



UNIVERSITÀ DEL PIEMONTE ORIENTALE

**GO!**  
**an ontology**  
**for the geographical knowledge**  
**contained in classical Latin texts**

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34th joined meeting of the CIDOC CRM SIG and ISO/TC46/SC4/WG9

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## Geolat geography for Latin literature

**Geolat** is a research project aimed at offering access to a digital library\* of the Latin literature (from its origins to the end of the Roman Empire) through a query interface of geographic/cartographic type representing the geographic knowledge expressed in the texts themselves

\* see digilibLT- [www.digiliblt.unipmn.it](http://www.digiliblt.unipmn.it)

the project is funded by Fondazione Compagnia di San Paolo

# Geolat

## geography for Latin literature

the members of our research group:

historians (gabriella vanotti), philosophers of mind, of science and other (cristina meini, margherita benzi, timothy tambassi), computer scientists (diego magro), latin scholars (alice borgna), geographers (raffaella afferni), comparatists (fabio ciotti), library & information science (maurizio lana)

and last but not least we work with three professional ontologists: claudia corcione, paola de caro, silvia naro, who are the authors of the ontology

## relevant similar projects

Pleiades

[pleiades.stoa.org](http://pleiades.stoa.org)



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Pelagios

[pelagios-project.blogspot.co.uk](http://pelagios-project.blogspot.co.uk)



Geolat adopts a geographical ontology for the human-made annotation of the placenames in the texts, while Pelagios adopts an approach parsing+NER

## why using ontologies ?

describing (aspects of) the content of a text using the categories (the classes) of an ontology allows:

to act *in the text* as interpreters (writing the annotation itself)

to do searches based on some type of mixed reasoning (“which are the fresh waters occurring in the works of Augustan writers?”)

to build factual connections among different texts – so putting them in relation beyond times (which places of Roman Antiquity are mentioned in French Renaissance texts?)

## GO!: the Geolat Ontology

### **general aims:**

- accessibility (both for the scientific community and for general public);
- informativeness;
- completeness;
- reuse and interoperability.

## GO! reuse and interoperability

reuse:

- the ontology is made of 4 different modules which can be used alone
- there are horizontal modules collecting shared features (TOP) and vertical modules which go into detail of a given subdomain (HUM, PHY, FAR)

interoperability:

- GeoSPARQL, which is an OGC (Open Geospatial Consortium) standard is imported and reused
- the mapping with some of the most relevant geographical ontologies (or containing a relevant geographical part) is declared

# GO!: the Geolat Ontology

## **specific aim:**

- describe geographical information contained in Latin texts – the first development started from the analysis of Caesar, Sallust, Tacitus, Lyvi, Ammianus Marcellinus;
- provide an inventory of classes and relation in order to annotate semantically Latin texts



## GO!: some necessities

GPS coordinates of the places; and actual names if any

historical events description

evolution of a given place (e.g. from village to city)

physical and geopolitical description of a given place

connection with places data in Pleiades

management of imaginary places

connection with the Barrington Atlas

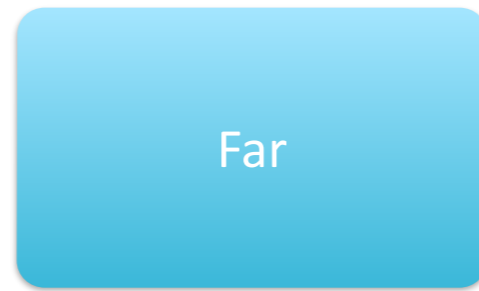
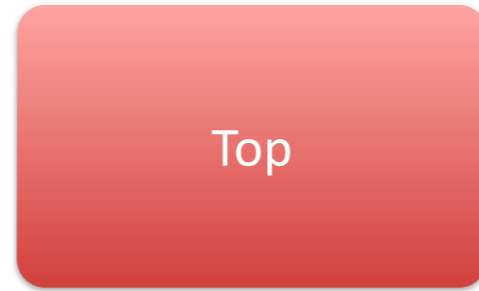
connection with the Open Annotation ontology to cite the passages

## GO! faces some problems

we can distinguish three different kinds of problems dealt with by ancient geographers, which share lack or vagueness of available data and information, and assume a central role in GO:

- **topological problems** (we must correctly interpret the descriptions of the places – more correctly than ‘before’);
- **source problems** (lack of reliability and homogeneity of some data, disagreement among different authors, etc.);
- **methodological problems** (heterogeneity of aims, points of view, interpretations and perspectives, use of assumptions and models representing cosmos, attempts to make the data more consistent, etc.).

## GO! modules (OWL2)



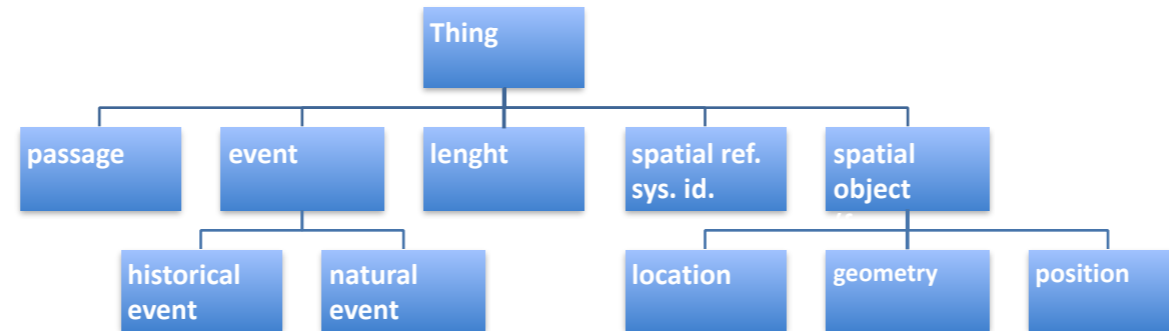
# GO-TOP

contains the most general classes and  
properties, which would be repeated  
in all the other modules

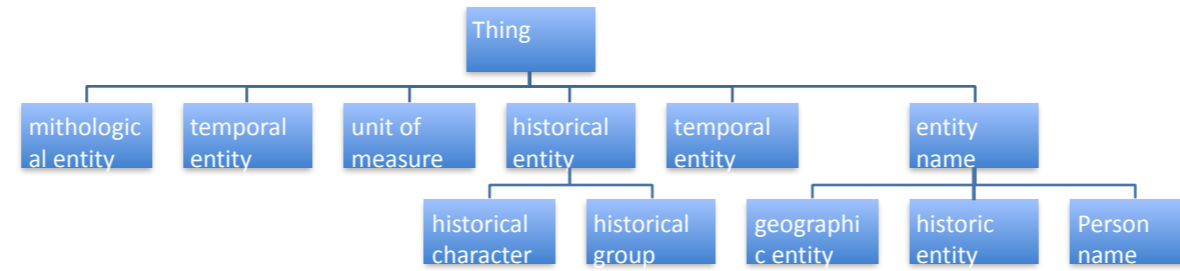
## **Imported Ontologies**

Geosparql

# GO! selected classes



# GO! selected classes



# Object Properties

- **about space:** above, below, borderToTheEast, borderToTheNorth, borderToTheSouth, borderToTheWest, hasLocation, hasRealPlace, hasSRID, identify, inPlace, inSRID, isUnder, leftOf, nearby, rightOf, visibleFrom, beginningPlace, endingPlace, partOf.
- **about time:** after, before, occurIn.
- **about names:** deriveFrom (it describes how the meaning of a placename depends/is derived from another name or entity), hasName, nameOf.
- **about actors:** becomes, wins, composedBy (it describes by which persons/parties/populations an alliance/formation/line-up is made), owns, foughtBetween (it connects a battle with the involved parties), hasPath, hasStopOver(it allows a journey path to be subdivided into legs), involves, isStopOverOf (it indicates a leg of a path/route), objectOf, subjectOf (see the external doc explaining the ontology, sect. 4.1.3), to, by, passesThrough, controls, belongsTo.
- **about measurement:** hasLength; measuredBy (it connects a length to a unit of measure).

# Data Properties

- **about space:** latitude, longitude.
- **about time:** beginningPeriod, temporalPeriod, endingPeriod, inDate, validSince, validUntil (queste ultime due proprietà servono a legare un'entità geografica antropica, spesso a carattere istituzionale e convenzionale ad una data o un periodo in cui tale istituzione/convenzione è valida) .
- **about names:** etymology (serve a legare al nome delle entità la rispettiva definizione etimologica), name (è una proprietà molto generica, per la quale non è stato specificato né dominio né codominio, proprio perché può essere legata a qualsiasi classe e contenere valori diversi, sia numerici che non) .
- **about measurement:** hasValue (tra un individuo della classe lunghezza e un valore numerico).



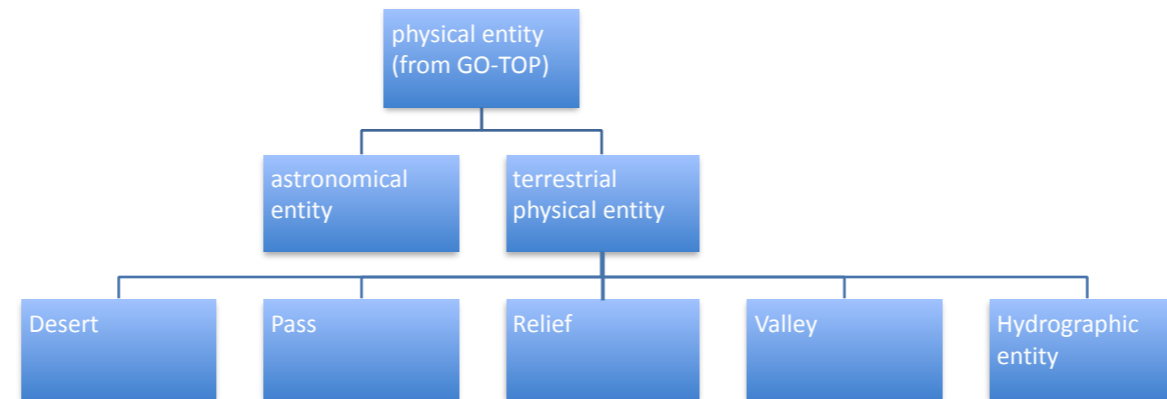
# GO-PHY

Include a taxonomy of all Geographic entities that can be found in nature

## **Imported Ontologies**

GO-TOP, Geosparql

# GO-PHY (selected classes)



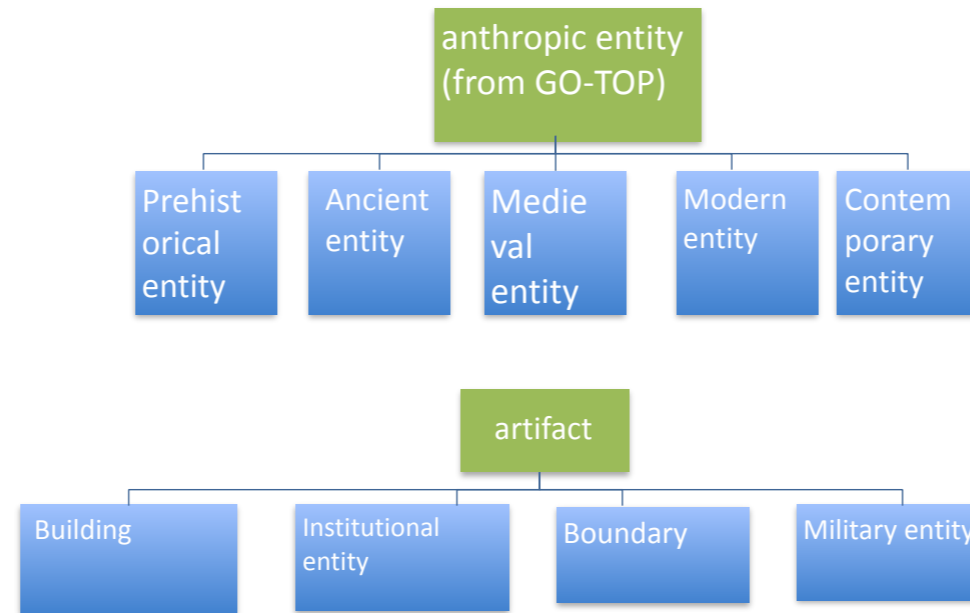
# GO-HUM

Includes a taxonomy of all Geographic  
Features produced by humans

## **Imported Ontologies**

GO-TOP, Geosparql

# GO-HUM (selected classes)



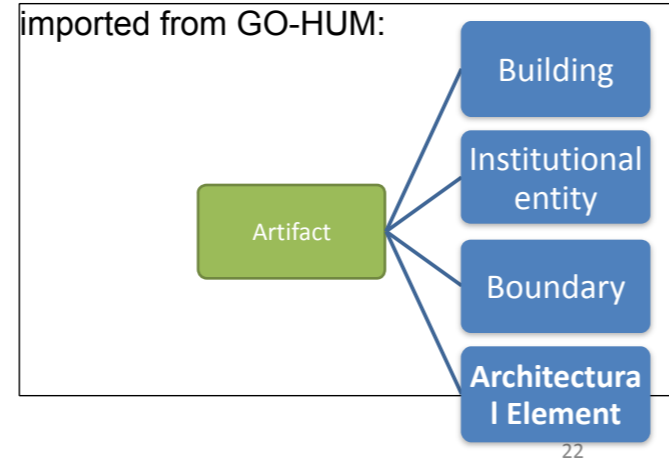
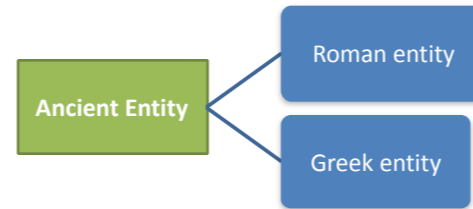
# GO-FAR

describe all Geographic Features produced  
by humans during ancient times,  
especially by ancient Romans

## **Imported Ontologies**

GO-TOP, Geosparql

# GO-FAR (selected classes)



# Mapping with External Ontologies

Geo (Insee)

DBpedia

erlangen-crm

<http://purl.org/ontology/places#>

Geonames

Schema.org

DUL

linkedgeodata

place-types  
(Pleiades)

## growing Geolat: more ontologies / more literatures

the keywords are *extending*:

extending the ontology-based annotation of texts from the Latin one to other literatures;

and to *expanding*:

expanding the ontology from the domain of the geography to the domain of the persons and their roles; and to the domain of the events and times



## THE link...

...to the GO! ontology:

<https://www.dropbox.com/sh/j2uaq60alocll97/AAAWfcyybPAL7uNJLaY-SOxea?dl=0>

and my email address [maurizio.lana@uniupo.it](mailto:maurizio.lana@uniupo.it)

if you like to keep in touch or have questions more suited for the computer scientist and ontologists of our group

thank you