

# The Value of Collections for Researchers in the Humanities

Jürgen Renn, Max Planck Institute for History of Science, Berlin

with contributions by Manfred Laubichler, Ulrich Pöschl, Matteo Valleriani, Dirk Wintergrün

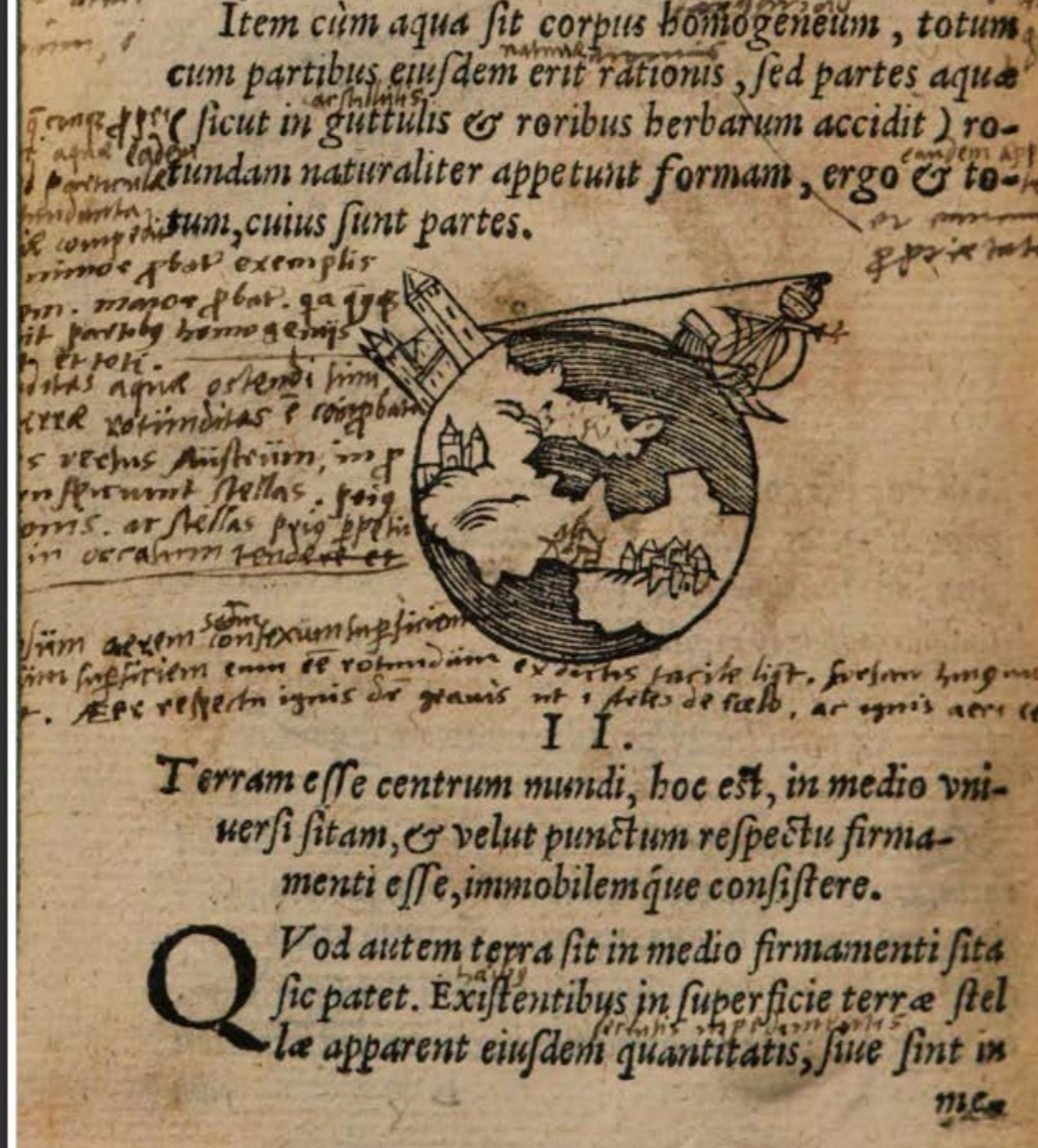


17th Fiesole Collection Development Retreat  
Berlin, 6 May 2015





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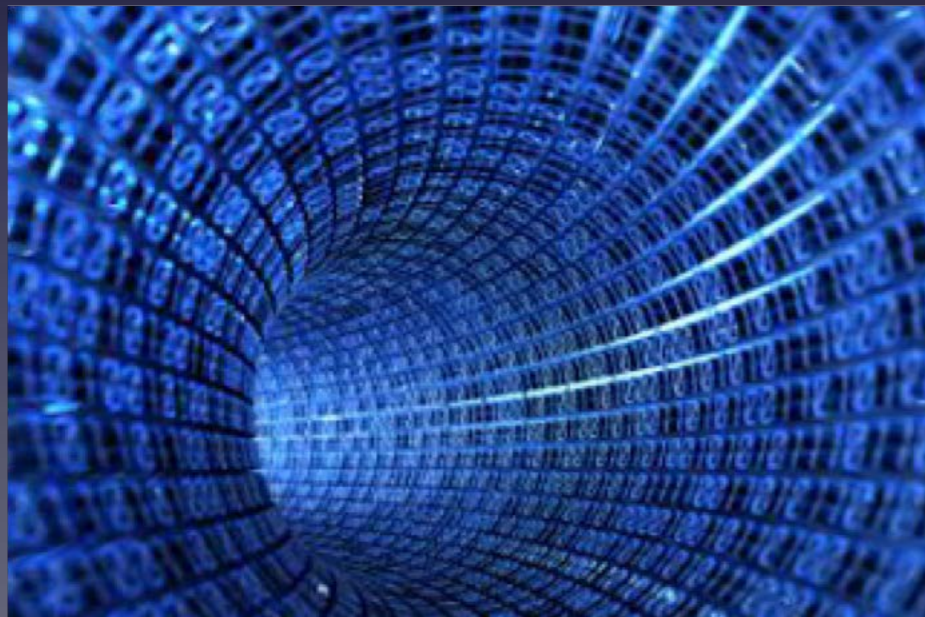
Manuscripts



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Objects

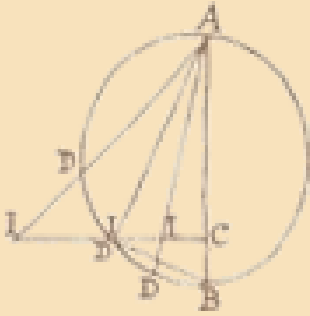




Archives

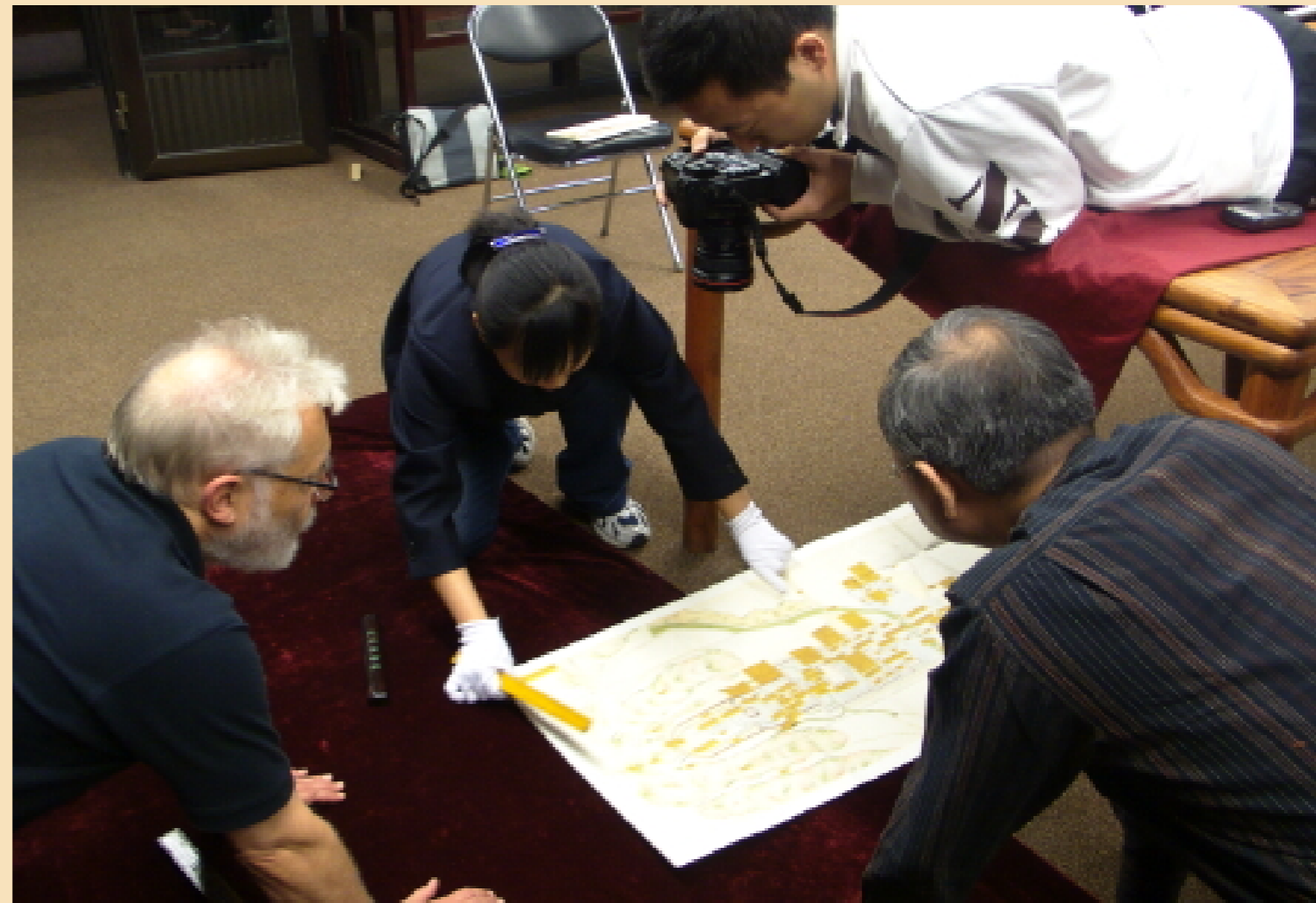
Big Data

## Acquisition of Sources: Images



- Sources in digital form as prerequisite
- Open availability and access
- Investment in digitization
- Acquisition strategies
  - Digitizing rare books and archival collections of MPIWG
  - Digitization campaigns on remote sites

Digitization of architectural drawings at the Archives of the Palace Museum, Beijing







We gratefully acknowledge support from the Simons Foundation and member institutions

# Quantum Physics

## Authors and titles for Apr 2015

[ total of 474 entries: 1-25 | 26-50 | 51-75 | 76-100 | ... | 451-474 ]  
[ showing 25 entries per page: fewer | more | all ]

- [1] [arXiv:1504.00019](#) [pdf, other]  
**Modified and controllable dispersion interaction in a 1D waveguide geometry**  
[Harald R. Haakh](#), [Stefan Scheel](#)  
Comments: 9 pages, 6 figures  
Subjects: [Quantum Physics \(quant-ph\)](#)
  
- [2] [arXiv:1504.00020](#) [pdf, other]  
**What is the probability of a thermodynamical transition?**  
[Álvaro M. Alhambra](#), [Jonathan Oppenheim](#), [Christopher Perry](#)  
Comments: 12+4 pages, 7+1 figures V2: Emphasized that X can be any state and that the achievability of our result in the full thermodynamics case, holds only when the target state is block-diagonal in the energy eigenbasis  
Subjects: [Quantum Physics \(quant-ph\)](#); [Statistical Mechanics \(cond-mat.stat-mech\)](#)
  
- [3] [arXiv:1504.00030](#) [pdf, ps, other]  
**Solution of the Schrödinger equation making use of time-dependent constants of motion**  
[G.F. Torres del Castillo](#)  
Subjects: [Quantum Physics \(quant-ph\)](#)
  
- [4] [arXiv:1504.00031](#) [pdf, ps, other]  
**The Linear Zeeman effect in the molecular positronium Ps2 (dipositronium)**  
[Daniel L. Miller](#)  
Comments: Submitted to Phys. Rev. A  
Subjects: [Quantum Physics \(quant-ph\)](#); [Atomic Physics \(physics.atom-ph\)](#)
  
- [5] [arXiv:1504.00035](#) [pdf, other]  
**Scalable Digital Hardware for a Trapped Ion Quantum Computer**  
[Emily Mount](#), [Daniel Gaultney](#), [Geert Vrijsen](#), [Michael Adams](#), [So-Young Baek](#), [Kai Hudek](#), [Louis Isabella](#), [Stephen Crain](#), [Andre van Rybach](#), [Peter Maunz](#), [Jungsang Kim](#)  
Subjects: [Quantum Physics \(quant-ph\)](#); [Atomic Physics \(physics.atom-ph\)](#); [Optics \(physics.optics\)](#)
  
- [6] [arXiv:1504.00042](#) [pdf, other]  
**Fermionic orbital optimisation in tensor network states**  
[C. Krumnow](#), [Ö. Legeza](#), [J. Eisert](#)  
Comments: 8 pages, 5 figures, tiny changes  
Subjects: [Quantum Physics \(quant-ph\)](#); [Strongly Correlated Electrons \(cond-mat.str-el\)](#); [Chemical Physics \(physics.chem-ph\)](#)
  
- [7] [arXiv:1504.00115](#) [pdf, other]  
**New shape resonances in one-dimension**  
[Zafar Ahmed](#), [Shashin Pavaskar](#), [Lakshmi Prakash](#)



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- Transfer of Knowledge in Systems
- Institutions and the Global Transfer of Knowledge
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- 3rd Conference on the History of Quantum Physics (HQ 3)
- Performing Voices
- What (Good) is Historical Epistemology?
- 1st Conference on the History of Quantum Physics (HQ 1)
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### Discussion

## Global Transfer of Knowledge and the Globalization of Knowledge

April 23, 2012



Max-Planck-Institute for the History of Science in Cooperation with the Forum Transregionale Studien

The Globalization of Knowledge has a long history. In four sessions of discussions with scholars from different disciplines it will be asked how transfer was achieved, which kinds of media were involved and in which spaces such processes took place.

### Discussion



#### Translation as Global Transfer of Knowledge

Participants: - Yehuda Elkana, Berlin - Mark Geller, Berlin - Richard Rottenburg, Halle-Wittenberg - Michael Allan, Eugene/Berlin → [More](#)

### Discussion



#### Individuals as Actors of Transfer of Knowledge

Participants: - Andreas Eckert (Berlin) - Matthias Schemmel (Berlin) - Sonja Brentjes (Berlin) - Islam Dayeh (Berlin) → [More](#)

### Discussion



#### Transfer of Knowledge in Systems

Participants: - Gerd Graßhoff, Berlin - Jens Braavig, Oslo - Susanne Klengel, Free University Berlin - Roger D. Woodard, University of Buffalo → [More](#)

### Discussion



#### Institutions and the Global Transfer of Knowledge

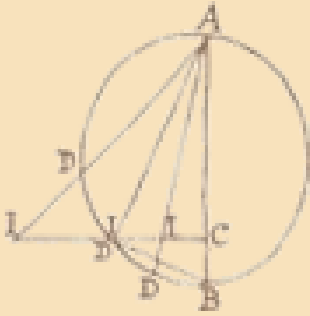
Participants: - Matthias Middell, Leipzig - Dhruv Raina, New Delhi/ Berlin - Viola König, Berlin - Pietro Daniel Omodeo, Berlin





The disappearance of  
print journals





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Ausgewählte Vorträge der 126. Versammlung der Gesellschaft Deutscher Naturforscher...  
Jürgen Renn, Robert Schlägl, Hans-Peter...

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**The Globalization of Knowledge in History**  
Jürgen Renn (ed.)

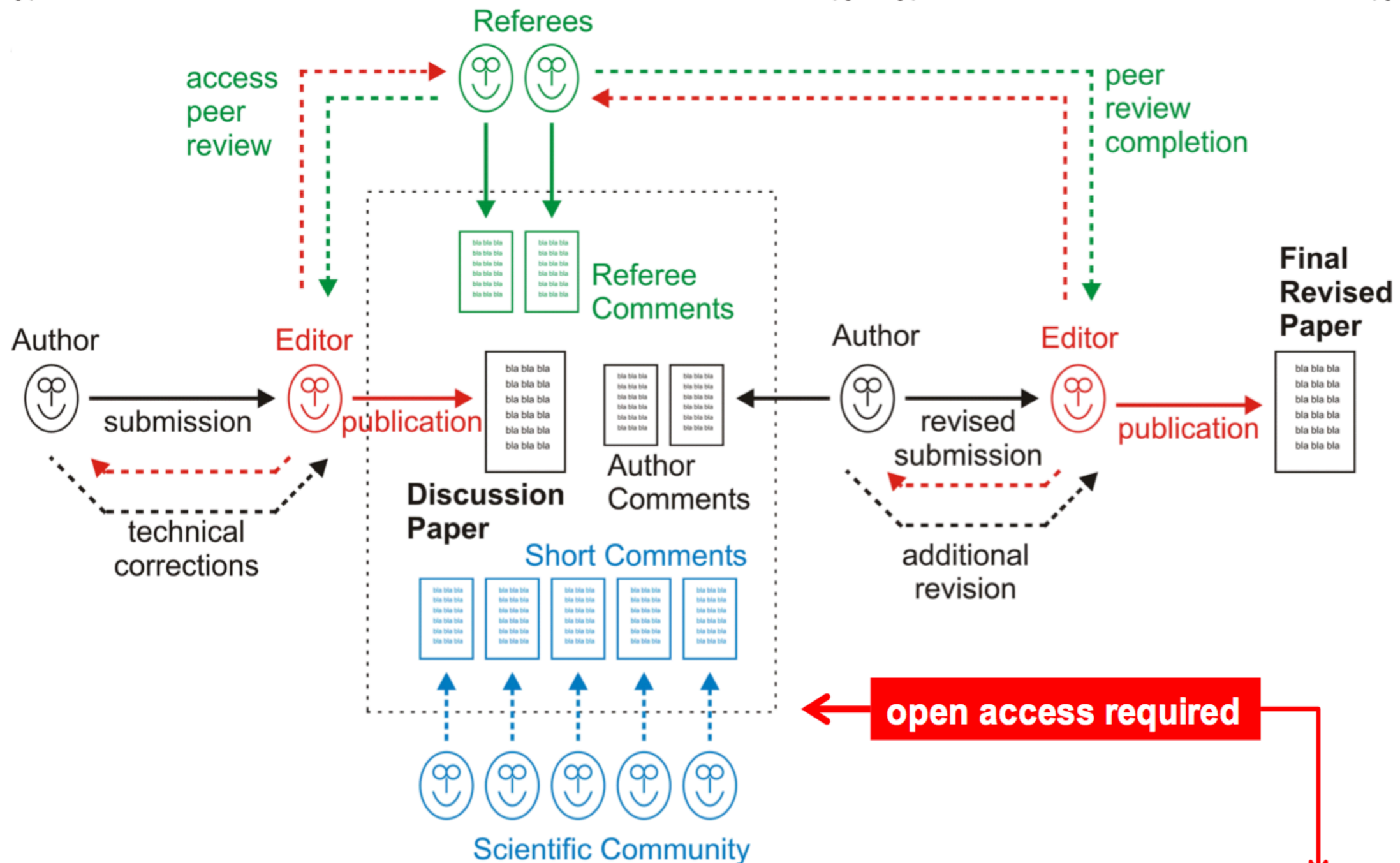
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# Multi-Stage Open Peer Review – Interactive OA Publishing

## Discussion Forum (Stage 1)

## Journal (Stage 2)



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**2. Public peer review & interactive discussion**  
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**3. Peer review completion**  
mid term

**4. Post-publication review & evaluation**  
long-term, **ALM**

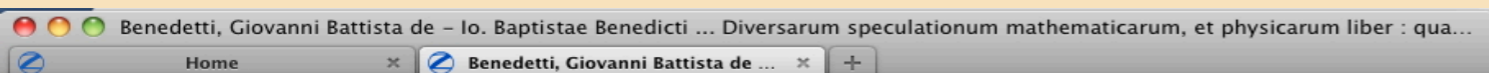
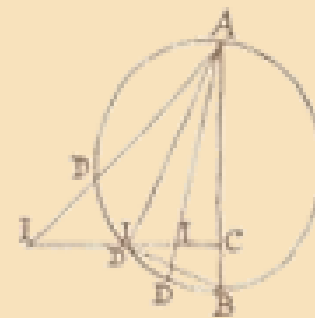






# Digitization of Historical Source Texts

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**ECHO** *Benedetti, Giovanni Battista de, Io. Baptistae Benedicti ... Diversarum speculationum mathematicarum, et physicarum liber : quarum seriem sequens pagina indicabit ; [annotated and critiqued by Guidobaldo Del Monte], 1585*

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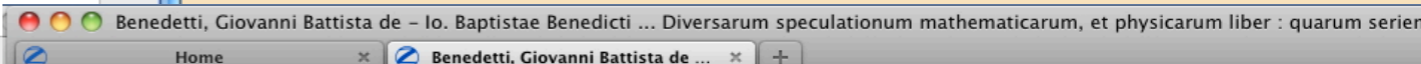
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144 IO. BAPT. BENED.  
*Quemadmodum ex supradictis causis omnes staterarum & uectium causae dependeant.*  
CAP. IIII.

VI s brachij longioris alicuius staterae, aut vectis, maior breuioris, ab ijs, quae in superioribus capitibus diximus, idest quod nitatur pendeatue magis aut minus à centro pondus in extremitate brachij maioris positum, oboritur. Quamobrem illud à nobis primò est cognoscendum, stateras, aut vectes, puras mathematicas lineas non esse, sed naturales, hincque existere corpora cum materia coniuncta. Nunc igitur imaginemur .n.s. eam superficiem esse, quae secundum longitudinem axem staterae scindit, & supponamus ipsius centrum esse primum in .i. & maius brachium esse .i. u. minus autem .i. n. & lineam verticalem .i. o. quae tanta sit, quanta est spissitudo, aut crassities ipsius staterae à superiori latere ad inferius, ad faciliorem intelligentiam, supponendo .n.s. parallelogrammum. Positis igitur duobus ponderibus aequalibus in extremitatibus brachiorum, experientia innotescit, quod pondus ad .u.s. appensum, viol entiam faciet ponderi appenso ad .n.x. sed nos volumus inuestigare causam huius effectus, quae à nemine vnquam literarum monumentis, quod sciam, consignata fuit. Iam diximus stateram, aut vectem materialem esse & .n.s. eius superficiem mediam, supponendo .i. esse centrum quo nititur dicta statera aut vectis; Cum hoc ergo ita se habeat, sint .u.s. et .n.x. lineae inclinationum ponderum, & imaginemur, quod dicta pondera pendeant à punctis .u. et .e. vt reuera pendent, etiam si appensa essent sub .s. et .x. quia punctum .u. & punctum .e. ita coniuncta sunt cum .s. et .x. ut qui vnus trahit alterum quoque trahat. Imaginemur quoque duas lineas .i. u. i. n. et .i. e. quae .i. e. faciat angulum .o. i. e. aequalem angulo .o. i. n. Hinc clarè nobis patebit, si quis ipsius .e. pondus ipsius .u. (quod aequale est ponderi .n.) appenderet, id eandem planè vim haberet, quam pondus ipsius .n. habet, & stateram neque sursum, neque deorsum moueret, quia ambo pondera ad centrum .i. mediantibus lineis .e. i. et .n. i. ex aequo anniterentur, sed dicto pondere posito in .u. linea .u. i. per quam pondus centro annititur, magis horizontalis quam .e. i. fit, & linea .u. s. inclinationis longius distans à centro .i. quam linea .e. t. vnde huiusmodi pondus magis quoque liberum à centro .i. resultat, magisque ponderosum, quam cum erat in .e. ratione eorum, quae primo & secundo capitibus diximus, & ob hanc causam superat pondus positum in .n. Sed si centrum fuerit in .o. imaginabimur duas lineas .o. s. et .o. x. & supponemus quòd pondera posita sint in .s. et .x. vnde existente magis horizontali linea .o. s. quam erit .o. x. & linea .u. s. inclinationis longius distans à centro .o. quam linea .e. t. eius pondus erit quoque

Impressum



**ECHO** *Benedetti, Giovanni Battista de, Io. Baptistae Benedicti ... Diversarum speculationum mathematicarum, et physicarum liber : quarum seriem sequens pagina indicabit ; [annotated and critiqued by Guidobaldo Del Monte], 1585*

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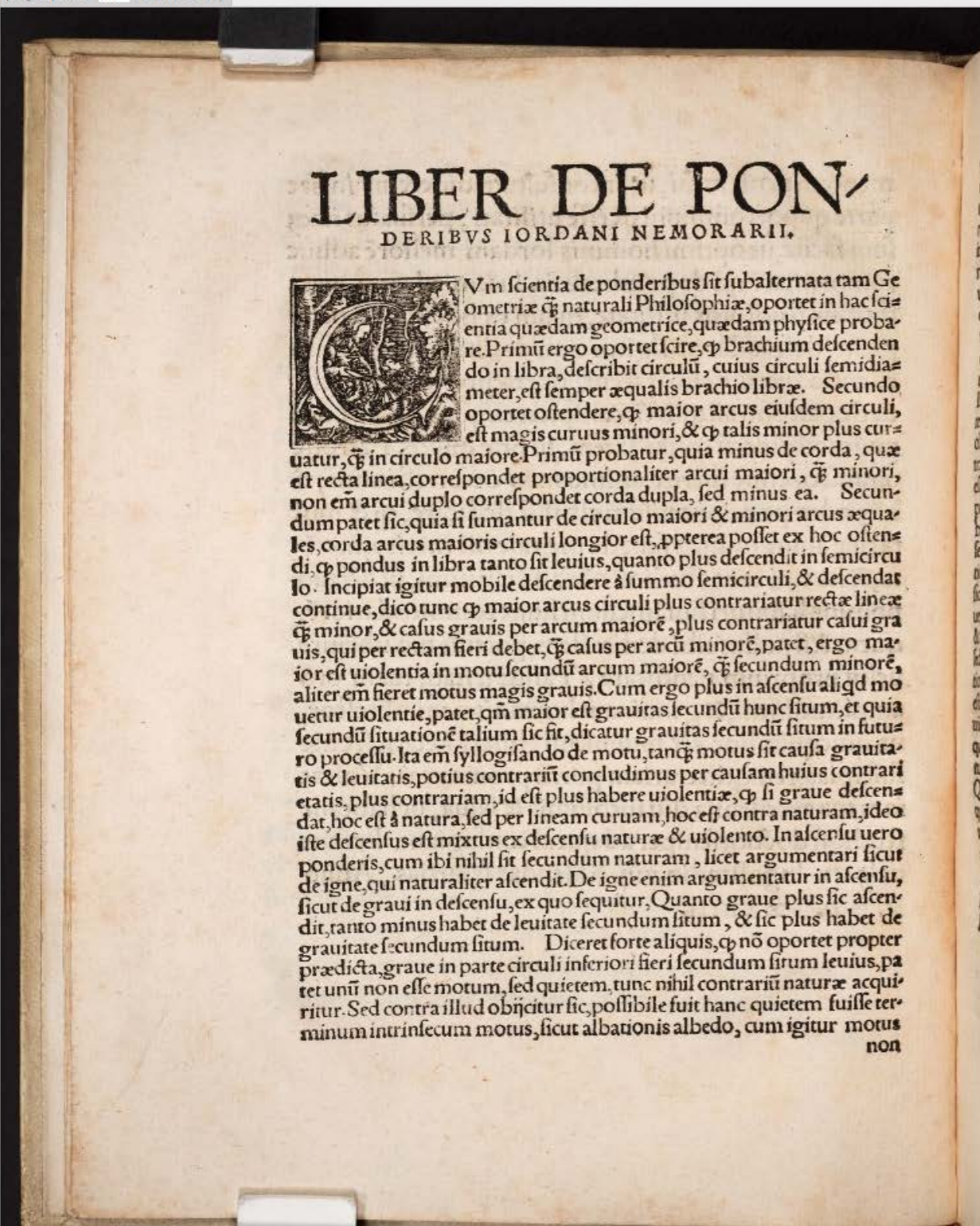
quàm linea .e. t. vnde huiusmodi pondus magis quoque liberum à centro .i. resultat, magisque ponderosum, quae cum erat in .e. ratione eorum, quae primo & secundo capitibus diximus, & ob hanc causam superat pondus positum in .e. Sed si centrum fuerit .in .o. imaginabimur duas lineas .o. s. et .o. x. & supponemus quòd pondera posita sint in .s. et .x. vnde existente magis horizontali linea .o. s. quae ergo .o. x. & linea .u. s. inclinationis longius distans à centro .o. quam linea .e. t. eius pondus ergo quoque

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<s id="id.0.0.02.00">LIBER DE PON

<lb/>

DERIBVS IORDANI NEMORARII.

<lb/>

</s>

<s id="id.0.0.02.01">Cum scientia de ponderibus sit subalternata tam Ge

<lb/>

ometriæ quam philosophiæ, oportet in hac sci

<lb/>

entia quædam geometricæ, quædam phyfice proba

<lb/>

re.</s>

<s id="id.0.0.02.02">Primi ergo oportet scire, quod brachium descenden

<lb/>

do in libra, describit

<expand abbr="circulū">circulū</expand>

, cuius circuli semidia

<lb/>

meter, est semper æqualis brachio libræ.</s>

<s id="id.0.0.02.03">Secundo

<lb/>

oportet ostendere, quod maior arcus eiusdem circuli,

<lb/>

est magis curvus minore, et quod talis minor plus cur

<lb/>

vatur, quam in circulo maiore.</s>

<s id="id.0.0.02.04">Primum probatur, quia minus de corda, quæ

<lb/>

est recta linea, correspondet proportionaliter arcui maiori, quam minori,

<lb/>

non enim arcui duplo correspondet corda dupla, sed minus ea.</s>

<s id="id.0.0.02.05">Secun

<lb/>

dum patet sic, quia si sumantur de circulo maiori et minori arcus æqua

<lb/>

les, corda arcus maioris circuli longior est, propterea posset ex hoc osten

<lb/>

di, quod pondus in libra tanto sit leuius, quanto plus descendit in semicirculo.</s>

<lb/>

<s id="id.0.0.03.02">Incipiat igitur mobile descendere a summo semicirculi,

<lb/>

continue, dico tunc quod maior arcus circuli plus contrariatur rectæ lineæ

<lb/>

quam minor, et casus gravis per arcum maiorem, plus contrariatur casui gra

<lb/>

vis, qui per rectam fieri debet, quam casus per arcum minorem, patet, ergo m

<lb/>

ior est violentia in motu secundum arcum maiorem, quam secundum minorem,

<lb/>

aliter enim non fieret motus magis gravis.</s>





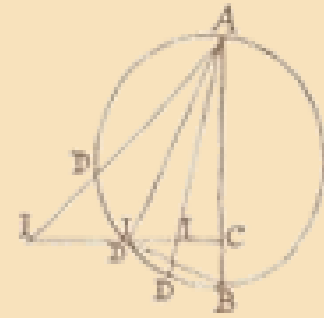
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### Collection of Historical Sources on Mechanics

- 266 resource(s) found.
- 
- » *Agricola, Georg, Berckwerck Buch: darinn nicht allain alle Empter, Instrument, Gezeug und alles so zu diesem Handel gehörig mit figuren vorgebildet und klärlich beschriben ...*, 1580
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:A9WQ5S14>
- 
- » *Agricola, Georg, De mensuris et ponderibus Romanorum atque Graecorum, lib. V; De externis mensuris et ponderibus, lib. II; Ad ea, quae Andreas Alciatus denuo disputavit de mensuris et ponderibus, lib. I; De mensuris, quibus interualla metimur, lib. I; De restituendis ponderibus atque mensuris, lib. I; De precio metallorum et monetis, lib. III*, 1550
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:8SFH4HDA>
- 
- » *Agricola, Georg, De re metallica Libri XII: quibus officia, instrumenta, machinae, ac omnia denique ad Metallicam spectantia, non modò luculentissimè describuntur, sed et per effigies, suis locis insertas, adiunctis Latinis, Germanicisque appellationibus ita ob oculus ponuntur, ... Eiusdem De Animantibus subterraneis liber, ab autore recognitus: cum indicibus diversis ...*, 1561
- 2nd Latin edition., corr. reprint of the 1st edition; the most famous book on mining, a milestone of technology, the most impressive illustrated book of the 16th century.
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:UE017T29>
- 
- » *Agricola, Georg, Georgii Agricolae Bermannvs, sive, De re metallica*, 1530
- ▶ Source Information
- 
- » *Agricola, Georg, Georgii Agricolae medici Libri quinque De mensuris et ponderibus: in quibus pleraque a Budaeo et Portio parum animadversa diligenter excutiuntur*, 1535
- ▶ Source Information
- 
- » *Alberti, Giuseppe Antonio, Istruzioni pratiche per l'ingegnere civile: o sia perito agrimensore, e perito d'acque*, 1782
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:ZMVEPBWF>
- 
- » *Albrecht, Andreas, Eygendliche Beschreibung und Abriss eines sonderbaren nutzlich und nohtwendigen mechanischen Instruments, so auff ein Schreiftafel gerichtet, welches zum Feldmessen, zum Vestung aussstecken, zum hoeh und tiefen messen, zum Land und Wasser abwegen, dessgleichen zur Perspectiv gar fueglich zu gebrauchen ist*, 1625
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:2MGKFMAG>
- 
- » *Alembert, Jean Le Rond d', Traité de dynamique : dans lequel les loix de l' équilibre & du mouvement des corps sont réduites au plus petit nombre possible, & démontrées d' une maniere nouvelle, & où l' on donne un principe général pour trouver le mouvement de plusieurs corps qui agissent les uns sur les autres d' une maniere quelconque*, 1758
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:M9956NT6>
- 
- » *Algarotti, Francesco, Opere varie del Conte Francesco Algarotti, vol. 1: Dialoghi sopra l' ottica neutoniana. Vita di Stefano Benedetto Pallavicini. Lettere varie [u.a.]*, 1757
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:T463W1RX>
- 
- » *Algarotti, Francesco, Opere varie del Conte Francesco Algarotti; vol. 2: Saggio sopra la necessita di scrivere nella propria lingua. Saggio sopra la durata de' Regni de' Re di Roma; ... Saggio spr la Artiglierie; Saggio sopra la scienza militare del Segretario Fiorentino; ... Saggio sopra l' architettura [u.a.]*, 1757
- ▶ Source Information
  - ▶ Permanent URI: <http://echo.mpiwg-berlin.mpg.de/MPIWG:RZTXFT96>
- 
- » *Altmütter, Georg, Beschreibung der Werkzeug-Sammlung des k. k. polytechnischen Institutes: nebst einem vollständigen Verzeichnisse der in derselben enthaltenen Stücke; für Gewerbsleute und Liebhaber der mechanischen Künste, vorzüglich aber zum Gebrauche seiner Vorlesungen*, 1825



# “Database Machine Drawings”



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**THE ARCHIMEDES PROJECT** **DATABASE MACHINE DRAWINGS**

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**viba459** **Barbaro, Daniele** **Vitruvius: I dieci libri dell' architettura** **1567**

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<b>Provenance of Image:</b>		Edition of Classical Sources	
<b>Text:</b>		Text with Image	
<b>Content of Text:</b>		Explanation of Function; Additional Reasoning on Mechanics; Reduction of Friction; Materials	
<b>Commentary :</b>		Text refers to Cardano's „de subtilitate“ Transcription from the Digital Research Library of the Archimedes Project ( <a href="http://zope.mpiwg-berlin.mpg.de/archimedes/archimedes_templates">http://zope.mpiwg-berlin.mpg.de/archimedes/archimedes_templates</a> ).	

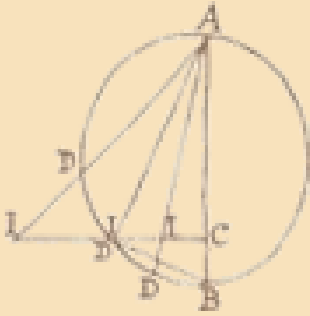
>> Click to enlarge picture

**Text:**  
 [Legend of the image:] F — la Taglia di sopra, & il luogo doue ella si lega. L — la Taglia di sotto detta Artemone, et Pastecca, & in Creco Epagon. + — il Peso. A — la Leua, che s'appunta

>> Click to read text

<http://dmd.mpiwg-berlin.mpg.de/>





# Open Access to Primary Sources, Scholarly Data and Tools

- Online availability of sources, scholarly metadata and research results
- Enabling collaborative work
- Immediate verification of scholarly interpretation
- Creating a new situation for peer reviewing
- Preservation of cultural heritage

Open access journal of CDLI with hyperlinks to sources

The image displays three browser screenshots illustrating the CDLI (Cuneiform Digital Library Initiative) website interface. The first screenshot shows the journal homepage for CDLIJ 2002/1, no. 1, featuring navigation links and a search bar. The second screenshot shows the article page for record P212341, displaying metadata such as the primary publication, collection, museum number, and a list of tablet images. The third screenshot shows a close-up of a tablet image with a red circle highlighting a specific area of text, which is linked to the article's content.

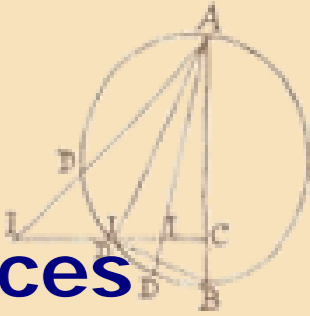
**CDLIJ 2002/1, no. 1**  
Record 1 of 1 records found

Primary Publication: CDLIJ 2002/1, no. 1, Englund, Robert K., 2002  
Collection: California Museum of Ancient Art, Los Angeles, California, USA  
Museum no.: CMAA 002-C0005  
CDLI no.: P212341  
Provenience: Drehem ?  
Genre: Administrative  
Period: Ur III  
Measurements (mm): 30x27x13

View full catalogue entry

Obv.  
1. 4(disz) gu4 4(disz) ab2  
2. e2 muhaldim  
3. u4 2(u) 5(disz)-kam  
4. zi-ga  
5. ur#-{d}en-lil2-la2  
Rev.  
n lines broken  
blank  
1. mu us2-sa ki-masz{ki} ba-hul





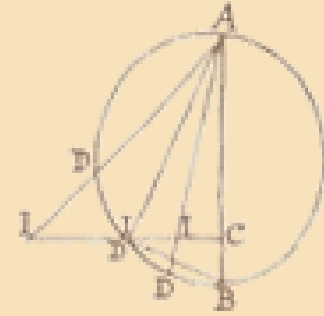
# Research at MPI WG based on digitized primary sources

- Internet as a medium of research, for scientific communication and publication
- extension of empirical basis
- open access
- interoperability
- scholarly infrastructures for the humanities
- development of specific tool

Cuneiform Digital Library Initiative (CDLI):  
<<http://cdli.ucla.edu>>

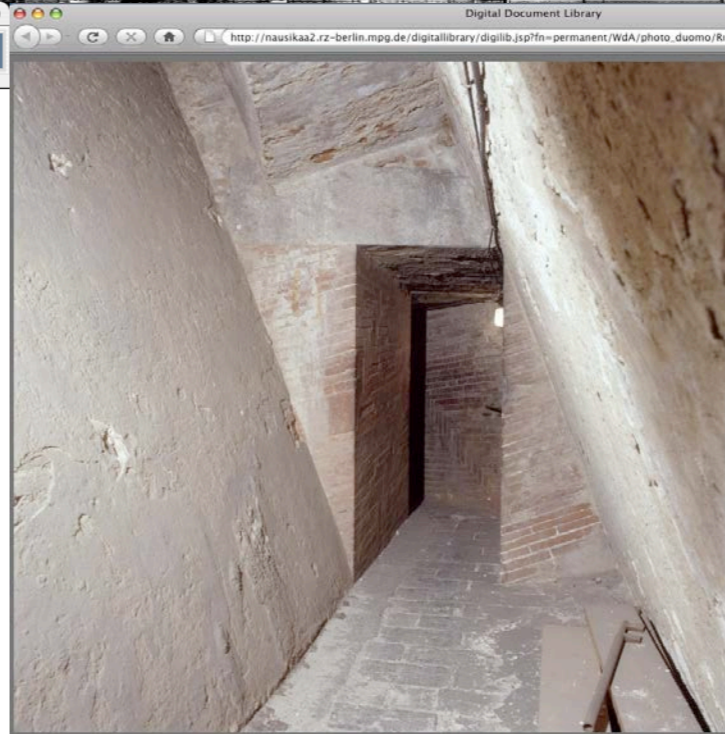
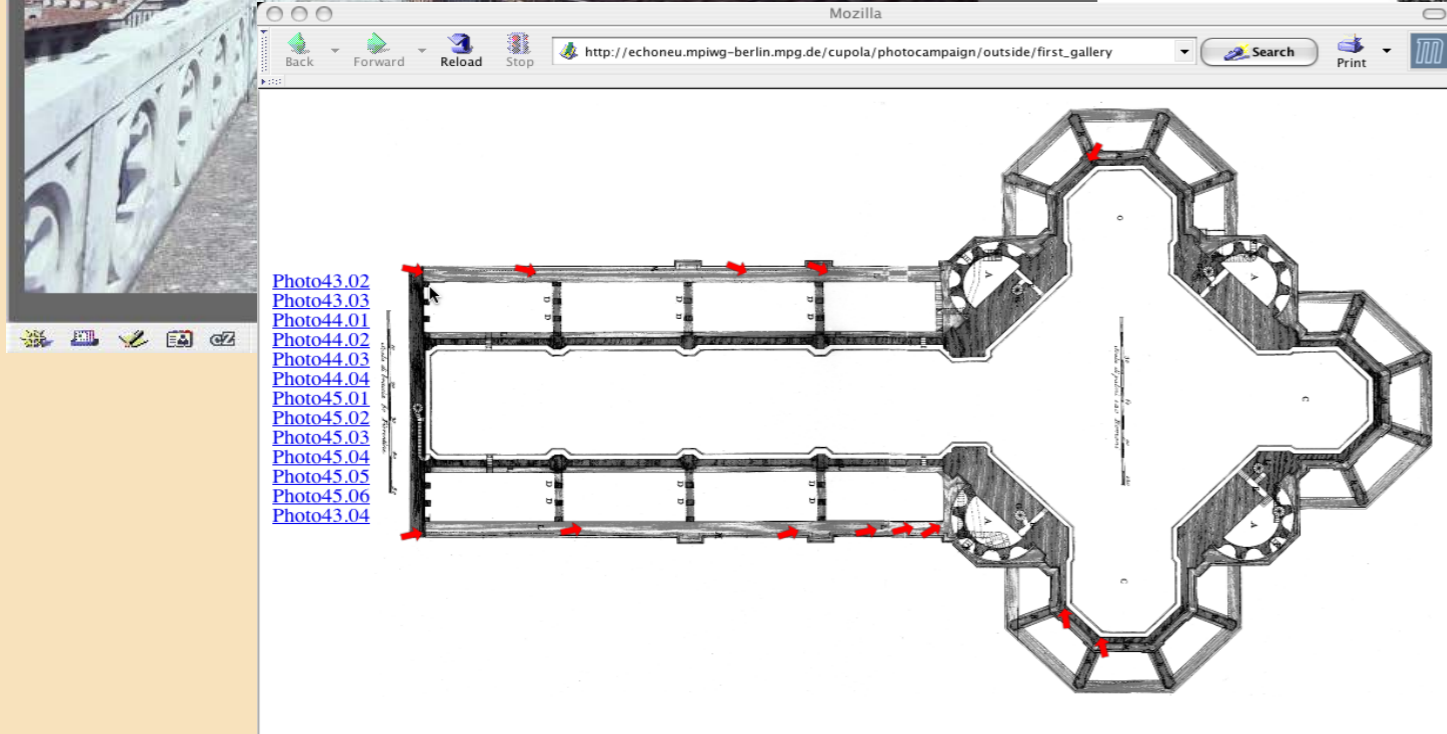


# "Florentine Cathedral - Construction Details"



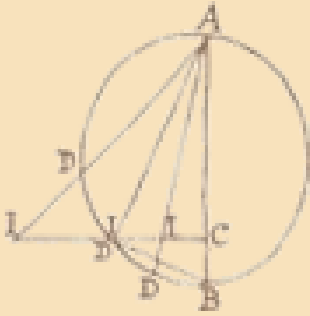
Ground plans:

- [Level of the base of the lantern](#)
- [Level of the Gabbia dei Grilli](#)
- [Level of the theridge of the main building](#)
- [Level of the first exterior gallery](#)

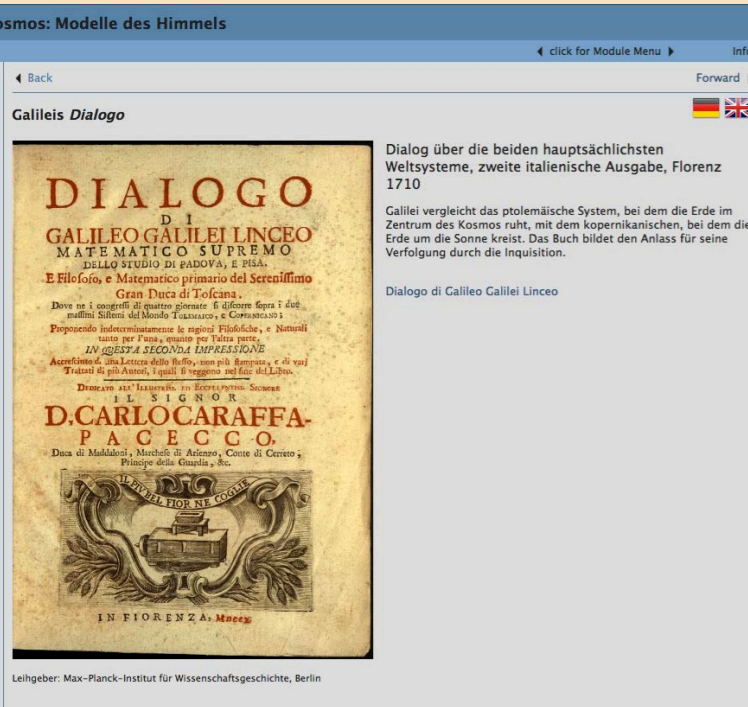


<http://echo.mpiwg-berlin.mpg.de/content/florentinecathedral>

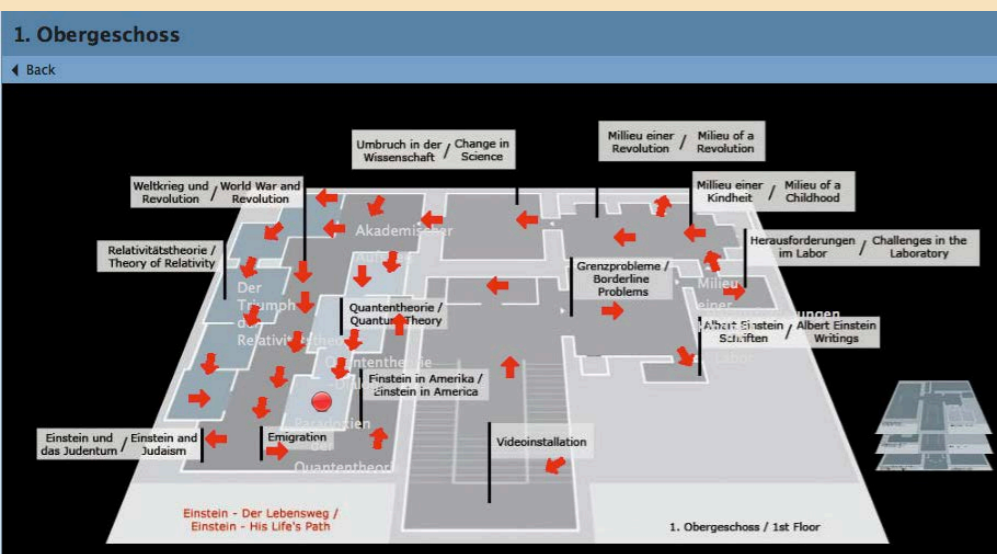




# Creation of Virtual Exhibitions



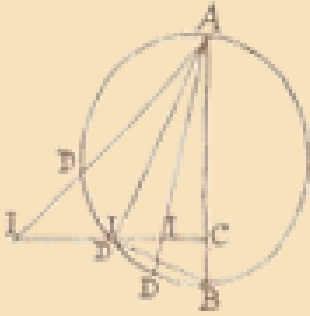
- virtual exhibition as documentation format of temporary physical exhibitions
- new publication format: "exhibition without walls"



Virtual exhibition „Albert Einstein – Engineer of the Universe“, 2005  
 <[einstein-virtuell.mpiwg-berlin.mpg.de](http://einstein-virtuell.mpiwg-berlin.mpg.de)>



# Creation of Virtual Knowledge Spaces: The Pratolino Garden Project



La Villa e le Grotte  
http://pratolino.mpiwg-berlin.mpg.de/home/ancient\_route/5\_007

Villa and Grottos

Fontana di Giove  
Spugna Ovest  
Spugna Est  
Gigante  
Fonte della Maschera  
Grotta di Cupido  
Villa e Grotto  
Viale delle Fontane  
Fonte del Giardino dei Frutti  
Casino dei Marmotti  
Fonte della Lavandaia  
Fontana della Rovere  
Monte Parnaso

Villa's Grotto

Fountain of the Mask  
Aviary

Pneumatic machine reproducing the cuckoo

Translation:  
At the top there is a container A full of water, middle tap B, so that much nor too little water flows into the wheel and into the pipes (from which the air pipes)

Transcription:  
X — steht ein Guckguckheglauch; oberirdener Scherb A vor ein Thailhanen B, d. oder winig Wasser in Casten C (daraus Pfeifen geht) kom

Database Machine Draw

Cod. hist. Q. 148, Württembergische Landesbibliothek, Stuttgart. Transcription: Jonkanski Dirk, Die Italienreise Schickhardts, in: Neue Forschungen zu Heinrich Schickhardt, ed. Robert Kretschmar, Stuttgart, pp. 79-102

Hidden passage for hydraulic practitioners

Passage to connect the machines room of the Grotto of Pan to the Grotto of the Fame, and a staircase connected to the six grottos of the Villa placed at the upper level.

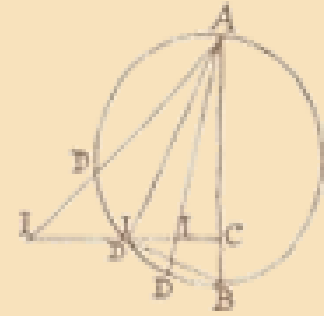
In the garden of Pratolino the hydraulic system and the pneumatic devices were not running constantly. A great number of keys and valves were placed along underground passages through which hydraulic practitioners moved to operate them. When a visitor moved within the garden, hidden practitioners traced their movements underground. The concept of the garden is such that the places and the times of a visit had to be very well coordinated in advance.  
Photo: Jochen Büttner (October 2007). Max Planck Institute for the History of Science, Berlin

http://pratolino.mpiwg-berlin.mpg.de

- Creation of “virtual knowledge spaces”
  - several types of semantic access
  - hierarchical structured information level
  - sorting, classifying and linking of sources and repositories
  - integration of webservices (e.g. Google Earth)
- relations become new scholarly metadata



# Visualization of Historical Data



**MPIWG MPDL** Song Yingxing, *Tian gong Kai wu*, 1959 (Facsimile of the "tuben" edition, printed 1637 in Nanchang)

pages 38 of 461 Image Text

十三b

麥

凡麥有數種。小麥曰來。麥之長也。大麥曰牟，曰臠。雜麥曰雀，曰薺。皆以播同時，花形相似，粉食同功而得麥名也。四海之內，燕，秦，晉，豫，齊魯諸道。黍民粒食。小麥居半。而黍，稷，稻，梁僅居半。西極川，雲。東至閩，浙。捻頭，環餅，饅道，湯料之需。而糶不及焉。種余麥者五十分之一。閩閩作苦以充朝膳。而貴介不與焉。廣麥獨產陝西。一名青稞。即大麥。隨土而變。而皮成青黑色者。秦人

Current User: rieger

Main Function: Data Entry, Search and Mapping

Search in: User Tables, China Historical GIS, MPDL

Selected Database Directory is: "User Tables"

language, teachers, siyuan, lifangcarvers, metadata, mingmanufactures, mingside, ministry\_of\_work, ministry\_of\_work\_nanjing, newtest, objekt, objektmedien, silk, sometable, song\_yingxing, test, test1

Map of selected features from user-table "song\_yingxing"

Select layer and time-intervall for Google-Maps

Layer	From	To
Prefecture seat	-9999/12/31	9999/12/31
Province seat	-9999/12/31	9999/12/31
Regime seat	-9999/12/31	9999/12/31
County seat	-9999/12/31	9999/12/31
Prefecture border	-9999/12/31	9999/12/31
Province border	-9999/12/31	9999/12/31
Regime border	-9999/12/31	9999/12/31
Rivers	Length (km) > 500	
Manufactures	-9999/12/31	9999/12/31

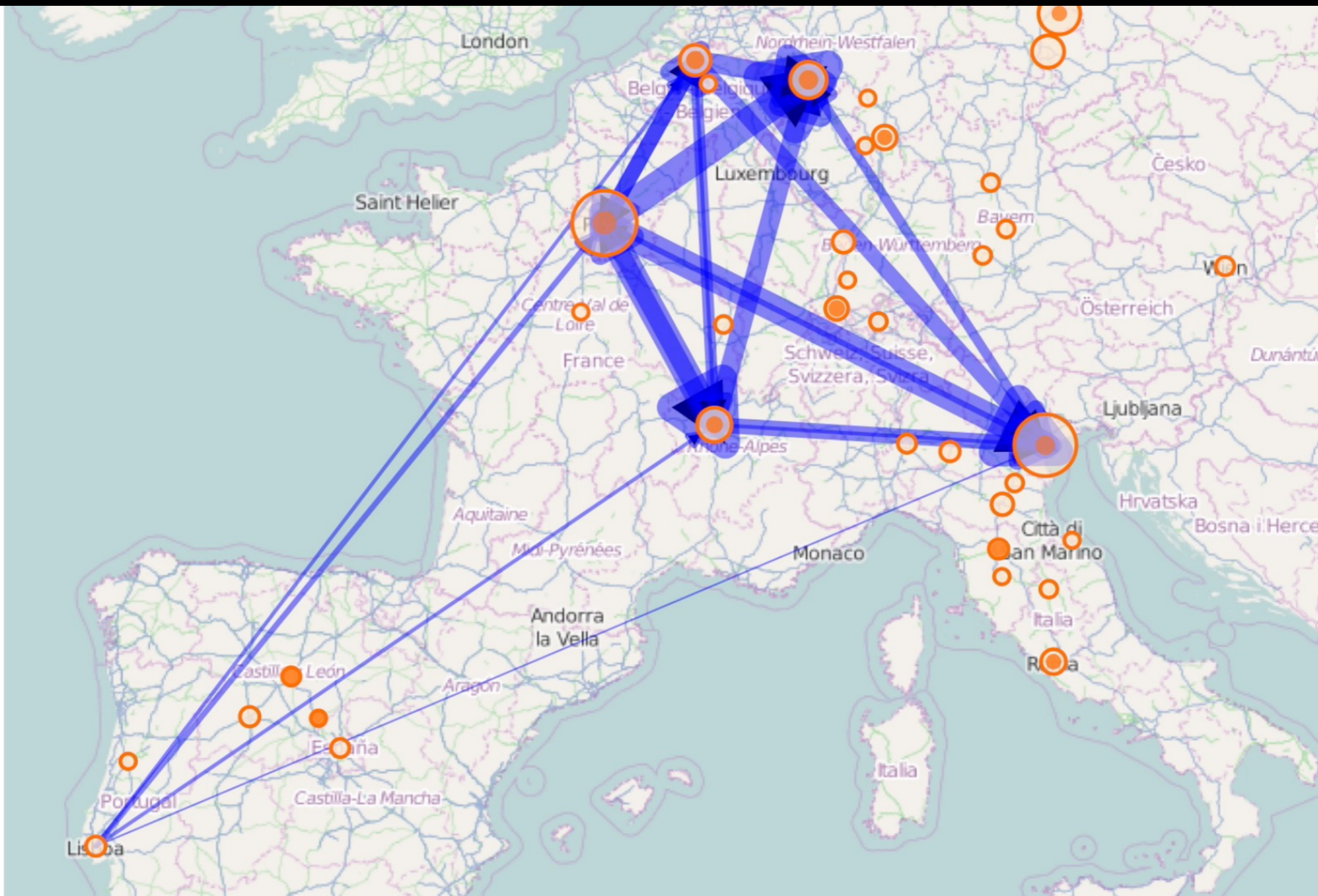
- Historical data referring to time periods, specific dates or geographical locations
  - visualizing locations named in the text, other places of the time
  - prototype system ChinaGIS:
  - based on GoogleMaps combined with specific research database

<http://chinagis.mpiwg-berlin.mpg.de/>









Formation of a Small-World  
Max. Robustness for preservation of knowledge



Control Panel

Network Style Select Dynamic Network

Sheet1 36(0) 84(0)

Results Panel

Network Statistics of Sheet1 (directed)

Simple Parameters In-Degree Distribution Out-Degree Distribution

Clustering coefficient : 0.280  
 Connected components : 1  
 Network diameter : 26  
 Network radius : 1  
 Shortest paths : 620 (49%)  
 Characteristic path length : 8.085  
 Avg. number of neighbors : 4.667

Number of nodes : 36  
 Network density : 0.0  
 Isolated nodes : 0  
 Number of self-loops : 0  
 Multi-edge node pairs : 0  
 Analysis time (sec) : 0.032

Save Statistics Visualize Parameters Close Tab

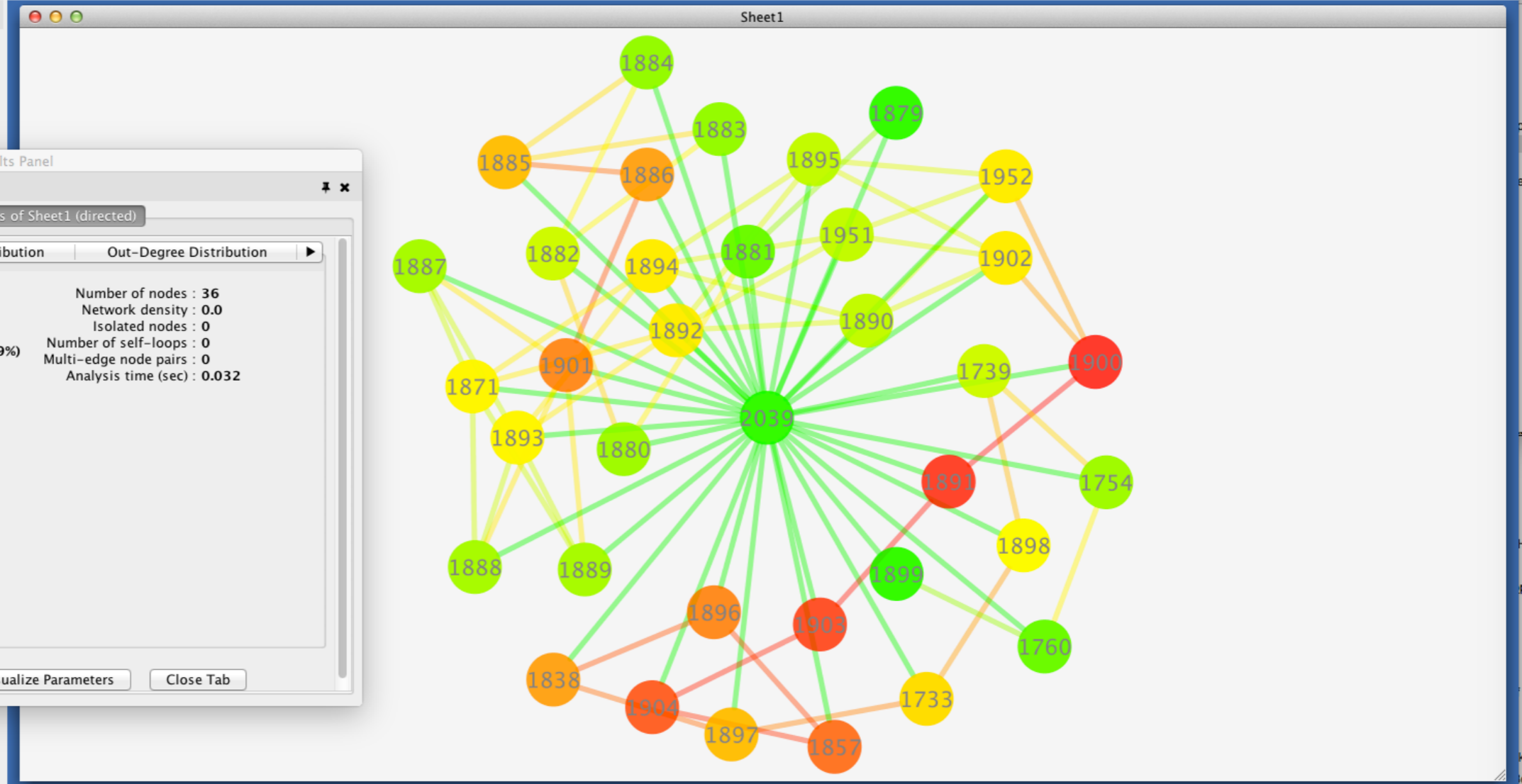


Table Panel

shared...	name	Averag...	Cluster...	Closen...	IsSingl...	Partne...	SelfLoo...	Eccent...	Stress	EdgeC...	Indegree	Outde...	Betwee...	Neighb...
2039	2039	1.0	0.0411...	1.0	false	0	0	1	0	35	0	35	0.0	3.8
1879	1879	12.470...	0.5	0.0801...	false	0	0	26	0	2	1	1	0.0	19.0
1881	1881	11.818...	0.3333...	0.0846...	false	0	0	25	2284	3	2	1	0.0277...	13.333...
1880	1880	11.156...	0.3333...	0.0896...	false	0	0	24	4566	3	2	1	0.0537...	14.0
1882	1882	10.483...	0.25	0.0953...	false	0	0	23	6846	4	2	2	0.0781...	11.0
1884	1884	10.137...	0.3333...	0.0986...	false	0	0	22	4560	3	2	1	0.0487...	14.333...
1883	1883	10.137...	0.3333...	0.0986...	false	0	0	22	4560	3	2	1	0.0487...	14.333...
1885	1885	9.4642...	0.25	0.1056...	false	0	0	21	11390	4	3	1	0.1411...	11.0
1886	1886	8.7777...	0.3333...	0.1139...	false	0	0	20	12518	3	2	1	0.1588...	14.666...

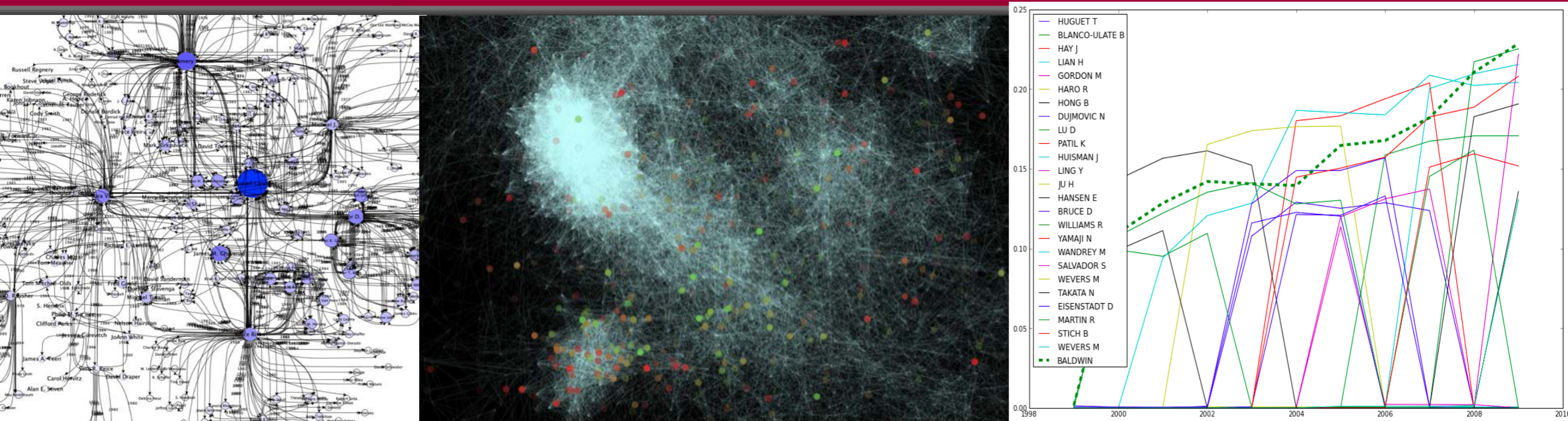
Node Table Edge Table Network Table







# Big Data Computational Analysis of Evolving Knowledge Systems



## Computational History of Science — Analysis and Modeling

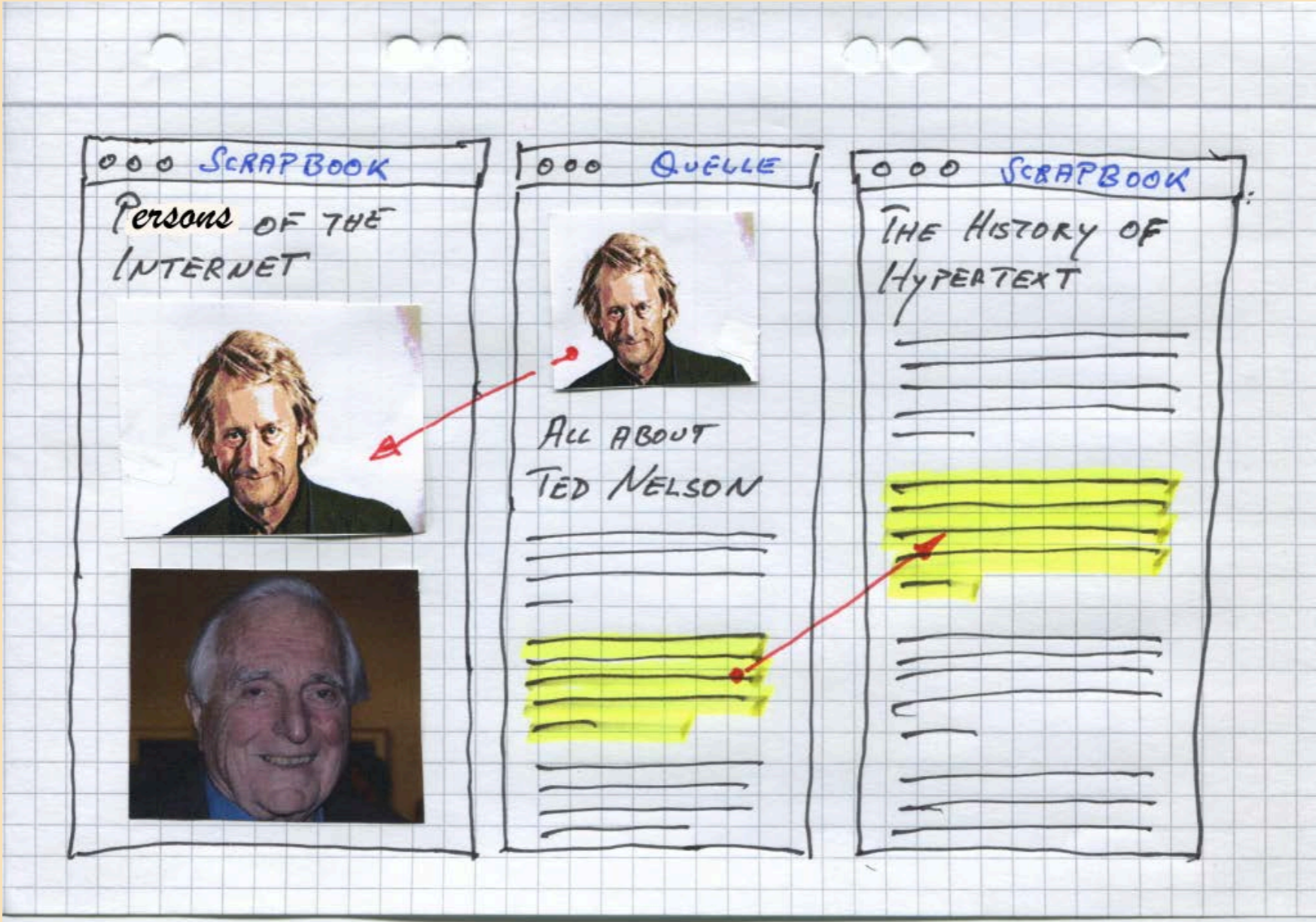
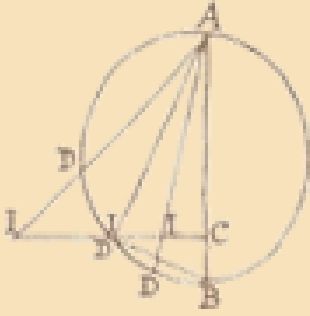
How can we detect/model co-evolutionary dynamics and innovation in the history of science?

How can we detect/model the spread of ideas?

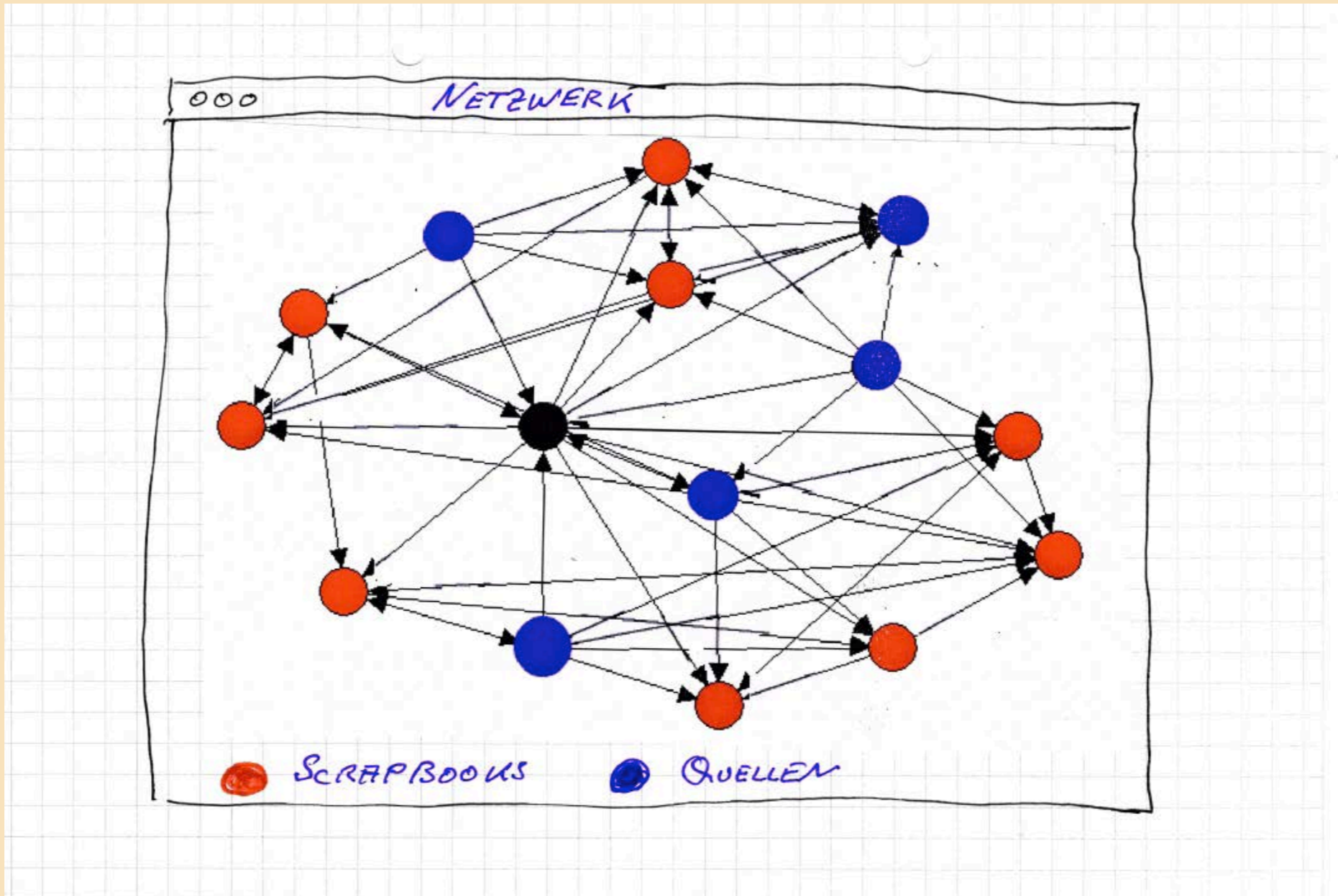
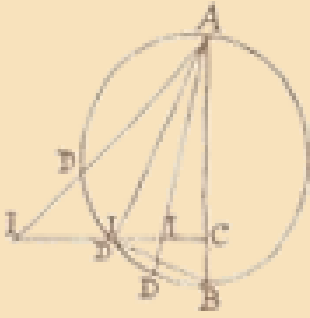
How can we detect/model conceptual shifts in science?



# Digital Scrapbook: Networking sources and interpretations



# Digital Scrapbook: Networking sources and interpretations





# The Value of Collections for Researchers in the Humanities

Jürgen Renn, Max Planck Institute for History of Science, Berlin

with contributions by Manfred Laubichler, Ulrich Pöschl, Matteo Valleriani, Dirk Wintergrün



17th Fiesole Collection Development Retreat  
Berlin, 6 May 2015