Proposal for the Regional Centre for Space Science & Technology Education in East Asia and the Pacific Under the UN Programme on Space Applications

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The fiftieth session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space
Vienna, February 19, 2013
• **Introduction**

• **Current Space Education at Beihang University**

• **Outline of the Proposed New Regional Centre**

• **Commitment**
Introduction

Regional Centres for Space Science and Technology Education
(Affiliated to the United Nations)
Introduction

- Great development and wide use of space technology
- Growing demands on space education from developing countries.
- China’s contribution to the UN programme on space applications

Weather Forecast

Disaster Management

Satellite Navigation
• Introduction
• Current Space Education at Beihang University
• Outline of the Proposed New Regional Centre
• Commitment
Beihang University, the first aerospace university in China, has been engaged in space international education since 2000 with the support of China National Space Administration (CNSA).

- **Schools**: 28
- **State Key Laboratories**: 7
- **Undergraduate Programs**: 57
- **Master’s Programs**: 144
- **Doctoral Programs**: 49
- **Students**: 25,825
  - **Undergraduates**: 13,704
  - **Graduates**: 12,121
- **Faculty & Staff**: 3,799
Current Space Education at Beihang University

Beihang University
Space Applications Education Centre
was founded in 2004
Current Space Education at Beihang University

Inside the Centre

Seminar Room

Distant Learning Room

Computer Room
Current Space Education at Beihang University

Facilities for space technology applications education

Remote Sensing (RS) Data Receiving Ground Station on campus

RS & Geographic Information System (GIS) Lab

Global Navigation Satellite System (GNSS) Lab
# Current Space Education at Beihang University

**Regular degree program — International participants graduated**

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Master</th>
<th>Ph.D</th>
<th>Total</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science and Engineering</td>
<td>29</td>
<td>18</td>
<td>47</td>
<td>6</td>
</tr>
<tr>
<td>Navigation, Guidance and Control</td>
<td>32</td>
<td>13</td>
<td>45</td>
<td>9</td>
</tr>
<tr>
<td>Flight Vehicle Design</td>
<td>65</td>
<td>21</td>
<td>86</td>
<td>16</td>
</tr>
<tr>
<td>Solid Mechanics</td>
<td>11</td>
<td>1</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td>Aerospace Propulsion Theory and Engineering</td>
<td>36</td>
<td>12</td>
<td>48</td>
<td>10</td>
</tr>
<tr>
<td>Manufacture Engineering of Aerospace Vehicle</td>
<td>10</td>
<td>6</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Mechatronic Engineering</td>
<td>18</td>
<td>6</td>
<td>24</td>
<td>10</td>
</tr>
<tr>
<td>Mechanical Manufacture and Automation</td>
<td>10</td>
<td>2</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Computer Science and Technology</td>
<td>32</td>
<td>31</td>
<td>63</td>
<td>16</td>
</tr>
<tr>
<td>Precision Instrument and Machinery</td>
<td>13</td>
<td>10</td>
<td>23</td>
<td>5</td>
</tr>
<tr>
<td>Space Technology Applications</td>
<td>36</td>
<td></td>
<td>36</td>
<td>7</td>
</tr>
<tr>
<td>Control Theory and Control Engineering</td>
<td>9</td>
<td>5</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>9</td>
<td>7</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Communications and Information Systems</td>
<td>15</td>
<td>19</td>
<td>34</td>
<td>10</td>
</tr>
</tbody>
</table>

**TOTAL: 476**
## Current Space Education at Beihang University

### Training programs

<table>
<thead>
<tr>
<th>Year</th>
<th>Topic</th>
<th>Stu.</th>
<th>Country</th>
<th>Sponsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>Satellites Technology</td>
<td>22</td>
<td>10</td>
<td>AP-MCSTA</td>
</tr>
<tr>
<td>2002</td>
<td>Remote sensing Applications</td>
<td>31</td>
<td>18</td>
<td>AP-MCSTA</td>
</tr>
<tr>
<td>2003</td>
<td>Space Technology and Remote sensing Applications</td>
<td>29</td>
<td>17</td>
<td>AP-MCSTA</td>
</tr>
<tr>
<td>2007</td>
<td>International Space University Summer Session</td>
<td>117</td>
<td>25</td>
<td>ISU/CASC</td>
</tr>
<tr>
<td>2009</td>
<td>Remote sensing Data Processing and Applications</td>
<td>42</td>
<td>8</td>
<td>APSCO</td>
</tr>
<tr>
<td>2011</td>
<td>1st International Summer School on Aerospace Science Technology</td>
<td>90</td>
<td>17</td>
<td>BEIHANG</td>
</tr>
<tr>
<td>2012</td>
<td>2nd International Summer School on Aerospace Science Technology</td>
<td>120</td>
<td>18</td>
<td>BEIHANG</td>
</tr>
<tr>
<td>2012</td>
<td>1st BeiDou/GNSS International Summer school on GNSS Frontier Technology</td>
<td>67</td>
<td>2</td>
<td>CPGPS/CSNO</td>
</tr>
<tr>
<td>2012</td>
<td>Demonstration of Remote Sensing Data Usage for Earthquake Monitoring and Evaluation</td>
<td>17</td>
<td>9</td>
<td>APSCO and NDRCC</td>
</tr>
</tbody>
</table>
Current Space Education at Beihang University
Training programs
Current Space Education at Beihang University

**Master program on Space Technology Applications (MASTA)**

In 2004, Beihang was authorized by Chinese Ministry of Education to develop a new program, *Master Program on Space Technology Applications (MASTA)*, by introducing the *Education Curricula of Centres for Space Science and Technology Education* issued by the Office for Outer Space Affairs of the United Nations.

Vision: *Open, Cooperation and Demand Driven*
## Current Space Education at Beihang University

### Master program on Space Technology Applications (MASTA)

<table>
<thead>
<tr>
<th>Year</th>
<th>Directions</th>
<th>Participants</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>RS and GIS</td>
<td>14</td>
<td>Bangladesh, Indonesia, Iran, Mongolia, Pakistan, Peru, Thailand</td>
</tr>
<tr>
<td>2008</td>
<td>RS and GIS</td>
<td>11</td>
<td>Indonesia, Mongolia, Pakistan, Thailand</td>
</tr>
<tr>
<td>2010</td>
<td>RS and GIS</td>
<td>11</td>
<td>Indonesia, Iran, Mongolia, Peru, Pakistan, Thailand</td>
</tr>
<tr>
<td>2011</td>
<td>SATCOM</td>
<td>14</td>
<td>Bangladesh, Indonesia, Iran, Mongolia, Laos, Pakistan, Peru, Thailand,</td>
</tr>
<tr>
<td>2012</td>
<td>GNSS</td>
<td>20</td>
<td>Indonesia, Iran, Mongolia, Pakistan, Peru, Spain, Thailand</td>
</tr>
</tbody>
</table>
Current Space Education at Beihang University

Participating scholars —— Global selection and recruitment

(Partners)

Beihang University

(Harbin Institute of Technology)

University of Hong Kong

University of Alberta
Practice Base

In close cooperation with space industry and related agencies, the centre creates more opportunities for the participants to take part in space application projects to enhance their knowledge learnt from the courses.

- China Earthquake Administration
- China Center for Resources Satellite Data and Application
- ....
International cooperation and exchange

• Participated in the development of GNSS Curriculum which was released by the United Nations
• Actively involved in ICG Working Group C, Workshops
• Communicated with other regional centres
• Closely cooperated with APSCO
• ......
• Introduction

• Current Space Education at Beihang University

• Outline of the Proposed New Regional Centre

• Commitment
Outline of the Proposed New Regional Centre

Goals of the centre

• To develop and spread the knowledge and skills about space science and technology;
• To enhance the exchanges and cooperation within the East Asia-Pacific Region;
• To promote the programme of space applications.
Outline of the Proposed New Regional Centre

- Goal of the centre
- Major disciplines
- Program categories
- Degree program
- Participating scholars
- Experiment and practice
- Quality assurance/assessment

- Target audience
- Logistics
Outline of the Proposed New Regional Centre

**Major disciplines**

**Ongoing**

- Remote Sensing and Geographic Information Systems
- Satellite Communications
- Global Navigation Satellite System (GNSS)

**Forthcoming**

- Space Law
- Basic Space Science and Technology

**To be launched**

- Satellite Meteorology and Global Climate
- Space and Atmospheric Sciences
Outline of the Proposed New Regional Centre

Major disciplines

While continuing the existing disciplines at Beihang, such as *remote sensing and GIS*, *satellite communications*, special efforts will be made on *GNSS*, *space law*, and *basic space science and technology*.

The new regional centre would benefit the UN program by introducing new focused areas above.
Outline of the Proposed New Regional Centre

GNSS

- BeiDou International Communication and Training Centre was established at Beihang in 2012

- GNSS education & application exhibition and iGMAS station sponsored by China Satellite Navigation Office (CSNO) are going to set up in 2013
Outline of the Proposed New Regional Centre

Education and training on GNSS in 2013

MASTA Program on GNSS 2013

2nd BeiDou/GNSS Summer school 2013
Outline of the Proposed New Regional Centre
Basic Space Science and technology

Beihang is the member of Chinese University Mirco Satellite Consortium.

Beihang SAT-1 (35kg) to be launched in 2014
Beihang SAT-1 2U-CubeSat to be launched in 2015.
The first space law institute in China was founded in 2000, which has been active in the process of space legislation.

**Core Courses:**

- General public international law
- Comparative study on space law
- Space law
- Space policy
- Space project management
Outline of the Proposed New Regional Centre

**Program categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Training mode</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Degree Program</em></td>
<td><em>Master Program</em>, <em>Ph.D Program</em></td>
</tr>
<tr>
<td><em>Non-Degree Program</em></td>
<td>short training, summer school, summer / winter camp, popular science lectures,</td>
</tr>
<tr>
<td></td>
<td>visiting study (semester / year)</td>
</tr>
<tr>
<td><em>Tailor-made Program</em></td>
<td><em>customized courses according to the needs of users</em></td>
</tr>
</tbody>
</table>

Distant learning facilities are available
### MATSA program:

**1\textsuperscript{st} stage: Core Courses Study in China (9 months) (Leading to postgraduate certificate of Beihang)**

- **Module I:** 2 months for fundamental courses
- **Module II:** 4 months for specialized courses
- **Module III:** 3 months for pilot-project (practice)

**2\textsuperscript{nd} stage: Research Project in Participant’s Homeland (6-12 months) (Leading to Master degree of Engineering of China)**

- **I. Advanced Project**
- **II. Thesis preparation and Defense**
- **III. Graduation and Granting Master Degree in China**

Degree will be offered by Beihang University.
Outline of the Proposed New Regional Centre

Participating scholars
The participating scholars will be globally recruited.

Experiment and practice
The centre would take advantages of the experimental facilities of Beihang University for teaching, and integrate various resources available in China to provide opportunities for practice.
Outline of the Proposed New Regional Centre

Quality assurance and assessment

- Reviews by *the academic peer review committee*
- Evaluations by Chinese education authorities
- Assessment by the participants and program sponsors.
Target audience (Participants)

The prospective audience will include engineers, researchers, managers, policy maker, university educators, college students, and professionals from various institutions, enterprises, and government agencies related to space science and technology research and applications.
Outline of the Proposed New Regional Centre

Logistics

Beihang University (home institution) should provide teaching venues, accommodation, catering, administration, and other necessary facilities and service.
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Commitment

Supported by the Chinese government, Beihang University is full of confidence to set up a new Regional Centre for Space Science & Technology Education in East Asia-Pacific Region.

The new centre would benefit the region and the world at large by providing more education opportunities and enhancing space applications.
We welcome you to join us

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