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# The HKSAR Roadmap: Aerospace, AI, and the Security of Innovation in Hong Kong

Space * AI * Computing

## Introduction: The Architecture of "New Industrialization" in Hong Kong

The period spanning 2024 to 2025 marks a definitive structural pivot in the Hong Kong Special Administrative Region (HKSAR). Historically anchored in four service pillars -- financial services, tourism, trading and logistics, and professional services -- Hong Kong is engineering a state-directed transition into an International Innovation and Technology Centre (IITC) under China's 14th Five-Year Plan.[1][2] Through the Hong Kong Innovation and Technology Development Blueprint, the HKSAR Government has replaced laissez-faire policy with targeted "New Industrialization," deploying a HK$10 billion I&T Industry-Oriented Fund and the Hong Kong Investment Corporation (HKIC) to channel capital into aerospace, sovereign artificial intelligence, microelectronics, and biotechnology.[1][3][4]

This innovation ecosystem rests on three physical and regulatory pillars: the Hong Kong Science Park (HKSTP) hosting InnoHK research clusters;[5] Cyberport's Artificial Intelligence Supercomputing Centre (AISC);[6] and the Lok Ma Chau Loop's Hong Kong-Shenzhen Innovation and Technology Park (HSITP), which facilitates cross-boundary flows of biobank samples and capital.[3] Concurrently, the 2025 Protection of Critical Infrastructures (Computer Systems) Ordinance (Cap. 653), which took legal effect on January 1, 2026, hardens digital infrastructure under a statutory security framework.[7][8] This report evaluates Hong Kong's hard-tech trajectory across aerospace, sovereign compute and semiconductors, life sciences, advanced materials, and dual-use security.

## Aerospace: Academic Vanguard vs. Commercial Headwinds

Hong Kong's aerospace sector exhibits a sharp divergence between state-funded university payloads for the China National Space Administration (CNSA) and capital-constrained commercial satellite manufacturing. On the academic front, The Hong Kong Polytechnic University (PolyU) designed the automated "Surface Sampling and Packing System" for the historic 2024 Chang'e-6 mission, using near-field machine vision to collect and vacuum-seal 1,935 grams of lunar far-side regolith in the South Pole-Aitken Basin -- an achievement honored with the 2025 IAF World Space Award.[9][10][11] PolyU is now building microgravity sampling instruments for the Tianwen-2 asteroid mission, while the University of Hong Kong (HKU) Laboratory for Space Research (LSR) contributes to Tianwen-3 Mars sample return planning, kinetic-impactor planetary defense tests, and the ILO-C wide-field lunar telescope aboard Chang'e-7.[10][12][13][14][15]

Conversely, commercial satellite manufacturing at USpace Technology Group's (formerly HKATG) 18,580 m ASPACE center in Tseung Kwan O -- engineered to produce

200 satellites annually -- generated minimal manufacturing revenue by mid-2025 amid acute liquidity pressures and atmospheric re-entries of its Golden Bauhinia No. 3 and No. 4 satellites.[16][17][18][20][21][22] Navigating Western export controls, USpace pivoted toward Belt and Road markets, signing a $21 million contract for 600 remote-sensing satellites in the UAE and a joint venture with the Egyptian Space Agency.[19] Meanwhile, the Hong Kong University of Science and Technology (HKUST) launched its 0.5-meter resolution HKUST-FYBB#1 optical satellite for slope digital twins and is readying a Tiangong-deployed carbon satellite to track global CO2 and methane forcing in climate change.[23][24][25] In parallel, a March 2025 Civil Aviation Department regulatory sandbox accelerated the "Low-Altitude Economy," deploying 5.5G-connected Beyond Visual Line of Sight (BVLOS) drones for skyscraper facade computer-vision inspections (viAct) and MTR railway maintenance.[26][27]

## Digital Infrastructure: Sovereign AI and RISC-V Semiconductors

To insulate local digital infrastructure from geopolitical supply-chain shocks, HKSAR has prioritized a "Sovereign Tech Stack" spanning foundation models, high-performance compute, and open-instruction-set silicon:

* HKGAI V1 Sovereign LLM: Released in February 2025 by the InnoHK Hong Kong Generative AI R&D Center, HKGAI V1 is fine-tuned on the DeepSeek architecture for fluent trilingual code-switching (Cantonese, English, and Putonghua) and evaluated against an "Adversarial HK Value Benchmark" for statutory compliance.[28][29][30] Deployed across civil service bureaus via the "HKPilot" application, it processes administrative drafting within a secure government perimeter.[28][31]

* Cyberport AISC Supercomputing: Commencing Phase 1 operations in December 2024 and scaling to 3,000 petaFLOPS by late 2025 using liquid-cooled clusters, Cyberport's AISC is backed by a HK$3 billion AI Subsidy Scheme to retain local research talent.[6][32][33][34]

* Third-Generation Semiconductors & RISC-V: Established in September 2024, the Hong Kong Microelectronics R&D Institute (MRDI) is constructing two Yuen Long pilot lines for Silicon Carbide (SiC) and Gallium Nitride (GaN) power electronics.[32] Concurrently, HKUST's ACCESS center -- supported by a HK$20 million Strategic Topics Grant -- demonstrated ultra-efficient Digital Compute-In-Memory (DCIM) AI accelerators built on the open-standard RISC-V architecture, bypassing US export restrictions on x86 and ARM IP.[35][36]

| Strategic Initiative / Entity | | Domain | | 2024-2025 Technical & Financial Metric | | Strategic & Geopolitical Function |

| HKGAI V1 & Cyberport AISC | | Sovereign AI | | DeepSeek-based trilingual LLM; 3,000 PetaFLOPS + HK$3B subsidy. | | Localizes civil-service AI training & data residency.[6][29][34] |

| MRDI & ACCESS (HKUST) | | Semiconductors | | GaN/SiC Yuen Long pilot lines; RISC-V DCIM AI chips. | | Sanction-proofs chip design; bridges lab-to-GBA fab.[32][35] |

| USpace (ASPACE) | | Commercial Space | | 200-sat/yr capacity; $21M UAE deal amid manufacturing losses. | | Pivots commercial LEO satellites to Middle East / BRI.[17][19] |

| Insilico Medicine & HKUMed | | Biotechnology | | HK$2.277B HKEX IPO; global FDA/EMA/NMPA trial recognition. | | Accelerates AI drug discovery & oncology translation.[37][40] |

| PolyU & Security Bureau | | Quantum & Security | | 33.89% perovskite tandem cell; chip QKD network; 60k CCTV plan. | | Hardens encryption & urban AI surveillance by 2028.[41][44][46] |

## Biotechnology, Advanced Materials, and Dual-Use Security

Biotechnology remains Hong Kong's most commercially mature deep-tech pillar, leveraging clinical trial data mutually recognized by the US FDA, European EMA, and China's NMPA alongside HKEX Chapter 18A pre-revenue listing rules.[3][37] In 2024-2025, HKU researchers discovered how the Epstein-Barr virus (EBV) reorganizes 3D host chromatin and epigenetics to drive nasopharyngeal carcinoma (NPC), while CUHK Medicine developed a targeted mRNA-LNP lytic induction therapy (mTZ3-LNP) against EBV-positive epithelial cancers and HKU secured tri-agency recognition for translational cancer immunology.[37][38][39] Simultaneously, Science Park anchor Insilico Medicine raised HK$2.277 billion in December 2025 -- the year's largest HKEX biotech IPO -- validating generative AI drug discovery.[40]

In materials physics and robotics, PolyU achieved a world-record 33.89% power-conversion efficiency in perovskite/silicon tandem solar cells (targeting 40% large-area modules),[41] CityU identified medium-range structural motifs linking amorphous and crystalline states to engineer high-strength metallic glasses,[42] and the Hong Kong Center for Construction Robotics (HKCRC) deployed AI computer-vision tower cranes at the Pak Tin Estate redevelopment in mid-2025.[43]

Finally, civil innovation is closely intertwined with national security. In late 2025, PolyU tested a chip-based optical fiber Quantum Key Distribution (QKD) network, complemented by HKU's 9.6 km free-space QKD trials.[44][45] Concurrently, the Security Bureau is expanding AI facial-recognition CCTV coverage from 4,000 to 60,000 cameras by 2028 alongside the "iAM Smart" digital identity platform,[46][47] while the Protection of Critical Infrastructures (Computer Systems) Ordinance (Cap. 653, effective January 1, 2026) mandates strict incident reporting and audit powers across energy, finance, and communications.[7][8][48]

## Conclusion: The Securitization of the Sovereign Stack

By 2026, Hong Kong has evolved beyond a financial entrep t into a specialized hard-tech R&D node. While commercial satellite manufacturing faces revenue headwinds, breakthroughs in lunar robotics, perovskite photovoltaics, EBV oncology, and AI therapeutics confirm world-class execution. Ultimately, the convergence of RISC-V silicon, the HKGAI V1 model, quantum cryptography, and critical infrastructure law forms a sanction-resilient, state-secured tech stack integrated into the Greater Bay Area.

Updates... (Nov 20, 2026): Updated statutory framing to note that Hong Kong's Protection of Critical Infrastructures (Computer Systems) Ordinance (Cap. 653) entered into legal effect on January 1, 2026; clarified CUHK's 2024 Nature Communications mTZ3-LNP lytic mRNA therapy mechanism and CityU's 2021 Nature Materials metallic glass motif study; encoded ITIB blueprint URL (%26), replaced

dead/403/404 and generic links with verified primary DOIs and HKSAR government records carrying explicit publication dates, escaped currency symbols ($), and enforced 1:1 inline citation parity.

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