Cyber Network Earth: an approach to eGY

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It has been 50 years after IGY, which was successfully conducted as new era of Earth science. The Electronic Geophysical Year, 2007-2008 (eGY) provides an opportunity for the international geo-scientific community to focus effort on a 21st Century e-Science approach to issues of data stewardship: open access to data, data preservation, data discovery, data rescue, capacity building, and outreach. The development of Virtual Observatories and Laboratories is a central feature of eGY.

In the present talk we are going to propose a new platform for studies of the Earth: a **Cyber Network Earth** . The Cyber Network Earth is a concept to reproduce the Earth both in computers and networks. All of the Earth information is collected in the Cyber Network Earth through the Internet. Computer simulations are also performed, from which anyone can get any information at any time and at any location on the Earth.

The Cyber Network Earth is composed of four layers: (1) Virtual Earth, (2) Sentinel Earth, (3) Network Earth, and (4) Sustainable Earth. In the Virtual Earth, we perform large-scale super computer simulations. In the Virtual Earth, we can reproduce the Earth at any period: in the past, present and in the future. For the Virtual Earth, we need a new technique for an integrated, large-scale, simulation with multi-layers and multi-regions. Object-oriented methodology is a plausible information technology (IT) to realize the Virtual Earth. The Sentinel Earth corresponds to a system to observe the Earth by sensing network probes: by satellites, by ground-based observatories and other sensors. In Web 2.0, one of the most important concepts is aggregate knowledge. Most of the observation data are recently public on the Internet. We aggregate them and construct a semantic database for a variety of Earth sciences. The Sustainable Earth is devoted to human being living on the Earth. Web 3D services, virtual reality systems and other human interface and communication tools help everyone to understand, realize, get knowledge of the Earth from rich data obtained by the Virtual Earth, Sentinel Earth and Network Earth.

The Cyber Network Earth is a concept to realize eGY project, one of the final goals of the eGY. It will not be achieved very soon, but it is not a dream. If we, all of the researchers working in the Earth science fields, collaborate for the Cyber Network Earth, we will be able to step up to a new era of Earth science.