

The Scientific Geography of East Asia

VITAL STATISTICS

Country	Population	GDP*	R&D Spending*
Japan	125 million	\$1.9 trillion	\$55.9 billion
China	1.2 billion	\$3 trillion	\$21.4 billion
Taiwan	21 million	\$146 billion	\$2.5 billion
South Korea	44 million	\$271 billion	\$5 billion
Hong Kong	5.9 million	\$64 billion	NA
Singapore	3.1 million	\$33 billion	\$292 million

*1990 figures in constant 1987 purchasing power parity dollars.

Good chemistry. The city of Dalian is a hotbed of physical chemistry, with its two state key labs, one for molecular reaction dynamics and one for catalysis, and the Chinese Academy of Science's Institute of Chemical Physics.

Science bazaar. With the lion's share of China's top research institutes and universities, Beijing has become a marketplace for technology and scientific consulting services. Over 2000 enterprises crowd the Zhong Guan Chun quarter, spawned by researchers from nearby institutes of the Chinese Academy of Sciences, Beijing, and Qinghua universities.

Tau of physics. Built on a shoestring, the 5.8-GeV Beijing Electron Positron Collider, China's first high-energy particle accelerator, has obtained the world's most precise measurements of the tau lepton. A planned upgrade will turn it into the world's first (and perhaps only) tau-charm factory.

Silk Road dinosaurs. Japan's Asahi newspaper company is sponsoring fossil digs by Chinese paleontologists in exchange for rights to announce any discoveries.

A tale of two academies. Founded in Nanking in 1928, Academia Sinica, China's first advanced research organization, split in two in 1949. Taiwan's academy, with 13 institutes in science and humanities and 2000 researchers, is very much an ivory tower. The mainland Chinese Academy of Sciences, a Soviet-style empire of over 100 institutes, mostly based in Beijing and Shanghai, employs 80,000 people and boasts some of China's best science.

Computing stronghold. China's computer science is rising fast, and one of the most advanced centers is at Changsha's National Defense University of Science and Technology.

Rent-a-rocket. With some of Asia's most advanced space technology, China is eager to find partners both for R&D and for commercial launches. The next launch, planned for late 1994 or early 1995, will loft a Hong Kong telecommunications satellite to serve Asia's booming television market.

Asian hub. Singapore's IT2000 project aims to link the nation's homes, schools, offices, universities, and industries with fiber optics. The ultimate goal: to turn this island into the high-tech communications hub for all of Asia.

Singapore, Inc. To attract high-tech investment, the government is developing a 74-acre Science Park and a "technology corridor" to house R&D labs and manufacturing plants. Like everything else in Singapore, it's planned down to the last detail, including residences, cultural centers, and pubs.

The little lab that could. Singapore's 6-year-old Institute of Molecular and Cell Biology has become the biology lab to watch in Asia.

CHINA

SINGAPORE

A new Hong Kong? The United Nations-sponsored Tumen Railway International Development Project aims to stimulate regional development by bringing together Siberian raw materials, Chinese cheap labor, and a new port on the Japan Sea providing access to markets in Japan and South Korea.

Power center. South Korea's political, academic, and industrial power is concentrated in Seoul. The most prestigious universities, Seoul National, Yonsei, and Korea, are here, as are government ministries and headquarters of South Korea's giant conglomerates.

Every lab is an island. Fifty national and corporate labs and three universities dot 6680 green acres at Taeduk, a science city modeled on Japan's Tsukuba. But labs operate like isolated fortresses, and many researchers find the town so boring that they commute from Seoul, 2 hours away.

Steel town university. Pohang Institute of Science and Technology (POSTECH), funded by the world's second biggest steel company, has put provincial Pohang on the map. The faculty is largely made up of mid-career professors recruited from U.S. universities. POSTECH's 2-GeV synchrotron radiation source will open in 1995.

Reluctant leader. Asian students are pouring into Japanese universities, bringing the country rapidly toward its goal of 100,000 foreign students annually by 2000. But job opportunities for Asian researchers are limited, and Asian governments complain that transfer of technology lags.

Industrial capital. China's largest, most industrialized city, Shanghai excels in research. Key institutes include Fudan University, one of China's best; institutes of physiology, biochemistry, organic chemistry, cell biology, lasers and optics; and the nation's first biotechnology center.

Economy outpaces infrastructure. Living costs in Taipei approach Tokyo's, but pollution, crowding, and crumbling infrastructure are those of a Third World metropolis. The \$190 billion, 6-year National Development Program will give Taipei a badly needed upgrade, but scientists are feeling it in their pocketbooks.

Mini-Silicon Valley. Hsinchu science-based industrial park was founded in the early 1970s to spur development of high-tech industries. One-hundred forty firms crowd the 939-acre grounds. The Synchrotron Radiation Research Center serves researchers at nearby National Tsing Hua University and National Chao Tung University.

Breakneck development. Six southern coastal cities designated as "economic free zones" lead China in economic growth and foreign investment, but also in rampant corruption and industrial pollution. The focus has been on cheap labor, but some areas are trying to attract high-tech workers.

Jockeying for position. Hong Kong's 2-year-old University of Science and Technology is the colony's eleventh-hour bid to become a cutting-edge R&D center so valuable to the region that China's government will leave it alone after 1997. HKUST has amassed an impressive faculty, but the lack of a research funding agency and good students could prove stumbling blocks.

