

## 編見

電動滑板車曾一度風靡全世界，被《時代》評為去年世界二十五項最佳發明之一。

《時代》選出的其他最佳發明，還包括一種鷹咀豆做的意式麵食，蛋白質和纖維含量都比普通的意式麵食高出多倍，但碳水化合物卻相對低。更有一個座檯基因測試器，可在數小時內把人類基因複製出來，以便作排列分析之用。

創新往往由科技推動，但在人人都把科技智珠在握的年代，破立通常都發自內心而非指尖。真正的創新，當然要算進一群伍宜孫書院師生的心血結晶，他們的「山城士多」，不僅濟人燃眉，而且關懷社眾。山城士多的故事，已不止一次在媒體報道，但今期的特寫，肯定更能觸動你心。

《時代》選出的另一最佳發明是人工智能平底鍋，可以教用者烹調出不同菜式，意念最先來自兩位麻省理工學生。戴沛權教授（右圖）在麻省理工念的是環境工程，其後在哈佛深造，中途想過放棄轉投前線環保工作。今期「口談實錄」，說的是一個深愛自然的年青學者的成長故事。

## Editorially Speaking

Until its road safety was called into question, the hoverboard scooter was the world's rage and one of the 25 Best Inventions of 2015 named by *Time*.

Other inventions given recognition by *Time* include a pasta made from chickpeas that contains more protein and fibre but fewer carbohydrates than traditional pasta and a desktop DNA lab that can make copies of the human genes in three hours for further analysis and matching.

Innovations are always powered by technology. But when everyone is tech savvy if not a wizard, it is often a spark from the heart that makes the difference, or the breakthrough.

True innovations must include what some students of Wu Yee Sun College have spawned. Their online grocery store combines necessity with social responsibility, and accomplishes much beyond commerce and convenience. Though the story of the store has been widely reported in the media, our in-depth version in these pages will touch a deeper chord.

Another best invention of 2015, an AI pan that teaches a user how to cook the food in it, was first dreamed up by two MIT students. Prof. Amos Tai (*right*) studied environmental engineering at MIT, and later Harvard where he had at one point thought of quitting to join an NGO. It's fortunate that he didn't. The bildungsroman of a young scientist who cares deeply for the air and the sea can be found in 'Viva Voce'.



Photo by ISO staff

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Photo by ISO staff

## 你玩過嗎? Have you tried this?

「中大有晴」活動在百萬大道上擺設了各式各樣的遊戲裝置，希望大家在繁忙的學業和工作中找到平衡點，將壓力轉化成動力，共同體驗生活的美好。  
'Sunshine at CUHK' features a variety of playground installations at the University Mall to help you relax amid your busy schedule.

## 理學院地球系統科學課程

Earth System Science Programme,  
Faculty of Science

## 戴沛權教授

## Prof. Amos Tai

香港首位「世界氣象組織青年科學家研究獎」得主  
First Hong Kong Winner of the WMO Research Award  
for Young Scientists

### 你是怎樣走上科研路的？

我從小就喜歡探索大自然的奧妙，小時候還試過養昆蟲、蝸牛等，雖然大都給養死了。到申請大學時，我決定到美國攻讀環境工程科學，更在研究院專攻大氣科學，研究氣候變化和空氣污染的問題。我認為環境科學家的工作非常有意義，因為他們肩負保障人類健康、社會發展和保護自然環境的重要使命。

### 你在麻省理工完成學士課程後，再到哈佛修讀五年研究院課程。在這兩所頂尖學府做學問，感覺是否如天之驕子？

每天和科學界的著名教授和尖子同學在一起，我反而變得更謙虛，也驅使我發掘自己在實用科學的長處。由於我比較喜歡身體力行去解決問題，做研究生時曾一度想過放棄學業，去國際環保或社福機構做前線工作。但後來發現自己還是很喜歡教學生，又漸漸發掘做科研莫大的樂趣，就一直留在學術機構，盡力開拓人類知識的極限。

### 甚麼機緣促使你回流香港？

我一直很想教香港的學生。在麻省理工做博士後研究的那年，得知中大正籌備開地球系統科學的課程，但當時還未有該課程的網站，只好找研究相關範疇的中大教授詢問詳情，終於聯絡上現任地球系統科學課程主任黃庭芳教授，他囑咐我盡快遞申請表。我很感恩能成功通過面試，回到出生成長的地方，做我喜愛的工作。

### 可以說說去年獲頒「世界氣象組織青年科學家研究獎」的研究嗎？

研究重點是全球暖化和空氣污染之間的相互作用怎樣夾擊影響全球糧食產量，加劇發展中國家營養不良問題。研究發現，嚴格控制空氣污染，除了可以保障人類健康，更可部分抵銷氣候暖化對農作物的傷害，這表示，控制污染的環境政策其實和農業政策密切相關，着手解決公共健康、氣候變化與糧食危機不同範疇的科學家和政策制定者更應跨越固有的分歧，聯手擬定綜合解決方案。

### 空氣污染不就是霧霾和PM2.5嗎？為甚麼臭氧污染同樣值得關注？

臭氧通常令人聯想到臭氧層。高空的臭氧層阻隔紫外線，是地球的保護傘，百利而無一害。有害的臭氧空氣污染指的是地表臭氧，在我們周圍存在。臭氧具極強氧化力，吸入會氧化呼吸系統，引發各種呼吸疾病。大眾及傳媒對臭氧污染的關注不及PM2.5，我認為主要因為臭氧在室外濃度正常時無色無味，是個隱形殺手；PM2.5則是可見的，霧霾繚繞的相片更能引起嘩然。但科學家和政策制定者都知道，臭氧和PM2.5是同等危險的空氣污染物。

### 你囊括中大的校長模範教學獎和理學院模範教學獎，你屬於哪種教學風格？

我講課著意從學生角度出發，緊記自己當學生時怎樣從一竅不通慢慢一步步領會新知識，所以我教書不會只顧自說自話，或假定學生已有相關基礎。另外，我受過戲劇訓練，上課也嘗試運用比較生動活潑的語調，像講故事般演繹艱深的理論和概念，希望令學生聽得懂之餘又覺得有趣、不沉悶。

### 教研以外有何嗜好？

從小到大都喜歡音樂與戲劇。我會彈鋼琴，愛彈音樂劇的曲目，像《西貢小姐》、《孤星淚》，也喜歡爵士樂和中外流行曲。小時候愛演話劇，但已多年沒粉墨登場了，那就當台下觀眾欣賞別人演出吧。



Photo by ISO staff

### Why did you decide to become a scientist?

I have always been fascinated by the wonders of our natural environment. I even tried to raise insects and snails when I was a child, though I hastened their deaths instead. After receiving my BSc degree, I finally chose to specialize in the field of atmospheric science in graduate school. For me, being an earth scientist is a very meaningful career as I can explore possible ways to protect both the planet and its inhabitants.

### You spent your undergraduate and postgraduate years at MIT and Harvard, respectively. Did you feel superior studying at such renowned institutions?

I only became more humble when surrounded by renowned scholars and intelligent classmates. With an urge to make real-world impact, there was a moment early in my PhD study when I thought of quitting graduate school and work in an NGO or environmental agency instead. But later, I realized I really loved to teach and interact with students. Meanwhile, my passion for scientific research intensified over time, so I decided to continue my academic pursuit to help push the boundaries of human knowledge.

### What propelled you to come back and work in Hong Kong?

I always thought it would be great to teach students in Hong Kong as we share a common cultural background. When I was a postdoctoral fellow at MIT, I learnt of CUHK's new programme in Earth System Science. At that time, the programme website was not even up yet and I had to ask professors in various departments for details. In the end, I was able to get in touch with Prof. Wong Teng-fong, current programme director, who then invited me to submit my application. I passed the interview and here I am, working in a city where I was born and raised.

### Tell us about the research that won you the United Nations' World Meteorological Organization (WMO) Research Award for Young Scientists.

The main thrust of the research is the interplay between global warming and air pollution, and how it jeopardizes global food production and exacerbates the problem of malnutrition in developing countries. Our research shows that stringent controls on air pollution, in addition

to safeguarding human health, can partially offset the adverse impacts of climate change on crop growth, implying that pollution control policy and the issue of food security are intimately connected. We call for greater communication and collaboration among scientists and policy makers across disciplinary boundaries, only then shall we come up with integrated solutions for public health, climate change and the food crisis.

### Isn't air pollution equivalent to smog or PM2.5? Why do you turn the spotlight on ozone air pollution?

People usually hear of ozone in the context of the ozone layer, which is very high up in the sky and protects living things from ultraviolet radiation of the sun. However, when it exists near the surface and in the air we breathe, it becomes a toxic pollutant. When inhaled, this powerful oxidant can damage the respiratory system and contribute to a range of diseases. The reason ozone air pollution draws less attention from the public and the press, I guess, is that ozone is an odourless and colourless gas at ambient levels. It is an invisible killer, whereas PM2.5 is a key contributor to smog that makes for sensational photos. However, it is generally agreed among scientists and policy makers that ozone and PM2.5 are equally hazardous air pollutants.

### You have bagged the Vice-Chancellor's Exemplary Teaching Award and the Faculty Exemplary Teaching Award, among others. What is your teaching style?

It is paramount to think from the standpoint of my students. I remember how I used to pick up new ideas one step at a time when I was a student, so I won't presume my class already has some knowledge about what I have to say. In addition, having been trained in drama and theatre, I often try to make my presentation more vivid and animated, and expound on recondite theories and concepts in a narrative style. It hopefully helps to hold the students' attention and make the content comprehensible at the same time.

### What are some of your hobbies after work?

I have always been a huge music and theatre lover. I can play the piano, and have a penchant for songs from Broadway musicals, such as *Miss Saigon* and *Les Misérables*. I also like jazz and pop, but am never a big fan of classical music. I used to act in plays but that's ancient history. Now I enjoy being in the audience. 🎭

