



Co-ordination & Harmonisation of
Advanced e-Infrastructures
for Research and Education Data Sharing

*Research Infrastructures
Grant Agreement n. 306819*

The CHAIN-REDS Project and its Data Infrastructure Program

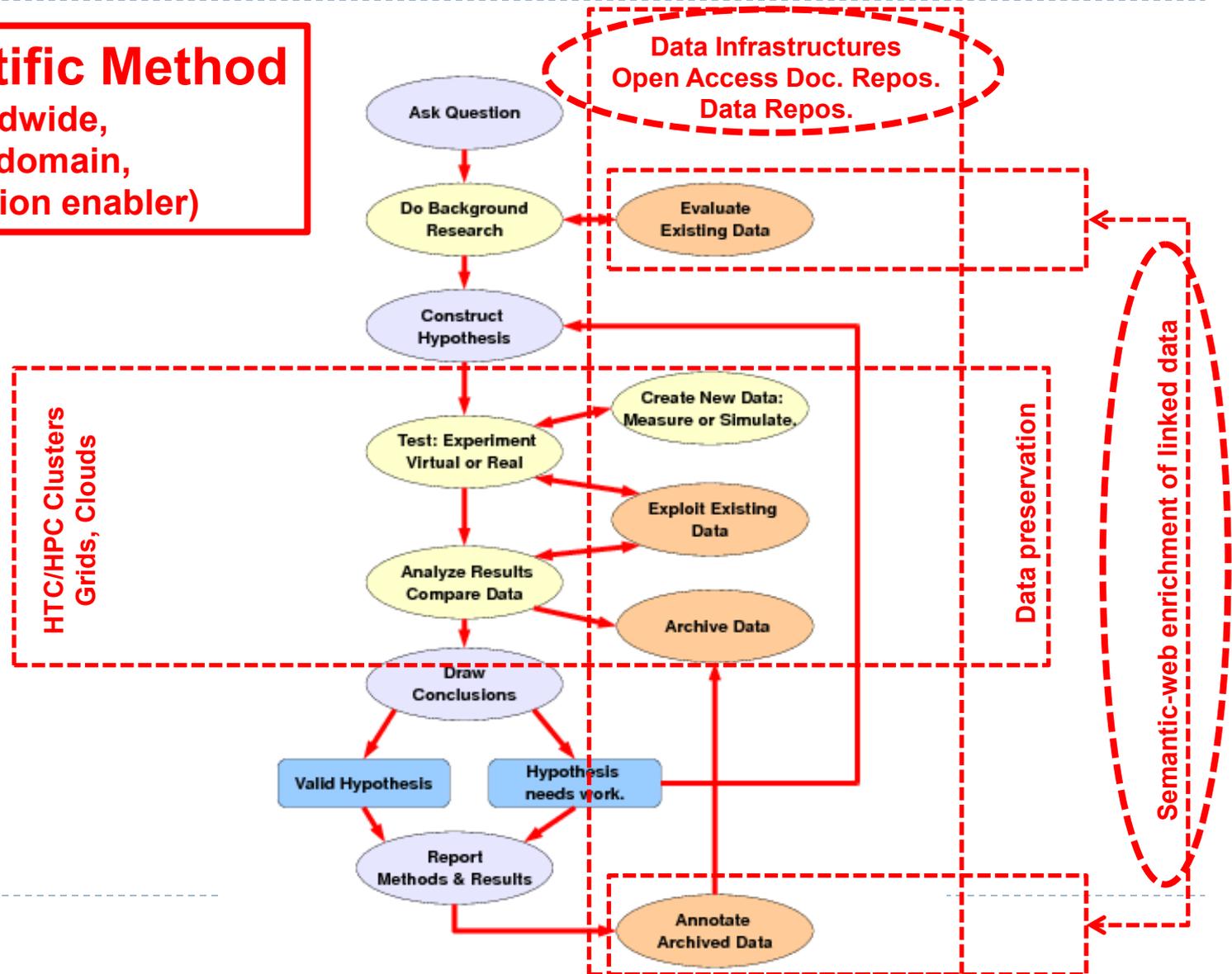
Roberto Barbera
University of Catania and INFN
DCH-RP Workshop @ EGI CF 2013 – Manchester, 10 April 2013



What do researchers do and how can DCI's help them to improve it ?

The Scientific Method

(worldwide,
cross-domain,
collaboration enabler)





The CHAIN-REDS Project

(www.chain-project.eu)



Started: 1 Dec 2012

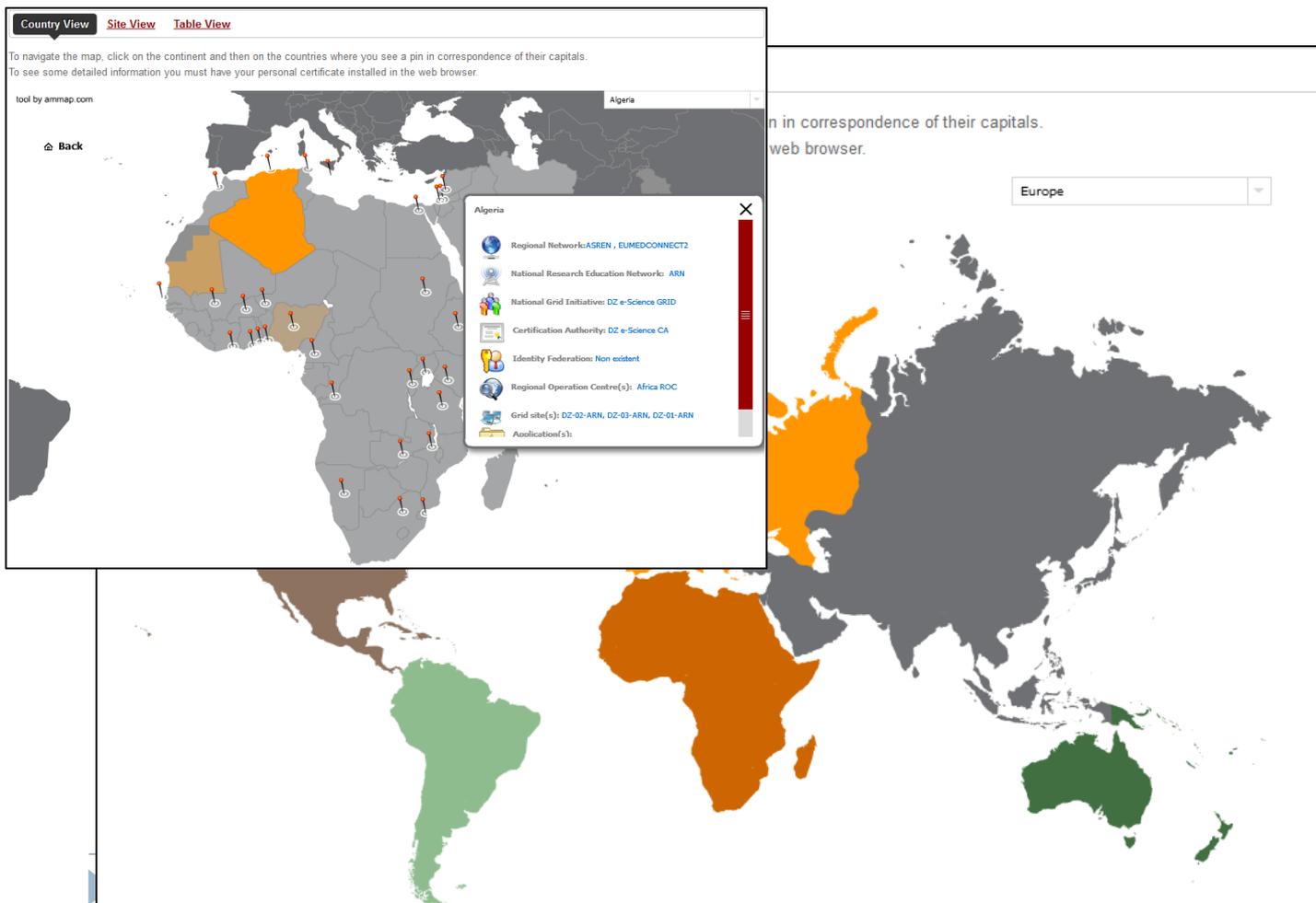
Duration: 30 months

Targeted regions: **Africa, Middle-East and Gulf Region, Latin America, China, India, and Far-East Asia**

Objectives

- Extend and consolidate the international cooperation of Europe with other regions of the world in the domain of e-Infrastructures for R&E, thus reinforcing the scientific collaboration and broadening the impact of the European Research Area
- Promote, coordinate and support the effort of a critical mass of non-European e-Infrastructures for R&E to collaborate with Europe by addressing interoperability and interoperation of Grids and other DCIs such as potential upcoming Cloud federations and HPC centres
- Study the opportunities of data sharing across different e-Infrastructures and continents thus widening the scope of the existing CHAIN Knowledge Base to Data Infrastructures and Cloud implementations
- Promote trust-building towards open Scientific Data infrastructures across the world regions, including organisational, operational and technical aspects
- Demonstrate the relevance of intercontinental cooperation in several scientific data fields addressing existing and emerging Virtual Research Communities (e.g. Earth Science, Climate Change, Genomics, etc.) and propose pragmatic approaches that could impact the everyday work of the single researcher, even if not structured in the framework of a Virtual Research Community
- Provide guidance and recommendations for roadmaps for long-term global collaboration in e-Infrastructures and harmonisation of existing policies. These are envisaged to act as input to policy and decision-making mechanism, harmonised with the European Digital Agenda and Horizon 2020

Largest e-Infrastructure related knowledge base. Information both from the survey and other sources for more than half of the countries of the world



- ▶ RREN(s)
- ▶ NREN
- ▶ NGI
- ▶ CA(s)
- ▶ Id.Fed(s)
- ▶ ROC(s)
- ▶ Grid site(s)
- ▶ Application(s)



CHAIN-REDS program for Data Infrastructures

- ▶ Identify standards to easily gather and access both Open Access Document Repositories (OADRs) and Data Repositories (DRs)
- ▶ Build a demonstrator to easily visualise and access OADRs and DRs (both geo-views and tab-views)
- ▶ Correlate OADRs and DRs to create linked data and discover new knowledge through semantic enrichment of metadata
- ▶ Promote Data Infrastructure standards and identify new OADRs and DRs from regions addressed by the project (Africa, Middle-East and Gulf Region, Latin America, China, India, Far-East Asia)
- ▶ Populate the demonstrator with these new repositories, add them to the semantic enrichment tool, and set-up at least two use-cases from different domains



Open Access Document Repositories (OADRs)



Country View DCI Site View DCI Table View **OADR Site View** OADR Table View DR Site View DR Table View

Click on a red marker to get more information on the corresponding Open Access Document Repository. Data are currently taken from the almost 2,500 repositories of DRIVER, OpenAIRE and OpenDOAR and currently refer to more than 30 million documents

- ~2,500 repos
- >33 M docs



Country View DCI Site View DCI Table View **OADR Site View** OADR Table View DR Site View DR Table View

Data are currently taken from the almost 2,500 repositories of DRIVER, OpenAIRE and OpenDOAR and currently refer to more than 30 million documents

Copy Print Save Search:

Show 10 entries First Previous 1 2 3 4 5 Next Last

Country	Name	Domain	Organization
Afghanistan	ACKU Library Catalogue	Multidisciplinary	Afghanistan Centre at Kabul University
Argentina	La Biblioteca de Publicaciones Periódicas UNL	Multidisciplinary	Universidad Nacional del Litoral
Argentina	Scientific Electronic Library Online - Argentina	Health and Medicine, Science General, Social Sciences General, Technological	Centro Argentino de Información Científica y General
Argentina	Servicio de Difusión de la Creación Intelectual	Multidisciplinary	Universidad Nacional de La Plata
Argentina	Memoria Académica	Education, Multidisciplinary	Universidad Nacional de La Plata
Argentina	Biblioteca Digital por la Identidad	Law and Politics, Psychology	Comisión Nacional por el Derecho a la Identidad
Argentina	Repositorio Hipermedial de la Universidad Nacional de Rosario	Multidisciplinary	Universidad Nacional de Rosario
Argentina	Repositorio OAI Biblioteca Digital Universidad Nacional de Cuyo	Health and Medicine, Multidisciplinary, Science General	Universidad Nacional de Cuyo
Argentina	Repositorio Institucional del Centro Atómico Bariloche y el Instituto Balseiro	Science General	Comisión Nacional de Energía Atómica
Argentina	Repositorio Institucional de la Universidad Nacional de Salta	Multidisciplinary	Universidad Nacional de Salta

Showing 1 to 10 of 2,488 entries First Previous 1 2 3 4 5 Next Last

- Search
- About the ECHO Initiative
- Promotion Activities
- Intranet
- Full text search

ECHO – Cultural Heritage Online

Open Access Infrastructure for a Future Web of Culture and Science



Available in ECHO

- more than 1000 authors and editors represented by ECHO collections
- 95 seed collections in several disciplines and thematic fields, in particular history of science
- more than 206,600 catalogued documents
- more than 890,000 high resolution images of historical and cultural source documents and artefacts
- more than 240 film sequences of scientific source material
- more than 57,500 full-text page transcriptions in several languages
- more than 170 institutions from 24 countries worldwide as active knowledge weavers in ECHO

Search in ECHO re
title, year):

► List of Authors in
collections

How to join

Interested institutions and projects, who share the vision of ECHO are invited to join the bring in cultural heritage, research source material and scholarly metadata related to the
► [Contact](#)



[CONTACT](#) [IMPRESSUM](#) Last Update: April 2013



Papacino d' Antoni, Alessandro Vittorio, Physikalisch-mathematische Grundsätze der Artillerie in denen die Natur und Eigenschaften des Pulvers untersucht und durch viele gründliche Erfahrungen ins Licht gesetzt werden, 1768

Image
Thumbnail overview
Document information

List of thumbnails

< 1-10 >


1


2


3


4


5


6


7


8

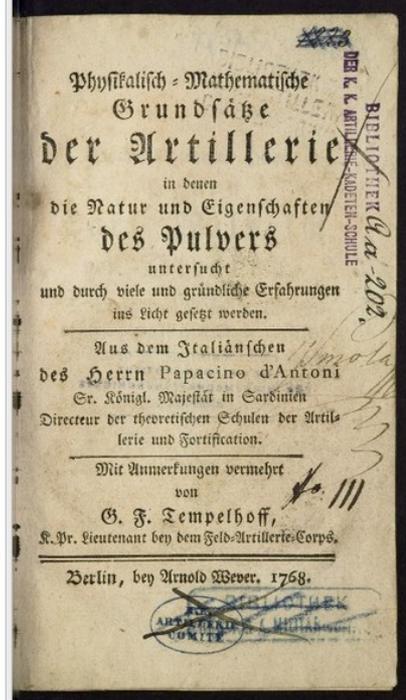

9


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page | << 7 of 543 >> |

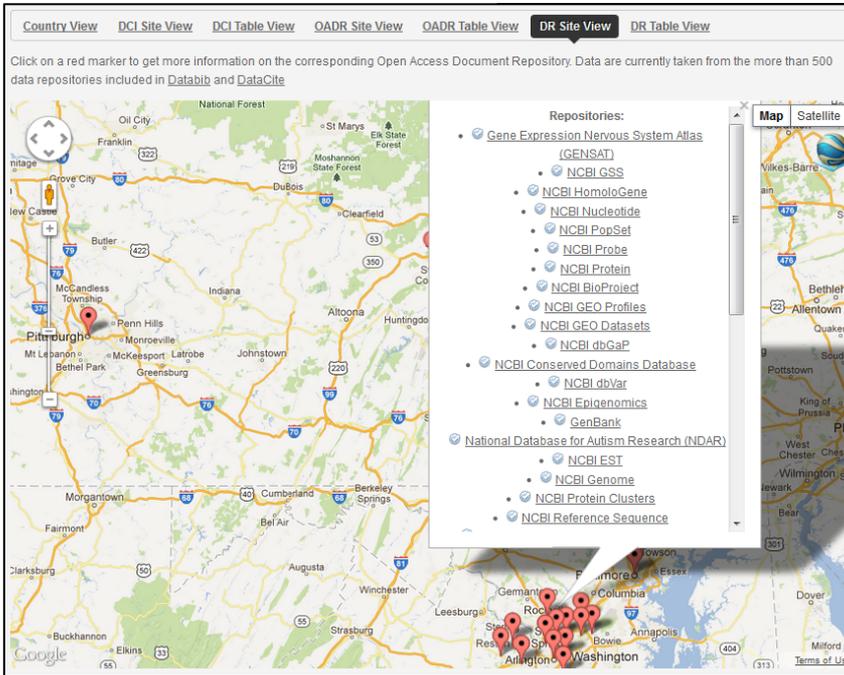
+ zoom in
- zoom out
⊞ zoom area
⊞ full page
↔ page width
■ set mark
✕ remove mark
[http: get reference](http://get.reference)
 digilib





Country View DCI Site View DCI Table View OADR Site View OADR Table View **DR Site View** DR Table View

Click on a red marker to get more information on the corresponding Open Access Document Repository. Data are currently taken from the more than 500 data repositories included in [DataCite](#) and [DataCite](#)

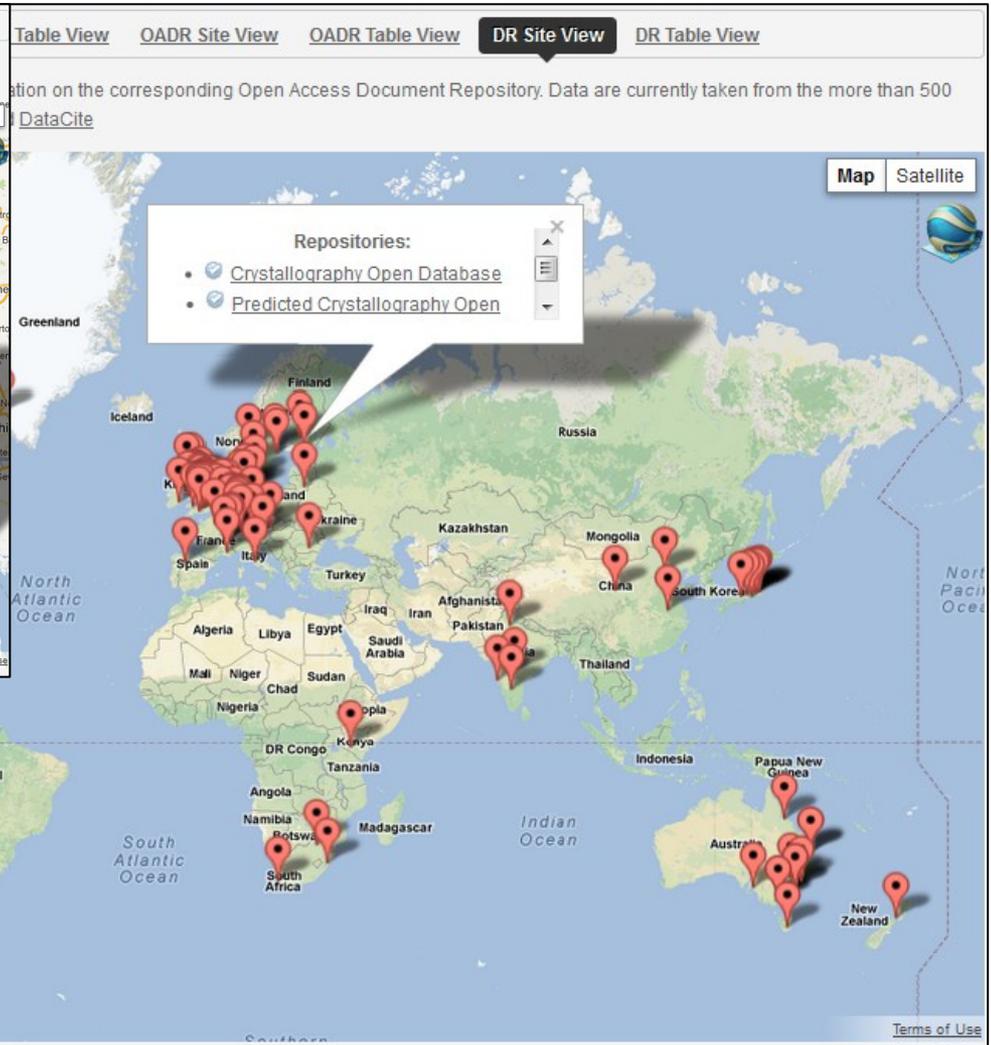


Repositories:

- Gene Expression Nervous System Atlas (GENSAT)
 - NCBI GSS
 - NCBI HomoloGene
 - NCBI Nucleotide
 - NCBI PopSet
 - NCBI Probe
 - NCBI Protein
 - NCBI BioProject
 - NCBI GEO Profiles
 - NCBI GEO Datasets
 - NCBI dbGaP
- NCBI Conserved Domains Database
 - NCBI dbVar
 - NCBI Epigenomics
 - GenBank
- National Database for Autism Research (NDAR)
 - NCBI EST
 - NCBI Genome
 - NCBI Protein Clusters
 - NCBI Reference Sequence

Table View OADR Site View OADR Table View **DR Site View** DR Table View

Click on a red marker to get more information on the corresponding Open Access Document Repository. Data are currently taken from the more than 500 data repositories included in [DataCite](#) and [DataCite](#)



Repositories:

- Crystallography Open Database
- Predicted Crystallography Open

• >500 repos
• Lots of data !



arts and humanities data service

Search Collections

Creating Resources

Depositing Resources

News and Events

About the AHDS

Projects

Search Site

[Printer friendly version](#)

[Text version](#)

AHDS Executive Address:
26 - 29 Drury Lane
3rd Floor
King's College London
LONDON, WC2B 5RL
Tel: 020 7848 1988
Fax: 020 7848 1989
[Email the AHDS](#)

Enabling Digital Resources for the Arts and Humanities

Latest News

From April 2008 the Arts and Humanities Data Service (AHDS) will no longer be funded to provide a national service. However, the JISC have very kindly provided funding for a further year to keep the website available, to maintain and update the AHDS cross-search catalogue, and for the Centres to continue to deliver AHDS collections. The catalogue will allow users to search across the collections of the AHDS partners, including new collections added after 31st March. To use the cross-search catalogue please use the link on the left hand side.

Despite the loss of central funding, the host institutions of the AHDS are committed to working separately and together to retain the expertise and skills of the staff of the AHDS, and to provide a revised set of services for the arts and humanities research community. For further details about the services on offer please click on the links on the right:

AHDS website content



Executive

For [Management strategy](#),
[e-infrastructure developments](#)
and shared repository services.



Archaeology

For Archaeo-
services from



History

For History re-
services from

ARCHAEOLOGY DATA SERVICE

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Ceramics and Society: Early Tana Tradition and the Swahili Coast

Stephanie Wynne-Jones, Jeffrey Fleisher, 2013

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Database files

CCP database for ADS

notes

[Explanation of motifs](#)

[Methodology](#)

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CCP database for ADS

CCP	sherd #	site	unit x	unit y	context	exc.	she
CCP0001	manda	MHM	,2,,1	58.94	45.4	12.8	8.7
CCP0002	manda	MHII	,14,,1	64.3	63.2	6.8	
CCP0003	manda	MHI	,7,,1	57.6	67.8	8.6	6.77
CCP0004	manda	MHH	,8,,1b	46.12	44.28	6.95	
CCP0005	manda	MHH	,5,,1	34.43	77.46	8.84	12.7
CCP0006	manda	MHH	,8,,1b	59.09	87.87	7.66	27
CCP0007	manda	MHM	,1,,1	49.07	92.53	11.18	6.16
CCP0008	manda	MHM	,3,,1	73.26	81.38	10.2	6.5
CCP0009	manda	MHH	,2,,1	44.08	69.97	8.6	5.51
CCP0010	manda	MHII	,8,,1c	40.75	73.3	5.18	4.9
CCP0011	manda	MHH	,?,,,1	35.61	69.05	4.92	4.61
CCP0012	manda	MHH	,4,,1	69.17	59.83	7.74	5.67
CCP0013	manda	MHH	,7,,1b/1c	75.7	121.44	9.6	8.
CCP0014	manda	MHI	,6a,,1	76.13	75.91	7.75	7.87
CCP0015	manda	MHM	,2,,1	70.49	92.82	7.25	6.7
CCP0016	manda	MHM	,2,,1	40.22	100.65	12.46	7.6
CCP0017	manda	MHH	,7,,1b/1c	57.68	65.7	8.47	3.
CCP0018	manda	MHIII	,7,,1b	68.92	63.25	6.55	5.
CCP0019	manda	MHH	,4,,1	36.29	67.17	7.6	21
CCP0020	manda	MHH	,9,,1a/1b	88.21	79.36	7.37	5
CCP0021	manda	MHM	,2,,1	54.65	84.01	9.23	8.65
CCP0022	manda	MHF	,5,,1	42.57	60.57	13.49	
CCP0023	manda	MHM	,2,,1	44.54	65.94	7.91	8.5
CCP0024	manda	MHIII	,4,,1	92.22	55.75	6.48	5.7
CCP0025	manda	MHIV	,3,,1	80.53	71.14	8.88	6.5
CCP0026	manda	MHIII	,7,,1d	63.97	63.91	7.98	7.
CCP0027	manda	MHMII	,2,,1	57.79	80.4	9.58	7.92
CCP0028	manda	MHH	,8,,1b	49.84	91.1	8.5	7.7
CCP0029	manda	MHH	,7,,1b/1c	80.09	63.84	5.48	3
CCP0030	manda	MHIII	,8,,1(c?)	26.94	40.78	6.56	
CCP0031	manda	MHH	,6,,1c	47.77	69.28	6.42	7.94
CCP0032	manda	MHIT	,17d,,1	48.84	66.68	9.73	5.
CCP0033	manda	MHIT	,17d,,1	20.63	55.46	9.73	5.
CCP0034	manda	MHIII	,6,,1d	84.3	55.48	8.75	7.3
CCP0035	manda	MHIT	,15j,,1a/b	132.85	137.86	9.	
CCP0036	manda	MHF	,5,,1	76.47	50.91	10.97	10.4
CCP0037	manda	MHM	,2,,1	50.3	91.25	7.58	6.81
CCP0038	manda	MHIT	,11,,1d	113.23	99.11	6.32	5
CCP0039	manda	MHH	,8,,1b	27.8	64.16	7.96	0
CCP0040	manda	MHIV	,3,,1	54.22	81.57	7.88	6.04
CCP0041	manda	MHII	,19,,1	60.31	86.41	9.62	10.0
CCP0042	manda	MHH	,6,,1c	74.2	49.42	9.19	9.11

CCP_database_for_ADS.csv
[DOWNLOAD] right-click and save link

Linked-data enrichment

Linked-data search engine



Semantic-web enrichment



Harvester
(running on grid/cloud)

Harvester
(running on grid/cloud)

OAI-PMH



End-points

OAI-PMH



OADRS

Registry of Open Access Repositories (ROAR)

Data Repos.

Linked data semantic search

(www.chain-project.eu/linked-data)

Co-ordination & Harmonisation of Advanced e-Infrastructures
for Research and Education Data Sharing



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Semantic Search on Linked Data

Here you can search across the thousands of semantically enriched [Open Access Document Repositories](#) and [Data Repositories](#) included in the CHAIN Knowledge Base. Some exemplar keywords are: cardiology, cornea, geology, linked data, natural gas.

Select a language: All ▼



Submit Query

Enter a keyword or select a language and then choose a subject

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Select a language: All ▼



Submit Query

- ALL
- | | | | | |
|---------|---------|------------|-----------|----------------|
| Bashkir | Danish | German | Italian | Russian |
| Basque | Dutch | Greek | Japanese | Serbo-Croatian |
| Catalan | English | Hungarian | Latin | Slovenian |
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Select a language: All ▼



Enter a keyword or select a language and then choose a subject

Results | Graphs

Title
Lies, damned lies, and statistics (in Geology)

Author
Vermeesch, Pieter

Description
According to Karl Popper's epistemology of critical rationalism, scientists should formulate falsifiable hypotheses and test them against empirical observations. In other words, we should predict and test rather than merely explain phenomena. This paper discusses tests such as...

[More Info](#)

Title
Selecting the geology filter wavelengths for the ExoMars Panoramic Camera instrument

Author
Crawford, Ian A.; Coates, Andrew J.; Cousins, Claire R.; Griffiths, Andrew D.; Gunn, M.; Davis, L. E.; Prosser, B. J.; ...

[More Info](#)

Title
Geology, geochemistry, and geophysics of the Moon: status of current understanding

Author
Crawford, Ian A.; Wieczorek, M.; Anand, M.; Hiesinger, H.; Knapmeyer, M.; Sohl, F.; Hussmann, H.; Jaumann, R.; Jolliff, B. L.; Krohn, K.; Spohn, T.; Hempel, S.; Oberst, J.; Grott, M.; Carpenter, J.; Kähler, U.; Robinson, M. S.; Wagner, R.; Scholten, F.; Schmitz, N.; Hoffmann, H.

Geology, geochemistry, and geophysics of the Moon: status of current understanding

General Information

Authors: Crawford, Ian A.; Wieczorek, M.; Anand, M.; Hiesinger, H.; Knapmeyer, M.; Sohl, F.; Hussmann, H.; Jaumann, R.; Jolliff, B. L.; Krohn, K.; Spohn, T.; Hempel, S.; Oberst, J.; Grott, M.; Carpenter, J.; Kähler, U.; Robinson, M. S.; Wagner, R.; Scholten, F.; Schmitz, N.; Hoffmann, H.

Date Stamp: 2012-12-07T11:20:32Z

Description: The Moon is key to understanding both Earth and our Solar System in terms of planetary processes and has been a witness of the Solar System history for more than 4.5 Ga. Building on earlier telescopic observations, our knowledge about the Moon was transformed by the wealth of information provided by Apollo and other space missions. These demonstrated the value of the Moon for understanding the fundamental processes that drive planetary formation and evolution. The Moon was understood as an inert body with its geology mainly restricted to impact and volcanism with associated tectonics, and a relative simple composition. Unlike Earth, an absence of plate tectonics has preserved a well-defined accretion and geological evolution record. However recent missions to the Moon show that this traditional view of the lunar surface is certainly an over simplification. For example, although it has long been suspected that ice might be preserved in cold traps at the lunar poles, recent results also indicate the formation and retention of OH and H₂O outside of polar regions. These volatiles are likely to be formed as a result of hydration processes operating at the lunar surface including the production of H₂O and OH by solar wind protons interacting with oxygen-rich rock surfaces produced during micrometeorite impact on lunar soil particles. Moreover, on the basis of Lunar Prospector gamma-ray data, the lunar crust and underlying mantle has been found to be divided into distinct terranes that possess unique geochemical, geophysical, and geological characteristics. The concentration of heat producing elements on the nearside hemisphere of the Moon in the Procellarum KREEP Terrane has apparently led to the nearside being more volcanically active than the farside. Recent dating of basalts has shown that lunar volcanism was active for almost 3 Ga, starting at about 3.944 Ga and ceasing at ~1.2 Ga. A recent re-processing of the seismic data supports the presence of a partially molten layer at the base of the mantle and shows not only the presence of a 330 km liquid core, but also a small solid inner core. Today, the Moon does not have a dynamo-generated magnetic field like that of the Earth. However, remnant magnetization of the lunar crust and the paleomagnetic record of some lunar samples suggest that magnetization was acquired, possibly from an intrinsic magnetic field caused by an early lunar core dynamo. In summary, the Moon is a complex differentiated planetary object and much remains to be explored and discovered, especially regarding the origin of the Moon, the history of the Earth-Moon system, and processes that have operated in the inner Solar System over the last 4.5 Ga. Returning to the Moon is therefore the critical next stepping-stone to further exploration and understanding of our planetary neighborhood.

Publisher: Elsevier

Identifier: Jaumann, R.; Hiesinger, H.; Anand, M.; Crawford, Ian A.; Wagner, R.; Sohl, F.; Jolliff, B. L.; Scholten, F.; Knapmeyer, M.; Hoffmann, H.; Hussmann, H.; Grott, M.; Hempel, S.; Kähler, U.; Krohn, K.; Schmitz, N.; Carpenter, J.; Wieczorek, M.; Spohn, T.; Robinson, M. S. and Oberst, J. (2012) Geology, geochemistry, and geophysics of the Moon: status of current understanding. Planetary and Space Science 74 (1), pp. 15-41. ISSN 0032-0633.

Subject: Earth and Planetary Sciences

Date: 2012-12

Dataset Information

Type (1): Article

Type (2): PeerReviewed

Relation (1): <http://eprints.bbk.ac.uk/5061/>

Relation (2): <http://dx.doi.org/10.1016/j.pss.2012.08.019>

[More info](#)

Linked data semantic search

(www.chain-project.eu/linked-data)

Results
Graphs

Filter to view a struct of Resource (max 10 Resource)

Select one or more Resources to view

[R17] Selective inhibition of the cellular sodium pump by emicymarin and 14A anhydroxy bufadienolides
 [R18] Opsin stability and folding: modulation by Phospholipid Bicelles
 [R19] The effects of intracellular signalling pathway inhibitors on phagocytosis by haemocytes of Manduca sexta
 [R20] Role of human tear fluid in Acanthamoeba interactions with the human corneal epithelial cells

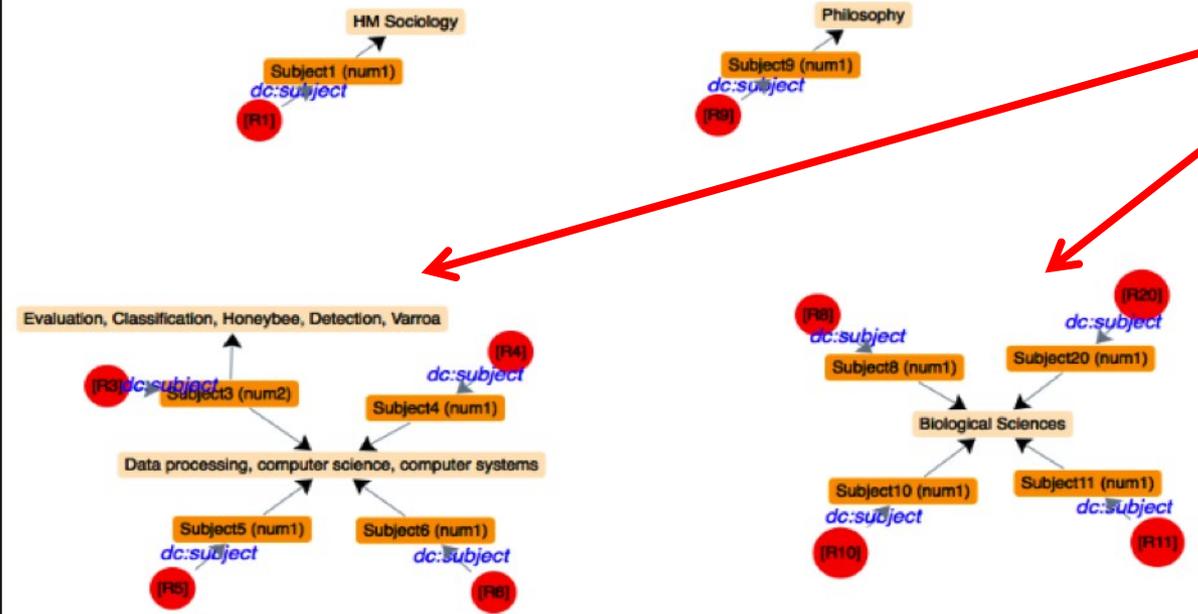
9 Resources Selected

Select a Filter for visualization:

Subjects
 Authors
Subjects
 Publishers

(To clear the graph wait until the particles are firmly.)

Preliminary !



New knowledge discovery!

Summary and conclusions

- ▶ Data Infrastructures are becoming an essential component of e-Infrastructures
- ▶ Next years' biggest challenge is to uniquely correlate research papers with data used to write them with applications used to analyse them so to be able to go across the *knowledge path* both ways
- ▶ Semantic Web and Linked Data technologies can play a major role in this context and CHAIN-REDS aims to promote these standards in the targeted regions
- ▶ CHAIN-REDS is willing to provide DCH-RP both with web (integrated in the e-Culture Science Gateway) and RESTful (from DCH-RP partner's website/applications) access to its Knowledge Base and add to the semantic enrichment service OADRs' and DRs' belonging to the cultural heritage domain
- ▶ CHAIN-REDS is also looking forward to receiving feedbacks from DCH-RP on the Knowledge Base and the semantic search service



Thank you !