

# Helix Nebula, the Science Cloud

**Results and Engagement**  
**ESRIN, 16 January 2013**

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On behalf of Helix Nebula Consortium

# Helix Nebula, the Science Cloud initiative

is a **Partnership**

born from a **Vision**

# Vision

- In 2020, **all scientists** of all disciplines will choose the Helix Nebula Infrastructure as their **first option** to store, access, process & analyse data
- It will contain **vast quantities of data, open source tools**, and a literally infinite amount of computing power accessible and usable from any kind of computer, smart phone or tablet device.



# Vision

- **Science** will make significant progresses by applying **data sharing** and **interdisciplinary research** using this infrastructure as the fundamental tool.
- This infrastructure will have such a **reliability** and **worldwide recognition** for its implemented security/privacy scheme that also commercial companies will be using this "high security area" to derive patents.

# Key Objective

- The European Research Area shall drive the development and implementation of a **secure and globally recognised European Cloud Computing Infrastructure**, initially targeting science users. This infrastructure will become **THE** platform for Europe, under public governance, ensuring **open standard** and **interoperability** and adhering to **European policies, norms and requirements**.

# Strategic Plan for a Scientific Cloud Computing infrastructure for Europe



1.1

8<sup>th</sup> August 2011

1. Set up a **sustainable multi-tenant cloud computing infrastructure** in Europe, initially based on the needs of the European Research Area & Space agencies
2. Identify and adopt **policies** for trust, security and privacy on a European-level
3. Create a light-weight **governance** structure involving all stakeholders
4. Define a short and medium term **funding** scheme

## Contacts

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**To make this happen,  
we created  
Helix Nebula, the Science Cloud  
Partnership**

# Partnership – Why?

- The **scale and complexity** of services needed to satisfy the foreseen needs of Europe's IT-intense scientific research & space organisations are beyond what can be provided by **any single company** and will require the collaboration of a variety of service providers and SMEs.
- By partnering with Science and Space Organizations, it shall cover most, if not all, of the needs of a public Cloud infrastructure.

# Partnership – Why?

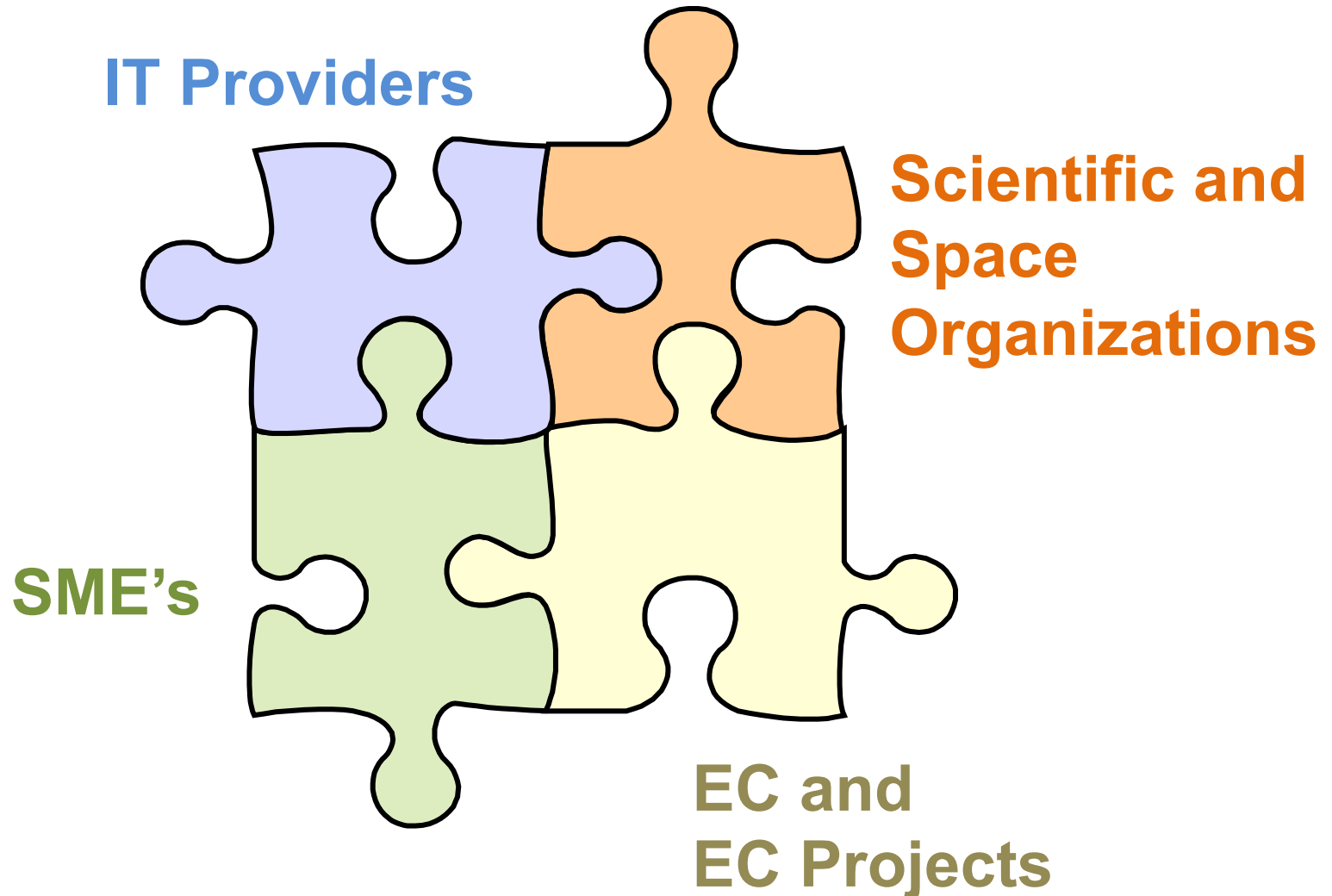
We, European R&D labs and space agencies, T-Com and IT industry, SMEs, EC projects want to **break out the loop** :

No “technology” → No need → No interest

We are the **Game Changers**:

We build the “technology”, show that it’s needed and creates interest

# Partnership – Who?



# Partnership – How?

## IT Providers

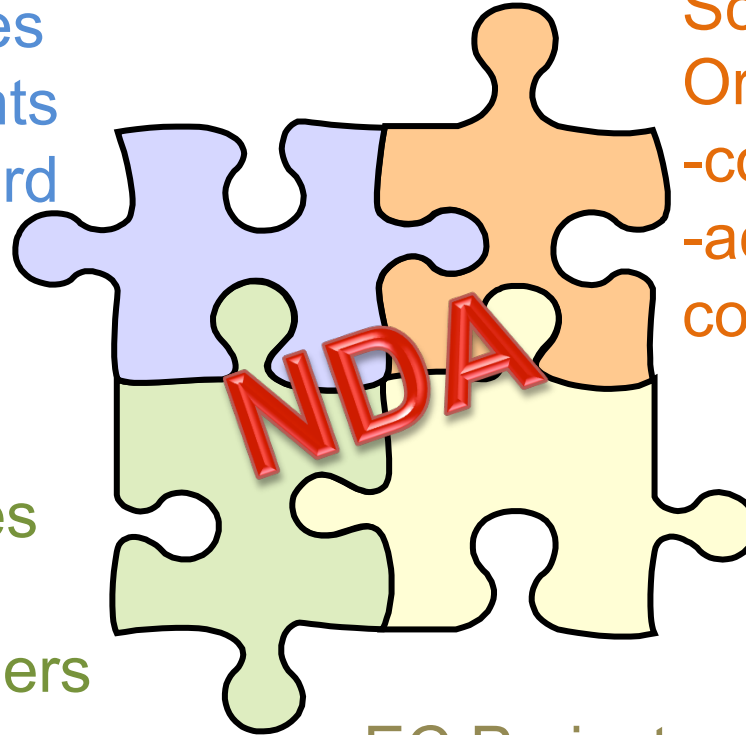
- commit resources
- share investments
- agree on standard
- interoperability

## SME's

- commit resources
- link between

## Users and Providers

- Act as catalyser



## Scientific and Space Organizations

- commit resources
- access to data & user communities

EC supports with  
-Policy & Strategy  
-through targeted calls under FP7

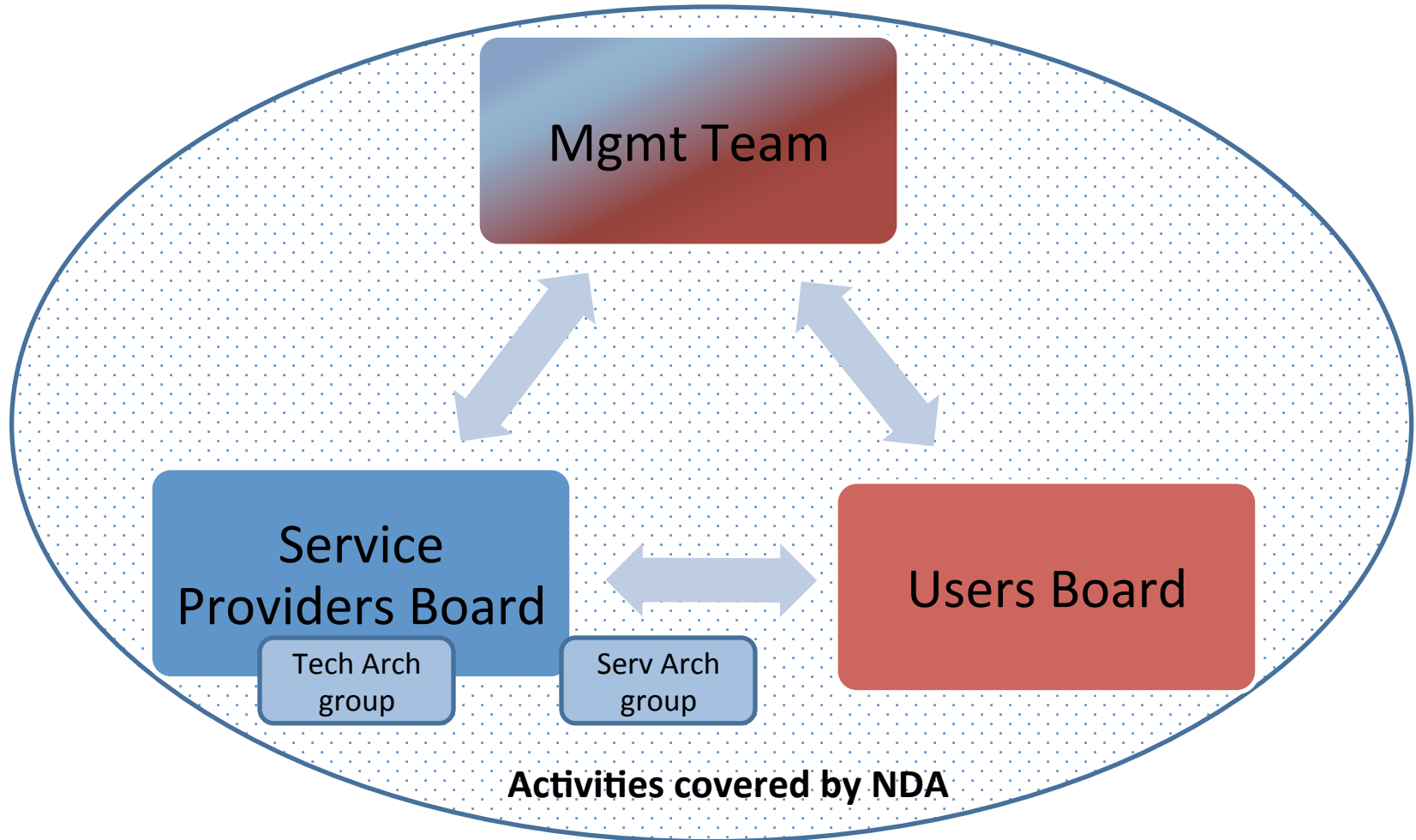
## EC Projects

- Standard/Open source
- Contributing / using HN

# Consortium membership

- Consortium includes all participating supply-side and demand-side companies/organisations
  - Member status and adopter status
  - All sign a non-disclosure agreement
  - “interested parties” can also register
- Procedure to become a new member is on Helix-Nebula website <http://www.helix-nebula.eu/>

# Governance Model during Proof of Concept in 2012



**Where do we want to go  
and  
why do we want to go there?**

# Long Term Goal

- To create a multi-tenant '**Open Market Place for Science**', where data, scientists, funding bodies, SMEs and downstream industry are meeting to work along common interests.

**This ecosystem should implement many-to-many relationships, quickly being established, to transform data into valuable information**

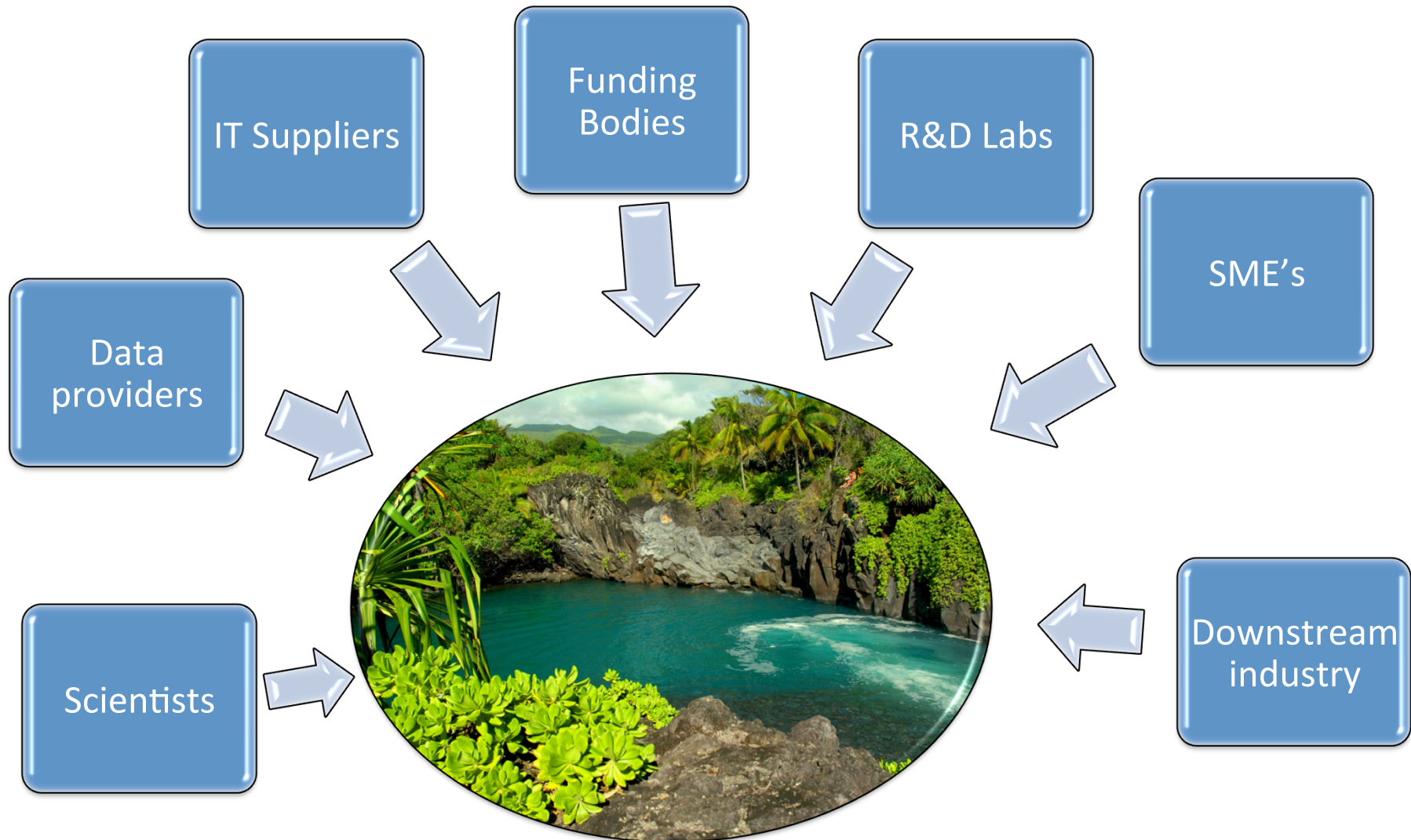
# Creating an environment for Growth



# Operating as an Ecosystem



# Contributors to the Ecosystem



# Expected Benefits

- We build **scale** to allow you and us to handle **elasticity**
- **Risk sharing** between partners
- Compliance with **EC rules and policy** (privacy, security, ethics)
- **Business opportunities** for SMEs
- **Breakthrough in Science** thanks to cross-domain fertilization (data, tools, funding, capacity, peers)

# Helix Nebula and Europe 2020



- The Horizon 2020 EU framework programme for research and innovation will build on 3 major pillars:
  - Strengthening the EU's position in science
  - Strengthening industrial Leadership in innovation
  - Tackling Societal Challenges

**Helix Nebula's vision and strategic goals  
are fully aligned with Europe 2020 strategy.**

# Validating our approach

# Timeline

2011

- Endorse the Common **Strategy**
- Agree on the **Partnership**
- Select **flagships** use cases
- Define **governance** model

2012-2013

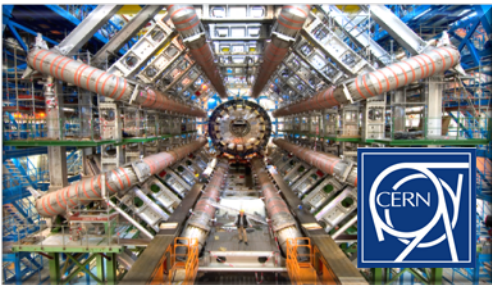
- **Pilot** Phase
- **Deploy** flagships,
- **Analysis** of functionality, performance & financial model

2014 ...

Towards an **open market for Science**

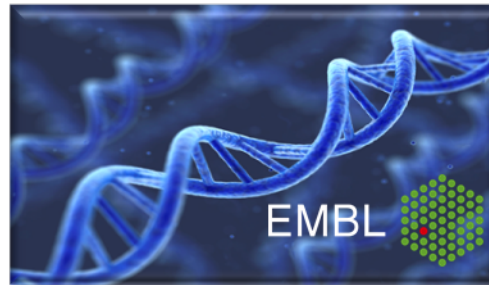
# Initial Flagship Use Cases

## ATLAS High Energy Physics Cloud Use



To support the computing capacity needs for the ATLAS experiment

## Genomic Assembly in the Cloud



A new service to simplify large scale genome analysis; for a deeper insight into evolution and biodiversity

## SuperSites Exploitation Platform



To create an Earth Observation platform, focusing on earthquake and volcano research

- Scientific challenges with societal impact
- Sponsored by user organisations
- Stretch what is possible with the cloud today

# Extending the Partnership

- Process for new Suppliers / new Users to join has started:
  - New comers can either submit flagships that propose some **innovation** in terms of performance or use the HN platform as is.
  - The flagship use cases must be **sponsored by user organisations** and **Service Providers**. Will be selected so as to be complementary and maximise coverage of the objectives outlined in the Strategic Plan

Partnership has grown  
from 20 to 34 members in 2012 !

# A European cloud computing partnership: big science teams up with big business



## Strategic Plan

- ▶ Establish multi-tenant, multi-provider cloud infrastructure
- ▶ Identify and adopt policies for trust, security and privacy
- ▶ Create governance structure
- ▶ Define funding schemes



To support the computing capacity needs for the ATLAS experiment

EMBL



Setting up a new service to simplify analysis of large genomes, for a deeper insight into evolution and biodiversity



To create an Earth Observation platform, focusing on earthquake and volcano research

