



NFDI4Objects

Research Data Infrastructure
for the Material Remains of
Human History

KLASSIK
STIFTUNG
WEIMAR

Klassik Stiftung Weimar and NFDI4Objects

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<https://www.klassik-stiftung.de/>

60th CIDOC CRM & 53rd FRBR/LRMoo SIG meeting | 1 April 2025

Klassik Stiftung Weimar



Klassik Stiftung Weimar

- The Klassik Stiftung Weimar is a unique ensemble of cultural monuments.
- With its **numerous museums, palaces, historic houses** and **parks** as well as its **collections of literature and art**, it is **one of the largest and most important cultural institutions in Germany**.
- 31 museums and places of experience
- 12 unesco world heritage sites



Klassik Stiftung Weimar

Directorate of the Goethe- und Schiller-Archiv



Directorate of the Herzogin Anna Amalia Bibliothek



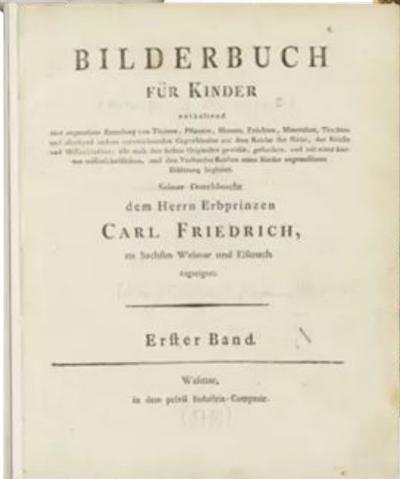
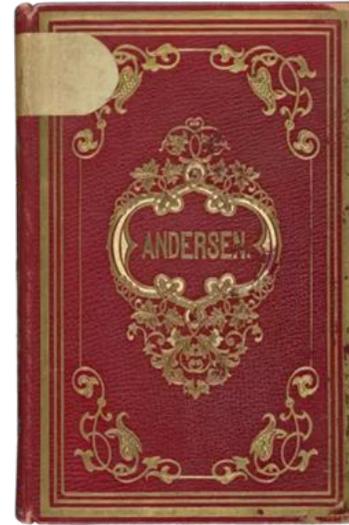
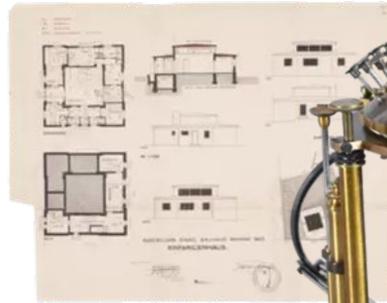
Directorate of Castles, Gardens and Buildings



Directorate of Museums



Klassik Stiftung Weimar



Tasks of the Klassik Stiftung Weimar

- Preservation, cataloguing, research and documentation of the cultural monuments and collections
- Mediation and preservation of the historic houses, buildings and park monuments
- Presentation, mediation and supplementation of the museum collections
- Planning and realisation of exhibitions and events
- Supporting national and international research



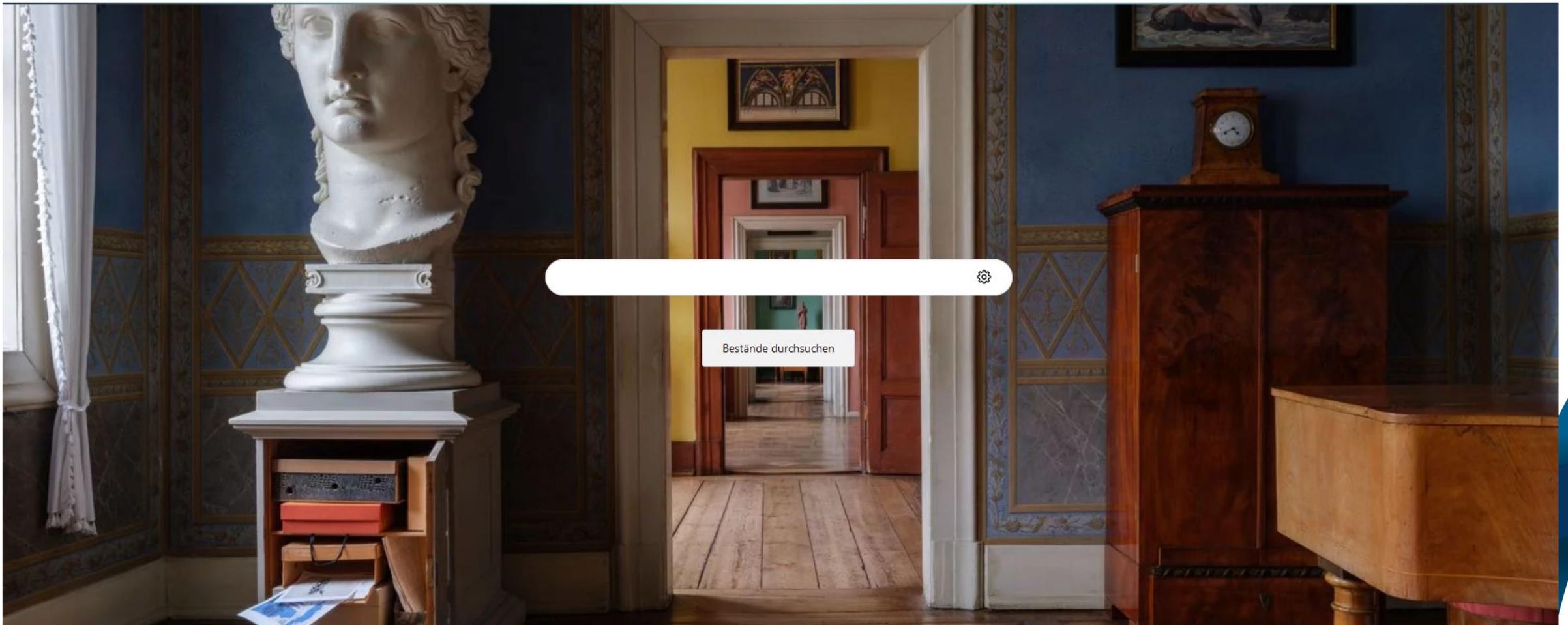
Data Integration at the Klassik Stiftung Weimar

KLASSIK
STIFTUNG
WEIMAR

Suchportal (beta)

Info

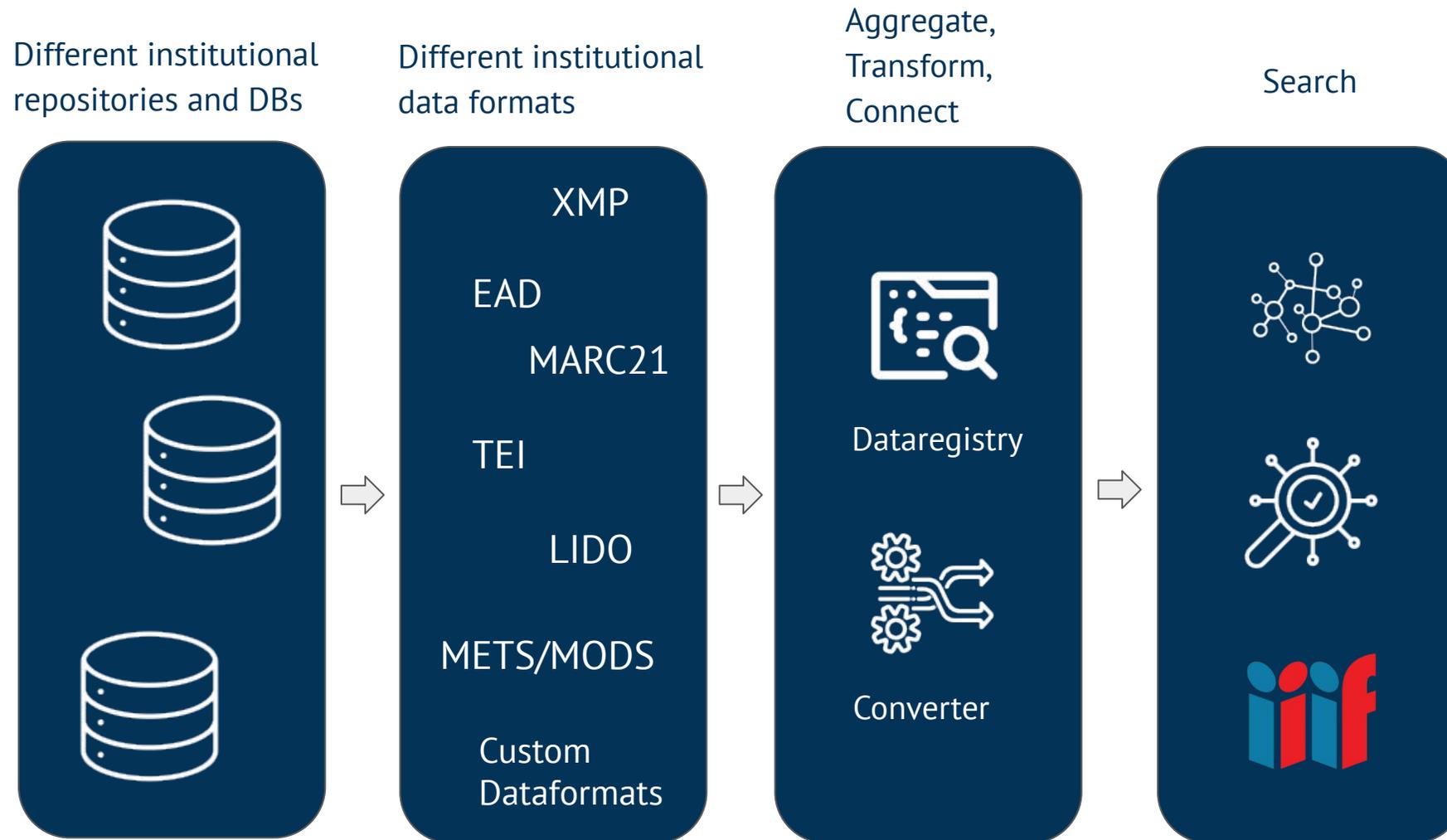
Feedback zur Betaversion geben



Data Integration at the Klassik Stiftung Weimar

- The search portal of the Klassik Stiftung provides a **central search entry point** to the heterogeneous Collections
- The Research Data of the Museums, the Goethe and Schiller Archive and the Duchess Anna Amalia Library can be searched digitally via a standardised access point
- Around 75 percent of the museum objects (i.e. over 248,000 data records) are now digitally accessible with core data and, in some cases, high-quality photo documentation → they can be viewed and researched worldwide
 - The online catalogue 'Digital Collections of the Museums' of the Klassik Stiftung Weimar had previously published around 30,000 curated data records
- <https://suche.klassik-stiftung.de>

Data Integration at the Klassik Stiftung Weimar



NFDI and NFDI4Objects



The German National Research Data Infrastructure



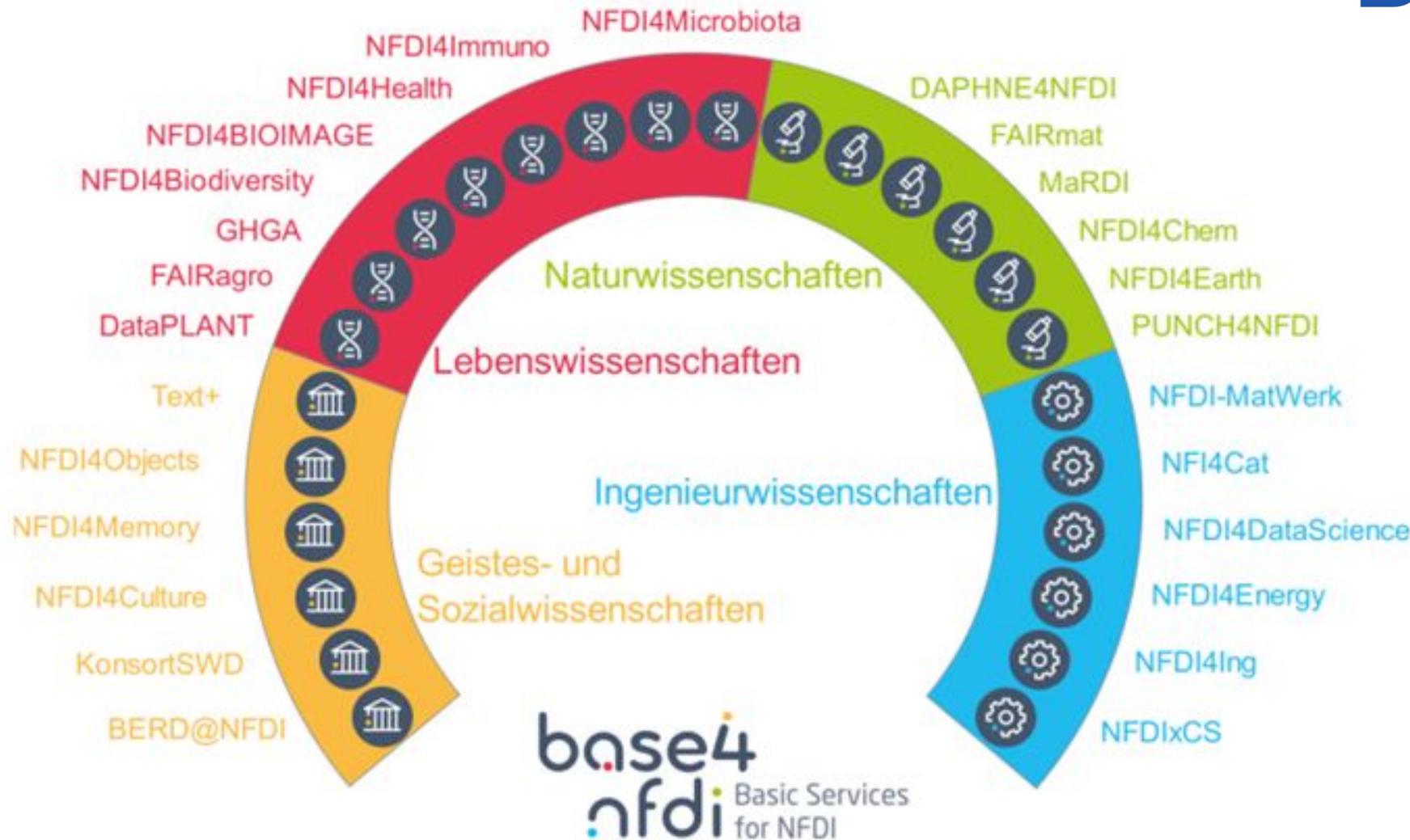
“The aim of the national research data infrastructure (NFDI) is: to systematically manage scientific and research data, provide long-term data storage, backup and accessibility and network the data both nationally and internationally.

The NFDI will bring multiple stakeholders together in a coordinated network of consortia tasked with providing science-driven data services to research communities.”

Source: Deutsche Forschungsgemeinschaft (DFG),
<https://www.dfg.de/foerderung/programme/nfdi/>

More information on NFDI: <https://www.nfdi.de/?lang=en>

The German National Research Data Infrastructure



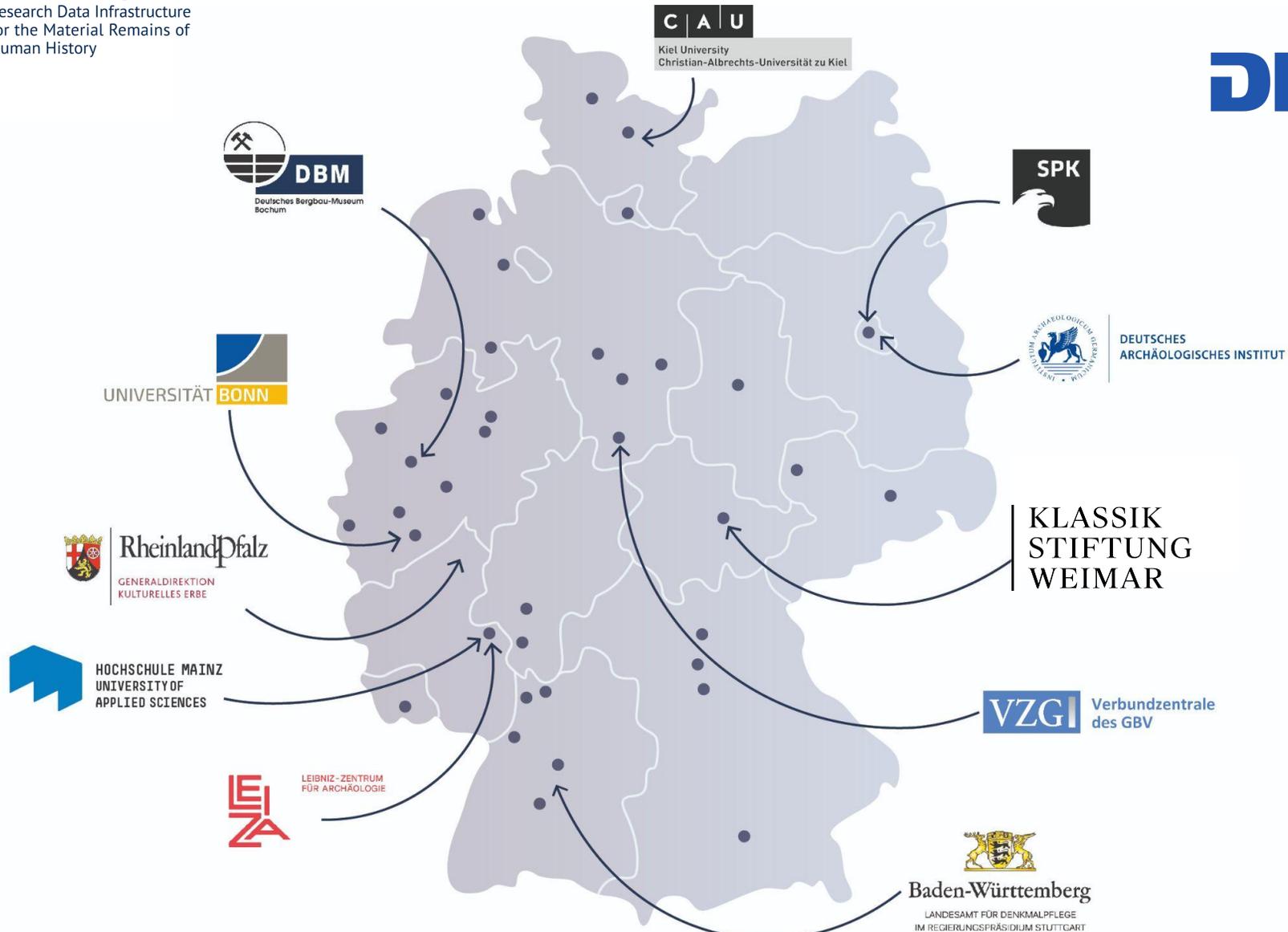


NFDI4Objects

Research Data Infrastructure
for the Material Remains of
Human History

nfdi Nationale
Forschungsdaten
Infrastruktur

DFG Deutsche
Forschungsgemeinschaft



NFDI4Objects

- Consortium within the National Research Data Infrastructure (NFDI), part of Humanities@NFDI
- Focus: material heritage of around three million years of human and environmental history
- 13 applicant institutions
- Main applicant: German Archaeological Institute
- 12 co-applicant institutions: Prussian Cultural Heritage Foundation Berlin, Mainz University of Applied Sciences, Klassik Stiftung Weimar, ...
- over 60 participants: including FAU Erlangen-Nuremberg, academies such as AdWL Mainz and BBAW, state offices for the preservation of historical monuments, universities, various museums, ...



Community Meeting
November 2023;
Foto: mika-fotografie, Berlin

Task Areas in NFDI4Objects

-  **TA1 Documentation:** coverage of arising needs from the collection, research and documentation of primary data sources (artefacts, sites and monuments, etc.) on site, in repositories and collections
-  **TA2 Collecting:** promotion of research data infrastructure and data management processes to address the complex requirements of collections of artefact and their contextualisation
-  **TA3 Analytics and Experiments:** development of platforms, standards and services for research and laboratory-based analysis of artefacts
-  **TA4 Protecting:** addresses the requirements of protecting, conserving, restoring and researching cultural monuments and artefacts as well as related fields of work and research
-  **TA5 Storage, Access & Dissemination:** providing of comprehensive technologies and standards for the long-term archiving of research data and all other aspects of the FAIR principles
-  **TA6 Qualification, Harmonisation & Integration:** deals with content-related negotiation processes and their mediation for the N40-specific areas from a scientific perspective
-  **TA7 Support & Coordination:** manages the operational organisation of the consortium, coordinates the processes between the task areas and ensures the science-driven further development of the consortium

Task Area 6 Qualification, Integration and Harmonisation

Co-Spokespersons and employees:

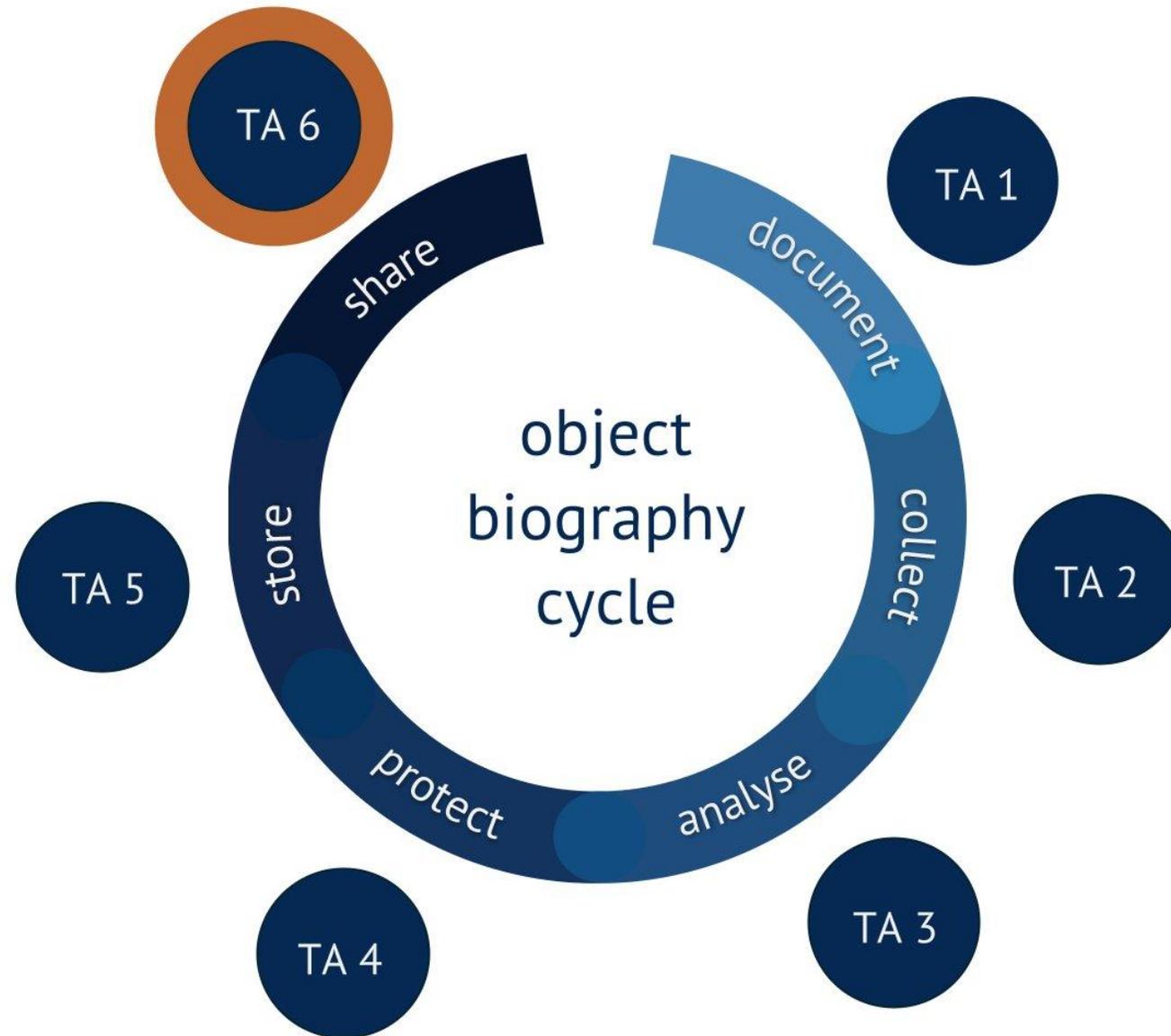
Prof.Dr. Kai-Christian Bruhn
Hochschule Mainz
Dr. Dirk Wintergrün
Klassik Stiftung Weimar

Klassik Stiftung Weimar (KSW)

Dr. Dirk Wintergrün
Anja Gerber

FAU Competence Center for Research Data and Information (FAU CDI)

Prof.Dr. Michael Kohlhase
Prof.Dr. Günther Görz
Dr. Sarah Wagner



The FAIR principles

Make your data:

Findable
Accessible
Interoperable
Reusable

Findable

- Descriptive metadata
- Persistent Identifiers

Accessible

- Determining what to share
- Participant consent and risk management
- Access status

Interoperable

- XML standards
- Data Documentation Initiative
- CDISC

Reusable

- Rights and licence models
- Permitted and non-permitted use

Source: <https://www.force11.org/fairprinciples>

Participation in NFDI4Objects



How to participate in NFDI4Objects

TRAILS:

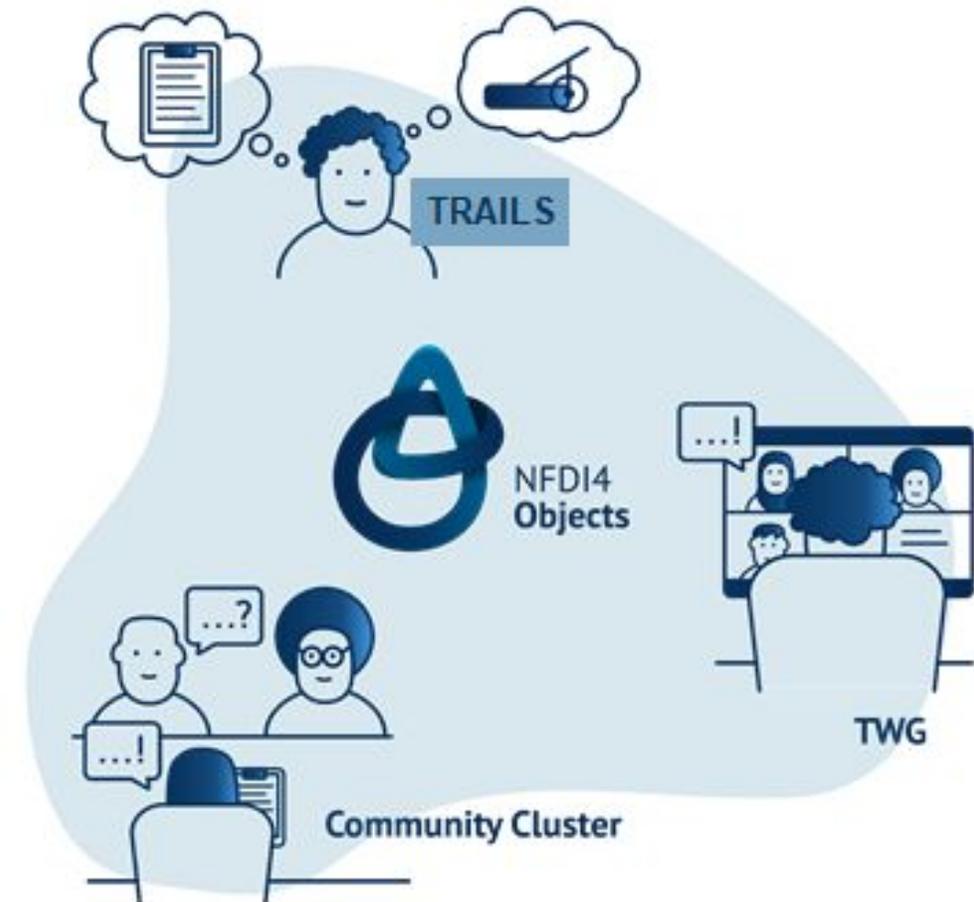
- **T**ask **R**elated **A**ctivities for the **I**mplementation of **S**ervices
- Pilots for applied testing and implementation of tools and guidelines
- Cooperation with a broad array of partner institutions

Community Clusters:

- Bring together experts and users in RDM related questions of particular research fields
- Identify and address needs in the community
- Discuss drafts and developments

Temporary Working Groups

- Smaller groups of dedicated experts
- Cooperate on a specific task for a limited time period



Community Meetings



Save the Date!

30.09. - 02.10.2025

NFDI4Objects Community Meeting

Deutschen Bergbaumuseum Bochum

How to reach us

Website:
<https://www.nfdi4objects.net/en/>

Home / Portal / Helpdesk

Helpdesk

Do you have research data management-specific topics that NFDI4Objects should work on?

Would you like to get actively involved, do you want to participate in our working groups?

Then contact us.

We are happy to help.

Name:

Given Name:

Email:

Title:

NFDI4Objects

Über uns Beratung Mitwirkung Commons Dienste Portal EN | DE | Q

NFDI4Objects

Eine Forschungsdateninfrastruktur für die materiellen Hinterlassenschaften der Menschheitsgeschichte

Aktuelles
Neuigkeiten und Aktivitäten

Dienste
Unser Dienstportfolio

Commons
Die Wissensallmende

Helpdesk
Direkter Kontakt



@nfdi4objects
Konsortium für Forschungsdaten zum materiellen Erbe der Menschheitsgeschichte

Veranstaltungen

- Ask your Data-Dude
- Rückblick CM24
- Rückblick Regionaltreffen

Newsletter & Support

- Helpdesk
- Newsletter
- Zenodo Community Space

Community Cluster (CCs)

Helpdesk:
<https://www.nfdi4objects.net/en/portal/helpdesk/>

NFDI4Objects Services

- Databases and libraries
- Storage options and repositories
- Web tools and applications
- Guidelines for data curation
- Best practices for workflows and data processing pipelines
- Open educational resources
- More information:

<https://www.nfdi4objects.net/en/portal/services/>

The screenshot shows the NFDI4Objects Services portal. At the top, there is a navigation bar with links for 'About', 'Support', 'Participation', 'Commons', 'Services', and 'Portal'. Below the navigation bar is the NFDI4Objects logo and a search bar. The main content area is titled 'Services' and includes a description of the service portfolio, a search bar, and a filter by category section. The filter by category section lists nine categories: Data Curation, Databases, Libraries, Storage, Support/Consulting, tools/Applications, Training, Web Applications, and Workflows/Pipelines. Below the filter by category section, there are six service cards: Academic Meta Tool (AMT), ArboDat+, archaeology.link, NFDI4Objects Inkubator, NFDI4Objects Commons, and DANTE.

NFDI4Objects

About Support Participation Commons Services Portal

Home / Portal / Services

Search...

Filter by:

Data Curation	Databases	Libraries
Storage	Support/Consulting	tools/Applications
Training	Web Applications	Workflows/Pipelines

The NFDI4Objects service portfolio

In NFDI, services are divided into nine categories. Use the free text search or filter by category to familiarise yourself with the NFDI4Objects services.

We have written down **what is meant by the service categories and everything else you need to know about services** [here](#).

Academic Meta Tool (AMT)

ArboDat+

archaeology.link

NFDI4Objects Inkubator

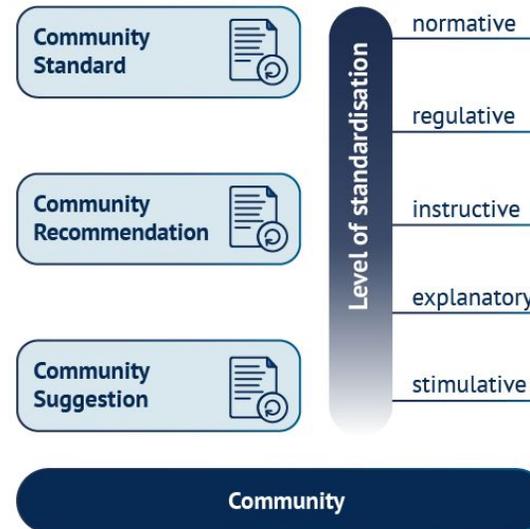
NFDI4Objects Commons

DANTE

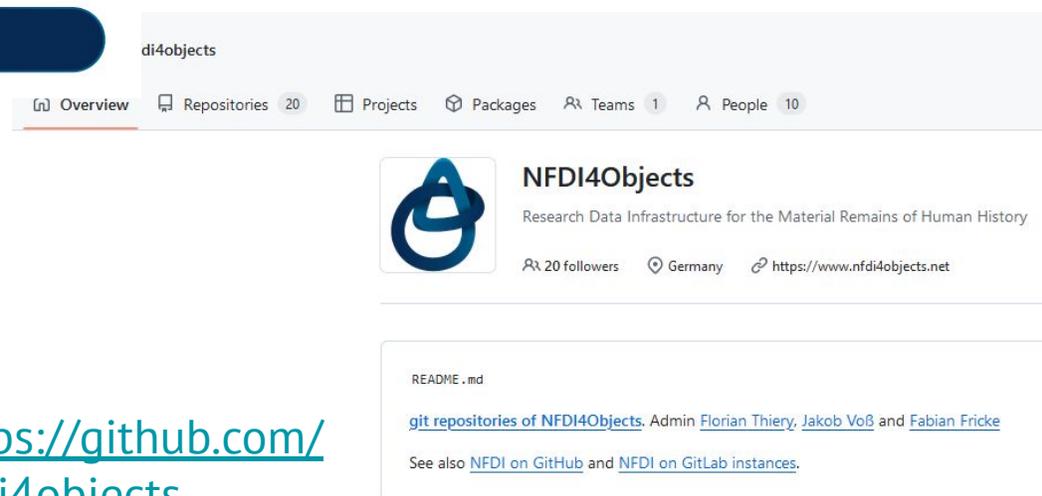
NFDI4Objects Publishing Platforms

NFDI4Objects Commons

- Our commons are suggestions, recommendations and standards that derive directly from the N4O community
- To ensure and uphold the quality of our commons we have implemented a unique community driven process
- <https://www.nfdi4objects.net/en/commons/>



<https://zenodo.org/communities/nfdi4objects/records?q=&l=list&p=1&s=10&sort=newest>



<https://github.com/nfdi4objects>

NFDI4Objects Knowledge Graph



[NFDI4Objects Knowledge Graph](#) [SPARQL](#) [Collections](#) [Repositories](#) [Terminologies](#) [Manual](#)

A collection is an individual set of research data imported into the knowledge graph. Each collection is identified by an URI starting with <https://graph.nfdi4objects.net/collection/>. Each collection belongs to a repository where its data has been published.

Information about collections is stored in the RDF graph <https://graph.nfdi4objects.net/collection/>.

Table Response 14 results Simple view Ellipse

	collection	name	repository	license
1	n4oc:1	Ur- und Frühgeschichtliche Sammlung der FAU	wd:Q124695065	
2	n4oc:2	Paläontologischen Sammlung der FAU Geowissenschaftliche Sammlung der FAU	wd:Q124695065	
3	n4oc:3	Graphische Sammlung der FAU	wd:Q124695065	https://creativecommons.org/publicdomain/zero/1.0/
4	n4oc:4	Musikinstrumentensammlung der FAU	wd:Q124695065	https://creativecommons.org/publicdomain/zero/1.0/
5	n4oc:5	Medizinische Sammlung der FAU	wd:Q124695065	
6	n4oc:6	Schulgeschichtliche Sammlung der FAU und Schulmuseum	wd:Q124695065	
7	n4oc:7	KENOM Virtuelles Münzportal (via LIDO)	wd:Q21040628	
8	n4oc:8	Samian Research Database	wd:Q22661177	https://www.hbz-nrw.de/produkte/open-access/lizenzen/dppl/mdppl/m-DPPL_v3_en_11-2008
9	n4oc:9	Linked Open Ogham	wd:Q22661177	http://creativecommons.org/licenses/by/4.0/
10	n4oc:10	African Red Slip Ware	wd:Q22661177	http://creativecommons.org/licenses/by/4.0/
11	n4oc:11	Digitale Sammlungen der Museen der Klassikstiftung Weimar	wd:Q124536091	
12	n4oc:12	Graphische Sammlung des Germanisches Nationalmuseums	wd:Q478695	
13	n4oc:13	KENOM (via Nomisma)	wd:Q24578999	
14	n4oc:16	Berliner Kunstammer	wd:Q22661177	http://creativecommons.org/licenses/by/4.0/

<https://graph.nfdi4objects.net/>

Research Data in NFDI4Objects



Object Data in NFDI4Objects

- Generation of heterogeneous and multidisciplinary research data in Task Areas 1-4 ('Documentation', 'Collecting', 'Analytics and Experiments', 'Protection'), e.g.
 - Excavation data
 - Distribution of finds and find locations
 - Data from building research
 - Collection and provenance information
 - Laboratory analyses such as genome determination, material analysis or radiocarbon dating
 - Restoration and conservation measures
 - Research into cultural monuments
- = Various (meta-)data, formats, systems, models, ontologies, standardised data, terminologies, ...
- Orientation towards the so-called 'object biography cycle'



Situation of the research data in NFDI4Objects

- Objects are related to **place and time** (e. g. place of origin, place of discovery, place of storage, always in the context of time periods...)
- Mapping of historical places and processes (who, when, where, what) → **Object biographies**
 - Modelling with attribute events
- **Uncertainty** and **inaccuracies** ('Looks Celtic, 300-600 BC?', 'Elbe site')
- Relation to scientific methods (measurements, analyses...)
- **Heterogeneous** and **unstructured** data (e. g. free text fields and text documents)
- Data needs to be non-public due to theft and looted excavations
- **Special vocabularies** hidden in various systems or under development to cover own data collection needs

Object Biography

- Transfers the concept of biography to objects of cultural heritage
- Compiles any kind of object information (contexts, paths they "traveled", hands they went through, meanings, ...)
- **Objects** (artifacts, living beings, rocks)
- **Contexts & Events**, e.g.
 - Origin (Creation, Production, ..)
 - Usage
 - Encounter (Find, Excavation)
 - Collection/Museum context
 - Change of ownership
 - Research events
- **Actors, places, time** (context specific: who? where? when?)
- **Sources** (pictorial and written material, data, findings, ...)

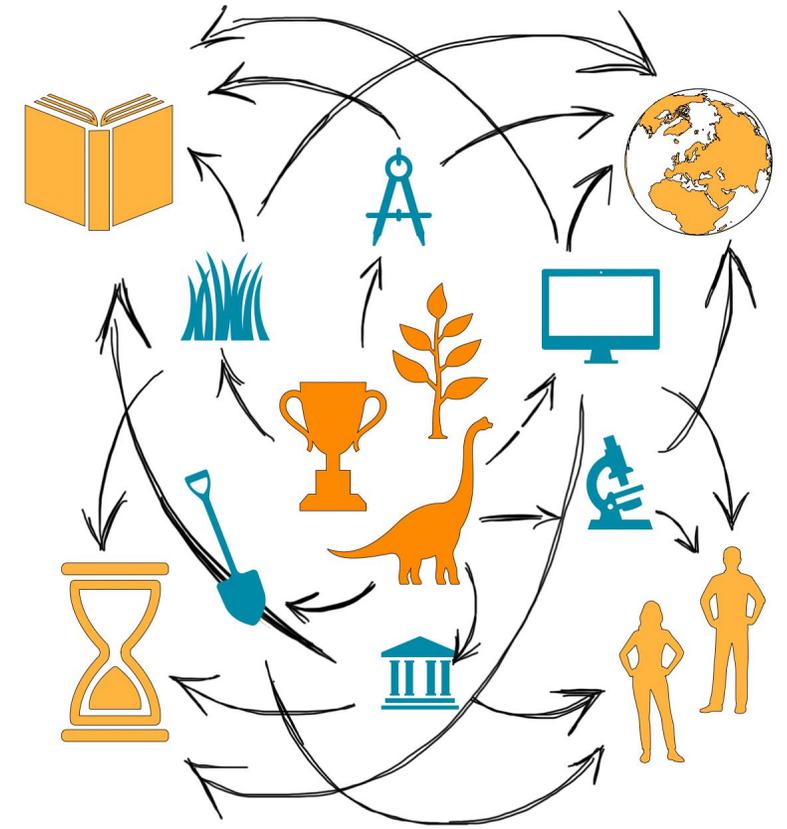
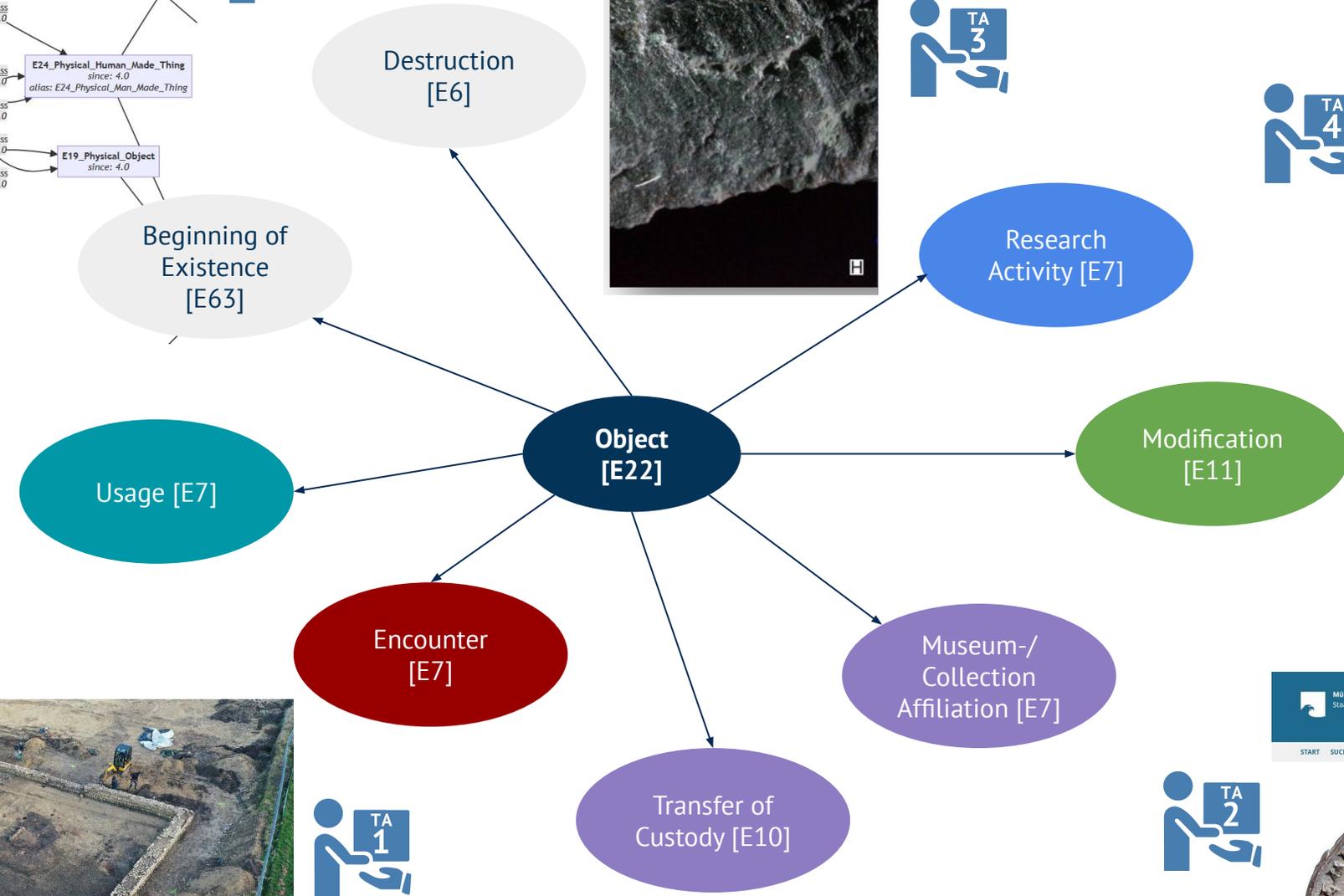
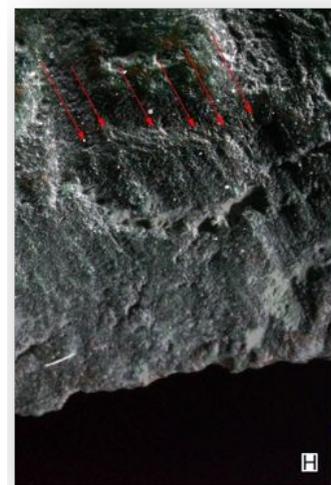
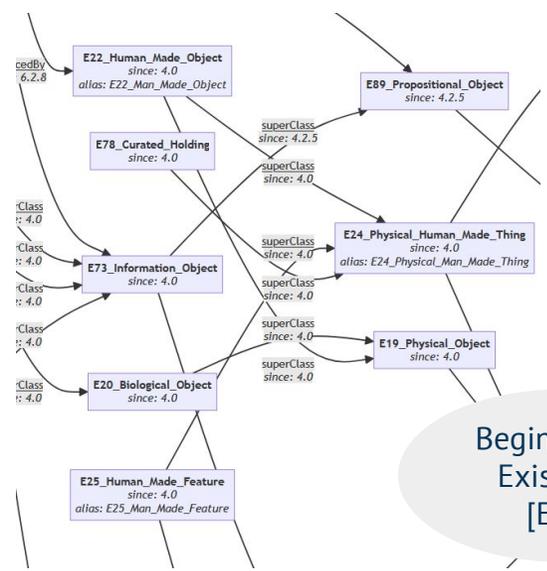


Fig.: Schematic representation of an object biography © Sarah Wagner, CC-BY 4.0



Objektdaten	
Gegenstand/Motiv:	Beispielobjekt
Objektnummer:	0.1234
Werkblattnummer:	WB_2023_123
Fundort:	Beispielhausen
Einlieferungsdatum:	23.10.2023
Ansprechpartner*in/ Eigentümer*in:	Dr. Beispiel
Datierung:	Römisch
Objekt-/Zustandsbeschreibung	
Objekttyp:	Trinkgefäß
Material:	Keramik
Maße:	Br. 126 L.160 H.165 mm
Durchgeführte Maßnahmen/Verwendete Materialien	
<ul style="list-style-type: none"> nach positiver Waschprobe feuchte Reinigung mit weichen Bürsten und Wasser Trocknung bei normalem Raumklima ca. 3 Tage keine vollumfängliche Festigung nötig, lediglich oberflächliche Tränkung mit Mowital B30H 5% in Ethanol Zusammensetzen und Kleben der Fragmente mit Mowital B60H 25% in Ethanol Teilabformung des vollständigen Henkels mit Dental silikon, für Ergänzung der Fehlstelle am abgebrochenen Henkel Ausguss der angefertigten Silikonform mit Gips und Anfügen/Anmodellieren des abgebrochenen Henkelteils mit ergänztem Fragment an Gefäßkörper Verriegelung der Gips-Ergänzung mit Mowital B30H 5% in Ethanol 	
Anmerkungen/Hinweise zu Handhabung und Lagerung	
Das Objekt liegt nach Abschluss der Restaurierungsmaßnahmen in stabilem, handelbarem und ausstellungsfähigem Zustand vor	
Lagerung unter konstanter, mäßiger Temperatur (ca. 20°C) und mittlerer relativer Luftfeuchtigkeit (50-55%)	
Datum	07.03.2024
Bearbeitungszeitraum	22.01-24.01.2024
Restaurator*in	K. Fella



Münzkabinett
Staatliche Museen zu Berlin

Interaktiver Katalog
des Münzkabinetts

START | SUCHE | KARTE

Laelanus
269 n. Chr.

Berlin, Münzkabinett der Staatlichen Museen

Ausstellung im Bode-Museum
Raum 241, BMZ/33 Münzwerte der Antiken Welt

Vorderseite
IMP C LAELIANVS P F AVG, Panzerbüste, mit Mantelbusch auf der l. Schulter, des Laelianus mit Strahlenkranz in der Brustansicht nach r.

Rückseite
VICTO-R-A-AVG, Victoria geht mit Kranz in der r. und Palmzweig in der l. Hand nach r.

Dargestellter
Laelanus

Münzstand
Antike Herrscherprägung

Autorität
Laelanus

Datierung
269 n. Chr.
Römische Kaiserzeit

Nominal
Doppeldener (AQT) 1

Herstellung
geprägt

Münzstätte
Köln

Region
Germania

Literatur
H. H. Giljman, Antoninus Cornelius Laelianus, GE (1982) 36 Nr. 54 (dieses Antoniniansprägung des Postumus bis Tetricus (S. J. Mairat, The Coinage Nr. 530 (6th), issue 1, p. Nr. 472,3 (dieses Stück, issue 1).

Webportale
<http://numismatics.org>

Sachbegriff
Münze

Abteilung
Antike, Römische Kaiserzeit

Accession
1874/271

Zugangsjahr
1874

Veräußerer (an Museum)
Münzenhandlung Adolph

Vorbesitzer
Senator Friedrich Eduard

Objektnummer
18202811

Permalink
<https://kfm.smb.museum>

LIDO-XML
[LIDO-XML](#)

JSON-RMK
[JSON-RMK](#)

JSON-LD
[JSON-LD](#)

Patenschriften
Fritz Rudolf Kurker

Fig.: Consolidation of Data from all Task Areas,
© Anja Gerber/Sarah Wagner/TA 1-5, CC-BY 4.0

A Core Metadata schema as base for Data Integration in NFDI4Objects

- **N4O Object Metadata Set** for the description of object data, based on LIDO (XML), among other standards
- **N4O Object Ontology application ontology** as RDF representation of the N4O OMDS for the knowledge graph, based on CIDOC CRM 7.1.3, among other ontologies
- **Terminologies** for the standardised description of research data

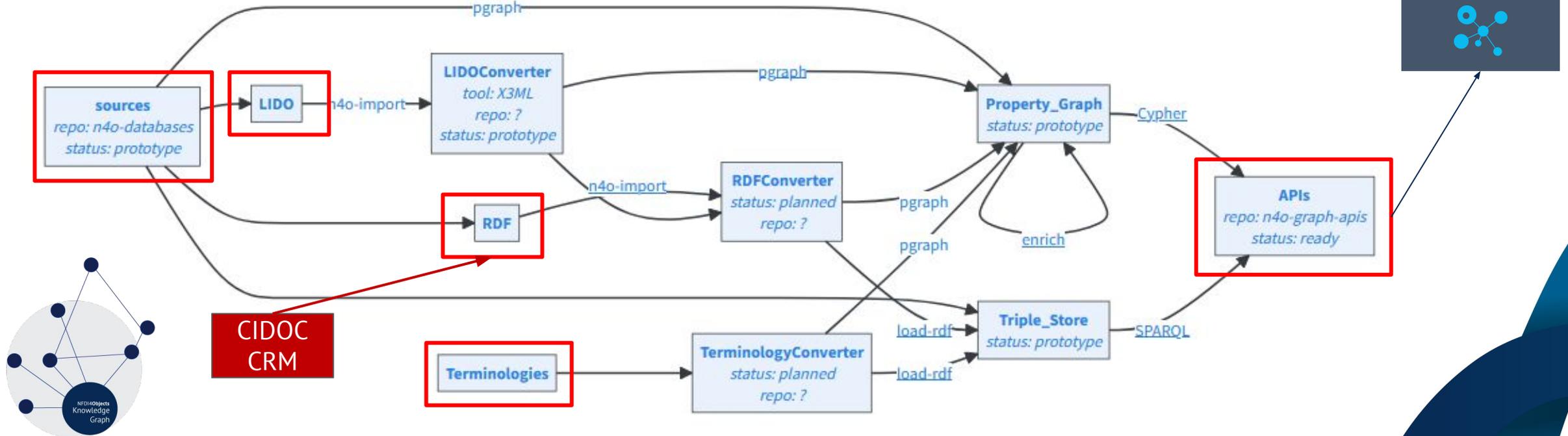


Fig.: [Data Integration N4O Graph](#), © Jakob Voss, GBV, CC BY 4.0

Tasks in TA6 by KSW & FAU CDI

- Development of an **Object Metadata Set (N40 OMDS)** in cooperation with the TA 1-4 (via a TWG) as a core schema for data integration in NFDI4Objects
- Development of the NFDI4Objects **Object Ontology N40 OO** (based on the CIDOC CRM 7.1.3. and other ontologies (via a TWG) as RDF realisation of the N40 OMDS
- Development of a data model to represent the **Core Data** of objects based on N40 OMDS and N40 OO
- Development, implementation and proof of concept of a knowledge graph to represent **Object Biographies** in the **VRE WissKI** (“**Maximum Dataset**”) based on N40 OO



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Thank you for your attention!

#NFDI4Objects
nfdi4objects.net
helpdesk@dainst.de