

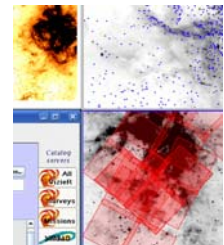
basis of “data factories” producing very large amounts of information. The availability of unprecedented quantity of experimental data poses new problems related to storage, management, search and preservation. It directly impacts the efficiency of obtaining results and transferring them into products and services.

Europe recognises the challenge and, in fact, the area of Scientific Data is a priority in the 7th European Framework Programme of Research and Development. In particular, the Capacities Programme frames it in the e-Infrastructures domain dealing with Digital Repositories, Computing Grids and High-speed networks serving Scientific and Education communities.

Experimental data used to be confined to the so-called wet-labs and somehow dissociated from the presentation of results. Today is different! This raw experimental information and journal articles are not detached from each other as they used to be in 'wet-labs'/paper-based' environments. The trend is now towards a continuum of the scientific information space enabled by digital technologies.

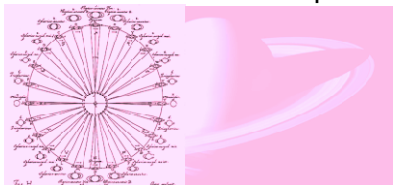
With a networked e-infrastructure of digital repositories experimental data can be processed simultaneously in different ways by various scientists, in different laboratorial sites. It creates completely new opportunities to re-use 'original data' and to apply it to different scientific areas, methods and perspectives which multiply the chances to have new insights. Multidisciplinary collaboration is another manifestation of the scientific information continuum.

Making the best infrastructures accessible to European Scientists, Educators and Students will lead the movement in which scientific methodologies and results will be discussed openly and complemented by quality control mechanisms established by specialists' peer-exchanges.



That is why an e-Infrastructure of Digital Repositories for scientific information is strategically essential for Europe. Transparent and cost-effective ways to store, manage and preserve experimental data will allow scientists to focus on their research tasks.

These elements cut across the pillars of the i2010 policy framework promoted by our Commissioner, Viviane Reding, responsible for Information Society and Media, aiming at building a common information space for science and research; strengthening of ICT R&D and its deployment in Europe; and promoting an inclusive Information Society.

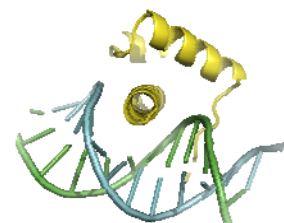


But there are more, and equally important, *continuums* in the digital future of information: one related with preservation so that past, present and future can be made accessible; one between the knowledge base of different scientific disciplines allowing filling

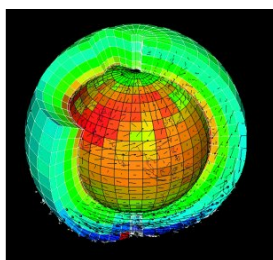
eventual gaps in certain domains of research and education; and one between institutions, organisations and people enabling the formation of global research communities opportunities for organisational change.

European Projects...

Some projects are now starting to push the European effort to build adequate e-Infrastructures for Scientific Information further. Below is a brief – non-exhaustive – overview of the projects launched under the Capacities programme.



IMPACT (Bioinformatics) will advance Interpro and its software and is an integrated documentation resource for protein families, domains and functional sites, which unifies data from 10 major signature databases into a single resource.



EURO-VO-AIDA (Astronomy) will unify the digital data collections of European astronomy. It integrates European data centres into the global Virtual Observatory effort, creates a registry of VO-compliant resources, co-ordinates development of science tools for end users and disseminates results to the astronomical community.

METAFOR (Climatology) aims to provide state-of-the-art scientific data standards for the United Nations IPCC Fifth Assessment Report. The challenge is to share data to foster European and International collaboration, demand metadata that not only encapsulates the whole complex process of climate modelling which creates the data, but also accommodates the requirements of a broad spectrum of potential end users of the data from climate scientists to climate impact assessment and policy makers.

GENESI-DR (Earth Observation) aims to provide open Earth Science Digital Repository access for European and world-wide science users. This will enable the sharing of data from space, airborne and in-situ sensors. The project builds upon existing European Earth Observation infrastructure and involves key partners in the Ground Segment Coordination Body.

NMDB (Space Physics) aims to establish a European digital repository for cosmic-ray data, based on existing data archives and develop a real-time database with observational results from many European neutron monitoring stations.

DRIVER II (e-Infrastructures and Info-structures) will deliver a pan-European infrastructure, federating scientific repositories. This will use open standards and support complex information objects.

PARSE.Insight (Access, Preservation, and Curation) aims to help define the infrastructure needed to preserve and use the digitally encoded information on which our society increasingly depends, but which is so fragile. These digital resources contain the intellectual inheritance we leave across time for future generations and which we need to exploit to the fullest, right now, across domains.

e-Infrastructures for and of...contribution to the debate at GRL2020

The global world of research is undergoing a revolution underpinned by e-Infrastructures. Advanced communication infrastructures like the world-leading pan-European research network GÉANT, Grid infrastructures enables new ways of scientific collaboration and resource sharing and repositories of scientific data providing increased productivity and the ability to collaborate on research independently of geographical location. These e-Infrastructures are the key drivers of emerging global virtual research communities, thus enabling scientific excellence and ultimately, economic and social well-being in Europe.

Acknowledgements and References

We are grateful for contributions coming from the European research projects. More Information about these projects can be found in http://cordis.europa.eu/fp7/ict/e-infrastructure/projects_en.html. Contributors to Position Paper: Carlos Morais Pires, Krystyna Marek, Mario Campolargo - European Commission – DG Information Society

Disclaimer: "The views expressed in this paper are those of the authors and do not necessarily reflect the views of the European Commission. They are put forward as a contribution to the discussions at GRL2020 second edition event."

*The rings of the Lord...
the Phases of Saturn as described by
Huygens superimposed on Saturn image
from the Hubble telescope*



e-Infrastructures: for Digital Repositories and of Digital Repositories (from eSciDR study report)