

Semantic Web und LOD in der digitalen Archäologie

Ein Blick in die Praxis



Q109744747

DOI [10.5281/zenodo.5729125](https://doi.org/10.5281/zenodo.5729125)



Mitglied der
Leibniz
Leibniz-Gemeinschaft

Römisch-Germanisches
Zentralmuseum
Leibniz-Forschungsinstitut
für Archäologie

R G Z M

mainzed

Mainzer Zentrum
für Digitalität in den
Geistes- und
Kulturwissenschaften



Research Squirrel Engineers



Florian Thiery M.Sc.

@fthierygeo

0000-0002-3246-3531

Q66606154

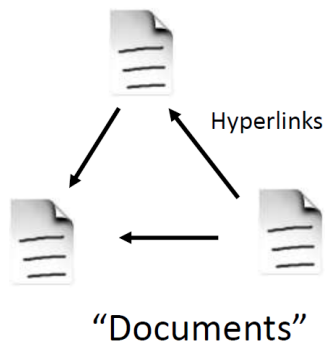
<http://fthiery.de>

RGZM, Mainz, Germany

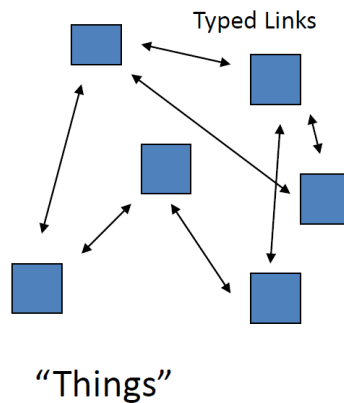




Web of Documents



Web of Data



more at <https://devopedia.org/semantic-web>

Semantic Web, from web of documents to web of data. Source: Fensel 2013, slide 15.

Web



Semantic Web



*Semantic Web adds links data on the web and adds a layer of meaning to data.
Source: Petkova 2016.*

Semantic Web

from the Web of Documents to the Web of Data



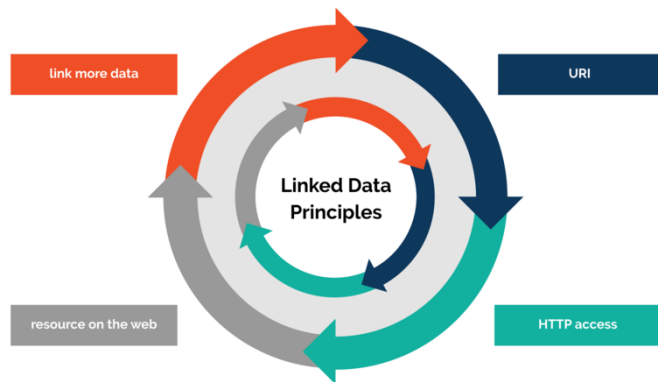
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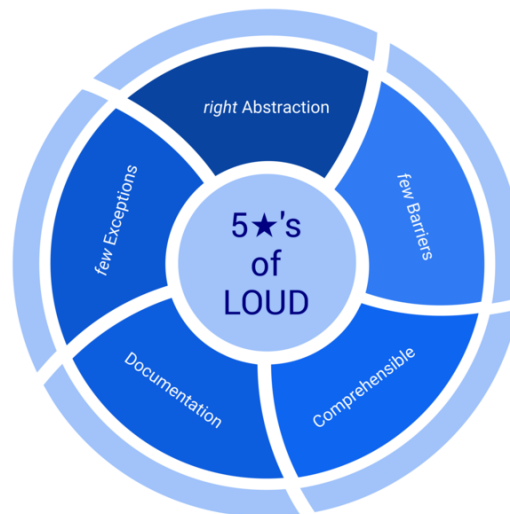
Semantic Web in der digitalen Archäologie

Was heißt das?

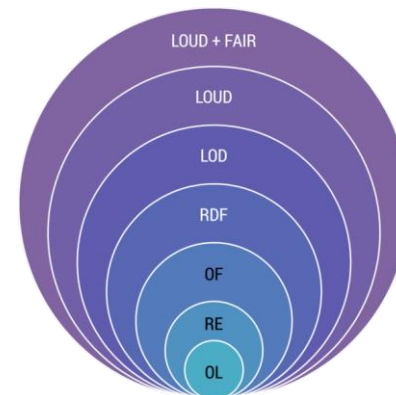


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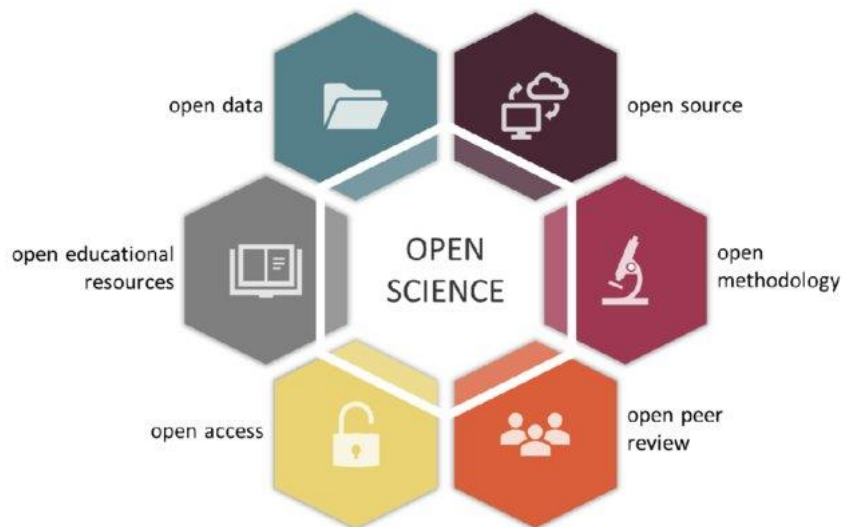
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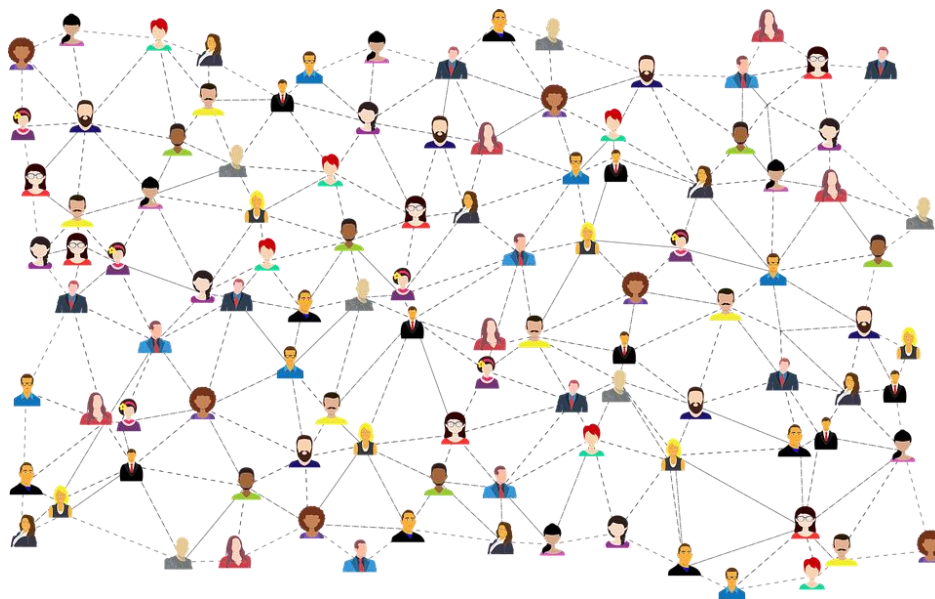


Linked Open (Usable) (Geo-)Data *plus FAIR + CARE*



<https://www.researchgate.net/publication/332352194>

Es heißt aber auch...
... es ist immer noch eine Nische - wie OPEN SCIENCE ...

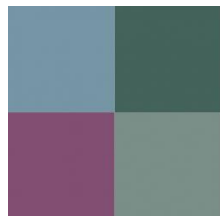


Dafür gibt es aber Ideen :-))
Die Community spielt eine große Rolle!

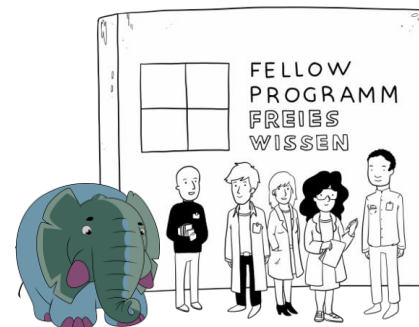


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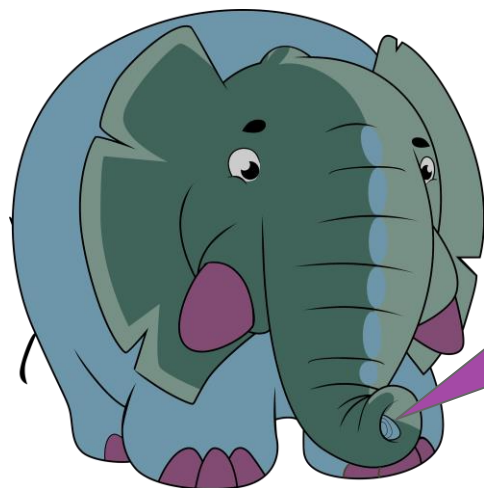
**FELLOW
PROGRAMM
FREIES
WISSEN**



*Riesenspatz Infoillustration für Wikimedia Deutschland,
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Wikimedia Deutschland

Open Science Fellows Programm



Florian Thiery. CC BY-SA 4.0.
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Mit dem Fellow-Programm
förderte Wikimedia Deutschland
zwischen 2016 und 2021 Freies
Wissen in der Wissenschaft, um
den Austausch und die
Zusammenarbeit zwischen
Wissenschaft und Gesellschaft zu
verbessern.

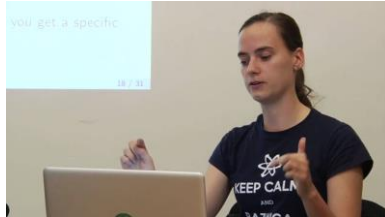
https://en.wikiversity.org/wiki/Wikimedia_Deutschland/Open_Science_Fellows_Program



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Sophie C. Schmidt



Martina Trognitz

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https://de.wikiversity.org/wiki/Wikiversity:Fellow-Programm_Freies_Wissen/Fellows2020



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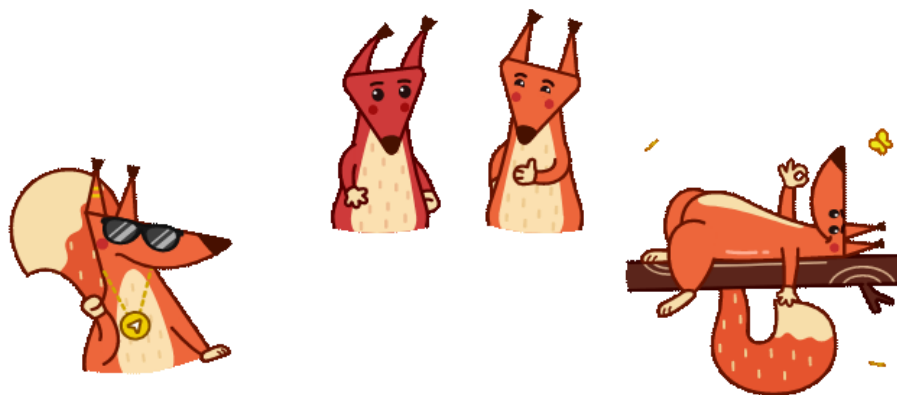


**FELLOW
PROGRAMM
FREIES
WISSEN**

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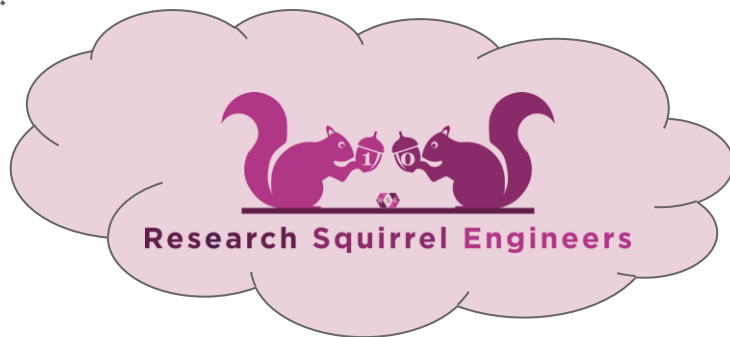


Florian Thiery



Research Squirrel Engineers

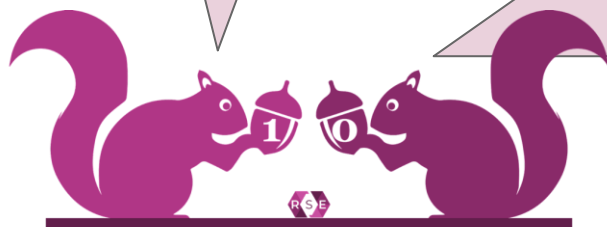
Ein Netzwerk für fleißige DH Squirrels!



Digital Archaeologists
& Research Software
Engineers benötigen eine
Community zur
Vernetzung und
Unterstützung.



We are
Research Squirrels
and interested in
Open Science and
Linked Data.



Research Squirrel Engineers

Wir haben derzeit einen
fachlichen Background in...

**Research Software
Engineering,**



Geoinformatics



und
Cultural Heritage.



Tippawan Sookruay from the Noun Project (globe + head)
Derivative work by Florian Thiery and Sophie Charlotte Schmidt of
Archaeologist by Nihar from the Noun Project, dig by Manthana
Chaiwong from the Noun Project and archaeology by Phatchara
Bunkhachary, TH from the Noun Project under CC BY 3.0
(archaeologist)



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Sophie

@idhrenil

0000-0003-4696-2101



Martina

0000-0003-0485-6861



Research Squirrel Engineers



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Florian

@fthierygeo

0000-0002-3246-3531



© i3mainz



Timo

@situxxx

0000-0002-9499-5840



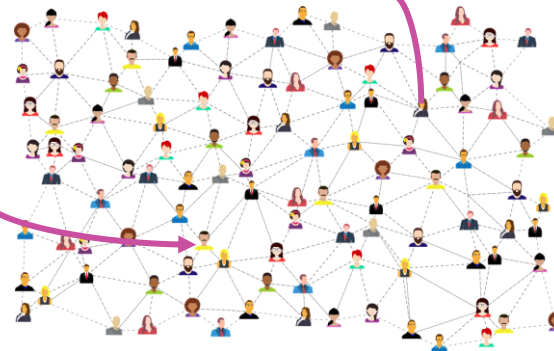
Tippawan Saekruay from the Noun Project (globe + head)
Derivative work by Florian Thiery and Sophie Charlotte Schmidt of
Archaeologist by Nhor from the Noun Project. dig by Manthana
Chaiwong from the Noun Project and archaeology by Phatchara
Bunkhachary. TH from the Noun Project under CC BY 3.0
(archaeologist)



deRSE e.V.
DH-RSE
CAA International & CAA Sektion Deutschland
CAA SIG Data-Dragon & CAA SIG Scientific Scripting Languages
CAA Little Minions Group
ISAAK - Initiative for Statistical Analysis in Archaeology Kiel
Linked Pasts (Linked Pipes Working Group)
Wikimedia Germany (Fellow-Program Freies Wissen Fellows)



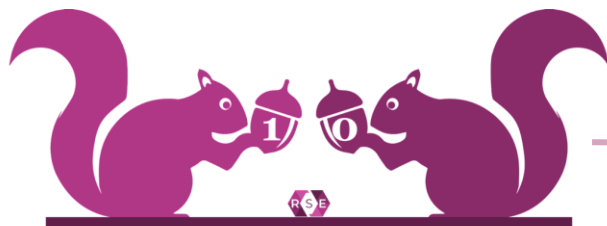
Research Squirrel Engineers





Research Squirrel Working Groups

- * SPARQLing Unicorn QGIS Plugin
- * Linked Open Ogham Data
- ... *to be continued* ...



Research Squirrel Engineers



Tippawan Sooltracy from the Noun Project (globe + head)
Derivative work by Florian Thiery and Sophie Charlotte Schmidt of
Archaeologist by Nihor from the Noun Project, dig by Manthana
Chaiwong from the Noun Project and archaeology by Phatchara
Bunthachary. TH from the Noun Project under CC BY 3.0
(archaeologist)



AG Graphen & Netzwerke

1. AG-Name

AG Graphen & Netzwerke

2. AG-Arbeitsschwerpunkte

Die **Modellierung von Daten** in einer graphenbasierten Struktur ermöglicht es, Informationen in einer flexiblen Art und Weise in Bezug miteinander zu setzen. Modelliert werden nicht in Dokumenten zusammengesetzte Informationseinheiten (wie etwa Tabellen bei relationalen Datenbanken) sondern distinkte Entitäten, die durch Relationen miteinander verknüpft ein semantisches Netz bilden.

Graphdatenbanken zeigen beim Umgang mit Metadaten eine hohe Performanz und liefern qualitativ hochwertige Suchergebnisse. Die Visualisierung der Daten als Graph, oder auch semantisches Netz, bieten dem Betrachter eine intuitiv-zugängliche Darstellungsform und kann damit auch Ausgangspunkt für weitere Analyseansätze sein.

Graphs and Networks in the Humanities 2022

Technologies, Models, Analyses, and Visualizations

6th International Conference, 3. – 5. February 2022,
Amsterdam

<https://graphentechnologien.hypotheses.org>

DHd AG *Graphen und Netzwerke*



LP Network

While not the responsibility of the Linked Pasts Steering Committee, which is limited to the annual symposium, the Linked Pasts Network refers to a growing collection of historical datasets published as Linked Open Data and the community of researchers across the globe whose projects are producing and using them. The nature of this emerging network is discussed at the Linked Pasts series of international symposia.

This site and [repo](#) are just getting under way. This visualization is a partial view of the projects and supporting organizations within the "geospatial region" of the network. Further information about Linked Pasts can be found in a Dec 2017 white paper, "[From Linking Places to a Linked Pasts Network](#)".

The Linked Pasts Network was inspired by work such as the [Pelagios Network and Association](#), the [Linked Ancient World Data Institute](#) (2012–13) and the [LAWD Ontology](#).



GHENT CENTRE FOR DIGITAL HUMANITIES

[HOME](#) [SERVICES](#) [PROJECTS](#) [ACTIVITIES](#) [LINKED PASTS VII SYMPOSIUM](#) [ABOUT THE CENTRE](#)

Linked Pasts VII Symposium

The annual [Linked Pasts conference](#), which has previously been held at KCL, Madrid, Stanford, Mainz, Bordeaux and virtually at London brings together scholars, heritage professionals and other practitioners with an interest in Linked Open Data as applied to the study of the ancient and historical worlds. Panels and working groups at Linked Pasts are more goal-oriented than a conventional academic conference, and activities and agendas are often proposed, developed and revised by all participants at the event itself. The Linked Pasts Symposium is a formal partner of the [Pelagios Network](#).

The seventh installment of Linked Pasts in December 2021 will be hosted by the [Ghent Centre for Digital Humanities](#) and [CLARIAH Flanders Open Humanities Service Infrastructure](#) consortium (an interdisciplinary team from Universities of Ghent, Antwerp, Leuven and Brussels).

CHANGE IN FORMAT: Due to corona related measures, Linked Pasts 7 will move from a hybrid event to an online event with activities taking place remotely (online) over two weeks (December 13-21). Other than welcome, keynotes and wrap-up at the beginning and end of the conference, most activities during the weeks will be asynchronous, with work or discussions taking place in whatever medium is most appropriate to the activity and community in question.

<https://www.ghentcdh.ugent.be/linked-pasts-vii-symposium>

Linked Pasts

Linking the Past



<http://datadragon.link>



Data Dragon

CAA SIG Data-Dragon

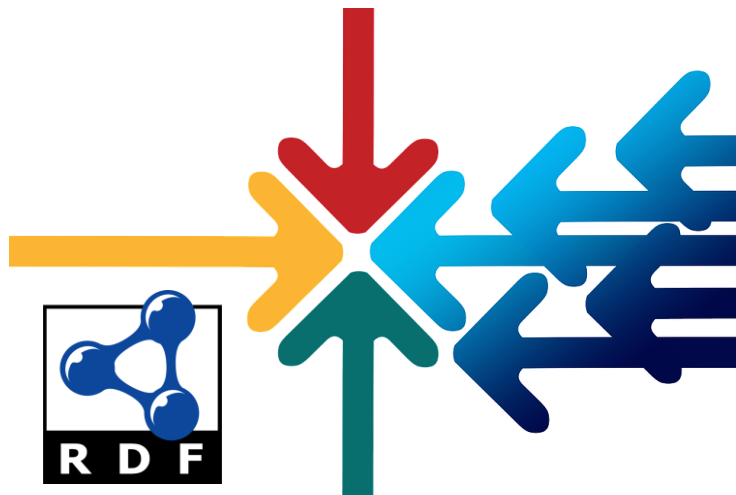
Semantics and LOUD in Archaeology



Linked Open Samian Ware
Irische #/ Stones in the Wikimedia Universe
SPARQLing Unicorn QGIS Plugin
REsearch REsource REGistry for DataDragons

Vier Beispielprojekte

aus der digitalen Archäologie / Semantic Web / LOD



Schwerpunkte

*Datenmodellierung, -erfassung und -präsentation,
verwendete Tools und Software, Challenges
und „lessons learned“*

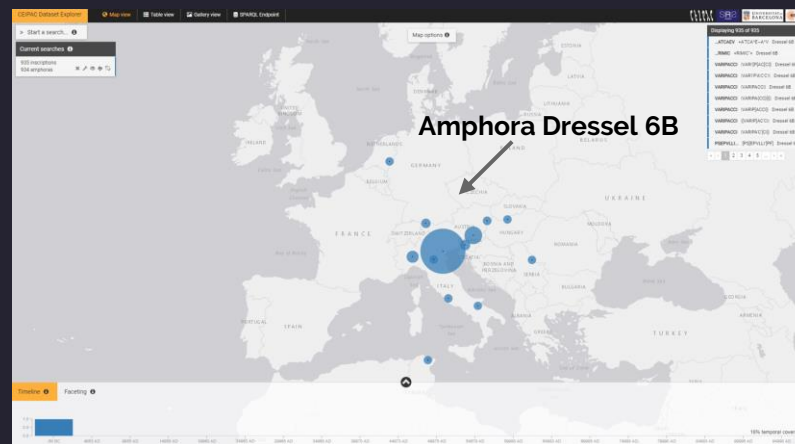
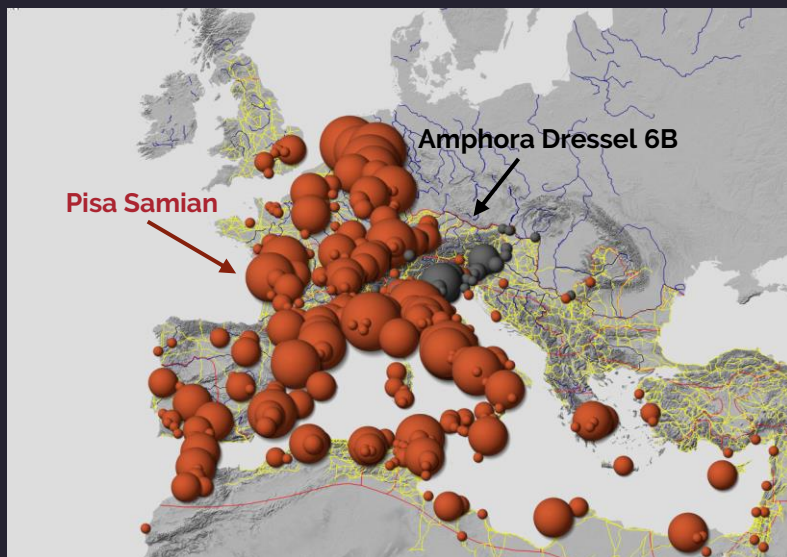


archaeology.link
A Linked Open Data Hub for the RGZM and its partners



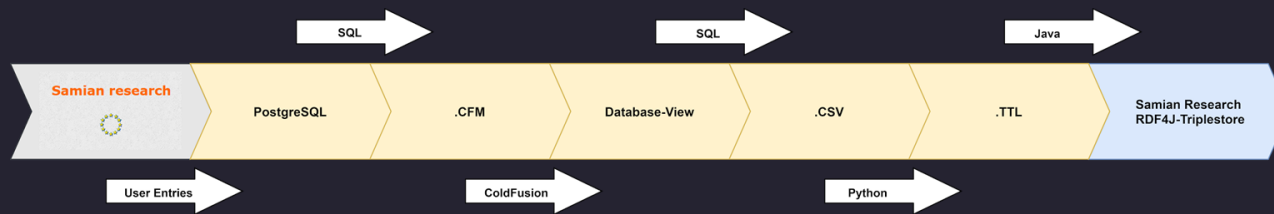
Linked Open Samian Ware

Samian Ware Data from the Samian Research Database



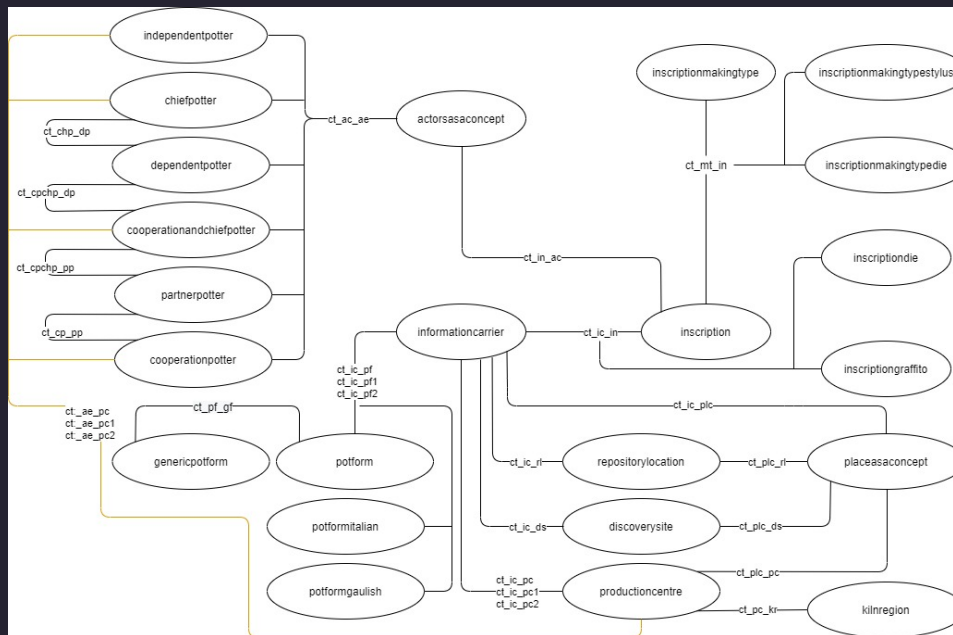
<https://romanopendata.eu/#!/main>

If so, we may link our LOD with existing LOD
like the Roman Open Data.

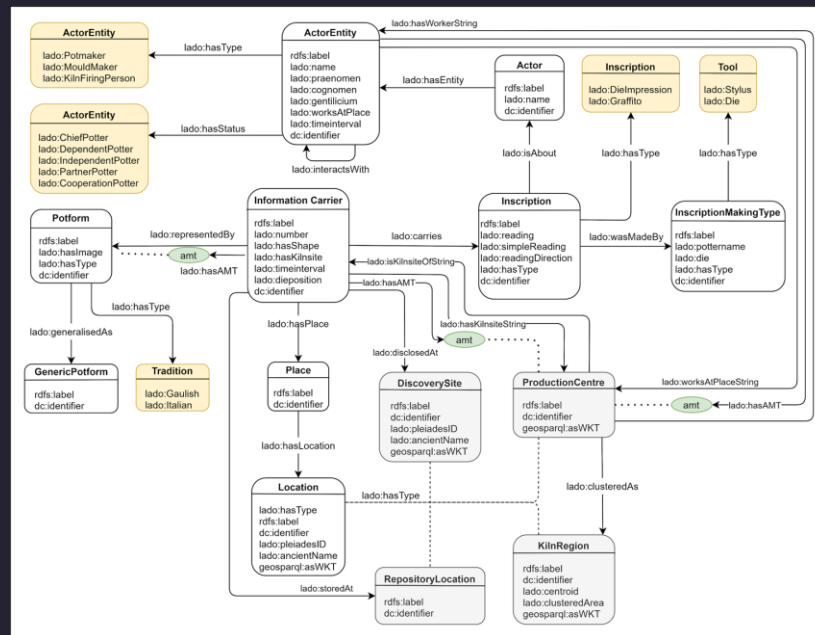


- *curate* entries in the **Samian Research Database**, stored in a **PostgreSQL** database
- *create* **database views** from the original database tables via **ColdFusion/SQL**
- *export* database views as **CSV** files
- *transform* CSV files with **Python** to **RDF** according to our **ontology**
- *import* RDF files with a **Java** application in a **RDF4J triplestore**
- *link* our data to the **Linked Open Data Cloud**, e.g. Pleiades, Wikidata

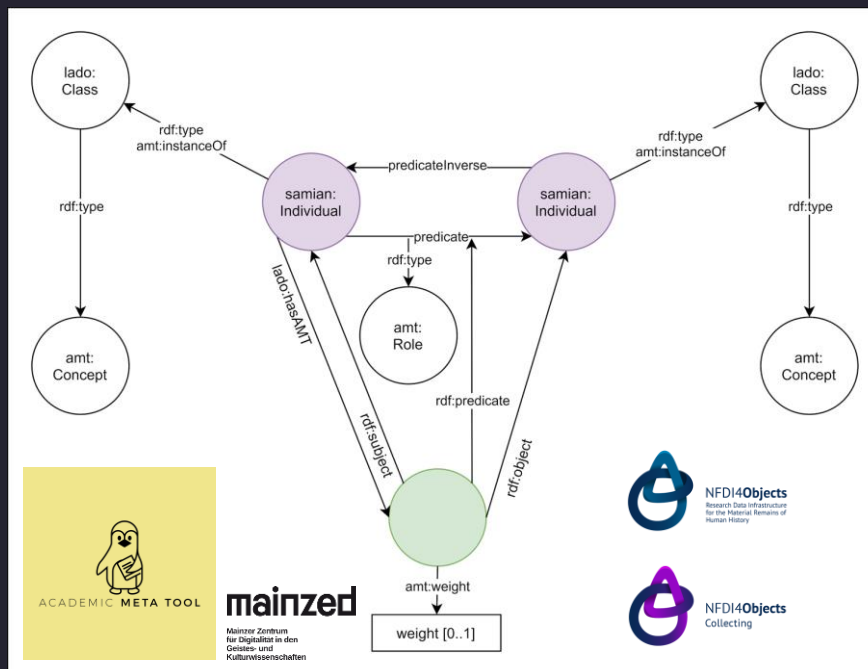
Challenge accepted! We created our own workflow.



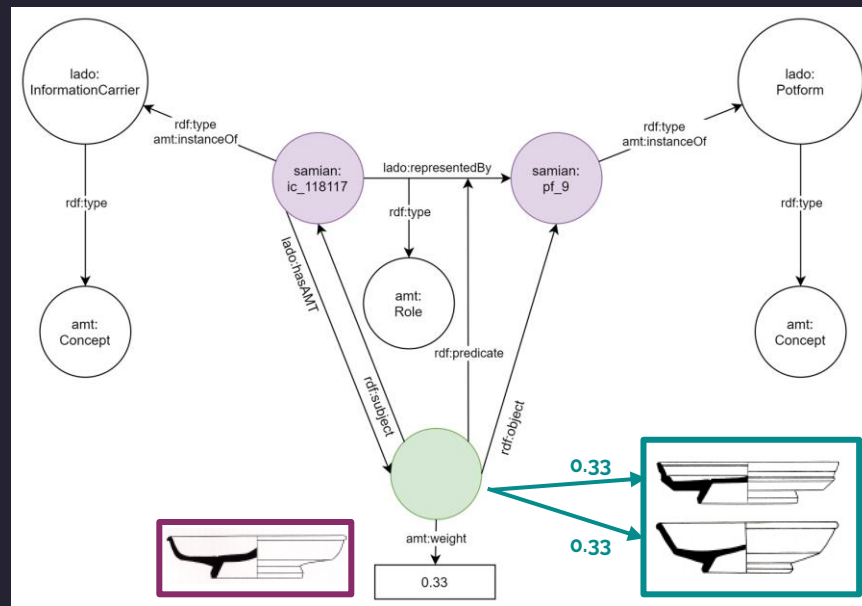
Transform CSV data to RDF according to our ontology.



The ontology represents a graph model of the original relational database which includes vague relations (*amt*).



**The data contains strings with vague expressions.
We model this vagueness using the *Academic Meta Tool*.**



**Informationcarrier 118117 can be represented by the potforms
18 OR 15/17 OR 18/31 resulting in a degree of 0.33 for 18.**



NFDI4Objects

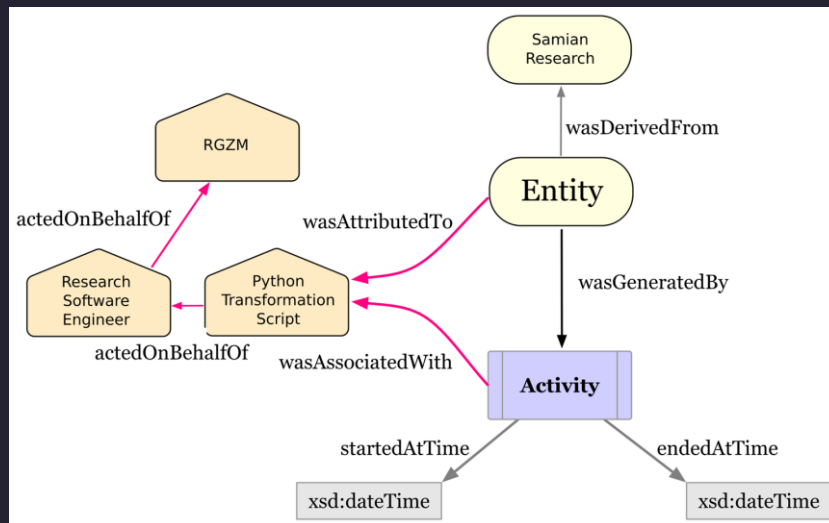
Research Data Infrastructure
for the Material Remains of
Human History

<https://www.nfdi4objects.net>

TRAIL 2.7

<https://osf.io/g4cr7/>

**Moreover, these items play a major role in the planned
German National Research Data Infrastructure (NFDI)
consortium NFDI4Objects.**



triples: 7.869.468

306.615 instances

information carriers: 185.059

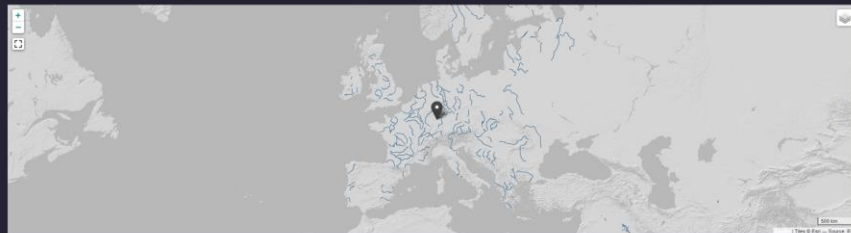
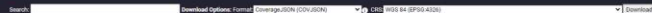
actors: 9419

discovery sites: 3879

production centres: 103

kiln regions: 11

The provenance information for the transformation process is stored using the PROV-O ontology.

[illegible]

Search: Download Options: Format Comma Separated Values (CSV)



Property	Value	refType
baseGeneralizedId	+ <code>pubkeysummary/174619</code>	baseWorkAPIPlace
basePostImage	+ <code><https://www1.rgm.de/po/forms/thumbs/13.jpg></code>	
baseHostType	+ <code>base.Coalish</code>	
baseId	+ <code>1 (and integer)</code>	
baseInstanceOf	+ <code>base.Polygon</code>	
refIdLabel	+ <code>18 (and string)</code>	
is refObject of	+ <code>10794 value</code>	
is baseRepresentivity of	+ <code>10794 value</code>	
refId	+ <code>base.Polygon</code>	



HTML rendering powered by geopubby (i3mainz)



Search: Download Online Format: [Comma Separated Values \(CSV\)](#) [Microsoft Excel](#) [Download](#)

Property	Value
isIsaHasMET	[2 values]
isIsaHasUnitOf	<ul style="list-style-type: none"> pubchem:unit/vec_7005889
isIsaHasUnit	<ul style="list-style-type: none"> isIsaIndependentUnit
isIsaHasType	<ul style="list-style-type: none"> isIsaKindOfIngredient isIsaMolecular isIsaFormulator
isIsaHasWorkerOf	<ul style="list-style-type: none"> pubchem:loc_pc_2000047 pubchem:loc_pc_2000003
isIdentifier	<ul style="list-style-type: none"> isIRI (xsd:string)
isNotInstanceOf	isIsaActivity
isReflected	<ul style="list-style-type: none"> Quanta (Quanta) (xsd:lengthy) (en)
isRefName	Quanta (Quanta) (xsd:string)
isRefSubject	[2 values]
isRefUnitInterval	<ul style="list-style-type: none"> AD 154 180 (xsd:string)
isRefType	isIsaActivity
isRefWorksAPPlace	<ul style="list-style-type: none"> pubchem:loc_pc_2000047 pubchem:loc_pc_2000003

DOI: 10.5281/zenodo.4305708

<https://rgzm.github.io/samian-lod>

The result: Linked Open Samian Ware!



























```
_:2119 rdf:type oa:Annotation .
_:2119 dcterms:creator <http://www.wikidata.org/entity/Q90412636> .
_:2119 <http://www.w3.org/ns/activitystreams#generator> <https://orcid.org/0000-0002-3246-3531> .
_:2119 dcterms:contributor <https://orcid.org/0000-0002-7634-5342> .
_:2119 dcterms:contributor <https://orcid.org/0000-0002-8761-4659> .
_:2119 dcterms:contributor <https://orcid.org/0000-0002-3246-3531> .
_:2119 dcterms:issued '2020-11-27T09:39:43Z'^^xsd:dateTime .
_:2119 oa:hasTarget samian:loc_ds_1003761 .
_:2119 oa:hasBody <http://pleiades.stoa.org/places/109169> .
_:2119 pelagios:relation relations:foundAt .
_:2119 oa:annotatedAt '2020-11-27T09:39:43Z'^^xsd:date .
_:2119_1 cnt:chars 'POINT(50 8.2791)' .
_:2119_1 dcterms:format 'application/wkt' .
```



according to <https://github.com/pelagios/pelagios-cookbook/wiki/Joining-Pelagios#minimum-example>

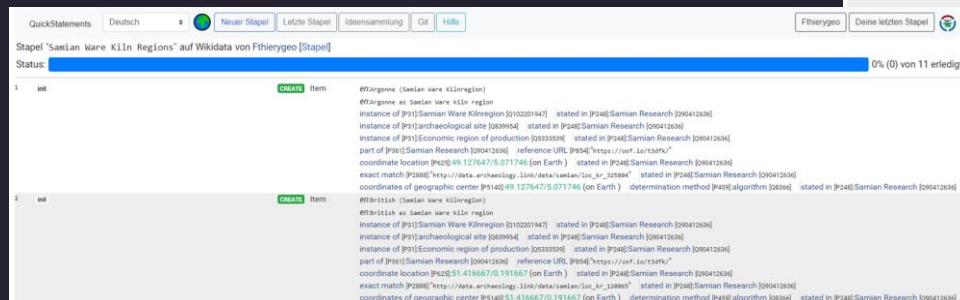
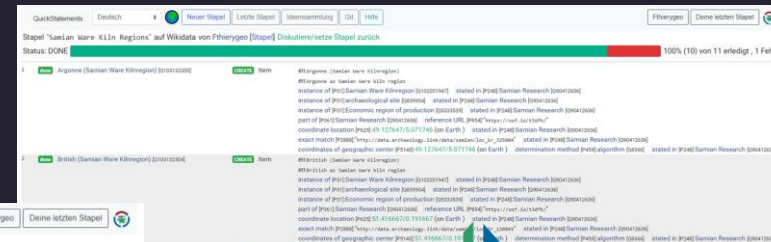
As an example, linking to Pleiades with Open Annotation.

La Graefesenque (Samian Ware Productioncentre) (new item)	
Label (override if present)	La Graefesenque (Samian Ware Productioncentre) (English)
Description (override if present)	La Graefesenque as Samian Ware production centre (English)
part of (P361)	 Samian Research (Q90412636)  1 references
exact match (P2888)	 http://data.archaeology.link/data/samian/loc_pc_2000001  1 references
coordinate location (P625)	 44°6'0.00"N, 3°4'59.99"E  1 references
instance of (P31)	 Samian Ware Productioncentre (Q102202026)  1 references  archaeological site (Q839954)  1 references  manufactory (Q380342)  1 references
Banassac (Samian Ware Productioncentre) (new item)	
Label (override if present)	Banassac (Samian Ware Productioncentre) (English)
Description (override if present)	Banassac as Samian Ware production centre (English)
part of (P361)	 Samian Research (Q90412636)  1 references
exact match (P2888)	 http://data.archaeology.link/data/samian/loc_pc_2000002  1 references
coordinate location (P625)	 44°25'59.99"N, 3°12'0.00"E  1 references
instance of (P31)	 Samian Ware Productioncentre (Q102202026)  1 references  archaeological site (Q839954)  1 references  manufactory (Q380342)  1 references

SCDH Semantic Web Workshop 2021 | 26th November 2021 | Florian Thiery @fthierygeo



```
CREATE
LAST Len "Central Gaulish (Samian Ware Kilnregion)"
LAST Den "Central Gaulish as Samian Ware Kiln region"
LAST P31 Q102201947 S248 Q90412636
LAST P31 Q839954 S248 Q90412636
LAST P31 Q5333539 S248 Q90412636
LAST P361 Q90412636 S854 "https://osf.io/t3dfk/"
LAST P625 @46.489095/2.501038 S248 Q90412636
LAST P2888 "http://data.archaeology.link/data/samian/loc_kn_156975" S248 Q90412636
LAST P5140 @46.489095/2.501038 P459 Q8366 S248 Q90412636
```



<https://quickstatements.toolforge.org/#/>

Abgeleitetes Werk: User:Perhelion:User:Planemad:user:Karl432.
Public domain, via Wikimedia Commons

Wikidata Import using OpenRefine and Quick Statements



```
Wikidata Query Service
1 # Samian Ware Discovery Sites
2 SELECT ?item ?samian ?itemLabel ?geom
3 WHERE
4 {
5   ?item wdt:P31 wd:Q102202066.
6   ?item wdt:P361 wd:Q90412636.
7   ?item wdt:P625 ?geom.
8   ?item wdt:P2888 ?samian.
9   SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE],en". }
10 }
```

<https://w.wiki/owf>

```
Wikidata Query Service
1 # Samian Ware Productioncentres
2 SELECT ?item ?samian ?itemLabel ?geom
3 WHERE
4 {
5   ?item wdt:P31 wd:Q102202066.
6   ?item wdt:P361 wd:Q90412636.
7   ?item wdt:P625 ?geom.
8   ?item wdt:P2888 ?samian.
9   SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE],en". }
10 }
```

<https://w.wiki/owe>

```
Wikidata Query Service
1 # Samian Ware Kilnregions
2 SELECT ?item ?samian ?itemLabel ?geom
3 WHERE
4 {
5   ?item wdt:P31 wd:Q102201947.
6   ?item wdt:P361 wd:Q90412636.
7   ?item wdt:P625 ?geom.
8   ?item wdt:P2888 ?samian.
9   SERVICE wikibase:label { bd:serviceParam wikibase:language "[AUTO_LANGUAGE],en". }
10 }
```

<https://w.wiki/owZ>

The result: Samian Ware as archaeological sites in Wikidata...



Rheinzaßern of archaeology:loc Linked type data
http://data.archaeology.link/data/samian/loc_pc_2000047 powered by geoparql / Strimling

Search: Download Options:

Property	Value
geoparql:crs:7	<http://www.opengis.net/def/crs/EPG/0/4326> POINT(8.278055999999998 49.118056)
lido:clusteredAs	pubby:samian/loc_kr_401298
lido:exactMatch	<http://www.wikidata.org/entity/Q103135703>

Property	Value
geoparql:asWKT	<http://www.opengis.net/def/crs/EPG/0/4326> POINT(8.278055999999998 49.118056)
lido:clusteredAs	pubby:samian/loc_kr_401298
lido:exactMatch	<http://www.wikidata.org/entity/Q103135703>

WIKIDATA

Rheinzaßern (Samian Ware Productioncentre) (Q103135703)

Rheinzaßern as Samian Ware production centre

In more languages

Language	Label	Description	Also known as
English	Rheinzaßern (Samian Ware Productioncentre)	Rheinzaßern as Samian Ware production centre	
German		No label defined	
Polish		No label defined	
French		No label defined	

Statements

instance of

- Samian Ware Productioncentre
- archaeological site
- manufactory

part of

- Samian Research

coordinate location

exact match

- http://data.archaeology.link/data/samian/loc_pc_2000047

... and bidirectional linking to and from Wikidata!



re3dragon

A REsearch REgistry REsource for Data Dragons



The *rezdragon* tool envisages two aims ...



Publication of an **open extendable
archaeology related LOD resource
catalogue** (Dragon Lair)
including authority data, thesauri,
controlled vocabularies,
(space-time) gazetteers,
as well as typologies and domain specific
resources.



Offering an API for requesting distributed
LOD resources (Dragon Items)
providing resources in a standardised
JSON format based on **JSKOS**.



re3dragon ⇒ REsearch REsource Registry for DataDragons

- # **online catalogue** of LOD resources (dragon lair) stored as RDF in a triplestore
- # **search API service** for LOD resources with string and distance similarity
- # **resolve API service** for LOD resources for specific URIs
- # provide a **standardised (Geo-)JSON(-LD) data model** according to **JSKOS** as response to an API request

embedded in **community** work in the **CAA SIG Data Dragon**, hosted by the RGZM



The re3dragon API is coded in *JAVA* using Maven and Apache Jena and is published *Open Source* on GitHub.

<https://github.com/RGZM/re3dragon>



VZG
format

Datenformate · Anwendungen · Strukturen · Kodierungen · Modelle · Schemas · Hintergrund

JSKOS data format for Knowledge Organization Systems

Mit dem **JSKOS data format for Knowledge Organization Systems (JSKOS)** lassen sich Wissensorganisationssysteme und ihren Bestandteile in **JSON** kodieren. Das Format basiert auf **SKOS** und **JSON-LD**.

Beispiel

```
{
  "uri": "http://example.org/terminology/P",
  "type": ["http://www.w3.org/2004/02/skos/core#Concept"],
  "scopeNote": {
    "en": ["lack of violent conflict or violence"],
    "de": ["Abwesenheit von Gewalt, Angst und anderen Störungen"]
  },
  "prefLabel": { "en": "peace", "de": "Frieden" },
  "altLabel": { "de": ["Friede"] },
  "notation": ["P"],
  "narrower": [ { "prefLabel": { "en": "world peace" } } ]
}
```

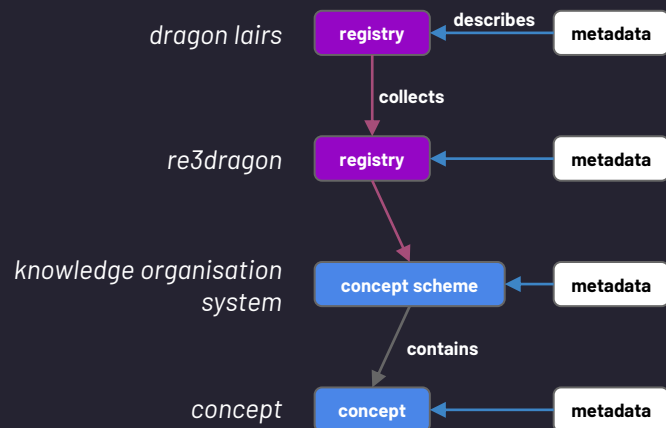
🏠 Homepage	https://gbv.github.io/jskos/
⬆️ Format	JSON
⬆️ Datenmodell	JSKOS data format for Knowledge Organization Systems (JSKOS)
🔗 Anwendung	Normdatenformate
⬆️ Anwendungsprofil von	Simple Knowledge Organisation System (SKOS) JSON-LD

Verbundzentrale des GBV (VZG) · Impressum · Datenschutz

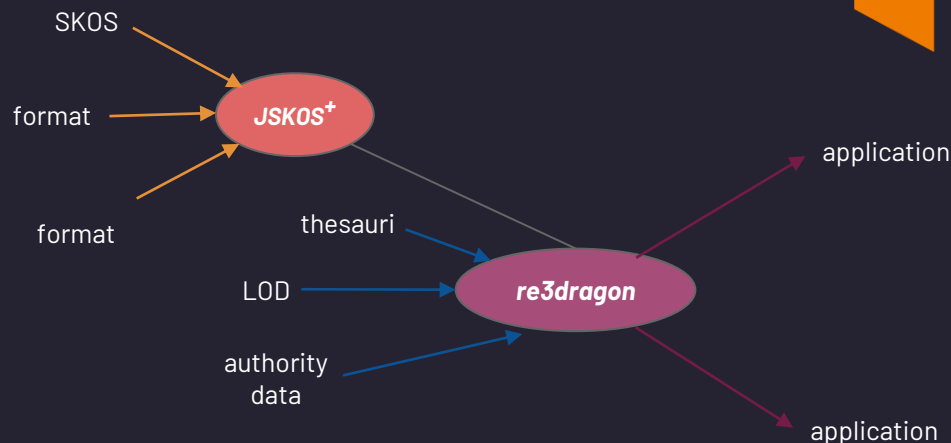
JSON · Quelltext · Lizenz

<https://gbv.github.io/jskos/jskos.html> | <https://github.com/gbv/jskos>

**The exchange format is based on JSKOS
by the VZG in Göttingen, Germany (Jakob Voß).**



after Describing Knowledge Organization Systems in BARTOC
and JSKOS U. Balakrishnan, A. Ledl, J. Voß Published (2016)



after Einheitliche Normdatendienste der VZG,
Jakob Voß, Tobias Helms (2016)

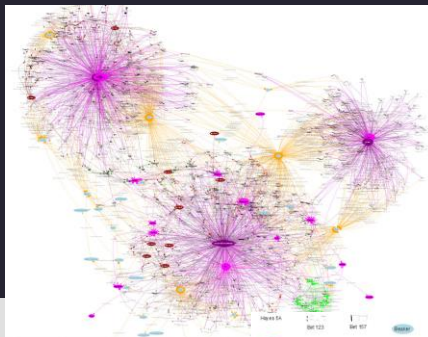
**This new JSKOS+ allows
for specialised
extensions**

Getty Vocabularies as Linked Open Data

The Getty Vocabularies have always been constructed to allow linking. Through the LOD (Linked Open Data) project at Getty, that goal is now being realized. The documents on this page contain information and presentations about the release of the Getty Vocabularies as LOD. These materials are subject to frequent modification and addition.



<https://www.getty.edu/research/tools/vocabularies/loa/>



<https://rgzm.github.io/samian-lod/>

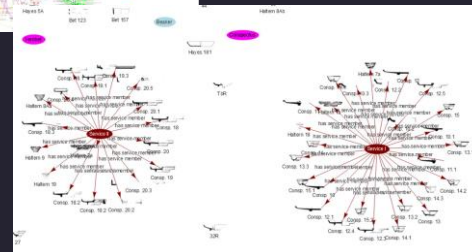
Welcome to Wikidata

the free knowledge base with 95,888,016 data items that anyone can edit.

[Introduction](#) • [Project Chat](#) • [Community Portal](#) • [Help](#)



https://www.wikidata.org/wiki/Wikidata:Main_Page



<https://github.com/RGZM/ceramictypologies-lod>

The basis for re3dragon is an online catalogue of LOD resources (Dragon Lair) including authority files and community-driven vocabularies as well as domain-specific typologies and archaeological data.



```
@prefix lado: <http://archaeology.link/ontology#> .
@prefix lair: <http://lod.datadragon.link/data/dragonlair/> .
@prefix wd: <http://www.wikidata.org/entity/> .
@prefix wdt: <http://www.wikidata.org/prop/direct/> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix owl: <http://www.w3.org/2002/07/owl#> .

# Getty AAT
lair:ULBU3XXM a lado:DataDragonLair .
lair:ULBU3XXM owl:sameAs wd:Q611299.
lair:ULBU3XXM rdfs:label 'Getty AAT'.
lair:ULBU3XXM lado:name 'Getty AAT'.
lair:ULBU3XXM lado:wikidataid 'Q611299'.
lair:ULBU3XXM lado:description 'controlled vocabulary used for describing items of art, architecture, and material culture'.
lair:ULBU3XXM lado:author 'Getty Research Institute'.
lair:ULBU3XXM lado:dateOfEntry '2019-11-13 15:15:29'.
lair:ULBU3XXM lado:sparqlendpoint <http://vocab.getty.edu/sparql>.
lair:ULBU3XXM lado:prefix <http://vocab.getty.edu/aat>.
lair:ULBU3XXM lado:link <https://www.getty.edu/research/tools/vocabularies/aat/>.
lair:ULBU3XXM lado:lairState lado:active.
lair:ULBU3XXM lado:hasLegalType lado:ResearchInstitution.
lair:ULBU3XXM lado:hasType lado:Thesaurus.
lair:ULBU3XXM lado:hasQuality lado:qualityHigh.
lair:ULBU3XXM lado:lairGroup lado:chreferencethesauriGroup.
lair:ULBU3XXM lado:language lado:en.
```

Example: The Getty AAT Dragon Lair described by the LADO ontology



```
{
  "displayLabel": {
    "en": "Panthera leo melanochaita (subspecies)"
  },
  "endDate": "",
  "prefLabel": {},
  "narrower": [],
  "type": [
    "http://www.w3.org/2004/02/skos/core#Concept"
  ],
  "lair": {
    "scheme": "Getty AAT",
    "legaltype": "http://archaeology.link/ontology#ResearchInstitution",
    "id": "ULBU3X00",
    "type": "http://archaeology.link/ontology#Thesaurus",
    "wikidata": "http://www.wikidata.org/entity/Q611299",
    "quality": "http://archaeology.link/ontology#QualityHigh",
    "group": "http://archaeology.link/ontology#ChreferencethesauriGroup"
  },
  "uri": "http://vocab.getty.edu/aat/300417488",
  "displayDesc": {
    "", ""
  },
  "similarity": {
    "levenshtein": 35,
    "dameraulevenshtein": 35,
    "jarowinkler": 0.5,
    "normalizedlevenshtein": 0.92,
    "searchstring": "lion",
    "lairstring": "Panthera leo melanochaita (subspecies)"
  },
  "location": {},
  "broader": [],
  "startDate": "",
  "scopeNote": {},
  "depiction": []
}
```

`[host]/re3dragon/rest/search?repo=gettyaat&q=lion`

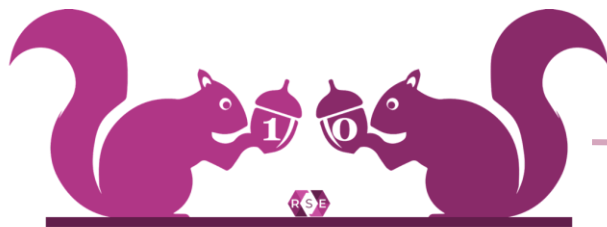
JSON search result (based on JSKOS*) for “lion” in Getty AAT.



```
{
  "displayLabel": {
    "en": "Panthera leo melanochaita (subspecies)"
  },
  "endDate": "",
  "prefLabel": {
    "la": "Panthera leo melanochaita (subspecies)"
  },
  "narrower": [],
  "type": [
    "http://www.w3.org/2004/02/skos/core#Concept"
  ],
  "laim": {
    "scheme": "Getty AAT",
    "legaltype": "http://archaeology.link/ontology#ResearchInstitution",
    "id": "ULBU3XXM",
    "type": "http://archaeology.link/ontology#Thesaurus",
    "wikidata": "http://www.wikidata.org/entity/Q611299",
    "quality": "http://archaeology.link/ontology#qualityHigh",
    "group": "http://archaeology.link/ontology#chreferencethesauriGroup"
  },
  "uri": "http://vocab.getty.edu/aat/300417488",
  "displayDesc": {
    "en": ""
  },
  "location": {},
  "broader": [
    {
      "prefLabel": {
        "en": "Panthera leo (species)"
      },
      "uri": "http://vocab.getty.edu/aat/300310388"
    }
  ],
  "startDate": "",
  "scopeNote": {},
  "depiction": []
}
```

[host]/re3dragon/rest/item?uri=http://vocab.getty.edu/aat/300417488

Resolved JSON output for Getty AAT ID 300417488.



Research Squirrel Engineers



Tippawan Sookruay from the Noun Project (globe + head)
Derivative work by Florian Thiery and Sophie Charlotte Schmidt of
Archaeologist by Nhor from the Noun Project, dig by Manthana
Chawong from the Noun Project and archaeology by Phatchara
Burkhachary, TH from the Noun Project under CC BY 3.0
(archaeologist)

Research Squirrel Engineers Projects

LOD, Digital Humanities, Archaeology, Wikidata, GIS





Riesenspatz Infoillustration für Wikimedia Deutschland.
Illustration Sichtbarkeit englisch, CC BY-SA 4.0

<http://ogham.squirrel.link>

Irische -#-/- Steine im Wikimedia Universum

I love data!

UCC Stone Corridor: Stein 4, CIIC 81

CIIC 81 nach Macalister (1945)

CIIC 180: Enlagh East (IMLEACH DHÚN SEÁNN), Co. Kerry

Das Ogham-Alphabet

This project is funded by Wikimedia Deutschland e. V. within the Open Science Fellows Program.

OPEN SCIENCE FELLOWS PROGRAM

wmde.org/opensciencefellows

Projektlogo

Projektbeschreibung

Im Rahmen des Fellow-Programms *Freies Wissen* möchte ich ein für alle im Sinne der *Knowledge Equity* frei zugängliche, semantisch beschriebene, transparente *Linked Open Data*^[1] (LOD) Datensammlung irischer Ogham Steine^[2] erstellen. Diese Sammlung wird auf bereits bestehenden publizierten Forschungen aufbauen und kann dadurch als weiteres wichtiges Forschungstool im Bereich der frühmittelalterlichen Inschriften dienen.

Auf privaten Reisen durch Irland sind mir insbesondere im westlichen Teil der grünen Insel, in den Counties Kerry und Cork, an diversen Stellen Hinweise auf eine mysteriöse Schrift und Steine als deren originale Inschriftenträger begegnet. Nach einer ersten Recherche stellten sich diese als Ogham-Steine mit einer frühmittelalterlichen Ogham-Schrift, als eine der bemerkenswertesten nationalen Schätze Irlands heraus. Ogham-Steine wurden in Irland und im westlichen Teil Britanniens zwischen dem 4. und 9. Jahrhundert aufgestellt. Die auf den Steinen eingemeißelten Inschriften zeigen insbesondere verwandtschaftliche oder Stammes-Beziehungen und könnten so als Grabsteine oder Flächenabgrenzungen gedient haben. Sie sind eine wichtige Quelle für Historiker, aber auch für Sprachwissenschaftler und Archäologen. Um einer großen Forschungsgemeinschaft diesen reichhaltigen Schatz eines kleinen überschaubaren Korpus an Inschriften und Steinen als freies Wissen nahezubringen, entstand die Idee des *Op-Ogham Projektes*^[3]. Diese Idee wurde mit Freunden in einer Freizeit-Working-Group, den *Research Squirrel Engineers*^[4], aufgenommen. Hierdurch sind bereits erste Modellierungen und Publikationen von Steinen nach Macalister^[5] entstanden.

Die semantische Modellierung soll dabei in zwei Arten erfolgen. Zum Einen sollen die Daten (Steine, Fundorte, Wörter, Personen, etc.) in Wikidata abgelegt werden, um so die Daten in der Linked Data Cloud verorten und der Community die Möglichkeit zu bieten sich an freiem Wissen im Bereich der Ogham Inschriften zu beteiligen. Dies kann z.B. auch durch Bilder von Ogham-Steinen in Wikimedia Commons geschehen sowie der Ergänzung und Übersetzung der erklärenden Wikipedia Seiten. Zum Anderen sollen die Daten in einer eigenen Ogham-Ontologie gespeichert, über einen SPARQL Endpoint zur Verfügung gestellt und mit den in Wikidata vorliegenden Steinen verknüpft werden. Dies ermöglicht eine tiefergehende semantische Modellierung der Ogham Steine und deren Inschriften und kann somit zum offenen und freien wissenschaftlichen Diskurs beitragen. Die Ogham Steine sollen darüber hinaus in einer community-freundlichen Webplattform eine Suche auf Wikidata und in anderen Triplstores ermöglichen. Dabei sollen Filtermöglichkeiten zu bestimmten Themen, wie benutzte Wörter, Material oder Personen, sowie nach geographisch abgrenzbaren Bereichen möglich sein. Zudem soll eine Integration in freie GIS Software ermöglicht werden, so dass Wissenschaftler weitere Analysen in ihrer eigenen Softwarewelt durchführen können.

Linked Ogham Data

Irish Ogham Stones in the Wikimedia Universe



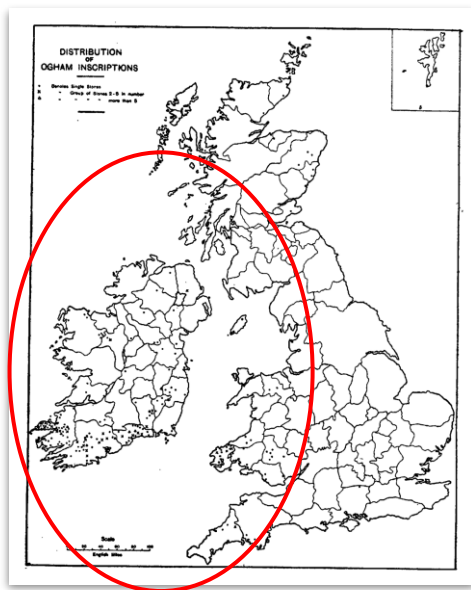
Ogham

4th-6th century AD

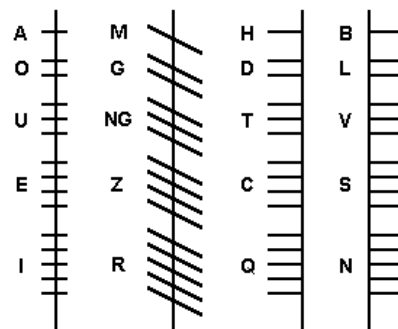
Distribution

Ireland

(+Wales, England, Isle of Man)



R.A.S. Macalister, *Corpus inscriptionum insularum Celticarum*, vol. I (1945) / p.502



Al-qamar / CC BY-SA 3.0 via Wikimedia Commons



Florian Thiery, CC BY-SA 4.0 via Wikimedia Commons



CIIC 200



MAQI-TTAL MAQI VORGOS MAQI MUCOI TOICAC

Son of Dal, son of Vergosus (Fergus), son of the tribe of Toica

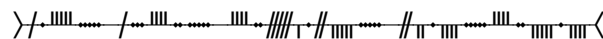
CIIC 3



CUNALEGI AVI QUNACANOS

Cunalegi, descendant of Qunacanos

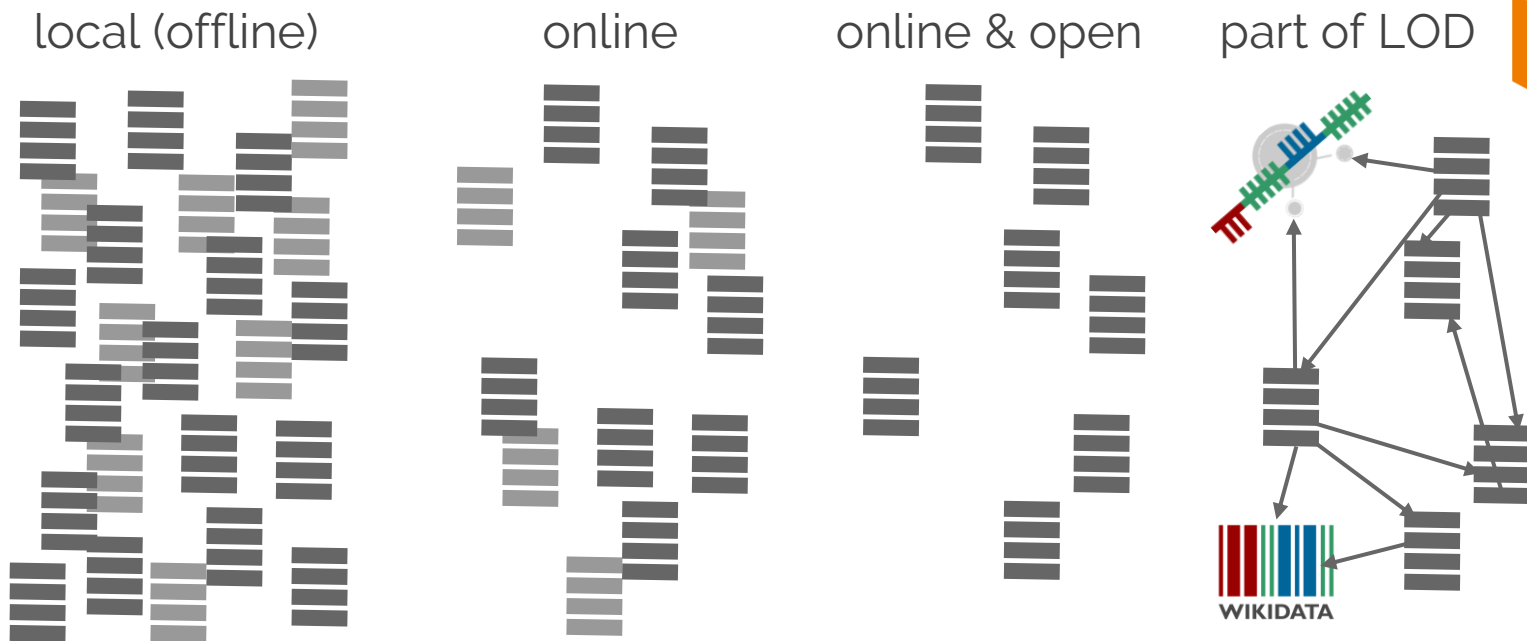
CIIC 8



MA[QUI MUCOI] CORBAGNI GLASICONAS

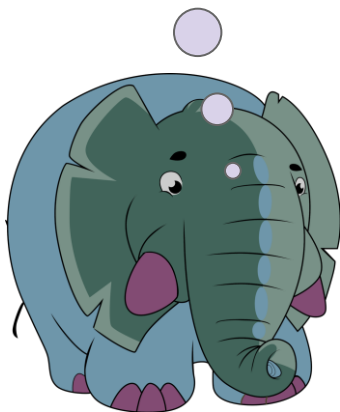
Son of the tribe Corbagnus Glasiconas

Ogham inscriptions



Not all databases are online. Few of them are openly available and accessible. Even less are part of the Linked Open Data Cloud.

I want to look at all
Ogham Stones from
Ireland...
Where do I find them?



Florian Thiery, CC BY-SA 4.0,
via Wikimedia Commons



Linked Ogham??

Online & Open:
3D Ogham Project:


<https://ogham.celt.dias.ie>

Heritage Management:

<http://webgis.archaeology.ie/historicenvironment/>

Online: CISP

<https://www.ucl.ac.uk/archaeology/cisp/database/>

Offline: 
CIIC by Macàlister
div. publications



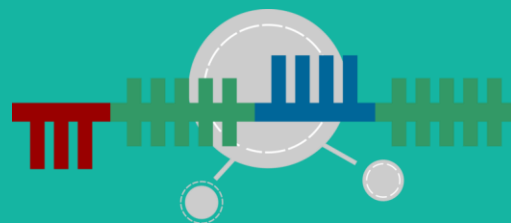
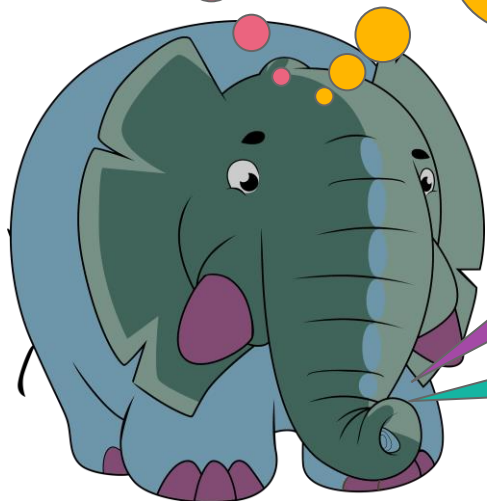


Linked
Ogham??



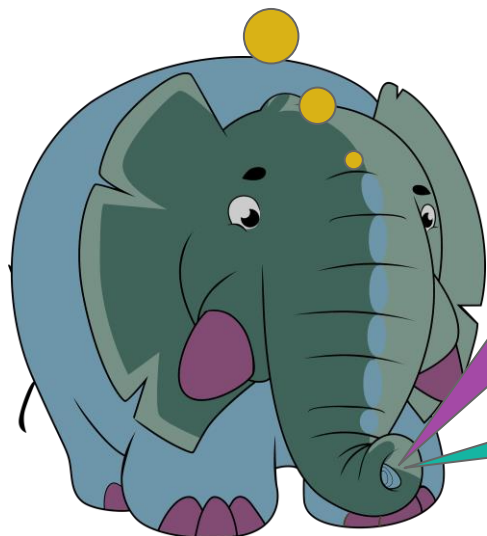
WIKIDATA

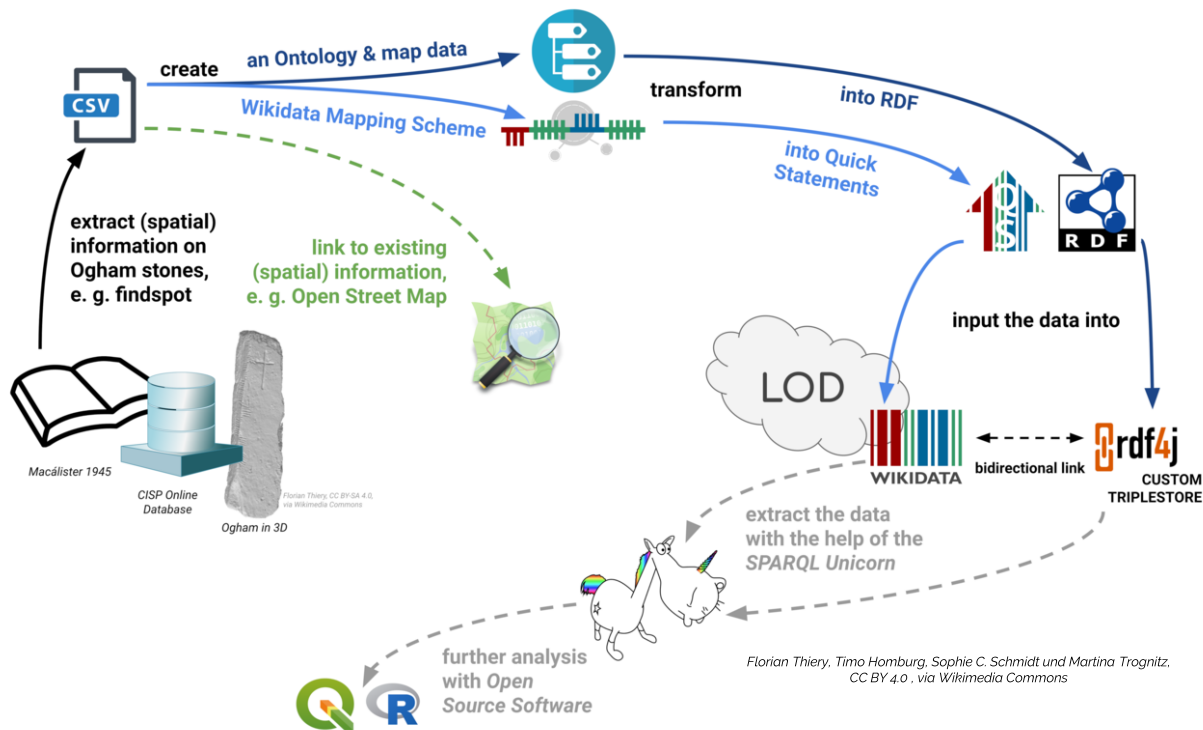
There are several
possibilities to
host and **publish**
Linked Open Data





Wikidata as data hub
allows for **Community
Work** and **Citizen Science**
→ **Swarm intelligence**





The “Wikidata Ogham Workflow”



Ogham in Wikidata

WikiProject:
Irish Ogham Stones
the Project

Ogi-Ogham
Project
Q70873595

Irish $\#$ / $\#$ Stones in the
Wikimedia Universe
Q100530634

Data Publication

Ogham Data - Version 1.0

DOI: 10.5281/zenodo.4765603

Ogham Data - v1.0 (GitHub)

ogham/ogham-datav1

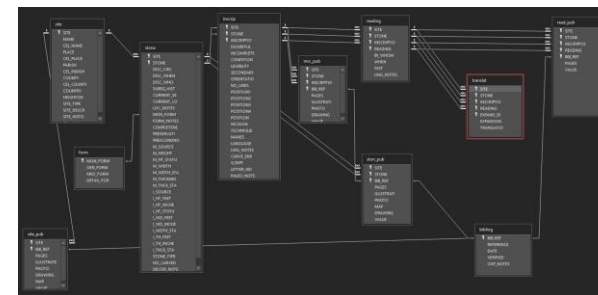
Resulting (Linked) Data

<http://ogham.link>
<https://github.com/ogi-ogham/ogham-datav1>

The Base

Data ID	Name	Type	Material	Date
1	OGHAM001	OGHAM	OGHAM	2000-00-01
2	OGHAM002	OGHAM	OGHAM	2000-00-01
3	OGHAM003	OGHAM	OGHAM	2000-00-01
4	OGHAM004	OGHAM	OGHAM	2000-00-01
5	OGHAM005	OGHAM	OGHAM	2000-00-01
6	OGHAM006	OGHAM	OGHAM	2000-00-01
7	OGHAM007	OGHAM	OGHAM	2000-00-01
8	OGHAM008	OGHAM	OGHAM	2000-00-01
9	OGHAM009	OGHAM	OGHAM	2000-00-01
10	OGHAM010	OGHAM	OGHAM	2000-00-01
11	OGHAM011	OGHAM	OGHAM	2000-00-01
12	OGHAM012	OGHAM	OGHAM	2000-00-01
13	OGHAM013	OGHAM	OGHAM	2000-00-01
14	OGHAM014	OGHAM	OGHAM	2000-00-01
15	OGHAM015	OGHAM	OGHAM	2000-00-01
16	OGHAM016	OGHAM	OGHAM	2000-00-01
17	OGHAM017	OGHAM	OGHAM	2000-00-01
18	OGHAM018	OGHAM	OGHAM	2000-00-01
19	OGHAM019	OGHAM	OGHAM	2000-00-01
20	OGHAM020	OGHAM	OGHAM	2000-00-01
21	OGHAM021	OGHAM	OGHAM	2000-00-01
22	OGHAM022	OGHAM	OGHAM	2000-00-01
23	OGHAM023	OGHAM	OGHAM	2000-00-01
24	OGHAM024	OGHAM	OGHAM	2000-00-01
25	OGHAM025	OGHAM	OGHAM	2000-00-01
26	OGHAM026	OGHAM	OGHAM	2000-00-01
27	OGHAM027	OGHAM	OGHAM	2000-00-01
28	OGHAM028	OGHAM	OGHAM	2000-00-01

postGIS (relational database)



CISP (Microsoft Access)



Wikidata

Item Discussion

CIIC 81 (Q69385424)

Ogam Stone CIIC 81
Ogam Stone 4 (Stone Corridor at UCC)

[edit](#)


[In more languages](#)

Language	Label	Description	Also known as
English	CIIC 81	Ogam Stone CIIC 81	Ogam Stone 4 (Stone Corridor ...)
German	CIIC 81	Ogam Stein CIIC 81	Ogam Stein 4 (Stone Corridor at...)
Polish	No label defined	No description defined	
French	No label defined	No description defined	

Statements

instance of [ogham stone](#) [edit](#)
+ 1 reference
[+ add value](#)

part of [Ogam Stones](#) [edit](#)
+ 1 reference
[Ogi-Ogam Project](#) [edit](#)
+ 0 references
[+ add reference](#)
[+ add value](#)

image  [edit](#)

- **P31 (instance of) Ogham stone (Q2016147)**
- **P361 (part of) Ogham Stones (Q67978809)**
- **P361 (part of) Ogi-Ogam Project (Q70873595)**
- **P17 (country) Ireland (Q27)**
- **P625 (coordinate location) derived from the Ogham site**
- **P189 (location of discovery) county and Ogham site**
- **P1684 (inscription)**
- **P1545 (series ordinal)**
- **P186 (material used)**
- **P195 (collection)**
- **P2043/P2049/2048 (length, width, height)**
- **P6568 (inscription mentions)**
- **P5816 (state of conservation)**
- **P18 (image)**
- **P2888 (exact match)**
- **P1382 (partially coincident with) → CIIC related to CISP**

Wikidata modelling of an Ogham stone



Ogham Site (Q72617071)

Site where an Ogham Stone was found

edit

Ogam Site

<https://www.wikidata.org/wiki/Q72617071>

▼ In more languages

Configure

Language	Label	Description	Also known as
English	Ogham Site	Site where an Ogham Stone was found	Ogam Site
German	Ogham Stätte	Ort an dem ein Ogham Stein gefunden wurde	
Polish	No label defined	No description defined	
French	No label defined	No description defined	

Statements

instance of

archaeological site

edit

▼ 0 references

+ add reference

+ add value

subclass of

geographic location

edit

▼ 0 references

+ add reference

+ add value

part of

Collection of Ogham Stones

edit

▼ 0 references

+ add reference

Ogi-Ogam Project

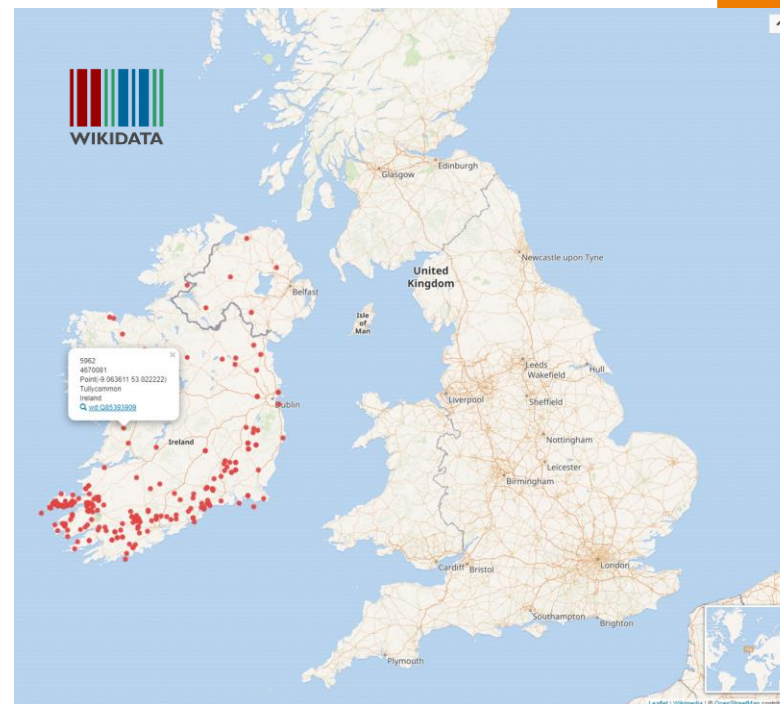
edit

▼ 0 references

+ add reference

+ add value

<https://github.com/ogi-ogham/ogham-wikidata>



<https://w.wiki/32n9>



Tullycommon (Q85393909)

townland in Glenroe, County Clare, Ireland

[In more languages](#)




[Configure](#)



[edit](#)

Language	Label	Description	Also known as
English	Tullycommon	townland in Glenroe, County Clare, Ireland	
German	No label defined	No description defined	
Polish	No label defined	No description defined	
French	No label defined	No description defined	

Statements

instance of	 townland	edit
	0 references	+ add reference
	 Ogham Site	edit
	0 references	+ add reference
+ add value		
part of	 Ogi-Ogam Project	edit
	0 references	+ add reference
	+ add value	

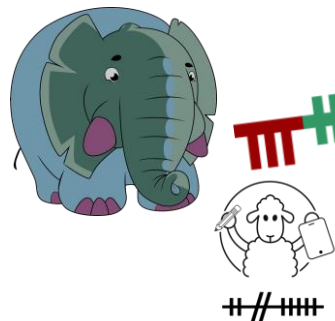


Ken Vermette, CC BY-SA 2.0,
via Wikimedia Commons

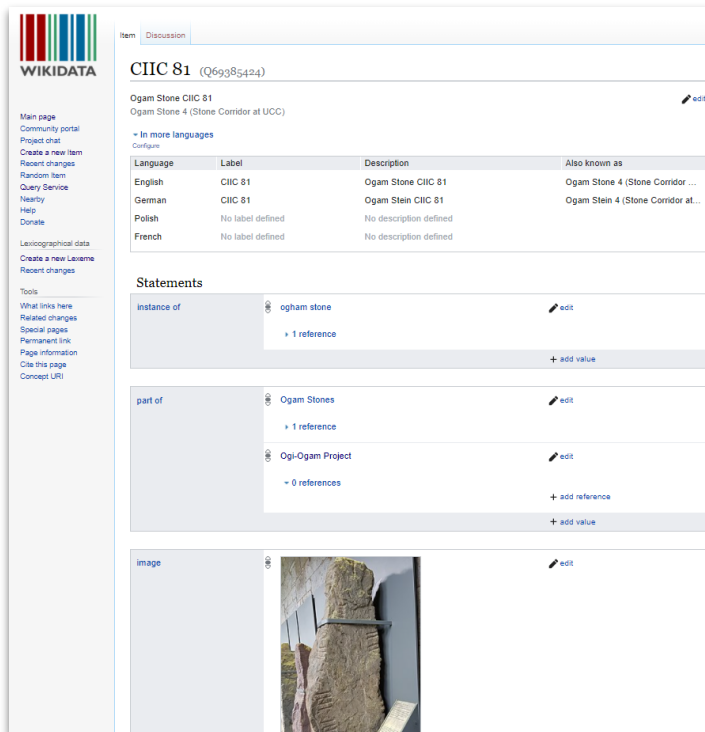


logainm.ie

<https://www.wikidata.org/wiki/Q72617071>



The Ogham Network using Wikidata as LOD hub



link to external resource at ogham.link



mapping to other Stones in other numbering systems (CIIC \Leftrightarrow CISP \Leftrightarrow Ogham3D) inside Wikidata

SCDH Semantic Web Workshop 2021 | 26th November 2021 | Florian Thiery @fthierygeo



CIIC 81 (Q69385424)

Ogam Stone CIIC 81
Ogam Stone 4 (Stone Corridor at UCC)

edit

▼ In more languages

Configure

Language	Label	Description	Also known as
English	CIIC 81	Ogam Stone CIIC 81	Ogam Stone 4 (Stone Corridor a...
German	CIIC 81	Ogam Stein CIIC 81	Ogam Stein 4 (Stone Corridor at...
British English	No label defined	No description defined	
Polish	No label defined	No description defined	

Statements

instance of

ogham stone

edit

► 1 reference

+ add value

part of

Ogam Stones

edit

► 1 reference

Ogi-Ogam Project

edit

▼ 0 references

+ add reference

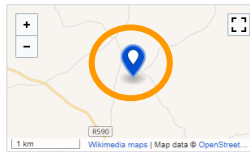
+ add value

CIIC 81 @ Stone Corridor University College Cork, No. 4

<https://www.wikidata.org/wiki/Q69385424>



country IR Ireland edit
1 reference
+ add value

coordinate location IR edit

51°48'59.000"N, 8°45'42.001"W
subject has role archaeological site
1 reference
+ add value

material used IR stone edit
1 reference
+ add value

collection IR Stone Corridor University College Cork edit
1 reference
Ogham Stones w/o collection reference edit
1 reference
+ add value

CIIC 81 @ Stone Corridor University College Cork, No. 4

<https://www.wikidata.org/wiki/Q69385424>



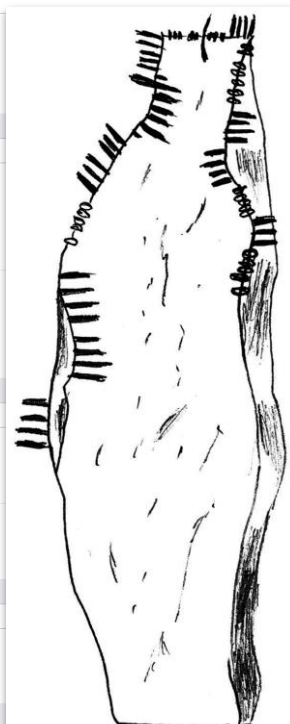
location of discovery	<div><div><div>County Cork</div><div>▶ 1 reference</div></div><div><div>Garranes Townland</div><div>▶ 1 reference</div></div></div> <div><div>edit</div><div>edit</div></div> <div>+ add value</div>
length	<div><div><div>17.78 centimetre</div><div>▶ 1 reference</div></div><div><div>edit</div></div><div>+ add value</div></div>
height	<div><div><div>175.26 centimetre</div><div>▶ 1 reference</div></div><div><div>edit</div></div><div>+ add value</div></div>
width	<div><div><div>48.26 centimetre</div><div>▶ 1 reference</div></div><div><div>edit</div></div><div>+ add value</div></div>

CIIC 81 @ Stone Corridor University College Cork, No. 4

<https://www.wikidata.org/wiki/Q69385424>



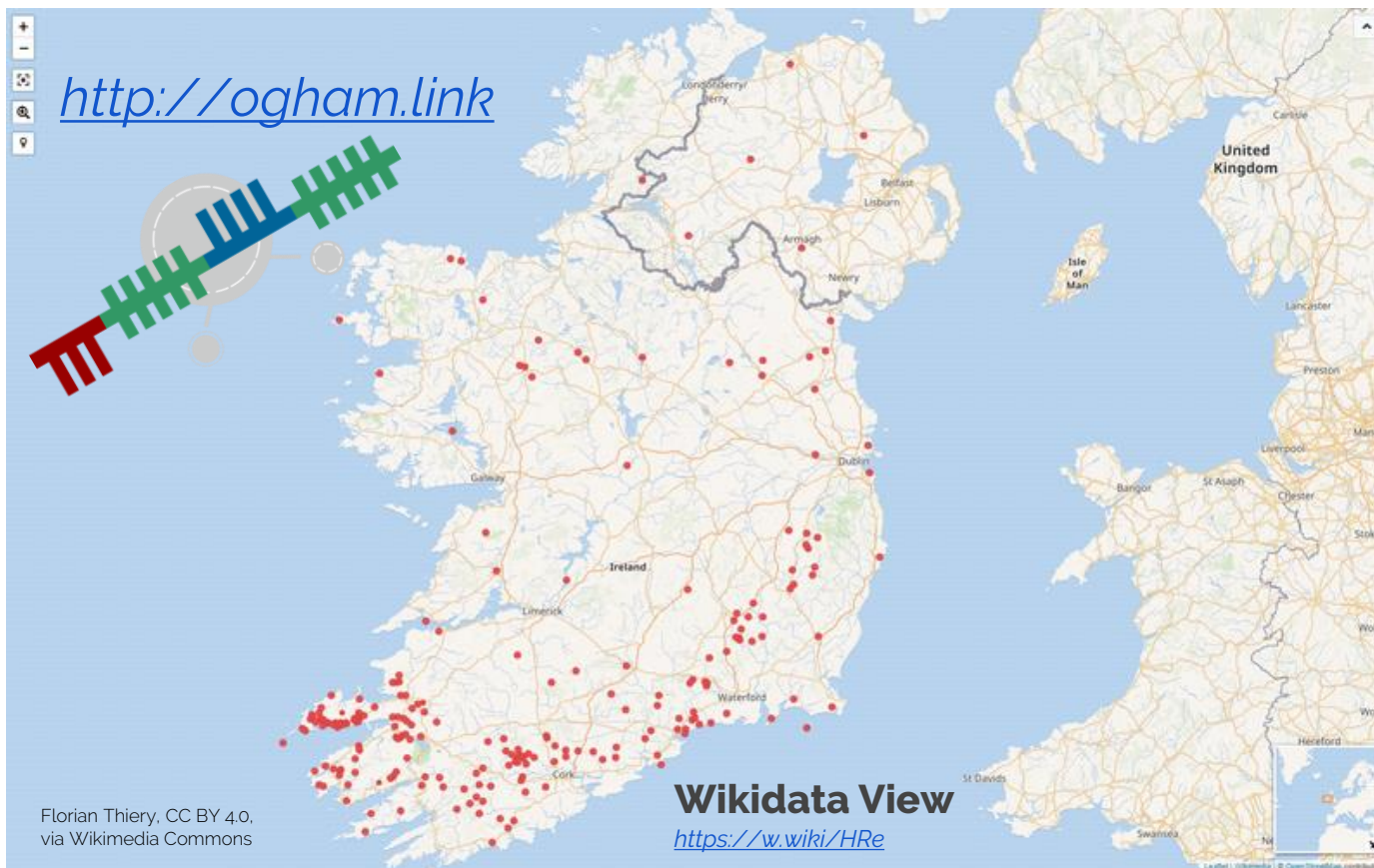
inscription	<div>C[A]SSITT[A]S MAQI MUCOI CALLITI (Irish) possibly part of a larger inscription, presumably ► 1 reference</div> <div>+ add value</div>
series ordinal	<div>81 criterion used Corpus Inscriptionum Insularum Celticarum Vol.1 ► 1 reference</div> <div>4 criterion used Stone Corridor University College Cork ► 1 reference</div> <div>+ add value</div>
inscription mentions	<div>MAQI ► 1 reference</div> <div>MUCOI ► 1 reference</div> <div>+ add value</div>
state of conservation	<div>preserved ► 1 reference</div> <div>+ add value</div>

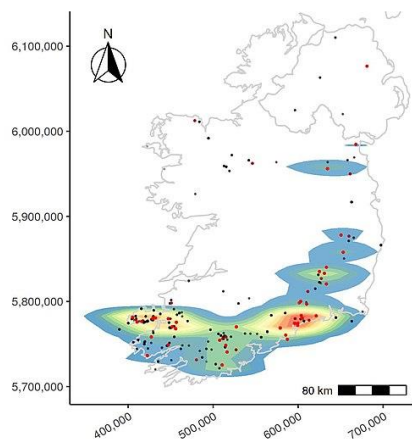


Florian Thiery / CC BY 4.0 via Wikimedia Commons

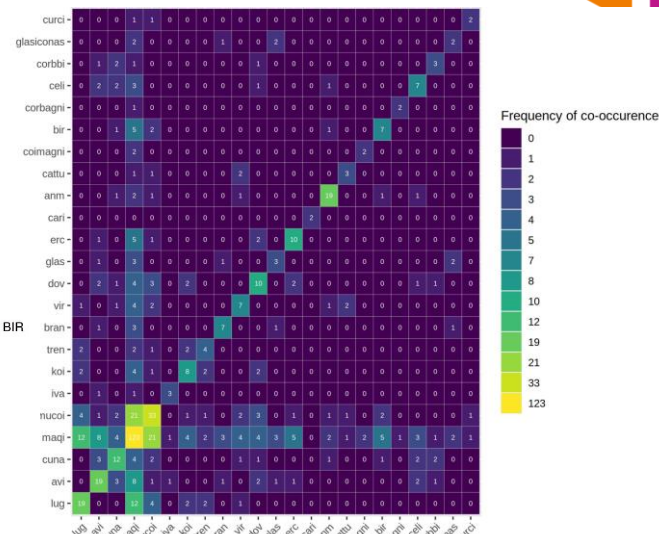
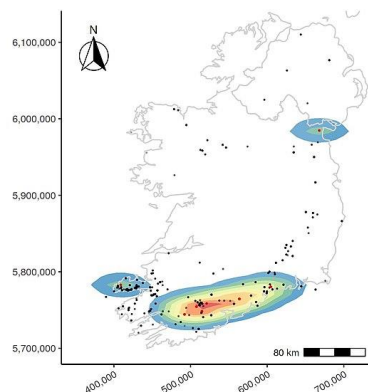
CIIC 81 @ Stone Corridor University College Cork, No. 4

<https://www.wikidata.org/wiki/Q69385424>



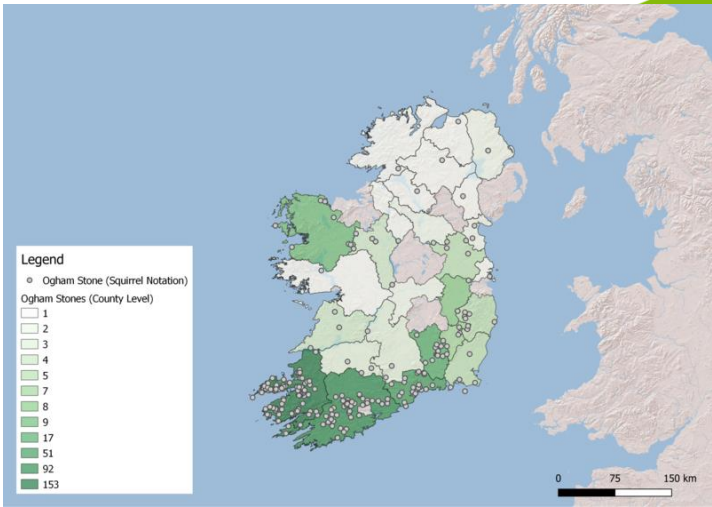


Sophie C. Schmidt, CC BY 4.0,
via Wikimedia Commons

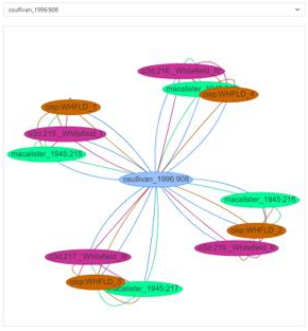


CC BY 4.0, Sophie C. Schmidt, see: <https://github.com/ogi-ogham/oghammaps>

Geospatial and Statistical Analysis



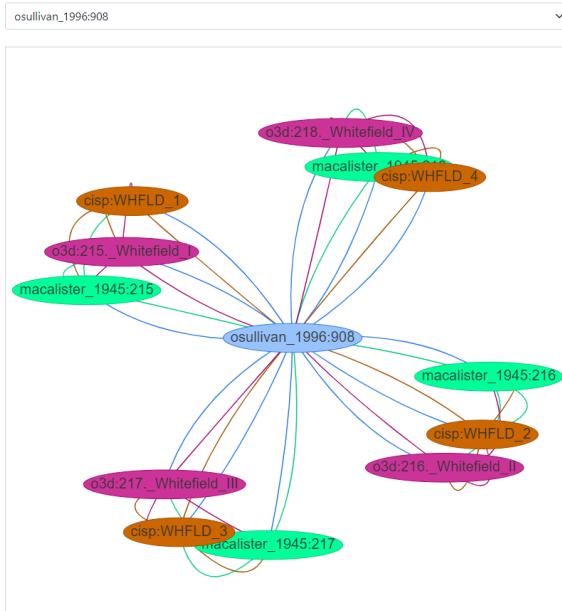
Florian Thiery, CC BY 4.0
via Wikimedia Commons



Geospatial and Statistical Analysis



A little Ogham Stone Reference Minion



<https://github.com/FellowsFreiesWissen/Ogham>

http://ref.ogham.link/?node=osullivan_1996:908

Visualisation of connections between distributed Ogham sources and different numbering systems.

Macálistar 1945, p. 209

215.—(No. 1).
3' 9" x 1' 0" x 0' 5". Inscription on dexter angle, last
two letters on top.



ALATTO CELI BATTIGNI

The writer has been confused by the turn of the angle, and he has, consequently, written Q instead of N. But his intention cannot be doubted. The line crossing 3T is a mere fracture of no importance.

O'Sullivan 1996,
p. 236

908 WHITEFIELD BANCHLUAIN
OS 57:14:5/6 (c. 380 025) 107 OD 0-100 c. V834939
Four ogham stones were displayed by the MacGillycuddy
of the Reeks at the Dublin Exhibition in 1853. At least
two of these, (1) and (2), were discovered in a souterrain

(1) This regular slab measures at least 1.16m in height
and .28m x .14m at base. Its deeply carved inscription is
evenly spread along the dexter angle and across its top.
Macalister (1945, 209) read this as:

ALATTO CELI BATTIGNI

The N is erroneously depicted as a Q.
(2) This pillar-shaped stone is at least 1.4m high and
measures .2m x .1m at base. Macalister (1945, 209)
read the deeply cut inscription as:

GOSOCITAS MOSAC MAKINI

The K is represented by a forlorn but would be more
meaningful as a P.

(3) This pillar, now broken on top, measures at least
1.16m in height and is .2m x .2m at base. The
inscription is neatly executed on two angles, reading
up-up. Macalister (1945, 211) read it as:

NOCATI MAQI MAQI-RECI . . . JMAQI MUCCI
URDAMI

There is a roughly cut cross on each face of the stone.

(4) This stone stands at least 1.06m high and is
tapered in section, measuring .26m x .23m. The
inscription is executed in broad, deep scores along both
angles. The dexter angle is badly damaged and
Macalister (1945, 212) interpreted the remaining scores
as:

LIAGROBBE . . .

CIIC 215



Ogham in 3d
Project - CC BY-
NC-SA 3.0 Ireland

The Discovery
programme
Centre for Archaeology
and Innovation Ireland



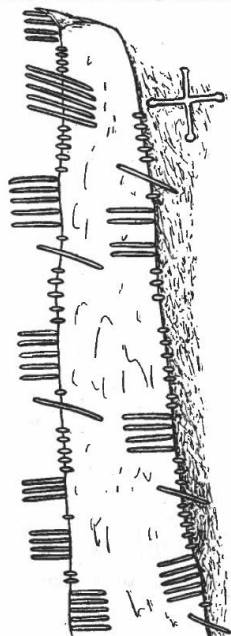
CISP

WHFLD/1	
Corpus:	Macalister 1945: 215
Refs:	O'Sullivan et al 1996: 908
Site:	WHFLD
Discovery:	first mentioned, 1853 The MacGillycuddy
History:	
Geology:	
Dimensions:	1.14 x 0.3 x 0.13 (converted from Macalister 1945)
Setting:	unanch.
Location:	Kerry County Museum (Cat. L1992-31)
Notes:	Macalister 1945: 209: Four stones inscribed with Ogham writing were exhibited by The MacGillycuddy of the Reeks at the Dublin Exhibition of 1853, and were presented by him to the Royal Irish Academy in the following year. Of these stones, two certainly, and all four probably, came from a souterrain in the townland of Whitefield.
Comments:	Gipps: Web, Ogham 215: The present stone was no. 9 in the RIA collection. It could not be identified when visiting the basement of the Dublin N.M. in 1968.
Form:	plus
Condition:	inc. some
Engrave:	none
Crosses:	none
Decorations:	no other decoration



Macáister 1945, p. 210

open to question whether the engraver has not written here a cross-line × (= K) by mistake for an underline × (= P). *Mapini* certainly seems to be more plausible than *Mapini*.



O'Sullivan 1996,
p. 236

908 WHITEFIELD BANCHLUAIN
OS 57:14:5/6 (c. 380 025) 107 OD 0–100 c. V834939
Four ogham stones were displayed by the MacGillycuddy
of the Reeks at the Dublin Exhibition in 1853. At least
two of these, (1) and (2), were discovered in a souterrain

(1) This regular slab measures at least 1.16m in height
and .38m x .14m at base. Its deeply carved inscription is
evenly spread along the dexter angle and across its top.
Macalister (1945, 209) read this as:

ALATTO CELI BATTIGNI

The N is erroneously depicted as a Q.
(2) This pillar-shaped stone is at least 1.4m high and
measures .2m x .16m at base. Macalister (1945, 209)
read the deeply cut inscription as:

GOSOCITAS MOSAC MAKINI

The K is represented by a forfil but would be more
meaningful as a P.

(3) This pillar, now broken on top, measures at least
1.16m in height and is .2m x .2m at base. The
inscription is neatly executed on two angles, reading
up-up. Macalister (1945, 211) read it as:

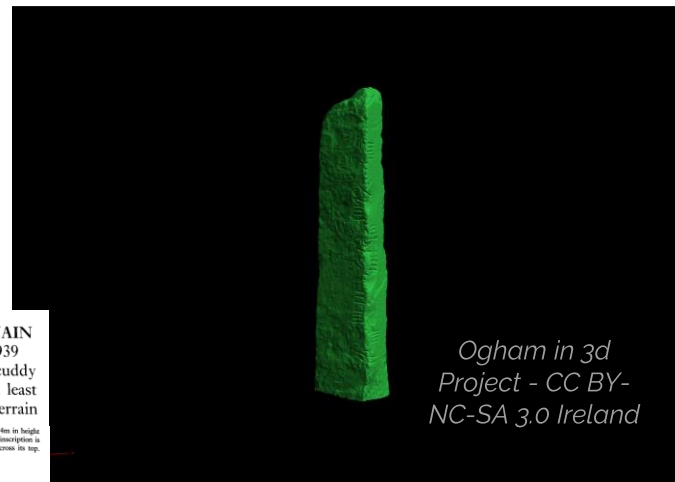
NOCATI MAQI MAQI-RECI . . . JMAQI MUCCI
UDDAMI

There is a roughly cut cross on each face of the stone.

(4) This stone stands at least 1.0m high and is
trapezoidal in section, measuring .26m x .23m. The
inscription is carved in broad, deep scores along both
angles. The dexter angle is badly damaged and
Macalister (1945, 212) interpreted the remaining scores
as:

LIAGROBBE . . .

CIIC 216



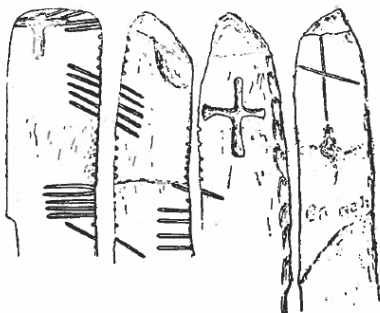
Ogham in 3d
Project - CC BY-
NC-SA 3.0 Ireland

CISP

WHFLD/2	
Corpus	Macalister 1945: 216
Refs:	O'Sullivan et al 1996: 908
Site:	WHFLD
Discovery:	first mentioned, 1853 The MacGillycuddy
History:	
Geology:	
Dimensions:	1.42 x 0.3 x 0.15 (converted from Macalister 1945)
Setting:	unanch.
Location:	National Museum, Dublin (Cat: W10)
Macalister 1945, 208: Four stones inscribed with Ogham writing were exhibited by The MacGillycuddy of the Reeks at the Dublin Exhibition of 1853, and were presented by him to the Royal Irish Academy in the following year. Of these stones two certainly... and all four probably, came from a souterrain in the townland of Whitefield.	
Form:	plain
Condition:	inc., some
Folklore:	none
Crosses:	none
Decorations:	no other decoration

217.—(No. III).

NOCATI MAQI MAQI-REC [...] MAQI MUCCI UDDAMI
Like the stones on Inchagoill (†) and Inisvicillane (†86) crosses have been made on the faces of this stone; incompetently formed, in contrast to the general neatness of the inscription, and evidently by a different and later hand (or hands). There is no cross on the face between the inscribed angles, but owing to the way in which this stone has been shifted, from grave to souterrain, from souterrain to private ownership, thence to an exhibition, and thence to a museum, it is now quite impossible to determine whether this side was originally the north side or not. The annexed diagram shows the crosses on the three sides.



O'Sullivan 1996,
p. 236

908 WHITEFIELD **BÁNHCHLUAIN**
OS 57:14:5/6 (c. 380 025) 107 OD 0-100 c. V834939
Four ogham stones were displayed by the Macgillycuddy
of the Reeks at the Dublin Exhibition in 1853. At least
two of these, (1) and (2), were discovered in a souterrain

(1) This regular slab measures at least 1.14m in height and 28m x .14m at base. Its deeply carved inscription is evenly spaced along the dexter angle and across its top. Macalister (1945, 209) read this as:

ALATTO CELI BATTIGNI

(2) This pillar-shaped stone is at least 1.4m high and measures .3m x .16m at base. Macalister (1945, 209) read the deeply cut inscription as:

GOSUCTEAS MOSAC MAKINT

The K is represented by a forid but would be more meaningful as a P.

(3) This pillar, now broken on top, measures at least 1.16m in height and is .2m x .2m at base. The inscription is neatly executed on two angles, reading up-up. Macalister (1945, 211) read it as:

NOCATI MAQI MAQI-RECJ. . . JMAQI MUCCI
UDDAMI

(4) This stone stands at least 1.06m high and is

trapezoidal in section, measuring .26m x .23m. The inscription is executed in broad, deep scores along both angles. The dexter angle is badly damaged and Macalister (1945, 212) interpreted the remaining score as:

LAGOBBE . . .

CIIC 217



Ogham in 3d
Project - CC BY-
NC-SA 3.0 Ireland

Discovery
programme
for Archaeology
Innovation Ireland

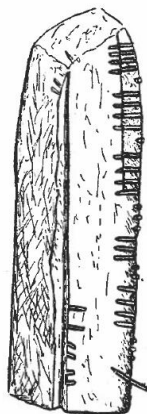
WHFLD/3

Corrals Macalister 1945: 217
Refs: O'Sullivan, ed. 1996: 908
Date: 3335-10
Discovery: first mentioned, 1853 The MacGillivuddy
History: Macalister 1945: 208. Four stones inscribed with Ogham writing were exhibited by The MacGillivuddy of the Reeks at the Dublin Exhibition of 1853; and were presented by him to the Royal Irish Academy in the following year.
Current Use: Ogham 217, cinn Braith (OZM 196) that this stone was found by J. Winstable, in the kitchen of a house belonging to the MacGillivuddy, on the townland of Wharfedale, Parake of Keshkane, and barony of Donkerrin, but the tenant could give no information as to where it came from; it was then used as a hearthstone.
Geology:
Dimensions: 0.99 x 0.23 x 0.2 (converted from Macalister 1945)
Setting: unattach.
Location: National Museum, Dublin (Cat. W11)
Form: plain
Condition: incomplete
Notes: Macalister 1945: 211. "The top of the stone is broken off
Failures: none
Types: 1. equal-armed, outline, expanded, expanded, plain; none, none, none, n/a
2. equal-armed, outline, straight, none, none, none, none, n/a
3. lute, outline, straight, plain; none, none, none, none, none, none
Decorations: Macalister 1945: 208. "crosses have been made on the faces of this stone; incompletely formed, in contrast to the general ornamentation of the inscription, and evidently by different or later hands.



Macálistar 1945, p. 212

for I. We should then have MUÇO-TUCACI, recalling the MUÇOI TOICACI on three stones at Coolmagort.



O'Sullivan 1996,
p. 236

908 WHITEFIELD **BÁNCHLUAIN**
OS 57:14:5/6 (c. 380 025) 107 OD 0–100 c. V834939
Four ogham stones were displayed by the MacGillycuddy
of the Reeks at the Dublin Exhibition in 1853. At least
two of these, (1) and (2), were discovered in a souterrain

(1) This regular slab measures at least 1.16m in height
and .38m x .14m at base. Its deeply carved inscription is
evenly spread along the dexter angle and across its top.
Macalister (1945, 209) read this as:

ALATTO CELI BATTIGNI

The N is erroneously depicted as a Q.
(2) This pillar-shaped stone is at least 1.4m high and
measures .2m x .16m at base. Macalister (1945, 209)
read the deeply cut inscription as:

GOSOCITAS MOSAC MAKINI

The K is represented by a forliff but would be more
meaningful as a P.

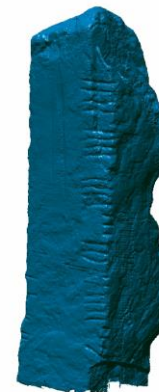
(3) This pillar, now broken on top, measures at least
1.16m in height and is .2m x .2m at base. The
inscription is neatly executed on two angles, reading
up-up. Macalister (1945, 211) read it as:

NOCATI MAQI MAQI-RECI . . . JMAQI MUÇOI
UDAMI

There is a roughly cut cross on each face of the stone.

(4) This stone stands at least 1.06m high and is
trapezoidal in section, measuring .26m x .23m. The
inscription is executed in broad, deep scores along both
angles. The dexter angle is badly damaged and
Macalister (1945, 212) interpreted the remaining scores
as:

LJAGROBRE . . .



Ogham in 3d
Project - CC BY-
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CISP

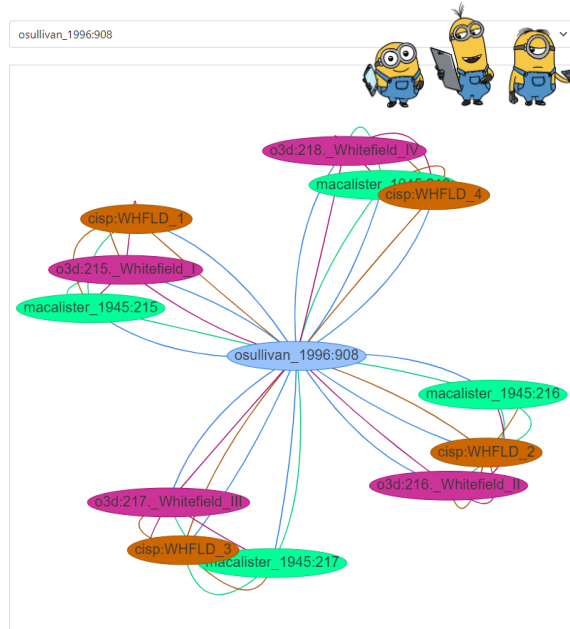
WHFLD/4

Corpus	Macalister:1945:218
Refs:	O'Sullivan,etal:1996:908
Site:	WHITEFIELD
Discovery:	first mentioned, 1853 The MacGillycuddy
History:	
Geology:	
Dimensions:	0.99 x 3.05 x 0.23 (converted from Macalister:1945)
Setting:	unattch.
Location:	National Museum, Dublin (Cat: W12)
Macalister:1945:208: Four stones inscribed with Ogham writing were exhibited by The MacGillycuddy of the Reeks at the Dublin Exhibition of 1853, and were presented by him to the Royal Irish Academy in the following year. Of these stones, two certainly... and all four probably, came from a souterrain in the townland of Whitefield.	
Form:	plain
Condition:	inc., some
Folklore:	none
Crosses:	none
Decorations:	no other decoration

CIIC 218



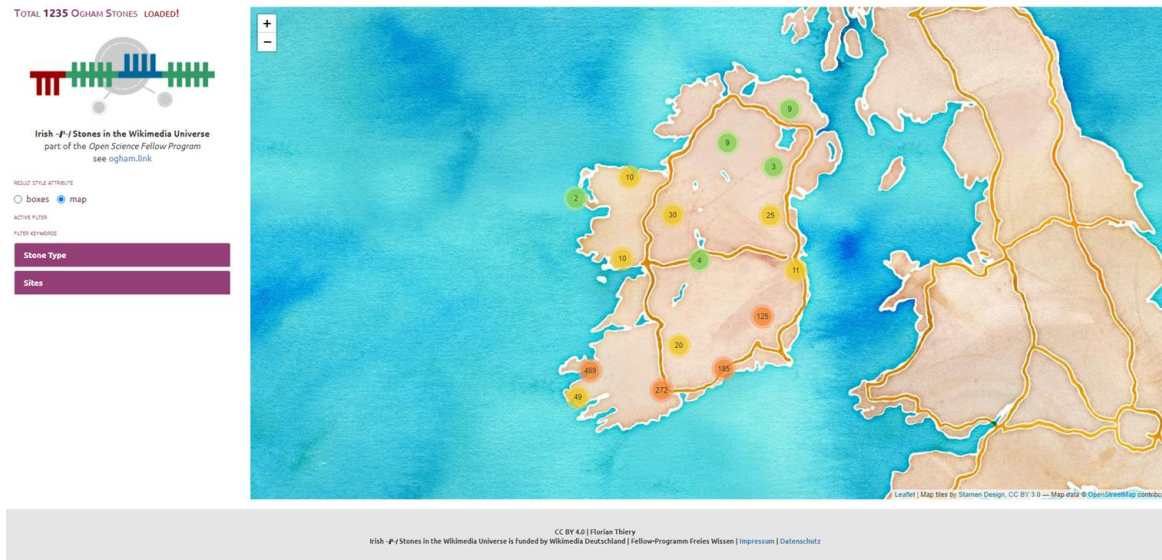
A little Ogham Stone Reference Minion



<https://github.com/FellowsFreiesWissen/Ogham>

http://ref.ogham.link/?node=osullivan_1996:908

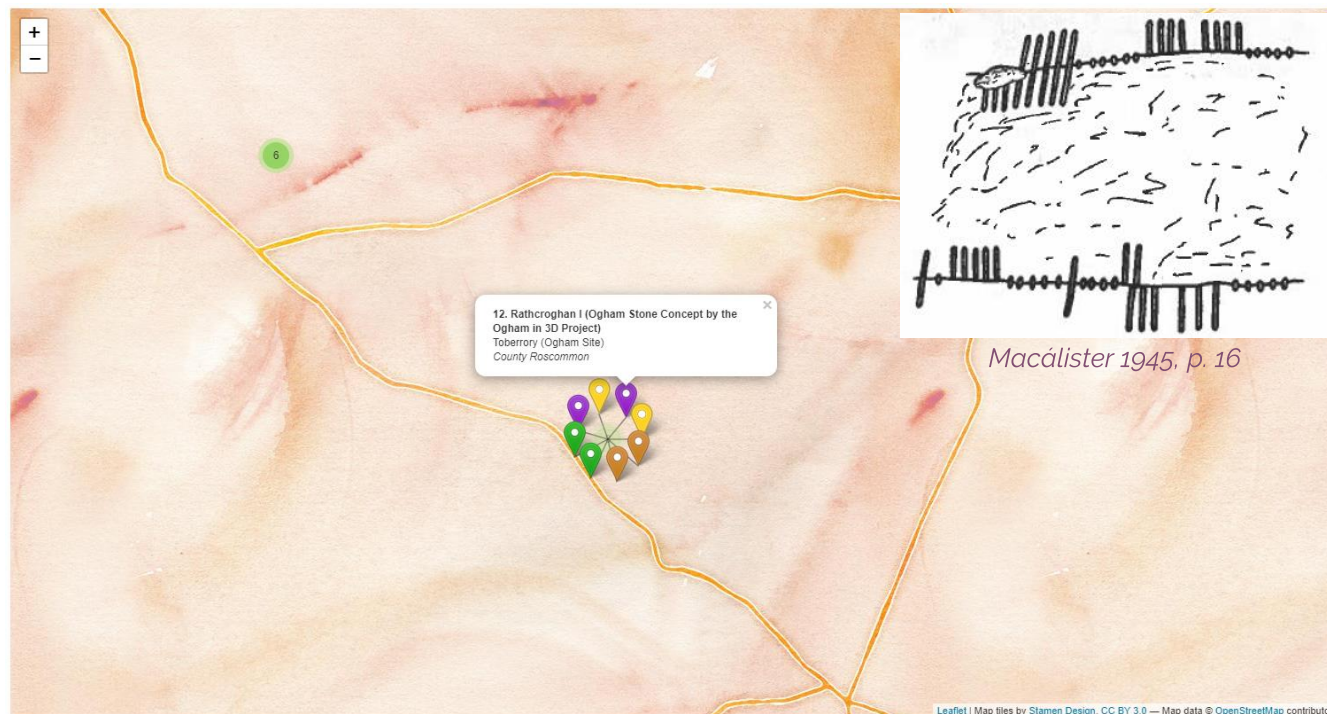
Implemented with JavaScript and vis.js.



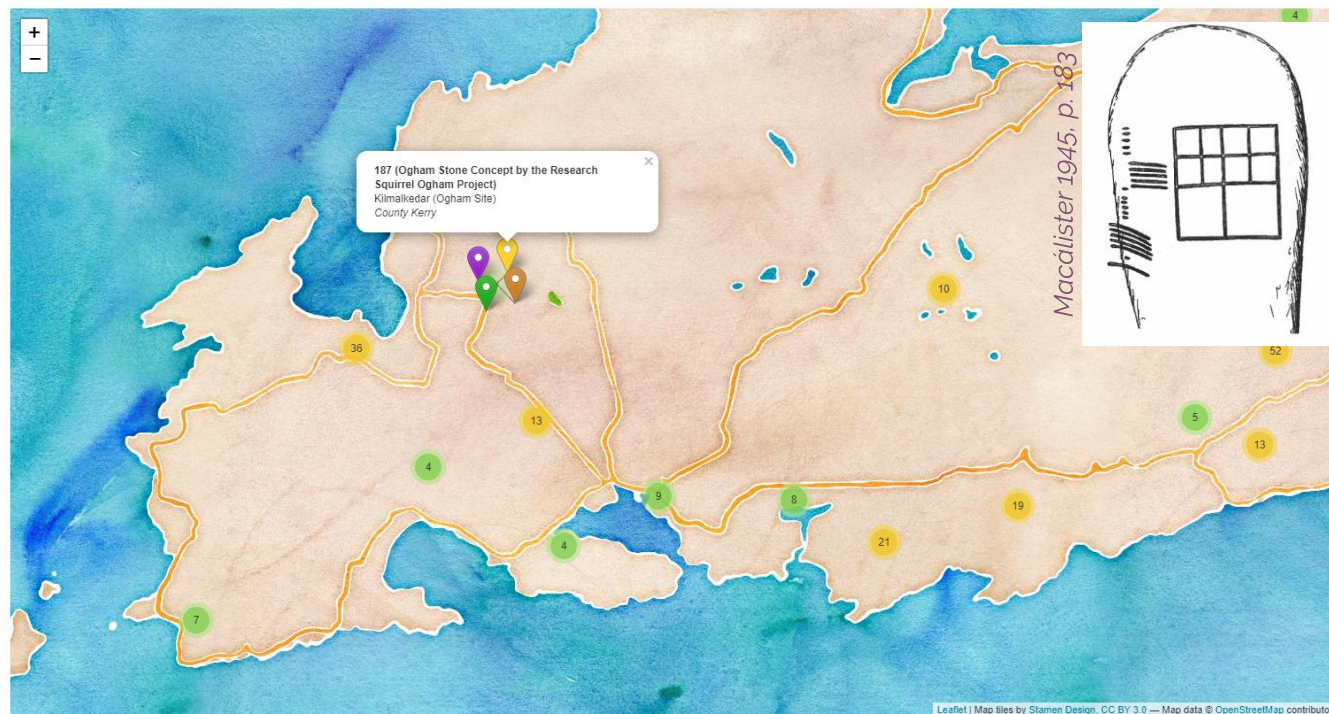
<https://github.com/ogi-ogham/ogham-lookup>

<http://lookup.ogham.link>

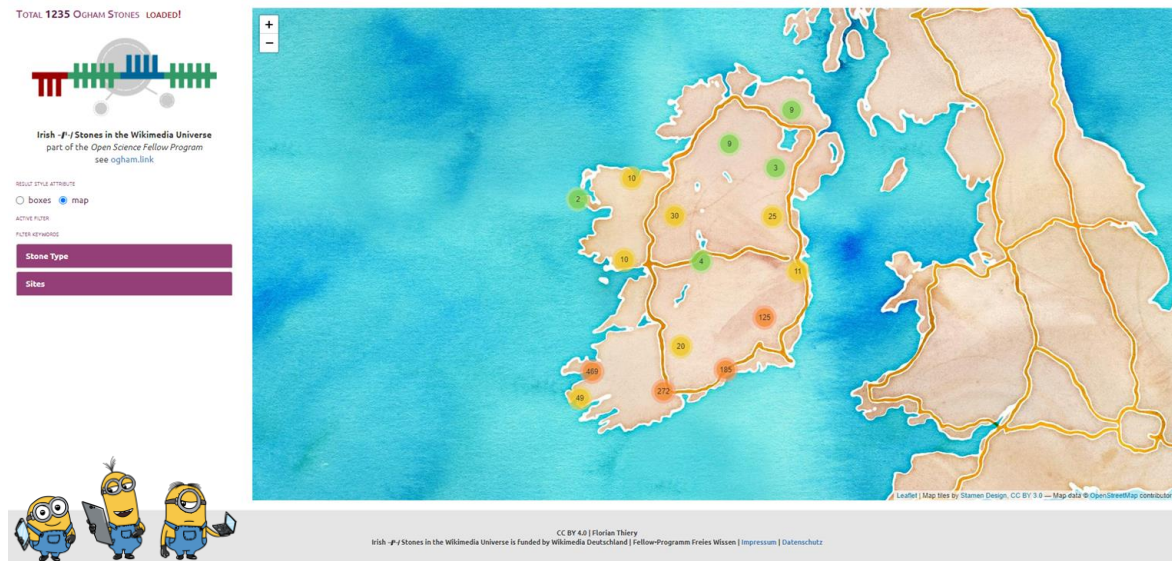
Visualisation of connections on an interactive map to show the distribution and different information on findspots.



Distribution of CIIC 12.



Distribution of CIIC 187.



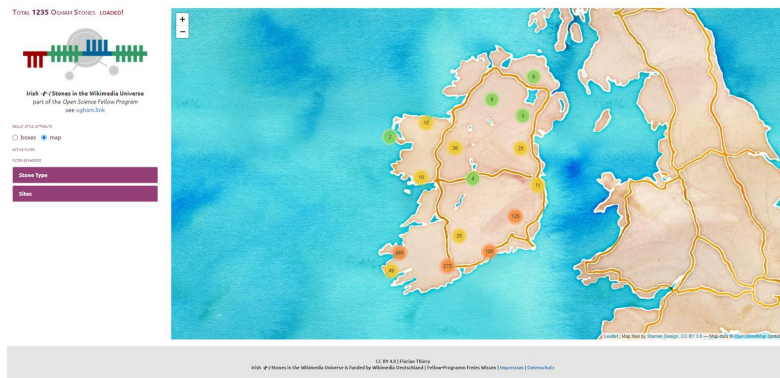
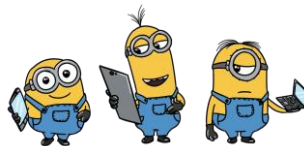
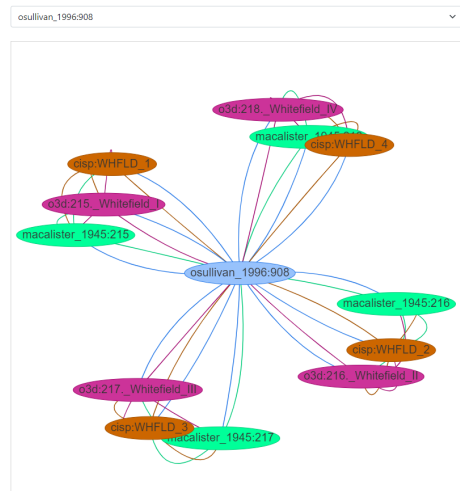
<https://github.com/ogi-ogham/ogham-lookup>

<http://lookup.ogham.link>

Implemented with JavaScript and Leaflet.



A little Ogham Stone Reference Minion



These little Minions help to create a better understanding of semantic modelling and Linked Open Data. Check them out!



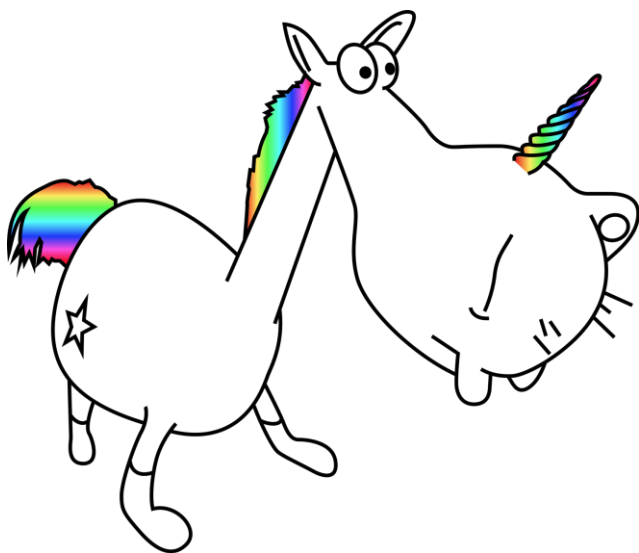
SPARQLing Unicorn QGIS Plugin

The first LOD / SPARQL integration in GIS Software

The **SPARQL Unicorn** was born at...



CHECK OBJECT INTEGRITY
CAA 2019
KRAKÓW 23-27 April

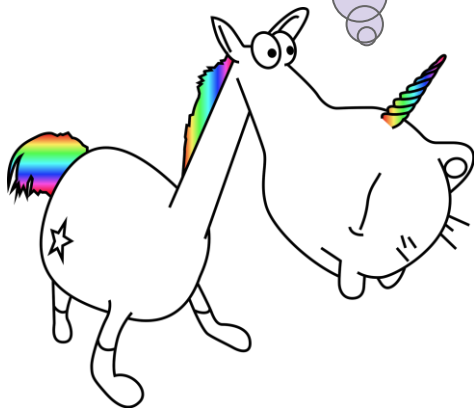


CAA
Computer Applications &
Quantitative Methods in Archaeology

Community



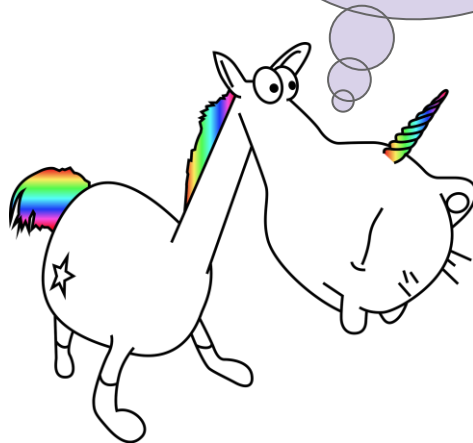
Die meisten LOD-Tools
erfordern Kenntnisse in
SPARQL... Abfragen
können sehr komplex
werden!

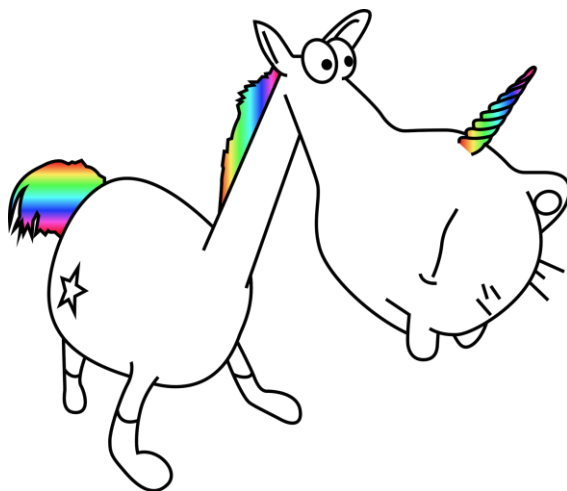


```
1 SELECT ?date ?work ?workLabel ?topics (GROUP_CONCAT(DISTINCT
separator=" // ") AS ?places) (GROUP_CONCAT(?authorLabel; separator="
authorstrings) (GROUP_CONCAT(?editorLabel; separator=" - ")
2 WITH {
3   SELECT DISTINCT ?work WHERE {
4     ?work wdt:P921 / (wdt:P361+ | wdt:P1269+ | (wdt:P31* / wdt:
5   }
6 } AS %works
7 WITH {
8   SELECT (MIN(?dates) as ?datetime) ?work (GROUP_CONCAT(?topic
9     INCLUDE %works
10    ?work wdt:P921 ?topic .
11    FILTER NOT EXISTS {
12      ?topic wdt:P31 wd:Q839954} .
13    FILTER NOT EXISTS {
14      ?topic wdt:P31 wd:Q220659}
15    OPTIONAL { ?work wdt:P577 ?dates . }
16
17    ?topic rdfs:label ?topic_label . FILTER (lang(?topic_label
18  )
19  GROUP BY ?work
20 } AS %result
21 WHERE {
22   INCLUDE %result
23
24   OPTIONAL { ?work wdt:P50 ?author .
25     ?author rdfs:label ?authorLabel . FILTER (lang(?authorLabel
26   )
27   # no extra label assignment here, because we already have a
28   OPTIONAL { ?work wdt:P2093 ?authorstring . }
29   OPTIONAL { ?work wdt:P98 ?editor .
30     ?editor rdfs:label ?editorLabel . FILTER (lang(?editorLabel
31   )
32   OPTIONAL { ?work wdt:P123 ?publisher . }
33
34   #collect related places (are in topic list; are instance of
35   OPTIONAL {?work wdt:P921 ?place
```



Wie kann ich Forscher*innen
ohne SPARQL-Kenntnisse bei
der Nutzung von community-
driven data aus dem Semantic
Web helfen?





(1) Describe your data in well documented semantic structured open formats, acc. to the 5 Star data principles.

(2) Model, generate and publish your data as 5 Star Linked Open Data

(3) Publish your data in Wikidata and interlink them to other resources in the Linked Open Data Cloud

(4) Use existing tools to query Wikidata dynamically and to do real time data analysis and support developers or develop new tools to give people without any deeper knowledge in Linked Open Data (SPARQL Unicorn tools) the possibility to also do dynamical real time analysis

(5) Use Wikidata and the SPARQL Unicorn tools in your own research and promote the SPARQL Unicorn principles that other interested researchers in the community may start with principle 1!

SPARQL Unicorn idea and principles



Es gibt einen Mangel an FLOSS
GIS Tools für LOD und
Archäologie. Das SPARQLing
Unicorn QGIS Plugin adressiert
das Problem der mangelnden
Verfügbarkeit von Tools für
Semantic Web Geodaten.



The SPARQLing Unicorn QGIS Plugin - a Linked Data Access Point for QGIS



The SPARQL Unicorn allows the execution of Linked Data queries in (Geo)SPARQL to selected triplestores and geo-enabled SPARQL endpoints and thus prepares the results of the queries in QGIS for the geocommunity.



The plugin currently offers three functions: (a) simplified querying of Semantic Web data sources (b) enrichment of geodata and (c) transformation of QGIS vector layers to RDF data.

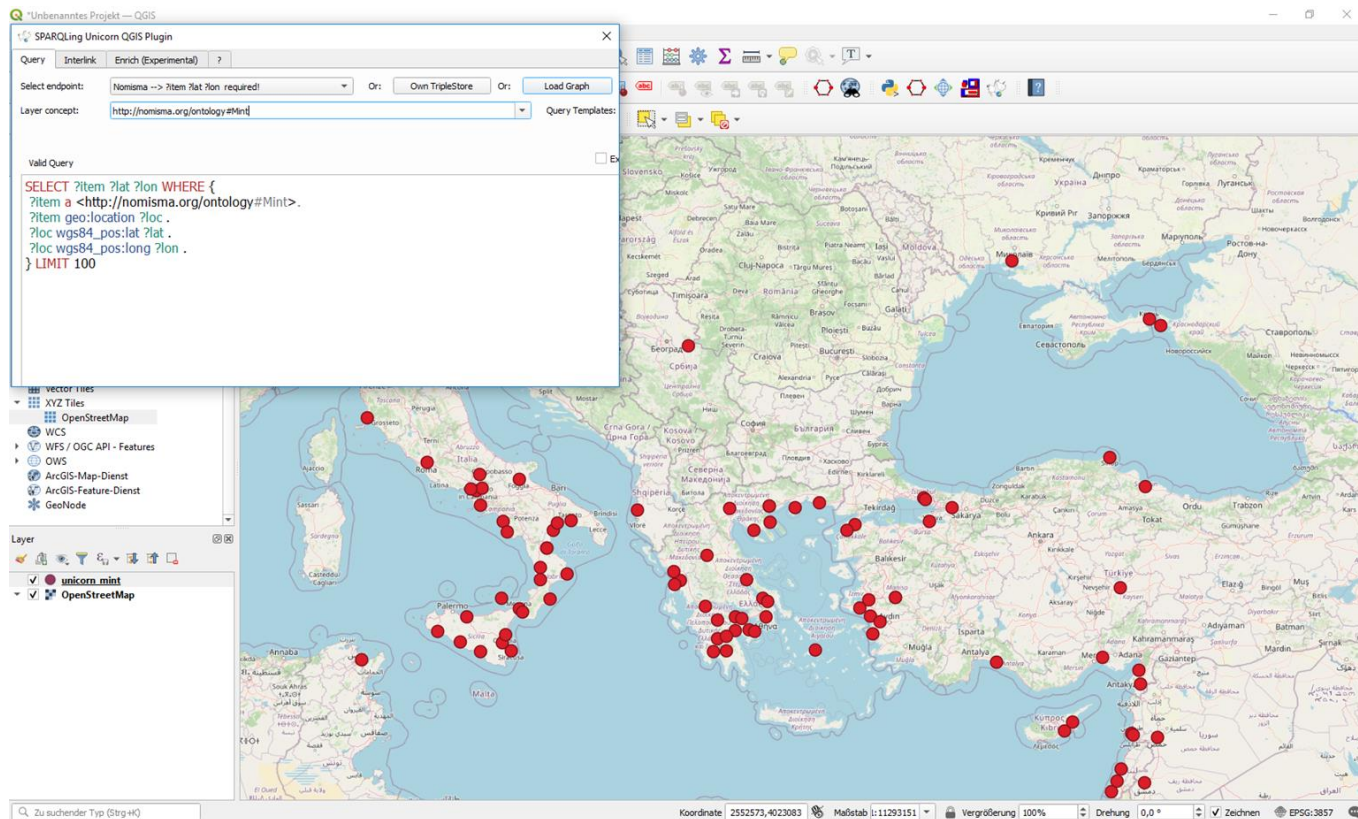


Function A

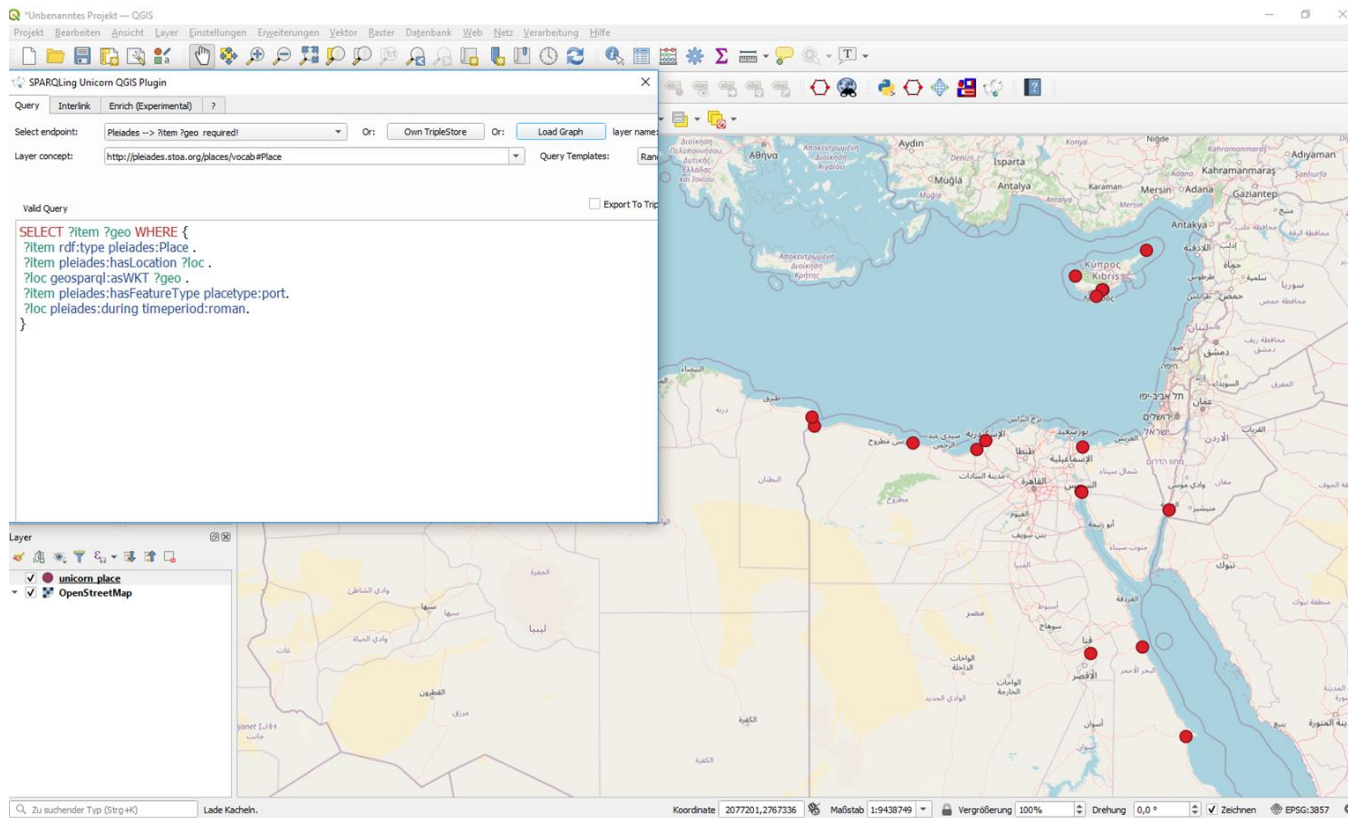




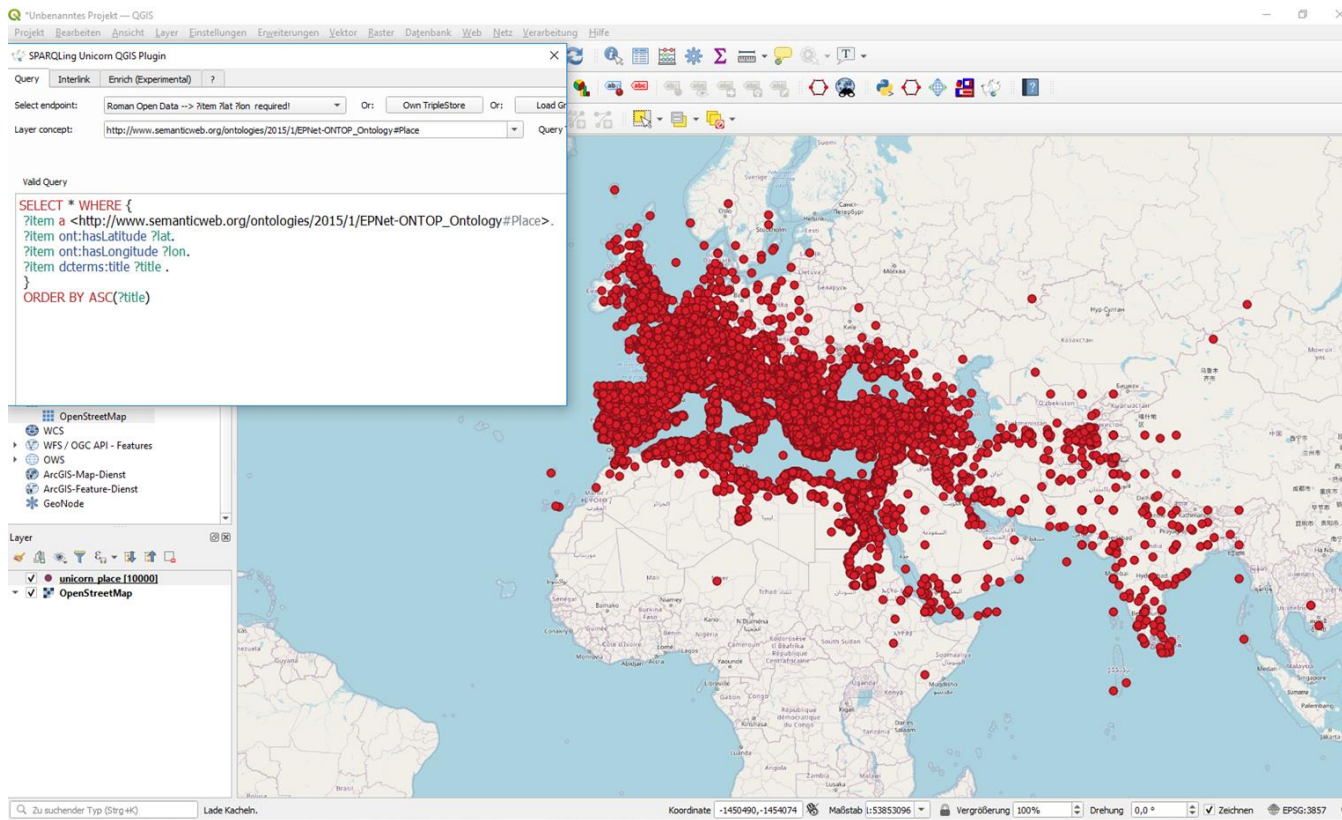
Function A allows assisted querying of several archaeological related triplestores e.g. Wikidata, Nomisma, Kerameikos, Pleiades and Roman Open Data. For assisting the user, example queries, a concept search and templates are given.



example: Nomisma (mints)



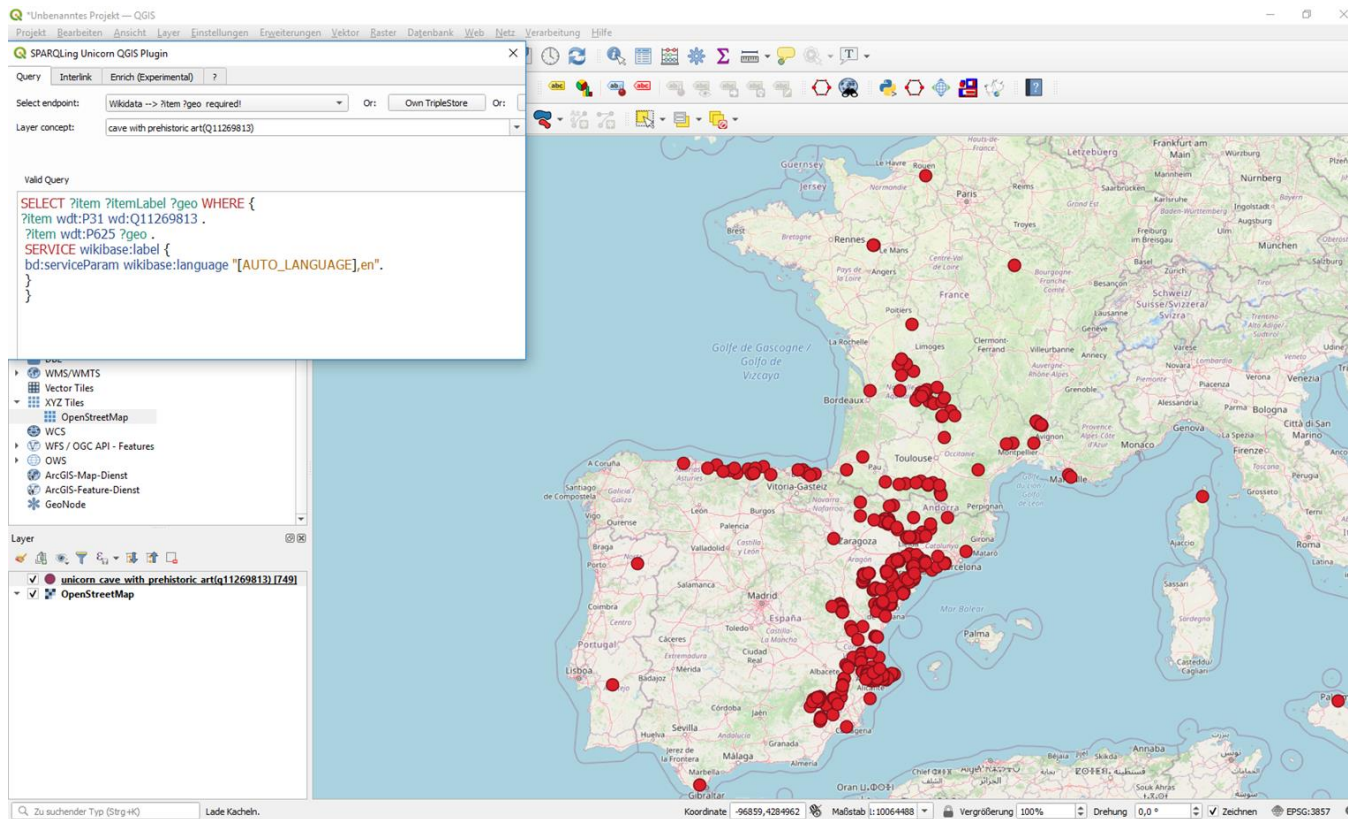
example: Pleiades (ports in the Roman period)



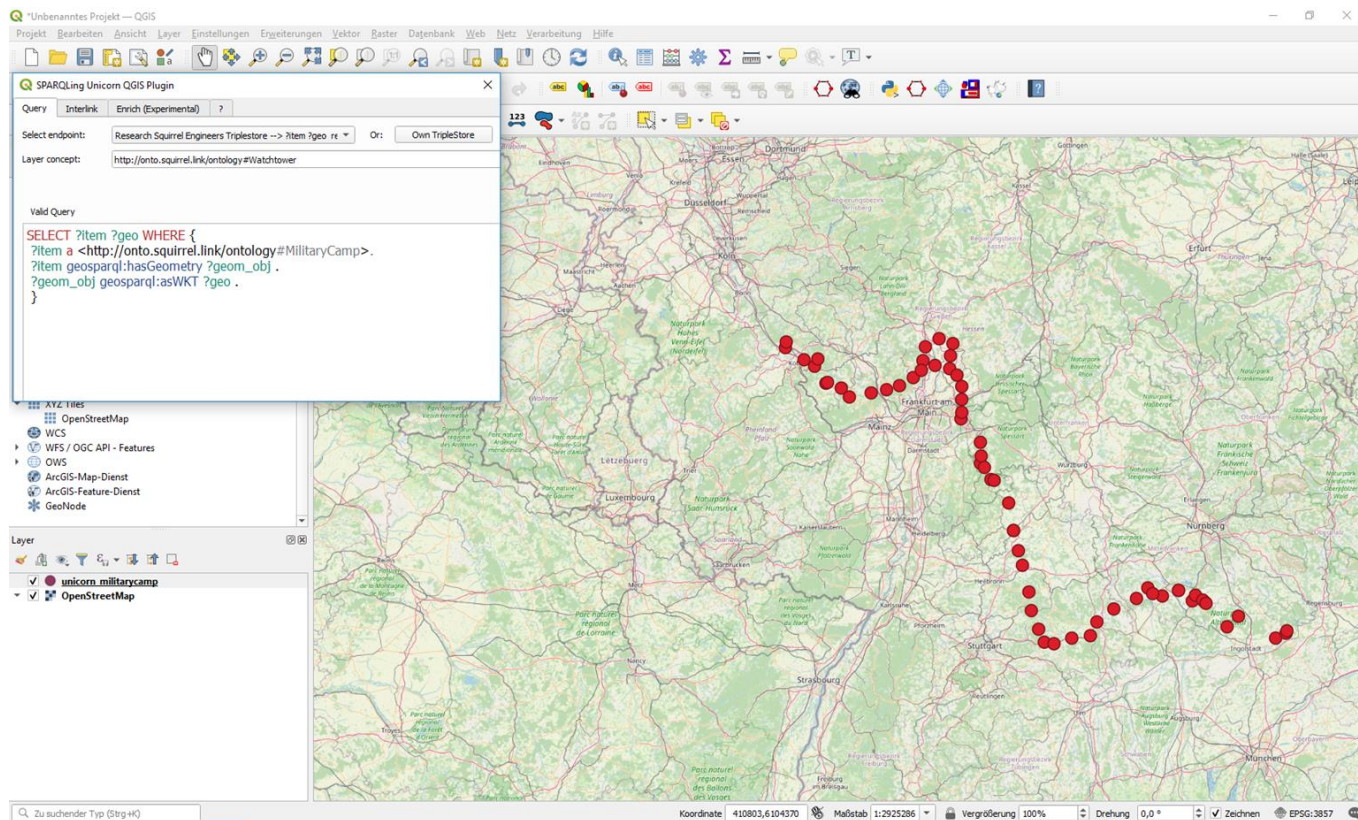
example: Roman Open Data (places)



For example: You could query the Wikidata triple store for prehistoric art sites or the Squirrel triple store for military camps of the limes. The results are saved as a QGIS vector layer.



example: Wikidata caves with prehistoric art



example: Limes military camps



Function B





Function B allows the enrichment of a given geodataset using Semantic Web resources from the Linked Open Data Cloud, especially Wikidata (e.g. the elevation level of towns along the Roman Limes). Geospatial data is always seen in a context of usage which usually requires additional data from different knowledge domains. Semantically interpreted Linked Data may represent such a resource for data enrichment.



Enrichment query using the SPARQLing Unicorn

limestownpard	limestown	limesobject	ID	limescategory
Orlen	Taunusstein	Zugmantel	1	Kastell
Heftrich	Idstein	Alteburg-Heftrich	2	Kastell
Niederreifenberg	Schmitten	Feldberg	3	Kastell
	Bad Homburg	Saalburg	4	Kastell
Ober-Rosbach	Rosbach	Kapersburg	5	Kastell

Q Search Property or Class

Search Concept: ☒ Class ☐ Property

Triple Store:

Define Own URI:

Search Results

municipality of Germany (Q262166) [the lowest official level of territorial division in Germany]

Q Enrichment Search

Search ID Concept:

Triple Store: In Area:

Search Results

- rdf-schema#label (5993.53%)
- description (1052.32%)
- core#altLabel (483.47%)
- located in time zone (209.88%)
- area (162.62%)
- located in the administrative territorial entity (137.39%)
- local dialing code (123.44%)
- coordinate location (123.39%)
- instance of (123.06%)
- elevation above sea level (116.47%)**
- Who's on First ID (112.76%)



SPARQLing Unicorn QGIS Plugin

Query Interlink Enrich ?

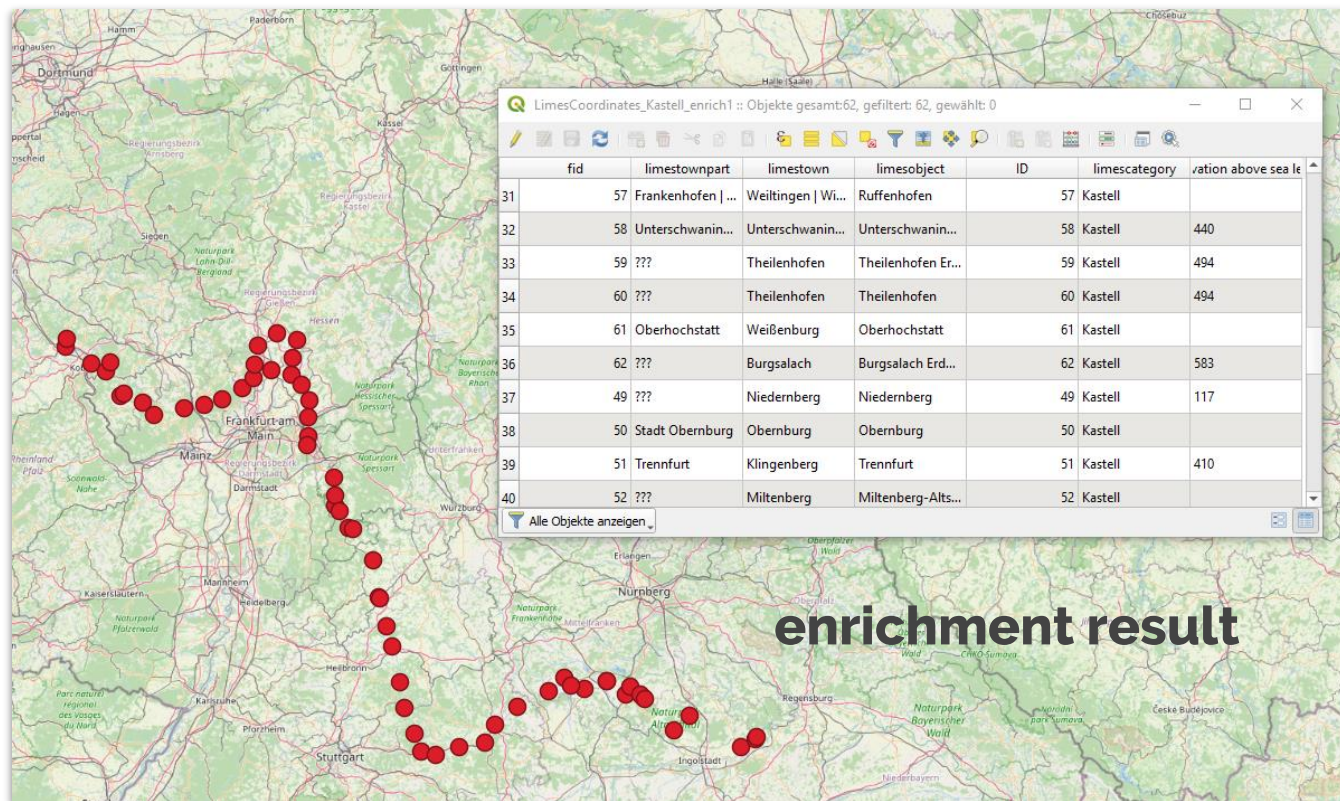
Refresh Layers LimesCoordinates_Kastell Load Layer

Add Row What to enrich?

	Column	EnrichmentConcept	TripleStore	Strategy	content	ID Column	ID Property	ID Domain	La
1	fid			No Enrichment	Enrich Value	fid	http://www.w3...		
2	limestownpart			No Enrichment	Enrich Value	fid	http://www.w3...		
3	limestown			No Enrichment	Enrich Value	fid	http://www.w3...		
4	limesobject			No Enrichment	Enrich Value	fid	http://www.w3...		
5	ID			No Enrichment	Enrich Value	fid	http://www.w3...		
6	limescategory			No Enrichment	Enrich Value	fid	http://www.w3...		
7	elevation above sea level	elevation above sea level (116.47%)	https://query.w...	Get Remote	Enrich Value	limestown	http://www.w3...	http://www.wik...	de

enrichment dialogue
using the SPARQLing Unicorn

Start Enrichment Add enriched layer





Function C





Function C converts
geospatial information e.g.
from GeoJSON into RDF, so
that this information might be
represented for the purpose of
publishing archaeological
geodata as Linked Data.



SPARQLing Unicorn QGIS Plugin

Query Interlink Enrich ?

Refresh Layers LimesCoordinates_Kastell_enrich1 Load Layer

OWL Class: Search Class

Target Namespace: Import Mapping Export Mapping

Table Columns to Concepts: ☐ Export To Triple Store

	Export?	IDColumn?	GeoColumn?	Column	ColumnProperty	PropertyType	ColumnConcept	ValueConcepts
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	fid		Automatic		
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	limestownpart		Automatic		
3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	limestown		DataProperty		
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	limesobject		DataProperty		
5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	ID		DataProperty		
6	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	limescategory		SubClass		
7	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	elevation above...		DataProperty		

Semantic Uplift using the SPARQLing Unicorn

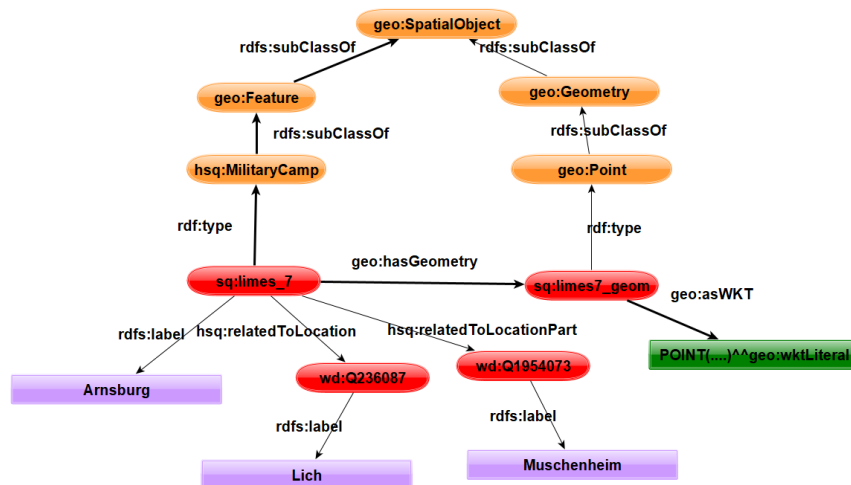
Export Result

```
<?xml version="1.0" ?>
<data>
  <file class="http://www.wikidata.org/entity/Q146924" namespace="http://www.github.com/sparqlunicorn#" indid="ID" >
    <column name="limestown" prop="data" >
    </column>
    <column name="limescategory" prop="subclass" >
    </column>
    <column name="elevation above sea level" prop="data" >
    </column>
  </file>
</data>
```





limestownpard	limestown	limesobject	ID	limescategory
	Friedberg	Friedberg	6	Kastell
Muschenheim	Lich	Arnsburg	7	Kastell
	Großkrotzenburg	Gross-Krotzenburg	8	Kastell

Semantic Uplift transformation process



Search:



Property	Value
as WKT (geosparql:asWKT)	<ul style="list-style-type: none"> <http://www.opengis.net/def/crs/EPSG/0/4326> POINT (8.784294 50.487393) (geosparql:wktLiteral)
has geometry (geosparql:hasGeometry)	<ul style="list-style-type: none"> Arnsburg Geometry
name (rdfs:label)	<ul style="list-style-type: none"> Arnsburg (xsd:string)
hsq:relatedToLocation	<ul style="list-style-type: none"> Lich (wd:Q236087)
hsq:relatedToLocationPart	<ul style="list-style-type: none"> Muschenheim (wd:Q1954073)
rdfs:seeAlso	<ul style="list-style-type: none"> Arnsburg (wd:Q697359)
list ein(e) (rdf:type)	<ul style="list-style-type: none"> Kastell (hsq:MilitaryCamp) Feature (geosparql:Feature)

as Turtle | as RDF/XML | as JSON-LD | as TriG | as TriX | as (Geo)JSON | as GeoURI | as KML | as GML

Semantic Uplift result of a limes part

Thx!

Any questions?

Twitter: @fthierygeo

0000-0002-3246-3531

WD: Q66606154

<http://fthiery.de>

RGZM, Mainz, Germany



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