

Department of  
**MECHANICAL  
ENGINEERING**

Annual Report 2017-2018



Department of Mechanical Engineering

The Hong Kong Polytechnic University

Hung Hom, Kowloon, Hong Kong

website: [www.polyu.edu.hk/me](http://www.polyu.edu.hk/me)



# ANNUAL REPORT

2017-2018

Department of Mechanical Engineering  
The Hong Kong Polytechnic University

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# 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

Acoustics Laboratory  
 Acoustic Wind Tunnel Laboratory  
 Advanced Materials for Energy Conversion and Storage Laboratory  
 Aeronautical Laboratory  
 Bio-mechanics Laboratory  
 Computational Aeroacoustics and Flow Physics Laboratory  
 Corrosion & Surface Technology Laboratory  
 Design Analysis Centre  
 Dynamics Laboratory  
 Fluid Mechanics Laboratory  
 Heat Transfer & Combustion Laboratory  
 Materials and Mechanics Technology Laboratory  
 Measurement and Control laboratory  
 Nano- & Micro-Mechanics Laboratory  
 Nano-scale Energy Conversion Devices and Physics Laboratory  
 Product Testing & Analysis Centre  
 Project Laboratory  
 Thermal Science Laboratory  
 Thermodynamics Laboratory  
 Undergraduate Computational Laboratory  
 Water Tunnel Laboratory  
 Wind Tunnel Laboratory

## 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.



# Head's Message



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

The Department of Mechanical Engineering is committed to providing a comprehensive and enjoyable learning experience for our students and a world-class environment for our faculty members to excel in their discovery and innovation. Underlying this mission is a sustained 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 research over the academic year of 2017/18.

At the core of our vision in enhancing students' interdisciplinary learning, the two UGC-funded full-time undergraduate programmes, namely BEng in Mechanical Engineering and BEng in Product Analysis and Engineering Design, have been merged into the BEng Scheme in Mechanical Engineering and started operating in September 2017. The three technical streams of ME programme have been modified into "Aerospace Engineering", "Design and Automation", and "Environmental and Energy Engineering"; and a number of new elective subjects have been developed in order to increase the diversity of the areas offered in the Scheme.

Our persistent efforts to attract and retain the highest quality faculty combined with our success in highly competitive research grants applications have continued to move the Department forward.

Our research reputation is further evidenced by the success in securing a number of external competitive funding: RGC Theme-based Research Scheme (Co-I), RGC General Research Fund, and National Science Foundation of China Fund including key project fund. Research funding secured by the department in 2017/18 was around HK\$ 14 million.

In addition to the fruitful harvest from the research grants, we sustained a high productivity of quality research outputs including journal/conference articles, books /book chapters and patents. Many of our research papers have been highly cited and selected as featured highlight in prestigious international journals. The involvement of our faculty members in international symposia and conferences, the awards they received, as well as the professional services they provided all offer the testimony of our well-established reputation worldwide.

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

To further elevate our research quality and academic standing, we invited six top-notch scholars to serve as our visiting chair professors, four of them are under the Distinguished Chair Professor Scheme: Prof. Adrian Bejan of Duke University, Prof. Huajian Gao of Brown University, Prof. Tong-Yi Zhang of Shanghai University, and Prof. Qiang Xu of AIST, Japan. Their expertise in thermal science, nano- and bio-mechanics, materials chemistry, and materials science and engineering respectively helped the Department in promoting high quality research and research collaborations at international and national levels.

In this academic year, PolyU was ranked the 29th in the subject of "Mechanical Engineering" by Academic Ranking of World Universities (ARWU) in 2018. PolyU is the only university in Hong Kong ranked in the top 50 under this subject by ARWU. We have made a significant improvement in the subject ranking from last year's 47th to this year's 29th in ARWU.

Our students and staff were awarded in various international, national and local competitions. To name a few, a ME student team triumphed in the 7th IMechE Greater China Design Competition. Another student team from the Product Analysis and Engineering Design programme was awarded the Winner in the iF Design Talent Award 2017 held in Germany. Prof. ZQ Su's sprayable sensing technology won a Gold Medal in the 46th International Exhibition of Inventions of Geneva 2018. Dr XJ JING received the European Senior Research Award in Rome.

## Looking Ahead

The new academic year comes with opportunities and challenges – the success in bidding for the organization of several international conferences and the phasing out of two self-financed part-time undergraduate programmes. While many challenges remain, the opportunities seem equally bright. Starting from late 2017, the Department has been actively preparing for the HKIE (Hong Kong Institute of Engineers) professional accreditation exercise. Further enhancements are being made to our programmes for quality assurance.

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

### Chairman

**Ir Conrad Wong**  
Vice-Chairman  
Yau Lee Group

### 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

**Ir Darryl Chan Chun-Hoi**  
Managing Partner  
Hong Kong Radar Aviation Services Ltd

**Prof TL Chan**  
Professor  
Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Ir Ronald KW Cheng**  
General Manager  
Technical and Engineering Services  
MTR Corporation Limited

**Ir Dr Angus HW Cheung**  
Chief Executive Officer  
China Aircraft Services Limited

**Ir Chris KC Cheung**  
Director, Generation Engineering  
CLP Power Hong Kong Limited

**Prof MW Fu**  
Professor  
Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Mr Dave TY Ho**  
Acting Assistant Director, Air Policy Division  
Environmental Protection Department, HKSAR

**Dr XJ Jing**  
Associate Professor  
Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Mr Alex Wong**  
Managing Director  
Kings Flair (Group) Development Limited

**Dr Daniel Yip**  
Managing Director  
G.E.W International Corporation Limited

**Ir Andrew Young**  
Associate Director (Innovation & Technology)  
Innovation & Technology Department  
Sino Land Company Limited

### Overseas Members

**Dr Cyrille Breard**  
The Noise and Emission Manager  
Commercial Aircraft of China Ltd.

**Prof Jean-Louis Guyader**  
Professor  
Laboratoire Vibrations Acoustique  
INSA de Lyon

**Prof Vigor Yang**  
AE Chair & William R. T. Oakes Professor  
School of Aerospace Engineering  
Faculty of Engineering  
Georgia Institute of Technology

### Student Representatives

**Mr Suen Cheung Kit**  
Full-time BEng Student  
Department of Mechanical Engineering  
The Hong Kong Polytechnic University

**Miss Anchalee Duongthipthewa**  
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

### Overseas Academic Advisor

**Prof. Robert O. Ritchie**  
H. T. & Jessie Chua Distinguished Professor of Engineering  
Professor of Materials Science & Engineering  
University of California, Berkeley  
Professor of Mechanical Engineering  
University of California, Berkeley

## Departmental Committee Chairman

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  
International Exchange Committee  
Departmental Health and Safety Committee

**Chairman**  
Prof. SQ Shi  
Prof. SQ Shi  
Prof. CY Wen  
Prof. ZQ Su  
Prof. CW Leung  
Prof. CS Cheung  
Prof. SQ Shi  
Prof. ZQ Su  
Dr P Zhang  
Dr P Zhang  
Prof. TL Chan  
Dr Y Liu  
Dr Curtis Ng

## Research Centre Director

Combustion and Pollution Control  
Consortium for Aerospace Engineering  
Consortium for Sound and Vibration Research  
Fluid-Structure Interactions  
Integrated Product Development

**Director**  
Prof. CS Cheung  
Prof. CY Wen  
Prof. L Cheng  
Dr Y Liu  
Prof. LM Zhou

## Discipline Areas Group Leader

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

**Group Leader**  
Prof. L Cheng  
Prof. LM Zhou  
Prof. Wallace Leung

# Academic Staff

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
President of PolyU and Chair Professor of Mechanical Engineering	
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
Associate Vice President (Research Support) 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
Chair Professor of Innovative Products & Technologies	
LEUNG Woon Fong Wallace (Prof.) 梁煥方教授 BSc(Cornell U.); MSME(MIT); ScD(MIT); Fellow of ASME, HKIE, AFS and AICHE; Senior Member of AIAA; Member of ACS and SBE	Product innovation, research and development; Physicochemical hydrodynamics; Turbine cooling; Nanofiber technologies for health (wound healing), environment (filtration of nano-aerosols and purification of gaseous pollutants; water purification), and renewable energy (Dye Sensitized Solar Cells); Separation & filtration technologies; Biotechnology separation; Membrane separation and processes; Rheology of semi-fluids; Water and wastewater treatment; Centrifugation technologies; Centrifugal microfluidics for micro-reactor and cell culture; Interactive rehabilitation robotic system; Clinical decision support system; Cancer biomarker discovery
Visiting Chair Professor of Engineering Science under the Distinguished Chair Professor Scheme	
Adrian BEJAN (Prof.) BSc (MIT); MSc (MIT); PhD (MIT); HonMemASME; Academy of Europe	Thermodynamics; Heat Transfer; Constructal Law of Evolution in Nature
Visiting Chair Professor of Mechanical Engineering under the Distinguished Chair Professor Scheme	
GAO Huajian (Prof.) 高華健教授 BS (Xian Jiaotong); MS (Harvard); PhD (Harvard)	Nanomechanics of engineering and biological systems
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
Visiting Chair Professor of Engineering	
Sylvie LORENTE (Prof.) BSc, MSc, PhD	Vascularized materials; Constructal Theory; Fluid Mechanics; Porous media; Heat and mass transfer
Professor Emeritus and Visiting Chair Professor of Fluid Dynamics and Aeroacoustics	
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
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
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
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.
CHEUNG Chun Shun (Prof.) 張鎮順教授 BSc, MSc (H.K.U.); PhD (H.K.Poly.); CEng; RPE; MHKIE; MIMarE	Internal combustion engine; Engine emissions
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
LEUNG Chun Wah (Prof.) 梁振華教授 BSc (CNAA); MSc (Cran IT); PhD (CNAA); CEng; RPE; FHKIE; FIMarEST; FIMechE; MCIBSE	Heat transfer; Fuel and combustion; Internal combustion engine emissions and their control
ZHOU Limin (Prof.) 周利民教授 BEng; MEng (Harbin); PhD (Syd)	Nanomaterials and nanotechnology for energy conversions and storages; Recyclable and reusable high performance structural composites; Functional composites; Structure health monitoring technology

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
TANG Hui (Dr) 唐輝博士 BEng(Tsinghua); MEng (Tsinghua); PhD (Manchester)	Aerodynamics; Hydrodynamics; Active flow control; Fluid-structure Interaction; Multiphase flow
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
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) 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
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
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
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
Temporary Full Time Teaching Fellow	
Udaya KAHANGAMAGE (Dr) BSc.Eng (SL); PhD (Uni. of Bristol, UK)	Product design and manufacturing; Risk analysis in early conceptual design; Productivity improvement in manufacturing systems; Cleaner production; Development of appropriate technology for developing world
LAM Chun Ki (Dr) 林俊祺博士 BEng; PhD; MION; MASME; MSAE; MIET	Advanced composite structures; Materials characterization; Nanoclay/polymer composites; Nanotechnology; On-road gaseous and particle emissions measurement
NG Tin Yau Ernest (Dr) 吳天佑博士 Civil Dip. (NAIT); Mech Dip. (NAIT); BEng; MASc; PhD (UVic)	Micromechanics; Computational solid mechanics; Multi-scale modeling of hybrid composites
ZHANG Yu Fiona (Dr) 章瑜博士 BEng (SJTU); MEng (NUS); PhD (UCR)	Nanostructured biomaterials for tissue engineering and drug delivery; Biomedical applications of nanomaterials; Advanced microscopy characterization on nanomaterials and nano-bio interface; Integrated micro/nanosensing devices
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
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
WOO Wai Chiu (Mr)	Senior Artisan

Staff Movement (1 July 2017 – 30 Jun 2018)

Concurrent Appointment

Prof. ZQ Su was appointed as Associate Head

Promotion

Prof. MW Fu was promoted to Professor  
Dr H Tang was promoted to Associate Professor  
Dr P Zhang was promoted to Associate Professor

New Appointment

Dr D Navarro-Alarcon, Assistant Professor  
Ms Karen Cho, Assistant Marketing Manager  
Mr CY Chan, Assistant Technical Officer

Retirement

Prof. CW Leung, Professor & Associate Head  
Mr KK Shum, Artisan

Staff Departure

Ms Celia Wong, Assistant Marketing Manager  
Dr P Liu, Technical Officer  
Mr KF Chan, Assistant Technical Officer



Research Personnel

Research Fellow (Full-time)

LAM Chi Yan Garret (Dr) 林志欣	PhD, The Hong Kong Polytechnic Univ
LI Xinlei (Dr) 李新雷	PhD, Northwestern Polytechnical Univ, China
PANG Lei (Dr) 庞磊	PhD, Beijing Inst of Tech, China
XIA Xi 夏溪	MSc, Univ of Colorado at Boulder, USA

Research Fellow (Part-time)

CHEUNG Yan Lung (Dr) 張人龍	PhD, The Hong Kong Polytechnic Univ
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Postdoctoral Fellow (Full-time)

CHENG Kui (Dr) 程魁	PhD, Harbin Engg Univ, China
CUI Liu (Dr) 崔柳	PhD, North China Electric Power Univ, China
DAI Honghua (Dr) 代洪华	PhD, Northwestern Polytechnical Univ, China
FEI Chengwei (Dr) 費成巍	PhD, Beijing Univ of Aeronautics and Astronautics, China
GU Shaonan (Dr) 顾少楠	PhD, Univ of Science & Technology Beijing, China
HUANG Bin (Dr) 黃斌	PhD, Central South Univ, China
KEFAYATI Gholamreza (Dr)	PhD, Flinders University, Australia
LI Peng (Dr) 李鵬	PhD, Xi'an Jiaotong Univ, China
LIU Shuyuan (Dr) 劉殊遠	PhD, The Hong Kong Polytechnic Univ
MIAO Yuee (Dr) 繆月娥	Doctor, Fudan Univ, China
QIN Xianying (Dr) 秦显莹	PhD, Donghua Univ, China
SABBAGHI, Aghil (Dr)	PhD, The Hong Kong Univ of Sci and Tech
SHEN Cheng (Dr) 沈承	PhD, Nanjing Univ of Aeronautics and Astronautics, China
TAN Furui (Dr) 檀付瑞	PhD, The Hong Kong Polytechnic Univ
TANG Jingjing (Dr) 唐晶晶	PhD, Central South Univ, China
WANG Chenglei (Dr) 王成磊	PhD, Nanyang Technological Univ, Singapore
WANG Zhibo (Dr) 王志博	PhD, The Hong Kong Polytechnic Univ
XIAO Lanlan (Dr) 肖兰兰	PhD, The Hong Kong Polytechnic Univ

XU Weifeng (Dr) 徐偉鋒 PhD, Northwestern Polytechnical Univ, China  
 XU Yanfeng (Dr) 徐琰鋒 PhD, Tongji Univ, China  
 YE Finfan (Dr) 叶一帆 PhD, City University of Hong Kong  
 YIN Huabing (Dr) 阴化冰 PhD, Shandong Univ, China

### Research Associate (Full-time)

BOUYX, Marie Paule Master, Institut National des Sciences Appliquees de LYON, France  
 CHIANG Yan Kei (Dr) 蔣欣岐 PhD, The Hong Kong Polytechnic Univ  
 CAO Shancheng (Dr) 曹善成 PhD, Univ of Liverpool, UK  
 CONG Zhenhua (Dr) 丛振华 PhD, Nagoya Univ, Japan  
 FANG Hongbin (Dr) 方虹斌 PhD, Tongji Univ, China  
 GUAN Ben (Dr) 關奔 DEng, Univ of Sci & Tech of China, China  
 GUO Huifeng (Dr) 郭会芬 PhD, Donghua Univ, China  
 KANG Wei (Dr) 康伟 PhD, Xi'an Jiaotong Univ, China  
 KANJWAL, Muzafar Ahmad (Dr) PhD, Chonbuk National Univ, Korea  
 KUANG Youdi (Dr) 匡友弟 PhD, Huazhong Univ of Sci & Tech, China  
 LI Kaikai (Dr) 李鐸鐸 PhD, The Hong Kong Univ of Sci and Tech  
 LI Xiaoyan (Dr) 李小燕 PhD, The Hong Kong Polytechnic Univ  
 LI Yinfeng (Dr) 李寅峰 PhD, Shanghai Jiaotong U, China  
 LIN Chen (Dr) 林晨 PhD, Xi'an Jiaotong Univ, China  
 LIN Ji (Dr) 林驥 PhD, Zhejiang Univ, China  
 LIU Chunchuan (Dr) 刘春川 PhD, Harbin Inst of Tech, China  
 LIU Qiang (Dr) 刘強 PhD, The Hong Kong Univ of Sci and Tech  
 LIU Wenbo (Dr) 劉文博 PhD, Sichuan Univ, China  
 TANG Liling (Dr) 唐利玲 PhD, The Hong Kong Polytechnic Univ  
 TANG Xuefeng (Dr) 唐学峰 PhD, Univ of Sci & Tech Beijing, China  
 WANG Xu (Dr) 王旭 PhD, Lanzhou Univ, China  
 WONG Chun Nam (Dr) 黃振南 PhD, Univ of Maryland, Baltimore Country, US  
 XIAO Zhihua (Dr) 肖知華 PhD, The Hong Kong Polytechnic Univ  
 XU Qi (Dr) 胥奇 PhD, Nanjing U of Aeronautics and Astronautics, China  
 YANG Yuebin (Dr) 楊躍彬 PhD, The Hong Kong Univ of Sci and Tech  
 YIN Yue (Dr) 殷悅 PhD, Ruhr-Univ Bochium, Germany  
 ZHANG Fei (Dr) 张菲 PhD, Dalian Univ of Tech, China  
 ZHANG Leiting 張雷霆 MPhil, The Hong Kong Univ of Sci and Tech  
 ZHANG Lu (Dr) 張璐 PhD, Harbin Engg Univ, China  
 ZHANG Zhenyu (Dr) 章振宇 PhD, Beijing Inst of Tech, China  
 ZHAO Rui (Dr) 趙瑞 PhD, Beihang Univ, China  
 ZHOU Kun (Dr) 周鋸 PhD, Zhejiang Univ, China

### Research Assistant (Full-time)

BAI Zhaowen 白肇文 MPhil, The Hong Kong Univ of Sci and Tech  
 BAO Xueyan 包雪岩 MSc, The Hong Kong Polytechnic Univ  
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 CHEN Fei 陳飛 BEng, Shenyang Aerospace Univ, China  
 CHEN Zongnan 陳宗南 MSc, The Hong Kong Polytechnic Univ  
 CHI Yicheng 池奕承 MSc, The Hong Kong Polytechnic Univ  
 CUI Huaifeng (Dr) 崔怀峰 PhD, Southeast Univ, China  
 DUAN Feng 段凤 BEng, Univ of Sci & Tech Beijing, China  
 FAN Ka Heng 范嘉興 PhD student, The Hong Kong Polytechnic Univ  
 FENG Xiao (Dr) 冯晓 PhD, South China Univ of Tech, China  
 FU Jin 傅进 MEng, Northeastern Polytechnical Univ, China  
 FU Yu 傅宇 Master, East China Univ of Sci & Tech, China  
 GUAN Ruiqi 关瑞琪 BA, Monash Univ, Australia  
 HALDAR Arindam (Dr) PhD, The Hong Kong Univ of Sci and Tech  
 HAN Zhuo 韩卓 BSc, Guizhou Univ, China  
 HAO Jiaao (Dr) 郝佳傲 PhD, Beihang Univ, China  
 JIANG Xiao 蒋潇 BEng, Wuhan Univ of Sci & Tech, China  
 JUAN Yuhuan 阮于軒 MSc, National Taipei Univ of Technology, Taiwan  
 LAM King Cheong 林景昌 PhD student, The Hong Kong Polytechnic Univ

LEE Yeeting 李宜庭  
 LI Chak Leung, Michael 李澤樑  
 LIU Mei (Dr) 刘梅  
 MA Jun 马俊  
 MAO Dongxu 毛东旭  
 MENG Qinghui 孟庆慧  
 MUDDASSIR, Muhammad  
 NG Ming To 吳銘濤  
 PANG Kaicheng 庞楷成  
 QIAN Jingui 钱金贵  
 SHEN Lu (Dr) 沈路  
 SHI Lisong (Dr) 時立松  
 SUN Bo 孫博  
 WANG Jin 王晋  
 WANG Yu (Dr) 王宇  
 WU Huihuan 吴会欢  
 YANG Xiongbin 杨雄斌  
 YU Dehai (Dr) 于德海  
 ZHANG Fu 張賦  
 ZHANG Hao 張浩  
 ZHANG Linli 張林立  
 ZHANG Mao (Dr) 張茂  
 ZHANG Zijian 張子健  
 ZHAO Wen 趙雯  
 ZHOU Bingchen 周冰晨  
 ZHOU Shuo 周碩

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 MSc, The Hong Kong Polytechnic Univ  
 Master, Chonnam National Univ, Korea  
 PhD, The Hong Kong Polytechnic Univ  
 PhD, The Hong Kong Polytechnic Univ  
 MSc, The Hong Kong Polytechnic Univ  
 Bachelor, Southwest Jiao Tong Univ, China  
 PhD, Harbin Inst of Tech, China  
 MSc, The Hong Kong Polytechnic Univ  
 MEng, Xi'an Jiaotong Univ, China  
 PhD, The Hong Kong Polytechnic Univ  
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 Master, Donghua Univ, China  
 MEng, Univ of Sci & Tech Beijing, China  
 MSc, The Hong Kong Univ of Sci and Tech

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 CHOW Man Kiu 周文翹 BEng, The Hong Kong Univ of Sci and Tech  
 JIANG Bailun 姜百倫 BEng, The Hong Kong Polytechnic Univ  
 KWOK Siu Lun 郭肇麟 MSc, The Hong Kong Polytechnic Univ

### Intern (Full-time)

CHEN Zongnan 陳宗南 MSc, The Hong Kong Polytechnic Univ

### Project Assistant (Full-time)

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### Project Assistant (Part-time)

Lam Tak Hung, Chrystie 林德紅 Master, The City University of Hong Kong

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 ANSARI, Talha Qasim MEng, North China Electric Power Univ, China  
 BIAN Jing 边菁 MEng, Tongji Univ, China  
 CAO Wuxiong 曹武雄 Master, Central South Univ, China  
 CHEN Long 陳龙 MSc, The Hong Kong Polytechnic Univ  
 CHEN Shengyang 陈晟洋 Master, Universitat Siegen, Germany  
 CHI Tianxi 迟天玺 MSc, Univ of Sheffield, UK  
 CHIANG Yan Kei 蔣欣岐 BEng, The Hong Kong Polytechnic Univ  
 CUI Jingyu 崔靖渝 MEng, Zhejiang Sci-Tech Univ, China  
 DING Haoqing 丁昊青 Master, Harbin Inst of Tech, China  
 DUONGTHIPEWAWA, Anchalee MEng, Xi'an Jiaotong Univ, China  
 FAN E 范鐸 MSc, Univ of Chinese Academy of Sciences, China  
 FAN Lei 范磊 MEng, Yanshan Univ, China  
 FU Jimin 傅济民 BEng, Zhejiang Univ, China  
 FU Yu 傅宇 Master, East China Univ of Sci & Tech, China  
 GAO He 郜贺 Master, Nanjing Univ, China



GAO Yang 高陽 MEng, Beihang Univ, China  
 GUO Zhenbin 郭鎮斌 MEng, The Hong Kong Polytechnic Univ  
 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  
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 HUANG Guangyuan 黃光遠 BEng, Tongji Univ, China  
 HUANG Kaicheng 黃凱程 MSc, The Chinese Univ of HK  
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 LI Dongfang 李東方 MSc, The Hong Kong Polytechnic Univ  
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 LI Jingying 李晶莹 Master, Harbin Inst of Tech, China  
 LI Meng 李蒙 MEng, Beijing U of Tech, China, China  
 LI Nana 李娜娜 MSc, University of Alberta, Canada  
 LI Qian 李倩 BEng, Tongji Univ, China  
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 LYU Linlong 吕林龙 MSc, The Hong Kong Polytechnic Univ  
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 PAN Zhefei 潘哲飞 MEng, Harbin Inst of Tech, China  
 PIAO Jinli 朴金丽 MEng, Beijing Univ of Tech, China  
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 WANG Shu 王庶 MSc, Peking Univ, China  
 WANG Tiangang 王天罡 MEng, China Academy of Space Technology, China

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 WANG Zhaokun 王兆坤  
 WANG Zhibo 王志博  
 WEI Long 魏龙  
 WEI Zhilong 衛之龍  
 WEN Fuzhen 温福祯  
 WEN Weisong 文伟松  
 WU Di 吴迪  
 XIAO Biao 向彪  
 YANG Haopeng 楊昊澎  
 YANG Juntan 楊君坦  
 YANG Tao 楊涛  
 YANG Weiping 杨维平  
 YANG Xiongbin 杨雄斌  
 YIN Qifang 殷其放  
 YU Dehai 于德海  
 ZAHRA, Omar Ibn Elkhatab Abdallah  
 Abdelkader Elkelay  
 ZHANG Dawei 張大尉  
 ZHANG Xiaqi 張曉奇  
 ZHANG Zhen 張振  
 ZHAO Fuwang 趙福旺  
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 MEng, Univ of Chinese Academy of Sciences, China  
 MSc, Univ of Chinese Academy of Sciences, China  
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 LAM King Cheong 林景昌  
 LEUNG Wing Yan, Maggie 梁詠欣  
 LO Chun Kong 盧鎮江  
 MA Hei Lam 馬曦嵐  
 MAK Yi Wah, Eva 麥浣華  
 WONG Yin Wai 黃燕威  
 ZHANG Hao 張浩

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 ZHOU Weifeng 周伟峰

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 MEng, Univ of Toronto, Canada

### Visiting Research Student (Full-time)

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 LU Yinyin 卢寅寅  
 ZASIMOVA, Marina (Ms)

Degree, Ufa State Aviation Technical U, Russia  
 Student, Peter the Great St. Petersburg Polytechnic University, Russia  
 Student, Peter the Great St. Petersburg Polytechnic University, Russia  
 Master student, Wuhan Univ of Sci & Tech, China  
 Student, Peter the Great St. Petersburg Polytechnic University, Russia



## Honours & Awards

(1 July 2017 – 30 Jun 2018)

### Prof. CHENG Li

- Faculty of Engineering Research Grant Achievement Award 2016/17
- Faculty Award in Research and Scholarly Activities – Merit Award (Individual) 2016/17

### Prof. LEUNG Chun Wah (retired in Dec 2018)

- Faculty of Engineering Outstanding Award in Services (Individual) 2016/17

### Prof. SHI Sanqiang

- Faculty of Engineering Research Grant Achievement Award 2016/17

### Prof. SU Zhongqing

- Gold Award, The 46th International Exhibition of Inventions of Geneva, Geneva, Switzerland

### Dr JING Xingjian

- The European Association for Structural Dynamics (EASD) Senior Research Award, The European Association for Structural Dynamics
- First Prize of Construction Safety, CIC Construction Innovation Award 2017, The Construction Industry Council

## Professional Services

### Prof. CHAN Tat Leung

- Chairman, 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
- Specialist, Engineering and Technology area of The Hong Kong Council for Accreditation of Academic & Vocational Qualifications
- Honorary Chair, Society of Automotive Engineers International- Hong Kong
- Section Vice 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. 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 JING Xingjian

- Technical Program Committee, 2016 International Conference on Mechanical Engineering and Robotics Research (ICMERR 2016), Singapore, December 26-28, 2016
- Technical Program Committee, "2016 International Conference on Energy and Mechanical Engineering", Wuhan, China, Nov 19-20, 2016

### Dr LEUNG Chi Kin Randolph

- Section Chair, American Society of Mechanical Engineers – Hong Kong Section

## 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. LEUNG Chun Wah (retired in Dec 2018)

- Fellow of The Hong Kong Institution of Engineers (FHKIE)
- Fellow of Institute of Marine Engineering (FIMarEST)
- Fellow of The Institution of Mechanical Engineers (FIMechE)

### 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 (AIAA)
- 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 / Taylor & Francis
- 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

## Distinguished Lecture / Keynote Speech at International Conference / Symposium

### 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

### Prof. CHENG Li

- "Structural Wave Manipulation through Acoustic Black Hole Effect for Vibration and Noise Control", 28th Congress on Vibration and Noise Technology and Applications (VNATA2018), 20 - 22 Apr 2018, Shanghai, China
- "Structural Wave Manipulation through Acoustic Black Hole Effect form a Solid Mechanics Perspective", 2017 Annual Conference of Shanghai Society of Mechanics and 13th Shanghai-Hong Kong Forum on Mechanics and Its Application, 24 Sep 2017, Shanghai, China
- "Acoustic Black Hole Structural Design for Vibration Energy Isolations", 5th Forum on Vibration and Noise Control of Equipment, 11 - 13 Nov 2017, Nanjing, China

### Prof. FU Ming Wang

- "Quality control of metal-forming products aided by finite element simulation", 8th International Conference on Tube Hydroforming, 14 - 17 Nov 2017, Bangkok, Thailand
- "Development of Multi-Scaled Deformation Fabricated Products Aided by Finite Element", 4th Int Conf on Metallic Materials and Processing (ICMMP) 2018, 18 - 20 Jun 2018, Xian, China
- "Development of Multi-Scaled Deformation Fabricated Products Aided by Finite Element", 中国兵工学会精密成形工程专业委员会 2018 年学术年会, 20 - 22 Jun 2018, Xian, China

### Prof. SU Zhongqing

- "A high-sensitivity, sprayable nanocomposite sensor for localizing damage in aircraft radomes", The 9th International Symposium on NDT in Aerospace, 8 - 10 Nov 2017, Xiamen, China
- "In-situ Health Monitoring of Space Structures Under Hypervelocity Impact: Hybrid Use of Passive Acoustic Emission and Active Nonlinear Guided Waves" International Congress on Ultrasonics (ICU) 2017, 18 - 20 Dec 2017, Hawaii, USA

### Prof. WEN Chih-Yung

- "Theoretical and numerical investigation of shock stand-off distance for non-equilibrium flows over spheres", 2nd International Workshop on Aerodynamics Covering Flow Regimes, 8 - 12 Aug 2017, Mianyang, China

### Dr AN Liang

- "Recent Advances in Direct Ethanol Fuel Cells for Sustainable Energy Production", Innovate Biotech 2017 "International Colloquium on Biotechnology & Industrial Revolution", 27 - 28 Nov 2017, Brisbane, Australia
- "Recent Advances in Direct Ethanol Fuel Cells for Sustainable Energy Production", International Conference on Membrane Science and Technology, 11 - 12 Sep 2017, Paris, France
- "Recent Advances in Direct Ethanol Fuel Cells for Sustainable Energy Production", 2017 International Conference on Electrochemistry and Energy Storage (CEES 2017), 1 - 3 Dec 2017, Sanya, China
- "A redox fuel cell capable of converting fuels to electricity at a high power output", 5th World Congress and Expo on Green Energy, 14 - 16 Jun 2017, London, UK

### Dr LIU Yang

- "The development of  $k-\omega-\varphi-\alpha$  turbulence model", Turbulence, Flow Control and Engineering Applications, 23 - 24 Sep 2017, Beijing, China

### Dr ZHANG Peng

- "Towards Quantitatively Predictive Reaction Mechanisms for Hypergolic Propellants", Hypergolic Liquid Rocket Engine and Spray Combustion Workshop, 18 - 21 Jan 2018, Xian, 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: <ul style="list-style-type: none"> <li>MSc in Mechanical Engineering (Product Development and Analysis)</li> <li>MSc in Mechanical Engineering (Air/Noise Pollution Management)</li> <li>MSc in Mechanical Engineering (Aeronautical Engineering)</li> <li>MSc in Mechanical Engineering (Aviation)</li> </ul>	Mixed-mode (Self-financed)
Engineering Doctorate	Mixed-mode (Self-financed)

# Performance Indicators

## Student Enrollment

Programme	Year 1 Intake	Total no. of Students in 2017/2018
Full-time BEng(Hons) Scheme in Mechanical Engineering	61	61
Full-time BEng(Hons) in Mechanical Engineering (including Double Degree students)	0	323
Full-time BEng(Hons) in Product Analysis and Engineering Design	0	98
Part-time BEng(Hons) in Mechanical Engineering	80	303
Part-time BEng(Hons) in Product Analysis and Engineering Design	47	182
MSc/PgD in Mechanical Engineering	72	140
Part-time Engineering Doctorate	1	2
<b>Total</b>	<b>261</b>	<b>1109</b>

## Student Feedback Questionnaire (SFQ)

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

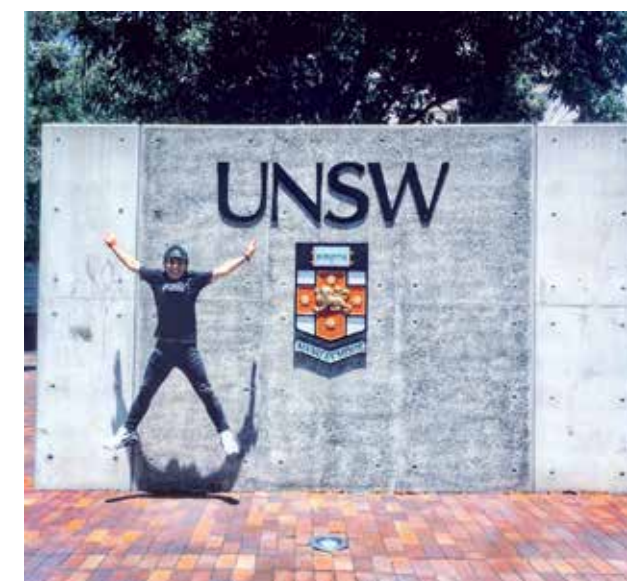
Items	ME Average	FENG Average
<b>Subjects</b>		
Clear understanding of what I am expected to learn	4.1	3.9
Teaching & learning activities helped me to achieve the subject learning outcomes	4.1	3.9
Assessments require demonstration of knowledge/ skills/ understanding of subject	4.1	4.0
Able to understand the criteria for grading	4.1	3.9
<b>Staff</b>		
Teaching was well-organized	4.1	4.0
Staff member was helpful	4.1	4.0
Useful and timely feedback	4.0	3.9
Encouraged students to ask questions/ discuss ideas	4.1	4.0
Encouraged students to learn independently	4.1	4.0
<b>Overall view about the teaching of the staff member</b>		
Provided me with a valuable learning experience	4.1	3.9
Overall, staff member is an effective teacher	4.1	4.0
<b>Grand mean of item on Overall View</b>	<b>4.1</b>	<b>3.9</b>

## 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
Beihang University	China	4
Case Western Reserve University	USA	1
Dublin Institute of Technology	Ireland	5
Institut Polytechnique Des Sciences Avancees	France	8
Kansas State University	USA	1
Lucerne University of Applied Sciences and Arts	Switzerland	3
Mikkeli University of Applied Sciences	Finland	1
National Tsing Hua University	Taiwan	1
National University of Singapore	Singapore	8
Sabanci University	Turkey	1
Seoul National University	Korea	1
Sichuan University	China	1
University of Technology of Troyes	France	11
University of Waterloo	Canada	1
<b>Total</b>		<b>47</b>





## Outbound

University	Country	No. of students
Friedrich-Alexander-University of Erlangen-Nuremberg	Germany	2
Hochschule Konstanz University of Applied Sciences	Germany	12
Lucerne University of Applied Sciences and Arts	Switzerland	3
National Tsing Hua University	Taiwan	2
Norwegian University of Science and Technology	Norway	2
The University of Manchester	United Kingdom	1
University of New South Wales	Australia	1
University of Stuttgart	Germany	1
University of Wisconsin-Madison	USA	1
<b>Total</b>		<b>25</b>



## 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.

### Overseas Placement

Organization	Country
91maker	China
Abe Archi Atelier	Japan
Aerospace Composites Malaysia	Malaysia
Anhui SDF Precision Manufacturing Ltd	China
Cathay Pacific Airways Ltd.	Thailand
Electricity Generation Authority of Thailand	Thailand
Esquel Vietnam - Hoa Binh	Vietnam
Fab Lab Valencia	Spain
Gudeng Precision Industry Co., Ltd.	Taiwan
Harbin Boshi Automation Co., Ltd.	China
IAT Automobile Technology Co., Ltd.	China
INEA d.o.o	Slovenia
IPMA Industry Sdn. Bhd.	Malaysia
JiLin Cancer Hospital	China
Jinan Time Group	China
KIA Jordan National Arab Motors	Jordan
Laboratory for Robotics and Automation Technology & Equipment, Institute of Mechatronic Engineering, Tsinghua University	China
NARI Group Corporation	China
Petroleum Development Oman	Oman
RB-Kolubara	Serbia
Schlumberger	Oman
Shanghai Aircraft Manufacturing Co., Ltd.	China
Shanghai Electric Wind Power Co., Ltd.	China
Tecnimont Private Limited	India
Thai Airways International Public Company Limited	Thailand
The Boeing Company	USA
Touch Surgery	UK

### Local Placement

Organization	Organization
8 Century Computer Products Ltd	ASB-biodiesel
A & P Instrument Co Ltd	ASM Technology Hong Kong Limited
A Star Coding Limited	ATAL Building Services Engineering Ltd
Advance Concept Product Solution Company Limited	BM Hong Kong Ltd
Advanced Intelligent Management Ltd	China Telecom
Aether Engineering Company Limited	Chun Tat Auto Service



## Local Placement

Organization	Organization
Chun Wah Garage Limited	Johnson Controls Hong Kong Limited
Chun Wo Construction	K-Pro Sports Technology Company
CLP Holdings Limited	Laford Engineering HK Ltd
Complete Solutions International Limited	Lead Hill Engineering Ltd
Construction Industrial Council	Majestic Engineering Co Ltd
Cummins Hong Kong Limited	Materials Design Solution
Daikin Air Conditioning (Hong Kong) LTD.	Mattel Asia Pacific Sourcing Ltd
Delmen Design	MC Group Exhibition Services Limited
Delta Asia Limited	Modern Terminals Limited
Dophen Engineering Co Ltd	MTR Corporation
Dynamics Structure Ltd	MultiTek Global
Electrical and Mechanical Department HKSAR Government	Nielsen Hong Kong
Enviro Process Engineering (HK) Co. Ltd.	Okmen Systems & Services Ltd
Equal Rich Enterprise Limited	Otis Elevator Company HK Ltd
FC Packaging Holding Ltd	PCCW Limited
Forexim International Limited	Plumis Company
Freotech Road Recycling Technology (Holdings) Ltd	Providence Garden of Rehab
Fu Tai Eng Co	Qing Dao City Construction Investment (Group) Co. Ltd
GEW International Corporation Ltd	REC Engineering Ltd
Global Environment Engineering Co. Ltd	Remington Product, Spectrum Brands
Green Mountain Interior Design and Construction Company	RF Tech Limited
HAECO	SGS Group
HAITEC	Shenyang Qili Composite Material Limited
Herman Miller Global Customer Solutions (HK) Limited	Shenzhen YixingLong Craft Work
HK Airlines	Shun Hing Group
HKSAR Government Marine Department	Sigma Elevator
Hoi Ming Engineering Company	Silverback Airsoft Ltd
Hong Kong Aero Engine Services Limited	Sino Ciomputer Service Limited
Hong Kong Aircraft Engineering Company Limited	Smartek E & M Engineering (HK) Ltd
Hong Kong Facility Solutions Co. Ltd.	The Hongkong Electric Co Ltd
Hong Kong Steel Limited	Vinci Construction
Housewell (Hong Kong) Construction Limited	Vtech Electronics (HK) Ltd
Hung Wan Aquarium Co	Wang & Lee Contracting Ltd.
In-Tech electronic Limited	Wilcom System Co Ltd (Nanjing)
Interior Design & Contracting Company Ltd	Winfield Vision Technology Ltd
Intertek Testing Service HK Limited	Wiscom System Co. Ltd
IP'S & Consulting INC	Yee Kee Building Material Co Ltd
Ja Eco Solutions (HK) Ltd	Yoeman Engineering Co. Ltd.
Jockey Club Centre for Positive Ageing	

## IAESTE (Summer Training Exchange Programme)

To nurture students to become all-round global citizens, apart from WIE activities locally, students are also encouraged to take up internships in other parts of the world, while the Department welcomes students from overseas institutions to stay and work in the Department.

### Inbound

Student Name	Institute	Country
Aneta LUKASIEWICZ	Warsaw University of Technology	Poland
Christian STUFF	RWTH Aachen University	Germany
Iva NIKOLOVA	Saints Cyril and Methodius University in Skopje	Macedonia
Konrad Piotr GODZINSKI	Lodz University of Technology	Poland
Kornchawan CHANGPHOO	King Mongkut's University of Technology North Bangkok	Thailand
Mateusz Jan MARCZEWSKI	Poznan University of Technology	Poland

### Outbound

Student Name	Institute	Country
CHEUNG Lap Wing	Ulsan National Institute of Science and Technol (UNIST)	Korea
FUNG Chun Kit	Electricity Generating Authority of Thailand	Thailand
GAO Liwen	Brno University of Technology	Czech Republic
HO Chi Hung	Petroleum Development Oman	Oman
LEUNG Wai Wa	Lodz University of Technology	Poland
LEUNG Yue Hin	INEA d.o.o.	Slovenia
SUEN Cheung Kit	King Mongkut's University of Technology North Bangkok	Thailand



## Technical Visits to Local Industries

The Department arranged the following visits to local industries for the students:



Date	Local Industry
25/9/2017	CLP Power HK Ltd
9/10/2017	Stratasys Limited
16/10/2017	Electrical and Mechanical Engineering Department, HKSAR
30/10/2017	Drainage Services Department, HKSAR
22/1/2018	Civil Aviation Department, HKSAR
29/1/2018	MTR
5/3/2018	HK Electric
12/3/2018	Mitsubishi Electric (Hong Kong) Limited



## Mentorship Programme

The Department continued to run the Mentorship Programme aiming at building a caring and supportive relationship between PolyU alumni, partners and friends of PolyU (as mentors) and undergraduates (as mentees) to achieve the following objectives:

- To facilitate the educational, social and personal growth of mentees
- To develop mentees' fullest potential, vision and aspirations for the future
- To enhance mentees' future professional and career development
- To help groom mentees to become preferred graduates
- To empower mentees to face challenges in society

The Alumni Mentorship Dinner was held on 7 Feb 2018. Over 100 alumni, honorable guests and academics, together with about 150 students from the graduating classes of BEng(Hons) in Mechanical Engineering, BEng(Hons) in Product Analysis and Engineering Design, and Double Degree Programme in Business Administration and Engineering showed up in that evening making the dinner a memorable and meaningful one.

The Alumni Mentorship dinner is a tradition of ME to enhance the bonding between alumni with members of the Department and more importantly, to provide a platform for our final year students to learn practical experiences and professional advice from alumni mentors.





## The 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 2017/2018 academic year.

Recipient		
AKHMET Dias	KWAN Kai Lok	SAPIULLAH Saad Bin
CHAN Hong Wah	KWOK Chi Kwan	SHA GATA Y Maral
CHAN Kwok Wai	KWONG Tak Chun	SHEK Chung Nam
CHAN Wai Ho	LAI Wing Sum	SHEK Siu Lam
CHEN Shujian	LAI Wing Tung	SHEK Yiu Shing
CHENG Haoran	LAM Kah Cheng	SHIN Ji Ho
CHENG Ho Yin	LAM King Shing	TAHIR Abdullah
CHEUNG Ho Yin	LAM Wai Sum Fion	TO Yip Sum
CHEUNG Lap Wing	LAU Kin Chiu	TONG Wai Lok
CHIU Chun Tak	LAW Tung Pan	TSANG Kai Cheung
CHOW Hung Ming Roy	LEE Ka Yip	TSANG Man Chun
CHOW Tsz Pan	LEE Kit Sing	TSE Hung Kwan
CHUNG Shan	LEE Tsz Hang	WAN Chak Pai
CHUNG Wang Yip	LI Chi Chung	WANG Damin
DING Yuxin	LI Xueyao	WANG Junyan
DUAN Yufei	LIANG Zixuan	XU Xinrui
GAO Liwen	LIT Hong Tat	YANG Chen
HO Hoi Chun	LO Kan Mo Bryan	YU Tsz Chun
HOO Shi Xiong	LO Siu Qing	YU Wai Yin
HUO Xiaoyu	LOONG Cheng Sheng	YUEN Wing Shan
JI Yuan	MAO Jiaqi	ZHANG Weiyi
JIANG Jiacong	NG Wa Yan	ZHAO Jingyuan
KEUNG Chun Yu	NG Wai Fun	ZHOU Jiahong
KHALID Farhan	NGAI Tsz Kit	ZHOU Siyang
KOK Wai Lok	POON Tak Ming	

## 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 2017, Department of Mechanical Engineering	JI Yuan
Scholarship	
A & P Scholarship	CHAN Kwok Wai KEUNG Chun Yu KONG Miu Shan
Bauhinia Cup Outstanding Entrepreneur WIE Scholarship	BI Yanding LOONG Cheng Sheng
CLP Scholarship in Mechanical Engineering	LAW Tung Fan
Chiang Chen Industrial Charity Foundation Scholarship	CHEUNG Lap Wing
Cobelco Industrial Supplies Ltd. Scholarship	KWAN Kai Lok
Commercial Radio 50th Anniversary Scholarship	XU Xinrui LEE Wai Seng Stanley LEUNG Yue Hin SHIN Ji Ho
Department of Mechanical Engineering Scholarship for Hall Residents	CHENG Haoran LOONG Cheng Sheng
Dr. Y.K. Ching Memorial Scholarship	DING Yuxin LOONG Cheng Sheng DING Yuxin LIU Yuanhao ZHANG Youren ZHU Zhaoran
Faculty of Engineering Academic Scholarship for Outstanding HKDSE Admittees (2016/17 intake)	HUNG Chun Sing KWONG Tak Chun LEUNG Wai Chun
Fuji Xerox (Hong Kong) Limited Scholarship	KONG Miu Shan
HAESL Scholarship	CHAN Wai Ho
HKCC Scholarship for PolyU Articulation	KONG Miu Shan SO Ho Yik TSANG Man Chun TSE Hung Kwan YIP Chun Lam
HKSAR Government Scholarship	BI Yanding GAO Linying LAU Pit Wing
HKSAR Government Scholarship Fund - Reaching Out Award	GU Zhengping JIAO Shiyu KONG Miu Shan KONG Yuk Ying LEE Wai Seng Stanley LEUNG Yue Hin LIM Shun Yao LIU Kin Kwan LOW Kah Onn NG King Ning ZHU Yaxuan



Scholarship	Recipient
HKSAR Government Scholarship Fund - Talent Development Scholarship	PANG Wai Fong
Hong Kong Aviation Scholarship	IP Shu Chuen IP Shu Chuen LEE Yiu Chun Alvin LEE Yiu Chun Alvin SHUEN Kenneth Tze Yong
Hong Kong Plastics Manufacturers Association Scholarship	TSANG Man Chun
Lam Sze Ming Scholarship	JI Yuan
Mitsubishi Electric (Hong Kong) Limited Scholarship	LIT Hong Tat
Outstanding Graduates Scholarship	CHEN Longye FANG Jieyichen HO Ka Kay LO Wan Yin MA King Sum MONZON Constance SHUEN Kenneth Tze Yong SU Yiyin SZE Wai Tak ZHENG Junyuan
PolyU Awards SPEED Scholarship	LAU Yiu Yeung LI Chi Yuen TO Yip Sum
PolyU Community Service Fund Service-Learning Scholarship	LAI Ying Wai LIU Kin Kwan
REC Engineering Company Limited Scholarship	KWAN Kai Lok
Rexroth Industry 4.0 Scholarship	CHAN Sui Hin Christ FUNG Gregory Tze Yu LAU Kwun Hin LEUNG Cheuk Hei YUEN Shing Nok
Simatelex Charitable Foundation Scholarship	CHOW Hung Ming Roy CHUNG Hei Lok CHUNG Wang Yip
The Hong Kong & Kowloon Engineering Employers Association Limited Scholarship	BI Yanding LIANG Zixuan TSE Hung Kwan ZHANG Weiyi
The Hong Kong Polytechnic University Scholarship	JI Yuan
The Hongkong Electric Co. Ltd. Scholarship	KWONG Tak Chun
VTech Group of Companies Scholarship	ZHANG Weiyi
Wong Tit-shing Student Exchange Scholarship	LEE Wai Seng Stanley LEUNG Yue Hin LIM Shun Yao LOW Kah Onn
Zhejiang Tianhuang Pharmaceutical Co Ltd Scholarship	QIN Chuan
Dr. Ng Tat-lun Memorial Scholarship	LEE Wai Seng Stanley
HKSAR Government Scholarship Fund - Targeted Scholarship	LOW Kah Onn
Targeted Scholarship Scheme - Belt & Road Scholarship (Indonesia)	WAHYONO Darren Anthony

Scholarship	Recipient
The Hong Kong Polytechnic University Entry Scholarship (Academic)	ALI Moazzam SHAGATAY Maral SAFIULLAH Saad Bin KHALID Farhan TAHIR Abdullah JIA Lu Meng
The Hong Kong Polytechnic University Entry Scholarship (Academic) and Faculty of Engineering Undergraduate Scholarship	AKHMET Dias
The Hong Kong Polytechnic University Entry Scholarship (Non-Academic)	PANG Yee Kwong LIM Tsz Hin Jeff
The Hong Kong Polytechnic University-APEC Entry Scholarship	LAM Kah Cheng LIM Shun Yao MOEY Ziwei LOONG Cheng Sheng
Bursary	
Bursary for Belt and Road (B & R) Scholarship Awardees	
Delong Bursary	
Freetech Technology Bursary	
K.K. Chow Bursary	
The Hongkong Electric Co. Ltd. Bursary	

## 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
The 11th "Mitsubishi Electric Cup" National Electric and Automation Contest	Second Prize and the CC-Link Special Award
iF DESIGN TALENT AWARD 2017	Winner
DFA Hong Kong Young Design Talent Award	CreateSmart Young Design Talent Special Award 2017
Trainee of the Year Award 2017	Trainee of the Year Award
The 7th IMechE Greater China Design Competition at Guangzhou	Champion and the Most Innovative Award
HKIE Joint Student Chapters Competition 2018	Champion and the Best Innovative Award
The 22nd Annual Conference of HKSTAM 2018	Best Student Presentation Award
Young Engineers Programme (YEP) 2017/2018	Champion
The Fourth International Conference on Metallic Materials and Processing (ICMMP)	Best Presentation Award



## Research & Consultancy

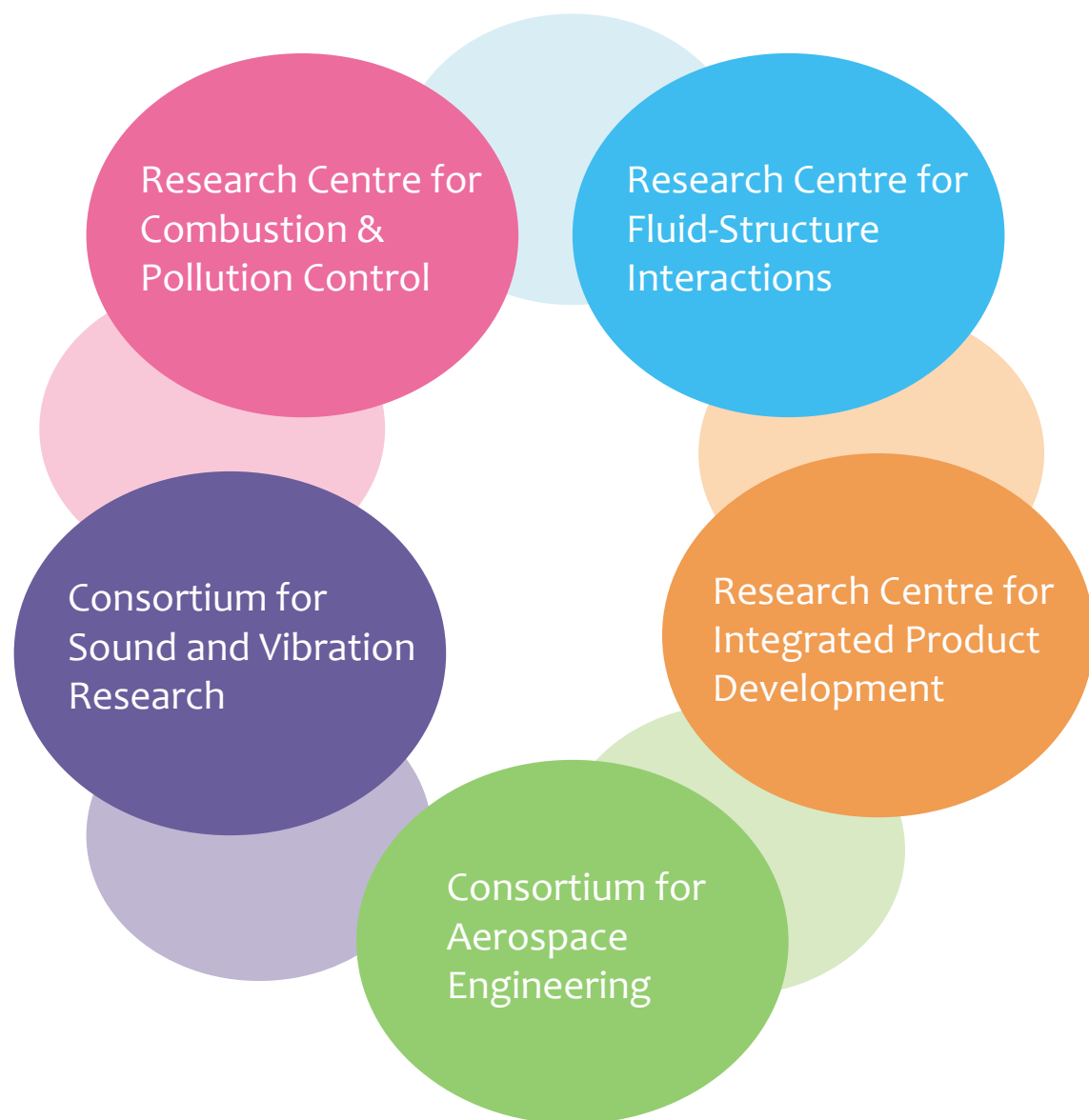
The Department continues to push the frontiers of knowledge and applications in the discipline of Mechanical Engineering. With the spirit of driving innovation for a better future, members of the Department are playing an significant role in making high-impact contributions to the profession by engaging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





# Research Centres/ 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, five research areas where a critical mass of experts is available in each have been identified.

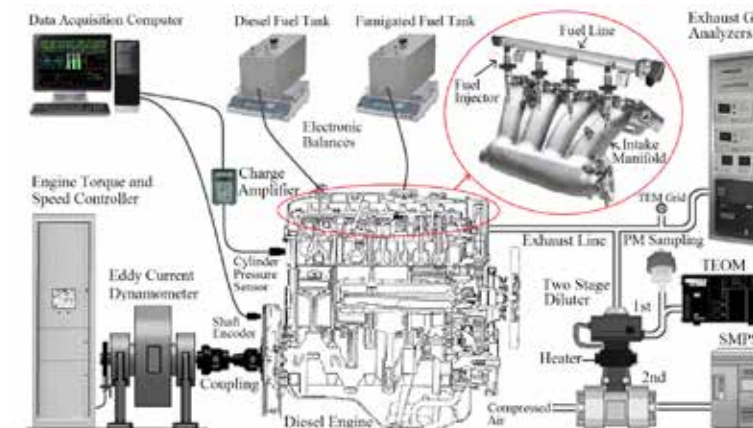


## Research Centre for Combustion and Pollution Control

The CPC Research Centre is operated smoothly with collaborative effort from the key members, including Prof. WF Leung, Prof. TL Chan, Prof. CS Cheung, Prof. C.W. Leung, Dr L An and Dr. P Zhang. The Research Centre 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 flames and combustion, alternative fuels, internal combustion engine performance and emissions, electrical chemical energy storage systems and nano-technology for air pollution control. The CPC Research Centre has made significant contribution to the development of new curriculum and new subjects for the Department, and has provided many research and undergraduate projects for our students. Excellent research outputs, including patents, book chapters, journal publications and conference presentations are made by the key members of the Research Centre to enhance the image of PolyU. In addition, we have been active in providing consultancy/expert services to the Environmental Protection Department of the HKSAR. Because of our efforts and achievements, The Hong Kong Polytechnic University (PolyU) is recognized to be one of the leading institutions in dealing with combustion and combustion-led air pollution problems in Hong Kong and the Pearl River Delta region. Some of the ongoing research projects are shown below.

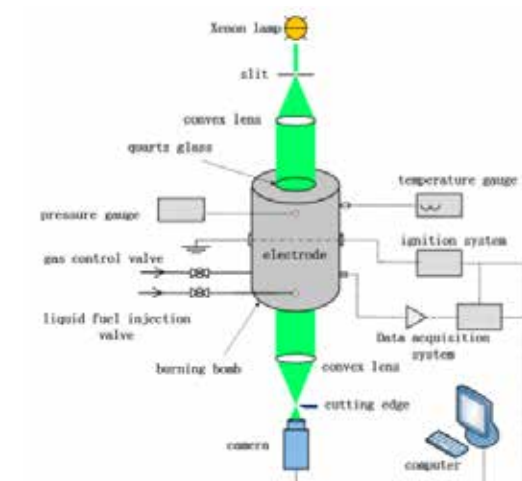
### Application of Alternative Fuels to Diesel Engine

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.



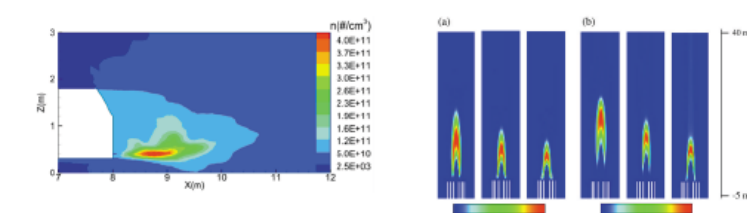
### Bio-syngas Combustion

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.



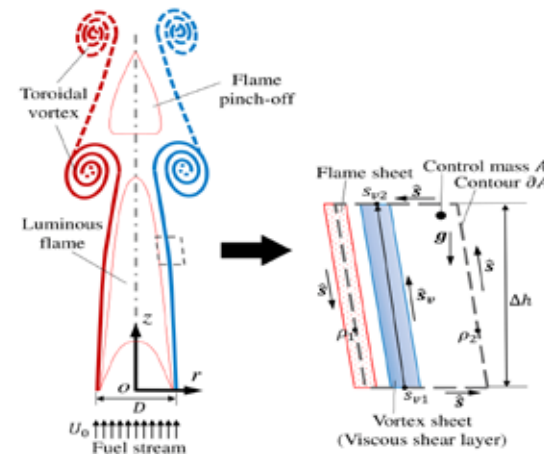
### Multiphase and Multi-component Complex Systems with Micro- and Nano-scale

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., thermal-fluid, materials, chemical and environmental sciences) and many potential engineering applications.



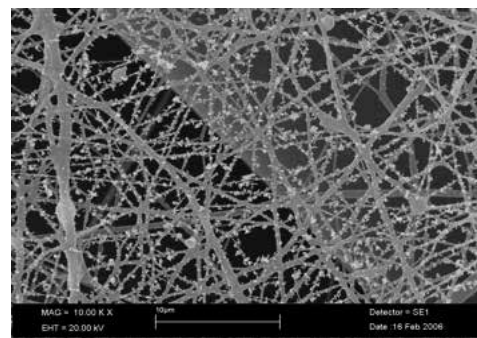
### Vortex Dynamics of flicking diffusion flames

Diffusion flames are ubiquitous in domestic and industrial applications that have been shaping human civilization. The development of flame instabilities could impair combustion performance, cause ignition failure or flame extinction, damage combustion devices, and trigger uncontrollable fire hazard. A prominent phenomenon related to the stability of a buoyant diffusion flame is flame flickering, or puffing, which describes the vibratory motion of the luminous flame. Recently, a theoretical framework based on vortex dynamics has been established and confirmed the scaling relations observed in experiments. However, more studies are merited for unveiling the secrets of flickering diffusion flames.



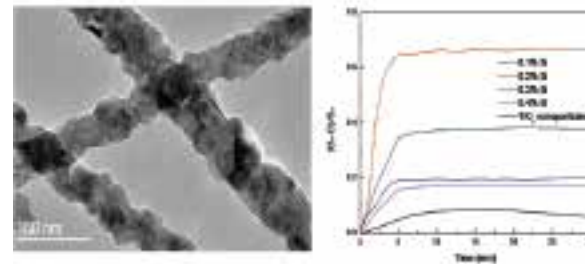
### Air Filtration

We have developed electrostatic charges to the nanofibers so that dipoles are induced on neutrally charged pollutants by the charged nanofibers as they get close to the charged fibers. Subsequent attraction will follow due to charge interaction between the charged fiber and the dipoles of the charged particles. This is also most effective when capturing viruses which typically carry negative charges. We have further developed shielding to enhance the electrostatic field of the charged fibers on the incoming pollutants. As a result, much higher capture efficiency can be obtained without higher pressure drop. Our charged nanofibers can also maintain good stability under humid environment for over 3 months.



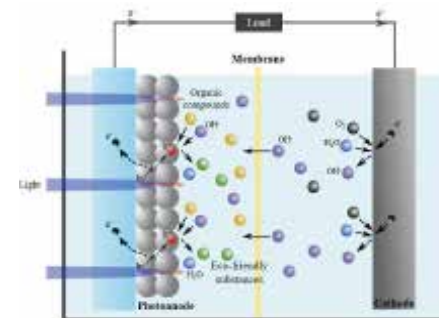
### Air-water Purification

We have developed a Titanium composite nanofiber photocatalyst with graphene inside that have demonstrated much higher performance in converting NO to NO<sub>2</sub> and formaldehyde to harmless CO<sub>2</sub> and water vapor. The nanofibers can also be coated onto a surface that lend themselves for use in both indoors and outdoors. The coated nanofibers can also be adopted in aqueous phase breaking down harmful dissolved organics upon illumination.



### 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.



## Research Centre for Fluid-Structure Interactions

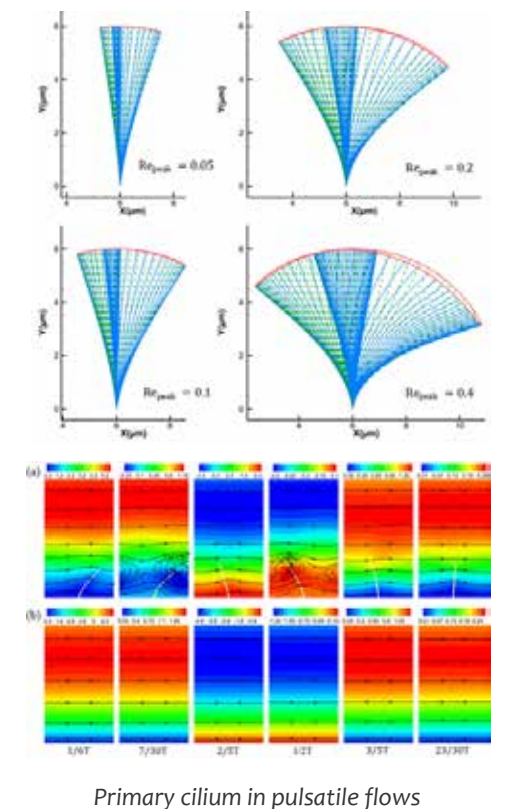
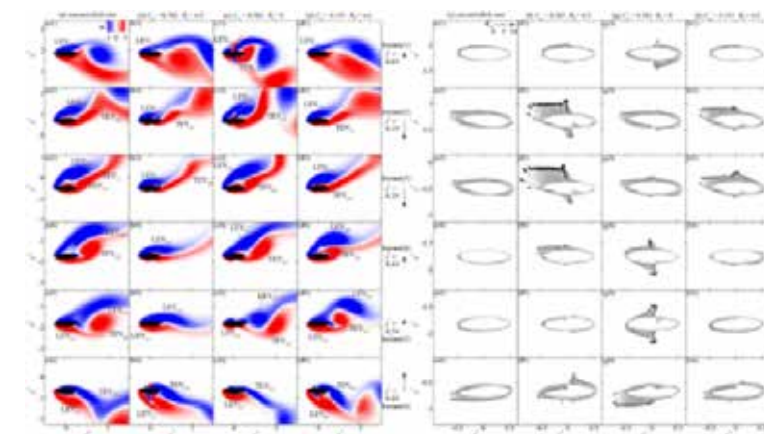
With rapid economic and industrial development in China, India and elsewhere, fluid-related structural vibration and noise problems are widely encountered in many fields, just as they are in the more developed parts of the world, causing increasingly grievous concerns. Turbulence clearly has a significant 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.



In the past year Dr Hui TANG has published 14 papers in top journals in FSI or fluid mechanics, including *International Journal of Heat and Mass Transfer*, *Physics of Fluids*, *Physical Review Fluids* and *Bioinspiration & Biomimetics*. He secured a GRF grant in 2018. The secured GRF research is an FSI research collaborating with University of California, Riverside, and Delft University of Technology. Dr Yang LIU has published 7 papers and one invited book chapter in 2017-2018 such as *Computers and Mathematics with Applications* and *Langmuir*, etc.

There are currently four GRF projects running in the FSI research center.



Active control of a heaving airfoil using a pair of synthetic jets. Much better aerodynamic performance can be achieved if the jet strength and phase angle are appropriately adjusted.



## Research Centre for Integrated Product Development

The research endeavors and activities of the Research Center for Integrated Product Development (IPD) 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 IPD members during this report period (from 1 July 2017 - 30 June 2018) resulted in 65 referred SCI journal papers and about 15 conference papers. The journals cover 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., Sci and Eng of Composite Materials, Int. J. of Applied Glass Science, Acta Materialia, etc. In addition, the IPD members were successful in applying internal and external research funds in the past year. They secured 2 GRF funded and 3 fundable projects, 2 Hong Kong PDF Scheme projects, 2 NSFC research projects, 1 Joint Supervision with Chinese Mainland, Taiwan and Macao Universities, and a number of fundable projects from the University and the HK Government, with a total amount of more than HK\$5 million.

The IPD members also actively participated in journal editorial boards including Editor-in-Chief for Composites Communications (Elsevier) and Advanced Materials Research (Trans Tech Publications), Regional Editors for International Journal of Computer Aided Engineering and Technology (Interscience Publisher) 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, IPD 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), Johns Hopkins University, Pennsylvania State University, University of Oxford, Sydney University, 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.

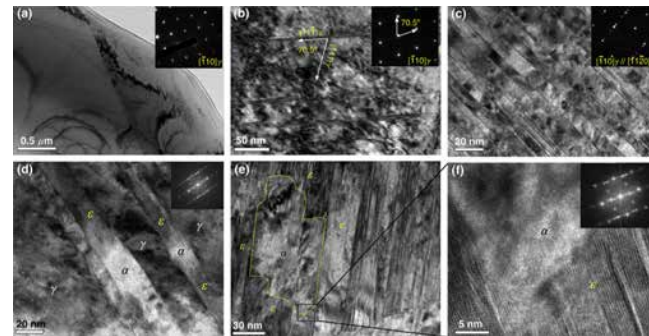


Fig. 1. The polymorphic  $\gamma(fcc) \rightarrow \epsilon(hcp) \rightarrow \alpha(bcc)$  martensitic transformation

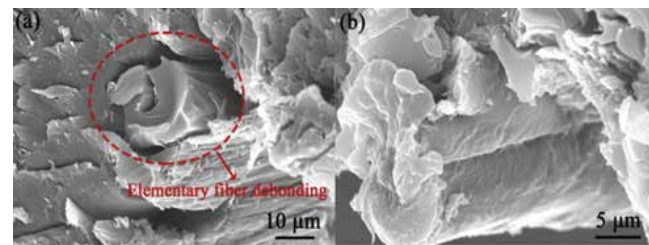


Fig. 2. SEM photographs of sisal fibers fractured by single fiber pull-out tests

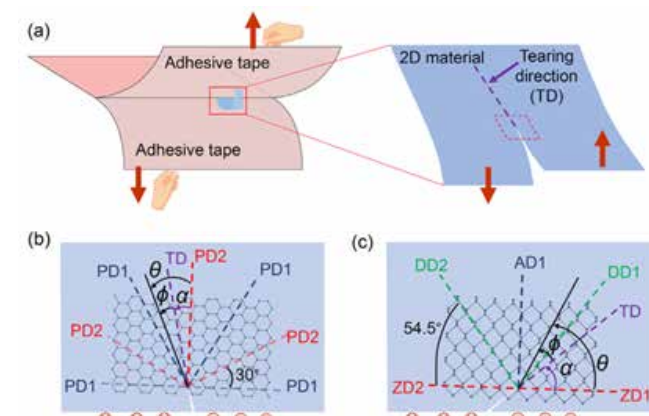


Fig. 3. (a) Schematic illustration of a crack mode describing the tearing process of mechanical exfoliation of 2D materials

## Consortium for Aerospace Engineering

The Consortium for Aerospace Engineering (CAE) has witnessed a successful sixth year, showing the strong commitment of ME, PolyU in developing the aerospace and aviation researches. The group has continued gaining international recognition in a number of aspects.

The CAE members were successful in applying research funds internally and externally in the past year. The CAE members secured 4 GRF funded and 5 fundable projects, 1 Hong Kong PDF Scheme projects, 1 RGC Postgraduate Students Conference/Seminar Grants, 3 NSFC research projects, 2 State Key Laboratory Open Research Fund, 2 Joint Supervision with Chinese Mainland, Taiwan and Macao Universities, and collaborative projects with Guangzhou Purple River Technology Limited and EMSD respectively, with a total amount of more than HK\$7 million.

The research works carried out by the CAE members have been shown consistently well, which is evidenced by the large number of quality papers published in the top notch journals in the area, such as AIAA (American Institute of Aeronautics and Astronautics) journal, Journal of Fluid Mechanics, Physics of Fluids, Journal of Acoustical Society of America, Structural Health Monitoring: An International Journal, Nature Materials, Advanced Materials, Physical Review Letters, Carbon, Acta Materialia, Applied Physics Letters, ... etc. In addition, Prof. ZQ Su and Prof. LM Zhou were awarded a Gold award in the 46th International Exhibition of Invention of Geneva, Switzerland, in Apr 2018 for their "Sprayable Smart Sensing Network Coating for Structural Health Monitoring". Prof. WWF Leung was granted a patent on a method of producing dye-sensitized solar cell. From January 2018 Prof L Cheng was appointed to several new positions, including Deputy Editor-in-Chief and Receiving Editor, Journal of Sound and Vibration (JSV), Advisory Board Member in ASME transaction, Journal of Non-destructive Evaluation, Diagnostics and Prognostics of Engineering Systems, Editorial Board Member, Advances in Aircraft and Spacecraft Science, Techno Press, and Director, International Institute of Noise Control Engineering (I-INCE). Together with his directorship in the International Institute of Acoustics and Vibration (IIAV), he involved in the two largest world organizations in sound and vibration, each involving member societies from around 40 countries. Dr XJ Jing received prestigious the European Association for Structural Dynamics (EASD) senior research award in Sep 2017, due to his important contributions for the analysis and design of nonlinear systems in the area of development of methodologies for structural dynamics. He also received the 1st Prize in the category of Construction Safety in the Hong Kong CIC (Construction Industry Council) Construction Innovation Award 2017 for his bio-inspired anti-vibration exoskeleton (BIAVE). Dr P Zhang, was appointed as the Guest Professor of State Key Laboratory of High-temperature Gas Dynamics, Chinese Academy of Sciences, in Aug 2017.

Many students' awards were received under the supervision of CAE members. Mr Jimin Fu, PhD student under the supervision of Dr HM Yao, received the "Best Student Presentation Award" at the 22nd Annual Conference of Hong Kong Society of Theoretical and Applied Mechanics (HKSTAM) in April 2018. In the 4th International Conference on Metallic Materials and Processing (ICMMP) held in June 2018, Mr Haopeng Yang under the supervision of Prof. MW Fu received a "Best Presentation Award" for his presentation titled "Investigation on semi-solid forming of A356 alloy for fabrication of microscaled and fine-pitched pillar parts for semiconductor and microelectronics applications".



Prof. ZQ Su and Prof. LM Zhou were awarded a Gold award in the 46th International Exhibition of Invention of Geneva



Dr XJ Jing received prestigious the European Association for Structural Dynamics (EASD) senior research award



## Consortium for Sound and Vibration Research

Since its establishment, the Consortium for Sound and Vibration Research (CSVSR) 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.

During the course of last year, CSVSR 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 including 3 GRF projects, 3 fundable projects and 1 National Science Foundation of China Fund, and a collaborative project with Guangzhou Purple River Technology Limited, with a total amount of around HK\$3 million.

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.

Among other conferences, CSVSR members were invited to deliver plenary talks at conferences such as the International Congress on Ultrasonics (ICU) 2017, 28th Congress on Vibration and Noise Technology and Applications (VNTA2018), 2017 Annual Conference of Shanghai Society of Mechanics, 13th Shanghai-Hong Kong Forum on Mechanics and Its Application, 5th Forum on Vibration and Noise Control of Equipment, and 9th International Symposium on NDT in Aerospace.

CSVSR members successfully co-organized with the Hong Kong Institute of Acoustics (HKIOA) the world-renowned INTER-NOISE 2017, the 46th International Congress and Exposition on Noise Control Engineering, were held in Hong Kong, China, between 27 and 30 August 2017 at the Hong Kong Convention and Exhibition Centre in conjunction with NVH Branch, Society of Automotive Engineering China (NVH-SAE) and the Acoustical Society of China (ASC). INTER-NOISE 2017 provided an excellent opportunity for engineers and scientists in all fields of acoustics to learn about and share their knowledge with colleagues from around the world. More than hundred technical sessions were arranged for exchange of views and sharing of experience. Apart from parallel technical sessions and exhibitions, meetings among the associated acoustical societies, performances and social functions were well organized. The event attracted around 850 abstracts and papers from 41 countries and districts were received and published in the conference proceedings. Together with more than 1000 registered participants and 34 exhibitors from all over the world, INTER-NOISE 2017 was definitely one of the most exciting events for international noise control engineering community in 2017.



Besides, the 17th Asia Pacific Vibration Conference (APVC 2017) were held on November 13-15, 2017, in Nanjing, China. CSVSR Director Prof. Li Cheng served as the General Co-Chair of the conference. The APVC is an international conference held once every two years with the intention of encouraging scientific and technical cooperation among Asia Pacific countries. The conference aims to bring researchers, engineers and students from but not limited to areas around the Asia Pacific countries in a collegial and stimulating environment to present the most recent developments and new information on any aspect of mechanical vibration and sound.

## 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 531,111

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 : Early Career Scheme  
 Amount Sponsored : HKD 820,000

Project Title : A Novel Bivariate Taylor Expansion Method of Moments (BTEMOMs) for Multi-Scale Agglomerate Synthesis in Turbulent Combustion Flows  
 Investigators : TL Chan and JZ Lin (Zhejiang University, China)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 835,025

Project Title : Development of a Novel Bimodal Moment Method (BMM) Model Scheme for Solving Complex Aerosol-Related Problems  
 Investigators : TL Chan  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 622,000

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 : 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 : 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 4,832,280

Project Title : Acoustic Boundary Design Based on a Wavelet-Decomposed Galerkin Formulation  
 Investigators : L Cheng  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 762,183

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 : Structure-Borne Wave Manipulation Through Acoustic Black Hole for Vibration and Noise Control Applications  
 Investigators : L Cheng and JH Qiu (Nanjing University of Aeronautics & Astronautics, China)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 594,874

Project Title : Vibrating Structures Coupled to Open/Close Acoustic Cavities with Application to Micro-perforated Panels  
 Investigators : L Cheng and JL Guyader (Institut National des Science Appliquees de Lyon, France)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 525,000

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 : 由微元動力平衡擾動辨識結構損傷的理論與方法  
 Investigators : L Cheng, WO Wong, JL Guyader (Institut National des Science Appliquees de Lyon, France), S Zhang, C Mao and H Xu  
 Source of Funding : 面上项目  
 Amount Sponsored : RMB 820,000

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 : Acoustic Behavior of Parallel-arranged Perforated Panel Absorber at High Sound Pressure Level  
 Investigators : YS Choy  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 525,000

Project Title : Online Sound Sources Identification for Space Vehicles  
 Investigators : YS Choy, L Cheng, ZQ Su, XJ Jing and SK Tang (BSE)  
 Source of Funding : Beijing Institute of Spacecraft Environment Engineering, China Academy of Space Technology  
 Amount Sponsored : HKD 600,000

Project Title : 帶背腔的薄膜結構用於管道風扇噪音控制的研究  
 Investigators : YS Choy, Y Liu, XN Wang and Q Xi  
 Source of Funding : 青年科学基金項目  
 Amount Sponsored : RMB 250,000

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 : Development of Semi-solid Forming Technologies for Fabrication of Micro-scaled and Fine-pitched Parts for Semiconductor and Microelectronics Applications  
 Investigators : MW Fu  
 Source of Funding : Hong Kong Government (ITF)  
 Amount Sponsored : HKD 1,215,800

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 : 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 : 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 : Effects of Deformation and Aging on the Microstructure and Mechanical Properties of Nanoscale Precipitation Strengthened Steels  
 Investigators : ZB Jiao, SQ Shi, L Fan and ZP Lu (University of Science & Technology Beijing)  
 Source of Funding : State Key Laboratory for Advanced Metals and Materials, U of Science and Technology Beijing, China  
 Amount Sponsored : HKD 82,999

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 : Anti-Vibration Assistive Exoskeleton Technology for Manipulating Vibrating Tools  
 Investigators : XJ Jing and KH Chu  
 Source of Funding : Hong Kong Government (ITF)  
 Amount Sponsored : HKD 1,304,000

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 239,700

Project Title : Feature Characterization and Fault Detection of Complex-structure Systems Based on Dynamic Response Signals & Initial Development of New Generation Vibration Isolation Technology in Aeronautic Engineering  
 Investigators : XJ Jing, L Cheng, WO Wong and RCK Leung  
 Source of Funding : Beijing Institute of Spacecraft Environment Engineering, China Academy of Space Technology  
 Amount Sponsored : HKD 1,200,000

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

Project Title : Nonlinear Analysis and Design in the Frequency Domain: Theoretic Basis and Practical Methods  
 Investigators : XJ Jing and L Cheng  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 1,163,130

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 300,000

Project Title : Development of Next Generation Multi-layer Chitosan Nanofiber Filters for Medical/ Environmental Use with Novel Filtration/Purification Technology  
 Investigators : WWF Leung and H Feng (Avalon Nano-Biotech (HK) Limited)  
 Source of Funding : Hong Kong Government (ITF)  
 Amount Sponsored : HKD 2,727,266

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 : High-performance all solution processing perovskite-based solar cells with TiO<sub>2</sub> /CNT nanofiber scaffold  
 Investigators : WWF Leung  
 Source of Funding : Hong Kong Government (ITF)  
 Amount Sponsored : HKD 1,217,361

Project Title : Loading and Cleaning of A Nanofiber Depth Filter for Capturing Submicron Aerosols  
 Investigators : WWF Leung  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 725,000

Project Title : Effect of Vasomotion on Efficient Flow Delivery in Microvascular Network  
 Investigators : Y Liu and XY Luo (University of Glasgow, UK)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 525,000

Project Title : A Sensor-Guided Robotic System for Automatic Manipulation of Laser, Radiofrequency, or related Instruments in Skin Rejuvenation Procedures  
 Investigators : D Navarro Alarcon  
 Source of Funding : Industry & Utilities (Rods Technology Company Limited)  
 Amount Sponsored : HKD 386,515

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 : Constitutive Modelling of Glass: New Experiments and New Models  
 Investigators : HH Ruan  
 Source of Funding : RGC Early Career Scheme  
 Amount Sponsored : HKD 921,290

Project Title : Development of A Phase Field Modeling Framework for Localized Corrosion Kinetics  
 Investigators : SQ Shi, SY Hu (Pacific Northwest National Laboratory, US) and JL Luo (University of Alberta, Canada)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 550,000

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 : 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 College London (UCL), University of London)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 488,345

Project Title : An Innovative Smart Sensing Network Coating towards in-situ Acousto-ultrasonics-based Health Monitoring for Engineering Structures  
 Investigators : ZQ Su and LM Zhou  
 Source of Funding : Hong Kong Government (ITF)  
 Amount Sponsored : HKD 1,579,182

Project Title : In-situ Sensing and Characterization of Fatigue Damage Using Nonlinearity of Elastic Disturbance Perceived by a Coated CNT-graphene Hybrid Sensor Network  
 Investigators : ZQ Su, LM Zhou and WK Li  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 550,000

Project Title : Online Health Diagnosis and Integrity Monitoring for Space Vehicles based on Elastic Waves and Embeddable Sensor Networks  
 Investigators : ZQ Su, L Cheng, YS Choy and XJ Jing  
 Source of Funding : Beijing Institute of Spacecraft Environment Engineering, China Academy of Space Technology  
 Amount Sponsored : HKD 600,000

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 : Structural Health Monitoring-oriented Quantitative Characterization of Fatigue Damage Using Nonlinearities of Acousto-ultrasonic Waves: Fundamental Investigation, Algorithm Development and Experimental Validation  
 Investigators : ZQ Su  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 525,000

Project Title : Trial : Online Health Diagnosis and Prognosis (Online-HD&P) for Train Structures Using a Large-scale Diagnostic Sensor Network  
 Investigators : ZQ Su and L Cheng  
 Source of Funding : Hong Kong Government (ITF)  
 Amount Sponsored : HKD 232,429

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 : 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 : A Unique Multipurpose Transonic-to-Hypersonic Ludwig Tube Facility for Study of the High-Speed Aerodynamics  
 Investigators : CY Wen, L Cheng, RCK Leung, P Zhang, CH Cheng (ISE), LX Huang (The University of Hong Kong, HK), HH Qiu (The Hong Kong University of Science and Technology, HK) and K Xu (The Hong Kong University of Science and Technology, HK)  
 Source of Funding : RGC Collaborative Research Fund  
 Amount Sponsored : HKD 4,500,000

Project Title : Application of Dielectric Barrier Discharge Plasma Actuators on a Highly Swept Delta Wing  
 Investigators : CY Wen  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 670,500

Project Title : Development of a wind-field simulation platform to assess installation sites of wind turbines in highly urbanized areas of Hong Kong  
 Investigators : CY Wen  
 Source of Funding : Hong Kong Government (Environment and Conservation Fund)  
 Amount Sponsored : HKD 1,062,660

Project Title : Experimental Investigation on Flow Instabilities of a Miscible Magnetic Droplet in a Hele-Shaw Cell  
 Investigators : CY Wen  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 550,000

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 810,776

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 : The Design, Manufacture, Analysis and Control of Vertical Take-Off and Landing (VTOL) Unmanned Aerial Vehicles (UAVs)  
 Investigators : CY Wen and SJ Shen (HKUST)  
 Source of Funding : Innovation and Technology Fund ITF Funding: HK\$4,551,200  
 DJI Innovations Technology Co., Ltd. Sponsorship: \$1,000,000  
 Amount Sponsored : Amount of funding to allocated to PolyU: \$2,033,750

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 : 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 : 面上项目  
 Amount Sponsored : RMB 620,000

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 : Infrasonic Vibration Suppression Using Viscoelastic Dynamic Absorber  
 Investigators : WO Wong  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 758,225

Project Title : Investigation of the Lithiation Process in Constrained Anode Materials for High-Performance Lithium Ion Batteries  
 Investigators : HM Yao and HT Wang (Zhejiang University, China)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 835,025

Project Title : Investigation on the Mechanics of Adhesion between Tubeworm (Hydroides elegans) and Substrata  
 Investigators : HM Yao and V Thiyagarajan (The University of Hong Kong, HK)  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 762,183

Project Title : Mechanics of Morphological Optimization of Current Collectors in Li-ion Batteries for Enhanced Adhesion with Si-based Electrode Materials  
 Investigators : HM Yao and LM Zhou  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 861,450

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 : Ab Initio Chemical Kinetics for Key Reactions in Biodiesel Combustion  
 Investigators : P Zhang  
 Source of Funding : RGC Early Career Scheme  
 Amount Sponsored : HKD 814,000

Project Title : Dynamics of Binary Droplet Collision under Elevated Gas Pressures  
 Investigators : P Zhang  
 Source of Funding : RGC General Research Fund  
 Amount Sponsored : HKD 550,000

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 : Theoretical Chemical Kinetics for Pyrolysis and Oxidation of Large Biodiesel Molecules  
 Investigators : P Zhang, CK Law (Tsinghua University, China) and XQ You (Tsinghua University, China)  
 Source of Funding : RGC Joint Research Scheme  
 Amount Sponsored : HKD 400,000

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研究  
 Investigators : P Zhang  
 Source of Funding : 重大研究计划项目  
 Amount Sponsored : RMB 600,000

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

Project Title : Design of Passive Unidirectional Acoustic Metamaterials  
 Investigators : J Zhu  
 Source of Funding : RGC Early Career Scheme  
 Amount Sponsored : HKD 631,290

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 : Transport Phenomena in Alkaline Direct Ethanol Fuel Cells  
 Investigators : L An  
 Amount Sponsored : HKD 200,000

Project Title : Understanding charge transport phenomena in photoelectrochemical storage cells for solar energy storage  
 Investigators : L An and H Tang  
 Amount Sponsored : HKD 642,421

Project Title : Experimental and Numerical Studies on the Gaseous and Particulate pollutants in Porous Media Combustion  
 Investigators : TL Chan  
 Amount Sponsored : HKD 105,782

Project Title : Modeling of Particle Flow  
 Investigators : TL Chan and JZ Lin (Zhejiang University, China)  
 Amount Sponsored : HKD 150,000

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

Project Title : Detection and Monitoring of Fatigue Cracks in Axles of High-speed Train Bogies Based on Nonlinear Acousto-Ultrasonic Waves and De-centralized Sensing  
 Investigators : L Cheng, ZQ Su and YQ Ni (CEE)  
 Amount Sponsored : HKD 322,802

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

Project Title : On Propagation Characteristics of Three-dimensional Elastic Waves Guided by Thick-walled Hollow Cylinder and Application to Detection of Damage in Train Axle  
 Investigators : L Cheng  
 Amount Sponsored : HKD 50,000

Project Title : Research on Mechanics Problems in the Manipulation and Exploration of Acoustic Black Hole (ABH) Effect  
 Investigators : L Cheng  
 Amount Sponsored : HKD 233,000

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

Project Title : Study on the Structural Damage Detection Method Based on Perturbed Local Equilibrium  
 Investigators : L Cheng  
 Amount Sponsored : HKD 206,558



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

Project Title : Vibration Control and Structural Health Monitoring for High Speed Train Applications  
 Investigators : L Cheng  
 Amount Sponsored : HKD 500,000

Project Title : Influence of Biofuels (Biodiesel and Alcohol Blended Fuels) on the Emissions of a Diesel Engine with Emphasis on Particulate Emissions  
 Investigators : CS Cheung and Z Ning (The City University of Hong Kong)  
 Amount Sponsored : HKD 150,000

Project Title : Influence of Biofuels on the Particulate Emissions of a Diesel Engine  
 Investigators : CS Cheung and Z Ning (The City University of Hong Kong)  
 Amount Sponsored : HKD 227,000

Project Title : Spray, Combustion and Emission Characteristics of Pentanol/biodiesel Blends  
 Investigators : CS Cheung and ZH Huang (Xi'an Jiaotong University, China)  
 Amount Sponsored : HKD 168,000

Project Title : Broadband Flow Through Silencer with Model Actuation on Light Panel  
 Investigators : YS Choy  
 Amount Sponsored : HKD 150,000

Project Title : Broadband Sound Insulation Panel Embedding with an Array of Tubular Cavities Covered by Membranes in Random Alignment  
 Investigators : YS Choy  
 Amount Sponsored : HKD 198,215

Project Title : Fan Noise Suppression by Light Microperforated Panel with Non-uniform Grazing Shear Flow  
 Investigators : YS Choy  
 Amount Sponsored : HKD 189,000

Project Title : Noise Reduction of Ducted-fan Product by Using Composite Materials  
 Investigators : YS Choy  
 Amount Sponsored : HKD 315,000

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

Project Title : Automated Vision-based Micro-surgical Task Execution through a Robotic Multi-arm Micromanipulation System  
 Investigators : KH Chu  
 Amount Sponsored : HKD 200,000

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

Project Title : Experimental and Theoretical Study of the Friction and Adhesion in the Micro Hot Embossing of Polymers  
 Investigators : MW Fu and XM Lai (Shanghai Jiao Tong University)  
 Amount Sponsored : HKD 180,600

Project Title : Heterogenous Recrystallization Mechanisms Incorporating the Grain Boundary, Edge and Junction of the Previous Particle Boundaries (PPBs)  
 Investigators : MW Fu  
 Amount Sponsored : HKD 18,424

Project Title : Investigation of Thermal Assisted Microforming of Bio-compatible Ti-alloys  
 Investigators : MW Fu  
 Amount Sponsored : HKD 98,600

Project Title : Investigation of Undesirable Geometries and Inaccurate Dimensions of Microformed Parts and Development of Their Avoidance Methods  
 Investigators : MW Fu  
 Amount Sponsored : HKD 150,000

Project Title : Modelling and Control of Springback in Warm Bending of Titanium Tubular Materials  
 Investigators : MW Fu and H Li (Northwestern Polytechnical University)  
 Amount Sponsored : HKD 180,600

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 : Rationales and Principles for Superplastic Development of Micro Scale Tubular Parts of Mg-Li Alloy for Biomedical Applications  
 Investigators : MW Fu  
 Amount Sponsored : HKD 189,000

Project Title : Research on Advanced Processing of Engineering Materials  
 Investigators : MW Fu  
 Amount Sponsored : HKD 315,000

Project Title : Research on Different Fracture Behavior and the Validity of Fracture Criteria in Multi-scale Plastic Deformation Process  
 Investigators : MW Fu  
 Amount Sponsored : HKD 192,788

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)  
 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 : Size Effect Phenomena and Gradient Effect in the Micromechanics of Micro-scaled Plastic Deformation  
 Investigators : MW Fu  
 Amount Sponsored : HKD 200,000

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

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

Project Title : Strengthening of High-entropy Alloys by Nanoscale Coherent Precipitates  
 Investigators : ZB Jiao  
 Amount Sponsored : HKD 50,000

Project Title : Employing Bio-Inspired Structure Nonlinearity in Passive Vibration Isolation: Theory, Methods, and Applications  
 Investigators : XJ Jing  
 Amount Sponsored : HKD 189,000

Project Title : High-Performance Vibration Isolation by Employing Bio-Inspired Structure Nonlinearity  
 Investigators : XJ Jing  
 Amount Sponsored : HKD 189,000

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

Project Title : Nonlinear Dynamics, Vibration, and/or Control, and Applications  
 Investigators : XJ Jing  
 Amount Sponsored : HKD 315,000

Project Title : Nonlinear Energy Harvesting Systems: Theory, Methods and Applications in Railway Systems  
 Investigators : XJ Jing  
 Amount Sponsored : HKD 500,000

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 : Study on Vibration Isolation and Control Methods by Exploiting Nonlinear Benefits  
 Investigators : XJ Jing  
 Amount Sponsored : HKD 204,039

Project Title : Thermal, Explosion, Burning and Emission Characteristics of an Array of Premixed Flame Jets Burning Liquefied Petroleum Gas Enriched with Hydrogen  
 Investigators : CW Leung, P Zhang and ZH Huang (Xi'an Jiaotong University, China)  
 Amount Sponsored : HKD 150,000

Project Title : Thermal, Explosion, Burning and Emission Characteristics of Premixed Flame Jets Array Burning Liquefied Petroleum Gas Enriched with Hydrogen  
 Investigators : CW Leung, P Zhang and ZH Huang (Xi'an Jiaotong University, China)  
 Amount Sponsored : HKD 189,000

Project Title : A Study of the Effects of Aeroacoustic-Structural Interaction on Airfoil Trailing Edge Noise  
 Investigators : RCK Leung  
 Amount Sponsored : HKD 189,000

Project Title : A Study of the Mechanisms of Thermoacoustic Oscillations in Gas Turbine Combustion Chamber Installed with Bluff Flame Holder  
 Investigators : RCK Leung and M Zhu (Tsinghua University, China)  
 Amount Sponsored : HKD 168,000

Project Title : Aeroacoustics of High-lift Airfoil with Trapped Vortex Cavity  
 Investigators : RCK Leung  
 Amount Sponsored : HKD 156,500

Project Title : Exploration of Tunable Fluid-structure Interaction for Development Advanced Aeronautical Noise Mitigation Technology  
 Investigators : RCK Leung  
 Amount Sponsored : HKD 315,000

Project Title : Low Dimensional Modeling of Duct Aeroacoustics with Multiple Side-Branched  
 Investigators : RCK Leung  
 Amount Sponsored : HKD 150,000

Project Title : New Acoustic Source Localization Methodology in Realistic Reverberant Sound Fields Using Optimal Broadband Beamformer Design  
 Investigators : RCK Leung and KFC Yiu (AMA)  
 Amount Sponsored : HKD 146,278

Project Title : Numerical Modeling of Aeroacoustic Generation by Flow Duct Side-Branched at Various Separations  
 Investigators : RCK Leung  
 Amount Sponsored : HKD 150,000

Project Title : Charge Transport in Perovskite Solar Cell  
 Investigators : WWF Leung  
 Amount Sponsored : HKD 189,000

Project Title : Numerical Modelling of Continuous Deposition of Nanoparticles in a Nanofiber Filter and Conversion of the Deposited Particles by Photocatalysis  
 Investigators : WWF Leung  
 Amount Sponsored : HKD 150,000

Project Title : Solid-State Dye Sensitized Solar Cells with High Conversion Efficiency using Electrospun TiO<sub>2</sub> Nanofiber Photoanode  
 Investigators : WWF Leung  
 Amount Sponsored : HKD 150,000

Project Title : Solid-State Solar Cells with High Conversion Efficiency using Electrospun TiO<sub>2</sub> Nanofiber Photoanode  
 Investigators : WWF Leung  
 Amount Sponsored : HKD 150,000

Project Title : Effect of Arteriovenous Shunts and Vessel Leakiness on Flowmotion in Normal and Tumor Vasculature  
 Investigators : Y Liu and BM Fu (City College New York, USA)  
 Amount Sponsored : HKD 189,000

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 : Numerical Model Development for Prediction of Silt Sediment of Yellow River at Delta Based on LIDAR Morphological Database  
 Investigators : Y Liu, XL Ding (LSGI) and ZL Li (LSGI)  
 Amount Sponsored : HKD 130,350

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

Project Title : Impact Induced Structural Vibration and Energy Conversion -- a Conceptual Investigation on Kinetic Energy Harvesting in Low-speed Impact  
 Investigators : HH Ruan  
 Amount Sponsored : HKD 189,000

Project Title : The Mechanism of Electroplasticity and Its Application for Emerging High-performance Alloys  
 Investigators : HH Ruan  
 Amount Sponsored : HKD 200,000

Project Title : Towards Predictable Thermoforming of Glass - from Microscopic Understanding to Constitutive Modeling  
 Investigators : HH Ruan  
 Amount Sponsored : HKD 200,000

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 : Development of A Phase Field Modeling Framework for Corrosion Kinetics  
 Investigators : SQ Shi  
 Amount Sponsored : HKD 150,000

Project Title : Formation and Fracture of Zirconium Hydrides under Temperature Transient and Gradient  
 Investigators : SQ Shi  
 Amount Sponsored : HKD 201,520

Project Title : Study of Advanced Structural and/or Functional Materials  
 Investigators : SQ Shi  
 Amount Sponsored : HKD 315,000

Project Title : Study of Gas Bubble Behavior in Nuclear Fuels Using Phase Field Method  
 Investigators : SQ Shi  
 Amount Sponsored : HKD 147,027

Project Title : Study of Intragranular Gas Bubble Behavior for High Burnup Nuclear Fuels Using Phase Field Methodology  
 Investigators : SQ Shi, SY Hu (Pacific Northwest National Lab, US) and YT Li (Pacific Northwest National Lab, US)  
 Amount Sponsored : HKD 189,000

Project Title : Study of Phase Stability of Low Dimensional High Entropy Alloys  
 Investigators : SQ Shi and ZB Jiao  
 Amount Sponsored : HKD 700,000

Project Title : An Insight into Shock Wave Propagation under Hypervelocity Impact (>4 km/s) and Its Application to Characterizing Orbital Debris-induced Damage in Space Structures  
 Investigators : ZQ Su  
 Amount Sponsored : HKD 189,000

Project Title : Development of Large-scale Smart Sensing Networks for Health Monitoring of Train and Railway Structures: From Fundamental Research to Real-world Engineering Application  
 Investigators : ZQ Su  
 Amount Sponsored : HKD 500,000

Project Title : Elastic-wave-based Characterization of Damage in Complex Aircraft Structures under Time-varying Service Conditions  
 Investigators : ZQ Su  
 Amount Sponsored : HKD 225,283

Project Title : Quantitative Characterization of Multiple Fatigue Cracks for Structural Integrity Monitoring (SIM) Using Nonlinear Acousto-ultrasonics and Active Sensor Networks  
 Investigators : ZQ Su, L Cheng and LM Zhou  
 Amount Sponsored : HKD 150,000

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

Project Title : Acoustical Nonlinearity of Structural Fatigue Cracks and Probability-based Characterization and Monitoring  
 Investigators : ZQ Su  
 Amount Sponsored : HKD 201,520

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

Project Title : Development of a GPU-based Numerical Framework for Fluid-structure Interaction Problems  
 Investigators : H Tang  
 Amount Sponsored : HKD 100,000

Project Title : Enhancement of Flapping-wing MAV Aerodynamic Performance Using Active Flow Control  
 Investigators : H Tang  
 Amount Sponsored : HKD 189,000

Project Title : On Energy Harvesting from Open Channel Water Flows Using Self-sustained Oscillating Hydrofoils  
 Investigators : H Tang  
 Amount Sponsored : HKD 200,000

Project Title : Study of magnetic hyperthermia based cancer treatment using a holistic simulation framework  
 Investigators : H Tang, S Kenjeres (Delft University of Technology) and K Vafai (University of California, Riverside)  
 Amount Sponsored : HKD 654,921

Project Title	: Control Techniques for Supersonic / Hypersonic Boundary Layer Transition
Investigators	: CY Wen
Amount Sponsored	: HKD 48,200
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	: Experimental and Numerical Study on the Effects of Dynamic Characteristics of Converging Shock Waves on Induced Richtmyer-Meshkov Instability
Investigators	: CY Wen and XS Luo (University of Science and Technology of China, China)
Amount Sponsored	: HKD 168,212
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)
Amount Sponsored	: HKD 642,421
Project Title	: Investigation on Aerodynamic Breakup of a Liquid Droplet behind a Shock Wave
Investigators	: CY Wen
Amount Sponsored	: HKD 189,000
Project Title	: Investigation on Reactive Richtmyer-Meshkov Instability in Convergent Geometry
Investigators	: CY Wen
Amount Sponsored	: HKD 70,513
Project Title	: Theoretical and Numerical Study on Vibrational Nonequilibrium Effect on Hydrogen Detonation
Investigators	: CY Wen
Amount Sponsored	: HKD 189,000
Project Title	: Fragmentation, Vaporization and Combustion of Liquid Fuels in High-Speed Flows
Investigators	: CY Wen
Amount Sponsored	: HKD 228,820
Project Title	: Complex Power Flow Control in Vibrating Plates with Dynamic Vibration Absorbers
Investigators	: WO Wong
Amount Sponsored	: HKD 150,000
Project Title	: Cross-Modal Vibration Energy Method for Dynamic Force Identification
Investigators	: WO Wong
Amount Sponsored	: HKD 150,000
Project Title	: Biomimetic Design and Manufacture of Gradient Silicon-based Anode Materials for Lithium-ion Batteries
Investigators	: HM Yao
Amount Sponsored	: HKD 72,787
Project Title	: Biomimetic Study on the Reaction Chambers of Bombardier Beetles for Aeronautical Applications: Thermal Resistance and Pulsed Jet Propulsion
Investigators	: HM Yao and P Zhang
Amount Sponsored	: HKD 157,350
Project Title	: Optimizing Heterogeneity in Si-based Nanocomposite Anode Materials for Higher Electrochemical Performance
Investigators	: HM Yao
Amount Sponsored	: HKD 189,000

Project Title	: Structural Optimization of Hierarchical Porous Anode for High Performance Microbial Fuel Cell
Investigators	: HM Yao and SL Chen (Jiangxi Normal University, China)
Amount Sponsored	: HKD 189,000
Project Title	: Active Noise Control in Acoustic Wave Guides (AWGs)
Investigators	: J Yuan
Amount Sponsored	: HKD 150,000
Project Title	: Computational Study on Slotted Swirl Combustor for Application in Gas Turbine Engines
Investigators	: P Zhang
Amount Sponsored	: HKD 200,000
Project Title	: Dynamics of Unequal-size Droplet Collision
Investigators	: P Zhang
Amount Sponsored	: HKD 450,000
Project Title	: Experimental Study and Large Eddy Simulation of Slotted Swirler Combustor Fueled with Natural Gas/ Synthesis Gas Mixtures
Investigators	: P Zhang and Y Yang (Peking University, China)
Amount Sponsored	: HKD 242,550
Project Title	: High-level Ab Initio Chemical Kinetics of Combustion of Large Molecule Straight-chain Alkanes
Investigators	: P Zhang
Amount Sponsored	: HKD 142,284
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)
Amount Sponsored	: HKD 180,600
Project Title	: Atomic-scale Experimental and Simulation Investigations on the Deformation Twinning in Nanostructured Titanium
Investigators	: GP Zheng
Amount Sponsored	: HKD 150,000
Project Title	: Experimental Investigation and ab initio Simulation on the Pizelectricity and Pyroelectricity of Graphene-ferroelectrics Heterostructures
Investigators	: GP Zheng
Amount Sponsored	: HKD 200,000
Project Title	: First-principles Calculations and Experimental Verification of Ferroelectrics in Two-dimensional Materials
Investigators	: GP Zheng
Amount Sponsored	: HKD 189,000
Project Title	: Frenkel-Kontorova model based simulation on the deformation mechanisms in nanostructured high-entropy alloys
Investigators	: GP Zheng
Amount Sponsored	: HKD 642,421



Project Title : Investigations on the Mechanical Properties of Bulk Amorphous Alloys with Nano-sized Microstructures  
 Investigators : GP Zheng  
 Amount Sponsored : HKD 315,000

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

Project Title : Multiscale Simulation Studies on the Processing and Mechanical Behaviors of Ultrafine and Nano-size Grained Magnesium Alloys  
 Investigators : GP Zheng  
 Amount Sponsored : HKD 189,000

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 : Advanced Composites and Functional Structures  
 Investigators : LM Zhou and L Ye (Sydney University, Australia)  
 Amount Sponsored : HKD 824,000

Project Title : All Solid State Quantum-dot-sensitized Solar Cells Based on Solution Processed Inorganic Semiconductors (G-YBDG)  
 Investigators : LM Zhou  
 Amount Sponsored : HKD 300,000

Project Title : Bi-functional Metal Organic Framework-derived Porous Electrospun Nanofiber Materials for Lithium-sulfur Batteries  
 Investigators : LM Zhou and HM Yao  
 Amount Sponsored : HKD 700,000

Project Title : Design and Performance Study on Micro-mesoporous Three-dimensional Framework Materials for Lithium-sulfur Batteries with High Energy Density  
 Investigators : LM Zhou and HM Yao  
 Amount Sponsored : HKD 700,000

Project Title : Development of Nanocomposite Materials for Energy Storages  
 Investigators : LM Zhou  
 Amount Sponsored : HKD 315,000

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 : Optimal Si-nanoparticle-based Nanocomposite Structure with Long-term Stability for Li-ion Batteries  
 Investigators : LM Zhou  
 Amount Sponsored : HKD 210,620.29

Project Title : Size- and temperature-dependent phase transition in NASICON-type material on Li<sup>+</sup> and Na<sup>+</sup> (de) intercalation  
 Investigators : LM Zhou and SQ Shi  
 Amount Sponsored : HKD 642,421

Project Title : Broadband Sub-diffraction-limit Acoustic Wave Focusing with Two-dimensional Acoustic Rainbow Trapping Metamaterials  
 Investigators : J Zhu  
 Amount Sponsored : HKD 189,000

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

Project Title : Investigation on broadband transition delay and stability control of hypersonic turbulent boundary layer via gradient-index acoustic metasurface  
 Investigators : J Zhu  
 Amount Sponsored : HKD 642,421

Project Title : Sub-diffraction-limit Sound Focusing and Imaging with Acoustic Metasurface  
 Investigators : J Zhu  
 Amount Sponsored : HKD 70,513

Project Title : Thin Layer Elastic Material Characterization Using Ultrasonic Bessel Transducer  
 Investigators : J Zhu  
 Amount Sponsored : HKD 200,000

Project Title : Two Dimensional Acoustic Rainbow Trapping Metamaterials  
 Investigators : J Zhu  
 Amount Sponsored : HKD 100,000

Project Title : Two-dimensional Acoustic Metamaterial for Turbulent Boundary Layer Transition Delay of Hypersonic Vehicles  
 Investigators : J Zhu, L Cheng and CY Wen  
 Amount Sponsored : HKD 200,000

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

Student Name	Project Title	Supervisor
<b>PhD (Full-Time)</b>		
AI Chunhui	Fluid-structure Interaction of Compliant Vessels with Pulsatile Flows	H Tang
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
CAO Wuxiong	Characterization of Hypervelocity Impact-induced Pitting Damage Based on Active Guided Waves: From Linear to Nonlinear	ZQ Su, BJ Pang (Harbin Institute of Technology)
CHEN Long	Localization and Characterization of the Fault in Wheel/Rail System	YS Choy
CHEN Shengyang	Vision-based Localizing and Navigation System for UAV Application	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

Student Name	Project Title	Supervisor
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), LL Xiao (Shanghai University of Engineering Science)
CUI Zhenxi	Image-based Alignment and Assembly of Cell-Laden Hydrogels under Cell Culture Medium	KH Chu, L Cheng
DING Haoqing	Health Monitoring-oriented Defect Detection for Rail Structures using Nonlinear Guided Ultrasonic Waves: Theory, Simulation and Validation	ZQ Su
DUAN Ran	Moving Target Precise Landing for UAV	P Lu (AAE), LM Zhou
DUONGTHIPHEWA 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
FU Jimin	Micro-and Nanotribology of Natural Biomaterials	HM Yao, SQ Shi
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 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)
HUANG Kaicheng	Cellular Patterns with Designed Form on Different Surfaces by Negative Dielectrophoresis	KH Chu, L Cheng
JIANG Xiao	Soot Formation and Evolution Characteristics of Premixed Hydrocarbon Flames	TL Chan
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 Feilong	The Study of Numerical Algorithm and Nonlinear Ultrasonic Imaging Technique of Early-stage Damages in Structures	Frank FX Zou (AAE), ZQ Su
LI Guangzhe	Enhancing Metal-Ion Storage by Rational Design of Three Dimensional Graphene-Based Electrodes	L An, GH Chen
LI Jie	Investigation of the Evolution Kinetics of Porous Metals during Dealloying by Phase-field Methods	SQ Shi

Student Name	Project Title	Supervisor
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)
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 Wenting	Investigation on Different Fracture Behaviors and the Validity of Fracture Criteria in Multi-scale Plastic Deformation Processes	MW Fu
LI Yun	Perovskite Solar Cell based on Solution Processing	WWF Leung
LI Zhengchao	Robust Control and Filtering for Systems with State-dependent Uncertainties and its Applications	XJ Jing, JY Yu (Harbin Institute of Technology), O KAYNAK (Harbin Institute of Technology)
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
LIANG Shanjun	Flexible Broadband Acoustic Metamaterials	J Zhu, YS Choy
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)
LIN Dongmei	Temperature Effect of TiO <sub>2</sub> Nanomaterials on Li/Na-Ion Batteries: Study of Performance, Structural and Transport Properties	LM Zhou, BH LI (Tsinghua University)
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
LIU Yao	Investigation on Shock Induced Stripping Breakup Process of a Liquid Droplet	CY Wen
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
NG Ming To	Low-frequency Flow Duct Noise Mitigation by Membrane-type Metamaterial Liner	RCK Leung
PAN Zhefei	Investigations on Direct Ethylene Glycol Fuel Cells using Hydrogen Peroxide as Oxidant	L An, CY Wen
PIAO Jinli	Modelling, Analysis and Design of Bio-inspired Structures with Geometric Nonlinearity	XJ Jing
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 Bo	Thermally Assisted Superelasticity Configuration of NiTi Wires with the Nanocrystalline and Coarse Microstructures	MW Fu, JP Lin (Tongji University)



Student Name	Project Title	Supervisor
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
TIAN Xudong	Experimental Study on the Stability and Transition of High-Speed Boundary Layer using ART Metamaterials	CY Wen
ULLAH Sana	Piezoelectric and Pyroelectric Properties of Ferroelectric Composite Containing Two-dimensional Materials	GP Zheng
UY Chun Kit	Theoretical and Numerical Investigation on Vibrational Nonguilbrium Effect in Detonation	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
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)
WANG Yafeng	Study of the Gas Bubble Behavior of High Burnup Nuclear Fuels using the Phase-Field Methodology	SQ Shi
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 Haopeng	Investigation on the Hot Working of Biodegradable Mg-Li Alloy for Biomedical Applications	MW Fu, S To (ISE)
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	3-D Ultrasonic Imaging for Scatterers Using Nonlinear Diffuse Waves: from Offline NDE to Continuous SHM	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 Guohao	A Novel V2V Cooperative Positioning Algorithm Based on GNSS for Autonomous Driving in Dense Urban Area	LT Hsu (AAE), CM Yu (AAE)
ZHANG Linli	Structural Wave Manipulation and Applications through Electro-mechanically Enhanced Acoustic Black Hole Effects	L Cheng
ZHANG Xiaoyi	Acoustic Behavior of Micro-Perforated Panels in a Grazing Flow	L Cheng

Student Name	Project Title	Supervisor
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
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 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)
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)
ZHOU Zeqi	Synthesis of Transition Metal Phosphosulfide@Carbon Nanocomposite as Anode Materials for Rechargeable Sodium Ion Batteries	GH Chen
ZHU Yinggang	Understanding the Self-healing Effect of Room-temperature Liquid Alloys as the Anode in Lithium Ion Battery	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 Qian	Study on the Multi-scale Structure and Interfacial Properties of Plant Fiber Reinforced Composites	LM Zhou, Y Li (Tongji University)
LU Bo	Robotic Knot Tying through a Spatial Trajectory with a Visual Servoing System	KH Chu, L Cheng
MAK Yi Wah	Chitosan-based Nanofiber Scaffold as Applied to Wound Healing	WWF Leung

**MPhil (Full-Time)**

CHANG Ching Wei	Path-planning and Trajectory Optimization for Unmanned Aerial Vehicle Bridge Inspection System	CY Wen
CHEN Zongnan	The Application of Dielectric Barrier Discharge Plasma Actuators on Active Flow Control around a Bluff Body	CY Wen
LIN Jiajie	Microscopic Progressive Compound Process Development for Pogo Pin and Deuterogenic Research of Size Effect in Micro Forming	MW Fu
LIU Yutong	Suppression of Li Dendrite using MOFs as Scaffolds	GH Chen
SHI Xingyi	Preparations and Characterizations of High-performance PVDF-HFP-based Porous Membranes for Vanadium Redox Flow Batteries	L An, HH Ruan

**MPhil (Part-Time)**

HOU Ruoyang	Numerical Modeling of Aeroacoustics with Porous Material	RCK Leung
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# Research Collaborations

In the year of 2017/2018, 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	China
Beijing Institute of Technology	China
Beijing Jiaotong University	China
Beijing University of Science and Technology	China
Blickson Limited	Hong Kong
Brandenburg University of Technology Cottbus–Senftenberg	Germany
Central South University	China
Centre for Research and Advance Studies	Mexico
China Jiliang University	China
Chinese Academy of Sciences	China
Chongqing University	China
City College of New York	USA
City University of Hong Kong	Hong Kong
College of France	France
COMAC Beijing Aeronautical Science & Technology Research Institute	China
Concordia University	Canada
Curtin Unviersity	Australia
Dalian Institute of Chemical Physics, Chinese Academy of Sciences	China
Dalian University of Technology	China
DJI Co.	China
Electrical and Mechanical Services Department, HKSAR	Hong Kong
GP Battery	Hong Kong
Graduate School at Shenzhen, Tsinghua University	China
Guilin University of Technology	China
Harbin Engineering University	China
Henan University	China
HK Non Woven Association	Hong Kong
Hong Kong University of Science and Technology	Hong Kong
Hong Kong Construction Industrial Council	Hong Kong
Hong Kong Jockey Club	Hong Kong
Huazhong University of Science and Technology	China
Huizhou Qichen New Tech	China

Institution / Organization	Region
Imperial College London	UK
INSA Toulouse	France
INSA-Lyon	France
Institute for the Development and Quality, Macau	Macau
Institute of Metal Research, Chinese Academy of Sciences	China
Jinan University	China
Le Mans Université	France
Man Yue Electronic Company Limited	Hong Kong
Mass Transport Railroad	China
Massachusetts Institute of Technology	USA
Midea	China
Monash University	Australia
Naitonal Taipei University of Technology	Taiwan
Nanjing University of Aeronautics and Astronautics	China
Nanyang Technological University	Singapore
National Research Council	Italy
National-provincial Joint Engineering Research Center of High Temperature Materials and Lining Technology	China
Ningbo Material Technology And Engineering Institute	China
Northwest Polytechnic University	China
Northwestern Polytechnical University	China
Office of Naval Research, USA	USA
Pacific Northwest National Lab	USA
Peking University	China
Pennsylvania State University	USA
Politecnico di Milano	Italy
Purdue Unvierstiy	USA
Qiqihar University	China
RODS Technology Company Ltd	Hong Kong
SCUT	China
Shanghai Jiaotong University	China
Shanghai University	China
Shenzhen Qichen New Tech Ltd.	China
Shenzhen University	China
Shenzhen μ Precision Technology Limited	China
Sichuan University	China
South China University of Technology	China
Sustech	China
Syncrude	Canada



Institution / Organization	Region
The Hong Kong Jockey Club	Hong Kong
The State Key Laboratory of Refractories and Metallurgy	China
Tianjin University	China
Tongji University	China
University of Science & Technology of China	China
University of Alberta	Canada
University of Hong Kong	Hong Kong
University of Illinois at Urbana-Champaign	USA
University of Liege	Belgium
University of Montpellier / LIRMM	France
University of Naples "Federico II"	Italy
University of Paris, UTC	France
University of Science and Technology Beijing	China
University of Sydney	Australia
University of Waterloo	Canada
Western Sydney University	Australia
Xiamen University	China
Xian Jiaotong University	China
Zhejiang University	China
Zhengzhou University	China

## Research Outputs

Summary	
Patent	2
Authored Book	1
Journal Paper	159
Conference Proceeding	99
<i>Total no. of archival publications</i>	261

### Patent

- LIY, C.T. and JIAO, Z.B., "Super-high Strength Ferritic Steel Reinforced with Nano-intermetallics and Manufacturing Method Thereof", China Patent 201310080019.7 (2017).
- LEUNG, W.W.F. and YANG, L. "Method of Producing Dye-sensitized Solar Cell and an Electrode of a Dye-sensitized Solar Cell", US patent, No. 9,754,731 B2 (2017).

### Authored Book

- LAI, X.M., FU, M.W. and PENG, L.F., "Sheet Metal Meso- and Microforming and Their Industrial Applications", Taylor & Francis Group, June (2017).

### Journal Paper

- AN, L. and JUNG, C.Y., "Transport Phenomena in Direct Borohydride Fuel Cells", Applied Energy, Vol. 205, pp.1270-1282 (2017).
- PAN, Z.F., CHEN, R., AN, L. and LI, Y.S., "Alkaline Anion Exchange Membrane Fuel Cells for Cogeneration of Electricity and Valuable Chemicals", J. Power Sources, Vol. 365, pp.430-445 (2017).
- NIE, Y., GAO, J., WANG, E., JIANG, L., AN, L. and WANG, X., "An Effective Hybrid Organic/Inorganic Inhibitor for Alkaline Aluminum-air Fuel Cells", Electrochimica Acta, Vol. 248, pp.478-485 (2017).
- WANG, Q., CHEN, F., LIU, Y., ZHANG, N., AN, L. and JOHNSTON, R., "Bifunctional Electrocatalysts for Oxygen Reduction and Borohydride Oxidation Reactions Using Ag<sub>3</sub>Sn Nano-intermetallic on Ensemble Effect", ACS Applied Materials & Interfaces, Vol. 9, pp.35701-35711 (2017).
- CHEN, M., CHEN, R., ZHU, X., LIAO, Q., AN, L., YE, D.D., ZHOU, Y., ZHOUY, X.F. and ZHANG, W., "A Membrane Electrode Assembled Photoelectrochemical Cell with a Solar-responsive Mesoporous CdS-ZnS-TiO<sub>2</sub>/SBA-15 Photoanode", J. Power Sources, Vol. 371, pp.96-105 (2017).
- LEUNG, P., MARTIN, T., LIRAS, M., BERENQUER, A.M., MARCILLA, R., SHAH, A., AN, L., ANDERSON, M.A. and PALMA, J., "Cyclohexanedione as the Negative Electrode Reaction for Aqueous Organic Redox Flow Batteries", Applied Energy, Vol. 197, pp.318-326 (2017).
- LIU, S.Y. and CHAN, T.L., "A Coupled CFD-Monte Carlo Method for Simulating Complex Aerosol Dynamics in Turbulent Flows", Aerosol Science and Technology, Vol. 51, No. 3, pp. 269-281 (2017).
- LIU, S.Y. and CHAN, T.L., "A Stochastically Weighted Operator Splitting Monte Carlo (SWOSMC) Method for the Numerical Simulation of Complex Aerosol Dynamic Processes", International Journal of Numerical Methods for Heat & Fluid Flow, Vol. 27, No. 1, pp.263-278 (2017).
- GENG, P. and CHEN, G., "Antifouling Ceramic Membrane Electrode Modified by Magneli Ti<sub>4</sub>O<sub>7</sub> for Electro-microfiltration of Humic Acid", Separation and Purification Technology, Vol. 185, pp.61-71 (2017).

10. ZHANG, L., CHEN, G., BERG, E. J. and TARASCON, J.M., "Triggering the In Situ Electrochemical Formation of High Energy Density Cathode Material from MnO", *Advanced Energy Materials*, Vol. 7, Article Number: 1602200 (2017).
11. ZHANG, L., BATUK, D., CHEN, G. and TARASCON, J.M., "Electrochemically Activated MnO as a Cathode Material for Sodium-ion Batteries", *Electrochemistry Communications*, Vol. 77, pp.81-84 (2017).
12. LIU, B., LI, X., ZHAO, Q., HOU, Y. and CHEN, G., "Self-templated Formation of ZnFe<sub>2</sub>O<sub>4</sub> Double-shelled Hollow Microspheres for Photocatalytic Degradation of Gaseous O-dichlorobenzene", *Journal of Materials Chemistry A*, Vol. 5, pp.8909-8915 (2017).
13. YANG, C., DENG, Y.F., GAO, M., YANG, X. QIN, X. and CHEN, G., "High-rate and Long-life Performance of a Truncated Spinel Cathode Material with Off-stoichiometric Composition at Elevated Temperature", *Electrochimica ACTA*, Vol. 225, pp.198-206 (2017).
14. DENG, Y.F., YANG, C., ZOU, K., QIN, X., ZHAO, Z. and CHEN, G., "Recent Advances of Mn-Rich LiFe<sub>1-y</sub>Mn<sub>y</sub>PO<sub>4</sub> (0.5<y<1.0) Cathode Materials for High Energy Density Lithium Ion Batteries", *Advanced Energy Materials*, Vol. 7, Article Number: 1601958 (2017).
15. GAO, M., ZOU, K.X., DENG, Y.F., ZHAO, Z.X., LI, Y.W. and CHEN, G., "An Unprecedented Case: A Low Specific Surface Area Anatase/N-Doped Carbon Nanocomposite Derived from a New Single Source Precursor Affords Fast and Stable Lithium Storage", *ACS Applied Materials & Interfaces*, Vol. 9, pp.28527-28536 (2017).
16. RUAN, B.Y., GUO, H.P., HOU, Y.Y., LIU, Q.N., DENG, Y.F., CHEN, G.H., CHOU, S.L., LIU, H.K. and WANG, J.Z., "Carbon-Encapsulated Sn@N-Doped Carbon Nanotubes as Anode Materials for Application in SIBs", *ACS Applied Materials & Interfaces*, Vol. 9, pp.37682-37693 (2017).
17. XIE, Y., DENG, Y.F., YANG, C.X., ZENG, Z.N., LI, Y.W. and CHEN, G., "CoO<sub>x</sub> Functionalized IrO<sub>2</sub>-Sb<sub>2</sub>O<sub>5</sub>-SnO<sub>2</sub> Anode with an Enhanced Activity and Stability for Electrocatalytic Oxygen Evolution", *Journal of Alloys and Compounds*, Vol. 696, pp.257-265 (2017).
18. YANG, C.X., TAN, H.Q., DENG, Y.F., QIN, X.S., LI, Y.W. and CHEN, G.H., "Importance of Synergistic Role of Cobalt and Aluminum on a Greatly Improved Electrochemical Performance of Li-rich Oxyfluoride Spinel at Elevated-temperature", *Journal of Alloys and Compounds*, Vol. 728, pp.612-622 (2017).
19. ZHANG, M.M., LI, X.Y., ZHAO, Q.D., FAN, S.Y., JIANG, Z. and CHEN, G., "AgInS<sub>2</sub> Nanoparticles Modified TiO<sub>2</sub> Nanotube Array Electrodes: Ultrasonic-assisted SILAR Preparation and Mechanism of Enhanced Photoelectrocatalytic Activity", *Molecular Catalysis*, Vol. 442, pp.97-106 (2017).
20. LI, P. and CHENG, L., "Propagation of Thickness Shear Waves in a Periodically Corrugated Quartz Crystal Plate and Its Application Exploration in Acoustic Wave Filters", *Ultrasonics*, Vol. 77, pp.100-109 (2017).
21. SHAN, S.B., CHENG, L. and LI, P., "Adhesive Nonlinearity in Lamb-wave-based Structural Health Monitoring Systems", *Smart Materials and Structures*, Vol. 26, pp. 025019 (2017).
22. TANG, L.L. and CHENG, L., "Enhanced Acoustic Black Hole Effect in Beams with a Modified Thickness Profile and Extended Platform", *Journal of Sound and Vibration*, Vol. 391, pp.116-126 (2017).
23. TANG, L.L. and CHENG, L., "Ultrawide Band Gaps in Beams with Double-leaf Acoustic Black Hole Indentations", *J. Acoust. Soc. Am.*, Vol. 142, pp.2802-2807 (2017).
24. TANG, L.L. and CHENG, L., "Broadband Locally Resonant Band Gaps in Periodic Beam Structures with Embedded Acoustic Black Holes", *Journal of Applied Physics*, Vol. 121, pp.194901 (2017).
25. ZHANG, S. and CHENG, L., "Wavelet Decompositions for High Frequency Vibration Analyses of Plates", *International Journal of Applied Mechanics*, Vol. 9, No. 6, pp.1750088 (20 pages) (2017).
26. HU, Z.Y., MAXIT, L. and CHENG, L., "Convergence Criteria on the Acoustic Velocity Continuity in a Panel-cavity System", *J. Acoust. Soc. Am.*, Vol. 141, No. 3, pp.2137-2142 (2017).
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29. YU, X., LU, Z.B., CHENG, L. and CUI, F.S., "Vibroacoustic Modelling of an Acoustic Resonator Tuned by Dielectric Elastomer Membrane with Voltage Control", *Journal of Sound and Vibration*, Vol. 387, pp.114-126 (2017).
30. HUANG, W., JI, H.L., QIU, J.H. and CHENG, L., "The Effect of Energy Focusing for Flexural Wave Using Two-dimensional Acoustic Black Hole", *Journal of Vibration and Shock*, Vol. 36, No. 9, pp.51-57 (2017).
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32. YU, X., LU, Z.B., CUI, F.S., CHENG, L. and CUI, Y.D., "Tunable Acoustic Metamaterial with an Array of Resonators Actuated by Dielectric Elastomer", *Extreme Mechanics Letters*, Vol. 12, pp.37-40 (2017).
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## Conference Proceeding

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2. GENG, P. and CHEN, G., “Electricity-assisted Antifouling Ceramic Membrane Modified by Magnéli Titanium Sub-oxides for Environmental and Biological Applications”, Global Chinese Symposium of Chemical Engineering, Hangzhou, China, 19 - 20 July (2017).
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  81. WU, K., ZHANG, P., YAO, W. and FAN, X., “LES Study of Flame Stabilization in DLR Hydrogen Supersonic Combustor with Strut Injection”, The 21st AIAA International Space Planes and Hypersonic Systems and Technology Conference, Xiamen, China, 3-9 March (2017).
  82. YU, D. and ZHANG, P., “Lewis Number Effect on the Flame Height of Circulation-controlled Firewhirls”, The 11th Asia-Pacific Conference on Combustion, NSW Australia, 10-14 December (2017).
  83. YU, D. and ZHANG, P., “On the Flame Height of Circulation-controlled Firewhirls: A Unified Analysis of Combining Power-law Vortex and Variable Physical Properties”, The 8th European Combustion Meeting, Dubrovnik, Croatia, 18-21 April (2017).
  84. YU, D. and ZHANG, P., “Lewis Number Effect on the Flame Height of Circulation-controlled Firewhirls”, 2017 China National Symposium on Combustion, Nanjing, October 12-16 (2017).
  85. ZHANG, D. and ZHANG, P., “Hypergolic Ignition Induced by Binary Collision of TMEDA and WFNA Droplets: Non-monotonic Effects of Impact Parameter”, The 11th Asia-Pacific Conference on Combustion, NSW Australia, 10-14 December (2017).
  86. ZHANG, D. and ZHANG, P., “Pressure-dependent Unimolecular Reactions of Benzyl Radical”, The 2nd National Combustion Chemistry Conference, Dalian, China, 19-21 May (2017).
  87. ZHU, X., XIA, X. and ZHANG, P., “Flow and Flame Dynamics of Confined Buoyant Inverse Diffusion Flames”, The 11th Asia-Pacific Conference on Combustion, NSW Australia, 10-14 December (2017).
  88. HE, C., ZHAO, J., YU, D. and ZHANG, P., “Unequal-size Droplet Collision and Internal Mixing”, The 8th European Combustion Meeting, Dubrovnik, Croatia, 18-21 April (2017).
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  90. CHI, Y., ZHU, Y., MENG, Q., ZHANG, L. and ZHANG, P., “An ONIOM-method-based High-level Theoretical Study on Hydrogen Abstraction Reactions of Large Straight-chain Alkanes Molecules by Hydrogen Radical”, 2017 China National Symposium on Combustion, Nanjing, October 12-16 (2017).
  91. ZHENG, G.P., “Pyroelectricity of Lead-free Ferroelectric Materials and Its Application in Thermal-electrical Energy Conversion”, CCS 9th Symposium on Inorganic Non-metallic Materials-New Energy Materials, Ningbo, August (2017).
  92. ZHENG, G.P., “Investigations on the Mechanical Deformation of Amorphous Alloy Nanowires Using Phase-Field Modeling and Thermodynamics Avalanche Models”, TMS 146th Annual Meeting Supplemental Proceedings, pp.435-442, San Diego, USA, 26 February-2 March (2017).
  93. JIANG, Z.Y. and ZHENG, G.P., “Thermal-to-Electrical Energy Conversion and Electrical Energy Storage in Poly(vinylidene

fluoride-trifluoroethylene) Based Nanocomposites Containing Ferroelectric Nanowire”, ICCM21, Xi-an, China, 20-25 August (2017).

94. JIANG, Z.Y., ZHENG, G.P. and ULLAH, S., “Direct Measurement on the Abnormal Electrocaloric Effects in  $\text{Bi}_{0.5}\text{Na}_{0.5}\text{TiO}_3\text{-xBaTiO}_3$  Solid Solutions”, CEEC-TAC4, Moldova, 28-31 August (2017).
95. ULLAG, S. and ZHENG, G.P., “Thermal Analyses on the Effects of Additions of Two-dimensional  $\text{C}_3\text{N}_4$  on Phase Transitions in Ferroelectric Copolymers”, CEEC-TAC4, Moldova, 28-31 August (2017).
96. LIAO, Y., DUAN, F., ZHOU, L.M. and SU, Z., “A High-sensitivity and Fast-response Nanocomposites-inspired Sensor for Acousto-ultrasonics-based Structural Health Monitoring”, Meetings on Acoustics (the 6th International Congress on Ultrasonics (ICU 2017)), Honolulu, HI., USA, Vol. 32, No. 065001, 18-20 December (2017).
97. LIAO, Y., LIU, M., XU, H., ZHOU, L.M. and SU, Z., “A Nanocomposite-inspired Smart Sensing Coating for Acousto-ultrasonics-based Structural Health Monitoring: Modeling, Validation and Application”, in Proceedings of the 8th ECCOMAS Thematic Conference on Smart Structures and Materials (SMART2017) & The 6th International Conference on Smart Materials and Nanotechnology in Engineering, pp.1172-1182, Madrid, Spain, 5-8 June (2017).
98. LIANG, S., LIU, T., CHEN, F. and ZHU, J., “Acoustic Wavefront Modulation with Helical Structures Array”, Proceedings of INTER-NOISE 2017, Hong Kong, 27-30 August (2017).
99. LIU, T., LINANG, S., CHEN, F. and ZHU, J., “Control Acoustic Rainbow Trapping with Gradient Profile Change”, Proceedings of INTER-NOISE 2017, Hong Kong, 27-30 August (2017).

## 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:

Electrical and Mechanical Services Department, HKSAR
Environmental Protection Department, HKSAR
G & M Engineering Company Limited
Hong Kong Police Force
Institute for the Development and Quality, Macau
Man Yue Electronic Company Limited
Marine Department, HKSAR
Midea Group
Philips Electronics Hong Kong Ltd.
深圳市微米精密科技有限公司

## Departmental Seminar Series

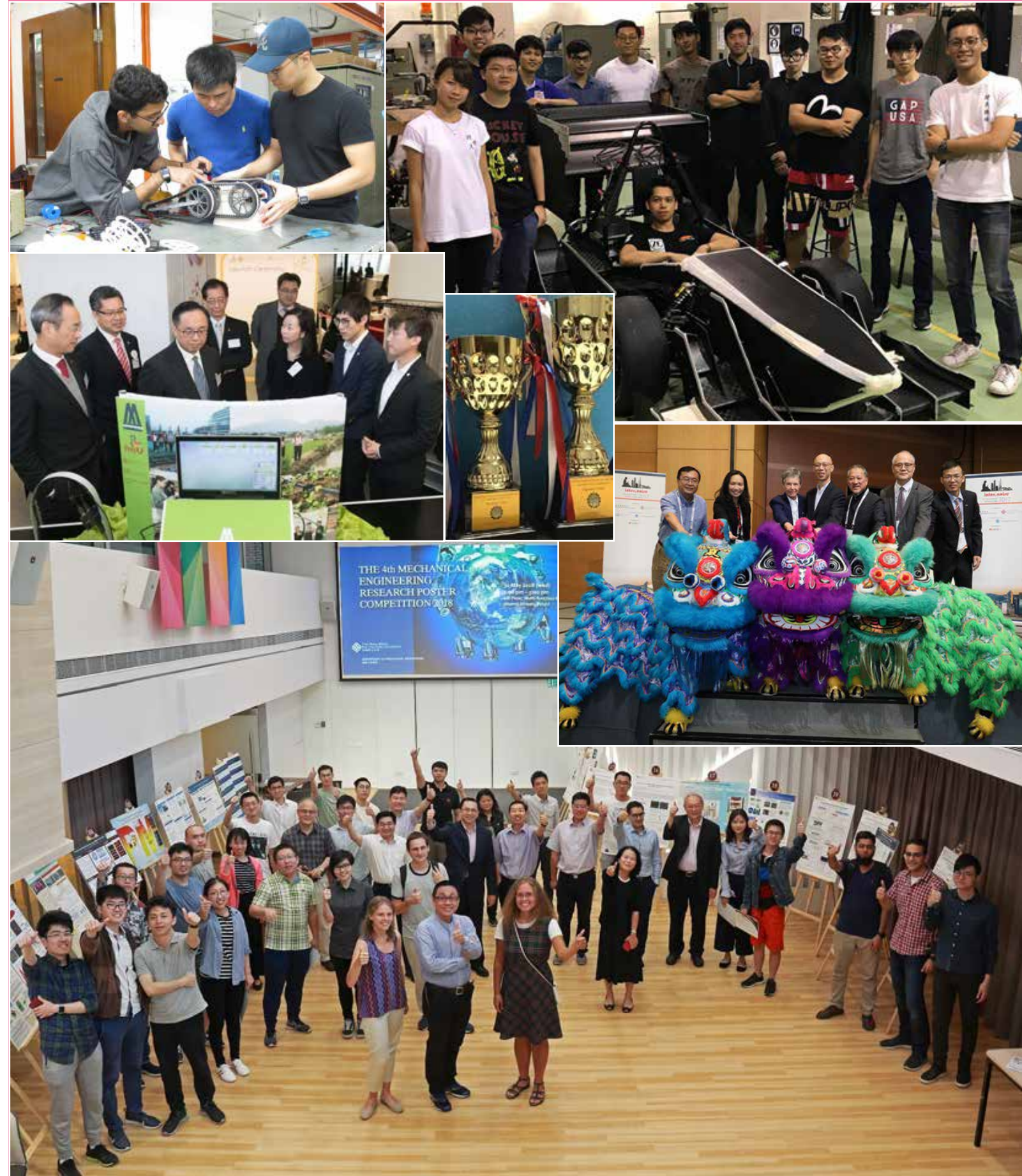
The Department regularly holds research seminars on a wide variety of topics delivered by distinguished visiting researchers or external invited speakers with the aim of advancing research by exchanging knowledge and ideas within the field of Mechanical Engineering.

Date	Speaker/ Affiliation	Seminar Title
3-Jul-2017	Prof. K. Hannemann German Aerospace Center, DLR, Spacecraft Department, Bunsenstrasse 10, 37073 Göttingen	A Joint HKSTAM/PolyU ME Distinguished Seminar: Hypersonic Research in the High Enthalpy Shock Tunnel Göttingen
2-Aug-2017	Dr Yikai Li School of Mechanical Engineering, Beijing Institute of Technology, Beijing, China	Ligament formation mechanism and breakup threshold for the Faraday instability
8-Aug-2017	Prof. Huajian Gao School of Engineering, Brown University	Topological Toughening of graphene and other 2D materials
18-Aug-2017	Prof. Zaiping Guo Institute for Superconducting and Electronic Materials & School of Mechanical, Materials, and Mechatronic Engineering, University of Wollongong, Australia	Hybrid Nanostructures as Electrode Materials for Metal-Ion Batteries
22-Aug-2017	Prof. An-Shik Yang Department of Energy and Refrigerating Air-Conditioning Engineering, National Taipei University of Technology, Taipei, Taiwan	Assessment of Wind Power Generation in Dense Urban Area
24-Aug-2017	Prof. Yongliang Yu School of Engineering Science, University of Chinese Academy of Sciences, China	The Propulsion of Flying and Swimming Animals
25-Aug-2017	Prof. Zhaoli Guo State Key Laboratory of Coal Combustion, School of Energy and Power Engineering, Huazhong University of Science and Technology, China	Progress of the discrete unified gas kinetic scheme for multiscale transport process
31-Aug-2017	Dr Koji Ishida Manager of the Consulting Group of Ono Sokki Co., Ltd.	Sound Quality Design for Industry Now and Future
28-Sep-2017	Dr Yu-Tai Lee Naval Surface Warfare Center, Carderock Division, West Bethesda, MD, USA	Multi-Objective Robust Optimization for a Centrifugal Impeller with Operational Flexibility and Discretized Interval Uncertainty
3-Oct-2017	Dr Jean-Daniel Chazot Université de Technologie de Compiègne, France	Acoustics and Vibrations from the Université de Technologie de Compiègne
9-Oct-2017	Prof. Zonglin Jiang Institute of Mechanics, Chinese Academy of Sciences, Beijing, China	Aerodynamic Testing at Duplicating Hypersonic Flight Conditions with Hyper-Dragon
29-Nov-2017	Dr Mingxin Huang Department of Mechanical Engineering, University of Hong Kong	Alloy Design by Dislocation Engineering
5-Dec-2017	Prof. Hui Hu Martin C. Jischke Professor in Aerospace Engineering Director, Advanced Flow Diagnostics and Experimental Aerodynamics Laboratory, Department of Aerospace Engineering, Iowa State University, Iowa, USA	Development of Advanced Flow Diagnostic Techniques to Study Complex Thermal/Fluid Phenomena
7-Dec-2017	Prof. Gang Wang Shanghai University, Shanghai, China	Metallic glasses: From fundamental research to application exploration
8-Dec-2017	Prof. Huan Lian Institute of Mechanics, Chinese Academy of Sciences, Beijing, China	Droplet Dispersion in a “Box of Turbulence”



Date	Speaker/ Affiliation	Seminar Title
8-Dec-2017	Prof. Xin Lin Director of Key Laboratory of Metal High Performance Additive Manufacturing and Innovative Design Deputy Director of the State Key Laboratory of Solidification Processing China, Northwestern Polytechnical University	Manufacturing of large components for the aviation using laser additive manufacturing
11-Dec-2017	Prof. Daolin Xu Director of the Centre for Marine Technology, Hunan University, China	Dynamics of Super-Scale Modularized Floating Airport
4-Jan-2018	Prof. B.C. Khoo Department of Mechanical Engineering, National University of Singapore, Singapore	Flow over shallow dimple arrays
8-Jan-2018	Dr Lau Gih-Keong Nanyang Technological University	Artificial muscles for MEMS, soft robotics, tunable optics & acoustics
22-Jan-2018	Dr Yen Bach Truong CSIRO-Manufacturing, Clayton, Australia	Advance Nanostructured Fabrics for Low Burden Protection
8-Feb-2018	Dr Yang LIU Department of Mechanical Engineering, The Hong Kong Polytechnic University	Traditional Chinese medicine describes the transduction pathways of signaling molecules 黃帝內經描述了信號分子的傳遞過程
13-Mar-2018	Prof. Wallace Woon-Fong LEUNG Department of Mechanical Engineering, The Hong Kong Polytechnic University	Advances in Nanofiber Filtration of Nano-aerosols
5-Mar-2018	Prof. Wallace Woon-Fong LEUNG Department of Mechanical Engineering, The Hong Kong Polytechnic University	Nanofiber Photocatalyst in Purifying Air and Water
13-Mar-2018	Prof. Xiao Dong Chen Department of Engineering Science, University of Oxford, UK	Process Engineering Evolution and Innovations – Food, Society and Future
20-Mar-2018	Dr Zuankai Wang Department of Mechanical and Biomedical Engineering, City University of Hong Kong, Hong Kong	Nature-inspired innovations for engineering novel mechanical systems
17-Apr-2018	Prof. Xiao Dong Chen School of Chemical Engineering and Environmental Engineering, Soochow University, Suzhou, China	Process Engineering Evolution and Innovations – Food, Society and Future
20-Apr-2018	Dr Darwin Lau Department of Mechanical and Automation Engineering, The Chinese University of Hong Kong	From Generalised Analysis to Application Realisation of Cable-Driven Robots
28-May-2018	Dr Low Kin Huat School of Mechanical and Aerospace Engineering, Nanyang Technological University, Singapore	Conceptual Study on Traffic Management of Multiple-Drone Operations in Urban Environments
20-Jun-2018	Dr Qing Xiao Department of Naval Architecture, Ocean and Marine Engineering, University of Strathclyde, Glasgow, UK	Computational Fluid Dynamics Application in Biomimetic and Marine Renewable Technology
27-Jun-2018	Prof. Liqiang Mai State Key Laboratory of Advanced Technology for Materials Synthesis and Processing, Wuhan University of Technology, Wuhan, China	Nanowires Devices for Emerging Energy Storage
28-Jun-2018	Prof. Fengquan Zhong State Key Laboratory of High Temperature Gas Dynamics, Institute of Mechanics, Chinese Academy of Sciences, China	Recent Progress in Fundamental Study of Supersonic Combustion

# Highlights of the Year





# Staff Achievements and Research Development

## Success in Securing GRF 2018/19

In the 2018/2019 results of grants from the Research Grants Council's General Research Fund (GRF) announced in June 2018, ME's success rate for the GRF was 33% in 2018/19 exercise. Seven of our GRF proposals were funded and listed below:

Principal Investigator	Project Title
Dr AN Liang	Understanding charge transport phenomena in photoelectrochemical storage cells for solar energy storage
Prof. CHENG Li	Thermo-Acoustic Oscillations: Mechanism Exploration and Control Based on Delay Differential Equation Theories Under a Fully- coupled Modelling Framework
Dr TANG Hui	Study of magnetic hyperthermia based cancer treatment using a holistic simulation framework
Prof. WEN Chih-yung	Investigation and Optimization of Porous Coatings on the Stabilization of Hypersonic Boundary-Layer Flows
Dr ZHENG Guangping	Frenkel-Kontorova model based simulation on the deformation mechanisms in nanostructured high-entropy alloys
Prof. ZHOU Li Min	Size- and temperature-dependent phase transition in NASICON-type material on Li+ and Na+-(de)intercalation
Dr ZHU Jie	Investigation on broadband transition delay and stability control of hypersonic turbulent boundary layer via gradient-index acoustic metasurface

## Prof. SU Zhongqing Won Gold Award in International Exhibition of Inventions of Geneva

Prof. Zhongqing SU of the Department of Mechanical Engineering won a Gold Medal in the 46th International Exhibition of Inventions of Geneva, Switzerland in April 2018.

### Sprayable Smart Sensing Network Coating for Structural Health Monitoring

Principal Investigators:

Prof. Zhongqing SU (*Department of Mechanical Engineering, The Hong Kong Polytechnic University*)

Prof. Zhong ZHANG (*CAS Center for Excellence in Nanoscience, National Center for Nanoscience and Technology, Beijing*)

Prof. Limin ZHOU (*Interdisciplinary Division of Aeronautical and Aviation Engineering, The Hong Kong Polytechnic University*)

This innovative, first-ever, nanocomposites-inspired smart sensor is made of carbon black (CB), 2D graphene and polyvinylidene fluoride (PVDF). The sensors made of this new breed of nanocomposites can be directly sprayed on any engineering structure to form a highly dense smart sensing network, which can acquire in-situ broadband ultrasounds of up to 1 MHz for damage detection. Lightweight, flexible and highly responsive, the sensing network can quantitatively evaluate invisible, undersized defect and damage in the structure, such as cracks caused by metal fatigue. This new sensing technology retrofits conventional ultrasonic sensing philosophy, and blazes a new trail for next generation of in-situ structural health monitoring.



## Prof. Adrian BEJAN Named 2018 Franklin Institute Award Laureate

Adrian Bejan, our Visiting Chair Professor, has been named a recipient of the 2018 Benjamin Franklin Medal in Mechanical Engineering.

Bejan was cited for “his pioneering interdisciplinary contributions in thermodynamics and convection heat transfer that have improved the performance of engineering systems, and for constructal theory, which predicts natural design and its evolution in engineering, scientific, and social systems.”

The Franklin Institute Awards has publicly recognized and encouraged outstanding accomplishments in science and technology since the Institute was founded in 1824.



## Prof. Wallace LEUNG Ganted the Patent on Method of Producing Dye-sensitized Solar Cell

A United States patent US 9,754,731 B2 was awarded to Prof. Wallace Leung, Chair Professor of Innovative Products and Technologies of the Department of Mechanical Engineering, PolyU, and his PhD student Lijun Yang, for a method of producing dye-sensitized solar cell, the most environmental friendly photovoltaics to-date.

The method concerns a novel configuration of using more than one or more dyes to harvest sunlight for the solar cell. The photo-anode made up of titanium nanofibers and the first dye is adsorbed onto the large surface area provided by the titanium nanofiber with diameter of 60 nanometers. The second dye is coated as a monolayer onto the nanofibers covering the first dye providing a core-shell structure, and likewise the third dye coated onto the second dye, etc. Each dye harvests sunlight independently whereby the photons are converted to electrons. The electrons from each dye pass onto the previous dye at lower energy level in a cascade manner and finally to the titanium nanofibers, which transport all the collected electrons to the electrode. This novel configuration reduces loss of electrons by recombination with the electrolyte/positive holes, thereby increasing the efficiency of the solar cell and each dye can harvest uniquely the wavelength of the solar spectrum thereby maximizing the light harvesting. The efficiency can reach 10% with low loss.



## Prof. CHENG Li Appointed to Key Positions

Prof. CHENG Li, Chair Professor of Mechanical Engineering, has been appointed to the following new positions starting from January 2018:

- Deputy Editor-in-Chief and Receiving Editor, Journal of Sound and Vibration (JSV)
- Advisory Board Member in ASME transaction, Journal of Non-destructive Evaluation, Diagnostics and Prognostics of Engineering Systems
- Editorial Board Member, Advances in Aircraft and Spacecraft Science, Techno Press
- Director, International Institute of Noise Control Engineering (I-INCE)

Together with his directorship in the International Institute of Acoustics and Vibration (IIAV), he involved in the two largest world organizations in sound and vibration, each involving member societies from around 40 countries.





## Prof. CHAN Tat Leung Elected Fellow of ASME

Professor CHAN Tat Leung has been elected a Fellow of American Society of Mechanical Engineers (ASME). With his distinguished engineering accomplishments, the ASME Board of Governors confers the Fellow grade of membership to Prof. Chan who is presently one of 3,519 Fellows out of 109,381 ASME members. The Fellow grade is truly a distinction among ASME members.

Prof. CHAN is an internationally recognized scholar for his outstanding contributions to basic and applied research and achievements in the mechanical engineering areas of thermofluids, combustion related pollutants, environmental sciences, energy & fuels, multiphase flow etc. In recognition of his outstanding research accomplishments, and exemplary leadership & management in academic programs and professional services in mechanical engineering, he was elected as Fellow of SAE International, USA, the Institution of Mechanical Engineers, UK and the Hong Kong Institution of Engineers. He also received a prestigious National Honor, First Class Natural Science Award, bestowed by the Ministry of Education of China.



## Dr JING Xingjian Received European Senior Research Award

Dr JING Xingjian received prestigious EASD senior research award announced in the X international conference on structural dynamics held in Rome Italy during 10-13 Sep 2017. The award ceremony was held in the conference dinner on 12 Sep 2017.

The European Association for Structural Dynamics (EASD) is a professional body founded in 1990. EASD oversees the organization of the European Conferences on Structural Dynamics (EURODYN) that will be held at three (or four) year intervals. The EURODYN Conference has developed into one of the key conferences in structural dynamics. These conferences are devoted to theoretical developments and applications of structural dynamics to all types of structures and structural materials.

Dr JING received the Senior Research Award in the area of development of methodologies for structural dynamics due to his important contributions for the analysis and design of nonlinear systems.



## Dr ZHANG Peng Appointed as Guest Professor of State Key Laboratory of China

Dr ZHANG Peng, Associate Professor of Department of Mechanical Engineering, was appointed as the Guest Professor of State Key Laboratory of High-temperature Gas Dynamics (LHD), Chinese Academy of Sciences. He accepted this honorary appointment during the 2017 LHD Summer Workshop held on 17 August 2017 at Tsien Hsue-shen Engineering Science Experiment Base, where he delivered an invited speech on fluid dynamics and chemistry of rocket propellants.



Dr ZHANG has established a close collaboration with LHD since 2013. He has also secured two external research grants from LHD and co-authored five papers published on top journals in aerospace engineering and combustion. These aerospace-related academic activities are in line with the core research strength and development of the Department and the University.

## Dr JING Xingjian Obtained the First Prize in HK CIC Construction Innovation Award 2017

Dr JING Xingjian's research team recently received the 1st Prize in the category of Construction Safety in the Hong Kong CIC (Construction Industry Council) Construction Innovation Award 2017. The award ceremony was held on 15 Dec 2017, at JW Marriot Hong Kong, addressed by Mr Matthew CHEUNG Kin-Chung, Acting Chief Executive of the Hong Kong Special Administrative Region.



The bio-inspired anti-vibration exoskeleton (BIAVE) developed by Dr JING Xingjian's research team was selected among 17 Finalists by an international selection panel, the BIAVE is a technical breakthrough effectively helping construction workers to avoid occupational diseases in operation of demolition tools.

## Dr ZHU Jie's Research Work Accepted by Physical Review Letters

A new study conducted by Dr ZHU Jie, the Assistant Professor of Department of Mechanical Engineering, and his team has made significant progress towards expanding such investigation. With passive acoustic system, Dr ZHU's team and his collaborator from Huazhong University of Science and Technology present the first experimental study of PT symmetry physics beyond one dimension. A two-dimensional intrinsic PT symmetric potential is demonstrated with an all passive acoustic metamaterials crystal. As an example, the two-dimensional unidirectional sound focusing effect is experimentally realized.



This progress breaks through the most essential roadblock to observing the evolution of non-Hermitian Hamiltonians respecting PT symmetry with acoustic system: the absence of natural gain medium. This all passive acoustic PT-symmetric material requires no electricity supply nor feedback control mechanism. It provides a much more compact and robust solution, when pushing the PT-symmetry acoustic research into practice in the future to build new devices for sound imaging and sensing.

This work was recently accepted for publication in Physical Review Letters. ME PhD student LIU Tuo is the first author. Dr ZHU Jie is the corresponding author.



# Student Accomplishments

## HKPolyU Racing Team Represented Hong Kong to take part in the Formula SAE

Pioneered by a group of ME students, HKPolyU Racing Team was the first from Hong Kong to join the 2017 Formula Student China in 2017 in Xiangyang, Hubei - a competition that involved design, engineering, manufacturing, testing, and races.



HKPolyU Racing was the first ever team representing Hong Kong to take part in the Formula SAE, which is described as the largest collegiate engineering design contest for undergraduate and graduate students from different parts of the world, such as Germany, Australia, UK, Italy, etc. The contest aims to enhance students' engineering design and project management skills by applying learned theories in a challenging competition.

Established in 2015 by a few students from the Department of Mechanical Engineering, the team is now expanding and collaborating with students from other disciplines including the Faculty of Business and School of Design. While collaboration across disciplines is on the rise and positioned to be a major catalyst for change in higher education, the team is creating a platform for students to share the best practices and knowledge across disciplines.

## PAED Students Won iF Design Talent Award 2017

A student team from the Product Analysis and Engineering Design programme, Department of Mechanical Engineering (ME), has made a notable achievement – they were awarded the Winner in the iF Design Talent Award 2017 held in Germany.



The iF Design Talent Award is one of the world's largest and most influential competitions for young designers. Twenty of the world's best young designers have been chosen as winners of the iF DESIGN TALENT AWARD 2017\_02. They were selected from over 5,000 design concepts submitted from 45 countries.

The PolyU team is simply the only representative from Hong Kong and crowned the Winner in the category of Mio Apartments – Maximizing Small Space.

The winning entry "Connex / Smart co-living concept" is developed by Lik Him Tam, Chun Hei Wong, Kim To Tse, and Tsz Wai Wong. Considering the growing phenomenon of co-living in small apartments in Hong Kong, the entry provides a solution to convert spaces between private and common zones. The design is a co-living apartment where private rooms can be customized to the needs of each individual and connected to the common area when necessary. If the tenant is open to social activity, part of the private room can be rotated and combined with the territory of the hub. If private space is needed, the room can be rotated and detached from the hub, closing it off to the rest.

"Connex / Smart co-living concept" was praised by the jurors as "uses the potential of space with efficiency and playfulness."

## Mr Zachary Wong Won DFA Hong Kong Young Design Talent Award 2017



Mr Zachary Wong Chun Hei, 2016 graduate of the Product Analysis and Engineering Design (PAED) Degree Programme, received the CreateSmart Young Design Talent Special Award 2017 in the DFA Hong Kong Young Design Talent Award. It is a highly-recognized award organized by the Hong Kong Design Centre. A total of 17 local design practitioners or graduates are awarded this year and Zachary is among one of the graduate awardees. Zachary will be receiving a financial sponsorship amount up to HK\$250,000 for six-to-twelve-month overseas work attachment or study to further stimulate design thinking and contributing to Hong Kong's ever-expanding creative industry upon return.



In his four years of study, Zachary partnered with his other classmates and demonstrated their engineering design talents by participating in a lot of competitions with remarkable results, including the Champion of Disney ImagiNations Hong Kong Design Competition 2015, iF Design Talent Award 2017 and etc.

Upon graduation, he and his partner have founded a company "AZ Imagine Limited" with a startup fund from the Hong Kong Polytechnic University. The company is going to launch a temperature-adjustable mug and a foam cutting device within a year.

## Miss Winky Lui Received Trainee of the Year Award 2017

Miss Winky Lui Ka Wing, graduated with Double Degree in Mechanical Engineering and Business Administration in 2015, a current ME MSc student, has received the Trainee of the Year Award 2017 organized by the Hong Kong Institution of Engineers (HKIE).

Trainee of the Year Award is a competition designed to promote Engineering Graduate Training Scheme "A". All Scheme "A" trainees are eligible to participate. This award aims to recognize trainees who have outstanding achievements during the period of Scheme "A" Training and who have made great contributions to the HKIE and the Hong Kong society. The winners went through a screening process with written submission and an interview with judging panel.

Winky joined The Hong Kong and China Gas Company Limited (Towngas) as a Graduate Trainee upon her graduation. During the two-year Scheme "A" training, she has enhanced her knowledge and practical skills of gas engineering. Not only has she participated in various innovation projects, she also gained valuable work experience in Mainland China to work on a design project about decentralized energy system.



Furthermore, Winky was selected as one of the eight HKIE President's Protégés last year to shadow the HKIE President 2016/2017 Ir Joseph Choi, gaining insight into the inner workings of the HKIE and broadening her exposure to the engineering environment. She also took the initiative to hold workshops on STEM education and to promote the image of women engineers.



## ME students Won Second Prize and CC-Link Special Award in 11th Mitsubishi Electric Cup

A students team from the Department of Mechanical Engineering won the Second Prize and the CC-Link Special Award in the 11th “Mitsubishi Electric Cup” National Electric and Automation Contest for College Students held in Tianjin, China from 7 to 11 August 2017. Facing and solving various problems while overcoming difficulties, the PolyU team competed against 70 participating teams, winning tremendous praise from experts in automation and students from other universities.



The PolyU team of four Mechanical Engineering students (SUN Yixiao, JI Yuan, LEE Chia-hang and ZHOU Zhuangyu) and two Electronic and Information Engineering students (YANG Jingrui and ZHOU Qihuan) had designed a robotic automatic parking system, aiming to solve the problem of lack of parking space supply in developed cities. The system was designed to be fully automatically operated, facilitated with Internet technologies to serve the customers or share information between devices and systems.

## PolyU ME Robot Triumphed in IMechE 2018

Bravo! The PolyU student team won the Champion and the Most Innovative Awards in the 7th IMechE Greater China Design Competition held at Guangzhou on 24-25 March 2018.

Organized by the Institution of Mechanical Engineers (IMechE) - Hong Kong Branch, this year challenge was to design an unmanned robot for relief. Eight top universities, including The University of Hong Kong, The Chinese University of Hong Kong, The Hong Kong University of Science and Technology, University of Macau, South China University of Technology and PolyU, participated in this annual competition.



The PolyU team, comprised of third year undergraduate students, Ji-ho SHIN, Hung Ming Roy CHOW and Rudra SOMESHWAR, under the supervision of Dr Henry CHU and Ir Dr Curtis NG of the Department of Mechanical Engineering, designed and created a robot, which can successfully move across different terrains for material transport.



The judging panel marked the competitors based on design innovation, design methodology, potential for commercialization, presentation skills, as well as the technical performance of the prototype design during the demonstration session.

The PolyU team robot stood out from the rest. The robot topped off the challenge in the competition with the full smoothness and highest efficiency.

## ME Students Won Champion and Best Innovative Award in HKIE Joint Student Chapters Competition 2018

A team of Mechanical Engineering students of the undergraduate final-year capstone project in the title of “Design and Construction of an Innovative Energy Conversion Device” - Fung Man Yi, Wong Hei Wa and Pang Wei Fong under the supervision of Dr Lam Chun Ki has won the Champion and the Best Innovative Award in the HKIE Joint Student Chapters Competition 2018.



The competition was organized by the Hong Kong Institution of Engineers (HKIE) and held at the Hong Kong Polytechnic University on 14 April 2018. The theme of this year is “Engineering a Utopia”. The topic should be related to Sustainable Development, and should fulfill at least one of the scopes of Intelligent Building, Green Construction and Methodology and Energy Efficiency and Management. Top universities in Hong Kong have participated in this annual competition.

The judging panel marked the competitors based on design innovation, design methodology, potential for commercialization and presentation skills during the presentation session. The winning innovative design for the team is an eco-friendly portable fridge powered up by energy conversion on a bike.

## Mr Jimin FU Won Best Student Presentation Award in 22nd Annual Conference of HKSTAM

Mr Jimin FU, a PhD student from the PolyU Department of Mechanical Engineering, got the Best Student Presentation Award at the 22nd Annual Conference of HKSTAM on 14 April 2018.

The 22nd Annual Conference of HKSTAM 2018 in conjunction with the 14th Shanghai-Hong Kong Forum on Mechanics and Its Application was co-organized by the Hong Kong Society of Theoretical and Applied Mechanics (HKSTAM), the Shanghai Society of Theoretical and Applied Mechanics (SSTAM) and the Hong Kong Polytechnic University (PolyU). The conference topics cover mechanics and its application in all science and engineering disciplines. The one-day conference featured 5 distinguished lectures and 38 presentations in eight parallel sessions. Student participants were provided opportunities to present their research work during the presentation sessions. Based on the assessment results by referees, eight best students were awarded the Best Student Presentation Award. The topic of Jimin’s presentation is “Microscopic ridge-like surface morphology: An antifouling strategy learned from nature”.



Jimin is a fourth-year PhD candidate. He is devoted to the study on micro-and nanomechanics of natural biomaterials under the joint supervisions of Dr Haimin YAO and Prof. Sanqiang SHI.



## ME Students Triumphed in HKIE Young Engineers Programme 2017/18

A team of four final-year undergraduate ME students has won the Champion in the Young Engineers Programme (YEP) 2017/2018 which is an annual flagship programme organized by the Manufacturing and Industrial (MI) Division of the Hong Kong Institution of Engineers (HKIE). This year, YEP is supported by China Light and Power Co Ltd. (CLP) with the theme “Redesign Power Plant for Next Hundred Year”.



In this programme, participants (Yeppers) were invited to join multiple seminars and technical visits to enrich their knowledge on power plants operation and to strengthen their business sense. The competition was conducted in research approach. Yeppers were required to read academic journals, identify critical problems in current power plant design, conduct business value analysis and propose comprehensive engineering solutions. After several submission of written reports, 11 teams of Yeppers presented in the first round on 24 March 2018 and the top 5 teams were selected into the final round of presentation on 27 April 2018.

PolyU Team, with members Mr Chan Kwok Wai, Mr Lau Tak Leong Tony, Mr Law Man Cheong and Mr Lit Hong Tat, awarded Champion in the competition. Throughout the half-year programme, Ir Dr Daniel Ng, Chairman of HKIE – MI Division 2017/2018, acted as a mentor to all Yeppers, while Miss Winky Lui, our PolyU ME graduate and a current ME MSc student, was assigned as the tutor of PolyU Team 4. The team has chosen “Integrated Gasification Combined Cycle (IGCC) with Pre-combustion Carbon Capture” as their research topic with an aim to reduce carbon dioxide emission from power plants and increase the plant efficiency in a cost-effective way. They would like to express sincere thanks to Ir Prof. Wallace Leung for his inspiring guidance and Miss Winky Lui for her zealous support.

## Mr Haopeng YANG Won Best Presentation Award in ICMMP 2018

Mr Haopeng YANG, a PhD student from the Department of Mechanical Engineering of PolyU, won the Best Presentation Award at the Fourth International Conference on Metallic Materials and Processing (ICMMP) on 20 June 2018.



ICMMP 2018 was organized by the Northwestern Polytechnical University. This conference aimed at bringing together world materials communities to discuss and review the recent development and progress in materials science, processing and computational materials with the focus on metals. Meanwhile, ICMMP helped to facilitate more fruitful cooperation among researchers, and to look into the future of metal research.

In this conference, 7 students and 5 full-time research fellows out of 58 participants were awarded the Best Presentation Award. Mr YANG’s awarded presentation was “Investigation on semi-solid forming of A356 alloy for fabrication of micro-scaled and fine-pitched pillar parts for semiconductor and microelectronics applications”.

Mr YANG is a 4th-year PhD student, under the joint supervision of Prof. Mingwang FU and Dr Sandy TO. YANG is devoted to doing research into hot working material behaviors of Mg and Al alloys.

## Department and Scholarly Activities

### Inter-Noise Successfully Held in Hong Kong

The 46th International Congress and Exposition on Noise Control Engineering (Inter-Noise) was successfully held in the Hong Kong Convention and Exhibition Centre on August 27-30 2017. The event was co-organized by The Hong Kong Polytechnic University and Hong Kong Institute of Acoustics under the patronage of the International Institute of Noise Control Engineering (I-INCE).



The congress attracted close to 1200 participants plus some 80 exhibitors from around 40 countries and regions, topped by China, Japan, South Korea, Germany and USA. The congress was officiated by the guest of honor, honorable Mr K. S. Wong, Secretary for the Environment of HKSAR government and Ms. Marion Burgess, president of the I-INCE. In his opening remarks, PolyU ME Professor, Li Cheng, the General Co-Chair of the congress welcomed guests around the globe and highlighted the active participation of PolyU in co-organizing this important international event, in particular, ME faculty members, Dr RCK. Leung and Dr J. Zhu as organizing committee members and Dr YS Choy as technical committee member under the leadership of Prof. SK. Tang, the Technical Chair from BSE department.



In the I-INCE board meeting following the congress, Prof. L. Cheng was elected as a Director of the I-INCE for a four-year term starting from 2017. The next edition of Inter-Noise will be held in Chicago next year.

### ME Co-hosted the 17th Asian Pacific Vibration Conference

The 17th Asia Pacific Vibration Conference (APVC 2017) was held on November 13-15, 2017, in Nanjing, P R China. Prof. Li Cheng from ME department served as the General Co-Chair of the conference.

The APVC is an international conference held once every two years with the intention of encouraging scientific and technical cooperation among Asia Pacific countries. The conference aims to bring researchers, engineers and students from but not limited to areas around the Asia Pacific countries in a collegial and stimulating environment to present the most recent developments and new information on any aspect of mechanical vibration and sound.

PolyU ME has a long connection with APVCs, through the organization of the its 14th edition of conference on PolyU campus back to 2011. ME scholars have also been actively participating in the past APVCs, exemplified by the keynote talk given by Prof. L. Cheng at the 15th APVC in Jeju, South Korea in 2013.



## The 4th ME Research Poster Competition 2018

Fever to PolyU Mechanical Engineering! In a hot afternoon on 30 May 2018, 22 research students displayed their posters and delivered their insights to us. Academic supervisors were there to give advice, classmates and friends came to learn together.

With an objective to provide the Research Postgraduate and Research MSc students of the Department a good opportunity to share their research project results and knowledge with their peers and the PolyU community, the Department has organized the Research Poster Competition on campus.

This year, a total of 22 posters covering a wide range of topics were displayed. The posters reflected the participants' research findings as well as their new and innovative ideas for successful approaches and the potential contribution to the advancement of Mechanical Engineering. During the competition, participants delivered a brief presentation of their research projects to win a vote from attendees including faculty members of the Department, research and MSc students, as well as peers and visitors on campus. Nearly 300 votes were cast and 6 outstanding posters were selected. The Champion, Runner-up and Excellent Poster Awardees won cash prizes of HK\$2,000, HK\$1,000 and HK\$500 respectively.

Congratulations to their wonderful presentations and excellent research work!

### Champion

**Student: Miss DUONGTHIPHEWA Anchalee**

Supervisor: Prof. L.M. Zhou

Title: Enhanced multi-functional properties of composites using conductive prepreg for lightning strike protection

### Runner-Up

**Student: Miss GAO Yang**

Supervisor: Dr H.M. Yao

Title: Spiral interface: A reinforcing mechanism for laminated composite materials learned from nature

### Excellent Poster Award

**Student: Mr FAN Lei**

Supervisor: Dr Z.B. Jiao

Title: Nanoscale precipitation and mechanical properties of particle-strengthened high-entropy alloys

**Student: Mr LIAO Yaozhong**

Supervisor: Prof. Z.Q. Su

Title: Ultrafast response of spay-on nanocomposite piezoresistive sensing network coating

**Student: Mr TIAN Xudong**

Supervisor: Prof. C.Y. Wen

Title: Supersonic/Hypersonic boundary layer control using porous coatings

**Student: Miss ZHOU Quan**

Supervisor: Prof. C.S. Cheung

Title: Effect of fuel composition on laminar flame speed of H<sub>2</sub>/CO/CH<sub>4</sub> biomass-derived syngas

