

SCHWEIZERISCHES NATIONALMUSEUM. MUSÉE NATIONAL SUISSE. MUSEO NAZIONALE SVIZZERO. MUSEUM NAZIUNAL SVIZZER.

Connecting Coins Around the Globe

Numismatics and Linked Open Data

«Chur» (Zurich), 6 June 2020

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What is Numismatics?

Numismatics (Greek: nomisma=coin) is the study of coins, monetary history and all the connected topics.



Why are Numismatists pushing LOD?



HENRICVS REX



BASILEA CIVITAS

This is the best-preserved specimen of a coin type of Henry II, minted in Basle (around 1006-1014 AD).

It was deciphered last year (2019) for the first time, after comparison with all the other known specimens of that type, changing it from Conrad I of Burgundy to Henry II, king of the Romans.

Why are Numismatists pushing LOD?

Coins are mass objects but at the same time objects with individual characteristics

We need all the information of all the linked specimens, often from various collections and publications.



...heterogeneous data makes our lives difficult.

Why are LOD-people fans of Numismatics?

Numismatics has been highly standardized and normalized for over a hundred years. It has developed a specialized ontology long before computer science.



As a discipline with connections to history as well as to archaeology and history of the arts, numismatics is traditionally highly interlinked with neighbouring disciplines

Nomisma.org – what, why, how?



Available datasets based on
nomisma.org:

<http://nomisma.org/datasets>

Sparql endpoint:

<http://nomisma.org/sparql>



What?

Numismatic reference data

Why?

To make our lives easier and more fun

How?

5 star linked open data – one machine readable stable URI for every numismatic concept

Nomisma.org – what, why, how?



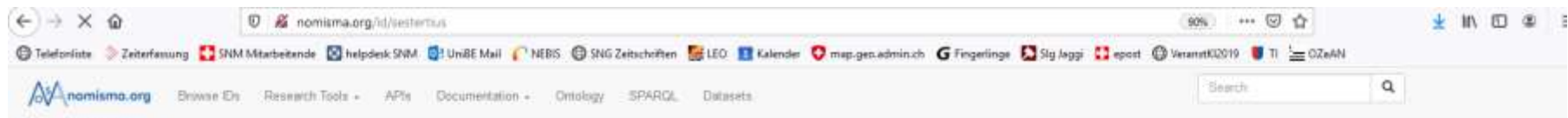
- Monthly: Google-Hangout of the steering committee
- Annually: meeting of the steering groups of nomisma.org/ECFN, including our workshops on specific questions: varying locations, embracing the local scientific community

Rule of thumb:

«If more than one person agrees on a numismatic concept, it is a numismatic concept!»



Nomisma.org – what, why, how?



sestertius (nmo Denomination)

skos:prefLabel Сестерциј (be), Сестерциј (bg), Sesterci (ca), Sestercius (ca), Sesterta (da), Sesterz (de), Τριτημόσιος (el), Sestertius (en), Sestercio (eo), Sestercio (es), Sestertio (eu), Sestertius (fi), Sesterte (fr), Sestercio (ga), σιστερτιος (he), Sestercij (hr), Sestercio (hu), Sestertio (it), セステルティウス (ja), სესტერტიუსი (ka), Сестерциј (kk), 세스테르티우스 (ko), Sestercia (la), Sestercija (lt), cecerpuyj (mk), Sestertius (nb), Sestertius (nl), Sesterci (oc), Sesterc (pl), Sestercia (pt), Сестерциј (ru), Sestercij (sh), Sestercius (sk), Sesterc (sl), Сестерциј (sv), Sestertis (tr), Сестерциј (uk), 塞斯忒提斯 (zh)

skos:definition An ancient denomination with the value of 1/4 denarius (en)

skos:definition 1/4 de dénaireus (fr)

dcterms:isPartOf http://nomisma.org/id/greek_numismatics

dcterms:isPartOf http://nomisma.org/id/roman_numismatics

rdfs:type skos:Concept

skos:changeNote <http://nomisma.org/id/sestertius#provenance>

skos:exactMatch <http://dtpedia.org/resource/Sestertius>

skos:exactMatch <http://vocab.getty.edu/ami/300037270>

skos:exactMatch <http://www.wikidata.org/entity/Q208041>

skos:exactMatch <https://www.freebase.com/m/01rh5c>

skos:inScheme <http://nomisma.org/id/>

Data Provenance

Export

Linked Data [GitHub File](#) [RDF/XML](#) [RDF/TTL](#) [JSON-LD](#)

Geographic Data [KML](#) [geoJSON \(mints\)](#) [geoJSON \(hoards\)](#) [geoJSON \(finds\)](#)



Associated Types (max 10)

[View SPARQL for full query](#) [Download CSV](#)

Type	Type Series	Example
RRC 44/7 Mint Rome Denomination Sestertius Date 211 B.C. - 211 B.C.	Roman Republican Coinage (Crowford 1974)	

RRC 464/9b Mint Rome Denomination Sestertius	Roman Republican Coinage (Crowford 1974)	
---	--	--

Nomisma.org – what, why, how?



```
<rdf:RDF>
  <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
  <skos:prefLabel xml:lang="en">Sestertius</skos:prefLabel>
  <skos:prefLabel xml:lang="de">Sesterz</skos:prefLabel>
  <skos:prefLabel xml:lang="fr">Sesterce</skos:prefLabel>
  <skos:prefLabel xml:lang="ro">Sestertius</skos:prefLabel>
  <skos:prefLabel xml:lang="ru">Сестерци</skos:prefLabel>
  <skos:prefLabel xml:lang="nl">Sestertius</skos:prefLabel>
  <skos:prefLabel xml:lang="it">Sesterzio</skos:prefLabel>
  <skos:prefLabel xml:lang="el">Σηστέρτιος</skos:prefLabel>
  <skos:exactMatch rdf:resource="http://dbpedia.org/resource/Sestertius"/>
  <skos:prefLabel xml:lang="bg">Сестерци</skos:prefLabel>
  <dcterms:isPartOf rdf:resource="http://nomisma.org/id/roman_numismatics"/>
  <skos:exactMatch rdf:resource="http://vocab.getty.edu/aat/300037270"/>
  <skos:definition xml:lang="en">
    An ancient denomination with the value of 1/4 denarius
  </skos:definition>
  <skos:definition xml:lang="fr">1/4 de dénarius</skos:definition>
  <skos:prefLabel xml:lang="es">Sestercio</skos:prefLabel>
  <dcterms:isPartOf rdf:resource="http://nomisma.org/id/greek_numismatics"/>
  <skos:exactMatch rdf:resource="http://www.wikidata.org/entity/Q208041"/>
  <skos:prefLabel xml:lang="pl">Sesterc</skos:prefLabel>
  <skos:prefLabel xml:lang="eu">Sestertzio</skos:prefLabel>
  <skos:prefLabel xml:lang="ko">세스테르티우스</skos:prefLabel>
  <skos:prefLabel xml:lang="he">סֶסְטֵרְטִיּוּס</skos:prefLabel>
  <skos:prefLabel xml:lang="hu">Sestertius</skos:prefLabel>
  <skos:prefLabel xml:lang="gl">Sestercio</skos:prefLabel>
  <skos:prefLabel xml:lang="ja">セステルティウス</skos:prefLabel>
  <skos:prefLabel xml:lang="sh">Sestercij</skos:prefLabel>
  <skos:prefLabel xml:lang="sv">Sestertie</skos:prefLabel>
  <skos:prefLabel xml:lang="pt">Sestercio</skos:prefLabel>
  <skos:prefLabel xml:lang="eo">Sesterco</skos:prefLabel>
  <skos:prefLabel xml:lang="sk">Sestercius</skos:prefLabel>
  <skos:prefLabel xml:lang="tr">Sestertius</skos:prefLabel>
  <skos:prefLabel xml:lang="mk">сестерци</skos:prefLabel>
  <skos:prefLabel xml:lang="ca">Sesterci</skos:prefLabel>
  <skos:prefLabel xml:lang="fi">Sestertius</skos:prefLabel>
```

Using LOD for (online) collections



Nomisma.org



Berlin
reference data



Wikipedia



DNB



VIAF



Chur: Johann V. Flug von
Aspermont
1601-1627

Münzkabinett der Staatlichen Museen zu Berlin
Ausstellung im Bode-Museum
Raum 243, BM-074/06 Europa. Donative 16.-18. Jh.

Vorderseite IOANNES DEI GRA - EPISCOPVS CVR. Büste des Heiligen
Lucius mit Krone und Nimbus nach rechts. Im I. F. S L, im
r. F. PEC. Unten das Stifts- und Familienwappen des
Bischofs Johann Flug von Aspermont.

Rückseite RÖDOL II D G ROM IMP SEMP AVGVSTVS. Bekrönter und
nimbierter Reichsadler.

Münzstend Bistum

Münzherr Johann V. Flug von Aspermont (1601-1627), Bischof von
Chur


Datierung 1601-1627
Barock

Nominal 7 Dukaten

Material Gold

Herstellung geprägt

Using LOD for (online) collections

 [Browse IDs](#) [Research Tools](#) [APIs](#) [Documentation](#) [Ontology](#) [SPARQL](#) [Datasets](#)

chur (nmo:Mint)

skos:prefLabel [خورد](#) (ar), [Kyp](#) (be), [Kyp](#) (bg), [Chur](#) (bs), [Coira](#) (ca), [Kyp](#) (ce), [Chur](#) (cs), [Chur](#) (cy), [Chur](#) (da), [Chur](#) (de), [Koup](#) (el), [Chur](#) (en), [Kairo](#) (eo), [Coira](#) (es), [Chur](#) (et), [Chur](#) (eu), [شور](#) (fa), [Chur](#) (fi), [Coire](#) (ff), [Chur](#) (ga), [Clura](#) (gd), [کور](#) (he), [Chur](#) (hr), [Chur](#) (hu), [Chur](#) (id), [Chur](#) (is), [Coira](#) (it), [クール](#) (ja), [کورچین](#) (ka), [쿠오](#) (ko), [Curia Raetorum](#) (la), [Kūras](#) (lt), [Kūra](#) (lv), [Kyp](#) (mk), [Chur](#) (ms), [Chur](#) (nb), [Chur](#) (nl), [Chur](#) (nn), [Coira](#) (oc), [Chur](#) (pl), [Coira](#) (pt), [Cuira](#) (rm), [Cuira](#) (ro), [Kyp](#) (ru), [Chur](#) (sh), [Chur](#) (sk), [Chur](#) (sl), [Chur](#) (sq), [Xyp](#) (sr), [Chur](#) (sv), [қы](#) (th), [Chur](#) (tr), [Kyp](#) (uk), [کور](#) (ur), [Chur](#) (vo), [庫羅](#) (zh)

skos:definition The mint(s) of Chur or Coire, the capital and largest town of the Swiss canton of Grisons. Coins were issued for the carolingian Empire, the bishopric of Chur (958-1767) and the municipality of Chur (1529-1767) as well as for the Gotteshausbund (1556-1570). (en)

dcterms:isPartOf http://nomisma.org/id/medieval_european_numismatics

dcterms:isPartOf http://nomisma.org/id/modern_swiss_numismatics

geo:location <http://nomisma.org/id/chur#this>

rdf:type [skos:Concept](#)

skos:changeNote <http://nomisma.org/id/chur#provenance>

skos:closeMatch <http://catalogue.bnf.fr/ark:/12148/cb12369126b>

skos:closeMatch <http://d-nb.info/gnd/4010189-7>

skos:closeMatch <http://sws.geonames.org/7285515/>

skos:closeMatch <http://viaf.org/viaf/154757544>

skos:closeMatch <http://www.idref.fr/027428575>

skos:closeMatch <http://www.wikidata.org/entity/Q69007>

skos:closeMatch <https://www.freebase.com/m/015vjp>

skos:inScheme <http://nomisma.org/id/>

#this (geo:SpatialThing)

geo:lat 46.84702


geo:long 9.53728

Data Provenance

Export

Linked Data [GitHub File](#) [RDF/XML](#) [RDF/TTL](#) [JSON-LD](#)

Geographic Data [KML](#) [geoJSON \(mints\)](#) [geoJSON \(hoards\)](#) [geoJSON \(finds\)](#)



[View fullscreen](#)

Using LOD for (online) typologies

RIC I (second edition) Augustus 2B

[Exemplare dieses Typs](#) | [Quantitative Analyse](#)

typologische Beschreibung

Datierungsspanne

Datum von: 25 BC

Datum bis: 23 BC

Objekttyp: [Münze](#)

Herstellung: [Geprägt](#)

Nominale: [Denar](#)

Material: [Silber](#)

Autorität

Autorität: [Augustus](#)

Herausgeber: [P. Carnius](#)

geographisch

Münzstätte: [Emerita](#)

Region: [Lusitanien](#)

Vorderseite

Legende: [IMP CAESAR AVGVST](#)

Type: [Head of Augustus, bare, left](#)

Porträt: [Augustus](#)

Rückseite

Legende: [P CARISVS LEG PRO PR](#)

Type: [Round shield, spear-head, and curved sword](#)

Karten



Using LOD for (online) typologies

```
<rdf:RDF>
  <nmo:TypeSeriesItem rdf:about="http://numismatics.org/ocre/id/ric.1(2).aug.2B">
    <rdf:type rdf:resource="http://www.w3.org/2004/02/skos/core#Concept"/>
    <skos:prefLabel xml:lang="en">RIC I (second edition) Augustus 2B</skos:prefLabel>
    <skos:definition xml:lang="en">RIC I (second edition) Augustus 2B</skos:definition>
    <dcterms:source rdf:resource="http://nomisma.org/id/ric"/>
    <dcterms:replaces rdf:resource="http://numismatics.org/ocre/id/ric.1(2).aug.2b"/>
    <nmo:representsObjectType rdf:resource="http://nomisma.org/id/coin"/>
    <nmo:hasManufacture rdf:resource="http://nomisma.org/id/struck"/>
    <nmo:hasDenomination rdf:resource="http://nomisma.org/id/denarius"/>
    <nmo:hasMaterial rdf:resource="http://nomisma.org/id/ar"/>
    <nmo:hasAuthority rdf:resource="http://nomisma.org/id/augustus"/>
    <nmo:hasIssuer rdf:resource="http://nomisma.org/id/p_carisius"/>
    <nmo:hasMint rdf:resource="http://nomisma.org/id/emerita"/>
    <nmo:hasRegion rdf:resource="http://nomisma.org/id/lusitania"/>
    <nmo:hasStartDate rdf:datatype="http://www.w3.org/2001/XMLSchema#gYear">-0025</nmo:hasStartDate>
    <nmo:hasEndDate rdf:datatype="http://www.w3.org/2001/XMLSchema#gYear">-0023</nmo:hasEndDate>
    <nmo:hasObverse rdf:resource="http://numismatics.org/ocre/id/ric.1(2).aug.2B#obverse"/>
    <nmo:hasReverse rdf:resource="http://numismatics.org/ocre/id/ric.1(2).aug.2B#reverse"/>
    <void:inDataset rdf:resource="http://numismatics.org/ocre"/>
  </nmo:TypeSeriesItem>
  <rdf:Description rdf:about="http://numismatics.org/ocre/id/ric.1(2).aug.2B#obverse">
    <nmo:hasLegend>IMP CAESAR AVGVST</nmo:hasLegend>
    <dcterms:description xml:lang="en">Head of Augustus, bare, left</dcterms:description>
    <nmo:hasPortrait rdf:resource="http://nomisma.org/id/augustus"/>
  </rdf:Description>
  <rdf:Description rdf:about="http://numismatics.org/ocre/id/ric.1(2).aug.2B#reverse">
    <nmo:hasLegend>P CARISIVS LEG PRO PR</nmo:hasLegend>
    <dcterms:description xml:lang="en">Round shield, spear-head, and curved sword</dcterms:description>
  </rdf:Description>
</rdf:RDF>
```

Using LOD in numismatic daily life

- Harvest data (sparql queries)
- Searching for anomalies in the data
- Matching similar data with same phenomena
- Update new results (e.g. attribution to another king) simultaneously in all connected databases



Example of use: automation enabled by LOD

Objektdatenbank SLM

AMI-R 126

Römisches Kaiserreich, Claudius (41-54 n. Chr.) für Nero Claudius Drusus, Muz. Rom. Aenus 41-46 n. Chr.

Letzte Änd: 2016-08-29 13:58:39 Meier Bernasconi

Historisch | Eigentümer: SSM | SSM | 454217

Objektbeleg: Münzmatik | Temp. Standort: Hauptstandort

Standort: Münzkabinett, (LMZ-N) Platz: Münzkabinett

Temp.: LMZ Temp. Platz: LMZ.26.820N.2.5

Klassifikation: Münzfolge: 0

Münzgröße: Normal | Dat. (Text):

Via Legende: Ra Legende | Ra Typ:

Masse: 1.0 cm | H: 6.0 cm | B: 0.8 cm | Gew.: 7.739 g | Stempelbildung: | Masse kontrolliert

Material: Technik:

Stempel: Online

stable URI: <http://numismatica.org/coins/dm:10201737ang-de> | Normdaten ergänzen

PUBLIKATIONEN

Titel	Autoren	Seiten	Verlag	Jahr
The Royal Imperial Coinage	Walshy, H. J. ; Robinson, E. A. ; Sutherland, J. S.	73	Beard (Revised Edition) Spink & Son Ltd.	1923 - 1961

FINDORT / ERWERBUNG / TAXATION

Fundort: Funddatum: Erg.Datum: ACH | Alter Bestand: Tax: 0.00 CHF | neck

Ben: Nachweiseakte | Ausleihbeschränkungen | Kulturgüterchutz | Copyright | Bed. Sicherheit | Bed. Konservatorfach

Determine the coin type and fill in the stable URI of that type...



Example of use: automation enabled by LOD

The screenshot displays the 'Objektdatenbank SLM' (Object Database SLM) interface. The main record is for a Roman gold coin (Aureus) from the reign of Nero Claudius Drusus (41-54 n. Chr.). The interface is divided into several sections:

- Grunddaten:** Includes the object ID (AMI-R-128), date (2016-09-09), and location (Meier Besto).
- Identifikation:** Shows the object name (Römisches Kaiserreich, Claudius [41-54 n. Chr.] für Nero Claudius Drusus, Mzst. Rom. Aureus 41-45 n. Chr.), inventory status (Vollinventarisiert), and historical status (Erlassung beendet).
- Standort:** Lists the location (Münzkabinett, LMZ) and the specific cabinet (Münzkabinett).
- Klassifikation:** Shows the classification (Münzen, Medaillen und Wertzeichen, Münzen: Römische Kaiserzeit, Claudius [41-54]) and the type (Aureus).
- Metall:** Details the metal (Silber), weight (7,750 g), and technical specifications (Stempeltechnik, Masse kontrolliert).
- Legende:** Provides the obverse (MERO CLAUDIVS DRVSVS GERMANVCVS) and reverse (DE GERMANIS) legends, along with a description of the reverse side (Two shields, two pairs of spears, two trumpets, all crossed behind, wreath with flag above, left).
- Publikationen:** Lists the publication 'The Royal Imperial Coinage' by Mattingly, H. C. and Eckstein, E. A. (Oxford: 1927).
- Findeort / Erwerbung / Taxation:** Includes fields for find location, acquisition date, and tax information.

Two images of the coin are shown on the right side of the interface, one showing the obverse and the other showing the reverse.

... all the needed fields are completed via a predefined sparql query.

This saves time and helps to be consistent with the entries at the same time!

The background of the entire image is a dense, overlapping field of gold coins, likely American Gold Eagle coins, which are scattered across the frame. The lighting is bright, highlighting the metallic sheen and intricate details of the coins.

**Thank you for your
attention!**

(I'm happy to answer any question)