# Informing Teaching and Advancing Knowledge through Research

*CPCE academic staff members are always actively engaged in research activities that inform teaching and advance knowledge. In this issue of CPCE CONNECT, five lecturers share with us their personal experience and enthusiasm about their fruitful research.*

## Dr Ding Hongdi: Studying Grammar of Niesu

Having developed research strengths in Tibeto-Burman linguistics, Dr Ding Hongdi, Lecturer, received funding support of about HK$480,000 from the Faculty Development Scheme under the Research Grants Council (RGC) Competitive Research Funding Schemes for the Local Self-financing Degree Sector in 2019/20 for his research project "A Grammar of Niesu, a Southeastern Dialect of Nuosu". Niesu Yi, which belongs to Sino-Tibetan languages, is a Tibeto-Burman language spoken by around 600,000 people living in Sichuan's Liangshan Yi Autonomous Prefecture, China. Dr Ding's research aims to describe the lesser-known grammatical features of Niesu Yi.

"Describing their grammar is a scientific way of studying languages. It also enables me to see how people of various cultures understand the world differently and uniquely with their language. Being in long-term contact with ethnic minorities living in remote and high-altitude localities, I feel being re-educated by their traditional knowledge," said Dr Ding.

With his outstanding research proposal scoring full marks, Dr Ding was invited by the RGC to give, in November 2019, a presentation to academic staff from self-financing tertiary institutions on how to prepare a successful application for funding.

Taking up both teaching and research duties requires not only time but also support. Dr Ding was grateful to the College for the support on conducting linguistic fieldwork in 2018/19 in Sichuan, a province with high linguistic diversity. In addition, Dr Ding was also supported financially to present his research results at key international linguistic conferences outside Hong Kong.

## Dr Liang Shanjun: Enhancing Understanding of Wave Radiation

Dr Liang Shanjun, Lecturer, together with various scholars, published a paper entitled ***Revealing the Missing Dimension at an Exceptional Point*** in the journal ***Nature Physics***, a top peer-reviewed scientific journal, in March 2020. This paper presents an intriguing and counterintuitive discovery that there is no correlation between the radiation of waves and the eigenstates at the "exceptional point" of a non-Hermitian system in a particular condition.

"This research can enhance the understanding of wave radiation, which helps complete the wave theories and inspire more complex designs to control wave propagation," said Dr Liang.

Dr Liang was particularly thankful to the scholars from The Hong Kong Polytechnic University and Peking University for giving him the opportunity to participate in this groundbreaking research and publish the results in a top-ranked academic journal. He also appreciated the supportive environment and ample resources provided by the College to facilitate his research work as well as teaching.

In the coming years, Dr Liang hopes to introduce new concepts in physics for the design of broadband sound absorbers and sound barriers so as to enhance noise control in Hong Kong.

# 藉著研究促進教學及推動知識發展

*CPCE 教員一直主動參與研究，以促進教學及推動知識發展。五名講師於今期《院訊》分享他們的研究經驗及熱忱。*

## 丁泓棣博士：研究聶蘇語法

講師丁泓棣博士的研究專長之一是藏緬語語言學，其「四川涼山聶蘇語參考語法」研究項目獲 2019/20 年度研究資助局本地自資學位界別競逐研究資助轄下的教員發展計劃資助，撥款約 48 萬元。聶蘇彝語屬於漢藏語系之藏緬語族，大多數母語者聚居在中國四川涼山彝族自治州，數量約 60 萬，但其語法特點仍然鮮為人知，因此，這項研究旨在對聶蘇彝語的語法進行描寫。

丁博士說：「語法描寫是研究語言的一種科學方法，同時也讓我看到不同文化背景的人士如何通過他們的語言，以自己獨特的方式去理解我們所生活的世界。此外，通過與居住在遠離城市、高海拔地區的少數民族的長期接觸，他們的傳統知識令我再受教育。」

由於丁博士的研究計劃書獲評為滿分，研究資助局遂邀請他於 2019 年 11 月向多間自資專上院校的教員闡述如何準備一份成功的計劃書，以申請資助。

兼顧教學和研究，除了需要時間外，還要獲得支持。丁博士慶幸獲學院支持，於 2018/19 學年前往四川這個語言高度豐富的地方進行語言學田野考察，他亦多次獲學院資助，出席香港以外的重要語言學會議，發表研究成果。

Invited by the RGC, Dr Ding shares his experience in writing an outstanding research proposal.

丁博士獲研究資助局邀請，分享如何撰寫出色的研究計劃書。

## 梁善軍博士：加強對波輻射的認識

講師梁善軍博士與多名學者於 2020 年 3 月在同行評審的權威科學期刊《自然－物理學》發表題為 *Revealing the Missing Dimension at an Exceptional Point* 的論文，提出耐人尋味又違反慣性思維的發現：在特定的情況下，於非厄米系統的「例外點」中，輻射波與本徵態無關。

梁博士表示：「這份研究有助加強對波輻射的認識，以完善波動理論，也有助啟發更複雜的設計，以控制波的傳播。」

梁博士特別感謝香港理工大學及北京大學的學者，讓他參與這次研究，取得突破，並在首屈一指的學術期刊發表結果。他亦感激學院營造良好研究氣氛及提供足夠資源，促進他的顧研究及教學。

未來數年，梁博士希望在寬帶吸聲設計及隔音屏障方面提出新的物理概念，以加強香港的噪音管制。


Dr Liang (right) attended The 46th International Congress on Noise Control Engineering held in Hong Kong in 2017.

梁博士（右）出席於 2017 年在香港舉行的第四十六屆國際噪音控制工程會議暨博覽。

## Dr Chan Hau-ling: Researching on Sustainable Supply Chain Management

Dr Chan Hau-Ling, Lecturer, has always devoted herself to studying sustainable operations, supply chain management, and information system management. This year, Dr Chan and three scholars published a paper entitled ***Environmental Taxes in Newsvendor Supply Chains: A Mean-Downside-Risk Analysis*** in the journal ***IEEE Transactions on Systems, Man, and Cybernetics: Systems*** to study how the retailer's risk attitude and the number of consumer returns affect supply chain operations, the performance of environmental taxes, and supply chain coordination.

Dr Chan shares her tips on writing journal papers, "Before writing a paper, I would usually read the news and the latest journals to understand the current business environment first. Furthermore, it is crucial to read journal submission guidelines carefully, cite relevant literature properly, and present the research proposition and analysis clearly."

Dr Chan is planning to publish a book on sustainable supply chain management. "Companies all over the world are paying more and more attention to the concept of environmental protection for sustainable development, we should focus more on improving its operational efficiency in future," she added.

## 陳巧玲博士：研究可持續供應鏈管理

講師陳巧玲博士一直醉心於研究可持續營運、供應鏈管理，以及信息系統管理。今年，陳博士聯同三位學者，於《IEEE Transactions on Systems, Man, and Cybernetics: Systems》期刊發表了題為 *Environment Taxes in Newsvendor Supply Chains: A Mean-Downside-Risk Analysis* 的論文，探討零售商的風險態度和消費者退貨數量如何影響供應鏈營運、環境稅的實行，以及供應鏈協調。

Dr Chan plans to publish a book on sustainable supply chain management.

陳博士計劃出版有關可持續供應鏈管理的著作。

陳博士分享撰寫期刊論文的秘訣：「通常我會先閱讀新聞及最新期刊，了解目前的商業環境，然後才開始撰寫論文。另外，必須仔細閱讀投稿指南，正確引用相關文獻，並清晰表達研究的概念和分析。」

陳博士計劃出版有關可持續供應鏈管理的著作。她補充：「很多企業愈來愈重視可持續發展的環保概念，所以未來我們應該更加注重提升這方面的營運效率。」

## Dr Cindy Chen: Exploring Green Building Technology

Passionate about teaching and research, Dr Cindy Chen, Lecturer, has published 18 Science Citation Index journal papers, 7 international conference papers, and 1 monograph.

Last year, she published a paper entitled ***A Proportional–integral (PI) Law Based Variable Speed Technology for Temperature Control in Indirect Evaporative Cooling System*** in the journal ***Applied Energy***, discussing the feasibility, application and economic efficiency of adopting an Indirect Evaporative Cooling (IEC) system as a cooling technology. "The technology discussed in the paper has a high potential for commercialisation, which in turn can promote the development of the IEC and advance the sustainable cooling technology," said Dr Chen.

Looking ahead, Dr Chen plans to continue her research on green building technology and present her research results in top journals.

## 陳奕博士：探究綠色建築科技

講師陳奕博士一直熱衷於教學和研究工作，發表了 18 篇科學引文索引期刊論文、7 篇國際會議論文和 1 本著作。

去年，陳博士於《Applied Energy》期刊發表了一篇題為 *A Proportional–integral (PI) Law Based Variable Speed Technology for Temperature Control in Indirect Evaporative Cooling System* 的論文，探討間接蒸發冷卻器（IEC）系統這種冷卻技術的可行性、應用和經濟效率。陳博士表示：「這篇論文討論的技術，商業化的潛力很大，而商業化更可以進一步促進 IEC 及可持續冷卻技術的發展。」

Dr Chen hopes her research on green building technology can bring greater contribution to the community.

陳博士希望她在綠色建築科技的研究工作，能夠為社區帶來更大的貢獻。

展望未來，陳博士計劃繼續致力於綠色建築科技的研究工作，並於權威期刊發表研究成果。

## Dr Ivy Zhou: Investigating Bio-syngas

Dr Ivy Zhou, Lecturer, has over the years devoted her research efforts mainly to laminar and turbulent combustion, biomass fuels, energy utilisation safety, and emission and pollution control. This year, she published her paper ***Explosion Characteristics of Bio-syngas at Various Fuel Compositions and Dilutions in a Confined Vessel*** in the journal ***Fuel***, focusing on the laminar premixed combustion and flame dynamics of bio-syngas. This detailed study enhances the understanding of this multi-component bio-syngas regarding combustion behaviour and energy utilisation and also provides guidelines for its practical applications.

"As one of the important renewable energy resources for maintaining sustainable energy development and reducing air pollution and greenhouse gas emissions, bio-syngas has great research potential. Therefore, I plan to take my research further by investigating the combustion behaviour and pollutant emission characteristics of burning bio-syngas, so as to help us gain a comprehensive understanding of its utilisation in practical combustion devices," said Dr Zhou.

## 周全博士：研究生物質合成氣

講師周全博士近年的研究主要圍繞層流與湍流燃燒、生物質燃料、能源使用安全，以及排放物和污染控制。今年，她於《Fuel》期刊發表了題為 *Explosion Characteristics of Bio-syngas at Various Fuel Compositions and Dilutions in a Confined Vessel* 的論文，主要探討層流預混燃燒和生物質合成氣火焰動力學。這項深入的研究有助增加對多元生物質合成氣燃燒行為和能源使用方面的了解，並提供實際應用指引。

Dr Zhou (right) receives the Excellent Poster Award in The 4th Mechanical Engineering Research Poster Competition organised by the Department of Mechanical Engineering of PolyU.

周博士（右）在理大機械工程學系舉辦的第四屆機械工程研究海報比賽中，奪得最佳海報獎。

周博士說：「生物質合成氣是重要的可再生能源資源，有助維持可持續能源的發展，並減少空氣污染和溫室氣體排放，具有很大的研究價值。因此，我計劃進一步研究燃燒生物質合成氣的燃燒行為和污染物排放的特性，以幫助我們全面認識它在實際燃燒器中的應用。」