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City embarks on new chapter in national space exploration

For the past three years, through these pages, I have chronicled a quiet but profound revolution. We in the Hong Kong Special Administrative Region's academic space science community have progressed from enthusiastic observers of China's monumental space achievements to active, trusted participants in its most ambitious space endeavors. This journey began years ago at Hong Kong Polytechnic University (PolyU) on the drawing boards of its engineering labs, and in the stark, airless vistas of the moon and the ruddy plains of Mars. This is a testament to the power of the "one country, two systems" principle to foster scientific excellence here. The Space Day of China announcements in Chengdu on April 24 did not merely continue this story, they catapulted it into a thrilling new epoch, confirming the role of Hong Kong's elite universities in humanity's next great leaps into lunar and Martian exploration. It is as inspiring as it is significant. I was fortunate to be invited to the Space Day of China events to give two keynote talks and personally witnessed the announcements of Hong Kong's involvement in three out of five international Tianwen-3 Mars science payloads with another from Macao too.

For my own university, the University of Hong Kong (HKU), the foundational moment, the seed from which some of this new chapter has grown, is the hard-won involvement of its Laboratory for Space Research (LSR) in the Chang'e-7 lunar mission. The ILOA-LSR "ILO-C" camera, an instrument born from the ingenuity of the LSR team, represents far more than a piece of precision optics. It is a physical symbol of capability, trust, and convergence. When it descends to the lunar south pole aboard Chang'e-7 in late November this year, it will not just be taking iconic color images of the galactic plane above the rim of the Shackleton crater (near the lunar south pole) but it will also be validating a model of international collaboration. This is because this is the only Chang'e lunar mission with any American involvement (ILOA is the International Lunar Observatory Association of Hawaii). It also continues to demonstrate that Hong Kong's universities can deliver world-class, flight-ready space mission hardware that meets the exacting standards of the China National Space Administration (CNSA). With the amazing past success of PolyU's Mars camera and robot arms for earlier Chang'e lunar missions and Tianwen-1, and the participation of the Hong Kong University of Science and Technology in a Chang'e-8 robotic rover, this latest HKU success has further opened a critical airlock, and now, the flood of opportunity is upon us.

The Space Day of China announcements are a resounding endorsement of this model. They revealed Hong Kong's involvement is not as a singular event, but as a developing, diversified, strategic partnership across multiple flagship missions. Most significantly, Hong Kong's horizon has expanded beyond the moon to Mars.

The Hong Kong SAR has decisively moved from the periphery to the operational core of China's journey into space. Our task now is to oversee this responsibility with the utmost rigor and support, to continue fostering our unique blend of global perspectives and national commitment, and to ensure that the students of today become the mission leaders of tomorrow.

The international payloads revealed for the Tianwen-3 Mars mission with Hong Kong's involvement exemplify the sophisticated, multilayered collaboration the SAR now enjoys. The first, led by Professor Li Yiliang of HKU, is a powerful statement. A Hong Kong principal investigator leading a core instrument on a national flagship mission to Mars shatters any remaining glass ceiling for the city's scientists. It declares that Hong Kong is not just a contributor but a leader, capable of conceiving and directing frontier science on the interplanetary stage.

The second payload, spearheaded by the Committee on Space Research (COSPAR) with co-principal investigator (co-PI) Professor Bernard Foing, showcases Hong Kong's unique value as an international scientific bridge. Here, HKU-LSR, with myself as a co-I, partners with Shenzhen University (co-PI Professor Zhu Ping). This triad is emblematic of the future — a premier global space body, a Hong Kong university with deep international roots, and a pioneering mainland institution in the Guangdong-Hong Kong-Macao Greater Bay Area's innovation heartland. Together, the three partners bring complementary strengths to a single instrument, leveraging Hong Kong's global connectivity and Shenzhen's technological dynamism in service of China's national goal. This is arguably the most complex deep-space mission ever attempted by any nation. It is aiming to do what has never been done — return pristine Martian soil to Earth. To have Hong Kong's fingerprints on this historic endeavor is beyond what many of us dared to dream just a few years ago.

Furthermore, the involvement of the Chinese University of Hong Kong as a co-PI organization on another aspect of these missions confirms that this is a sector-wide awakening. It is not the story of one lab, but of an entire academic ecosystem in Hong Kong rising to the occasion. This multi-institutional engagement fosters healthy competition, shared infrastructure, and a powerful collective voice for space science in the city.

So, what does this mean for Hong Kong? The implications are profound and extend far beyond its university-based labs. It represents an unparalleled engine for talent. Nothing inspires the next generation of STEM students like the tangible prospect of working on missions to the moon and Mars. We are no longer selling a dream from afar; we are offering a career pathway. We see it in the heightened quality and passion of applicants to our programs; bright young minds who now see Hong Kong as a launchpad, literally, for their ambitions. It also drives high-tech transformation. Taken together, the rigorous demands of space-grade instrumentation miniaturization, radiation hardening, computational autonomy, and systems engineering all force rapid advancement. These technologies have direct spillover effects into sectors like advanced manufacturing, artificial intelligence, medical diagnostics, and fintech, bolstering Hong Kong's drive to become a true innovation hub.

Finally, it solidifies Hong Kong's international standing. The city's role in CNSA missions, coupled with HKU-LSR's partnership with COSPAR, positions Hong Kong as a unique nexus in global space science. The city is seen as a reliable, world-class partner with privileged access to the most exciting exploration programs on Earth. This attracts top global talent, investment, and collaborative projects, enhancing the city's overall knowledge economy.

To conclude, I see the path — from our early advocacy for a Hong Kong role in national space science to the Chengdu announcements — has been a journey of perseverance and proof. With the Chang'e-7 ILO-C camera, HKU knocked on the door first opened to PolyU; and with the Tianwen-3 payloads, we have been invited to help build the house. The Hong Kong SAR has decisively moved from the periphery to the operational core of China's journey into space. Our task now is to oversee this responsibility with the utmost rigor and support, to continue fostering our unique blend of global perspectives and national commitment, and to ensure that the students of today become the mission leaders of tomorrow. The universe, as they say, is the limit, and Hong Kong's star is firmly in the ascendant.

The views do not necessarily reflect those of China Daily.