INTERNATIONAL RESEARCH CENTER OF BIG DATA
FOR SUSTAINABLE DEVELOPMENT GOALS
可持续发展大数据国际研究中心

SDGSAT-1: A Frontier Technology of TFM for Sustainable Development Goals

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February 10, 2022 Beijing, China

SDGs Challenge

SUSTAINABLE DEVELOPMENT GOALS

Sustainable Development
UN SDGs

Measuring Status & Progress

17 Goals

169 Targets

230+ Indicators

Tier I
supported by both methods and data — **53%**

Tier II
have methods but lack data — **46%**

Tier III
have neither standard methods nor data — **1%**

Technology Facilitation Mechanism (TFM)

TECHNOLOGY FACILITATION MECHANISM | SUSTAINABLE DEVELOPMENT GOALS

UNITED NATIONS INTERAGENCY TASK TEAM ON STI FOR THE SDGS (IATT)

10-MEMBER GROUP TO SUPPORT THE TECHNOLOGY FACILITATION MECHANISM

MULTI-STAKEHOLDER FORUM ON SCIENCE, TECHNOLOGY AND INNOVATION FOR THE SDGS (STI FORUM)

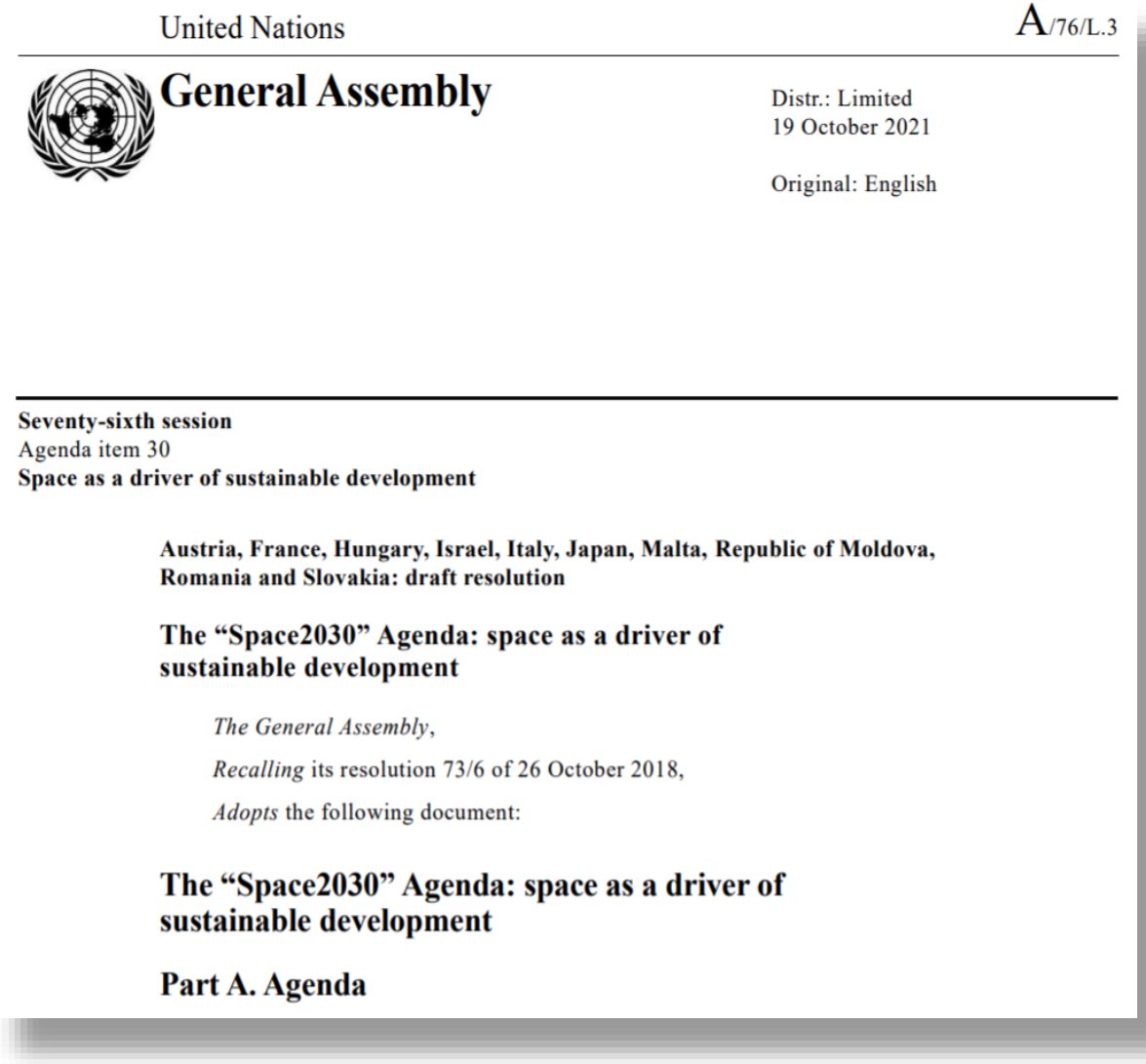
ONLINE PLATFORM (2030 Connect) - GATEWAY FOR INFORMATION ON EXISTING STI INITIATIVES, MECHANISMS AND PROGRAMS

“Space2030” Agenda

01 On Oct 25 2021, UN General Assembly Adopted the “Space2030” Agenda: space as a driver of sustainable development.

02 62 countries Sponsor the “Space2030” Agenda.

03 Four pillars: space economy, space society, space accessibility and space diplomacy.



United Nations A/76/L.3

General Assembly

Distr.: Limited
19 October 2021

Original: English

Seventy-sixth session
Agenda item 30
Space as a driver of sustainable development

Austria, France, Hungary, Israel, Italy, Japan, Malta, Republic of Moldova, Romania and Slovakia: draft resolution

The “Space2030” Agenda: space as a driver of sustainable development

The General Assembly,

Recalling its resolution 73/6 of 26 October 2018,

Adopts the following document:

The “Space2030” Agenda: space as a driver of sustainable development

Part A. Agenda

SDGSAT-1: The World's first Science Satellite for SDGs

SDGSAT-1 satellite was Launched on Nov. 5, 2021

SDGSAT-1
可持续发展科学卫星

- Thermal infrared + nighttime-light + multi-spectral
- Wide scale (300 km)
- High-resolution (10 m)

- *Explore new methods to sense Earth's environment*
- *Provide datasets for SDGs that representing interaction between human activities and natural environment*

Scientific Objectives

- Study/characterize the correlation and coupling of SDGs indicators representing the interaction between human activities and natural environment;
- Convert the Earth surface object parameters into SDGs application information (digital transformation);
- Monitor, evaluate and study of SDGs indicators introduced by human activities;
- Explore new methods and approaches to detect surface environmental elements under low-light conditions such as night light or moonlight.

Requirements-Driven Design

Monitor, evaluate and study of SDGs indicators that representing the interaction between human activities and natural environment

Requirements Analysis

- Artificial construction coverage status
- Consumption of Energy and power
- Urban functional area identifying
- Temperature field distribution
- Human settlement pattern,
- Intensity and concentration of human activities
- Water quality status
- Coastal ecosystems monitor
- Glacier changes and land creatures
- Offshore Water quality evaluation
- Port economic activity intensity
- Urban pollution at night
- snow and ice detection in polar night

Observing Parameters

- Night light intensity
- Night light distribution
- Night light index

- Thermal radiation intensity
- Water temperature
- Industrial heat source
- Heat source identifying

- Land cover/change
- Artificial construction
- Sediment concentration
- COD、Total P/N
- Blue algae, red tide

Technical Demand

- High spacial resolution
- High dynamic range
- Quantitatively detection
- Wide coverage

Night light detection—
Glimmer Imager

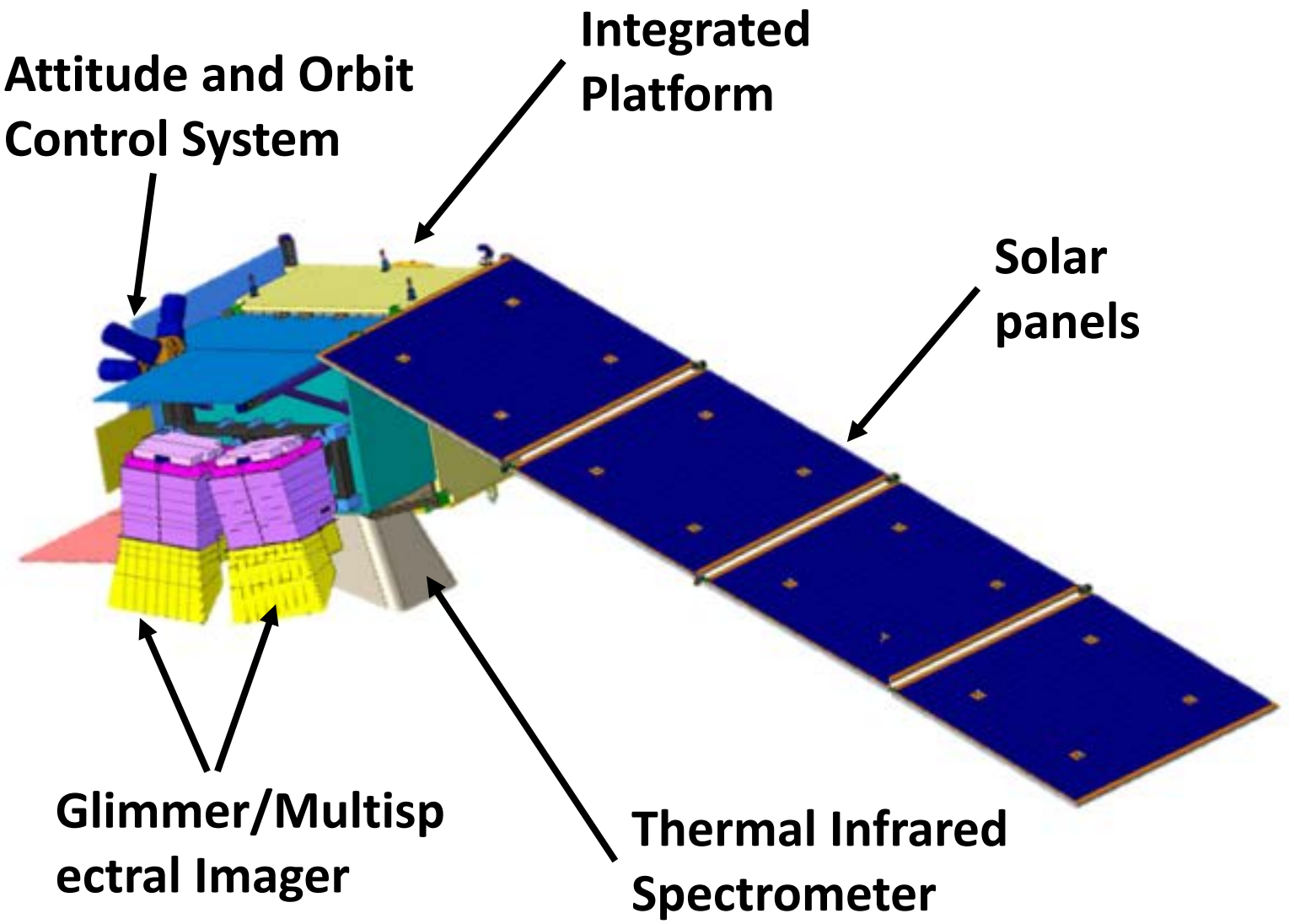
Thermal radiation detection—
Thermal Infrared Spectrometer

Earth surface/water detection—
Multispectral Imager

Overall Design

Innovational design

- Integrated design of satellite platform and payload systems;
- High sensitivity integrated design and high precision multi-mode control;
- Single solar panel wing with fixed angle of 30°;
- Multi-mode design of Glimmer/Multispectral Imager sharing optical path and switching imaging between night/day, ensuring synergetic observations in 24h.



Technical Specifications

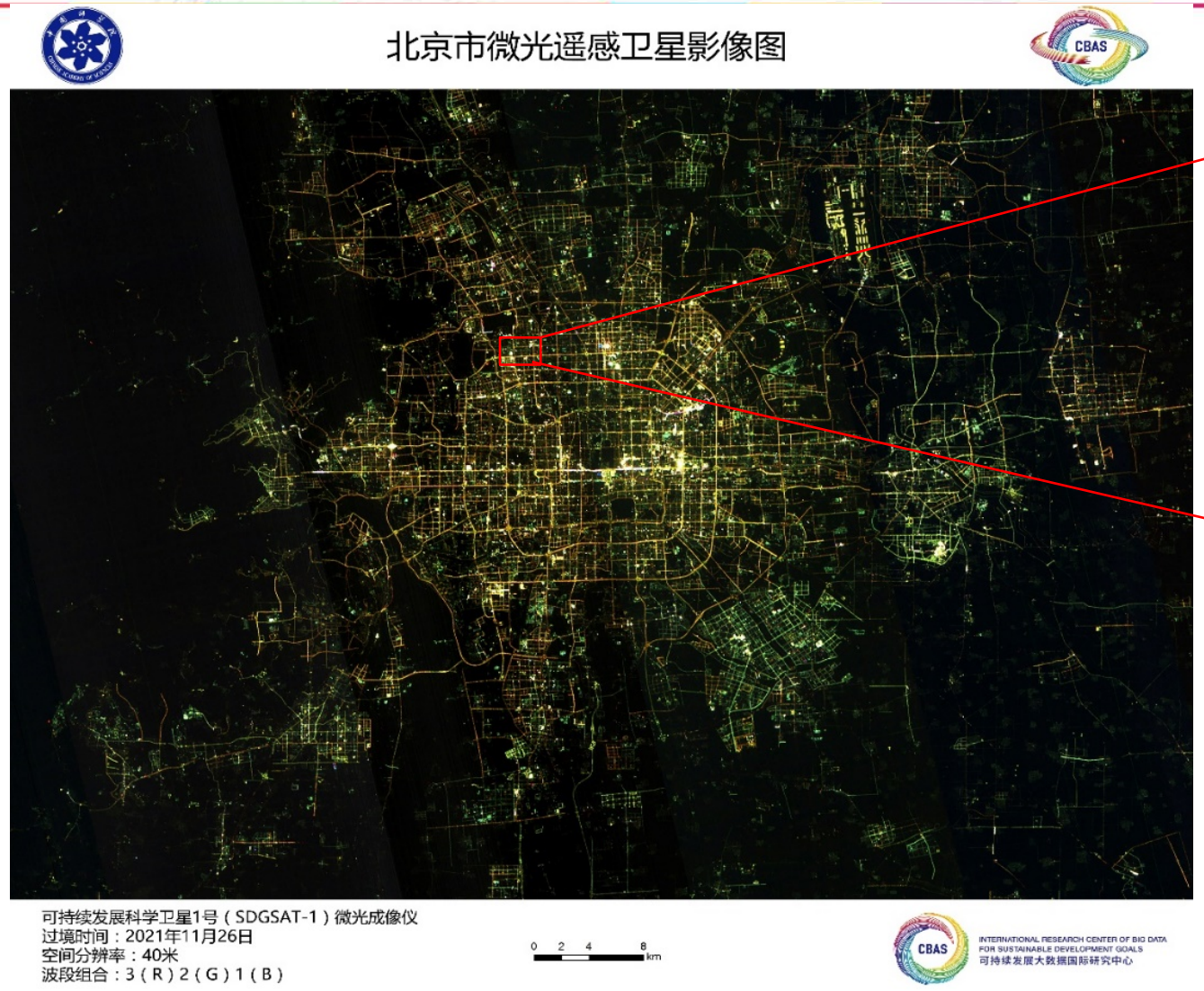
- Orbit altitude: 505km;
- Orbit inclination angle: 97.5°
- Spacial Resolution: 10m for Glimmer/Multispectral, 30m for Thermal Infrared.
- Data collect mode: Thermal Infrared + Glimmer (night); Thermal Infrared + Multispectral (day), and single sensor.
- Calibration Model: Moon, black body, LED lamp, etc., ensuring accurate quantitative detection.

Technical specifications of SDGSAT-1

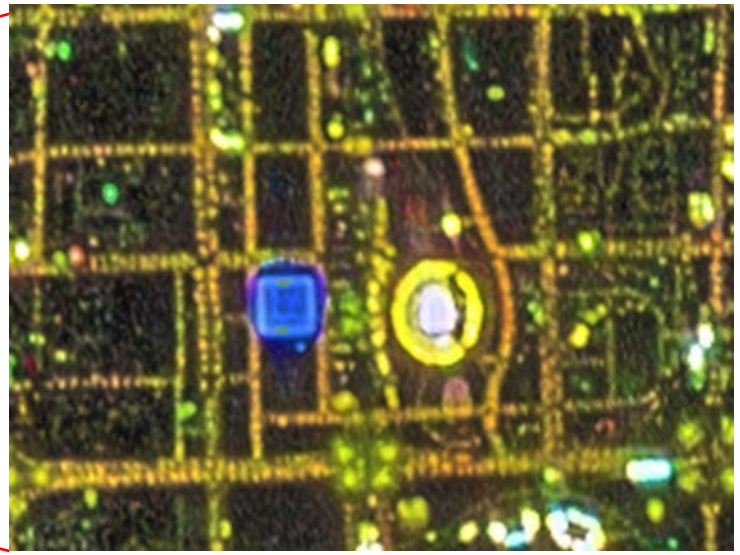
Type	Index	specifications
Orbit	Type	sun-synchronous
	Altitude	505 km
	Inclination	97.5°
Thermal Infrared Spectrometer	Swath Width	300 km
	Bands	8～10.5 μm 10.3～11.3 μm 11.5～12.5 μm
	Spatial Resolution	30 m
Glimmer/Multispectral Imager	Swath Width	300 km
	Bands/Glimmer	P：450～900 nm B：430～520 nm G：520～615 nm R：615～690 nm
	Resolution/Glimmer	P:10 m, RGB: 40 m
	Bands /Multispectral	B1：380nm～420 nm B2：420nm～460 nm B3：460nm～520 nm B4：520nm～600 nm B5：630nm～690 nm B6：765nm～805 nm B7：805nm～900 nm
	Resolution/Multispectral	10 m

Test in Satellite Launch Site

First set of images Released on Dec. 20th, 2021



Colored Glimmer image of Beijing/ 40m



Bird Nest & Water Cube

- Urban layout, road network, building, true color scene at night can be clearly displayed;
- Water Cube(blue), neon light(red), road light(yellow) can be clearly identified.

北京市微光遥感卫星影像图

可持续发展科学卫星1号（SDGSAT-1）微光成像仪
过境时间：2021年11月26日
空间分辨率：10米
波段：全色

0 2 4 8 km

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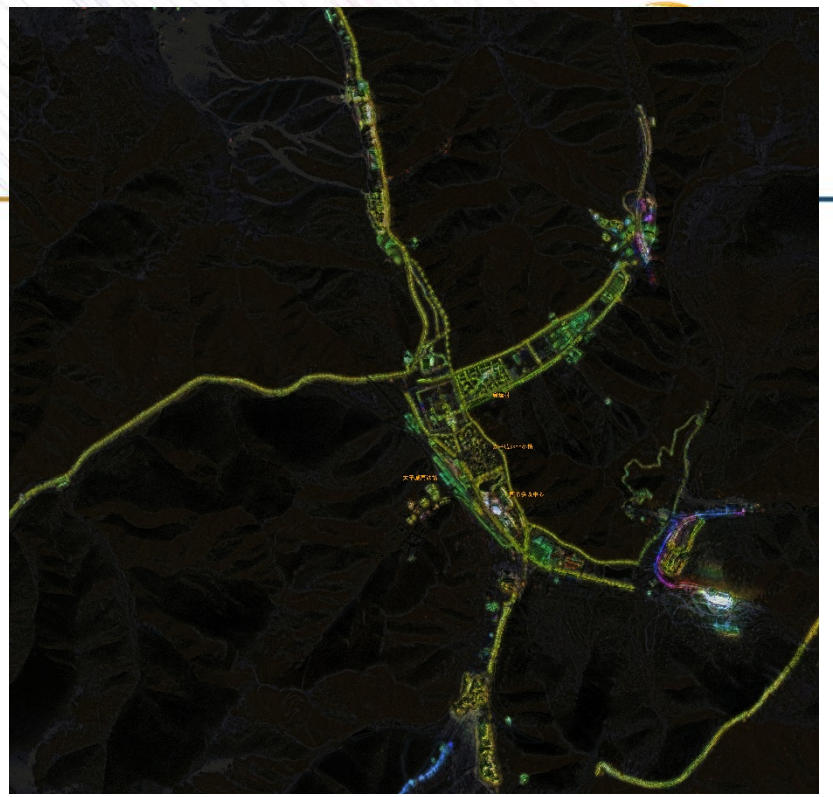
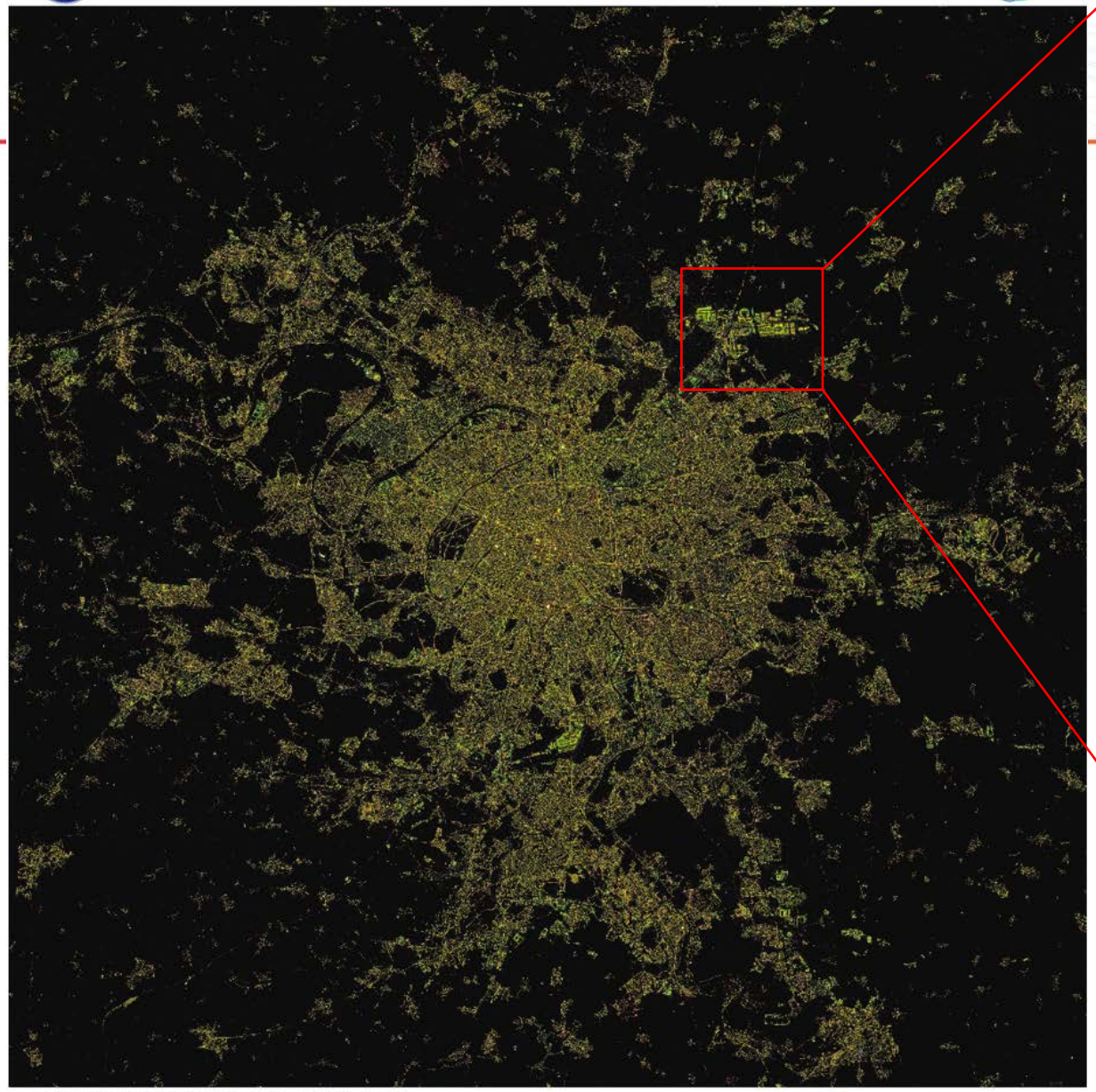


Olympic Winter Games Beijing 2022：Zhangjiakou Zone

Panchromatic Glimmer Image of Beijing/10m

巴黎市微光遥感卫星影像图



可持续发展科学卫星1号（SDGSAT-1）微光成像仪
过境时间：2021年11月6日
空间分辨率：40米
波段组合：3（R）2（G）1（B）

0 2.5 5 10 km

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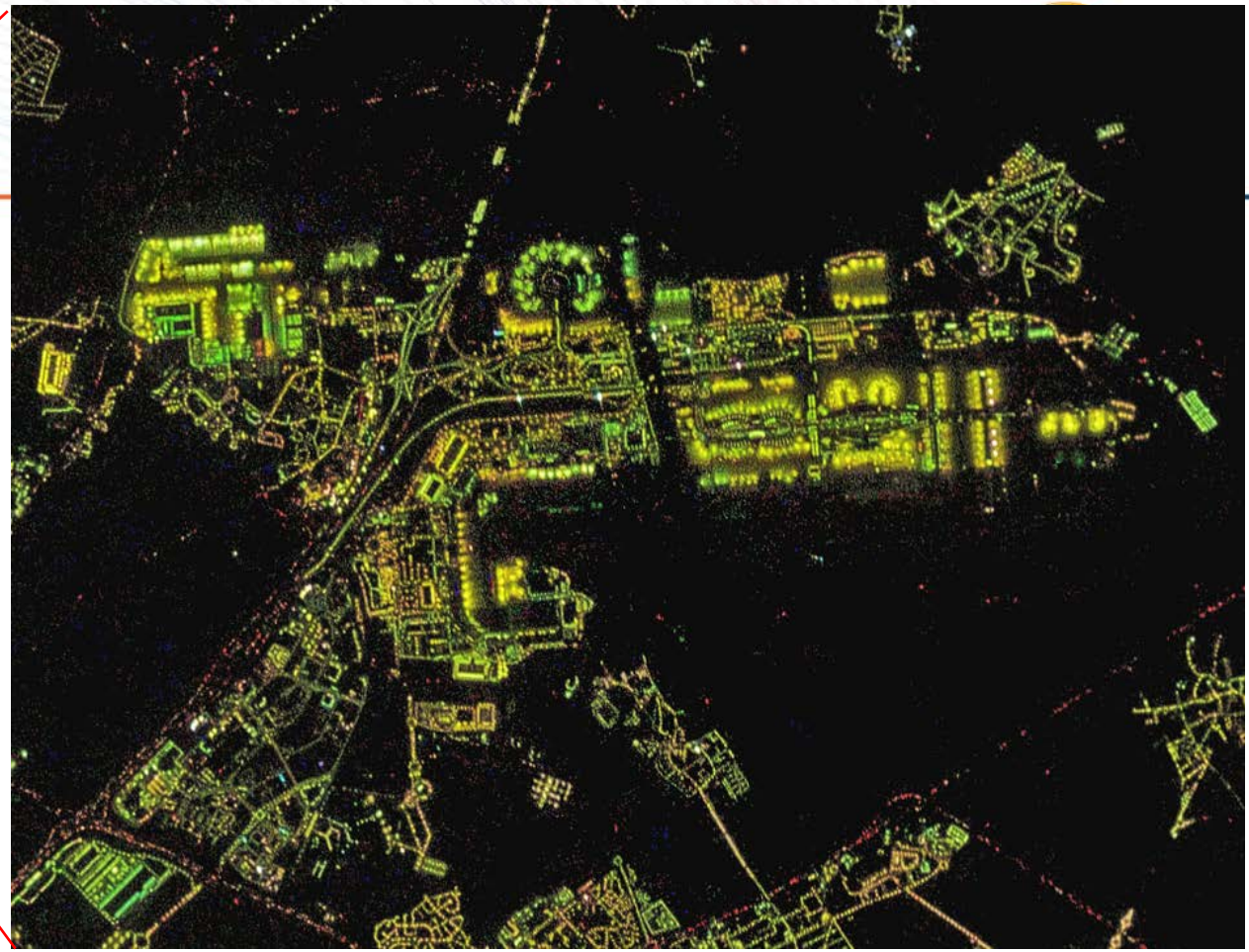

Charles de Gaulle Airport

Fused Colored Glimmer image of Pairs /10m

山东胶州湾多谱段遥感卫星影像图

可持续发展科学卫星1号（SDGSAT-1）多谱段成像仪
过境时间：2021年11月12日
空间分辨率：10米
波段组合：5（R）4（G）3（B）

0 1 2 4 km

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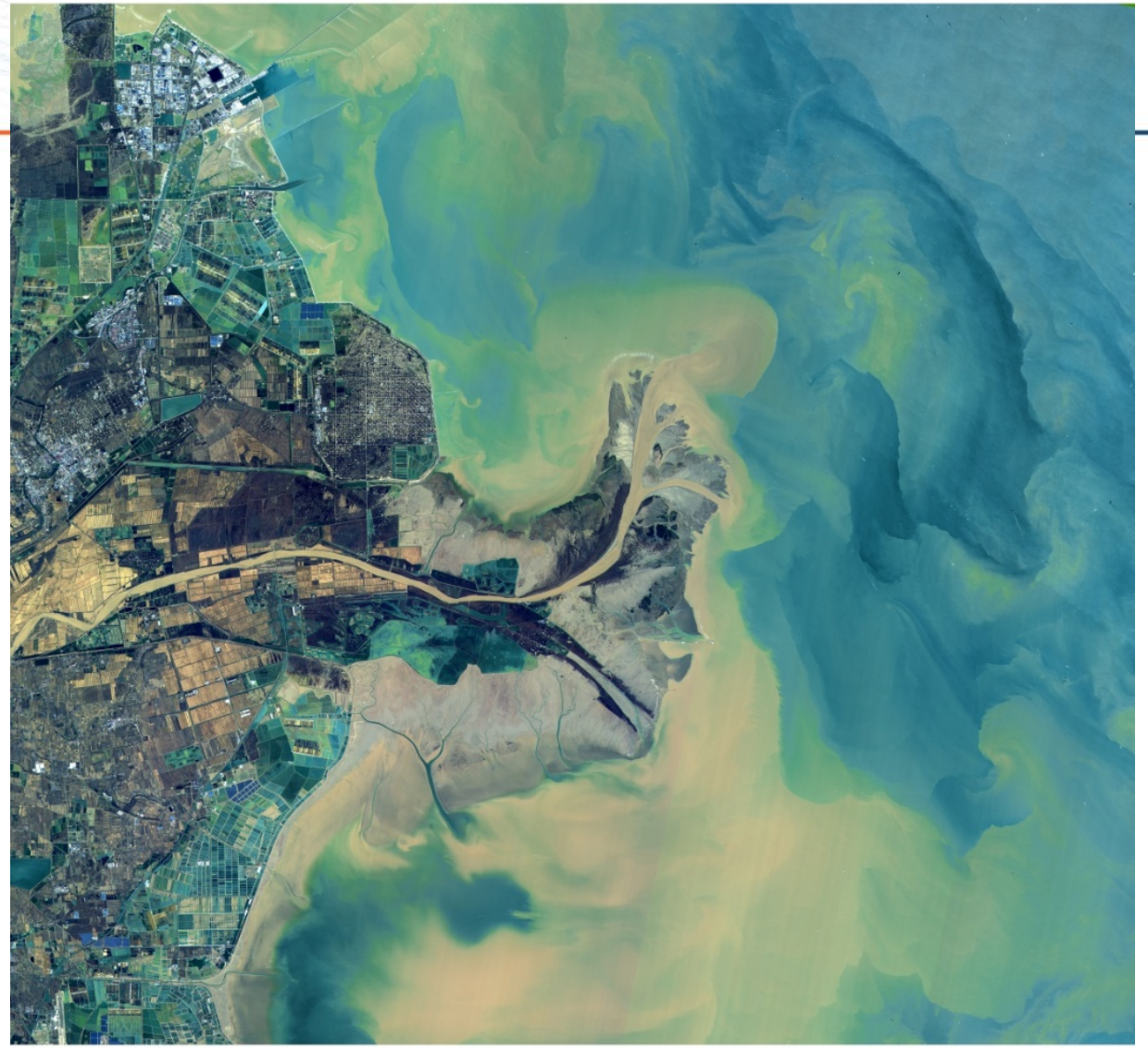
Multispectral image of JiaoZhou Bay, Qingdao.

黄河入海口多谱段遥感卫星影像图



可持续发展科学卫星1号（SDGSAT-1）多谱段成像仪
过境时间：2021年11月12日
空间分辨率：10米
波段组合：5（R）4（G）3（B）

0 2 4 8 km

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Multispectral image of entry of Yellow River/10m

CBAS:International Research Center of Big Data for SDGs

CBAS

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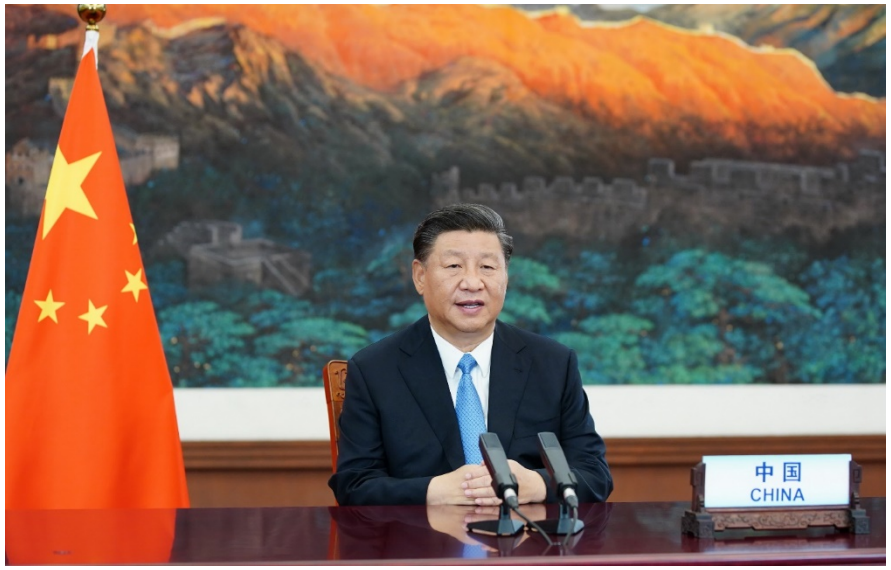
President Xi and UN SG's Congratulatory Letter to CBAS's Launch



The sci-tech innovation and application of big data will help the international community to overcome difficulties and implement the UN 2030 Agenda globally.

-- President Xi's congratulatory letter

This Research Centre will work side-by-side with the Regional Hub for Big Data to support the UN Global Platform. Together, we can do more to end poverty, protect the planet and promote peace.

-- UN Secretary-General António Guterres' video message

Congratulations on International Research Center of Big Data for SDGs

Liu Zhenmin
UN Under-Secretary-General for UN DESA

Inger Andersen
UN Under-Secretary-General and Executive Director of UNEP

Ibrahim Thiaw
UN Under-Secretary-General and Executive Secretary of UNCCD

FBAS

可持续发展大数据国际论坛
International Forum on Big Data for Sustainable Development Goals

A research team with extensive capacity

33 CAS Institute

96 Participating Organization

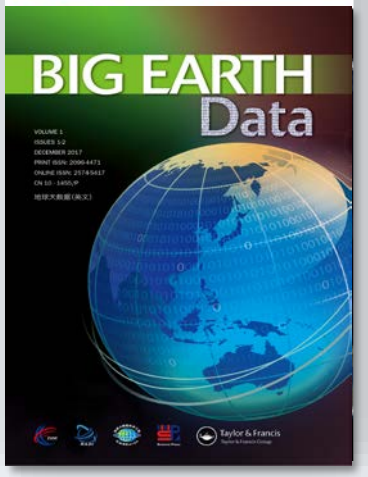
>1200 Scientist

CBAS Vision

Vision

The Center provides a range of services essential for **addressing** the most **challenging problems** such as **lack of data** and **technology barriers** in the implementation of the **SDGs**, including data sharing, technology solutions, decision-making support, as well as capacity building for developing countries.

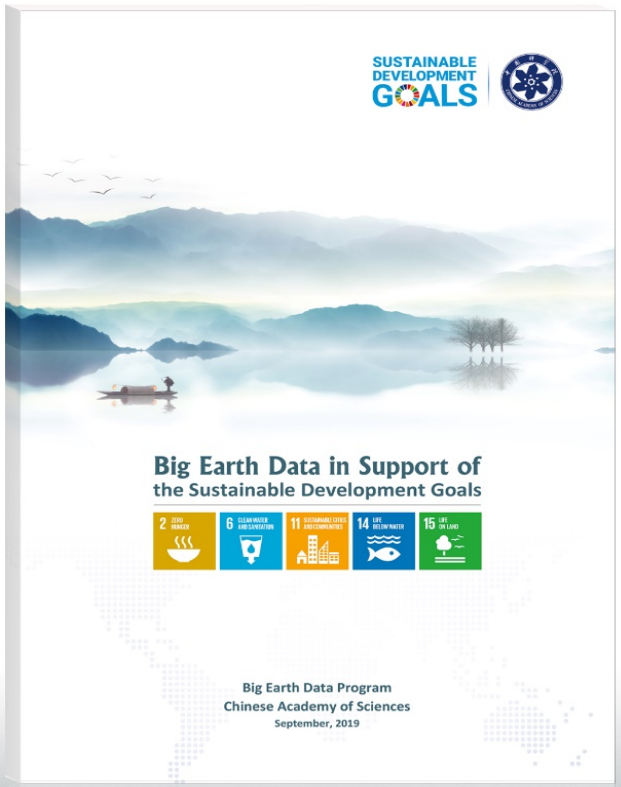
CBAS Key Missions

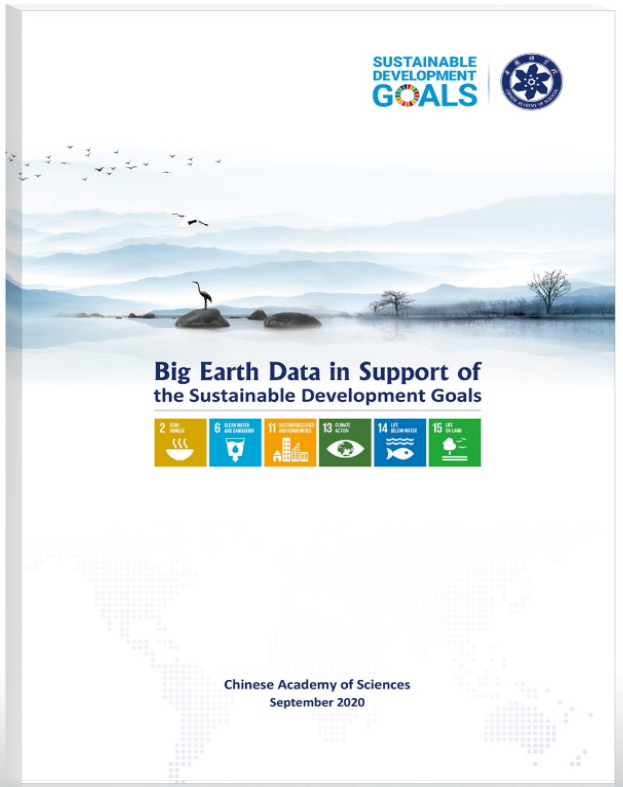


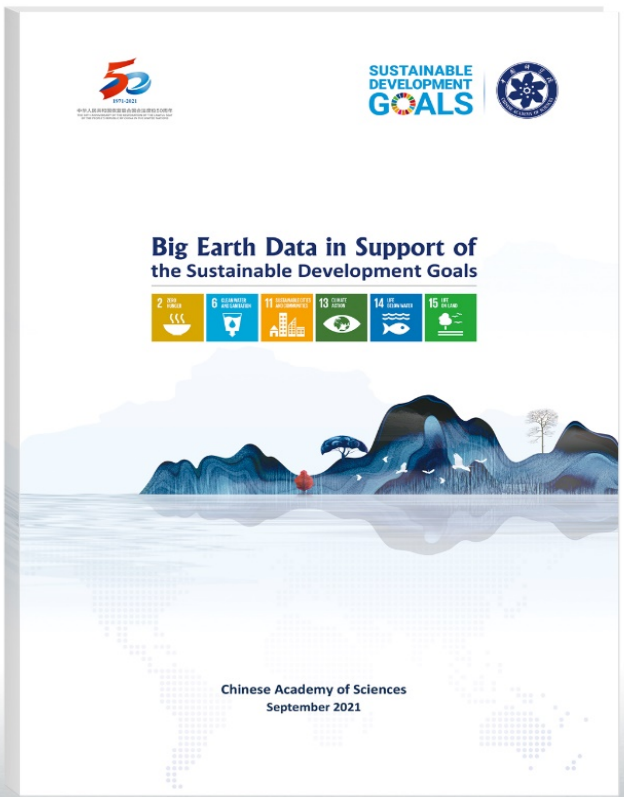
- Develop SDG **data infrastructure and information products**
- Provide new **knowledges** for SDG monitoring and evaluations
- Develop and launch **a series of SDG Satellites**
- Establish a **think tank** for STI to promote SDGs
- **Capacity development** for SDGs in developing countries

The Reports on SDGs

Chinese government released reports at the 74th , 75th and 76th UN GA







Achieve SDGs with the Key of Big Data Together

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THANKS

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