Enhancing the societal value of Research Infrastructures

——Three “Face to” of Huairou National Science Center

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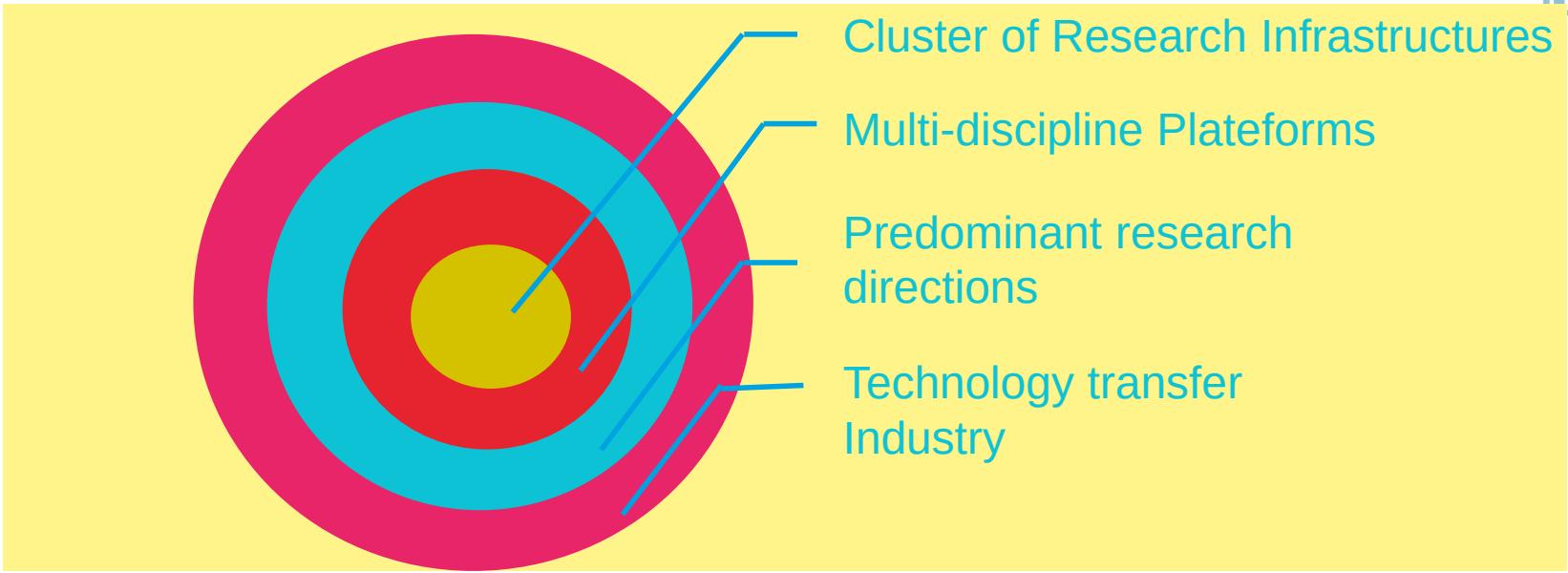
Framework of National Science Center, Huairou, Beijing



In May 2017, the Chinese Central Government approved to construct the National Comprehensive Science Center in Huairou, Beijing

The Cluster of Research Infrastructures
-under construction /begin within 2018

- Big Science Facilities
  1. High Energy Photon Source : 6Gev, 60 pm·rad
  2. Synergetic Extreme Condition User Facility: 1mK, 300GPa, 26T
  3. Earth System Science Numerical Simulator Facility: Horizontal res.(°): Atmosphere-0.25X0.25, Ocean-0.1X0.1
  4. Multimodal Trans-Scale Biomedical Imaging Facilities: Scale：10^{-8} -1 m ; resolution： 10^{-10} -1 mm
  5. Ground-based Space Environment Monitoring Network: 30 parameters
- Platforms
  ① Advanced Photon Source Technology R&D
  ② Materials Genome Research
  ③ Materials Research and Analysis Center for Clean Energy
  ④ Test and Assurance Platform for Space Science Satellite Missions and Payload Development
  ⑤ Advanced vehicle and measuring technique integrated exp. facility

Research Infrastructures in plan (within 5 years)

- Large facilities
  1. Atmospheric environment simulation system大气环境模拟系统
  2. China's Terrestrial Ecosystem Observation Network 中国陆地生态系统观测实验网络
  3. National biomedical big data (North)国家生物医学大数据(北方)
  4. Shennong facility (molecular breeding)神农设施(北方)

- Platfoms
  - ① Virtual research and development platform for material transformation process
  - ② Research and testing platform for molecular materials and devices
  - ③ Brain cognitive function map and brain intelligent cross platform
  - ④ Frontier crossing platform for precision medicine and data information
  - ⑤ Space laboratory ground test base
  - ⑥ R & D platform for ultra precision optical manufacturing
  - ⑦ Deep resource exploration technology and equipment research and development platform
  - ⑧ Collaborative innovation platform for identification and control of environmental pollutants
  - ⑨ Cross cutting study on atmospheric environment and physical chemistry in Beijing Tianjin Hebei region

Predominant research directions and related frontier science problems

- Matter science
  - New superconductors, super-alloy, quantum computing
- Space science
  - origin of the universe, dark hole, dark matter/energy, gravity wave
- Geoscience
  - deep resource exploration, evolution of the earth environment, ecosystem changes, disaster prediction and assessment
- Life and Health
  - Birth, aging, sickness related
- Artificial intelligence
  - General intelligence, neuromorphology brain, brain-like computing, etc.
- Atmosphere and environment
  - Pollution prevention, climate change and projection

Enhancing the societal value of Research Infrastructures

1. Positioning the requirements of nation, social and economic developments
2. Technical R&D: bottom-up, or target-oriented
3. Integration to form systematic solutions for the needs
4. Adopt by industry and spreading application

HSC is advantage with cluster research infrastructures, and multidiscipline researchers

Major national requirements

- Comprehensive well-off society project
  - 30 million poor persons out of poverty, by 2020
- Environment pollution
  - Air, water, and soil
- Resource and energy
  - Oil-import as high as > 200B$/year

Social and economic development

- Material
  - 32% of the key materials are ZERO, and 52% of the key material rely on import.
- Health
  - Aging society- 17.3% population are >60 years old, with the number as 240 millions.
  - 3.8 million new cancer patients each year
- Chips
  - The largest import products, 260B$/year
- Industrial upgrading
  - 3.6% of the iphone's value

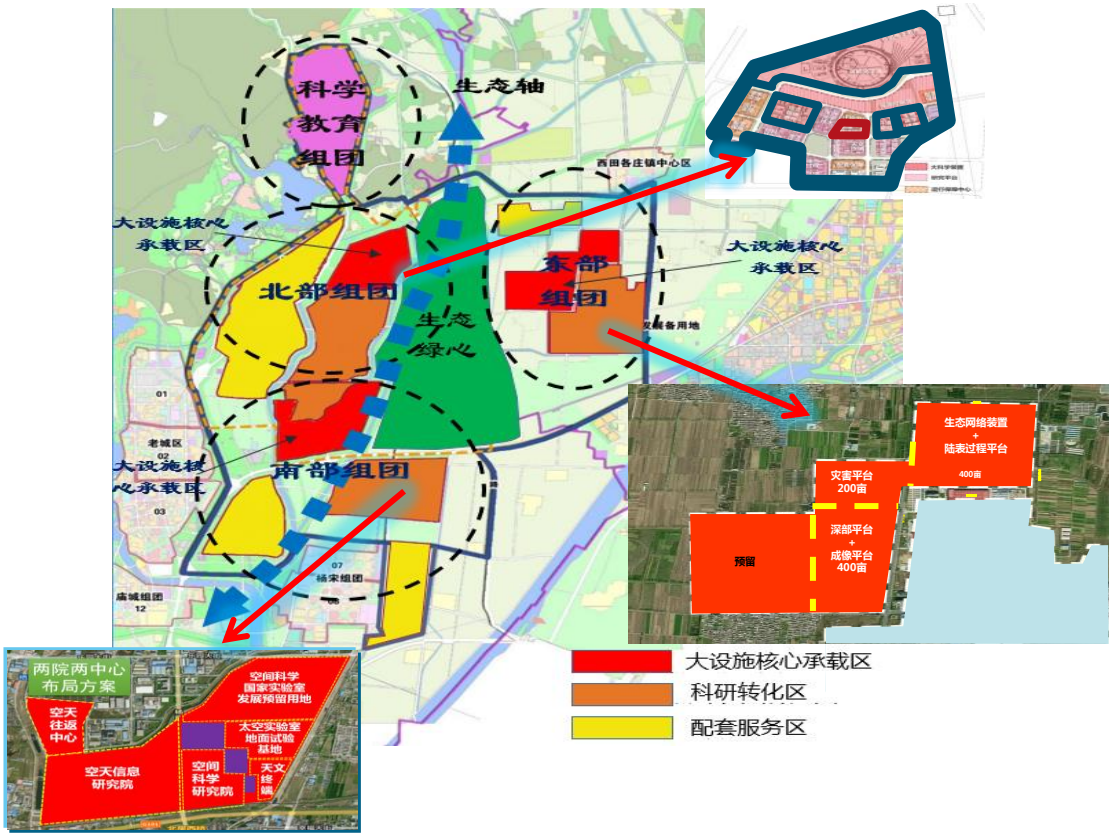
Measures for technique transfer

- HSC special program
  - 130 millions of Chinese RMB delivered to about 30 projects
- Fund for S&T innovation
  - Totally about 30 billions of RMB, to support the original innovation, technical breakthrough, and technical transferring.
- Industrial parks
  - Zhongguancun Science City: Individual company
  - Future Science City: State owned company

Prospects —2050

- National S&T development Project
  - By 2020, in the rank of innovation countries
  - By 2035, in the front rank of innovation countries
  - By 2050, S&T powerful nation
  - Function and Contribution by HSC
- Roadmap of HSC
  - By 2025, phase-I construction
  - By 2035, playing important role for raising the S&T innovation ability
  - By 2050, the leading science center.

Huairou Science City – in Brief



Area

-100 km^2 in total

- 10 km^2 key region

Humen Resource

- three 10ks people: staffs, visitors and students

Investment(2020)

- 20billions fo RMB
- half from the central government for RI

Thank you
for your attention!