Extensive University-Enterprise Collaboration and Innovation:

Demand Driven, Talents Supported, and Mutual Development

President: ZHOU YU

哈爾濱工業大學
HARBIN INSTITUTE OF TECHNOLOGY

IMPORTANCE of UNIVERSITY-ENTERPRISE COLLABRATION

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An important way to realize technology innovation.

- **USA：Stanford University——Silicon Valley**
- **Germany：Fraunhofer Gesellschaft——German Industry 4.0**

Stanford University

Silicon Valley

UNIV.-ENTERPRISE COLLABRATION DEVELOPMENT AT HIT

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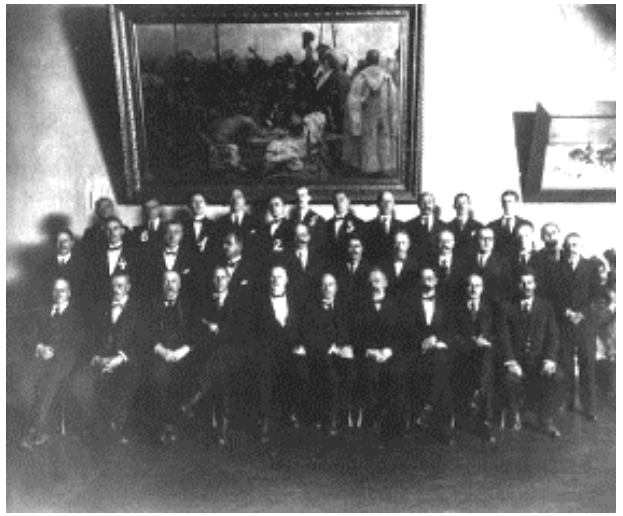
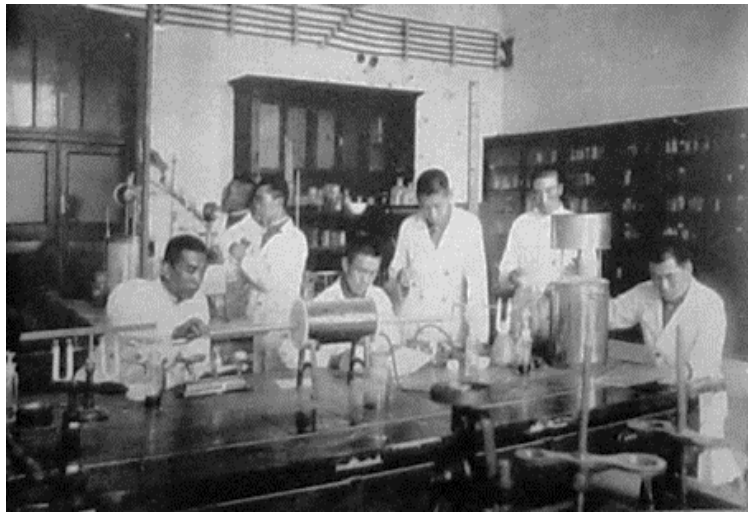
HIT was founded from demands of Z-C railway construction in 1920
In 1920-1940, HIT provided and trained engineers/technical personnel for Z-C railway

- **Russian Education Model adopted**
- **In 1920's Programs launched (1st time in China) : Railway Construction, Electrical mechanical engineering**
- **In 1940's, Programs added (demanded from industry): Civil Engineering, Electrical and Mechanical Engineering, Economics, Mining, Chemical Engineering and Preparatory programs**

Campus in the 1920's



The first engineering graduates in 1924



Iron Metallurgy Lab in 1941

UNIV.-ENTERPRISE COLLABRATION DEVELOPMENT AT HIT

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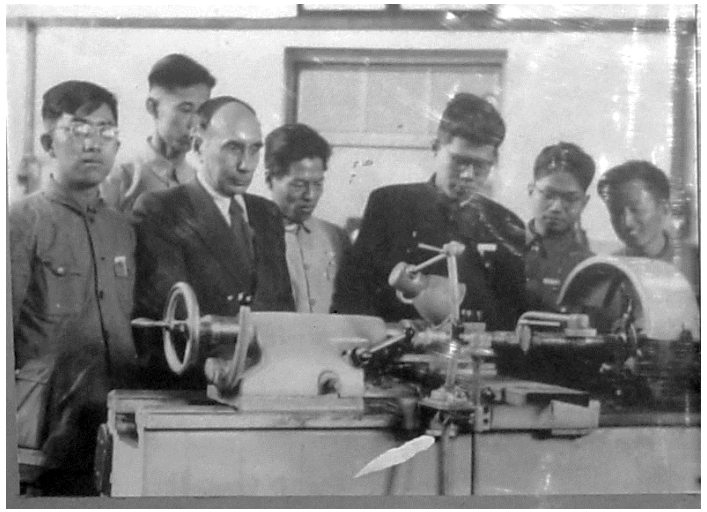
1950-1960, HIT provided engineers and technical personnel for Chinese industries, and trained teachers for Chinese engineering universities.

- **In 1951, one of the two universities learning from Soviet Union education models.**
- **In 1952, HIT began to award graduates engineering degrees - "Cradle of Engineers"**
- **In 1960, HIT had completed more than 460 machinery and automation projects, together with 107 factories in Harbin**

Welcome the Soviet experts in 1952



Research supervision by Soviet experts

Oral defense for graduation in the 1950's

UNIV.-ENTERPRISE COLLABRATION DEVELOPMENT AT HIT

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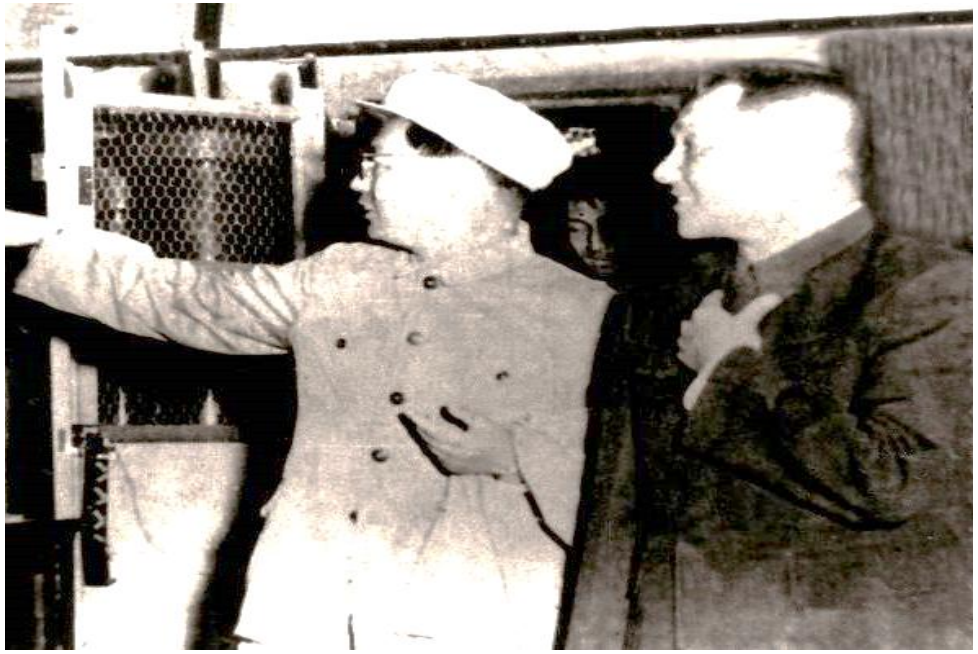
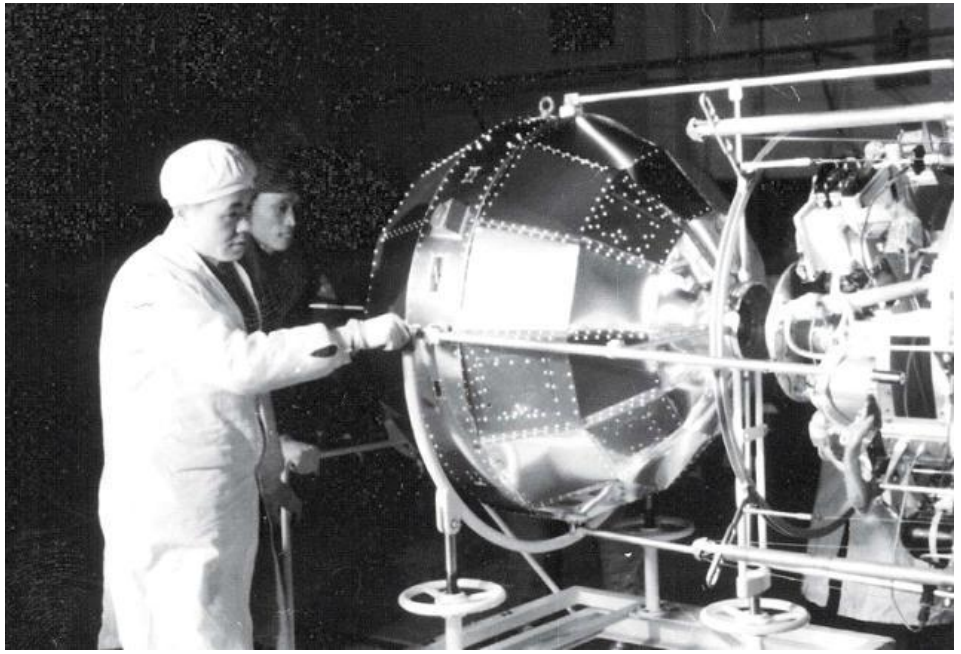
At end of 1950's, HIT gradually focused collaboration in aerospace engineering, national safety and served the main areas of the national economy.



Chairman Deng Xiaoping visited HIT in 1958



Red East 1 Satellite

UNIV.-ENTERPRISE COLLABRATION DEVELOPMENT AT HIT

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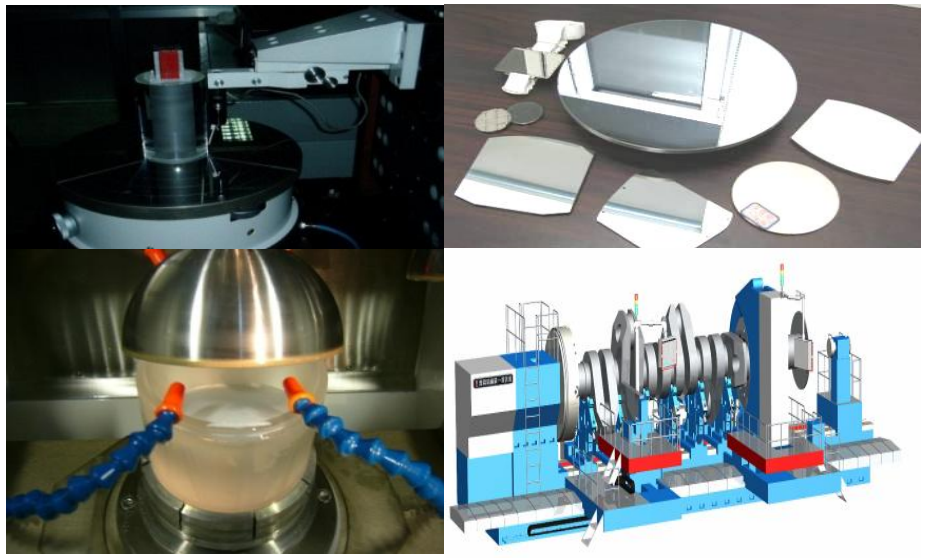
From 1990's, HIT continued to promote extensive cooperation with enterprises:
large or small, government owned or not, national or international, local or not

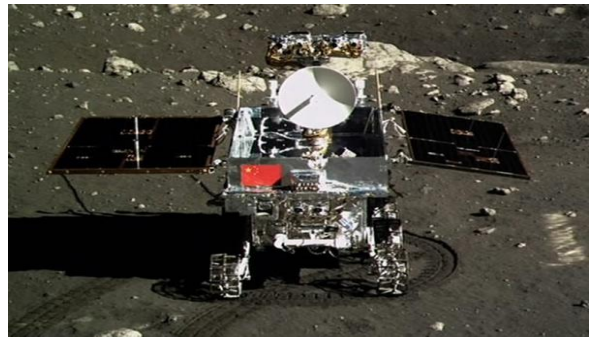
- **Equipment Manufacturing**
- **Materials**
- **Electronic Information**
- **Civil Engineering and Architecture**
- **Energy and Environment**



SPECIALITIES AND STRENGTHS OF HIT

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

✓ **Aerospace engineering**

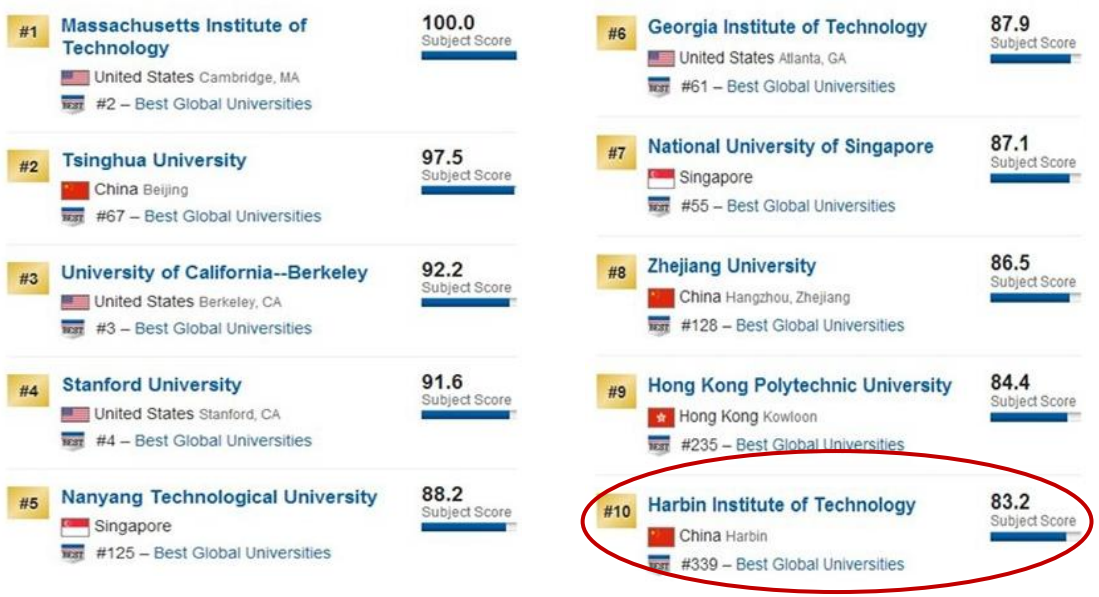


✓ **Engineering**

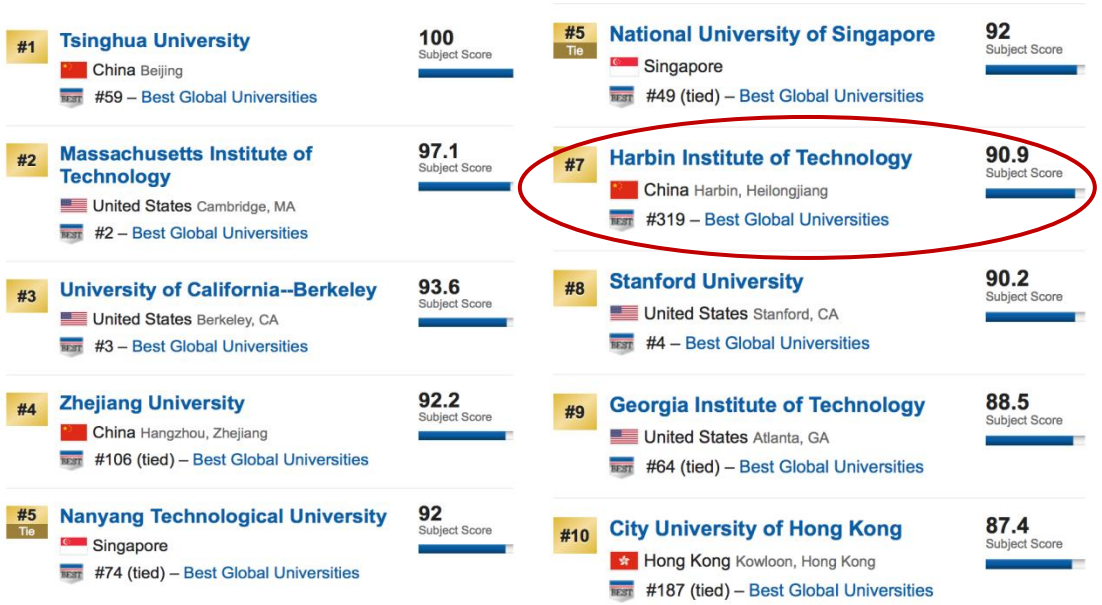
- **Mechanical engineering**
- **Electrical engineering**
- **Material engineering**
- **Civil engineering**
- **Control engineering**
- **Power Engineering**

Best Global Universities for Engineering

"These well-regarded universities from around the world have shown strength in producing research related to a variety of engineering topics. They include aerospace engineering, mechanical engineering, electrical engineering and civil engineering. All rely on the basic engineering concept of using math and science to solve problems. These are the world's best universities for engineering." Quote from US News website.



Best Global Universities for Engineering 2014



Best Global Universities for Engineering 2015

HIT MODEL: UNIVERSITY-ENTERPRISE COLLABRATION

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

✓ Industry-Academic-Research Innovation Alliance

✓ Joint Laboratory

✓ Industrial Technology Research Institute

IBM SIEMENS CONNECT with Rockwell hp

✓ Innovation and Entrepreneurship Park

- HIT Innovation Park
- HIT Student Innovation and Entrepreneurship Park

✓ Staff exchange between university and enterprises

- Science and technology coordinators to Guangdong enterprises
- Mayor Group to Jiangsu Province

✓ Setting-up Companies

- HIT Robot Group Co., Ltd
- HIT Welding Group Co., Ltd

✓ Entrepreneurship of faculty members

- Harbin Boshi Automation Co., Ltd.
- Aurora Optoelectronics Co., Ltd.

HIT ACHIEVEMENTS: UNIVERSITY-ENTERPRISE COLLABRATION

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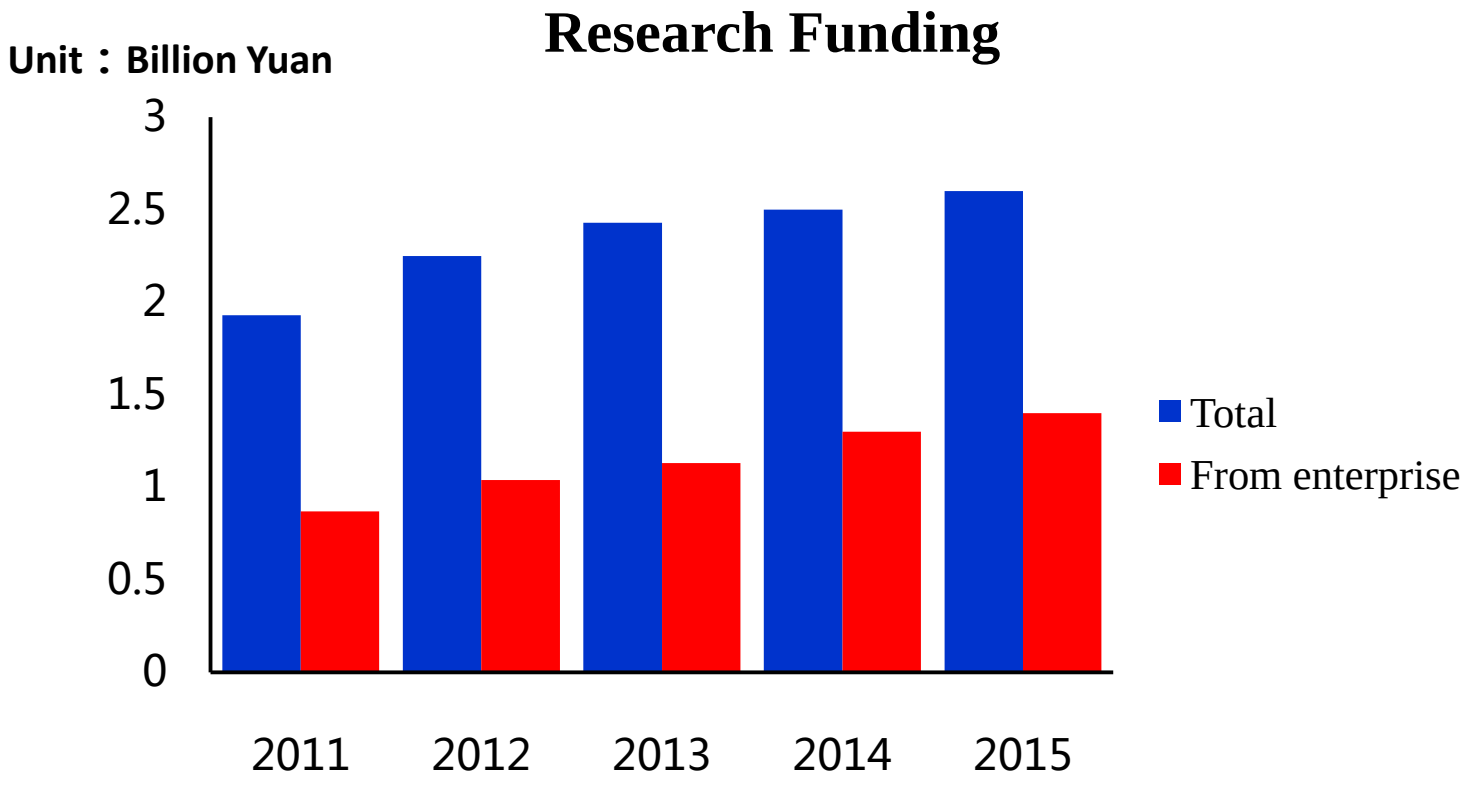
- ✓ **Total research funding: 2.63 billion CNY (RMB)**
- ✓ **The funding of University-Enterprise- Collaboration:**

1.403 billion CNY (RMB)

53% of total research funding



HIT COLLABRATION WITH AEROSPACE INDUSTRY

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

The Collaborative Innovation Center of Astronautical Science and Technology

- ✓ One of 14 collaborative innovation centers which were first approved by Central government
- ✓ "Two Chief Model"----The Director in Chief from CASC and Engineer in Chief from HIT

2008

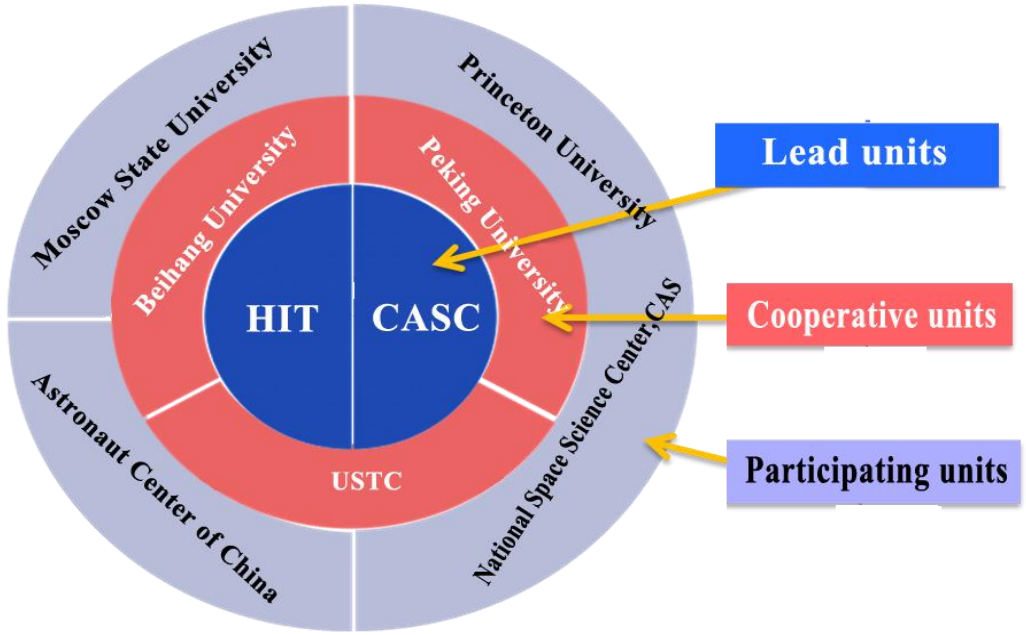
Joint Technology Innovation Center of CASC and HIT was founded.

2010

Aerospace Science and Technology Innovation Institute was founded.

2012

The Collaborative Innovation Center of Astronautical Science and Technology was founded.



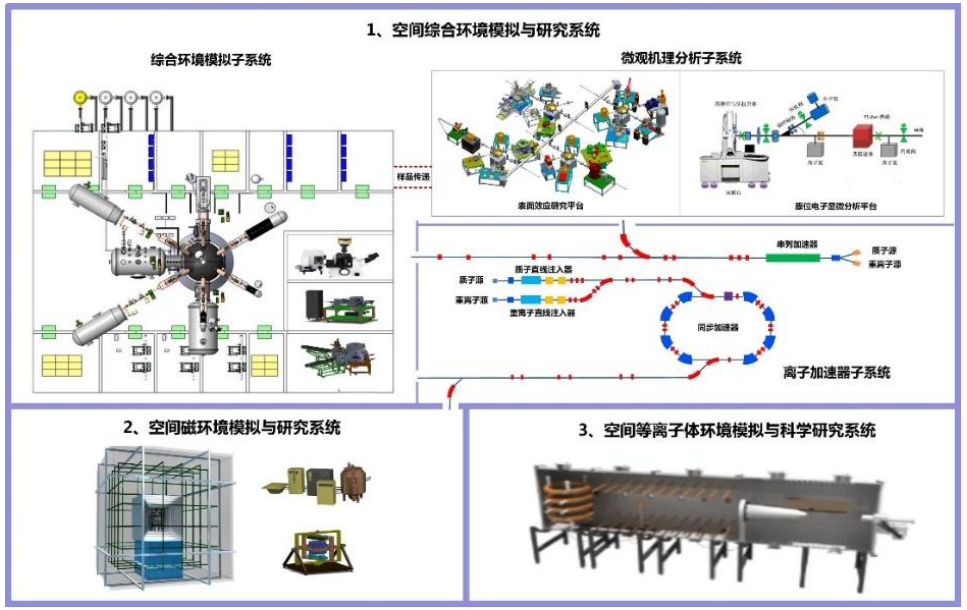
HIT COLLABRATION WITH AEROSPACE INDUSTRY

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Major National Technology Infrastructure

---- “Space Environment Simulation Research Infrastructure”(SESRI)

- Domestic and even the world's largest comprehensive fundamental scientific research platform for space environment and materials
- Provide strong support for the development of China's space science and aerospace technology after completion.

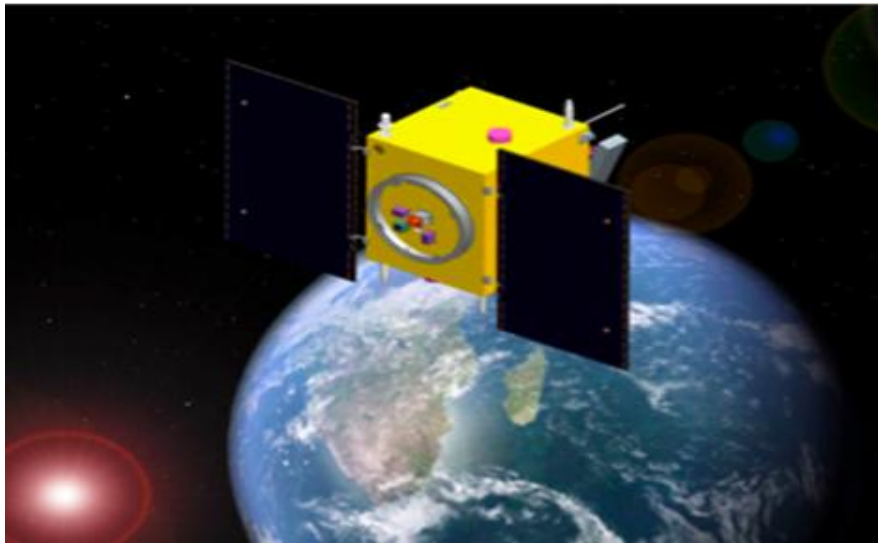


HIT COLLABRATION WITH AEROSPACE INDUSTRY

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Series of Micro-Satellites

- ✓ 2004----Test I (the 1st micro-sat independently developed by a Chinese university)
- ✓ 2008----Test III
- ✓ 2013 and 2014---- Fast Ship I and II
- ✓ 2015----Jilin I and Lilac II (the 1st micro-sat independently developed and controlled by university students)

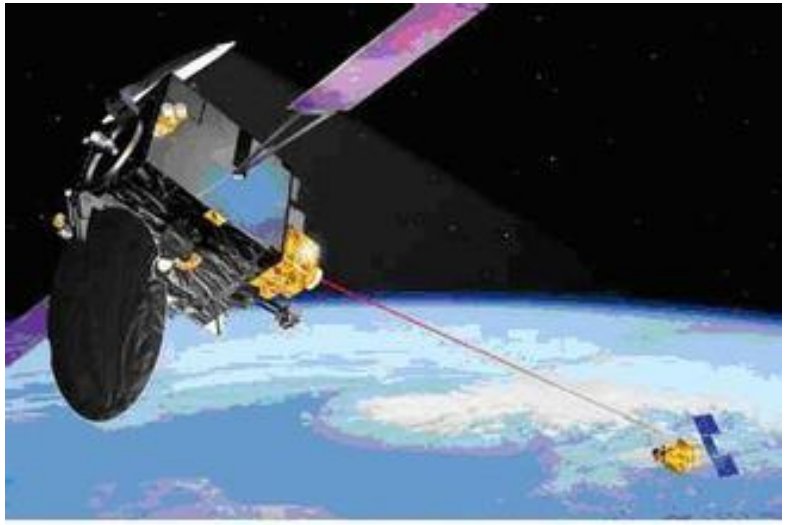


HIT COLLABRATION WITH AEROSPACE INDUSTRY

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Satellite Laser Communication

- ✓ In 2012, the 1st Chinese satellite-earth high speed laser communication test was successfully completed.
- ✓ In 2014, this achievement was awarded the First Prize of National Technology Invention.
- ✓ In 2015, together with the Heilongjiang provincial government, HIT established a company to realize the commercialization of these technology achievements.



HIT COLLABRATION WITH AEROSPACE INDUSTRY

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Manned Space Engineering Project and Lunar Exploration Project

- ✓ The Ultra-large Space Environment Simulator
- ✓ The OUT Type Closed Turntable for Low Gravity Simulation
- ✓ The Spacecraft Data Management Fault Tolerant Computer
- ✓ Re-entry Capsule Welding Deformation Control Techniques
- ✓ The Expert Spacecraft Fault Diagnosis System
- ✓ Moving System of Moon Rover

HIT won the Outstanding Collaboration Award in Manned Space Engineering Project

HIT COLLABRATION WITH AEROSPACE INDUSTRY

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Famous Alumni:

- ✓ So far, HIT has provided space industry with more than 25,000 graduates


Jinai Li


Enjie Luan

Jiadong Sun


Shixiang Hu


Xingrui Ma

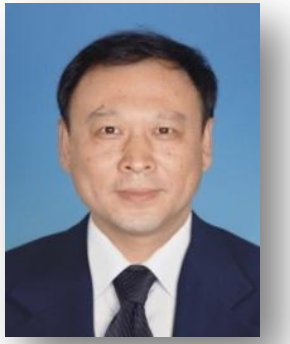

Dazhe Xu


Zhaoyao Wang


Jiajun Yuan


Feng Li


Bonan Zhang


Baohua Yang


Zhisong Zhu

HIT COLLABRATION WITH INDUSTRY LEADERS

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Joint Engineering Experiment Platform——Shenhua Group

HIT constructed the National Engineering Laboratory of Air Pollutants from Coal Combustion and Emissions Reduction with Shenhua Group.

Ten-arm Bolt Driller

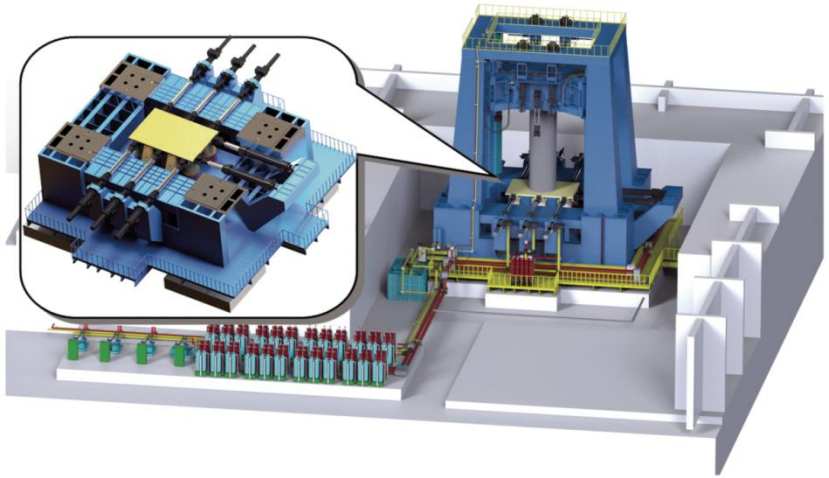
1.2t/d Pure Oxygen Compression Coal Dust Gasification System

HIT COLLABRATION WITH INDUSTRY LEADERS

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Key Grand Engineering Project——10,000-ton Multifunctional Test System with China State Construction Engineering Corporation (CSCEC)

- ✓ Highest internal load clearance and net loading height at home and abroad
- ✓ A vertical load capacity of 10,800 tons, which is far larger than other similar testing machines at home and abroad
- ✓ Highest load capacity to the mega reinforced concrete columns under large axial load and two way shear in the world



HIT COLLABRATION WITH INDUSTRY LEADERS

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Key Grand Equipment Development——Natural Gas Liquefaction and Marine Equipment with China National Offshore Oil Corporation (CNOOC)

- ✓ Projects in natural gas liquefaction, off shore equipments
- ✓ Undertook an engineering design project with CNOOC in Iran, involving more than 10 million tons of natural gas

HIT COLLABRATION WITH DOMESTIC ENTERPRISES

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

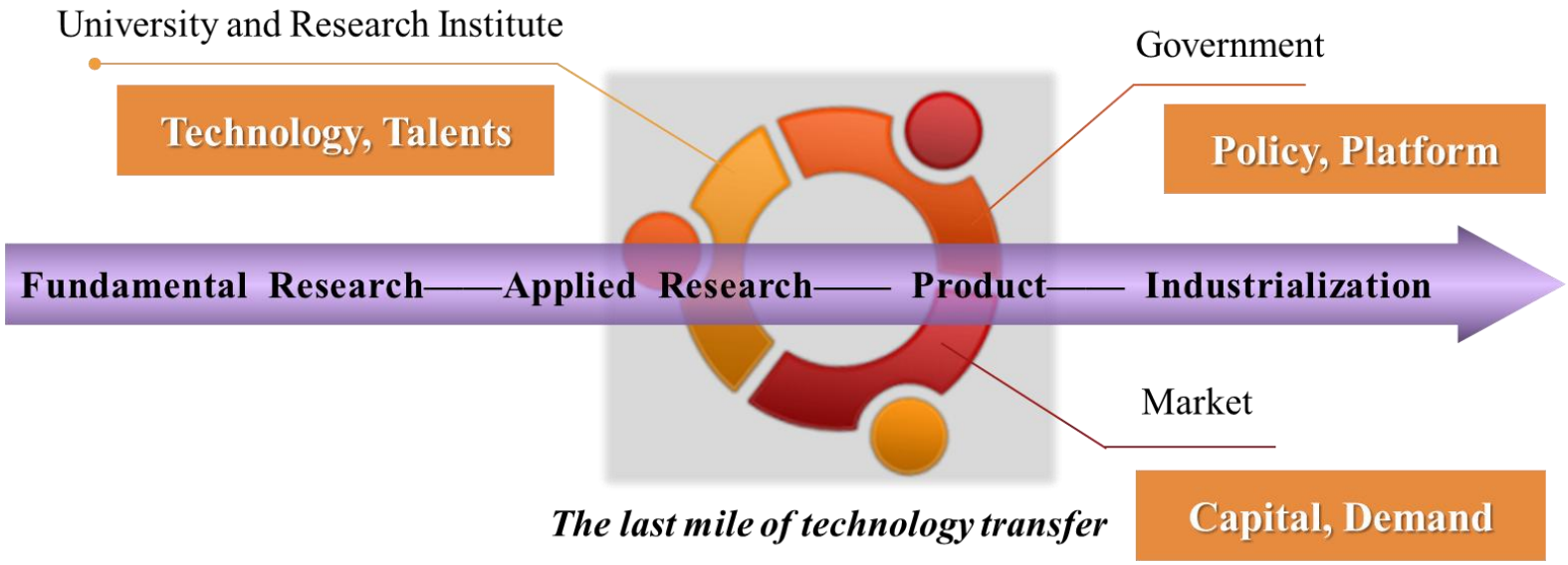
Relying on the Industrial Technology Research Institute jointly founded the local government and HIT; HIT served the Northeast Revitalization and spread advanced technology to economically developed areas.

- HIT-Zhangjiagang Intelligent Equipment and New Materials Research Institute
- HIT-Wuhu Robot Technology Research Institute
- HIT-Wuxi New Materials Research Institute
- HIT-Yixing Academy of Environmental Protection
- HIT-Qingdao Industrial Technology Research Institute
- HIT-Anshan Industrial Technology Research Institute
- Industrial Technology Research Institute of Heilongjiang Province ⟶

HIT COLLABRATION WITH ENTERPRISES IN HEILONGJIANG

Industrial Technology Research Institute of Heilongjiang Province

- ✓ Realize integration of personnel, funds, policy and market, the Institute supports technology transfer to applied research and development, then shifting quickly to enterprise and bringing products to market
- ✓ Uses the trustee council governing structure and market-oriented management
- ✓ The Institute has Financial allocation of nearly 100 million RMB, assisted in the creation of 78 start-ups, 119 engineering and technology staff members, including 83 postgraduates. The incubating provide more than 1,500 jobs.



HIT COLLABRATION WITH ENTERPRISES IN HEILONGJIANG

哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Relies on research institutes, incubators and innovation parks;
Promotes technology transfer, **creates** large cooperation groups, and **provides** service for industries.

- Harbin Boshi Automation Co., Ltd (listed)
- Aurora Optoelectronics Co., Ltd (listed)
- HIT Software Engineering Co., Ltd (listing)
- HIT Robot Group
- HIT Welding Group Co., Ltd
- HIT Environmental Group Co., Ltd
- HIT Satellite Laser Communication Co., Ltd
- HIT Leixin Technology Co., Ltd

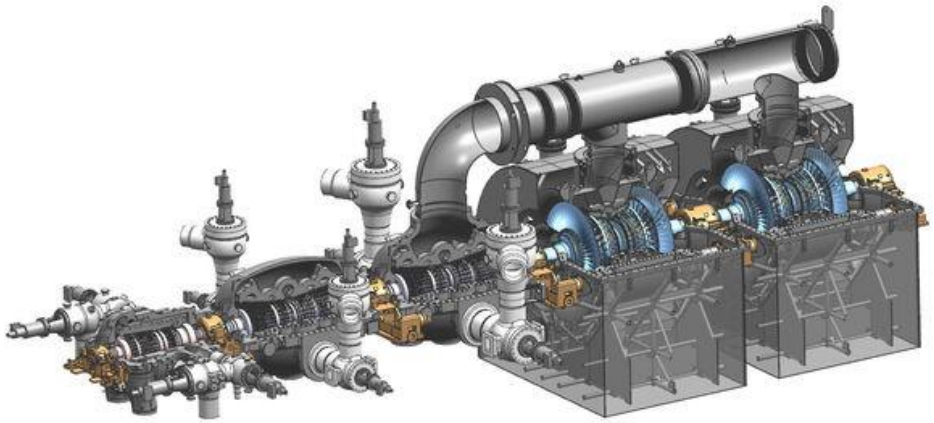
HIT COLLABRATION WITH ENTERPRISES IN HEILONGJIANG

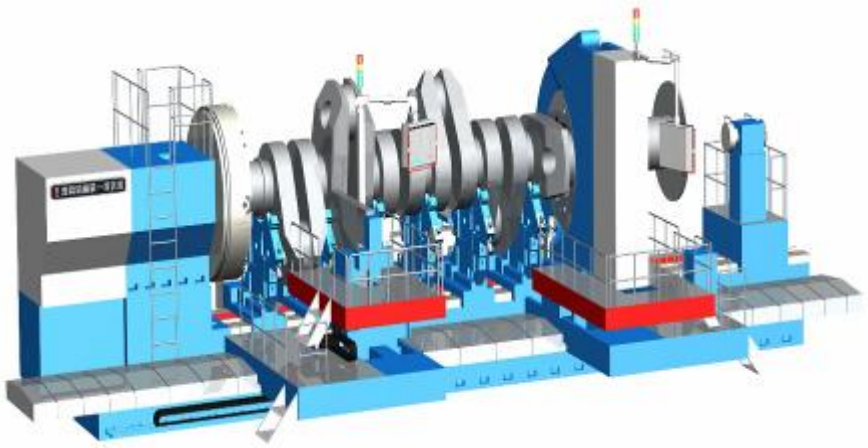
哈爾濱工業大學 HARBIN INSTITUTE OF TECHNOLOGY

Takes advantage of the innovation of mechanical engineering, materials engineering, energy and power engineering, electric engineering etc.;

Promotes the transfer of technological advancements to enterprise.

- CFHI—— Large CNC Machine Tools
- Hafei group——Z-9 Helicopter
- Harbin Power Plant Equipment Cooperation——1000MW Ultra-supercritical Thermal Power Units
- China FAW Group Corporation——Hydroforming Equipment and Technology
- AVIC Harbin Bearing Corporation——Ceramic Bearings with high performance





SUMMARY

University-Enterprise-Collabaration is a comprehensive system, it needs:

- ✓ **Enterprise's demand as driving force**
- ✓ **University to support as sources and stimulator**
- ✓ **Government to guide as organizer and platform**
- ✓ **Fair rules to guarantee responsibilities and benefit distribution**

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THANK YOU!