



16th Meeting of the International Committee on
Global Navigation Satellite Systems



Construction of BDS/GNSS Teaching & Practice Courses

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2022/09

CONTENTS

01 International Exchange and
Training Center of CSNO

02 The UN Regional Centre
in China

03 BDS/GNSS Teaching and Practical
Platform

04 RCSSTEAP MASTA/DOCSTA
Programme





International Exchange
and Training Center of
CSNO

01

International Exchange and Training Center of CSNO

中国的北斗
世界的北斗

China BeiDou, Benefit the World

BeiDou International Exchange and Training Center was established on August 24, 2012 to prompt education and training for the purpose of the Applications of BDS in the world.

Location: in the campus of Beihang University

(<http://www.buaa.edu.cn>)



Inauguration Ceremony of the Centre

Talent is the first resource for International Cooperation

Postgraduate Program on BeiDou/GNSS

- Program started since Sep. 2012.
- Until now, 135 master's and doctoral students from 22 countries are cultivated.

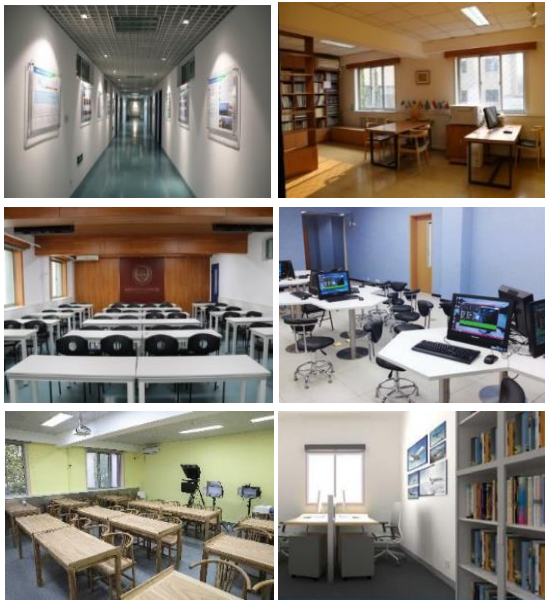
1 st : stage: Course Study in China (9 months)	
Module 1: 2 months for fundamental courses	Module 2: 4 months for major courses
Module 3: 3 months for pilot project (practice)	
2 nd stage: Thesis Research(6-12 months)	
Module 1: Advanced Project	Module2: Thesis preparation and defense
Module 3: Graduation and Granting Master's	

Duration: 9 month + 1 year
Teaching Language: English

Core Course	Class Hrs
GNSS Reference System	18
Principle of Global Navigation Satellite Systems	32
GNSS Navigation Signal	18
GNSS Receiver Principles and Design	32
GNSS/INS Integration Navigation	32
Global Satellite Navigation System Applications	18
Satellite Navigation Data Processing	32
GNSS Experiment	18
GNSS New Technologies	18

Excellent Teaching and Practice Facilities

Teaching Infrastructure



Practical Platform



Orbital Model of BDS Constellation



Antenna



BDS Signal Sampler



BDS Signal Process

Practical Courses and Textbooks

Software for Practical Course



Textbook for Practical Course



Practice Base

UniStrong
合众思壮

北斗星通
BDStar Navigation

Hwa Create

华力创通

千方集团
CHINA TRANSINFO

SuperMap
超图软件

The BeiDou/GNSS experimental platform has been built up since 2012. It include four series (17 experiments).

International Exchanges and Cooperation



Indonesia



Singapore



Egypt



Mongolia



Malaysia



Sudan



Nigeria



Australia



Morocco



Thailand



Laos



Uzbekistan



ASEAN(Thailand)



League of Arab States(Egypt)



League of Arab States(Tunis)



The UN Regional
Centre in China

02

UN Regional Centre in China

In 2014, a new UN Regional Centre was established in China, namely Regional Centre for Space Science and Technology Education in Asia and the Pacific (China) in short RCSSTEAP.



The RCSSTEAP also located at Beihang Campus



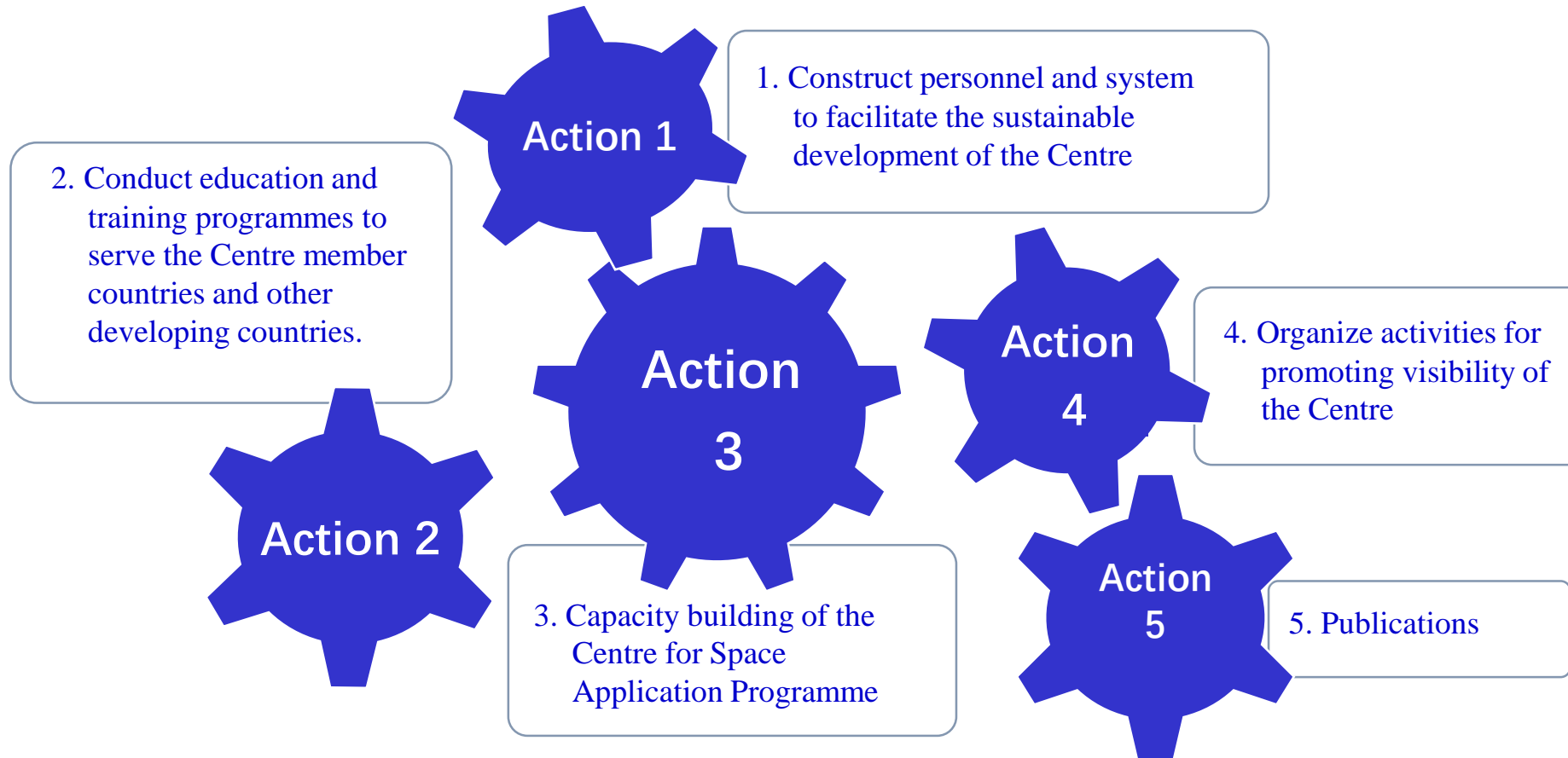
联合国附属空间科技教育亚太区域中心
Regional Centre for Space Science and Technology Education in Asia and the Pacific(China)
(Affiliated to the United Nations)



an education and training entity supported by UN-COPUOS

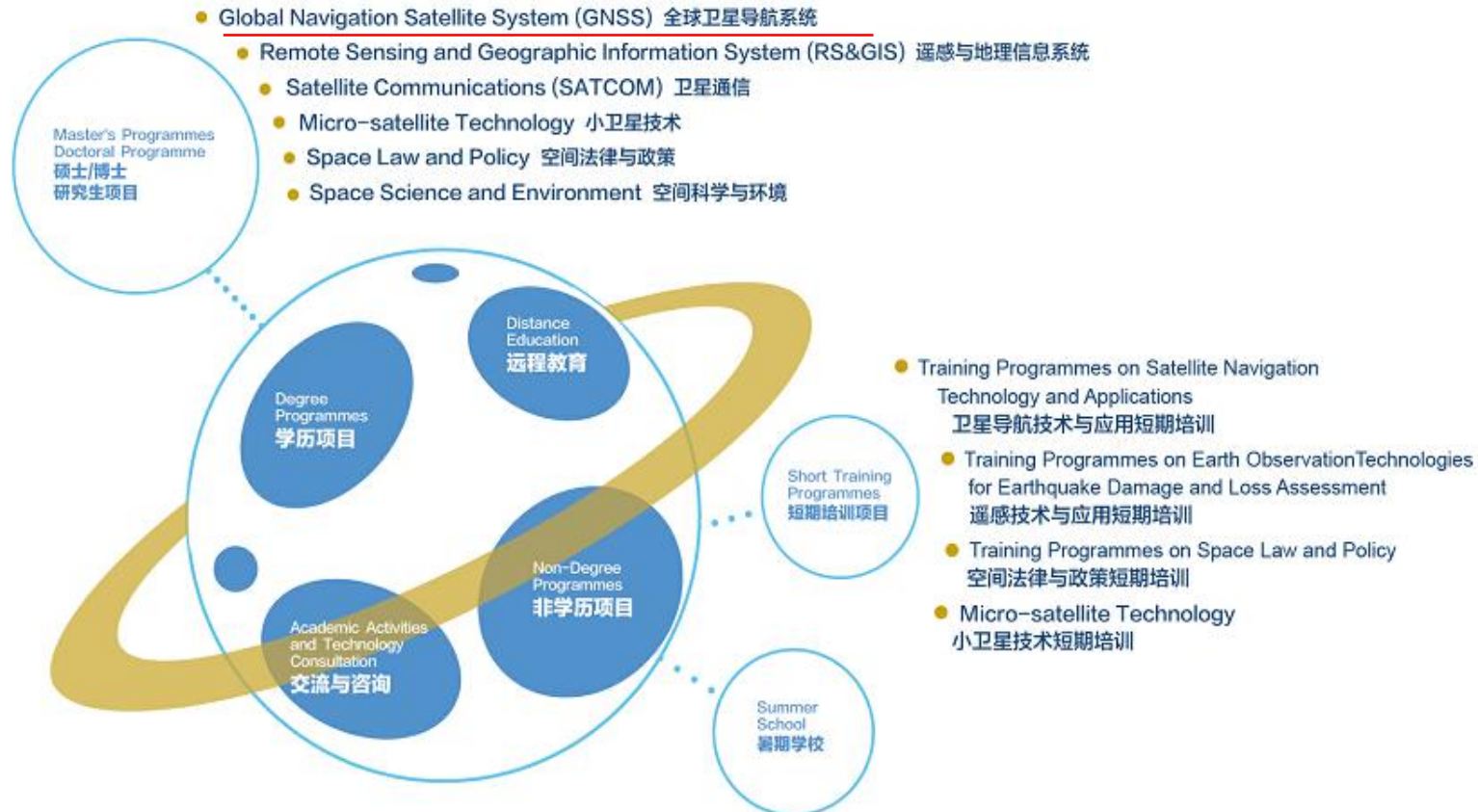
BeiDou/GNSS education and training Program is one major part of RCSSTEAP

Annual Work Plan – 5 Actions



Education and Training Programmes

Education and Training Programmes 教育培训项目



So far, the Centre has trained **334** MASTA&DOCSTA participants for **27** developing countries and organized more than **20** short training programmes with over **1000** participants from more than **70** countries.

Short-term Training Programmes



The first Summer Camp of the APSCO Student Small Satellite Project, **Beijing**, August, 2017



GNSS and BeiDou System Deep Understanding Training
Tunisia, April, 2018



Training on Space Cooperation for Global Health,
China, April, 2018



Short Training in Satellite Technology CRASTE-LF
Morocco, October, 2018

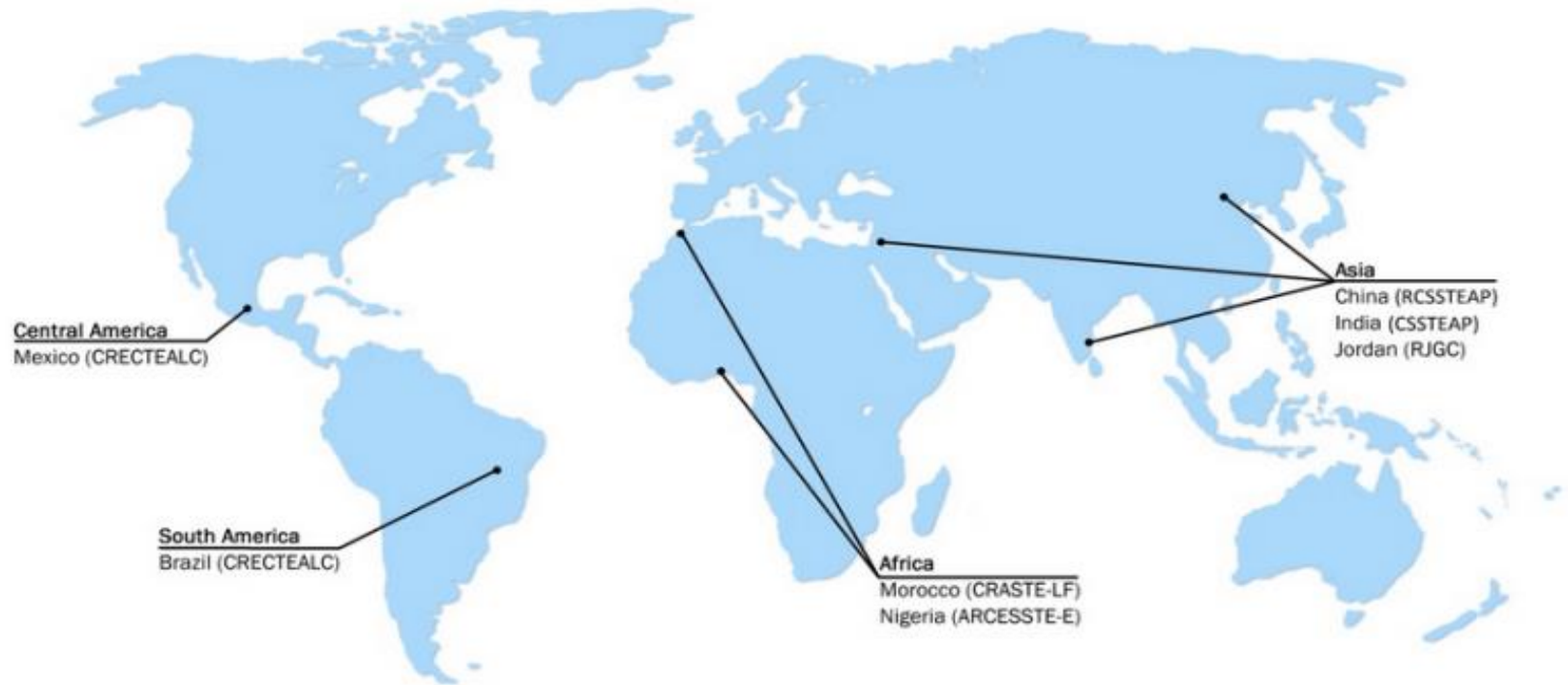


International Training Course on "Space-based technologies for disaster risk assessment"
China, September, 2019



A series of lectures on Space Technology Applications
Online, May-June, 2020

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



CSSTEAP India
(inaugurated in
1995)

CRASTE-LF
Morocco
(inaugurated in
1998)

ARCESSTE-E
Nigeria
(inaugurated in
1998)

CRECTEALC
Mexico and Brazil
(inaugurated in
2003)

RCSSTEWA /
RJGC Jordan
(inaugurated on 29
May 2012)

RCCSTEAP China
(inaugurated in
2014)

73 countries among the 6 Regional Centres



BDS/GNSS Teaching and
Practical Courses

03

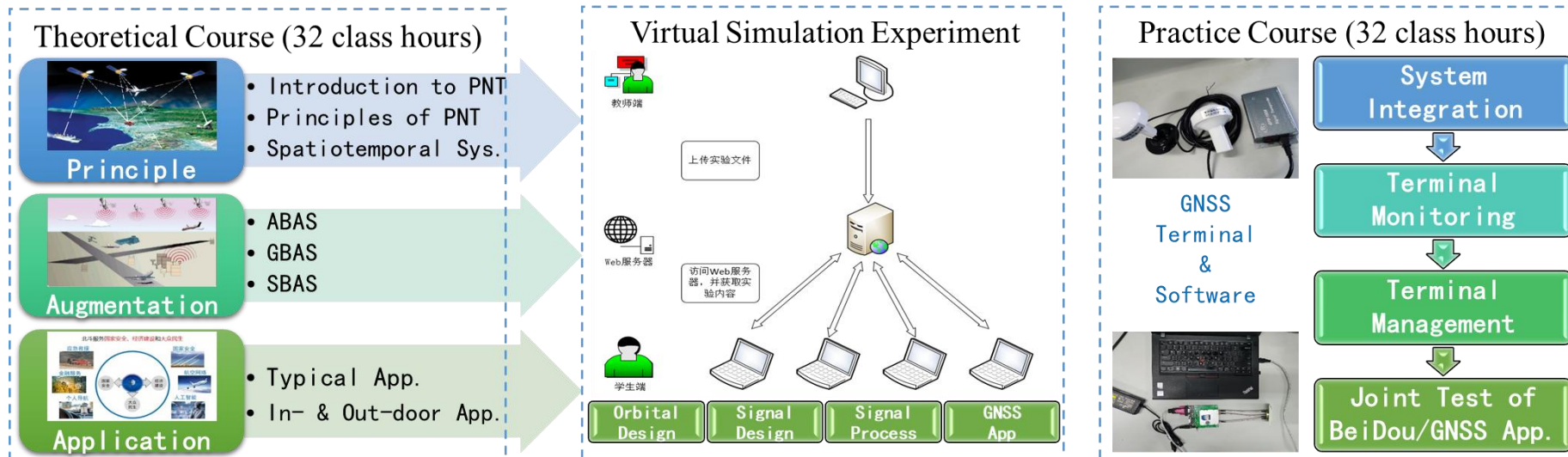
Theoretical Teaching and Practical System

□ In-class experiment

On the basis of the current hardware experimental equipment and supporting models in this course, by improving and expanding the “**BDS/GNSS satellite orbit design**”, “**BDS/GNSS satellite signal design**”, “**BDS/GNSS satellite signal processing**” and “**BDS/GNSS satellite navigation application**” four typical virtual simulation experiments of BDS/GNSS

□ Future virtual simulation experiment

Improve the visualization effect of experimental content, and closely combine virtual simulation experiments with theoretical teaching, teaching models and hardware experiments.



Teaching and Practical Courses

- **Wide coverage of students:** Sharing for domestic students among 7 universities in Beijing and for international students among 12 countries
- **Application and practice:** 32 hours theory class to understand the principle + 32 hours practice class for out-door test
- **Real environment test:** Build the application environment of the BeiDou/GNSS system

Indoor & Outdoor satellite navigation and positioning experiment

《北斗卫星导航系统的应用与实践》
实验指导书



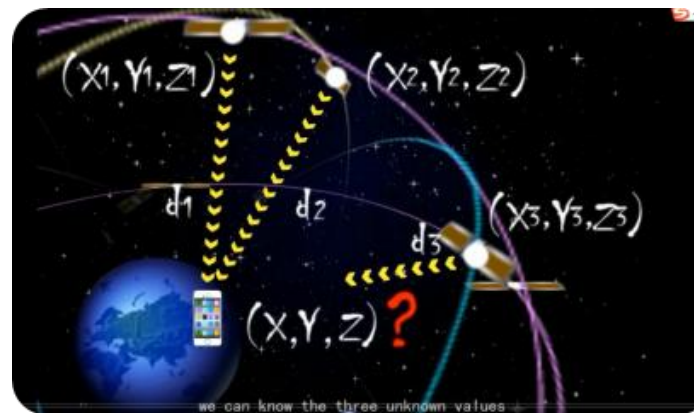
Students' feedback

This course let me know a lot about the frontier of navigation science and technology and the status quo of the country in this field. Every time after learning theoretical courses and doing experiments, I feel a lot of harvest and a sense of accomplishment. —Student L

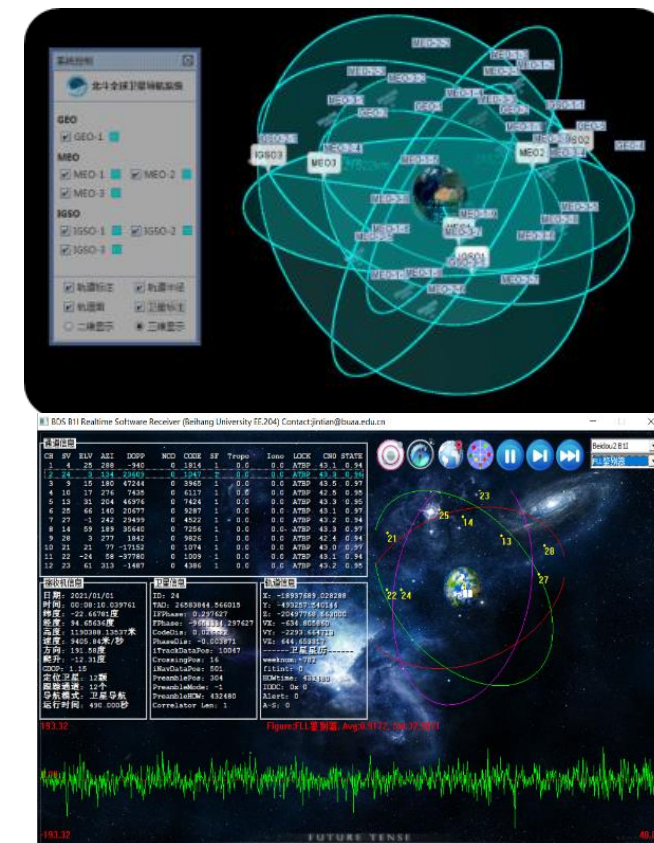
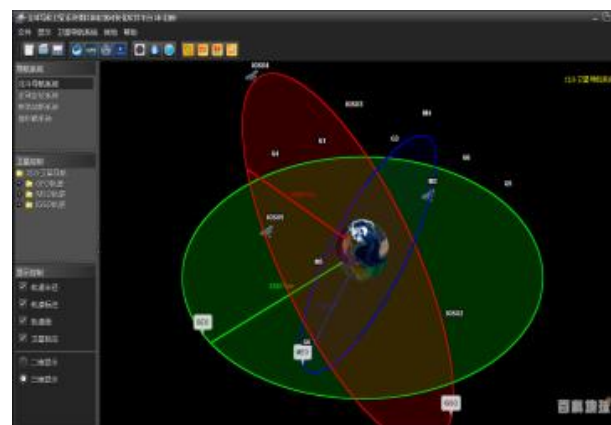
The teacher of theory course explained the development process and industrial application of Beidou in a simple and profound way. The content of the experimental course was very interesting, and I didn't feel enough. —Student W

Virtual Simulation Platform

❑ Improve the **visualization effect** of the existing satellite navigation experimental interface.



❑ Improve the **connection** between theoretical courses and hardware practice courses, and improve the teaching effect of the course.



Sharing MOOC and virtual simulation experiment platform among members



RCSSTEAP MASTA/DOCSTA
Programme

04

RCSSTEAP MASTA/DOCSTA Programme



Accepted applicants study at Beihang University /Center in last 5 years

Year	BeiDou /GNSS	RSGIS	Small Satellete Technology	Space Law/Policy	Space Science and Enviroiment	Space Technolgy Application	Total
	Master's Programme					Doctoral Programme	
2018	6	10	17	12	/	11	56
2019	12	15	11	/	/	10	48
2020	11	11	/	5	9	12	48
2021	6	8	11	/	/	9	34
2022	1	5	11	/	/	9	15

2023 Programmes will include GNSS,RSGIS, etc. The Announcement will be released in <http://rcssteap.buaa.edu.cn>

Major Procedures

Online Application Time:
Jan.1, - May 31, 2023

- All applicants recommended by our member states or cooperation parterns
- Material Review
- Online Interview
- Selected and appoved by a expert team according to participants's overall preformance