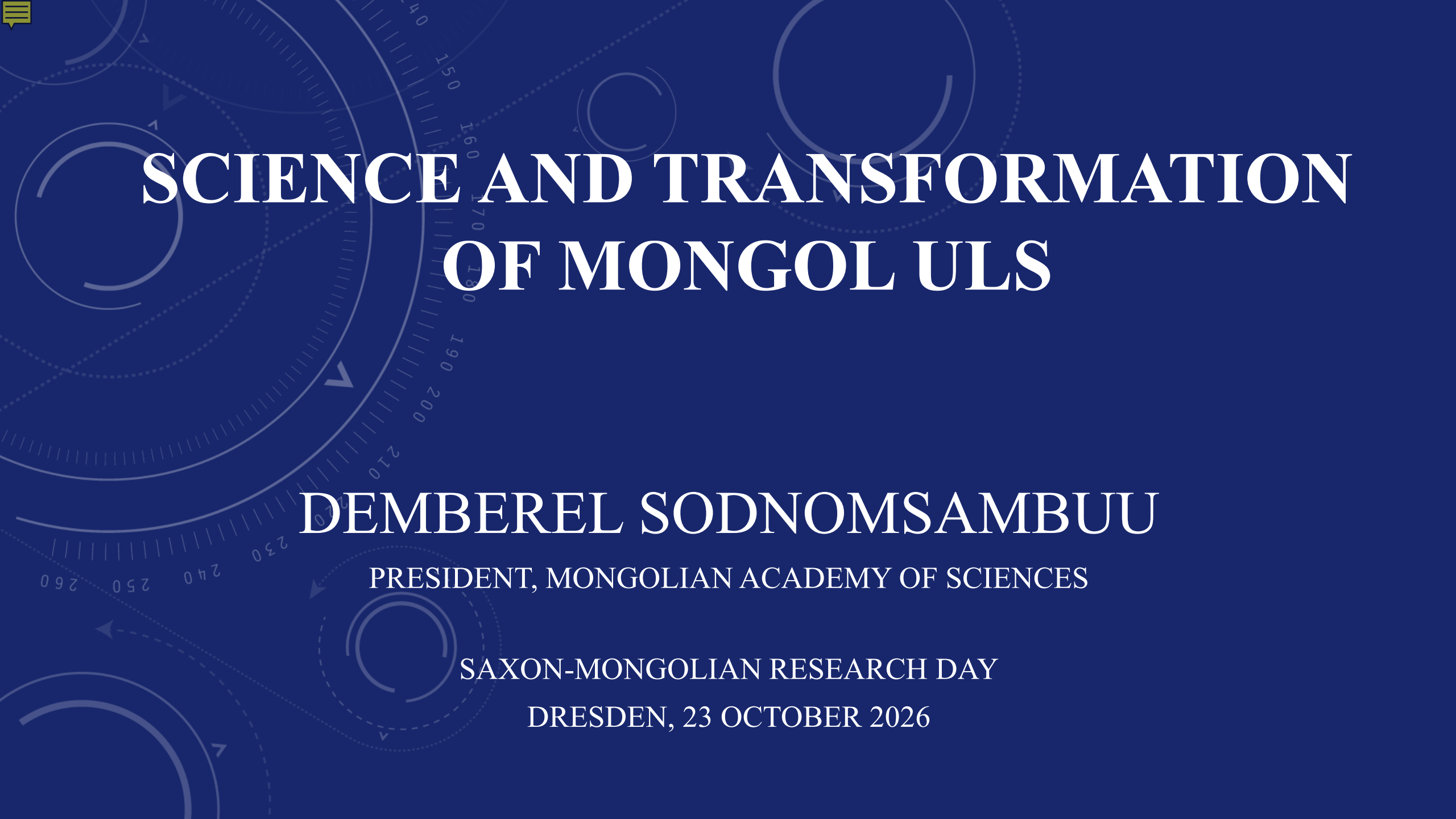




SCIENCE AND TRANSFORMATION OF MONGOL ULS

DEMBEREL SODNOMSAMBUU

PRESIDENT, MONGOLIAN ACADEMY OF SCIENCES

SAXON-MONGOLIAN RESEARCH DAY

DRESDEN, 23 OCTOBER 2026

OVERVIEW OF THE TALK

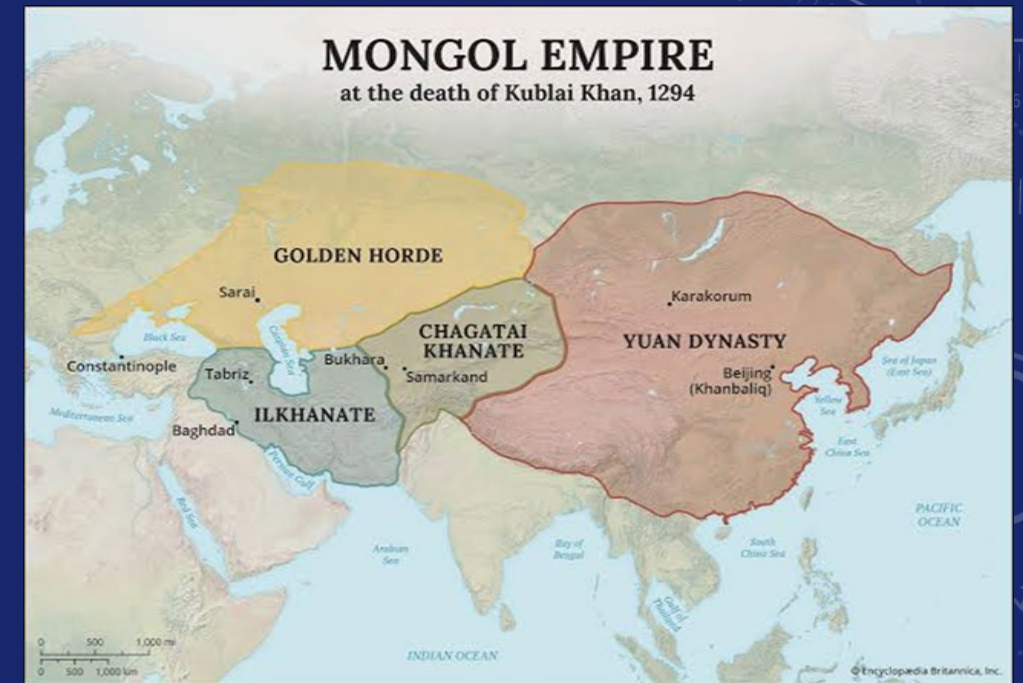


- Mongol Empire and scientific knowledge & technology
- Development of the Mongolian Academy of Sciences (MAS) and science, technology and innovation (STI)
- MAS through complex transition to democratic society and market economy



Mongol Empire and scientific knowledge & technology

- Chinggis Khan unified the nomadic tribes in 1206, laying foundation of Mongolian statehood and the Mongol Empire.
- The Mongols were military conquerors, but they played an important role in creating scientific knowledge and transferring technology.





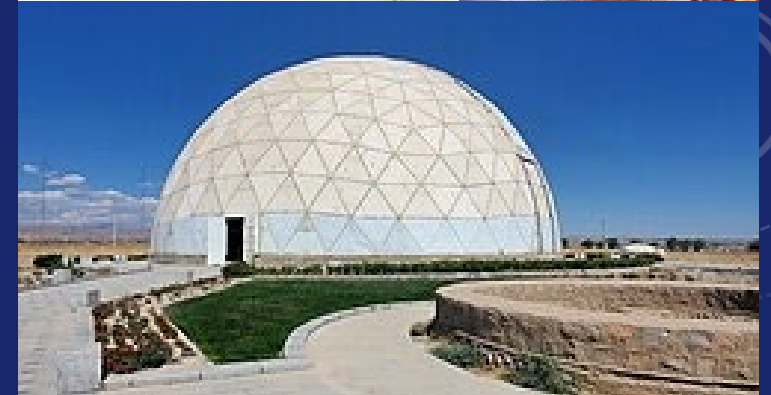
Mongol Empire and scientific knowledge & technology

Mongols set up research centers, supported institutions:

- Khubilai Khan restored Hanlin Academy in 1261, founded Academy of Scholarly Worthies in 1281.

East-West exchange of new inventions:

- Muslims brought astronomical instruments (a wooden terrestrial globe) to Khubilai Khan in 1267. He established the Institute of Muslim Astronomy in 1271.
- Maragaheh astronomical observatory established in the mid 13th century in Iran by the Ilkhanate Hulegu, grandson of Chingis Khan.



Mongol Empire and scientific knowledge & technology



Organized highly efficient armies. Famously known the decimal system.

Postal system and experimented with paper money.

Developed military communication and intelligence network Örtöö or checkpoint. Established by Genghis Khan and expanded by his successor, Ögedei Khan, in 1234.



Brief History of the MAS



13th century

Academy of Scholarly
Worthies

Institute of Script
and Literature

1921



Судар бичгийн хүрээлэнгийн анхны байр



1961

The Mongolian
Academy of Sciences

Current structure
of the MAS

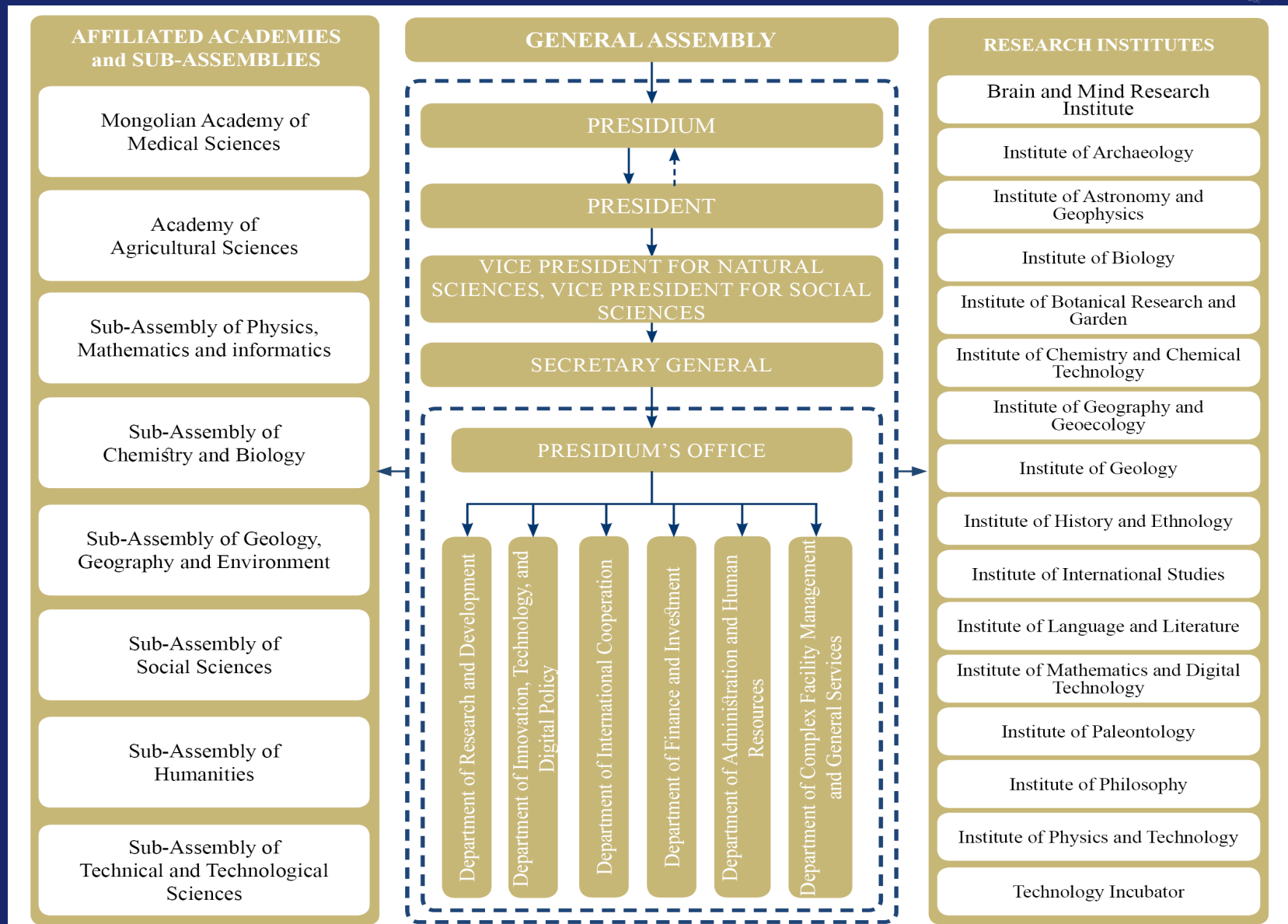
2022



2026

New complex of the MAS
opens Dec. 03, 2026

Current structure of the MAS



Science foundation and challenges in Mongolia

FOUNDATIONS (Pre-1990s)

Focus: Basic Scientific research

Key Institutions: Mongolian Academy of Sciences

Funding: Fully financed by government

Challenges: Limited International collaboration

TRANSITIONAL PERIOD (1990s-2000s)

Focus: Reform of science in post socialist era

Key steps: Restructure of the MAS, new Universities,
research centers, private sector engagement

Challenges: Low R&D investment, brain drain

MODERN DEVELOPMENT (2010s-Present)

Focus: Innovation-driven economy, STI policy framework

Key Institutions: MAS, Universities, Private R&D

Funding: Mixed-government (mostly), international, private (low)

Key policies: National STI strategy and International collaborations

Challenges: Low market output of research and tech transfer
Limited human capital in advanced R&D

LAWS AND REGULATIONS



- ✓ Law on Science and Technology (2006, 2012, 2024)
- ✓ Law on the Legal Status of the Academy of Sciences (1996, 2006)
- ✓ The Law on Technology transfer (2006)
- ✓ The Law on Innovation (2012, 2014)
- ✓ The Law on Patent (1998, 2006, 2015)
- ✓ The State policy on Innovation (2017) and others.

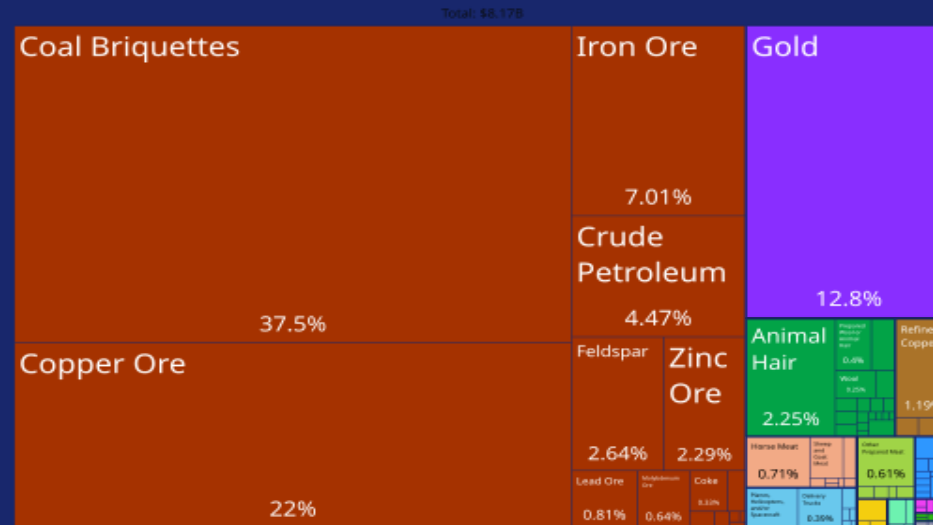
MAS during transition

Mongolia is experiencing a triple transitions all at once:

Democratic society



Market economy



Global autonomy



Science Lens: to overcome triple transition our country needs science-based policy governance driven by data

MAS during transition

Reorienting the Economy: actions toward innovation and market output

- The Government of Mongolia has identified 14 infrastructure and industry related Mega-projects aimed at transforming the nation's economy.
- These projects encompass various sectors, including energy, mining, transportation, and urban development.

4

The hydroelectric power station at the “Eg” river



8

Mongolian-French joint uranium and nuclear power plant



9

The coal-chemical complex



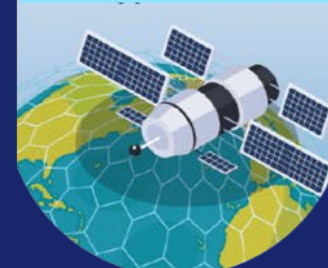
10

The copper processing complex



14

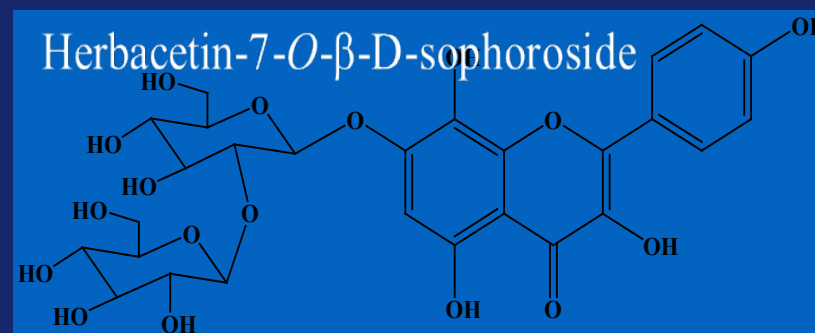
The national satellite project



MAS during transition

Reorienting the Economy: actions toward innovation and market output

- Modernizing Agriculture: Integrating biotechnology, nanotechnology, and genetic engineering to produce high-value livestock and resilient, climate-adapted crops.
 - Orkhon sheep for fine wool breeds
 - Climate resilient wheat variety
 - Biochemical/biotechnological studies of medicinal plants
- Established remote sensing and AI/machine learning labs alongside regional cloud networks under the Institute of Mathematics and Digital Technology.

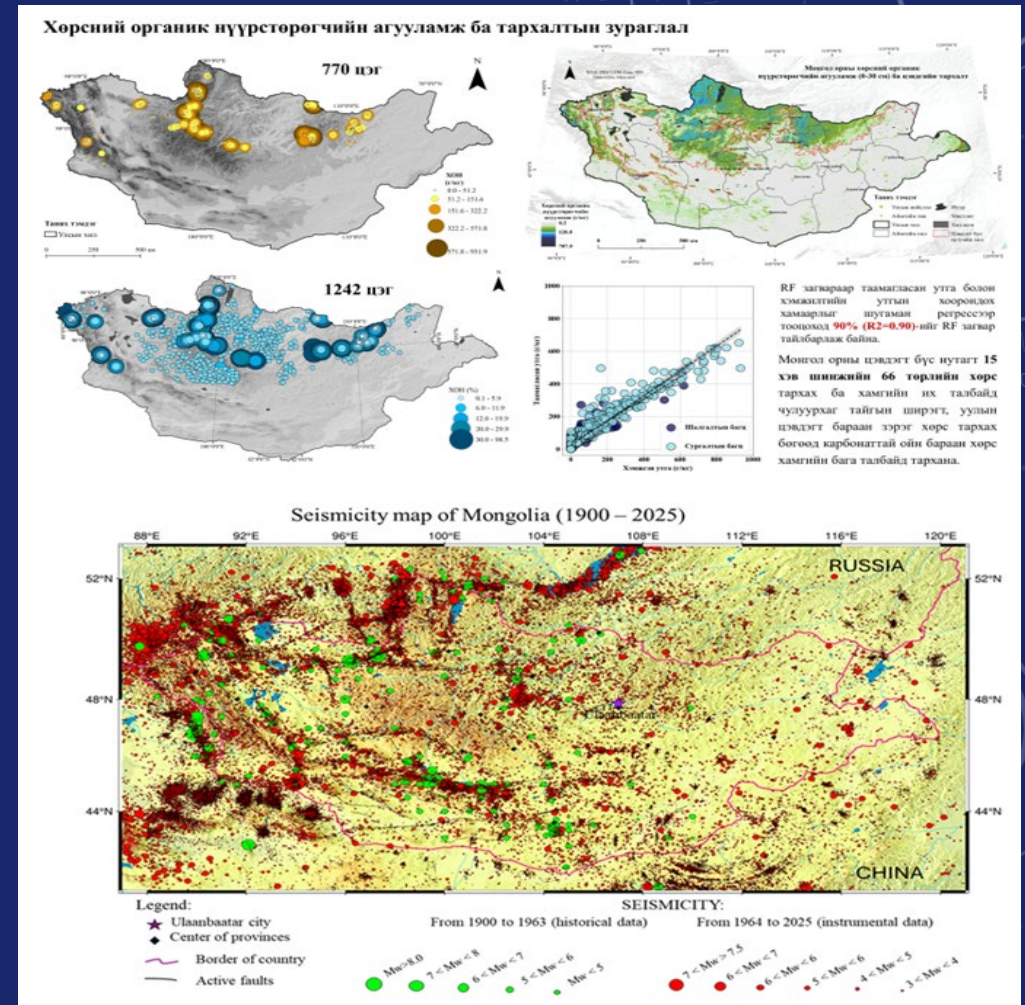


To date, approximately 120 new compounds have been discovered

MAS during transition

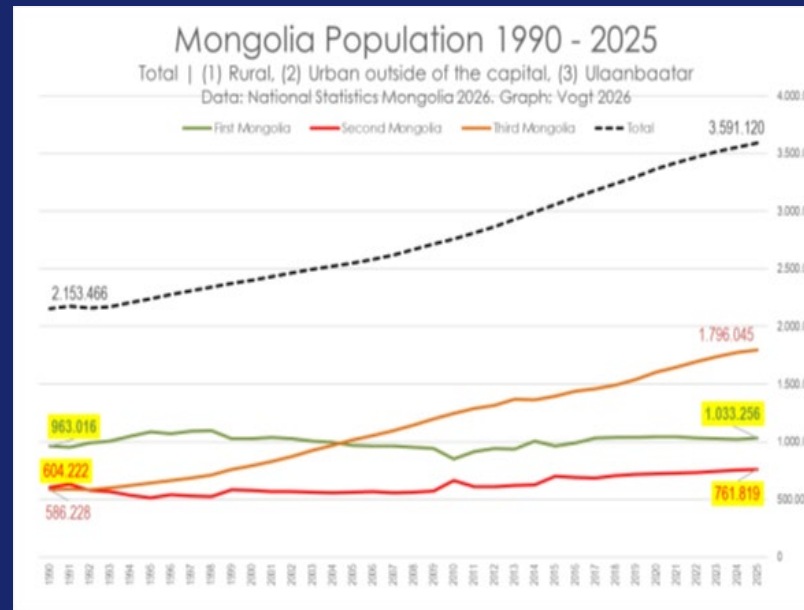
Reorienting the Economy: actions toward innovation and market output

- Map of Mongolia's Soil Organic Carbon developed by Institutes of Geophysics and of Geography and Geo-ecology
- Seismicity map developed by Institute Astronomy and Geophysics. Green-recorded before 1960s, red-mid 1960s-2025



MAS during transition

Balancing Ancient Heritage with Rapid Urbanization

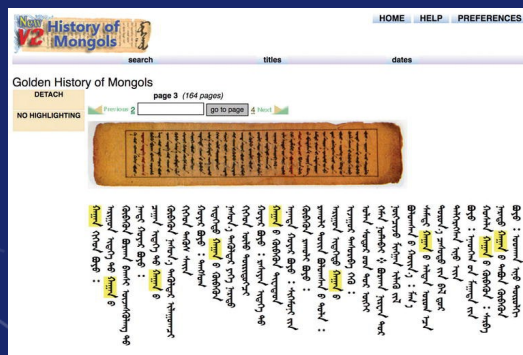


MAS during transition

Balancing Ancient Heritage with Rapid Urbanization

Digitally archiving

MAS Institutes actively archiving digitally linguistic data, historical chronicles, and nomadic folklore to inform education systems that protect Mongolian identity in a globalized era.



The Secret History of Mongolia

Scholars conducted a comprehensive detailed analysis of this book and its various translations. This work culminated in a scholarly English translation (publicly accessible) that provides an authoritative resource for the study of Mongolia's history and culture.



The Orkhon Valley Cultural Monument, a UNESCO World Heritage site, preserves archaeological remains representing all periods of human history and culture beginning with the Middle Paleolithic period, dating back at least 58,000–62,000 years."



Balancing Ancient Heritage with Rapid Urbanization

Kharakhorum was the ancient capital of the Mongol Empire, located in the Orkhon Valley.



Mongolia launched urban development program known as “New Kharkhorum”



MAS during transition

Cultivating Human Capital and Geopolitical Ties



EDUCATIONAL PHILOSOPHY

**Learning through Research,
Creating Knowledge,
Advancing Innovation,
and Contributing to the
Sustainable Development of Mongolia.**

RESEARCH COURSEWORK

70%

30%

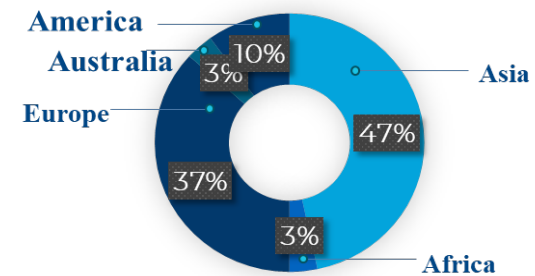
Cultivating Human Capital and Geopolitical Ties



United States
Australia
Austria
Belarus
Bulgaria
Brazil
United Kingdom
Vietnam
Germany

Iran
Kazakhstan
Canada
Kyrgyzstan
Kuwait
Nepal
Russia
South Africa
South Korea

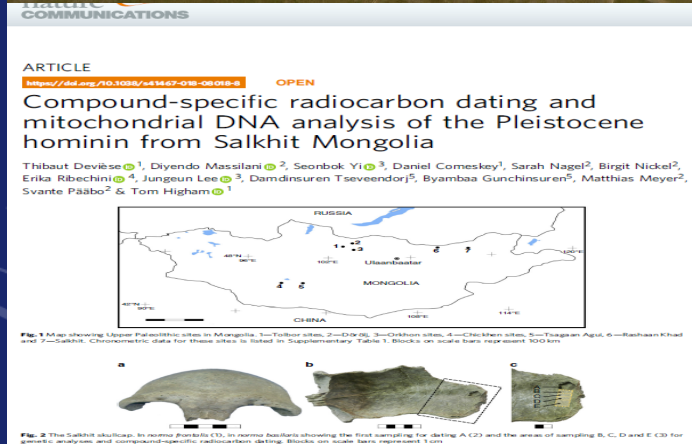
Poland
Slovakia
Turkey
Uzbekistan
Ukraine
Hungary
North Korea
China
France
Czech republic



Cultivating Human Capital and Geopolitical Ties

Key: sustainable scientific collaboration with real outputs and further grant developments

Joint research between the MAS
and German Institutes in the past



Exciting research opportunities:

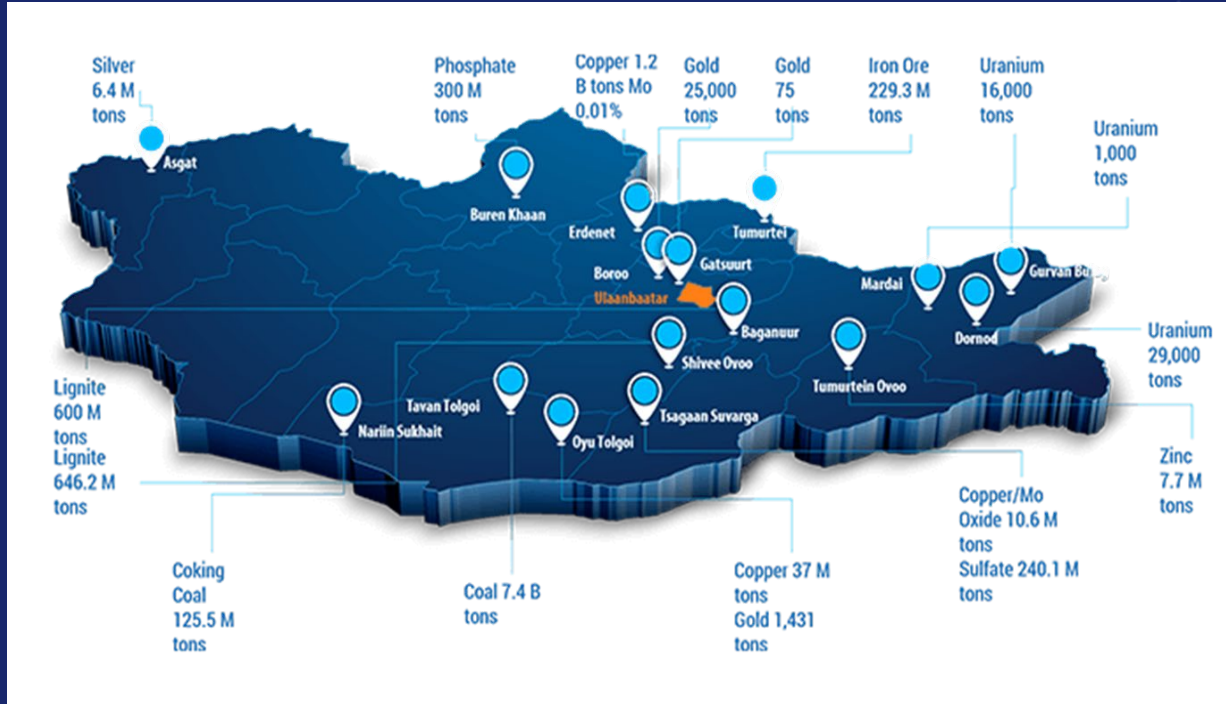
Archaeology & Cultural Heritage

Biodiversity and biotechnology

Artificial Intelligence & Digital Technology

Chemical & Environmental Engineering

Physics, Geology & Geography :



Science as the Engine of Vision 2050

STI Policy 2021–2030, Vision 2050: Developing an internationally competitive national science, technology, and innovation system.



- Develop science and technology as one of the main factors for the country's sustainable development and create an efficient national innovation system



- Create a system for bringing national science and innovation to the global market



Thank you for your attention...

