PKU
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P02 **Spotlights**

Peking University Medical Teams Rush to Wuhan

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Three PKU Projects Win 2019 State Science and Technology Prizes

The 2019 State Science and Technology Prizes was awarded by Chinese President Xi Jinping to distinguished scientists and engineers, at the Great Hall of the People in Beijing on 10th January, 2020. Three projects launched by Peking University – "Mechanism of New Particle Formation and Secondary Aerosol Growth under Complex Air Pollution in China", "Magnetic Nanomaterials Construction and Multifunctional Regulation", and "Establishment and Application of Key Technique of Emulsification in New Pharmaceutical Preparations" – were honored with the State Natural Science Award and the State Science and Technology Progress Award.

Yenching Students Launch Cultural Journey in Southwest China

Around January, students from Peking University Yanching Academy have visited different places in southwest China, exploring Sanxingdui in Sichuan and Chengdu International Railway Port, examining the distinctive features of Chinese ancient culture, learning about the trade networks that connect China to the world nowadays.

Peking University Visits Saudi Arabia

From January 6-8, a delegation led by PKU Vice President Wang Bo visited Saudi Arabia for a board meeting of the King Abdulaziz Public Library Branch in Peking University. Both sides pledged to do more to boost academic and cultural communication between China and Saudi Arabia. The year 2020 marks the 30th anniversary of the establishment of diplomatic relations between the two countries.

Peking University Medical Teams Rush to *Wuhan*

January 25 marked the first day of the Lunar New Year, also known as the Spring Festival. For Chinese people, it is normally a time for family reunions and grand celebrations. But this year, instead of enjoying family time at home, a group of sixty medical workers from Peking University People's Hospital, Peking University First Hospital and Peking University Third Hospital joined a Beijing-based medical team rushing to Wuhan to help fight the novel coronavirus (COVID-19).

As ground zero for the outbreak that began in December, Wuhan currently has the highest number of confirmed cases and deaths due to the pneumonia caused by COVID-19. To prevent more outbreaks in other areas, Wuhan imposed an emergency lockdown on January 23 to limit the otherwise tremendous number of people that would be leaving the city to travel.

However, the number of suspected cases within the city is still on the rise and deaths are mounting up, so Wuhan is currently experiencing a significant shortage of medical personnel and supplies, making it even more difficult to combat this deadly virus.

Medical staff from the three affiliated hospitals of Peking University, some with experience tackling SARS in 2003, left their families to lend their expertise to join a Wuhan relief team comprised of doctors and nurses trained in fields such as respiratory illnesses and intensive care. These brave men and

Seventeen years ago, hundreds of Pekingers rushed into the trenches of anti-SARS battlegrounds across the country, and some of them lost their lives in the fight. Seventeen years later, Pekingers are answering the call once more. It is the PKU spirit that encourages generations of Pekingers to selflessly combat the virus for their fellow citizens.

women are now on the front line in the battle against the new coronavirus in Wuhan, putting their own lives at risk so that others have a better chance at survival.

Back in Beijing, another team of student volunteers from the Peking University School of Public Health are working at the Chinese Center for Disease Control and Prevention, helping staff there with the control and prevention of COVID-19.

Moreover, Peking University has decided to postpone the 2020 Spring Semester, as Beijing has launched a Level I emergency response to control and prevent the spread of the coronavirus. ◐

Peking University Tops THE "The Most International Universities Rankigs 2020"

On January 28, Times Higher Education University Rankings published the "Most International Universities Rankigs 2020". Peking University tops the "Most International Universities Rankigs 2020" within China mainand. The data of "THE Most International Universities Rankigs" mainly comes from the "international vision" part of "THE World University Ranking" in 2020. The table compiled using the international student score, international staff score, international co-authorship score and international reputation metrics collected for the Times Higher Education World University Rankings 2020, shows the 13 most international universities in China mainland area. From 2019 to 2020, Peking University continues to occupy the first place. ◐

Most international rank 2020

- **Peking University**
- **Zhejiang University**
- **Nanjing University**
- **Shanghai Jiao Tong University**
- **Tsinghua University**
- **Fudan University**
- **Beijing Normal University**
- **Wuhan University**
- **Harbin Institute of Technology**
- **Xi'an Jiaotong University**
- **Sun Yat-sen University**
- **University of Science and Technology of China**
- **Huazhong University of Science and Technology**

WORLD ECONOMIC FORUM | 50 YEARS

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Peking University Holds the World Economic Forum 2020 Affiliated Session

On January 22, Peking University hosted the World Economic Forum Annual Meeting 2020 Affiliated Session titled "A Roadmap for AI towards SDGs" together with University College London, discussing a topic of global concern – how AI can help us achieve sustainable development. Hao Ping, President of Peking University, Michael Arthur, President of University College London, Robert Zimmer, President of University of Chicago, Michael Hengartner, President of University of Zurich and nearly 100 representatives from global educational circles, governments, enterprises and international organizations attended the forum

Three famous scientists from the fields of artificial intelligence, neuroscience and life science from Peking University and University College London expressed their opinions on the transformation power brought by artificial intelligence technology. Huang Tiejun, Professor of the School of Electronics Engineering and Computer Science (EECS) at Peking University, said optimistically that the application of artificial intelligence technology has not only emerged in education and garbage sorting, but also will play an important role in many important fields such as human response to natural disasters in the future. Geraint Rees, Assistant Vice President of University College London and President of the school of life sciences,

stressed that the widespread application of artificial intelligence technology will have an important impact on human behavior patterns. We need to strengthen research and guide it to play a more positive role. Professor Xiaoliang Sunney Xie, Dean of Sciences of Peking University and Lee Shao-kee Professor of Peking University, believes that although we can use artificial intelligence technology to assist the study of life mechanism and clinical diagnosis, we should not overstate their role at the same time. 🕐

Peking, Tsinghua to Open Shared Courses

On January 15, CGTN reported that Students attending Peking University and Tsinghua University will be able to take elective courses at both institutions starting spring 2020. The educational administration departments of the two universities have agreed to open some elective undergraduate courses and recognize credits, each from the other institution.

Come spring, Peking University will partially open 27 courses to Tsinghua students. Mainly in the humanities and social sciences faculties, the Peking University offerings include developmental psychology, introduction to logic, historical geography in China and the history of Western art. Meanwhile, Peking University students who wish to study at Tsinghua University will have access to 12 courses with a total of 15 classes and 170 places for undergraduates to choose from. The courses are mainly in science and engineering and include artificial intelligence technology, computational and systems neuroscience, industrial data mining and analysis. ◐
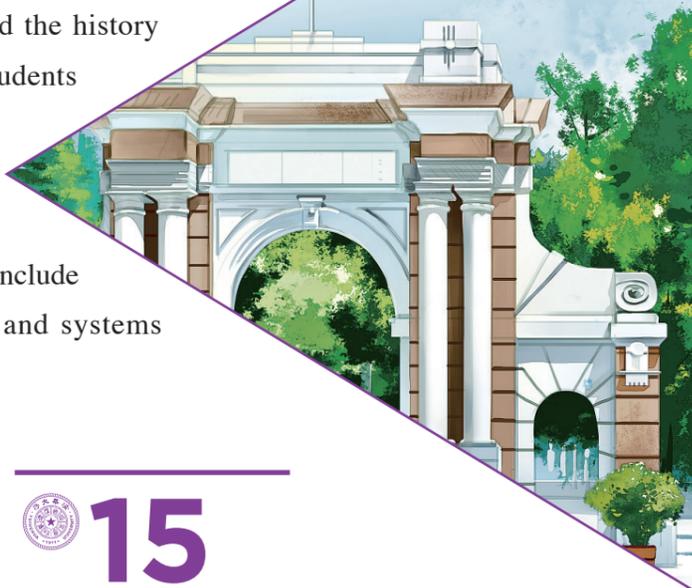
27
courses
to Tsinghua students

15
courses
to Peking students

Peking University Holds New Year's GalaWelcoming 2020

On the evening of December 31, 2019, Peking University held New Year's Gala at PKU Hall, waving goodbye to 2019 and ringing in 2020.

The gala started with stunning video clips reviewing PKU's achievements in 2019. The fervent opening music "Boat Dance", given by PKU Folk Orchestra, delighted everybody on the spot. PKU President Hao Ping delivered his best New Year wishes to all PKUers and friends who support the development of the university. In the ever-changing era, Hao encouraged all PKUers to keep striving for new progress and innovation.
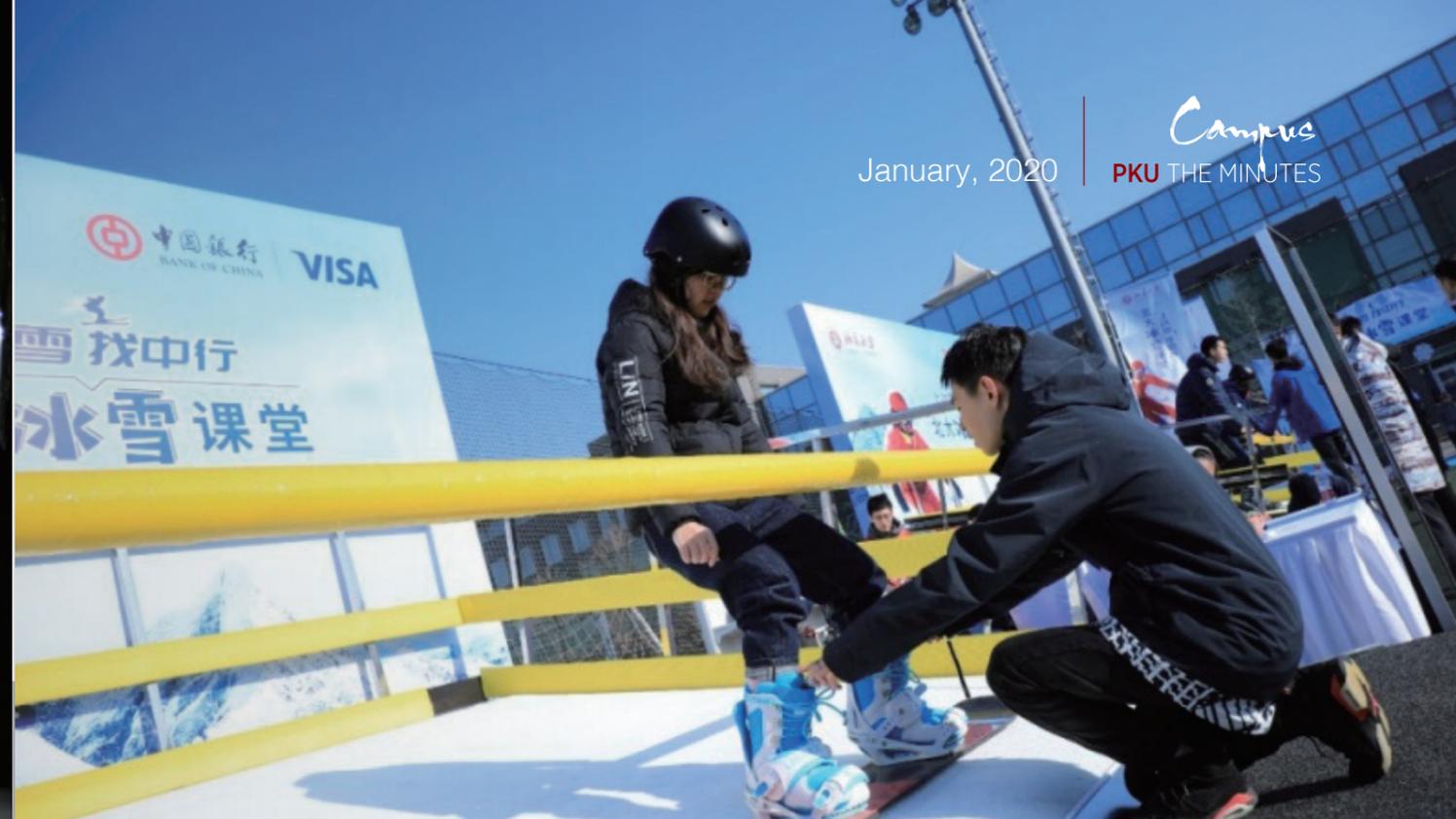
Seventeen fascinating and diverse performances, such as magic shows, Peking Operas, cross talks and more, were staged during the three-hour gala, filling the night with fantasy and fun. ◐

The National Ballet of China Brought New Year Performance at Peking University

On the evening of January 2 and 3, the 2020 new year ballet concert performed by the National Ballet of China was staged at Peking University's Hall. More than 2000 teachers and students attended the performance. Diverse ballet performances including "Swan Lake", "Crane Soul", the "Red Detachment of women", "Don Quixote", "The Butterfly Lovers", "Ruby" staged in turn, pushing the performance atmosphere to the climax. ◕

Peking University Holds "Ice and Snow Class"

From January 4 to 5, 2020, the " Ice and Snow Class of Peking University" was held in Peking University football field. "Ice and Snow Class" brings professional ice and snow activities such as skating, skiing guidance and curling experience for teachers and students of Peking University. "Figure skating world champion" Pang Qing and Tong Jian shared their love for ice and snow sports with their classmates.

In recognition of the excellent achievements made by the ice and snow team of Peking University in recent years, Zheng Zhong, the deputy director of the Sports Teaching and Research Department of Peking University awarded the ice and snow team, the skiing team of Peking University as the "Excellent Team of Ice and Snow Project of Peking University", and the flower skating team and the curling team of Peking University as the "Outstanding Team of Ice and Snow project of Peking University". The ice and snow team of Peking University are looking forward to another good performance in the new year. ◕

Microsoft Research and Peking University Develop
AI DEEPFAKE DETECTOR

FaceShifter
face X-Ray

On January 7, BiometricUpdate website reported a collaboration between Peking University and Microsoft. Microsoft Research in partnership with Peking University has published two academic papers discussing a concept for face-swapping artificial intelligence and face forgery detection technology: FaceShifter and Face X-Ray "a framework for high-fidelity and occlusion-aware face swapping and a representation for detecting forged face images, respectively," writes Venturebeat.

Researchers claim that, compared to other approaches developed, the two apps don't need as much data and performance is still optimal.
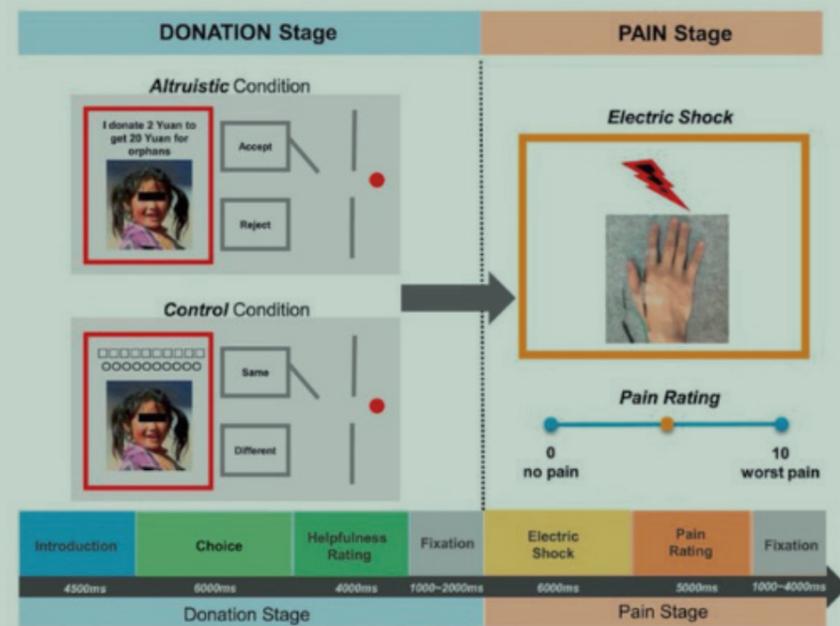

FaceShifter addresses the substitution of a person a target image with a different person in a source image, retaining head pose, facial expression, lighting, color, intensity and background. The researchers say that while AI applications such as Reflect and FaceSwap claim to be accurate in the process, they can be influenced by changes in posture and angle. On the other hand, to ensure face swap accuracy, FaceShifter leverages a generative adversarial network (GAN) dubbed Adaptive Embedding Integration Network (AEI-Net) that can collect features in multiple spatial resolutions. The generator is equipped with Attentional Denormalization (AAD) layers that trained how to integrate facial features, and with the Heuristic Error Acknowledging Refinement Network (HEAR-Net) that detects roadblocks by analyzing inconsistencies between reconstructed images and their inputs.
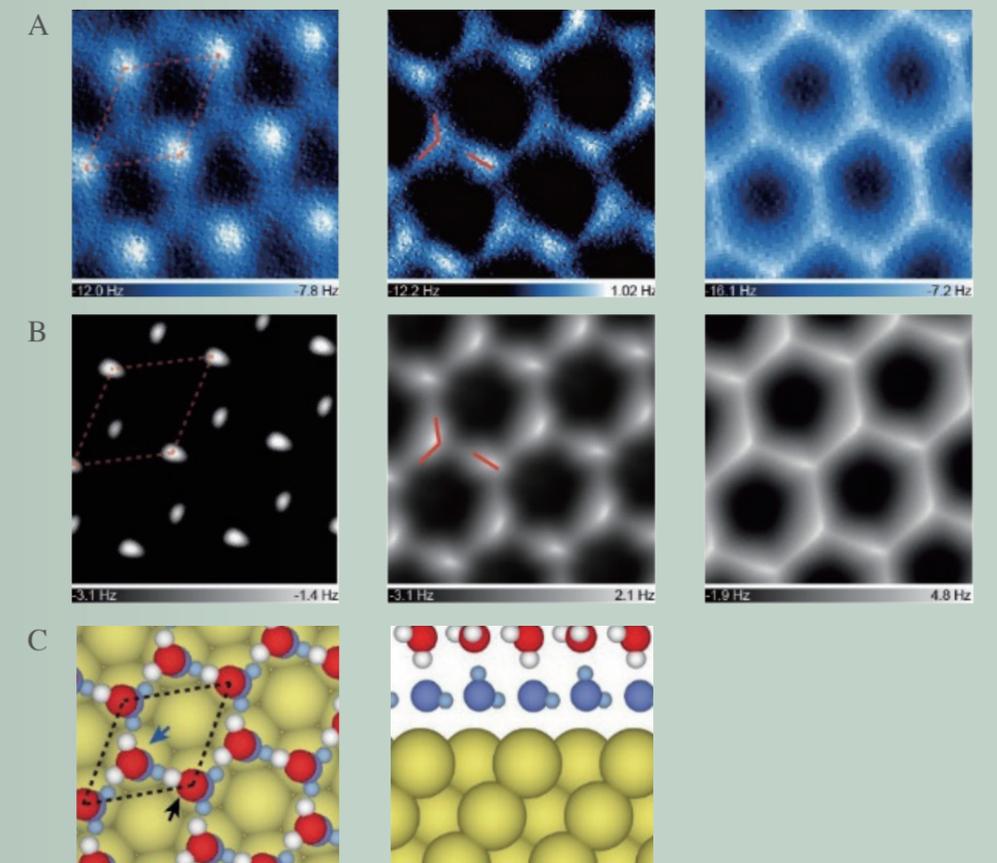
Peking University's Discovery Leads to New Pain Therapies

In a report published in PNASNews in January, scientists from Peking University conducted a series of behavioral and neural experiments which showed that doing good deeds makes us less sensitive to pain. This discovery could lead to new pain therapies.

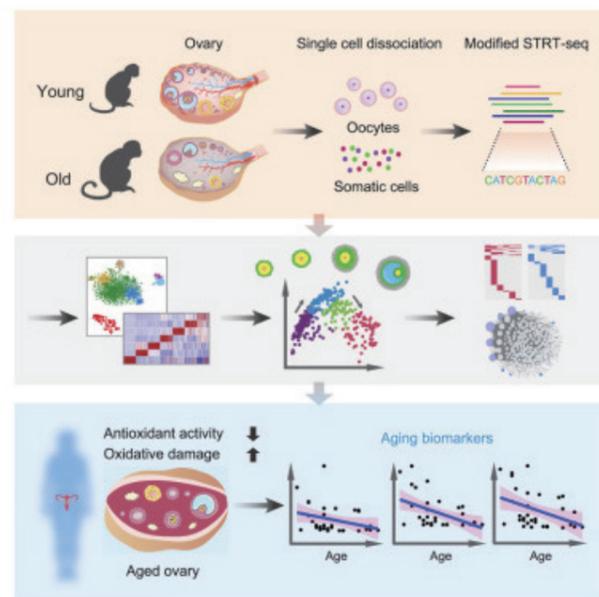## The Growth of the Thinnest Ice Sheet in Nature

The teams led by Professor Jiang Ying, Professor Xu Limei and Professor Wang Enge of International Center for Quantum Materials (ICQM) of Peking University, in collaboration with Professor Xiao Cheng Zeng of Department of Physics of University of Nebraska-Lincoln, successfully grow a 2D bilayer hexagonal ice (named "2D ice I") and image the 2D ice growth at the edges with atomic resolution, through a combined study using scanning probe microscope (SPM), density functional theory (DFT) calculations and molecular dynamics (MD) simulations. This work is published in Nature on January 2, 2020.

Detailed AFM characterization of the 2D bilayer ice and the corresponding structural model. a, b, Constant-height AFM imaging and simulated AFM images for different tip heights (the tip height decreases from left to right). c, Top and side views of the bilayer-ice structure on the Au(111) surface.

Single-Cell Transcriptomic Atlas of Primate Ovarian Aging

On January 30, Professor Tang Fugui published an online article (cover article) entitled "single cell transparent Atlas of primitive ovarian aging" in cell magazine, in collaboration with research groups of Institute of Zoology, Chinese Academy of Sciences, and Salk Institute for Biological Studies. This work surveyed the single-cell transcriptomic landscape of ovaries from young and aged non-human primates (NHPs) and identified seven ovarian cell types with distinct gene-expression signatures, including oocyte and six types of ovarian somatic cells. In-depth dissection of gene-expression dynamics of oocytes revealed four subtypes at sequential and stepwise developmental stages. This study provides a comprehensive understanding of the cell-type-specific mechanisms underlying primate ovarian aging at single-cell resolution, revealing new diagnostic biomarkers and potential therapeutic targets for age-related human ovarian disorders.

Rats Sniff Off Toxic Air

On January 21, Professor Yao Maosheng of the Peking University College of Environmental Sciences and Engineering had his latest research on a ground-breaking new way to detect hazardous airborne volatile organic compounds. The research results were published on the top journal of environmental field Environmental Sciences & Technology.

Rats Shiff off Toxic Air
RSTair

USP38 Regulates Genome Stability

Zheng Xiaofeng and team, from the School of Life Sciences, Peking University, found that USP38, a protein coding gene, regulates genome stability and mediates cancer cell resistance to DNA-damaging therapy, providing insight into how tumors form and implicating USP38 as a potential target for cancer diagnosis. This work was initially published in Cancer Research online on 24th December 2019.

Zheng Xiaofeng
Professor
School of life Sciences
Peking University