

Introduction of Computational Earth&Space Science Center @ Zhejiang Lab

March 31, 2026



Location of Zhejiang Lab Hangzhou, Zhejiang

- Hangzhou—renowned as “the paradise city” of China, famous for its silk and tea
- Hangzhou is also the birthplace of many of China’s leading tech innovators.
- **AI: Qwen, Deepseek @ Hangzhou**



■ “AI + Science” : Practices of Open Science

- Build Public Technological Products: **The Science Foundation Model**、**GeoGPT**、**OneAstronomy**、Promote Global Open Scientific Cooperation through the Construction of the **"Three-Body Computing Constellation"**
- Participate in Global Science and Technology Governance: Establish the **GeoGPT Governance Committee** and Participate in the Development of **International Standards**

~220 full-time employee

AI+Astronomy

- 1、 OneAstronomy(Model)
- 2、 OneSpace(Platform)
- 3、 GOTTA
(@ UNESCO science decade)

AI+Geoscience

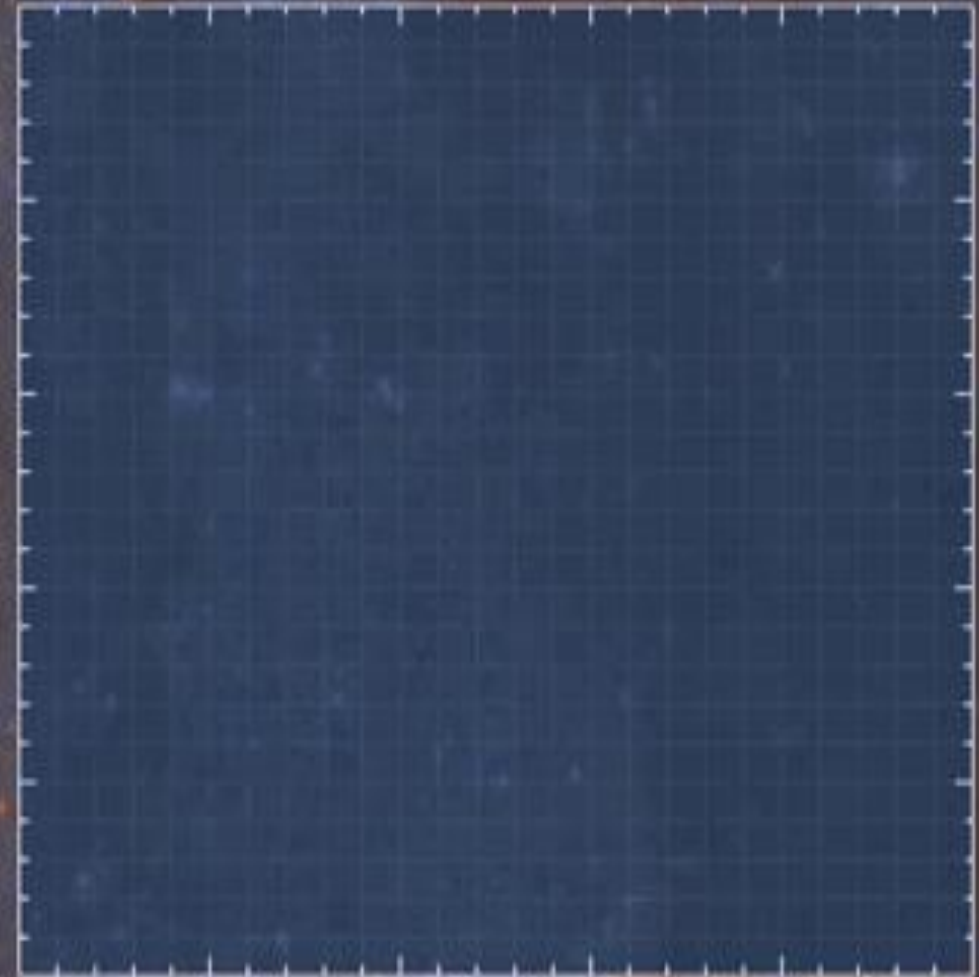
- 1、 GeoGPT (Model)
- 2、 OneEarth (Platform)

Why We Choose Astronomy:

Astronomy is one of the most suitable fields for building a domain-specific foundation model

- Massive data, low SNR, and rare discoveries
- Strong multimodality, yet homologous data sources
- Statistical inference rather than directly experiments
- Long historical archives and future enormous observation

Brightness

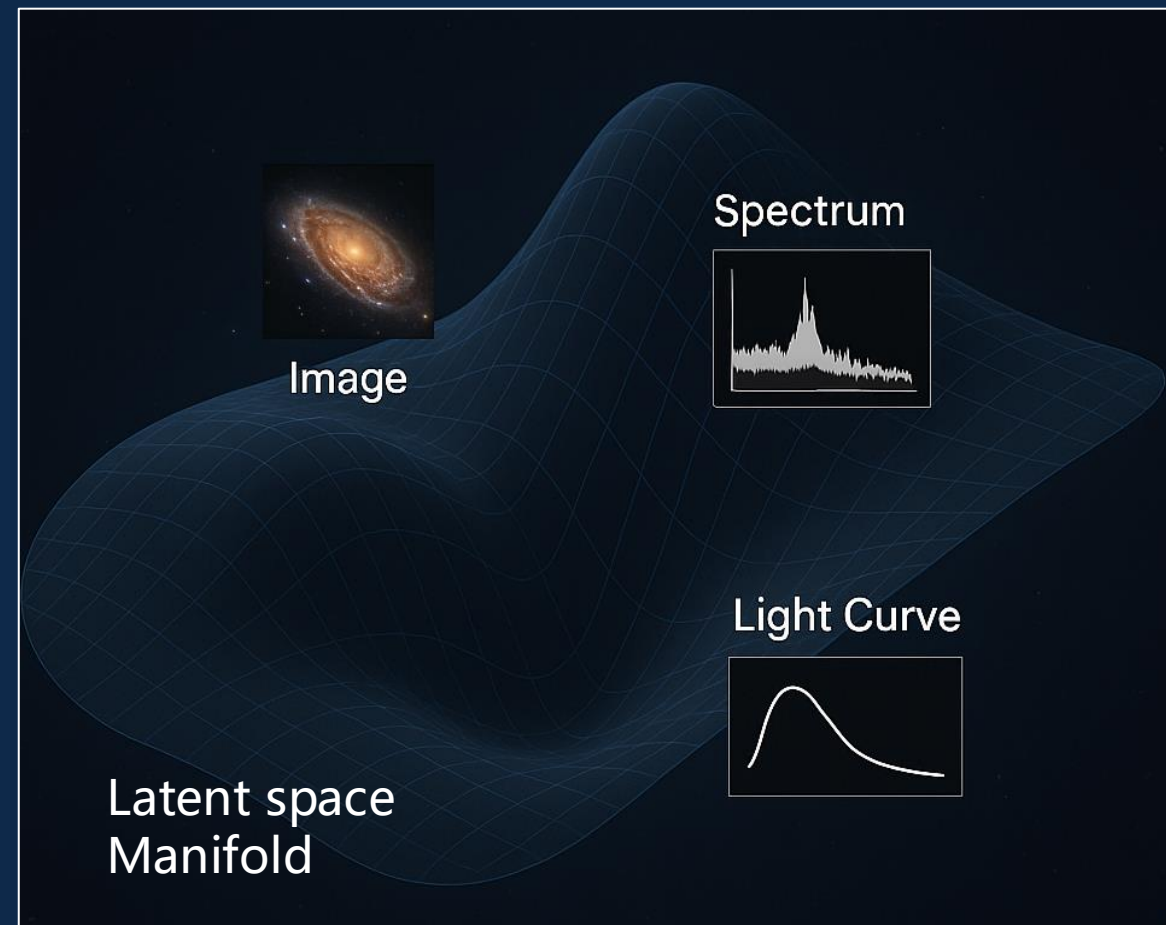


Time

The Universe Does Not Speak Human Language



Symbols organized by **grammar**



Symbols organized by **physical laws**

100y ago, Hubble decoded the universe: The universe is expanding.

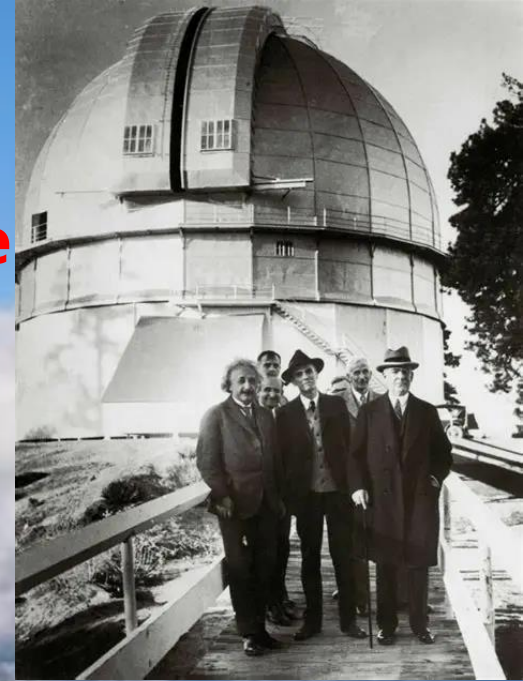
He combined image, spectrum and Light curve
—— “embedding data in the brain”



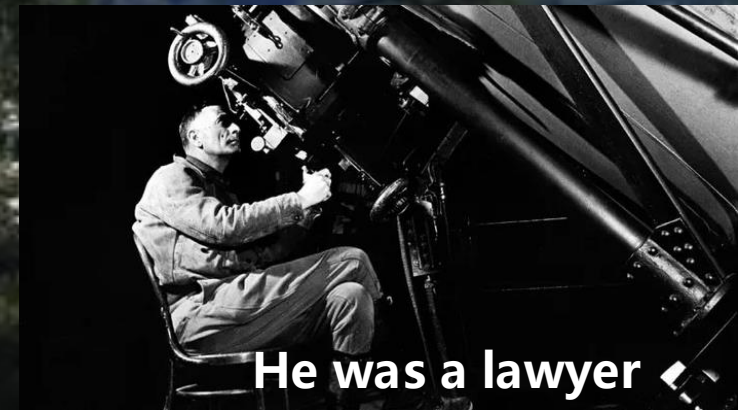
Yerkes Observatory
The Great Nebula *M*31 (N.G.C. 224) in Andromeda

The small nebula almost directly over the centre is the companion nebula *M*32 (N.G.C. 221)

M31, beyond
the Milk Way.



Wilson Observotary @ LA

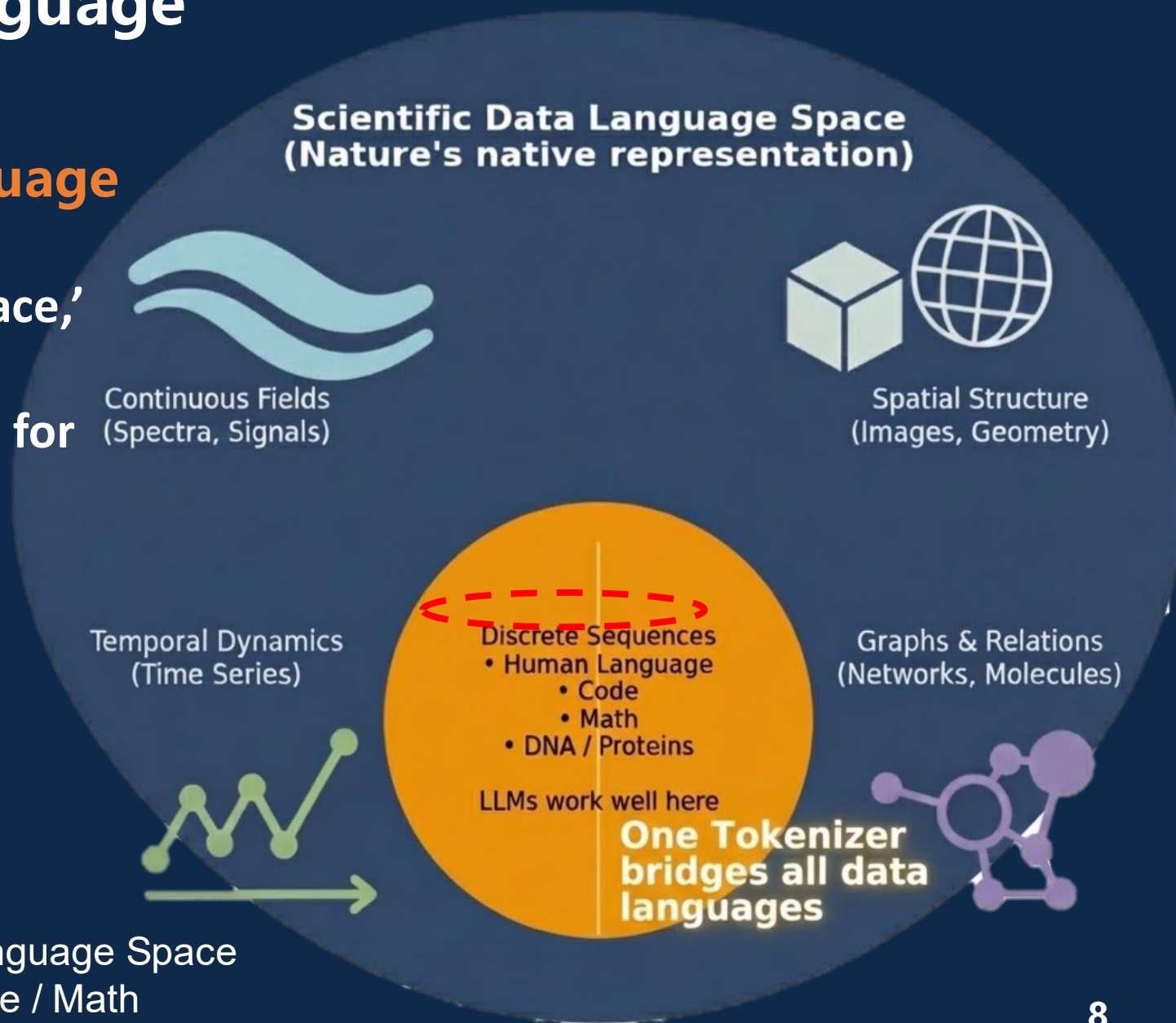


He was a lawyer ◀

Science Is More Than Language

Human Language $\neq$ Nature Language

- Science exists in the 'data-language space,'
- Human language is merely an interface for understanding the world.



- Big circle: Scientific Data Language Space
- Small circle: Language / Code / Math

Science Language in Astronomy and Geoscience

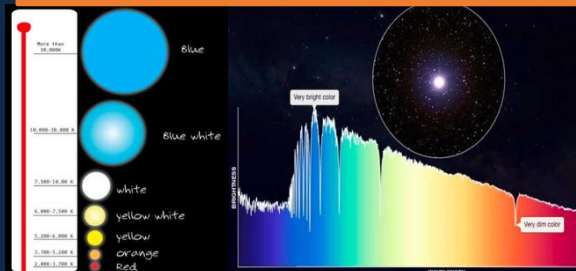
- Astronomy: Image, Spectrum, Light curve, GW

- Geoscience: 75% of information is not in textual form

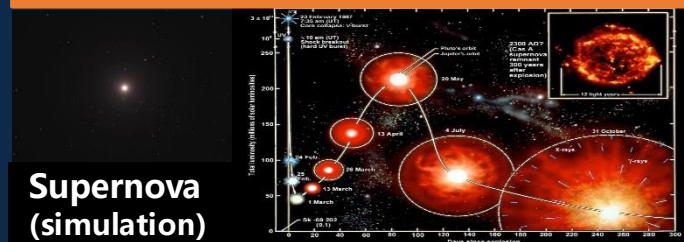
Image



Spectrum

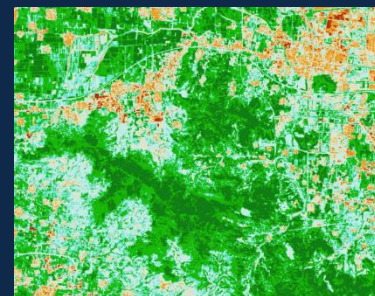


Light curve

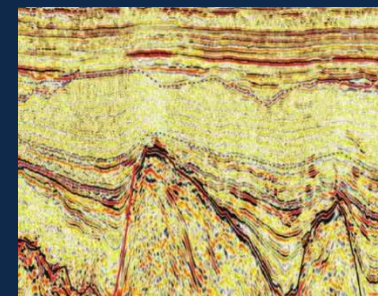


Supernova (simulation)

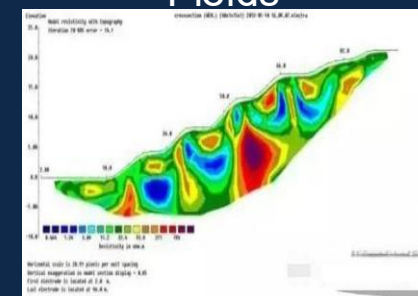
Spectrum



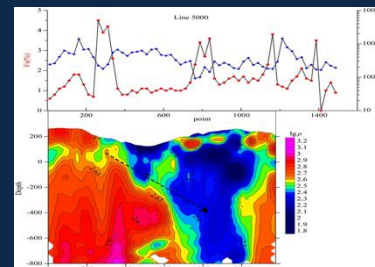
Acoustic Waves



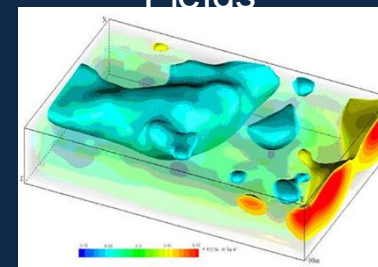
Electric Potential Fields



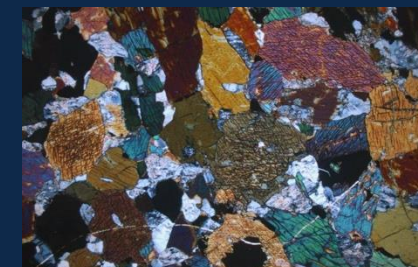
Magnetic Fields



Gravitational Fields



Geological Elements



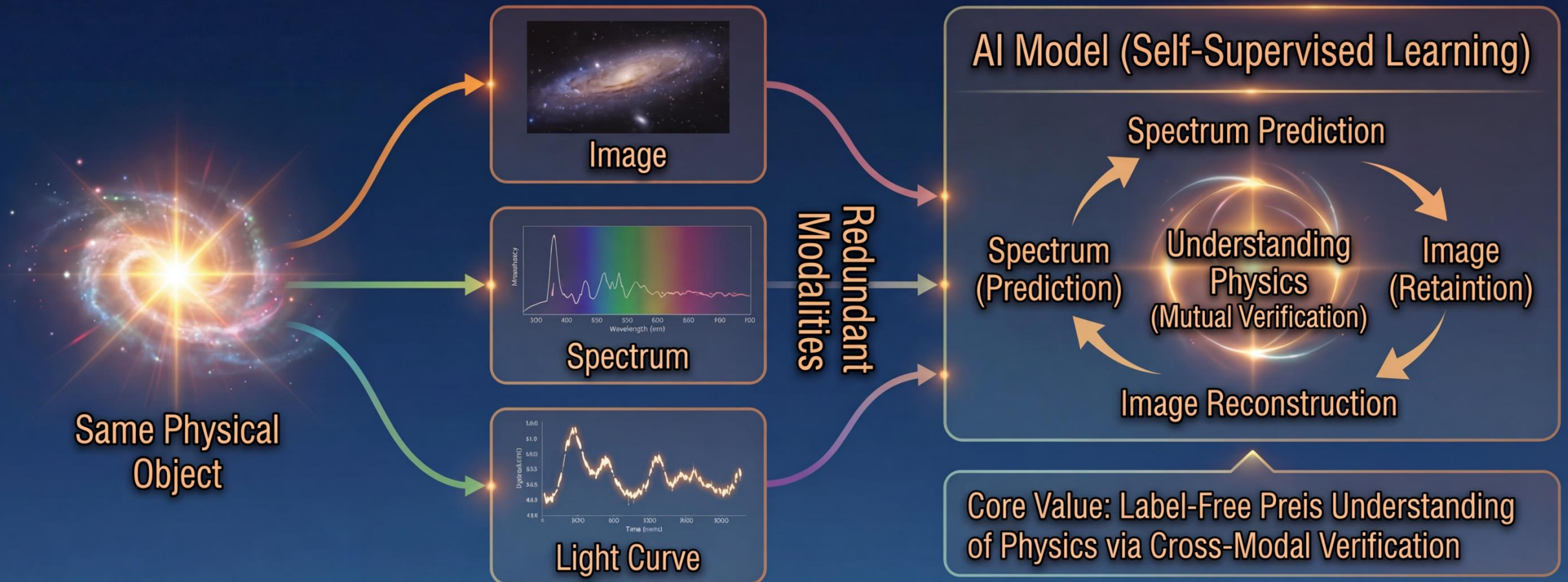
Multimodal “data language” understanding is the key

What We Do: Astronomy & Geoscience Foundation Model

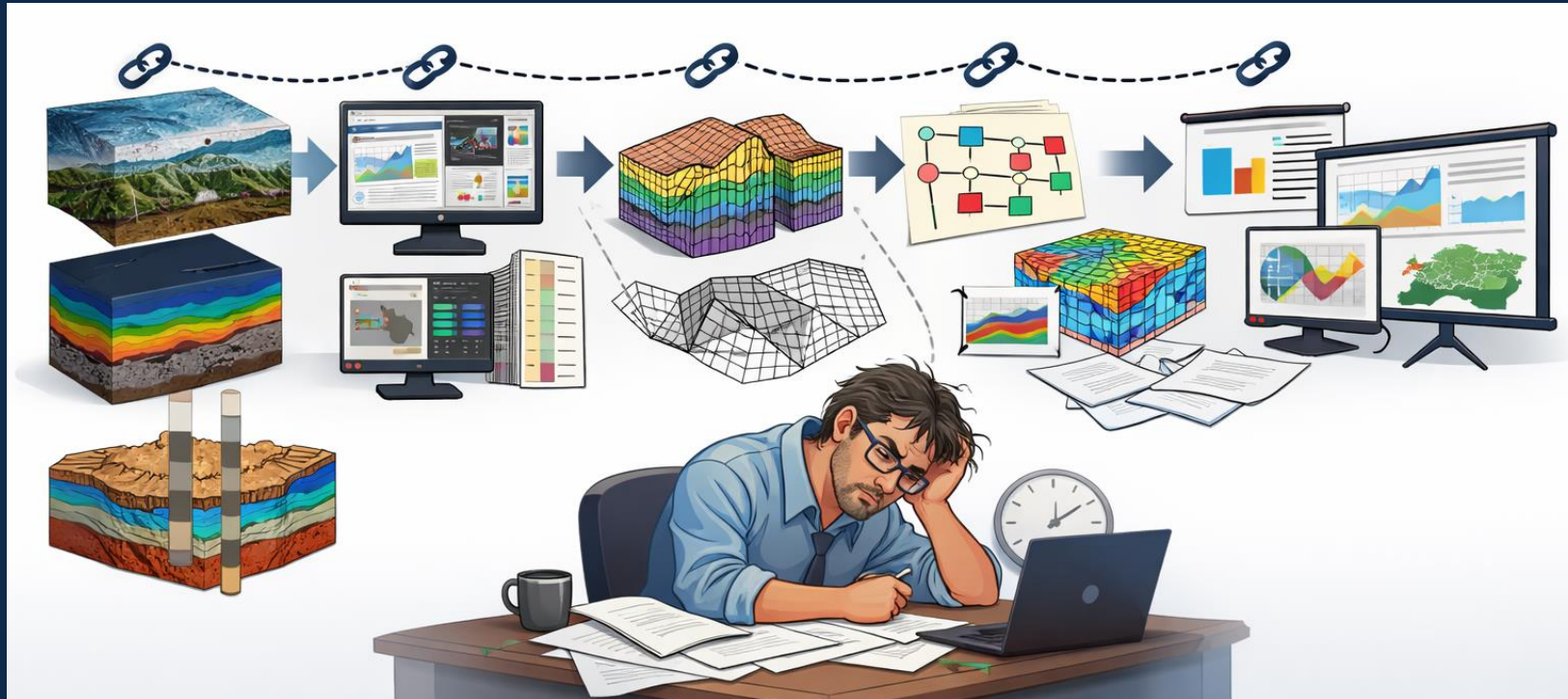


Astronomy's Data Redundancy: Key to Self-Supervised AI

Overlapping Modalities enabling AI to understand Physics



We Also Need Platforms



Powerful tools, but isolated — every step from raw data to final deliverable still needs hands-on experts

Join Us

- Share open data and skills
- Join application for funding
- Large-model seed program
- Scientific workshop

A wide-angle photograph of a desert landscape at night. The foreground is a sandy, undulating dune area. In the middle ground, several jagged, dark rock formations rise from the sand. The sky is a deep, dark blue, filled with countless stars. A prominent, bright, and colorful band of the Milky Way galaxy stretches diagonally across the sky, from the upper left towards the lower right. The colors of the Milky Way range from pale blue to bright white and yellow. In the far distance, on the right side, two small, dark silhouettes of people are visible standing on a ridge, looking up at the sky.

Thanks