developed parts of the world, causing increasingly grievous concerns. Turbulence clearly has a significant impact on many such problems. On the other hand, new opportunities are emerging with the advent of various new technologies, such as signal processing, flow visualization and diagnostics, new functional materials, sensors and actuators, etc. These have revitalized interdisciplinary research activities, and the Research Center focuses on biomedical applications, turbulent flows, biofluids, flow-induced vibration, and their control in relation to wings, wind turbines, buildings, cable-stayed bridges, moving vehicles, biomedical engineering, power equipment, heat-exchangers, micro and nano-scale structures, household appliances and products with innovation and technology values. Our research in fluid-structure interaction is world-class and our experimental/computational facilities are at the scientific frontier.

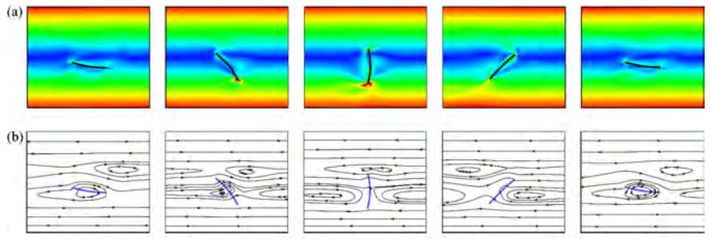
FSI Research Center has organized/co-organized the series symposium on fluid-structure-sound interactions and control (FSSIC) in 2013 in Hong Kong and Macau and in 2015 in Perth. Dr Yang LIU and other co-editors have edited the book of "Fluid-Structure-Sound Interactions and Control" which was published by Springer in 2014 and 2016, respectively. These books are the Proceedings of the 2nd and 3rd Symposium on Fluid-Structure-Sound Interactions and Control which largely focuses on advances in the theory, experimental research and numerical simulations of turbulence in the contexts of flow-induced vibration, noise and their control. These books include several practical areas for interaction, such as the aerodynamics of road and space vehicles, marine and civil engineering, nuclear reactors and biomedical science etc. One of the particular features of these proceedings is that it integrates acoustics with the study of flow-induced vibration, which is not a common practice but is scientifically very helpful in understanding, simulating and controlling vibration.



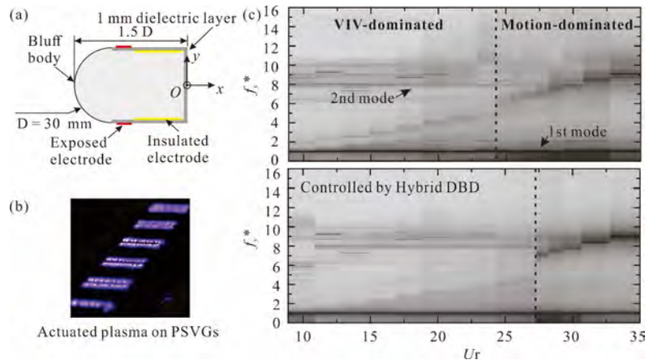
Simulated buckling modes and critical tip pressure for iris with different stiffness (from left to right) and different pupil dilation (from top to bottom) (Eye 34: 2227-2234, 2020)

In 2019/20, the center members kept publishing in top journals in FSI, fluid mechanics and also interdisciplinary fields. For example, sponsored by UGC GRF and collaborating with University of Glasgow and Gartnavel General Hospital in Glasgow, UK, Dr Hui Tang studied the intra-operative floppy iris syndrome using numerical simulations and confirmed the effectiveness of the Malyugin ring as a mechanical pupil expansion device in preventing abnormal iris movement. This work was published in Eye, an ophthalmology journal. Dr Yang Liu published a numerical work in European Journal of Mechanics - B/Fluids studying the detailed fluid-fiber interaction during fiber conveyance in a fiber transport channel, which provides more physical insights into the pneumatic-type textile field. Prof Chih-Yung Wen applied dielectric barrier discharge plasma actuators on a D-shaped bluff body to influence the natural vortex shedding and hence enhance the aerodynamic performance.

There are currently multiple GRF projects and one NSFC Major Program project running in the FSI research center.



Fluid-fiber interaction during fiber conveyance in a fiber transport channel (Eur. J. Mech. B-Fluids 76: 422-433, 2019)



A more stable vortex shedding system for a D-shaped bluff body was developed with plasma actuators. With this system, the dominant oscillation frequency's bandwidths in the vortex-induced vibration region shrank, and saltation was delayed.

Consortium for Advanced Materials Research

The research endeavors and activities of the consortium are mainly focused on the areas of advanced materials science and engineering covering nanomaterials & technologies, materials design & simulation, surface & interface technologies, structure-property relationships, and materials and structures covering biomedical, functional, energy-related, composite and smart materials arenas. In addition, advanced materials processing and product design and analysis are also our research interests.

The research works carried out by the members of the consortium during this report period (from 1 July 2018 - 30 June 2019) resulted in 83 referred SCI journal papers, 6 conference papers,1 patent and 2 authors books. The journals cover Carbon, Dry. Technol., Appl. Catal. B-Envi, Adv. Funct. Mater., Sci. Adv., Sci. Bull., Int. J. Hydrog. Energy, Corros. Sci., NPJ Mater. Degrad., Nano Energy, Int J of Mach Tool and Manuf., Mater Design, Int J of Mech Sci, Mater Sci Eng A, Int J Plasticity, Nanoscale, J. Alloys and Compounds, Int J of Mech and Solids of Physics, J of Mater Sci, J of Mater Process Tech, J of Mater Chem A, J. of Heat and Mass Transfer, J. of Chemical Eng., Mater Sci., Int. J. of Applied Glass Science, Acta Mater., etc. In addition, the CAMR members were successful in applying internal and external research funds in the past year. They secured one GRF grants, one NSFC/RGC Joint Research Scheme project, one RGC Theme-based Research Scheme Co-PI project, and three projects funded by the mainland chain funding agencies, and other funding agencies with a total amount of more than HK$12 million.

CAMR members also actively participated in journal editorial boards including Advanced Materials Research (Trans Tech Publications), Editor for Encyclopedia of Materials: Metals and Alloys (Elsevier), and The American Journal of Applied Sciences (Science Publication), and Associate Editors for Science of Advanced Materials (American scientific Publishers), Journal of Nanoscience and Nanotechnology (American scientific Publishers), Journal of Computational and Theoretical Nanoscience (American scientific Publishers), Nanomaterials (Hindawi Publisher), Structural Health Monitoring (SAGA Publications), and International Journal of Smart and Nano Materials (Taylor & Francis). Meanwhile, members collaborated with various external organizations either on an individual basis or on a collective basis. Some major collaborators are Massachusetts Institute of Technology (MIT), Argonne National Laboratory, Johns Hopkins University, Pennsylvania State University, University of Oxford, Imperial College, Sydney University, Pacific Northwest National Lab USA, University of Alberta, Tsinghua University, Zhejiang University, Beijing University of Aeronautics & Astronautics (Beihang University), University of Science & Technology Beijing, Shanghai Jiaotong University, Tongji University, Shanghai University, Harbin Institute of Technology, Harbin Engineering University, Dalian University of Technology. These collaborations resulted in journal publications, consultancy projects and awards of research projects.

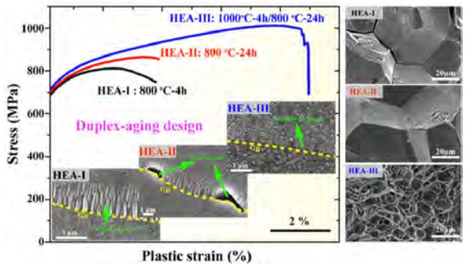
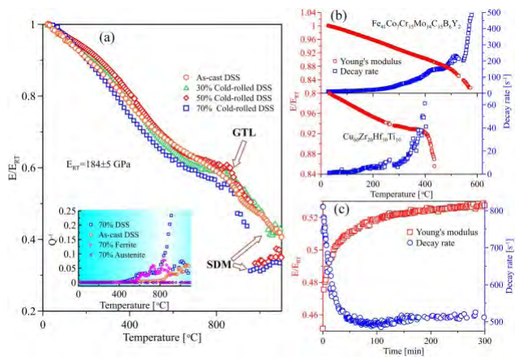
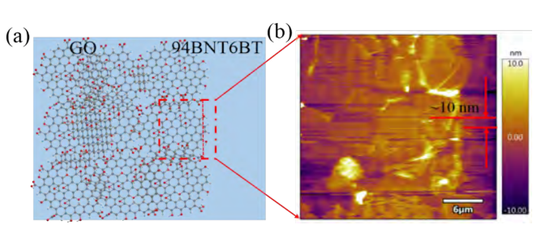


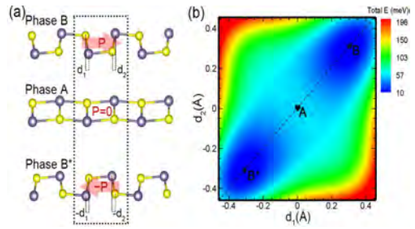
Fig.1. High-temperature mechanical properties of high-entropy alloys
(Provided by Dr ZB Jiao)

Fig.2 (a) The variation of Young's modulus of as-cast and cold-rolled Duplex stainless steel with temperature under a heating rate of 15 °C/min, which is measured by Impulse excitation technique (IET). The bottom inset is the internal friction of the as-cast and cold-rolled DSS as well as the 70% cold-rolled ferritic and austenitic stainless steels; (b) The temperature dependence of Young's modulus and decay rate of the Fe-based (Fe41Co7Cr15Mo14C15B6Y2) and Cu-based (Cu60Zr20Hf10Ti10) metallic glass measured by IET; (c) The measured Young's modulus and decay rate of the 70% cold-rolled DSS annealed at TSDM + 5 °C.
(Provided by Dr HH Ruan)





(a) Graphene Oxide-Bismuth Sodium Titanate Heterostructures



(b) β-GeS Monolayer

Fig.3 Two-dimensional (2D) Ferroelectric Materials
(Provided by Dr G Zheng)

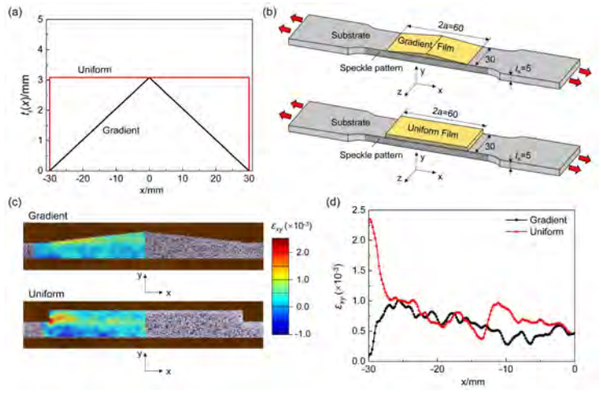


Fig. 4 The shear stress between a film and a substrate induced by the strain mismatch in between was found to depend on the thickness uniformity of the film. Here, we theoretically determined the optimal thickness profile (a) of the film which results in homogeneously distributed shear stress field. This theoretical result was verified by experimental tests (b,c,d).
(see JMPS 131 (2019) 112–124 by Dr Haimin Yao's group for the detailed story)

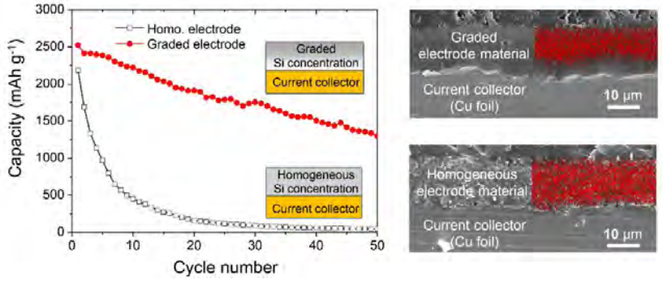


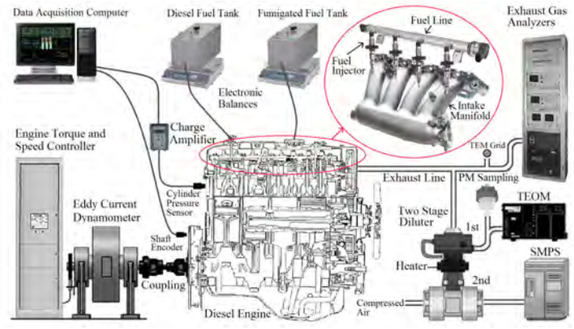
Fig.5 Inspired by the functional graded design in natural biomaterials, we propose to solve the interfacial delamination problem in Si-based anode for lithium-ion batteries by reallocating the Si in the electrode in a graded manner. The prepared graded electrodes especially those after gradient optimization are found quite successful in alleviating the interfacial delamination, resulting in higher capacity and capacity retention, higher coulombic efficiency, higher effective mass loading in comparison to the traditional ones.
(see Materials and Design 177 (2019) 107851 by Dr Haimin Yao's group for the detailed story)

Consortium for Combustion and Pollution Control

The CPC Consortium (previously known as CPC Research Centre) has been operating smoothly with collaborative effort from our core group members including Prof. TL Chan, Prof. GH Chen, Prof. CS Cheung, Prof. WF Leung, Dr L An and Dr P Zhang. The Consortium is established to create and develop a critical mass in the fundamental and applied studies in combustion and combustion-related air pollution problems and their control. We are one of the leading research groups in the areas of clean combustion and energy, alternative fuels, internal combustion engine performance and emissions, electrochemical technologies for energy and environmental applications, and nanofiber technologies in energy, environment, and health applications. The CPC Consortium has made significant contributions to the development of new curriculum and subjects for the Department, and has provided and supervised many research and undergraduate projects of our students. Significant research outputs, including patents, book chapters, journal publications and conference presentations have been published by the group members of the Consortium which has helped to enhance the international image and status of ME and PolyU. In addition, our group members have been active in providing consultancy/ expert & professional services to the Engineering Institutions/Societies and Environmental Protection Department of the HKSAR.

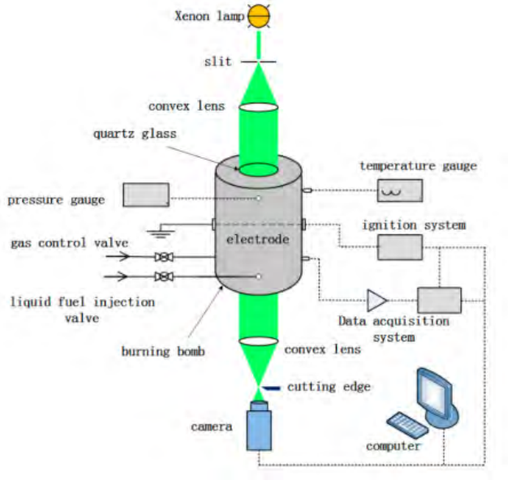
Application of Alternative Fuels to Diesel Engine

Research activities were focused mainly on the application of alternative fuels to diesel engine, which included the application of hydrogen, LPG, biodiesel and various alcohols. The influences of these alternative fuels on the combustion, performance, gaseous and particulate mass-number emissions, as well as the physico-chemical properties of the particulates were investigated. For the alcohols, the effects of both the blended mode as well as the fumigated mode have been investigated. The application of these alternative fuels could significantly reduce the particulate mass-number emissions and rendered the particulates easier to be oxidized.



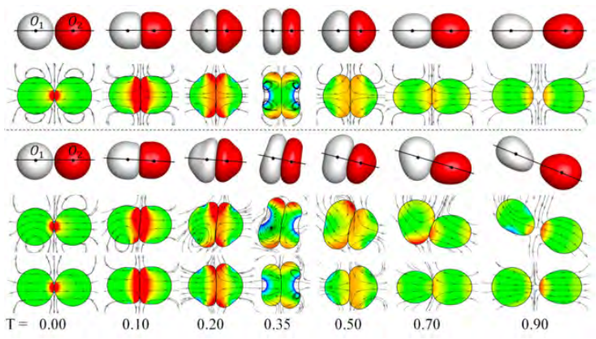
Bio-syngas Combustion

Bio-syngas primarily contains hydrogen (H_2), carbon monoxide (CO), and methane (CH_4). It may also contain other species like diluents nitrogen (N_2), carbon dioxide (CO_2), and high-order hydrocarbons. The variability of fuel composition in bio-syngas poses difficulties for combustor design, explosion damage control, and prevention of fire hazards. This project investigates the effects of fuel composition and diluents on the laminar burning velocity, cellular instability and explosion characteristics of bio-syngas.



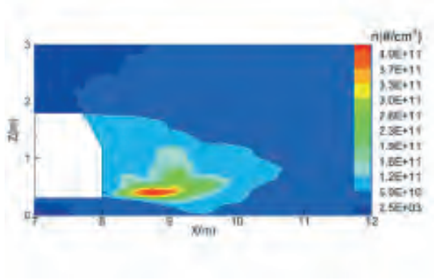
Discovered Phenomena of Spinning Droplet Collision

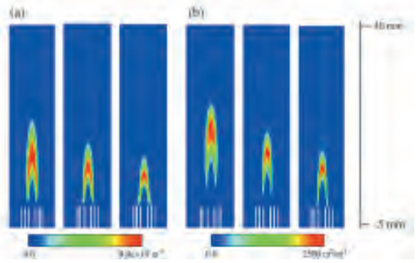
Droplet-droplet interaction is of essence to numerous natural and industrial processes, for example, rain clouds formation and fuel spray in rocket engines. Nowadays, with the help of high-performance supercomputers, we can successfully discover new phenomena of liquid droplet collision that are difficult to be captured by experiments. For a long time, scientists have suspected that colliding droplets may result in spinning motions, which may influence the subsequent droplet behaviors. A computational work was recently done to unveil the secret of the spinning effects on droplet collision. The prominent discovery is that the spinning droplet can induce significant nonaxisymmetric flow features for the head-on collision of equal-size droplets composed of the same liquid. The underlying physics is the spinning-orbital angular momentum conversion of the droplets. This discovery may have impact on the existing droplet collision models for spray simulation.

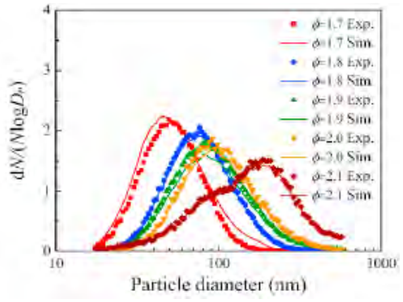


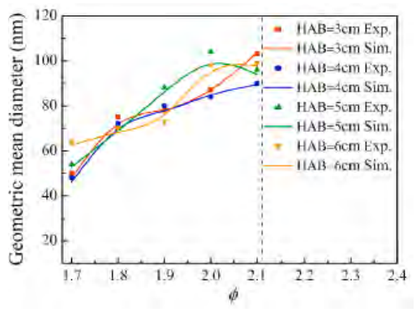
Multiphase and Multi-component Complex Systems with Micro- and Nano-scale

The development of novel model scheme for solving the challenging problems on multiphase and multi- component complex systems with micro- and nano-scale which have been identified in multi-disciplinary areas (i.e., thermofluids & combustion, materials, chemical and environmental sciences) and many potential engineering applications.



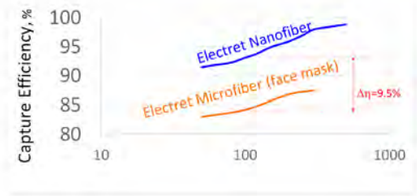






Charged Nanofiber Filter for Aerosol Filtration

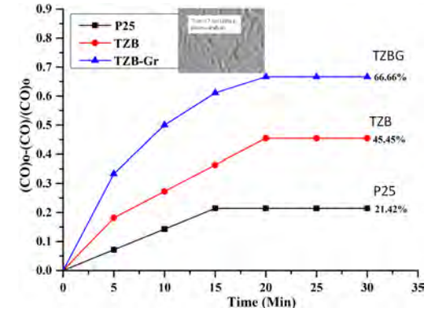
We have developed stable charged PVDF nanofibers that can effectively captured submicron aerosols 100 – 1000 nm. Examples are viruses that are attached to nuclei particles, agglomerated pollutant particles, and smog particles. As neutrally charged aerosols come close to the nanofibers, a dipole is induced followed by attraction capture between the charged fiber and the charge of the dipole aerosols. The charge nanofiber can increase filtration efficiency significantly without incurring pressure drop. The charged nanofiber mat can be multilayered to reduce the electrical interference of different layers of the charged fiber acting on the incoming aerosols. As a result, charged multilayered nanofiber mat made of PVDF can improve efficiency over existing mechanical filter of the same material by as much as 100%. Also, loading of charged multilayer nanofiber demonstrates that the filter can improve drastically the depth filtration which can last as much as more than 70% of the entire filter operation assuming the filter stops operation after reaching a terminal pressure drop. This is significantly changed from the charged single layer filter which operates only 30% in depth filtration. Also, charged nanofiber filter has been proven effective in capturing real aerosols from traffic emission same as with the NaCl aerosols generated in the laboratory.



Comparing our electret nanofiber filter with existing electret microfiber filter (9.5% add efficiency for 100nm particle)

Whitewash for Air/water Purification

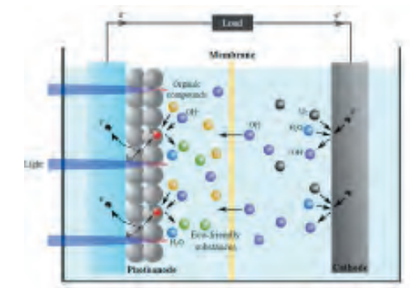
We have developed photocatalyst embedded in a coating that can effectively oxidize harmful gases in air, such as NOx and formaldehyde. It can also oxidize effectively harmful organics in water (simulated in the laboratory using methylene blue and rhodamine dye) much more effective than the P25, which is a gold standard photocatalyst. Also, it has been proven for effective disinfection killing both E. coli and S. Aureus in concentration of over 10,000 CFU/mL (30X dirty toilet). The technology has been protected by several United States patents and PCT and is licensed recently for commercialization for consumer products. One of the great benefits of the Whitewash is that the coating keeps the nanofibers enclosed. There is no concern on health hazard from loss of nanomaterials over use and no need for replenishment/recovery of the nanomaterials.



Whitewash with TZBG and TZB in converting formaldehyde of 700 ppb feed concentration.

Transport Phenomena in Electrochemical Energy Systems

Photocatalytic fuel cells: As an emerging wastewater treatment technology, photocatalytic fuel cell (PFC) can utilize solar energy to degrade the toxic organic compounds into eco-friendly substances and simultaneously harvest the chemical energy in the form of electricity, achieving environmental and economic sustainability by recovering valuable resources from wastewater. Before making the technology viable, however, the PFC performance must be substantially improved. Our current research focuses on the development of photocatalytic materials with novel properties for the light harvesting and the optimization in the structural design of the photoelectrode, which requires critical understanding of mass and charge transport through the photoelectrode.



Consortium for Sound and Vibration Research

Research Group

Director: Prof. L Cheng
Deputy Director: Dr RCK Leung
Members: Prof. ZQ Su
Dr YS Choy
Dr Henry Chu
Dr XJ Jing
Dr WO Wong
Dr J Zhu

Mission

Since its establishment, the Consortium for Sound and Vibration Research (CSVR) defined its mission to carry out high-quality research and development to meet the societal needs of the society, by fostering close collaborations and building up synergy in sound and vibration research through a research network with overseas research institutions, public service corporations, local industry and governmental departments.

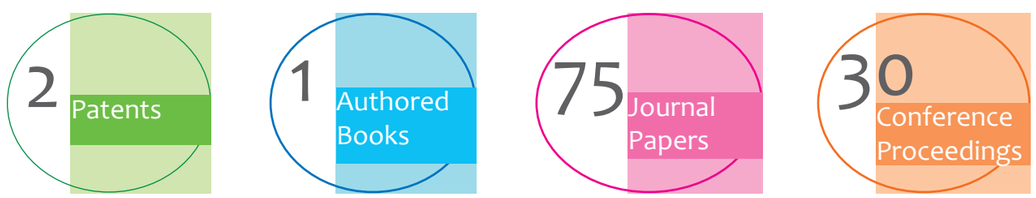
Research Funding

During the course of last year, CSVR has been maintaining its tradition and carrying out in-depth fundamental research and seeking high-end engineering applications. The success of the Consortium was reflected by the award of prestigious research grants, with a total amount of more than HK$8.8 million.

Principal Investigator	Project Title	Funding Scheme/ Source	Awarded Funding (HK$)
Prof. L Cheng	Enhanced Acoustic Black Hole Effects through Intentional Mechanical/Electromechanical Coupling and Nonlinearities	General Research Fund	883,995.00
Prof. ZQ Su	Non-invasive Ultrasound Monitoring of Blood Viscosity Using A Stretchable, Conformal, and Wearable Nanocomposite Sensing Array: Fundamental Research & Proof of Concept	General Research Fund	883,995.00
Dr YS Choy	Acoustics behavior of orifice with shallow backing cavity under grazing flow for development of perforated panel type metamaterial for fan noise control	General Research Fund	883,995.00
Dr XJ Jing	New Generation green and healthy Jackhammers with Integrated Bio-Inspired Anti-Vibration Handles	Construction Industry Council (CIC) Research and Technology Development Fund	908,500.00
	New Generation Vehicle Seats: Addressing Comfort and Health Issues	Innovation and Technology Fund	3,606,980.00
Dr RCK Leung	Passive Control of Cavity Aeroacoustic Resonance Using Localized Surface Compliance	General Research Fund	883,995.00
Dr WO Wong	Design of a tunable hybrid vibration damper with Coulomb and electromagnetic shunt damping	General Research Fund	756,000.00
		Total:	8,807,460.00

Research Output

Consortium members are attracting increasing international visibility and recognition by their active participations in almost all the most prestigious international journals in the field such as Journal of the Acoustical Society of America, Journal of Sound and Vibration, Mechanical Systems and Signal processing , Structural Health Monitoring, Ultrasonics, Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems etc. In 2019/20, CSVR members also worked out a lot of profound research outputs including patents, authored books, journal papers and conference proceedings.



On-going Research Projects

The Department has been very successful in recent years in winning research grant income from major sources including industry and the Government.

Externally funded projects

Project Title : Creation of Rechargeable Electron-fuels for Stationary Power Supplies and Electric Vehicles (ME)
Investigators : L An
Source of Funding : RGC Theme-based Projects
Amount Sponsored : HKD 1,707,053

Project Title : Mass and Charge Transport Through the Porous Photoanode in Photocatalytic Fuel Cells for Simultaneous Wastewater Treatment and Electricity Generation
Investigators : L An
Source of Funding : RGC Early Career Scheme
Amount Sponsored : HKD 820,000

Project Title : Understanding Charge Transport Phenomena in Photoelectrochemical Storage Cells for Solar Energy Storage
Investigators : L An and H Tang
Source of Funding : RGC General Research Fund
Amount Sponsored : HKD 642,421

Project Title : Development of a Novel Operator Splitting Framework for Solving Population Balance Equation on Aerosol Dynamics
Investigators : TL Chan and K Zhou (Wuhan University of Science and Technology, China)
Source of Funding : RGC General Research Fund
Amount Sponsored : HKD 579,126

Project Title : 多孔介质燃烧中气态及颗粒污染物生成与演化的实验及数值模拟研究
Investigators : TL Chan
Source of Funding : 面上项目
Amount Sponsored : RMB 788,000

Project Title : A Paradigm-shifting, Fully-integrated, Compact Wastewater-to-resource Facility
Investigators : GH Chen and GH Chen (The Hong Kong University of Science and Technology, HK)
Source of Funding : RGC Theme-based Research Scheme
Amount Sponsored : HKD 402,840

Project Title : Conformal Coating of Elastomeric Conducting Polymer with Ionic Conductivity on Ni-rich Layered Cathodes for Enhanced Redox Cycle Stability of Lithium-ion Batteries
Investigators : GH Chen
Source of Funding : General Research Fund
Amount Sponsored : HKD 579,522

Project Title : Investigation and Preparation of Long Cycle Life and Intrinsic Safe Lithium-Sulfur Batteries
Investigators : GH Chen, YN Zhu, XY Qin, JC Liu (EVE Energy Co., Ltd., China), YH Deng (Southern University of Science and Technology, China), JL Wang (Shanghai Jiao Tong University, China), XQ Dai (Guangdong Yiding New Energy Automotive Co., Ltd., China) and J Chen (Dalian Institute of Chemical Physics, China)
Source of Funding : Guangdong Key Areas Research and Development Scheme 2018/19 - "New energy Automotive" Major Special Project
Amount Sponsored : HKD 3,888,889

Project Title	:	Oxidative Chemical Vapor Deposition of Conductive Polymers on Particle Materials as Cathodes for Lithium Ion Batteries
Investigators	:	GH Chen and K Lau (Drexel University, US)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 637,584

Project Title	:	Preparation of High Performance Cathodes for Li-S Batteries and Their Property and Mechanism Study: Enhancement of Electron and Lithium Ion Transmission and Anchoring of Polysulfides
Investigators	:	GH Chen and YF Deng (South China University of Technology, China)
Source of Funding	:	RGC Joint Research Scheme
Amount Sponsored	:	HKD 1,124,880

Project Title	:	高性能锂硫电池体系与关键材料研究
Investigators	:	GH Chen, Q Liu, Y Liu, XY Qin and F Zhang
Source of Funding	:	深圳市科技計劃 - 深港創新圈
Amount Sponsored	:	HKD 3,341,400

Project Title	:	粤港澳光热电能源材料与器件联合实验室
Investigators	:	GH Chen, ZJ Zheng (ITC), Y Feng (AP), WY Wong (ABCT), G Li (EIE), JH Hao (AP), JY Dai (AP), YS Zhao (South China University of Technology, China/Guangdong), 郭姿珠 (深圳市比亞迪鋰電池有限公司 , China/Guangdong) and 裘小明 (深圳市瑞豐光電子股份有限公司 , China/Guangdong)
Source of Funding	:	粤港澳聯合實驗室
Amount Sponsored	:	HKD 1,081,400

Project Title	:	A Hierarchical Diagnosis Strategy and Integrity Monitoring Technique for Space Structures and Systems
Investigators	:	L Cheng, ZQ Su, YS Choy and XJ Jing
Source of Funding	:	Beijing Institute of Spacecraft Environment Engineering, China Academy of Space Technology
Amount Sponsored	:	HKD 4,843,430.03

Project Title	:	Nonlinear Third-Harmonic Shear-Horizontal Waves for Structural Health Monitoring Through Incipient Defect Detection
Investigators	:	L Cheng and JH Qiu (Nanjing University of Aeronautics and Astronautics, China)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 579,126

Project Title	:	Research on Structural Wave Manipulation and its Engineering Applications
Investigators	:	L Cheng
Source of Funding	:	State Key Laboratories of Mechanics and Control of Mechanical Structure, NUAA, China
Amount Sponsored	:	RMB 200,000

Project Title	:	Simulation, Monitoring and Control of Vibroacoustic Coupled Systems
Investigators	:	L Cheng
Source of Funding	:	State Key Laboratories of Mechanics and Control of Mechanical Structure, NUAA, China
Amount Sponsored	:	RMB 200,000

Project Title	:	Thermo-Acoustic Oscillations: Mechanism Exploration and Control Based on Delay Differential Equation Theories Under a Fully-coupled Modelling Framework
Investigators	:	L Cheng
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 642,421

Project Title	:	Vibroacoustics of Structures with Space-Dependent Structural Inhomogeneity: Modelling and Physical Exploration
Investigators	:	L Cheng
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 488,345

Project Title	:	基于声学黑洞效应（ABH）的波操纵及其工程应用中的力学问题研究
Investigators	:	L Cheng
Source of Funding	:	面上项目
Amount Sponsored	:	RMB 1,000,000

Project Title	:	面向载人航天器密封舱的噪音与振动控制理论方法及应用技术研究
Investigators	:	L Cheng, XJ Jing, YS Choy and ZQ Su
Source of Funding	:	China Academy of Space Agency (CAST)
Amount Sponsored	:	RMB 1,194,000

Project Title	:	基于非线性超声导波的材料早期疲劳评估方法研究
Investigators	:	L Cheng
Source of Funding	:	國家重點實驗室開放基金
Amount Sponsored	:	RMB 200,000

Project Title	:	剪切波典型与非典型非线性特性研究：从物理本质到材料评估
Investigators	:	L Cheng
Source of Funding	:	國家自然科學基金委員會合作研究項目
Amount Sponsored	:	RMB 1,400,000

Project Title	:	Tunable Sonic Perception Control Headset
Investigators	:	YS Choy, L Cheng, KH Chu, MH Siu (RS), PK Lun (EIE), CH Chan (RS) and WY Mung (Innovation Technology Company Limited, HK)
Source of Funding	:	Innovation and Technology Fund - University-Industry Collaboration Programme - Matching Grant for Joint Research (ITF-UICP-MGJR)
Amount Sponsored	:	HKD 6,240,375

Project Title	:	3D Fabrication of Vascularized Tissue Constructs Through a Combined Robotic and Dielectrophoretic Bio-Printing System
Investigators	:	KH Chu
Source of Funding	:	RGC Early Career Scheme
Amount Sponsored	:	HKD 732,164

Project Title	:	Development of Hybrid 3D Printing Technologies Aided by Reverse Engineering and Simulation Technologies for Making of Critical Spare Parts of Complex Systems
Investigators	:	MW Fu, ZB Jiao and C Ng
Source of Funding	:	Hong Kong Government (Electrical and Mechanical Services Department)
Amount Sponsored	:	HKD 350,000

Project Title	:	Epistemological Investigation of the Scattering Deformation Behaviors and Phenomena and the Undesirable Geometries and Inaccurate Dimensions in Micro-Scaled Plastic Deformation
Investigators	:	MW Fu
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 579,126

Project Title	:	不同尺度下塑性变形中断裂行为差异及断裂准则有效性研究
Investigators	:	MW Fu
Source of Funding	:	面上项目
Amount Sponsored	:	RMB 752,000

Project Title	:	不全冶金结合粉末原始边界的再结晶面棱隅形核的竞争机制研究
Investigators	:	MW Fu
Source of Funding	:	面上项目
Amount Sponsored	:	RMB 162,000

Project Title	:	钛合金薄板电致增塑机理及微细冲压成形工艺研究
Investigators	:	MW Fu
Source of Funding	:	面上项目
Amount Sponsored	:	RMB 100,000

Project Title	:	跨尺度构件形性协同塑性成形理论及技术基础研究
Investigators	:	MW Fu
Source of Funding	:	重点项目
Amount Sponsored	:	RMB 3,000,000

Project Title	:	Development and Application of TiC Reinforced Steel Matrix Composites Fabricated by in Situ Solidification
Investigators	:	ZB Jiao, L Fan, BC Zhou, YF Lin (Guangdong Institute of Materials and Processing, China), CJ Hu (Guangzhou Lei Meng Machinery Equipment Co Ltd, China), KH Zheng (Guangdong Institute of Materials and Processing, China), ZC Luo (Guangdong Institute of Materials and Processing, China), JX Lin (Guangzhou Lei Meng Machinery Equipment Co Ltd, China) and DK Li (Guangzhou Lei Meng Machinery Equipment Co Ltd, China)
Source of Funding	:	Guangzhou International Science and Technology Cooperation Project
Amount Sponsored	:	HKD 681,360

Project Title	:	Phase Stability and Deformation Mechanisms of Nanocrystalline FCC Medium- and High-entropy Alloys at Low and Intermediate Temperatures
Investigators	:	ZB Jiao
Source of Funding	:	RGC Early Career Scheme
Amount Sponsored	:	HKD 353,034

Project Title	:	共格 / 非共格纳米相复合强化钢的析出机理和强化机制
Investigators	:	ZB Jiao
Source of Funding	:	青年科学基金项目
Amount Sponsored	:	RMB 240,000

Project Title	:	Development of a Smart Localization Technique of Thermal Source
Investigators	:	XJ Jing
Source of Funding	:	Guangzhou Purple River Technology Limited
Amount Sponsored	:	HKD 287,435

Project Title	:	Modelling, Analysis & Design of Novel X-shaped Structures for Beneficial Nonlinear Stiffness and Damping Characteristics
Investigators	:	XJ Jing, R Allen (The University of Southampton, UK) and R Vaidyanathan (Imperial College, UK)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 488,345

Project Title		New Generation Vehicle Seats: Addressing Comfort and Health Issues
Investigators		XJ Jing and D Xie
Source of Funding		Innovation and Technology Fund - Automative Platforms and Application Systems R&D Centre (ITF-APAS)
Amount Sponsored		HKD 3,606,980

Project Title	:	Computational Science and Engineering for Product Innovation and Aeronautical System Design
Investigators	:	RCK Leung
Source of Funding	:	Charities & Foundation (Philip K. H. Wong Foundation)
Amount Sponsored	:	HKD 1,000,000

Project Title	:	Development of Advanced Close-Proximity (CPX) Technology with Suppressed Background Noise for Tyre/Road Noise Measurement in Hong Kong Traffic
Investigators	:	RCK Leung and WT Hung (CEE)
Source of Funding	:	Hong Kong Government (Environment and Conservation Fund)
Amount Sponsored	:	HKD 1,628,140

Project Title	:	Experimental and Numerical Studies of Innovative Acoustical Material Technology for Industrial and Urban Low-Frequency Noise Mitigation
Investigators	:	RCK Leung, WP Bi (Universite du Maine, Laboratoire d'Acoustique, France), Le D.A. (Universite du Maine, Laboratoire d'Acoustique, France) and Y. Auregan (Universite du Maine, Laboratoire d'Acoustique, France)
Source of Funding	:	RGC Joint Research Scheme (ANR/RGC Joint Research Scheme)
Amount Sponsored	:	HKD 3,240,000

Project Title	:	Novel Wave Functional Materials for Manipulating Light and Sound
Investigators	:	RCK Leung
Source of Funding	:	AoE Collaborated Project
Amount Sponsored	:	HKD 345,000

Project Title	:	High-Efficiency, Titanium-Graphene Composite Nanofiber Photocatalyst Integrated Into Flexible Surfaces or Wearables For Improving Air Purification
Investigators	:	WWF Leung
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 640,200

Project Title	:	Enhancing Human-Robot Interactions Through Thermal Point Clouds
Investigators	:	D Navarro Alarcon, LY Hu and L Li (Institute of Advanced Manufacturing Technology (IAMT), China/ Jiangsu)
Source of Funding	:	Jiangsu Industrial Technology Research Institute (JITRI) Collaborative Research Program Scheme
Amount Sponsored	:	HKD 779,030

Project Title	:	Experimental Study on Robotic Skin Rejuvenation with Thermal Monitoring
Investigators	:	D Navarro Alarcon
Source of Funding	:	Industry & Utilities (Rods Technology Company Limited)
Amount Sponsored	:	HKD 46,000

Project Title	:	Fourier-Based Shape Control of Soft Objects with Multiple Active Manipulation Points and Online Model Estimation
Investigators	:	D Navarro Alarcon
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 640,200

Project Title	:	Human-to-Robot Skill Transfer for Soft Manipulation in Unstructured Human Environments
Investigators	:	D Navarro Alarcon
Source of Funding	:	RGC Joint Research Scheme (France/HK Joint Research Scheme)
Amount Sponsored	:	HKD 86,400

Project Title	:	Visuo-Tactile Learning of Mechanical Properties for Robotic Grasping of Inhomogeneous Objects
Investigators	:	D Navarro Alarcon
Source of Funding	:	RGC Joint Research Scheme (Germany/HK Joint Research Scheme)
Amount Sponsored	:	HKD 43,200

Project Title	:	Synthesis of High Entropy Magnetic Nanoparticles (MNP) and MNP-Embedded Microswimmers for Targeted Heating in Biological Ducts
Investigators	:	HH Ruan and A Zhang (EE)
Source of Funding	:	NSFC/RGC Joint Research Scheme
Amount Sponsored	:	HKD 1,110,210

Project Title	:	Towards Low-cost Thermal Imaging Based on Chalcogenide Glasses: Exploiting Non-linear Viscoelasticity in Precision Lens Molding
Investigators	:	HH Ruan and TF Zhou (Beijing Institute of Technology, China/Beijing)
Source of Funding	:	General Research Fund
Amount Sponsored	:	HKD 892,398

Project Title	:	Investigation of the Evolution Kinetics of Porous Metals During Dealloying by Phase-field Method
Investigators	:	SQ Shi
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 640,200

Project Title	:	Size- and Temperature-dependent Phase Transition in NASICON-type Material on Li+- and Na+-(de) intercalation
Investigators	:	SQ Shi and LM Zhou
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 642,421

Project Title	:	Study of Gas Bubble Behavior for High Burnup Nuclear Fuels Using the Phase Field Methodology
Investigators	:	SQ Shi, SY Hu (Pacific Northwest National Laboratory, US), YL Li (Pacific Northwest National Laboratory, US) and CH Woo (The City University of Hong Kong, HK)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 579,126

Project Title	:	核燃料内部气泡演化行为的相场研究
Investigators	:	SQ Shi
Source of Funding	:	面上项目
Amount Sponsored	:	RMB 620,000

Project Title	:	A New Research Framework for Quantitative Characterization of Disorderedly Clustered Pitting-type Damage in Engineering Structures: A Bottleneck Breakthrough of Guided-wave-based Detection for Multitudinous Damage
Investigators	:	ZQ Su and P Fromme (University of London, UK)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 488,345

Project Title	:	Airworthiness Compliance Analysis and Verification of Structural Health Monitoring Technique
Investigators	:	ZQ Su, LM Zhou and F Zou (AAE)
Source of Funding	:	Beijing Aeronautical Science and Technology Research Institute of COMAC
Amount Sponsored	:	HKD 413,000

Project Title	:	Airworthiness Compliance Analysis and Verification Study on Structural Health Monitoring System
Investigators	:	ZQ Su and FX Zou (AAE) and LM Zhou
Source of Funding	:	Beijing Aeronautical Science and Technology Research Institute of COMAC
Amount Sponsored	:	HKD 2,970,000

Project Title	:	In-situ 3-D Nonlinear Ultrasonic Imaging for Embedded Scatterers with 3-D Features Using Diffuse Waves: from Offline NDE to Continuous SHM
Investigators	:	ZQ Su and David Z FAN (Nanyang Technological University, Singapore)
Source of Funding	:	General Research Fund
Amount Sponsored	:	HKD 637,750

Project Title	:	Probabilistic Evaluation of Hypervelocity Impact-Induced Damage Based on Cumulative Energy Transfer in Nonlinear Acousto-Ultrasonic Waves: a Framework for Space Application-Oriented Structural Health Monitoring
Investigators	:	ZQ Su and QM Zhang (Beijing Institute of Technology , China)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 1,007,680

Project Title	:	航空时变服役条件下复杂结构的损伤波动诊断
Investigators	:	ZQ Su
Source of Funding	:	重点项目
Amount Sponsored	:	RMB 950,000

Project Title	:	基于“准 - 弥散”喷涂传感网络及超声非线性的疲劳损伤原位定量监测
Investigators	:	ZQ Su
Source of Funding	:	面上项目
Amount Sponsored	:	RMB 650,000

Project Title	:	損傷誘發彈性波非線性特征的研究及其在飛行器 FRP 材料健康監測中的應用
Investigators	:	ZQ Su and SF Yuan (Nanjing University of Aeronautics and Astronautics, China)
Source of Funding	:	機械結構力學及控制國家重點實驗室開放課題項目
Amount Sponsored	:	RMB 200,000

Project Title	:	结构疲劳裂纹的非线性波动特征及其概率诊断与监测
Investigators	:	ZQ Su
Source of Funding	:	面上项目
Amount Sponsored	:	HKD 201,520

Project Title	:	On Physical Mechanism and Fluidic Control of Floppy Iris Syndrome During Cataract Surgery
Investigators	:	H Tang, KK Ramaesh (GTennent Institute of Ophthalmology, UK), PS Stewart (University of Glasgow, UK) and XY Luo (School of Mathematics & Statistics, UK)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 820,776

Project Title	:	Study of Magnetic Hyperthermia Based Cancer Treatment using a Holistic Simulation Framework
Investigators	:	H Tang, S Kenjeres (Delft University of Technology, Netherlands) and K Vafai (University of California, Riverside, US)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 654,921

Project Title	:	利用超疏水表面 Leidenfrost 现象实现可持续的湍流减阻
Investigators	:	H Tang
Source of Funding	:	國家自然科學基金委員會重大研究計劃項目
Amount Sponsored	:	RMB 475,000

Project Title	:	Investigation and Optimization of Porous Coatings on the Stabilization of Hypersonic Boundary-Layer Flows
Investigators	:	CY Wen, L Cheng and R Zhao (Beijing Institute of Technology, China)
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 642,421

Project Title	:	Investigation on Aerodynamic Breakup of a Liquid Droplet Behind a Shock Wave
Investigators	:	CY Wen
Source of Funding	:	RGC General Research Fund
Amount Sponsored	:	HKD 816,580.75

Project Title : Numerical and Experimental Investigations of Thermochemical Nonequilibrium Phenomena in Hypersonic Flows
Investigators : CY Wen, J HAO (AAE) and ZL Jiang (University of the Chinese Academy of Sciences, China/Beijing)
Source of Funding : General Research Fund
Amount Sponsored : HKD 705,919

Project Title : The Application of Dielectric Barrier Discharge Plasma Actuators on Active Flow Control around a Bluff Body
Investigators : CY Wen
Source of Funding : Non – Hong Kong (Office of Naval Research)
Amount Sponsored : HKD 557,420

Project Title : Trial: Development of Vertical Take-Off and Landing (VTOL) Unmanned Aerial Vehicle (UAV) for Air Quality Monitoring in Greater Bay Area
Investigators : CY Wen and SJ Shen (The Hong Kong University of Science and Technology, HK)
Source of Funding : Innovation and Technology Fund - Innovation and Technology Support Programme - Public Sector Trial Scheme (ITF-PSTS)
Amount Sponsored : HKD 1,000,000

Project Title : 汇聚激波诱导可燃界面的 Richtmyer-Meshkov 不稳定性研究
Investigators : CY Wen
Source of Funding : 面上項目
Amount Sponsored : RMB 620,000

Project Title : 液态燃料爆轰波形成之数值模拟研究
Investigators : CY Wen
Source of Funding : 爆炸科学与技术国家重点实验室 (北京理工大学) 开放基金项目
Amount Sponsored : RMB 100,000

Project Title : 存在粒度分布的铝粉 - 空气两相爆轰波的数值模拟研究
Investigators : CY Wen
Source of Funding : 国家重点实验室开放基金
Amount Sponsored : RMB 100,000

Project Title : 声学超表面对高超声速边界层转捩的抑制机理与应用
Investigators : CY Wen
Source of Funding : 面上项目
Amount Sponsored : RMB 200,000

Project Title : 多級生物黏附結構的實驗研究和仿製
Investigators : HM Yao, LL Hu (Sun Yat-sen University, China), XG Lei (Sun Yat-sen University, China), SY Liu (Sun Yat-sen University, China) and Q Ye (Sun Yat-sen University, China)
Source of Funding : 面上項目
Amount Sponsored : RMB 450,000

Project Title : 硅基锂电池负极材料的仿生梯度化设计与制备
Investigators : HM Yao
Source of Funding : 面上项目
Amount Sponsored : RMB 640,000

Project Title : Experimental and Numerical Investigation on the Collision of Binary Droplets of Shear-Thinning Fluids in Atmospheric Air
Investigators : P Zhang
Source of Funding : RGC General Research Fund
Amount Sponsored : HKD 1,015,442

Project Title : 高压环境下喷雾过程液滴碰撞模型的研究
Investigators : P Zhang
Source of Funding : 国家重点实验室开放基金
Amount Sponsored : RMB 100,000

Project Title : 大分子直链烷烃高精度从头算燃烧反应动力学的研究
Investigators : P Zhang
Source of Funding : 重大研究计划项目
Amount Sponsored : RMB 600,000

Project Title : Frenkel-Kontorova Model Based Simulation on the Deformation Mechanisms in Nanostructured High-entropy Alloys
Investigators : GP Zheng
Source of Funding : RGC General Research Fund
Amount Sponsored : HKD 642,421

Project Title : Investigations on the Formability and Mechanical Properties of Nano-Glasses by a Simulation Approach Combining Ab Initio Molecular Dynamics and Phase-Field Modeling
Investigators : GP Zheng
Source of Funding : RGC General Research Fund
Amount Sponsored : HKD 810,776

Project Title : Investigation on Broadband Transition Delay and Stability Control of Hypersonic Turbulent Boundary Layer via Gradient-index Acoustic Metasurface
Investigators : J Zhu
Source of Funding : RGC General Research Fund
Amount Sponsored : HKD 642,421

Project Title : Non-Hermitian Systems in Optics and Acoustics (ME)
Investigators : J Zhu and JTH Li (The Hong Kong University of Science and Technology, HK)
Source of Funding : RGC Collaborative Research Fund
Amount Sponsored : HKD 360,000

Project Title : Study of Genetic Algorithm-based Inverse Metamaterial Design for Acoustic Wave Manipulation in Water
Investigators : J Zhu
Source of Funding : General Research Fund
Amount Sponsored : HKD 705,919

Project Title : 基于超构表面的突破衍射极限的声波聚焦和成像
Investigators : J Zhu
Source of Funding : 面上项目
Amount Sponsored : RMB 620,000

Projects funded by Central Research Grant

Project Title : Flow and Transport Phenomena through Hierarchical Porous Electrodes in Vanadium Redox Flow Batteries for Large-scale Energy Storage
Investigators : L An
Amount Sponsored : HKD 150,000

Project Title : Large-size Lithiophilic Two-dimensional Metal Organic Frameworks on a Current Collector to Stabilize Lithium Deposition for Lithium Metal Batteries
Investigators : GH Chen and GP Zheng
Amount Sponsored : HKD 766.000

Project Title : The New Generation of High Capacity Batteries for Energy Storage
Investigators : GH Chen
Amount Sponsored : HKD 5,025,000

Project Title : Guided Wave Propagation in Both Plane and Cylindrical Structures with Applications to Crack Detection in Train Axles
Investigators : L Cheng
Amount Sponsored : HKD 500,000

Project Title : Structural and Acoustic Waves: Manipulation, Control and Monitoring
Investigators : L Cheng
Amount Sponsored : HKD 315,000

Project Title : Panel Silencing Device for Environmental Noise Control
Investigators : YS Choy
Amount Sponsored : HKD 189,000

Project Title : Development of a 3D Model-based Approach for Automated Surgical Knot Tying
Investigators : KH Chu
Amount Sponsored : HKD 189,000

Project Title : Development of a Motorized Microchip Platform for High-throughput Cell Assay and Characterization
Investigators : KH Chu
Amount Sponsored : HKD 50,000

Project Title : Numerical Evaluation of Damage and Failure Behaviours of Carbon Fiber Reinforced Metal Matrix Composites
Investigators : MW Fu and HH Ruan
Amount Sponsored : HKD 695,400

Project Title : Plastic Deformation Based Processing of Advanced Materials
Investigators : MW Fu
Amount Sponsored : HKD 315,000

Project Title : Shape Memory Performance and Micro-mechanics of 3D Printed Structures Made of Shape Memory Alloys for Bio-medical Applications
Investigators : MW Fu, SQ Shi, XS Yang (ISE) and Y Yang (The City University of Hong Kong, HK)
Amount Sponsored : HKD 400,000

Project Title : Size Effect Based Micro-mechanics and Its Affected Behaviors and Phenomena in Micro-manufacturing and Micro-product Service
Investigators : MW Fu and SQ Shi
Amount Sponsored : HKD 500,000

Project Title : Design of Advanced High-entropy Alloys for High-temperature Applications
Investigators : ZB Jiao
Amount Sponsored : HKD 150,000

Project Title : Design of High-strength and High-ductility Titanium Alloys for Aerospace Applications
Investigators : ZB Jiao
Amount Sponsored : HKD 200,000

Project Title : Microstructure Control and Property Optimization of High-strength Weldable Steels Strengthened by Nanoparticles for Construction Applications
Investigators : ZB Jiao, ZY Ding, BC Zhou and L Fan
Amount Sponsored : HKD 400,000

Project Title : Solute Segregation and Precipitation Mechanism in Nanoparticle-strengthened High-entropy Alloys
Investigators : ZB Jiao
Amount Sponsored : HKD 200,000

Project Title : Nonlinear Dynamics and Control with Innovative Applications (Mechanical Systems or Robots)
Investigators : XJ Jing
Amount Sponsored : HKD 315,000

Project Title : Robotic Technology for Underwater Infrastructure Inspection
Investigators : XJ Jing, WL Lai (LSGI), QX Wang (COMP) and Y Xia (CEE)
Amount Sponsored : HKD 1,000,000

Project Title : Novel Functional Devices Based on Spoof Surface Acoustic Waves
Investigators : T Liu
Amount Sponsored : HKD 500,000

Project Title : Effect of Red Blood Cell on Tumor Cell Adhesion -- Dissipative Particle Dynamics Study
Investigators : Y Liu
Amount Sponsored : HKD 50,000

Project Title : The Dynamics of a Single Fiber Conveyed in a Laminar Channel Flow
Investigators : Y Liu
Amount Sponsored : HKD 50,000

Project Title : Adaptive Visuo-Motor Models for Robotic Welding in Uncertain Construction Environments
Investigators : D Navarro Alarcon
Amount Sponsored : HKD 314,600

Project Title : Development of Robotic Technologies for Natural Human-Robot Interactions
Investigators : D Navarro Alarcon and KH Chu
Amount Sponsored : HKD 450,000

Project Title : Perceptual and Cognitive Methods for Intelligent Robot Behaviour
Investigators : D Navarro Alarcon
Amount Sponsored : HKD 200,000

Project Title : A Preliminary Study on an Acoustically-driven Artificial Sperm-like Structure that Swims for Targeted Heating
Investigators : HH Ruan
Amount Sponsored : HKD 150,000

Project Title : An Investigation of Dynamic Behavior of Metallic Glasses Using Mini SHPB System
Investigators : HH Ruan
Amount Sponsored : HKD 189,000

Project Title : Towards the Unique Miniaturized Optical Split Hopkinson Pressure Bar Apparatus - A Conceptual Investigation on Measuring Ultrahigh Strain Rate Using Optical Methods
Investigators : HH Ruan
Amount Sponsored : HKD 200,000

Project Title : Novel Bio-compatible Shape Memory Alloys with Zero Hysteresis, Linear Super-elasticity and Ultralow Modulus
Investigators : SQ Shi
Amount Sponsored : HKD 799,800

Project Title : Quantitative Damage Evaluation Using Nonlinear Vibro-Acoustics
Investigators : ZQ Su
Amount Sponsored : HKD 315,000

Project Title : Closed-loop Active Flow Control Using Machine Learning
Investigators : H Tang
Amount Sponsored : HKD 189,000

Project Title : Experimental and Numerical Investigation on the Interfacial Instability Induced by Rippled Shock Waves
Investigators : CY Wen and XS Luo (University of Science and Technology of China)
Amount Sponsored : HKD 180,600

Project Title : Numerical Study on the Hypervelocity Boundary-Layer Transition with Real Gas Effects
Investigators : CY Wen
Amount Sponsored : HKD 799,800

Project Title : Theoretical and Numerical Study on Vibrational Nonequilibrium Effect on Hydrogen Detonation
Investigators : CY Wen
Amount Sponsored : HKD 189,000

Project Title : UAV-Enabled Intelligent Bridge Inspection Systems for the Smart City
Investigators : CY Wen, P Lu (AAE), LT Hsu (AAE), W Chen (LSGI) and SJ Shen (The Hong Kong University of Science and Technology, HK)
Amount Sponsored : HKD 400,000

Project Title : Integrating the Physical and Chemical Antifouling Strategies Learned from Nature
Investigators : HM Yao
Amount Sponsored : HKD 148,780

Project Title : Optimizing Heterogeneity in Si-based Nanocomposite Anode Materials for Higher Electrochemical Performance
Investigators : HM Yao
Amount Sponsored : HKD 189,000

Project Title : Hypergolic Ignition Induced by Propellant Droplet Collision
Investigators : P Zhang
Amount Sponsored : HKD 378,000

Project Title : Spray Impingement Modelling and Simulation based on Accurate Description of Droplet Impact Dynamics
Investigators : P Zhang and CL Tang (Xi'an Jiaotong University, China)
Amount Sponsored : HKD 180,600

Project Title : First-principles Calculations and Experimental Verification of Ferroelectrics in Two-dimensional Materials
Investigators : GP Zheng
Amount Sponsored : HKD 189,000

Project Title : Multi-scale Simulation on the Deformation Mechanisms of Disordered Alloys
Investigators : GP Zheng
Amount Sponsored : HKD 315,000

Project Title : The Pyroelectric Properties and Electro-caloric Effect of Graphene Oxide-copolymer Multi-layer Structures
Investigators : GP Zheng and HH Ruan
Amount Sponsored : HKD 695,400

Project Title : Graphene Strengthened Silicon Nanocomposite Anodes for Lithium Ion Batteries
Investigators : LM Zhou, HT Huang (AP), HM Yao, JK Kim (Hong Kong University of Science and Technology, HK), SQ Shi and CY Tang (ISE)
Amount Sponsored : HKD 400,000

Project Title : Hypersonic Turbulent Boundary Layer Transition Delay with Acoustic Metasurface
Investigators : J Zhu
Amount Sponsored : HKD 189,000

Projects with Research Student funded by CRG/GRF/ITF/ other external grants

Student Name	Project Title	Supervisor
PhD (Full-Time)		
AI Chunhui	Fluid-structure Interaction of Compliant Vessels with Pulsatile Flows	H Tang
AKHTAR Awais	Nanocrystalline Alloy Coating with Ultrahigh Stability and Wearability for Molding Applications	HH Ruan
AN Shuowei	Non-Hermitian Elastic Wave Metamaterials Based on Parity-time Symmetry	J Zhu
ANSARI Talha Qasim	A Phase-Field Modelling Framework for Localized Corrosion Kinetics	SH Shi
ARIF Muhammad Irsalan	Aeroacoustics of Airfoil Tonal Noise and Its Reduction Using Passive Methods	RCK Leung
BIAN Jing	Analysis and Design of Nonlinear Damping and Its Applications	XJ Jing
CHANG Ching Wei	Path-planning and Trajectory Optimization for Unmanned Aerial Vehicle Bridge Inspection System	CY Wen
CHEN Long	Localization and Characterization of the Fault in Wheel/Rail System	YS Choy
CHEN Shengyang	Vision-based Localizating and Navigation System for UAV Application	CY Wen
CHEN Zongnan	The Application of Dielectric Barrier Discharge Plasma Actuators on Active Flow Control around a Bluff Body	CY Wen
CHI Tianxi	Spectral Analysis and Correlation Study of Skin Blood Flow Oscillation	Y Liu
CHI Yicheng	Ab Initio Chemical Kinetics of Combustion Reactions of Large Straight-Chain Alkanes	P Zhang, CY Wen
CUI Jingyu	Numerical Study on the Dynamics of Primary Cilium in Pulsatile Flow by the Immersed Boundary-Lattice Boltzmann Method	Y Liu, S Chen (Tongji University, China), LL Xiao (Shanghai University of Engineering Science, China)
CUI Zhenxi	Image-based Alignment and Assembly of Cell-Laden Hydrogels under Cell Culture Medium	KH Chu, L Cheng
DUONGTHIPTHEWA Anchalee	Carbon Fibre Composites with Multi-nanofillers for Lightning Strike Protection	LM Zhou
ECCEL VELLWOCK Andre	Biomimetic Surfaces Topographies as Antifouling Strategies	HM Yao
ESAN Oladapo Christopher	Mathematical Modeling of Fluid Flow and Mass/Charge Transport in Vanadium Redox Flow Batteries	L An, H Tang
FAN E	Numerical Investigation on Reacting Shock-Bubble Interaction	CY Wen
FAN Lei	Nanoscale Precipitation and Mechanical Properties of Coherent Precipitation Strengthened High-Entropy Alloys	ZB Jiao, SQ Shi
FANG Jieyichen	Thermal Stability and Elevated-temperature Mechanical Properties of Coherent Precipitation-strengthened High-entropy Alloys	ZB Jiao, MW Fu
FU Jin	Size Effects on Quality and Preperty of Micro Additive Manufactured Shape Memory Alloy Components	MW Fu
FU Yu	Multifunctional Structural Lithium Ion Batteries Based on Carbon Fibre Reinforced Polymer Composites	LM Zhou
GAO He	Inverse Design Method in Acoustic Wave Front Manipulation	J Zhu, YS Choy
GAO Lihao	Droplet Impact Dynamics of Complex Fluids	H Tang, Weiwei Deng (SUS Tech)
GAO Yang	Interface Mechanics in Advanced Composite Materials	HM Yao
GUO Zhenbin	Biomimetic Tuning of Electrode Materials for High-Performance Li-ion Batteries	HM Yao
HAMEED Imran	Navigation and Control of Mobile Robots on Uncertain and Rough Grounds	XJ Jing
HE Chengming	Binary Droplet Collision and Mixing in Gaseous Environment	P Zhang, RCK Leung
HU Jing	Heterogeneous Nanostructured Composite Electrode Materials for Flexible Supercapacitors	LM Zhou, HM Yao
HU Zhongyu	Hybrid Deterministic-statistical Models based on the Coupling by the Condensed Transfer Function Approach	L Cheng
HUANG Guangyuan	Modelling and Control of Noise Generation from Flow over a Generic Model of Road Vehicle	RCK Leung, ZG Yang (Tongji University, China)
HUANG Kaicheng	Cellular Patterns with Designed Form on Different Surfaces by Negative Dielectrophoresis	KH Chu, L Cheng
JIANG Qinghong	Dual Laser Additive/Forging Hybrid Manufacturing	MW Fu, Qi GE (SUS Tech)
JIANG Xiao	Soot Formation and Evolution Characteristics of Premixed Hydrocarbon Flames	TL Chan
LABAZANOVA Luiza	Development of the Robotic Hand that Mimics Human Anatomy and Possesses Dexterous in-hand Manipulation Skills	David Navarro-Alarcon
LAI Jiewen	Development of Continuum Robot System for Blood Suction	KH Chu, L Cheng
LI Dongfang	Advancement of Close-proximity (CPX) Measurement Methodology for Tyre/Road Noise Radiation in Highly Urbanized City	RCK Leung, WT Hung (CEE)
LI Guangzhe	Investigations on Carbon-based Materials for Sodium-based Ion Battery Applications	L An, GH Chen
LI Jie	Investigation of the Evolution Kinetics of Porous Metals during Dealloying by Phase-field Methods	SQ Shi
LI Jingying	Control and Filtering for Nonlinear Networked Control Systems via Fuzzy Model Approach and Its Applications	XJ Jing, XL Huang (Harbin Institute of Technology, China)
LI Meng	Nonlinear Vibration and Energy Harvesting Systems	XJ Jing
LI Quankun	Frequency Domain Methods for Analysis and Characterization of Nonlinearity in Fault Detection	XJ Jing
LI Tian	Studies on the Magnetic and Mechanical Properties of Amorphous Alloy Nano-glasses	GP Zheng
LI Ying	Aerodynamic Noise Control by Smart Structural Material	YS Choy
LI Zhengchao	Robust Control and Filtering for Systems with State-dependent Uncertainties and its Applications	XJ Jing, JY Yu (Harbin Institute of Technology, China), O Kaynak (Harbin Institute of Technology, China)
LI Zhengtong	Design Strategies of Using Urban Corridors in High-rise Urban Areas for Mitigation of the Heat Island Effect and Air Pollution	CY Wen
LIAO Yaozhong	An Innovative Nanocomposites-inspired In-situ Broadband Sensing Network Coating and Its Applications to Acousto-ultrasonics-based Structural Health Monitoring	ZQ Su, LM Zhou, Z Zhang (National Center for Nanoscience and Technology, China)

Student Name	Project Title	Supervisor
LIN Dongmei	Temperature Effect of TiO_2 Nanomaterials on Li/Na-Ion Batteries: Study of Performance, Structural and Transport Properties	LM Zhou, BH Li (Tsinghua University, China)
LIU Jinan	Artificial Micro-Swimmers for Targeted Heating in Biological Ducts	HH Ruan
LIU Mingran	Novel Flexible Nanocomposite Sensors for Monitoring of Vital Signs in Human Body	Y Liu
LIU Shuhong	Spectral Analysis and Correlation Study of Skin Blood Flow Oscillation	Y Liu
LO Kin Shing Kenneth	Perovskite and Dye-Sensitized Solar Cells with Graphene Enhancement	WWF Leung
LONG Tiehan	Spatial Normal Modes of High-Speed Boundary Layer on Porous Wall	CY Wen
LYU Linlong	Pre-Lithiated Silicon-Based Lithium Ion Battery and its Performance Optimization	LM Zhou
MA Li	Vibration and Sound Radiation Analysis of Plates Embedded with Acoustic Black Holes (ABHs)	L Cheng
MA Wanyu	Vision-Based Robotic Manipulation of Deformable Objects with Iterative Learning of Mechanical Properties	D Navarro-Alarcon
MUDDASSIR Muhammad	Development of an Automatic Skin Photo-Rejuvenation Treatment Robotic System	D Navarro-Alarcon
PAN Zhefei	Investigations on Direct Ethylene Glycol Fuel Cells using Hydrogen Peroxide as Oxidant	L An, CY Wen
RAZA Hassan	High Entropy Oxides (HEOs) For Lithium Sulfur Batteries	GH Chen
SHI Xingyi	Experimental Investigations on Vanadium-Air Redox Flow Batteries	L An, HH Ruan
SU Xiangyu	Design and Development of Formate Fuel Cells	L An, CY Wen
SU Yiyin	Composites Materials with Embedded Nanomaterials Sensors	LM Zhou, ZQ Su
SUN Qiangqiang	Charged Nanofiber Filters for Enhanced Aerosol Filtration	WWF Leung
SUN Ruqi	Design of Dynamic Vibration Absorber with Tunable Damping	WO Wong, L Cheng
SUN Xiang	Enhanced Acoustic Black Hole Effects through Intentional Nonlinearities	L Cheng
TIAN Xudong	Experimental Study on the Stability and Transition of High-Speed Boundary Layer using ART Metamaterials	CY Wen
TIAN Yishen	A Study of a Novel High-Static-Low-Dynamic-Stiffness Vibration Isolator	XJ Jing, Dengqing Gao (HIT)
ULLAH Sana	Piezoelectric and Pyroelectric Properties of Ferroelectric Composite Containing Two-dimensional Materials	GP Zheng
UY Chun Kit	Theoretical and Numerical Investigation on Vibrational Nonguilibrium Effect in Detionation	CY Wen
WANG Jianbiao	Theoretical and Experimental Investigations on Time-temperature Dependent Viscoelastic Properties of Chalcogenide Glass	HH Ruan, HM Yao
WANG Jingwei	Surface Modification of Electrode Materials with a Modified PEDOT: PSS Conducting and Flexible Polymer Coating	GH Chen, SH Song (Harbin Institute of Technology, China)
WANG Qian	Silicon-based Composites as Anodes for Lithium Ion Batteries	LM Zhou, HM Yao
WANG Shu	Investigation on Aerodynamics of Airfoil at Low Reynolds Number	Y Liu, Y Zhou (Harbin Institute of Technology, China)
WANG Yafeng	Study of the Gas Bubble Behavior of High Burnup Nuclear Fuels using the Phase-Field Methodology	SQ Shi

Student Name	Project Title	Supervisor
WANG Zhaokun	Physical Mechanism and Fluidic Control of Floppy Iris Syndrome during Cataract Surgery	H Tang
WEI Long	A Study of Tribology Performance and Airborne Wear Particles from Disc Brakes	YS Choy, CS Cheung
WEN Fuzhen	Third-Harmonic Shear-Horizontal (SH) Waves for Structural Health Monitoring through Incipient Damage Detection	L Cheng
WEN Weisong	GNSS/INS/LiDAR/HD Map-based Localization for Autonomous Vehicles in Super-Urbanized Areas	CY Wen, LT Hsu (AAE)
XIANG Biao	Vibration Dynamics and Control of Magnetically Suspended Rotating Machine	WO Wong
XIONG Jie	Machine Learning Approach for New Advanced Material Design	SQ Shi
XU Lei	Interaction of Nonlinear Ultrasonic Waves with Fatigue Cracks: from Analytical Modeling, through Experimental Validation to Engineering Applications	ZQ Su
YANG Jianwei	Tomography-based Health Monitoring of Composite Structures Using Fully Diffuse Sensing Networks	ZQ Su
YANG Juntan	Mechanics of Two-dimensional (2D) Materials	HM Yao
YANG Weiping	Prediction and Reduction of Tunnel Noise	YS Choy, J Zhu
YANG Xiongbin	Elastic Wave Imaging Using Nonlinear Ultrasonic Features and Phased Array-driven Reverse Time Migration	ZQ Su
ZAHRA Omar Ibn Elkhatab Abdallah A. E.	A Bio-Inspired Method for Sensorimotor Coordination of Robotic Systems Based on Self-Organising Maps	D Navarro Alarcon
ZHANG Linli	Structural Wave Manipulation and Applications through Electro-mechanically Enhanced Acoustic Black Hole Effects	L Cheng
ZHANG Xiaoqi	Acoustic Behavior of Micro-Perforated Panels in a Grazing Flow	L Cheng
ZHAO Fuwang	Flexibility and Ground Effects on the Performance of a Flapping Hydrofoil Based Flow Energy Harvester	H Tang
ZHAO Liangjing	Variation of Spectral Characteristic Vasomotion at Different Location of the Arm	Y Liu
ZHAO Qingxiang	Development and control of a novel continuum robot with a rotatable body for easy and smooth insertion in a new environment	Henry KH Chu
ZHENG Junyuan	Study on Size Effects Affected progressive Microforming Process and Deformation Using Sheet Metals and Wire Metals	MW Fu
ZHOU Bingchen	Microstructural Evolution and Mechanical Properties of Nanoscale Co-precipitation-strengthened Steels	ZB Jiao, SQ Shi
ZHOU Peng	Virtual Reality Based Intelligent Teleoperation Welding Robot System Design	David Navarro-Alarcon
ZHOU Pengyu	Design of a New All-inkjet-printed, Flexible, Ultra-broadband Film Sensor Using Nanocomposites for in-situ Acquisition of Dynamic Disturbance	ZQ Su, LM Zhou
ZHOU Quan	Thermal, Combustion and Emission Characteristics of Inverse-Diffusion-Flame Burner Burning Biomass-Derived Syngas	CS Cheung, CW Leung, ZH Huang (Xi'an Jiaotong University, China)
ZHOU Tong	Vibration Analysis of Structures with Space-Dependent Inhomogeneity: Numerical Modeling and Practical Applications	L Cheng
ZHOU Weifeng	Modelling and Controlling of an Autonomous Tail-sitter Vertical Take-off and Landing (VTOL) Unmanned Aerial Vehicles (UAVs)	CY Wen, P Lu (AAE)

Student Name	Project Title	Supervisor
ZHOU Zeqi	Synthesis of Transition Metal Phosphosulfide@Carbon Nanocomposite as Anode Materials for Rechargeable Sodium Ion Batteries	GH Chen
PhD (Part-Time)		
CHAN Ying Ngai	Soundscape Design and Planning for Learning in Hong Kong	YS Choy
LAM Ka Hei	Development of Low Frequency Duct Aeroacoustic Liner Using Metamaterial Technology	RCK Leung
LI Yun	Perovskite Solar Cell based on Solution Processing	WWF Leung
LIANG Shanjun	Flexible Broadband Acoustic Metamaterials	J Zhu, YS Choy
LIU Yao	Investigation on Shock Induced Stripping Breakup Process of a Liquid Droplet	CY Wen
TSE Kwai Wa	Real-Time Cracks Detection and Segmentation Using a Deed Neural Network on Unmanned Aerial Vehicle	CY Wen
WU Wai Hung	High Dynamic Range Stereo Vision Guided Robotic Are Welding	David Navarro-Alarcon
MPhil (Full-Time)		
LIU Yutong	Suppression of Li Dendrite using MOFs as Scaffolds	GH Chen
ZHU Yinggang	Understanding the Self-healing Effect of Room-temperature Liquid Alloys as the Anode in Lithium Ion Battery	GH Chen
MPhil (Part-Time)		
HOU Ruoyang	Numerical Modeling of Aeroacoustics with Porous Material	RCK Leung
HU Luyin	Robot Thermal Servoing: New Models, Controls & Experiments	David Navarro-Alarcon
TSOI Man Ho	Design and Fabrication of Sub-Giga-Hertz Range SAW Filter for IoT Applications	YS Choy
YUEN Tsz Wai	Simulation of Multi-Fish Swimming	H Tang

Research Collaborations

In the year of 2018/2019, the Department has worked hard to establish collaborative research activities with the following educational institutions and organizations:

Institution / Organization	Region
AGH university of Technology	Poland
Alfa Laval, Sweden	Sweden
Argonne National Lab	USA
Avalon	Taiwan
Beihang University	Mainland China
Beijing Institute of Technology	Mainland China
Beijing University of Technology	Mainland China
Blickson Limited	Hong Kong
Brandenburg University of Technology Cottbus-Senftenberg	Germany
Central South University	Changsha
China Jiliang University	Mainland China
Chinese Academy of Sciences	Beijing
Chongqing University	Chongqing
City College of New York	USA
City University of Hong Kong	Mainland China
College of France	France
COMAC Beijing Aeronautical Science & Technology Research Institute	Mainland China
Concordia University	Canada
Curtin Unviersity	Austrilia
Dalian Institute of Chemical Physics, Chinese Academy of Sciences	Dalian
Dalian University of Technology	Mainland China
DJI Co.	Mainland China
Edinburgh Centre for Robotics	UK
EMSD (Electrical and Mechanical Services Department), HKSAR	Hong Kong
French National Center for Scientific Research	France
GP Battery	Hong Kong
Graduate School at Shenzhen, Tsinghua University	Mainland China
Guilin University of Technology	Mainland China
Harbin Engineering University	Mainland China
Harbin Institute of Technology	Mainland China
Harbin Institute of Technology, Shenzhen	Mainland China
Henan University	Mainland China
HK Environmental Protection Department	Mainland China
HK Non Woven Association	Mainland China
Hong Kong Construction Industrial Council	Mainland China

Institution / Organization	Region
Hong Kong Jockey Club	Hong Kong
Hong Kong University of Science and Technology	Hong Kong
Huazhong University of Science and Technology	Mainland China
Huizhou Qichen New Tech	Mainland China
Imperial College London	UK
INSA Toulouse	France
INSA-Lyon	France
Institut Pascal / SIGMA Clermont	France
Institute for the Development and Quality, Macau	Hong Kong
Institute of Fluid-Flow Machinery, Polish Academy of Sciences	Poland
Institute of Metal Research, Chinese Academy of Sciences	Mainland China
Jilin University	Mainland China
Jinan University	Mainland China
Key Laboratory of Science and Technology on Liquid Rocket Engine, Xi-an Aerospace Propulsion Institute	Mainland China
Korea Advanced Institute of Science and Technology	South Korea
Le Mans Université	France
Mass Transport Railroad (MTR)	Mainland China
MayAir	Mainland China
Midea	Mainland China
Monash University	Australia
Naitonal Taipei University of Technology	Taiwan
Nanjing University of Aeronautics and Astronautics	Mainland China
Nanyang Technological University	Singapore
National Research Council	Italy
National-provincial Joint Engineering Research Center of High Temperature Materials and Lining Technology	Mainland China
Ningbo Material Technology And Engineering Institute (Chen Tao group)	Mainland China
Northwestern Polytechnical University	Mainland China
Northwestern Polytechnical University	Mainland China
Pacific Northwest National Lab	USA
Peking University	Beijing
Penn State University	USA
Pennsylvania State University	USA
Peter the Great St Petersburg Polytechnic University	Russia
Politecnico di Milano	Italy
Purdue Unvierstiy	USA
Qiqihar University	Mainland China
RODS Technology Company Ltd	Hong Kong

Institution / Organization	Region
Shanghai Jiaotong University	Mainland China
Shanghai University	Mainland China
Shenyang Institute of Automation, CAS	Mainland China
Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences	Mainland China
Shenzhen Qichen New Tech Ltd.	Mainland China
Shenzhen University	Mainland China
Shenzhen µ Precision Technology Limited	Mainland China
Shock Wave Laboratory, RWTH Aachen University	Germany
Sichuan University	Mainland China
South China University of Technology	Mainland China
Southeast University	Mainland China
Southern University of Science and Technology	Mainland China
Syncrude	Canada
Technical University of Munich	Germany
The Hong Kong Jockey Club	Hong Kong
The State Key Laboratory of Refractories and Metallurgy	Mainland China
The University of California, San Diego	USA
Tianjin University	Mainland China
Tongji University	Mainland China
University College London	UK
University of Alberta	Canada
University of Hong Kong	Hong Kong
University of Illinois at Urbana-Champaign	USA
University of Liege	Belgium
University of Montpelier / LIRMM	France
University of Naples "Federico II"	Italy
University of Paris, UTC	France
University of Science and Technology Beijing	Mainland China
University of Science and Technology of China	Mainland China
University of Southern Queensland	Australia
University of Sydney	Australia
University of Tasmania	Australia
University of Toronto	Canada
University of Toulon	France
University of Waterloo	Canada
Western Sydney University	Australia
Xi'an Jiaotong Univesity	Mainland China
Zhejiang University	Mainland China
Zhengzhou University	Mainland China

Research Outputs

Summary	
Patents	3
Books & Book Chapters	8
Journals	215
Conference Proceedings	55
Total no. of archival publications	281

Patents

1. 徐趙東，何振華，郭迎慶，景興建，潘文，金真求，“一種具有抗拉拔性能的多維隔減振裝置”，PRC patent (Utility model), No. ZL 2018 2 1646058.3 (2019).
2. JING, X.J., “Bio-inspired Omnidirectional Multi-tail Underwater Robot”, US provisional Patent, No. 62/825,918 (2019).
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3. HU, Z., MAXIT, L. and CHENG, L., "A Piecewise Calculation Scheme for the Mid-To-High Frequency Strong Coupling Modelling" , 26th International Congress on Sound and Vibration (ICSV26), 7-11 July, Montreal, Canada (2019).
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5. CHENG, L., "Recent Advances in Acoustic Black Hole Research" , Congress of Shanghai Society of Mechanics, 26 May, Shanghai (2019).
6. CHENG, L., "Structural Wave Manipulation through Acoustic Black Holes" , 13th International Conference on Recent Advances in Structural Dynamics (RASD2019), 15-17 April, Lyon, France (2019).
7. WEN, F.Z. and CHENG, L., "A Theoretical Model for SH-wave Generation and Reception by MsT Transducer" , The 9th East Asia Mechanical and Aerospace Engineering Workshop, 30 May - 1 June, Seoul, Korea (2019).
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46. LIANG, Y., LIU, L. and WEN, C.Y., "Evolution of an Air/SF6/Air Finite-thickness Fluid Layer Impacted by Shock Wave" , Proceedings of the 32nd International Symposium of Shock Waves (ISSW32), 14-19 July, National University of Singapore, Singapore (2019).
47. LIANG, Y., LIU, L. and WEN, C.Y., "Experimental and Numerical Study on Single-mode RM Instability under a Cylindrical Converging Shock" , Proceedings of 2019 Asian-Pacific Conference on Aerospace Technology and Science (APCATS), 28-31 August, National Chiao Tung University, Hsin Chu, Taiwan (2019).
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50. UY, C.K., SHI, L.S. and WEN, C.Y., "The Effect of Vibrational Nonequilibrium on One-dimensional Detonation Instability" , 1st International Conference of Thermal Fluid Dynamics and Control, 2-6 August, Christchurch, New Zealand (2019).
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53. SUN, R. and WONG, W.O., "Vibration Control with a Tunable Self-Sensing Electromagnetic Shunt Damper" , 23rd International Conference on Mechatronics Technology (ICMT), IEEE, 23-26 October, Fisciano, Italy (2019).
54. ZHENG, G.P., "The Improvement on Mechanical Strength and Ductility of Nanoglass through Boundary Engineering of Metallic-glass Nanoparticles" , International Congress on Advanced Materials Sciences and Engineering, 22-24 July, Osaka, Japan (2019).
55. ZHENG, G.P., "Simulations on Shear Banding in Ultra-thin Metallic Glasses" , TMS 148th Annual Meeting Supplemental Proceedings, San Antonio, 10-14 March, San Antonio, USA (2019).

Consultancy Projects

Member of the Department continued to make contributions to be the profession by engaging in high level consultancies for international organizations, government departments, private sector firms and community groups.

Below are some of our clients:

Ayric Material & Engineering Company Limited
Beijing Institute of Technology
Biel Crystal (HK) Manufactory Ltd.
Electrical and Mechanical Services Department, HKSAR
Environmental Protection Department, HKSAR
G&M Engineering Company Limited
Henan Mingmei Magnesium Technology Co. Ltd.
Hong Kong Applied Science and Technology Research Institute (ASTRI))
Hong Kong Police Force
Institute of Metal Research, Chinese Academy of Sciences
Intelligent CAD/CAM Technology Ltd.
Marine Department, HKSAR
北京航天和興科技有限公司
無錫鐘山環境工程科技有限公司

Departmental Seminar Series

The Department regularly holds research seminars on a wide variety of topics delivered by distinguished visiting researchers or external invited speakers with the aim of advancing research by exchanging knowledge and ideas within the field of Mechanical Engineering.

Date	Speaker/ Affiliation	Seminar Title
9-Jul-2019	**Dr Hao Zhao** Mechanical & Aerospace Engineering, Princeton University, USA	Extreme combustion: A New Frontier in Combustion Research
11-Jul-2019	**Prof. I-Ming Chen** Robotics Research Center, School of Mechanical and Aerospace Engineering Nanyang Technological University, Singapore	Robotic Perception and Learning for Intelligent Manufacturing and Warehouse Automation
11-Jul-2019	**Prof. Mo Li** School of Materials Science and Engineering, Georgia Institute of Technology, Atlanta, Georgia, USA	Nanoglass: An novel approach to harden and toughen metallic glasses by spatial patterning of heterogeneities
9-Aug-2019	**Dr Zheng Mingjie** Institute of Nuclear Energy Safety Technology, Chinese Academy of Sciences, Hefei, Anhui, 230031, China	Quick Screening Design of Solid-Solution Multi-Principal Element Alloy
14-Aug-2019	**Prof. Jingtao Du** College of Power and Energy Engineering, Harbin Engineering University, China	Flexible structure vibration and its coupling with bounded sound spaces
15-Aug-2019	**Dr Qi Xu** Southwest Jiaotong University, China	Definite integral stability method of multi-delay systems with applications
20-Aug-2019	**Dr Xianbo Xiang** Huazhong University of Science and Technology, China	Control of Marine Robots: Challenges, Methods and Applications
26-Sep-2019	**Prof. Zhaoyin Wen** Shanghai Institute of Ceramics, Chinese Academy of Sciences (SICCAS), China	Materials and interface in high energy density lithium and sodium batteries
8-Oct-2019	**Prof. Chun-Ying Lee** Department of Mechanical Engineering, National Taipei University of Technology, Taiwan	The Influence of Forced-Air Cooling on a 3D Printed Part Manufactured by Fused Filament Fabrication

Highlights of the Year

Staff Achievements and Research Development

Success in securing GRF 2020/21

In the 2020/2021 results of grants from the Research Grants Council's General Research Fund (GRF) announced in June 2020, ME's success rate for the GRF was 36% in 2020/21 exercise. Eight of our GRF proposals were funded.

Principal Investigator	Project Title
Prof. CHENG Li	Enhanced Acoustic Black Hole Effects through Intentional Mechanical/Electromechanical Coupling and Nonlinearities
Dr CHOY Yat Sze	Acoustics behavior of orifice with shallow backing cavity under grazing flow for development of perforated panel type metamaterial for fan noise control
Prof. FU Ming-wang	Size effect affected anisotropy and asymmetry in multi-scaled deformation of metallic materials
Dr LEUNG Chi Kin Randolph	Passive Control of Cavity Aeroacoustic Resonance Using Localized Surface Compliance
Prof. SU Zhongqing	Non-invasive Ultrasound Monitoring of Blood Viscosity Using A Stretchable, Conformal, and Wearable Nanocomposite Sensing Array: Fundamental Research & Proof of Concept
Prof. WEN Chihyung	Richtmyer–Meshkov Instability in a Multilayer Cylinder Configuration
Dr WONG Wai-on	Design of a tunable hybrid vibration damper with Coulomb and electromagnetic shunt damping
Dr ZHANG Peng	Towards Quantitatively Predictive Modelling of Droplet Collision in Spray Simulation: Headon Collision of Equal-size Droplets

Prof. Li Cheng awarded the Second Prize of the Science and Technology Progress Award 2019

Prof. Li Cheng, Chair Professor of Mechanical Engineering of ME Department was awarded the 2019 Second Prize of the Science and Technology Progress Award by the People's Government of Guangdong Province, China.

The prestigious prize is the fruit of long-term collaboration that Prof. Cheng and his team have been undertaking with Midea Ltd, the largest domestic product company in China. During the last two years, Prof. Cheng's research team has been closely collaborating with Midea through a number of research and consultancy projects, targeting some bottle-necking noise and vibration problems that the company was facing. The project on which the award was granted concerns the development of a complete set of design, analysis and optimization tools on the use of Micro-Perforated Panels (MPP) for sound absorption and their application in a wide range of key products that Media is manufacturing.

According to the company's report, the MPP-based technology has been successfully implemented in a total of 1.6 million Midea's domestic products, which has up to now secured a net additional income amounting to 1.93 billion RMB.

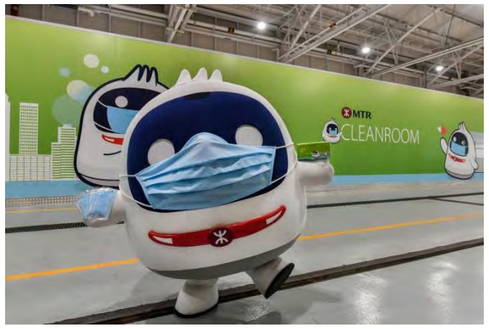
Prof. Wallace Leung Woon-Fong transferred nanofiber technology to develop highly protective facemasks for railroad operators

Avalon Nano-Biotech (HK) Limited has provided a donation to the ME department of 3 million Hong Kong dollars to support Prof. Wallace Leung in further developing and commercializing advanced air filtration nanofiber technologies to capture airborne pollutants and viruses (e.g., COVID-19 virus). Alongside with new technology development, Prof. Leung together with Avalon has transferred a nanofiber technology, which has been licensed earlier to Avalon, for the immediate need of developing a highly protective facemask for professionals working in railroad environment. This is especially vital during the current COVID-19 pandemic.

A new clean room for class 8 under ISO 14644-1 has been built in MTR Siu Ho Wan Depot in 3 months to accommodate several facemask production lines that have incorporated nanofibers into the facemasks. The produced facemasks are provided to over 17,000 MTR employees in Hong Kong. Protecting the health of MTR employees is very important as they serve nearly 6 million Hong Kong passengers riding the rail daily. This is also the first clean room ever built by the railroad service provider in the world to produce facemasks for their employees.

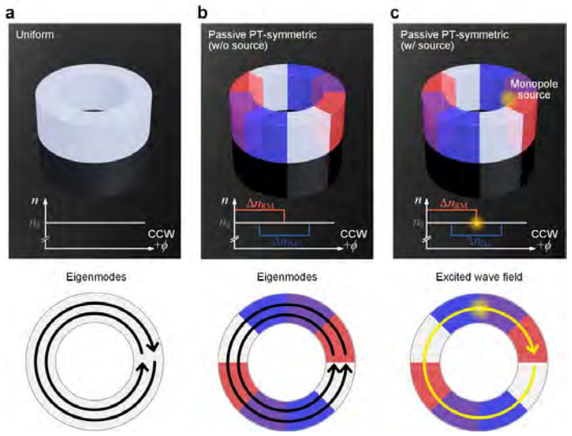
The technology adopted by MTR is based on the nanofiber filter technology developed by Prof. Leung's R&D group in ME since 2006. The nanofiber facemask has been certified for the ASTM level II standard with PFE (particulate filtration efficiency) and BFE (bacterial filtration efficiency) both exceeding 98% by certifying agency. In fact, the PFE and BFE of the nanofiber facemask are above 99% in the certification testing. Further, the nanofiber facemask can also capture 20-60 nm nanoaerosols with filter efficiency of 95-98%. Also, the facemask can be used in dirty environment with high aerosol loading. Not only the facemasks offer high protection against tiny invisible aerosols and airborne viruses, the pressure drop for the facemasks are relatively low providing comfort to wearers. All these merits are extremely beneficial for railroad operators and professionals.

Prof. Leung has also helped to set up quality assurance and quality control to ensure all the produced facemasks in the MTR Siu Ho Wan Depot clean room meet the stringent requirements per ASTM level II certification. This ensures the nanofiber technology is well transferred into a sound and useful product that benefit the Hong Kong community.



Dr Jie Zhu's research team revealed important physical phenomenon published in Nature Physics

When we press and pluck the strings of a guitar, it generates different types of acoustic waves. How those waves sound is decided by how we pick those strings and the strings' nature properties such as length and thickness. The principle here is that wave radiation depends on both the intrinsic properties of the source and the eigenstates of its surrounding environment. This has laid the foundation to explore and exploit various physical phenomena in a wide range of wave systems. The evolving understanding of this paradigm has inspired countless breakthroughs in wave-matter interaction related fields ranging from mechanics and acoustics to optics and photonics. A long-held belief of wave-matter interaction is that an emitter always radiates into and interacts with the eigenstates that exclusively define the surrounding environment. Even in non-Hermitian systems featuring exceptional point(s) where two or more eigenstates coalesce leading to an incomplete eigen-basis in the Hilbert space, this was still deemed to be valid previously as the wave function associated with the missing dimension of the Hilbert space has not been observed in any physical system.



Research team led by Dr Jie Zhu, Associate Professor of the PolyU Department of Mechanical Engineering, conducted collaboration with Prof. Ren-min Ma's team from Peking University, Prof. Li Ge's team from City University of New York and other colleagues. They show that the above-mentioned century-old tenet can surprisingly break down at an exceptional point. With investigation on difference classic wave systems, the researchers experimentally demonstrated a chirality-reversal phenomenon in a whispering gallery mode cavity where the excited unidirectional wave circulation exhibits opposite handedness to the coalesced eigenstate. This striking yet extensively existed phenomenon were confirmed in both acoustic and electromagnetic wave systems.

Their finding, for the first time, reveals that the radiation field of an emitter can become fully decoupled from the eigenstates of its environment. Such counter-intuitive phenomenon transforms the fundamental understanding of wave-matter interaction and enriches the intriguing physics of exceptional points hidden behind source-eigenstate interplay. In acoustics, it could contribute to a board range of research fields, including non-Hermitian acoustics, noise control and abatement.

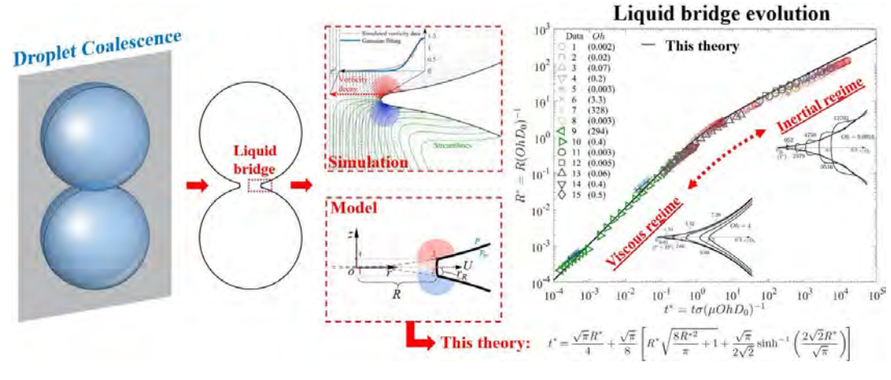
This work has been recently published in Nature Physics ["Revealing the missing dimension at an exceptional point", https://www.nature.com/articles/s41567-020-0807-y]. Dr Tuo Liu, Postdoctoral Fellow of the PolyU Department of Mechanical Engineering (also a PolyU ME PhD graduate) is the co-first author.

Dr Peng Zhang's research team discovered universality of droplet coalescence published in PNAS

Glancing out a window on a rainy day, your eyes are accidentally caught by a small droplet rolling down the glass, where its "other half" is awaiting… Now, the "dating" is about to begin and the droplet reaches out to another. The moment they touch, a connecting liquid bridge forms and quickly grows – the two droplets then coalesce into a bigger one before you could see clearly what has happened. While you are still wondering why it was so fast, another coalescence has just flashed by…

Droplet-droplet coalescence is of essence to numerous natural and industrial processes, for example, rain clouds formation and fuel spray in rocket engines. Nowadays, with the help of high-speed cameras, many experimental scientists have successfully captured the transient coalescence of liquid droplets that cannot be perceived by naked eyes. They discovered that, as the two droplets merge into one, the connecting liquid bridge grows by obeying two distinct rules: it either grows linearly with time when the droplets are smaller (or more viscous) or grows with the square-root of time when the droplets are bigger (or less viscous).

To unveil the secret of the different rules governing droplet coalescence, Dr Xi Xia, former research fellow (now Associate Professor of Shanghai Jiaotong University), Mr Chengming He, PhD student, and Dr Peng Zhang, Associate Professor of the PolyU Department of Mechanical Engineering, established a theory that unifies the dynamics of liquid bridge growth. The theory is amazingly simple but innovatively integrates some mathematical techniques, such as integral equation and asymptotic analysis, with some physical insights, such as flow self-similarity and interfacial vortex. This work has been recently published online on PNAS (Proceedings of National Academy of Sciences). [X. Xia, C. He and P. Zhang, "Universality in the viscous-to-inertial coalescence of liquid droplets", http://www.pnas.org/cgi/doi/10.1073/pnas.1910711116]



Dr Tracy Choy led research project secured $8.5m ITF funding to improve sonic perception

Dr Tracy Yat Sze Choy, Associate Professor, Department of Mechanical Engineering (ME), leads a research team to work on a project "Tunable Sonic Perception control for headset".

The research team is comprised of Prof. Li Cheng, Chair Professor, ME; Dr Henry Chu, Assistant Professor, ME; Prof. Chetywn Chan, Chair Professor, Department of Rehabilitation Science (RS); Dr Andrew Siu, Associate Professor, RS; and Dr Daniel Lun, Associate Professor, Department of Electronic and Information Engineering. The team works in close collaboration with the industrial sponsor Innovation Technology Company Limited and Dr Steve Mung from the company.

The research project has been awarded a three-year grant about HK$6.6 million by the Innovation Technology Commission. Dr Choy has also secured additional funding around HK$1.9 million by the Innovation and Technology Fund for Researcher Programme and Postdoctoral Hub Programme.

Distinguished Lecture on Nanotechnology in Canada by Prof. Wallace Leung

Prof. Wallace Leung was invited by the Waterloo Institute of Nanotechnology (WIN), University of Waterloo, Ontario, Canada, to deliver on October 21, 2019 a Distinguished Lecture Series in the Quantum Nano Center, Waterloo, on 'Novel Nanofiber technology for Energy and Environment'. WIN is the largest organization in Canada working on nanotechnology.

The Distinguished Lecture Series is to honor scholars in the world working on nanotechnology. The WIN Distinguished Lecture Series was created in 2008 to bring a small number of outstanding researchers and scholars to Waterloo, to interact with faculty, graduate students and postdoctoral fellows. They have hosted many internationally respected scientists, including Nobel Laureate Yuan T. Lee from Academia Sinica in Taiwan, Jacob Israelachvili of the University of California, Zhong Lin Wang from the Georgia Institute of Technology, and more recently Arun Majumdar from Stanford University. The lectures are open to the public and are extremely well attended.

It is a great honour that Prof. Wallace Leung is being recognized for his research on nanofibers and he was invited to share the nanofiber technologies developed jointly by him and his group in the Distinguished Lecture Series at WIN. The lecture was well attended with the audience showing great enthusiasm and interest in various novel clean energy and environment technologies that are feasible with the application of nanofibers. The lecture was also recorded live and posted on the WIN website.

Student Accomplishments

ME PhD Student awarded Best Student Poster in TAROS 2019

The 20th TAROS (Towards Autonomous Robotic Systems) conference was hosted by the Centre for Advanced Robotics @ Queen Mary, Queen Mary University of London from the 3rd to the 5th of July 2019.

PolyU ME department was honored to have the PhD student Omar Zahra appeared in the prestigious Robotic research conference of its kind, and he was awarded the Best Student Poster.

TAROS is the longest running UK-hosted international conference on Robotics and Autonomous Systems (RAS), which is aimed at the presentation and discussion of the latest results and methods in autonomous robotics research and applications.

TAROS offers a friendly environment for robotics researchers and industry to take stock and plan future progress. It welcomes senior researchers and research students alike, and specifically provides opportunities for research students and young research scientists to present their work to the scientific community.

Omar joined the ROMI-Lab in January 2018 as a PhD student in PolyU, under the supervision of Dr David NAVARRO-ALARCON. His research interest includes robotic manipulation, bio-inspired control, AI, and multi-modal perception. Currently, he is developing neuro-inspired methods for modelling and coordinating the motion of robotic systems.

ME PhD Student received Belt and Road Scholarship 2019/20

To strengthen education collaboration with the Belt and Road countries, the Belt and Road Scholarships have been offered to students coming from designated counties along the Belt and Road regions since the 2016/17 academic year. To attract more non-local outstanding students to further their studies in Hong Kong, the Belt and Road Scholarship further expanded to cover all regions along the Belt and Road in the 2019/20 academic year.

This year, our PhD student Luiza Labazanova coming from Russia was the recipient of the 2019/20 Belt and Road Scholarship (Research Postgraduate). Luiza received a scholarship to cover her full tuition fees and is tenable for the normal duration of the programmes concerned. The scholarship will be renewed annually subject to the satisfactory academic performance of the awardees.

ME PhD Graduate won Young Investigator Award in 11th Asia-Pacific Conference

Dr Dawei Zhang, a PhD graduate of PolyU Department of Mechanical Engineering, won the Young Investigator Award in the 11th Asia-Pacific Conference on Combustion (ASPACC 2017) held in Sydney, Australia on 10-14 December 2017. He presented a paper "Hypergolic Ignition Induced by Binary Collision of TMEDA and WFNA Droplets: Non-Monotonic Effects of Impact Parameter". The corresponding author of the paper is his PhD supervisor, Dr Peng Zhang. Mr Yicheng Chi, a PhD student of Dr Peng Zhang, collected the award as a delegate at ASPACC 2019 held in Fukuoka, Japan on 1-5 July 2019.

The Asia-Pacific Conference on Combustion (ASPACC) is a biennial event sponsored by the Combustion Institute and organized by members of the Asia-Pacific regional sections. Its goal is to promote the exchange of information and to elevate combustion science and technology through regional and global scientific partnership. ASPACC provides a forum for mutual exchange of information in the Asia-Pacific combustion community involved in both fundamental and application-oriented research and development works. In ASPACC 2017, six winners of the Young Investigator Awards from different regions were selected by the Conference Scientific Committee from nearly 400 papers.

Dr Dawei Zhang received his PhD degree under the supervision of Dr Peng Zhang in 2018. Currently, he is an Assistant Professor of State Key Laboratory of High Temperature Gas Dynamics, Institute of Mechanics, Chinese Academy of Sciences.

ME MPhil Student awarded IEEE MTT-S Undergraduate/Pre-graduate Scholarship 2020

PolyU ME MPhil student Man Ho TSOI was elected to be the awardee of IEEE MTT-S Undergraduate/Pre-graduate Scholarship 2020.

Man Ho, under the mentorship of an IEEE MTT-S member Dr Steve Wai Yin MUNG, submitted a research proposal topic titled "Design and Implementation of Surface Acoustic Wave (SAW) device in wireless circuit" which showed high potential for a productive career in RF (Radio Frequency)/Microwave Engineering.

IEEE (Institute of Electrical and Electronics Engineers) is the world's largest professional organization devoted to the innovation and advancement of technology across disciplines. MTT-S (Microwaves and Theory and Techniques Society) is one of the technical societies within IEEE. Undergraduate/Pre-graduate Scholarship Programme is held twice a year with a maximum of ten awardees around the world in each cycle. The scholarship programme encourages students to pursue study and job related to its field. In 2020 Cycle 1, six students from universities in USA, Russia, Spain and China were awarded the scholarship, Man Ho was one of them. 2020 Cycle 1 Awardees (October 2019 Competition)

Man Ho is currently pursuing the part-time MPhil degree under the supervision of Dr Yat Sze CHOY in the Department of Mechanical Engineering, the Hong Kong Polytechnic University.

ME PhD Students won Student Competition Awards in ISSW32

Two ME PhD students, Liang Yu and Liu Lili won the Student Competition Awards in the 32nd International Symposium on Shock Waves (ISSW32) held at the Faculty of Engineering, National University of Singapore in Singapore on 14-19 July 2019.

Since the inception of the International Symposium on Shock Wave (ISSW) in 1957, ISSW has served as authoritative platforms for the international scientific community to meet and exchange ideas on the study of shock wave and blast wave related phenomena and their applications. ISSW32 is a continuation in the series of biannual international symposia that have been held throughout the world. It had over 400 participants, including more than 370 overseas delegates. Student authors were encouraged to participate in the Student Competition. Winners were selected based on the best oral and poster presentations.

Liang Yu and Liu Lili are both devoted to Richtmyer-Meshkov instability (RMI) investigation. RMI plays a crucial part in promoting the supersonic combustion efficiency but impeding the ignition in the Inertial Confinement Fusion. Therefore, it is significant to investigate how to improve or suppress RMI developments. Liang Yu reported "Evolution of an air/SF6/air Finite-thickness Fluid Layer Impacted by Shock Wave" and Liu Lili presented "Richtmyer-Meshkov Instability on Dual-mode Interface Impacted by Shock Wave". Both of them concisely explained the interface coupling as well as compressibility effects on the fluid layer evolutions and the mode-competition effects on the multi-mode interface evolutions. The judging panel acclaimed their presentations, and each received an award of USD250.

Both research study is under the supervision of Prof. Chih-yung Wen and affiliated to the High-speed Thermo-fluid and MAV/UAV Laboratory, Department of Mechanical Engineering, The Hong Kong Polytechnic University.

ME PhD Student received the 2019 HKIE Outstanding Paper Award for Young Engineers/Researchers

A ME PhD student, Quankun Li, received the 14th HKIE outstanding paper award for young engineers/researchers announced in the award ceremony on 20 Sep 2019 held by the HKIE Transactions Committee, The Hong Kong Institution of Engineers (HKIE).

Structural health monitoring is a critical engineering issue attracting a lot of R&D strength from the literature and engineering areas in the past decades. Various complex structures including truss structures and satellites in space engineering, bridges and building structures in civil engineering, offshore structures in ocean engineering, water supply pipe systems, and railway systems etc are usually business-critical but may often suffer from vibration damage or fatigue problems, and eventually have structural cracks or bolt loosening issues. Timely structural health monitoring and regular maintenance are therefore greatly important to smooth operation of these structures and also highly relevant to public health and safety.

The award-winning work is entitled by "A second-order output spectrum based method for detecting bolt-loosening fault in a satellite-like structure", which is done by Quankun Li in the research group of nonlinear dynamics, vibration and control (NDVC) led by Dr Xingjian Jing. The work is about a systematic and effective method for accurately identify and locate potential crack or bolt-loosening faults in these aforementioned complex structures, based on a novel nonlinear feature of vibration response of structures using only several trails of vibration signals. Compared to existing results in the literature, this unique method can make full use of fault-incurred nonlinear features but minimize the influence of inherent nonlinear dynamics already existing in structures, and eventually can give more accurate and sensitive diagnosis on potential fault and its location. The method is developed based on a series of studies within Dr Xingjian Jing's NDVC group on the theory and methods for analysis and design of nonlinear systems in the frequency domain in the past years. The work done by Mr Li has led to several publications in top international journals including Structural Health Monitoring (IF3.798, Rank 6/86 in Multidisciplinary Engineering), Mechanical Systems and Signal Processing (IF5.005, Rank 6/129 in Mechanical Engineering), Nonlinear Dynamics (IF4.6004, Rank 7/134 in Mechanics), and so on, and would have wide engineering applications.

The HKIE Outstanding Paper Award for Young Engineers/ Researchers 2019 is an international paper award which is organised in its 14th consecutive year. It is the HKIE ultimate goal to encourage young engineers and researchers to publish their works and advance in their professional findings, as well as to promote engineering among the younger generation. This competition is open to young engineers and researchers worldwide who are at the age of 35 or below. Three papers have been selected for the year's Award. A Public Lecture will be organised for the three awardees to share and exhibit their findings and accomplishments in various engineering fields.

ME PhD Student awarded Best Paper Finalist in ROBIO 2019

PolyU ME PhD students Jiewen Lai and Kaicheng Huang won the Best Paper Finalist award with the paper entitled "A Learning-based Inverse Kinematics Solver for a Multi-Segment Continuum Robot in Robot-Independent Mapping", at the 2019 IEEE International Conference on Robotics and Biomimetics (IEEE-ROBIO 2019) in Dali, China from 6 to 8 December 2019.

IEEE-ROBIO is one of the most prestigious conferences in the robotic field. It is an annual conference co-sponsored by the IEEE Robotics and Automation Society (IEEE RAS). Continuing with more than a decade of its tradition, ROBIO aims to provide a premier forum for researchers, developers, and entrepreneurs involved in the general areas of robotics, artificial intelligence, and biomimetics to disseminate the latest results and exchange views on the future research directions of the related fields.

This year, ROBIO provided 6 best paper awards to the 403 accepted and orally-presented papers from all over the world, and 20 of the accepted papers were peer-nominated as the finalists for those competitive awards.

Jiewen and Kaicheng are both under the supervision of Dr Henry Chu in our department. Their research interest includes soft robotics, biomimetic robotic system, robotic manipulation, and machine intelligence.

ME PHD Student received Young Research Award in CNERC Annual Technical Symposium 2020

Bingchen Zhou, a PolyU ME PhD student, won the Young Research Award in the Chinese National Engineering Research Centre for Steel Construction (CNERC) Annual Technical Symposium 2020 held on 12 June 2020 at PolyU. She presented her research on "Effects of Cu on the nanostructure and mechanical properties of high strength steels" at the symposium.

The CNERC Annual Technical Symposium 2020 is a technical symposium organized by the CNERC aiming at promoting technological development, sharing and exhibiting the findings and accomplishments among researchers of CNERC projects. Through applied engineering research on steel construction, the CNERC aims to capitalize on huge potentials offered by construction professionals in Hong Kong to further enhance socio-economic development through technological advancement in sustainable infrastructure development. The CNERC receives strong support from the Development Bureau of the Government of Hong Kong SAR and also from the Construction Industry Council.

Bingchen Zhou is under the supervision of Dr Zengbao Jiao in the ME department. Her research interest focuses on the development and characterization of advanced high-strength steels strengthened by nanoscale co-precipitates.

ME Student Team acclaimed for innovating Tennis Ball Collector Robot

Three final year undergraduate students of the Department, Vincent Yu Wai Yin, Sampson Chung Shan and Clarence Lau Wing Hay, as a team working for their final year project, designed a tennis ball collector robot which can search, collect and store tennis balls autonomously. The robot is able to move swiftly and avoid obstacles such as ball net fence on the tennis court. It can also autodetect tennis balls and fetch them everywhere on the court. Its sophisticated device enables the robot to retrieve balls on the edge without hurdle.

The project was highly acclaimed for its skillful mechanism and practical application. The student team further enhanced the robot, under the project supervisor, Dr Wong Wai On of the Department of Mechanical Engineering, with the help from a PolyU alumni KF Leung as well as great support from the PolyU Industrial Centre.

The Tennis Ball Collector Robot won the Silver Prize in the 5th China College Students "Internet Plus" Innovation and Entrepreneurship Award held from 12 to 16 October 2019. The team was invited to showcase the robot in HKTDC DesignInspire held in the Hong Kong Convention and Exhibition Centre from 5 to 7 December 2019.

ME Student Team awarded in the 2019 Greater Bay Area Design Competition

A student team from the Department of Mechanical Engineering (ME) have made notable achievements in the 2019 Greater Bay Area Design Competition (2019 粵港澳大學生工程訓練綜合能力競賽) held in Guangzhou on 26-27 October 2019. For the first time, the HK PolyU team won the 2nd Class and the Most Collaboration Awards in the competition.

Sponsored by the Ministry of Education of China and organized by the Department of Education of Guangdong Province and the South China University of Technology, this year challenge was to design an unmanned robot for a pick-and-place race. A total of 35 teams from different universities in Hong Kong, Macau and Guangdong Province participated in this competition. They are The Chinese University of Hong Kong, The Hong Kong Polytechnic University, University of Macau, Harbin Institute of Technology (Shenzhen), South China University of Technology, Shenzhen University, etc.

The PolyU ME student team, comprised of final year undergraduate students, Parth MAHESHWARI, KWAN Kai Lok, and Maral SHAGATAY supervised by Ir Dr Curtis NG. They developed a robot which can swiftly move around in the field, and pick and place different sizes of balls from 16 PVC pipes. The team was one of the robust teams that can complete the challenge within 50 seconds in the knockout round of the competition.

"Our students were very dedicated to the competition. They were self-initiative to work on the prototypes and well-prepared for the competition," said Dr Curtis NG, the team advisor.

ME Student Team won in the ASME Student Design Competition Finals 2019

Team of BEng in Mechanical Engineering (ME) students won the 2nd Runner-up in the 2019 American Society of Mechanical Engineers (ASME) Student Design Competition (SDC) Finals held on 9 November 2019, in Salt Lake City, Utah, USA. The ASME SDC Finals, sponsored by Boeing every year, is a well-known international student design competition of its kind. The 14 competitors, each are from the regional SDC events held at the ASME Engineering Festivals.

"The Pick-and-Place Race", the theme of this year, is to challenge students to design a speedy robots that could quickly grasp various size of balls – small as ping pong to as large as basketballs running in its full speed without dropping off the balls in the competition field. The first 15 seconds is decisive for the winner.

Our team, comprising year four undergraduate students, Parth MAHESHWARI, Maral SHAGATAY and KWAN Kai Lok, supervised by Ir Dr Curtis NG of ME developed an agile robot which can swiftly moving around pick and hold different sizes of balls . With tactical strategy, our robot stood out from other competing robots and eventually made it to the Final Four and brought home the 2nd Runner-up!

"Our students were wholly dedicated to this challenge. They were highly self-motivated to work on the prototype and well prepared for the competition. With great support from Prof. SQ Shi (Head of Department of ME, PolyU), ME technical team, International Affairs Office (IAO) and Industrial Centre (IC), our robot could manage to compete with other strong competitors in ASME SDC Finals 2019 and took the 2nd Runner-up. "Students are excited with their achievement and we are highly proud of them." Ir Dr Curtis NG said.

The competition was held in conjunction with the ASME's 2019 International Mechanical Engineering Congress and Exposition (IMECE) in Salt Lake City, Utah, USA.

HKPolyU Racing Team inherits the legend

The HKPolyU Racing Team has finished the 2019 Formula Student Electric China (FSEC) competition on 18 to 23 Nov 2019 at the Zhuhai Airshow Center, China.

In the FSEC held in Zhuhai this year, nearly 2,000 students from 54 pure electric fleets and 14 self-driving fleets came here through breakthrough levels. The HKPolyU Racing, the first and only formula racing team, formed by Hong Kong local university students, has been representing Hong Kong to compete in the Formula Student Electric China (FSEC) since 2017.

At the FSEC 2019, besides competing in the car's overall design and technical features, as well as contesting on the racing track its acceleration, control, endurance, and various functions, the team also had to present its business proposal. It was thrilling that the HKPolyU Racing Team ranked 31 out of the 54 participating teams in terms of overall results, which was a step ahead compared to 2018 season and the best percentage amongst the three straight seasons.

Achievements of the HKPolyU Racing Team in FSEC 2019 included:

- ranked 7th in the Business Presentation Event
- passing all scrutineering checks
- finished competing in 2 out of 4 dynamic events; skid-pad & autocross

It took the team the whole year to design and manufacture the car. Their dedication and enthusiasm have gained tremendous support from various external parties as well as the University. This year, more than 20 industrialists or organizations offered substantial sponsorships through various means like giving the students financial back-up, sponsoring materials, offering technical advice, providing a testing venue, etc. The team obtained over 2 million HK dollars donations in the past year, and the main donors were as follows:

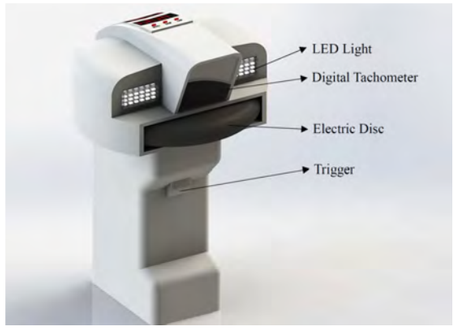
- HKI China Land Limited
- Kolinker Industrial Equipments Ltd.
- Ngai Hing Hong Plastic Materials (Hong Kong) Ltd.
- Dr Hou Lee Tsun, Laurence
- Hong Kong Productivity Council

Their dream of racing was triggered by 9 PolyU Mechanical Engineering students in 2015, who aspired to construct their Final Year Project on building a racing car for joining a formula competition. Since then, the team of the 9 core members has gradually grown into a team with over 70 students from different disciplines.

It was a huge step for the students to spark a racing dream and take to the large-scale annual international competition. Their initiative, aspiration, creativity and endurance are what we really proud of.

ME Student won in HKIE Student Project Competition 2019

The HKIE-SSC Student Project Competition, organized by The Hong Kong Institution of Engineers (HKIE), is an important annual event to attract HK young generation currently studying in universities to explore safety & health engineering for a touch of both life-critical systems and popular science innovation. The objectives of the competition are to promote safety engineering and science innovation, and to provide an open and competitive platform for engineering students to demonstrate their engineering capabilities and share the learning process in safety regime.



This year, a PolyU ME year 3 student, JIANG Jiacong, presented a novel design about improving the testing method of elevator over-speed governor during periodic elevator examination. His innovative idea was acclaimed by the judges and awarded the CIC award. He was the only undergraduate winner in the safety category among other postgraduate awardees. The award ceremony was held in the 25th HKIE-SSC Annual Dinner organized by the HKIE – Safety Specialist Committee on 14 Jan 2020.

Over-speed governor (GOV) is equipment to monitor and limit the moving speed of elevator cars. The maintenance and examination are therefore very essential in elevator annual test. However, the testing method of GOV using nowadays is still traditional, inconvenient and complicated with low accuracy, which also includes some safety problems. Therefore, it is highly relevant to develop a safer, more efficient, more accurate and user-friendly solution. Based on the analysis and understanding of existing safety problems, a novel testing device is designed, which can conveniently and safely measure the speed with an optical tachometer, and simultaneously accelerate the governor wheel with an electric disc so as to identify whether the GOV is qualified. Preliminary results show clearly the advantages of this new invention and prospects of being widely popularized.

The project was supervised by Dr Xingjian Jing of the Department, who has been actively working on solving various critical engineering problems including system control, engineering noise & vibration, energy harvesting, structural health monitoring, complex system identification, sensing and measuring systems, custom-tailored robotic systems and so on.

Department Activities and Development

Donation from Philip K. H. Wong Foundation to support PAED Co-op initiative

The PolyU Department of Mechanical Engineering (ME) received a generous donation from Philip K. H. Wong Foundation for the enhancement of the BEng (Hons) in Product Analysis and Engineering Design programme (PAED) engaging in real industrial learning.

The perspective of the PAED programme is to train up our mechanical engineering students on product development and analytical skills. It involves a lot of hands-on and project-based trainings to get our students ready for real industrial participation.

In 2019/20 academic year, PAED has launched the "Cooperative Education" (Co-op) option for students to grip the pragmatic knowledge through real-world experiential learning in professional and industrial setting.

While we are having more co-op relationships with industrial entities and engaging in more product development trial projects for the students, we are in need of resources to gear up our students before setting off on the Co-op working. That involves an establishment of a product development workshop, where hardware and software facilities are the requisites. Special training on product design and development will be emphasized. Furthermore, students will have the opportunities to practice and elevate their skills through an innovative PAED contest.

The department expressed sincere gratitude to Philip K. H. Wong Foundation for donating a funding of HK$1.5 million to sponsor the above Co-op initiative, which will benefit the PAED students in the coming two years.

ME Staff honoured for Loyal Service

Colleagues of the PolyU Department of Mechanical Engineering (ME) has always been devoting themselves to the development of ME.

This year, the Department Head, on behalf of the University, paid tribute to long-serving staff members for their loyal and committed service over the years.

Congratulations to the awardees and heartfelt thanks for their years of dedication and devotion which have marked the achievements of the Department.

Length of Service	Award Recipients	Post Title
35 years	Mrs Michelle Lai	Clerical Officer II
30 years	Prof. TL Chan	Professor
30 years	Mr KK Tang	Technician
25 years	Ms Lily Tam	Senior Executive Officer