

# Translating Data into Images

Dario Rodighiero

École polytechnique fédérale de Lausanne (EPFL)

Massachusetts Institute of Technology (MIT)

Journée d'études : imagination, imaginaire, et images des (big) data

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Transforming, Projecting, Translating



## transform (transformer)

verb [*with object*]

**1** make a marked change in the form, nature, or appearance of: *lasers have transformed cardiac surgery | he wanted to **transform** himself **into** a successful businessman.*

**2** *Mathematics* change (a mathematical entity) by transformation.

# project (projeter)

verb | prə'jekt | [*with object*]

**1** estimate or forecast (something) on the basis of present trends: *spending was projected at \$72 million.*

**2** [*no object*] extend outward beyond something else; protrude: *I noticed a slip of paper projecting from the book* | (as adjective projecting) : *a projecting bay window.*

**3** throw or cause to move forward or outward: *seeds are projected from the tree.*

**4** present or promote (a particular view or image): *he strives to project an image of youth.*

**5** *Geometry* draw straight lines from a center of or parallel lines through every point of (a given figure) to produce a corresponding figure on a surface or a line by intersecting the surface.

**6** make a **projection** of (the earth, sky, etc.) on a plane surface.

## translate (traduire)

verb [*with object*]

**1** express the sense of (words or text) in another language: *several of his books were **translated into** English.*

**2** move from one place or condition to another: *she had been translated from familiar surroundings to a foreign court.*

**3** *Physics* cause (a body) to move so that all its parts travel in the same direction, without rotation or change of shape.

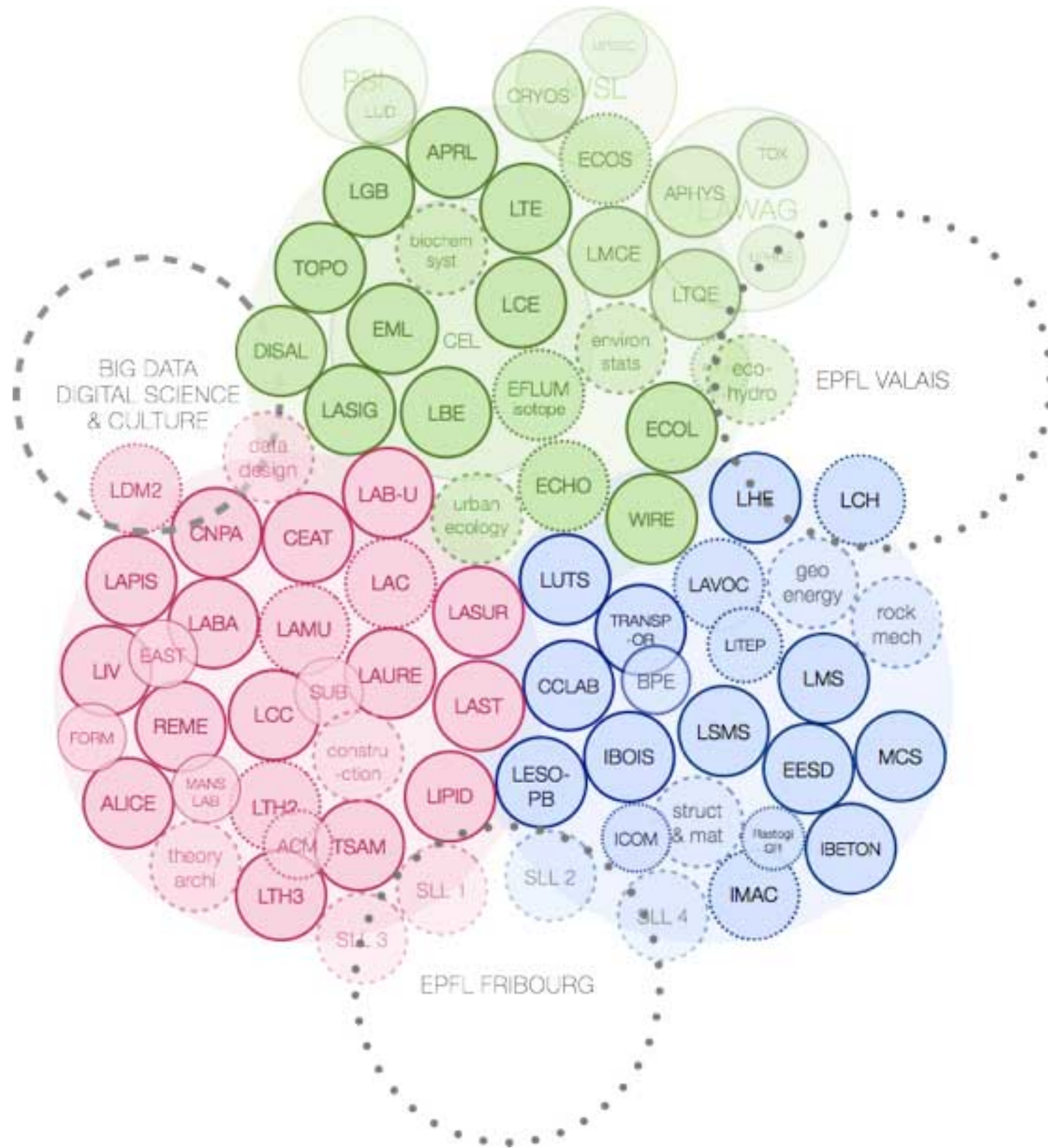
Callon, Michel. 1984. "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Briec Bay." *The Sociological Review* 32 (1): 196–233. doi:10.1111/j.1467-954x.1984.tb00113.x.

# Representing Academic Practice

*the case study*

The Affinity Map is a visual representation of **ENAC**  
ENAC is the school of building constructions that gathers  
**Architecture, Civil and Environmental Engineering**

The ENAC is composed by **three institutes,**  
**seventy laboratories** and a **thousand of scholars**



*Personal view of Marilyne Andersen of ENAC*

## *Academic Practice*

Many activities

Different according to discipline

Not only literature

## *Collaboration*

Part of academic practice

Multidimensional

Multi-scale

## *Affinity*

A concept to develop

Actual and potential

Intellectual and operational closeness

## *Visualization*

Academic practice is mostly hidden

It can be made visible

It can be made visible using affinities

## *Research Questions*

Which data?

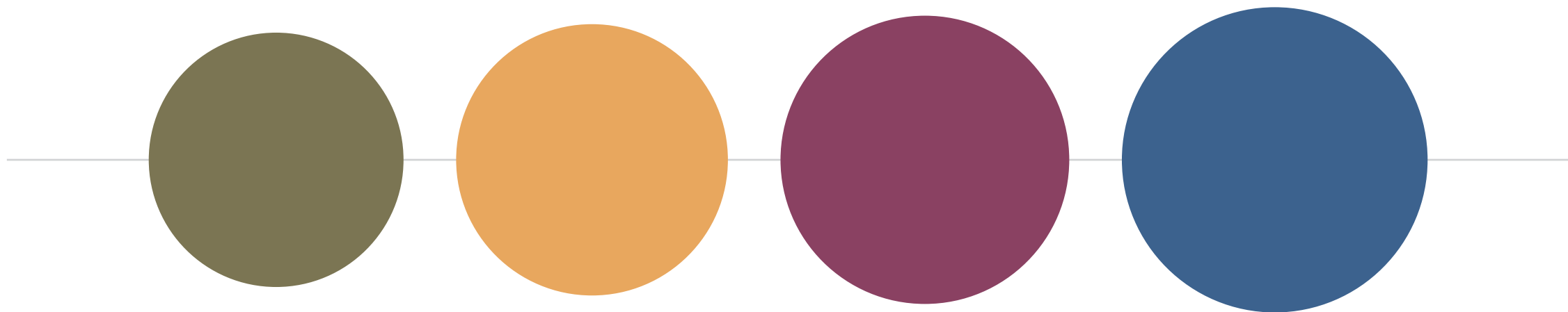
How to translate?

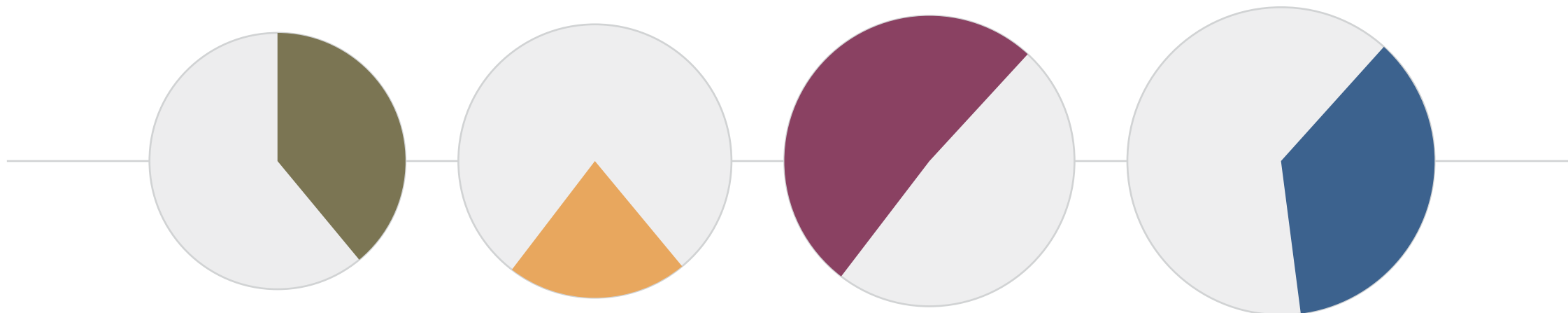
Does exist an ethics?

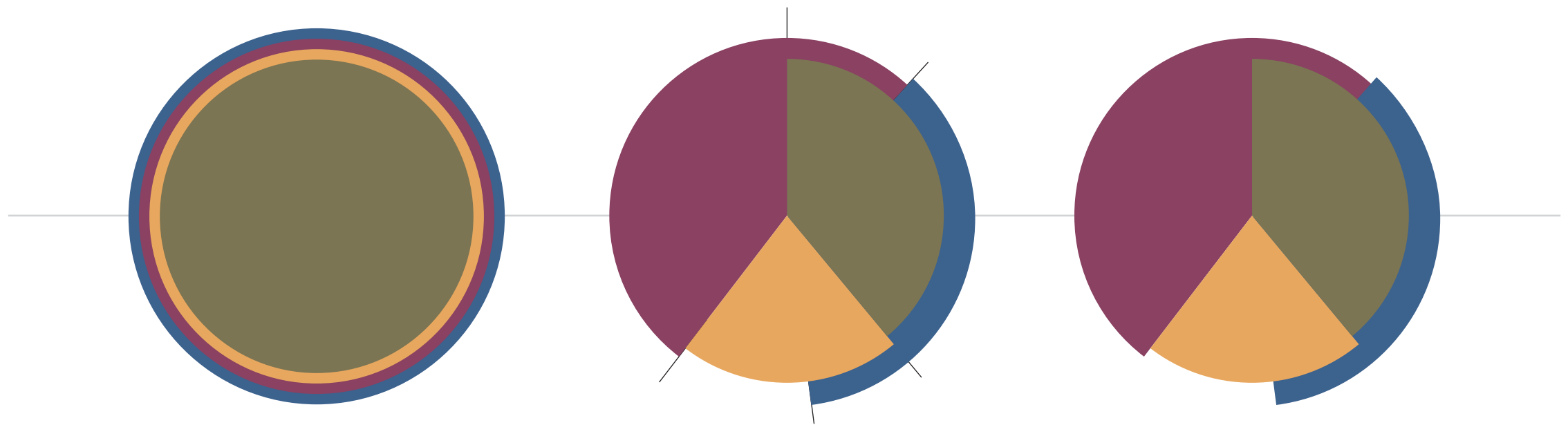


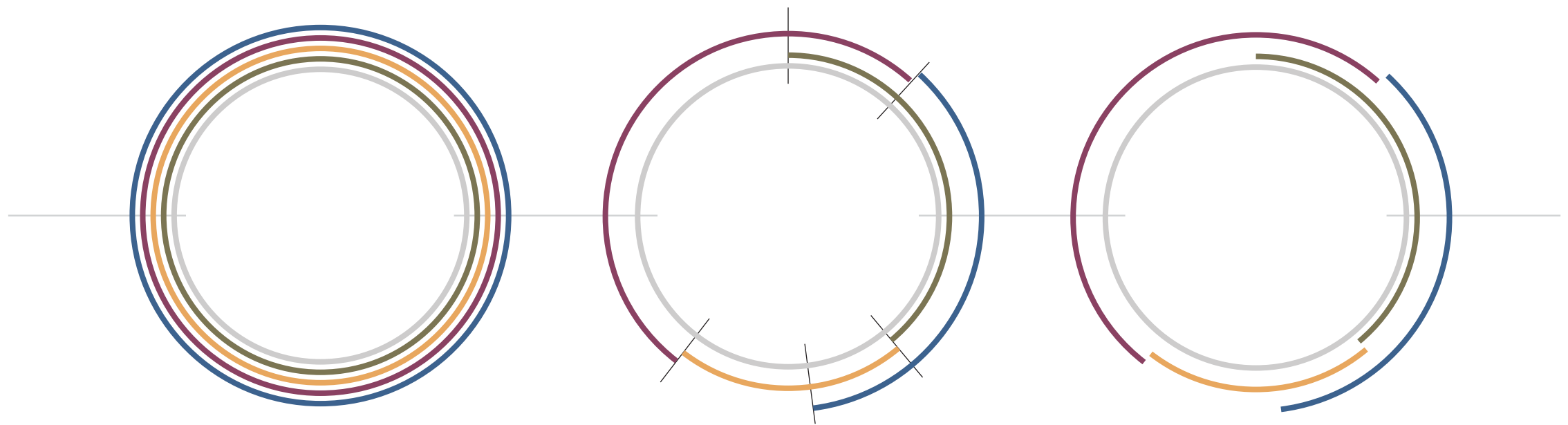
# Visual Investigation

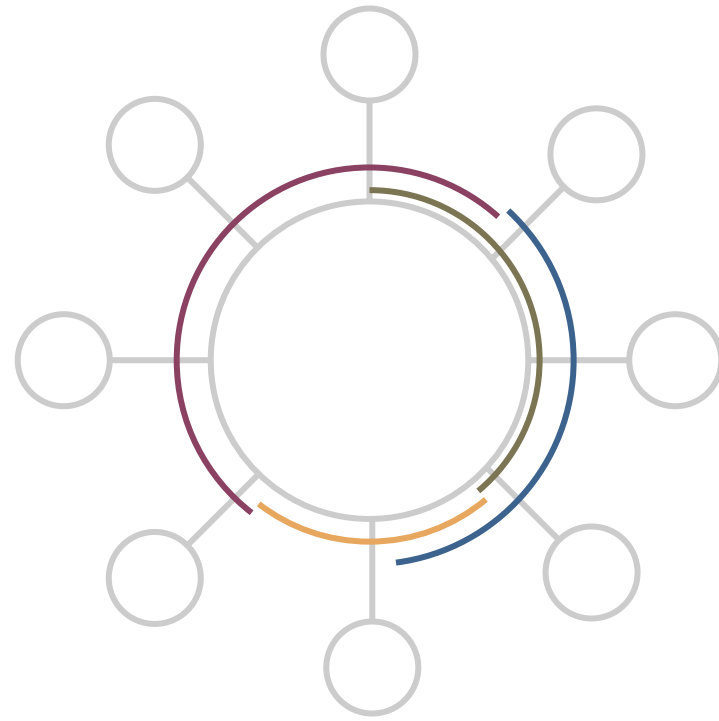
*drawing laboratories*

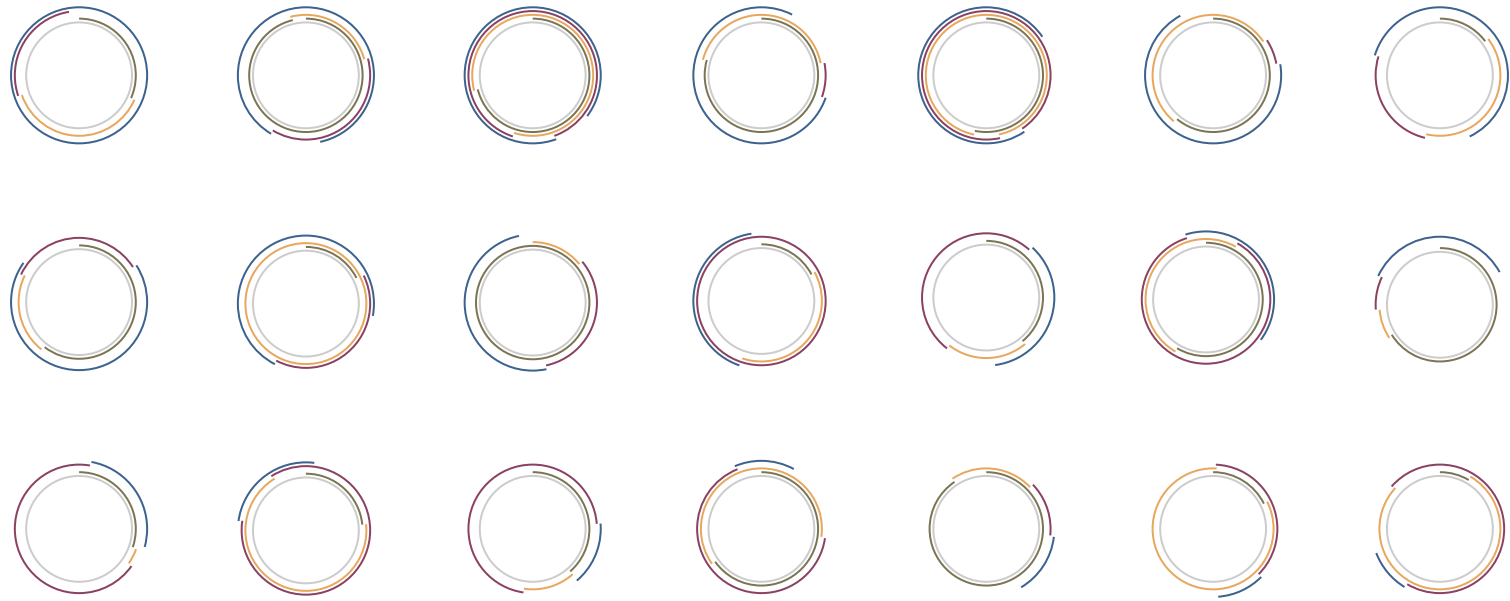


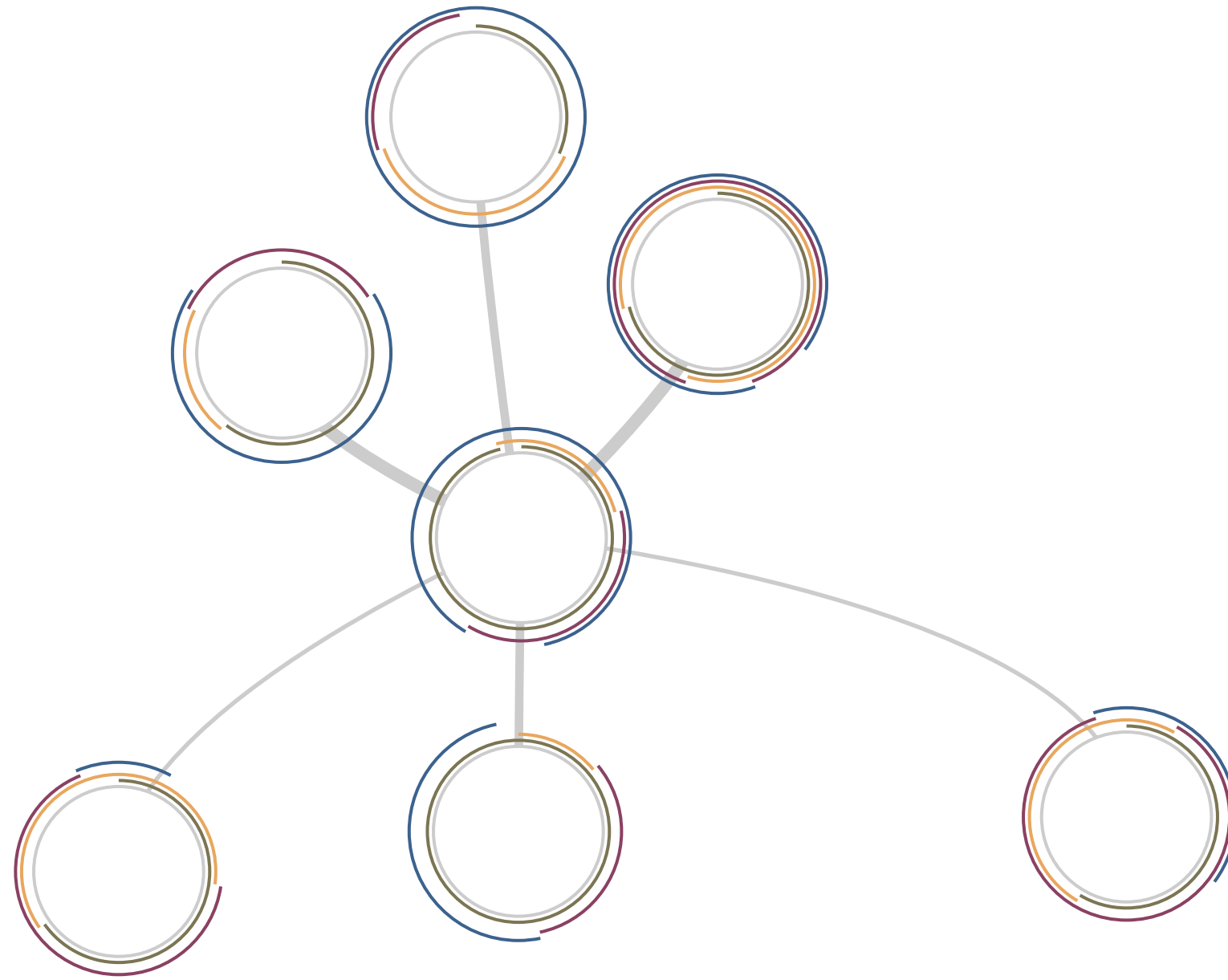
















# Data Investigation

*embrace all of the different practices*

manque description !!

Indicators	Primary source	Secondary source	To be specially required in online labs' activity report?
Focus topics (thematics)	Symphony database	Lab's websites (research)	Maybe (would be nice to have the user confirming existing data from Symphony/lab's website for instance)
Keywords	Lab's websites (metadata "keywords", from audit 2011)	<del>Lab's websites (research)</del>	Idem <i>pas possible</i>
Expertise areas	Symphony database	Lab's websites (expertise box)	Idem
Publications keywords and contents/abstract	Infoscience		No
Publications co-authors and their institutions	Infoscience (but institutions may be labelled variously...)	People's publication page	No
Alumni a3 (activity sector, localization)	Alumni database (with probable confidentiality issues?)		No
Co-teaching	IS-Academia	People's teaching page	Maybe (it could be provided by selecting the joint Professor from a list in the online formular?)
Industrial partners	Audit 2011 or lab's annual reports (extract from "valorization, collaboration & network")	Lab's annual reports	Yes (should be structured in an easy way for being extracted)
Main funding organizations	EPFL Grants database (maybe not possible?)		Yes (proposing a selectable list?) <i>gelle infos</i>
Link to flagship projects	Audit 2011 or lab's annual reports		Yes (proposing a selectable list, if possible?)
People & Team	<i>Annuaire surtout</i> People's pages (Expertise+Biography&Work +Teaching)		No
Lab's activities (events co-organised, guest speaker invitation, ...)	Memento	News flux	Maybe

faire une liste glissant  
laisser les gens proposer eux-mêmes  
ce qu'ils considèrent comme flagship

2 choses différentes

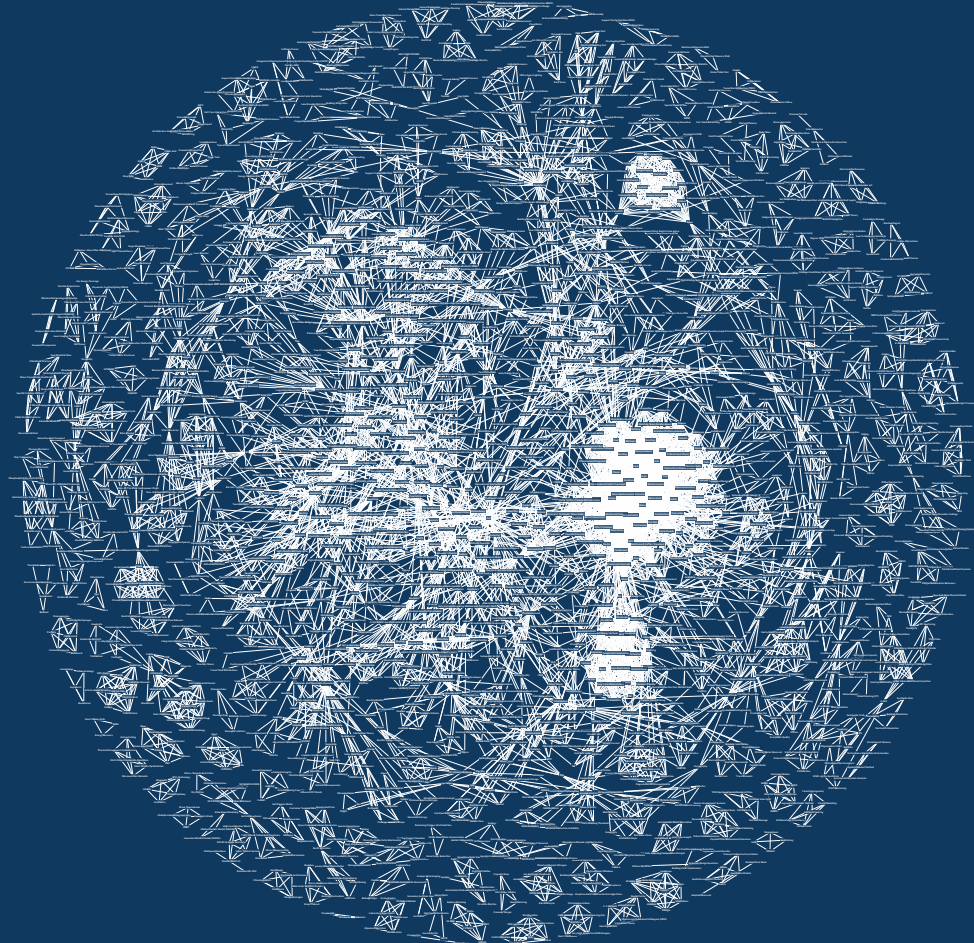
il n'a pas de sens  
du moment qu'il y  
a accès aux flux!

comment  
gérer les mouvements?



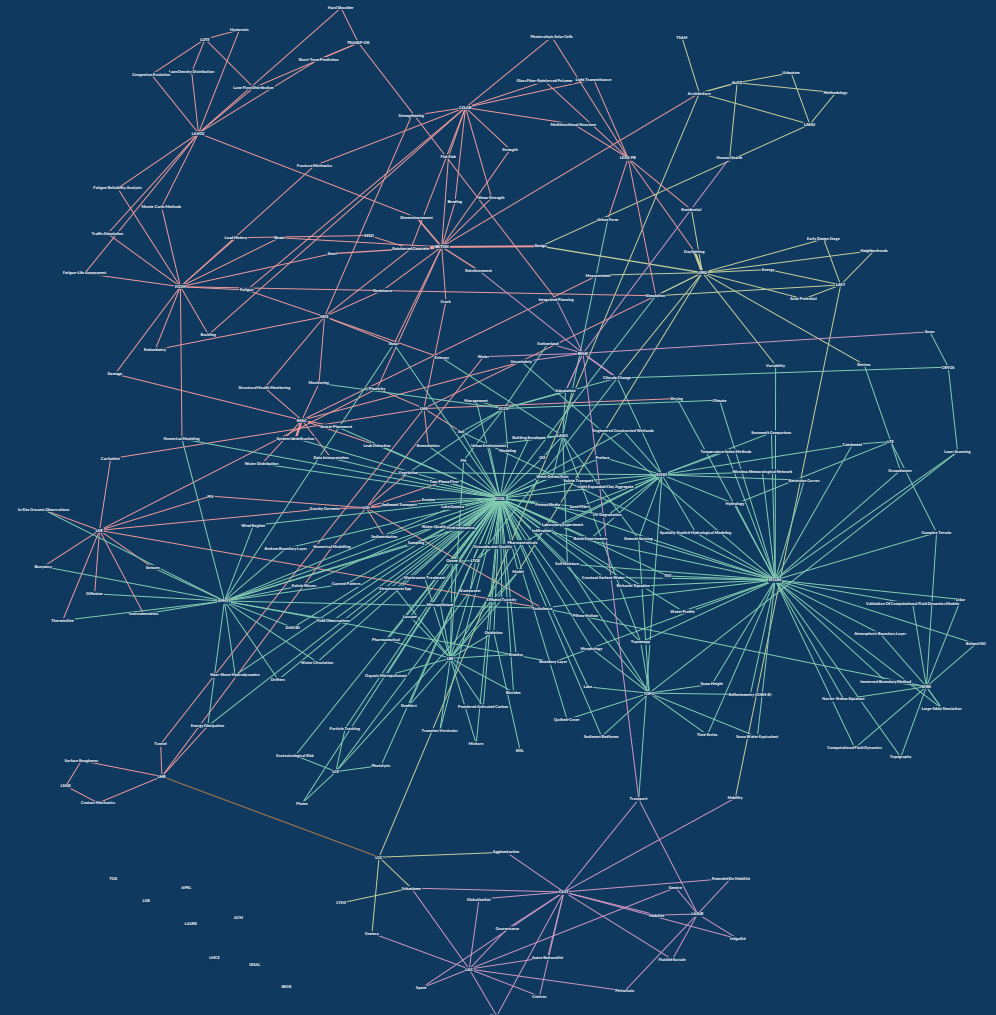


MOTS CLÉS PARTAGÉS ENTRE LES PUBLICATIONS



1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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RÉSEAU DE LABORATOIRES AVEC DES MOTS CLÉS EN COMMUN

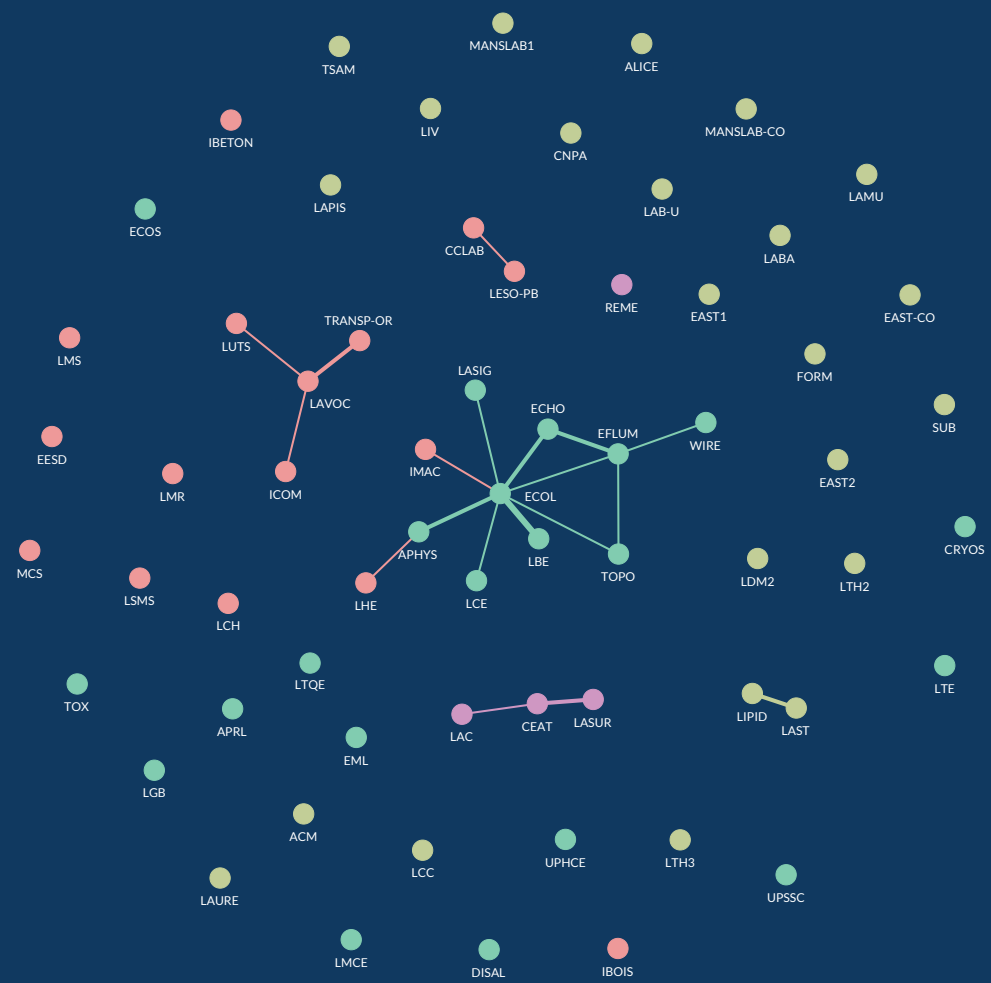




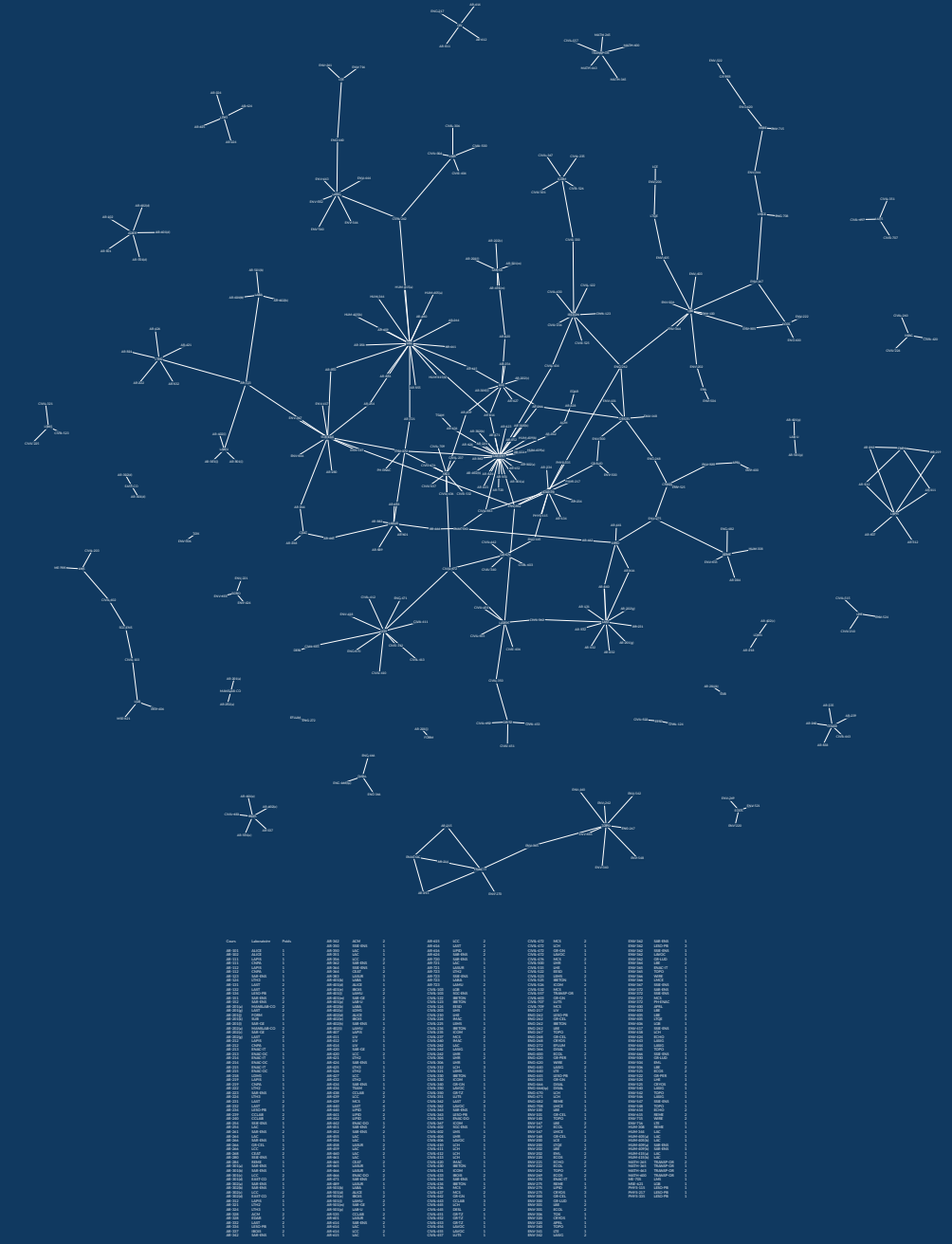




# LABORATOIRES AVEC LES PUBLICATIONS PARTAGÉES



# ENSEIGNEMENTS DE L'ENAC QUI PARTAGENT DES COLLABORATEURS



<b>Information</b>	<b>Affinity type</b>	<b>Source</b>
<del>Lab thematics</del>	Potential	<del>Symphony</del>
<del>Lab thematics</del>	Potential	<del>EPFL website</del>
<del>Individual expertise</del>	Potential	<del>Symphony</del>
<del>Individual expertise</del>	Potential	<del>EPFL website</del>
<del>Keywords</del>	Potential	<del>Audit 2011</del>
<del>Keywords</del>	Potential	<del>InfoScience</del>
Co-authoring	Actual	InfoScience
Co-teaching	Actual	IS-Academia
Co-advising	Actual	IS-Academia
Grants	Actual	Grant database
<del>Industrial partners</del>	<del>Actual</del>	<del>Audit 2011</del>

*Table of digital traces, the strikethrough identifies not usable data.*



The *structure of the school* was used to reassemble laboratories and institutes. In particular, the **personal ID** (SCIPER), the **affiliations** of the staff and the **hierarchical structure** of the EPFL.

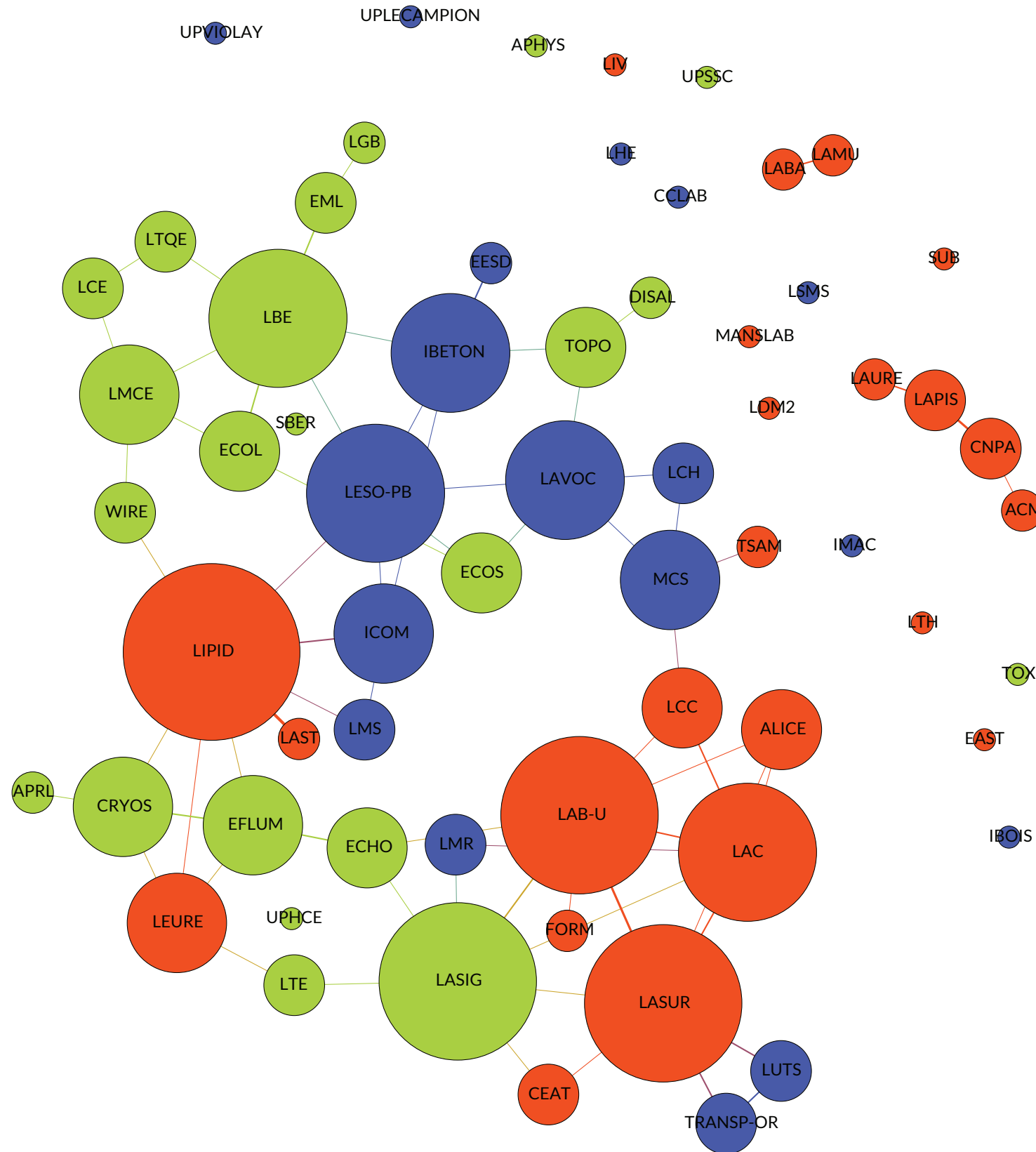
We identifies three types of *actual affinities*: the **publications** stored in the *Infoscience system*, the **courses** and the **supervision** recorded in *IS-Academia*.

*Potential affinities* were generated as **keywords** through an algorithm of text mining working on the publication abstracts of the ENAC laboratories.

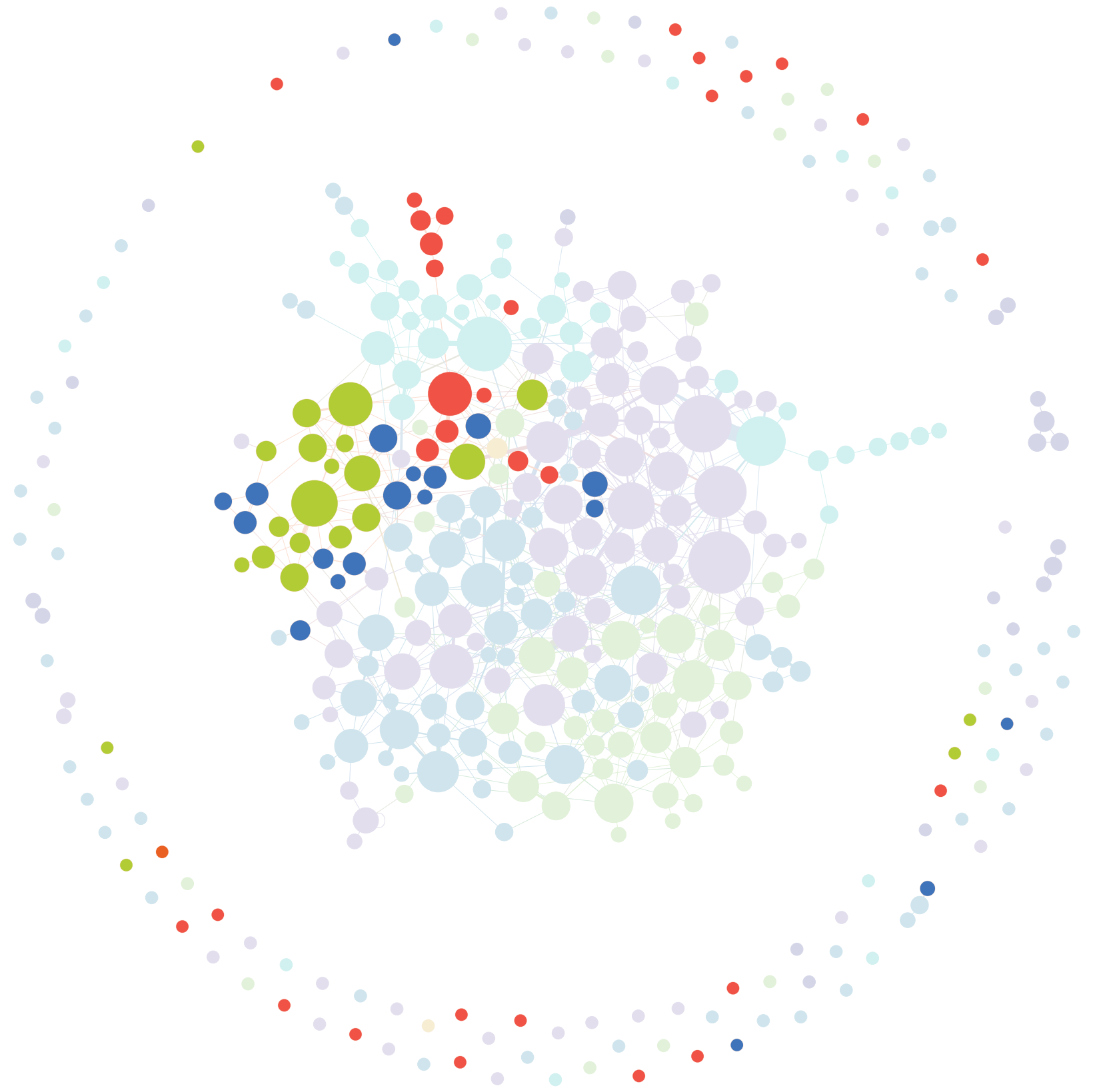
# Hexagonal Network Visualization

*size, isolemment, continuity*





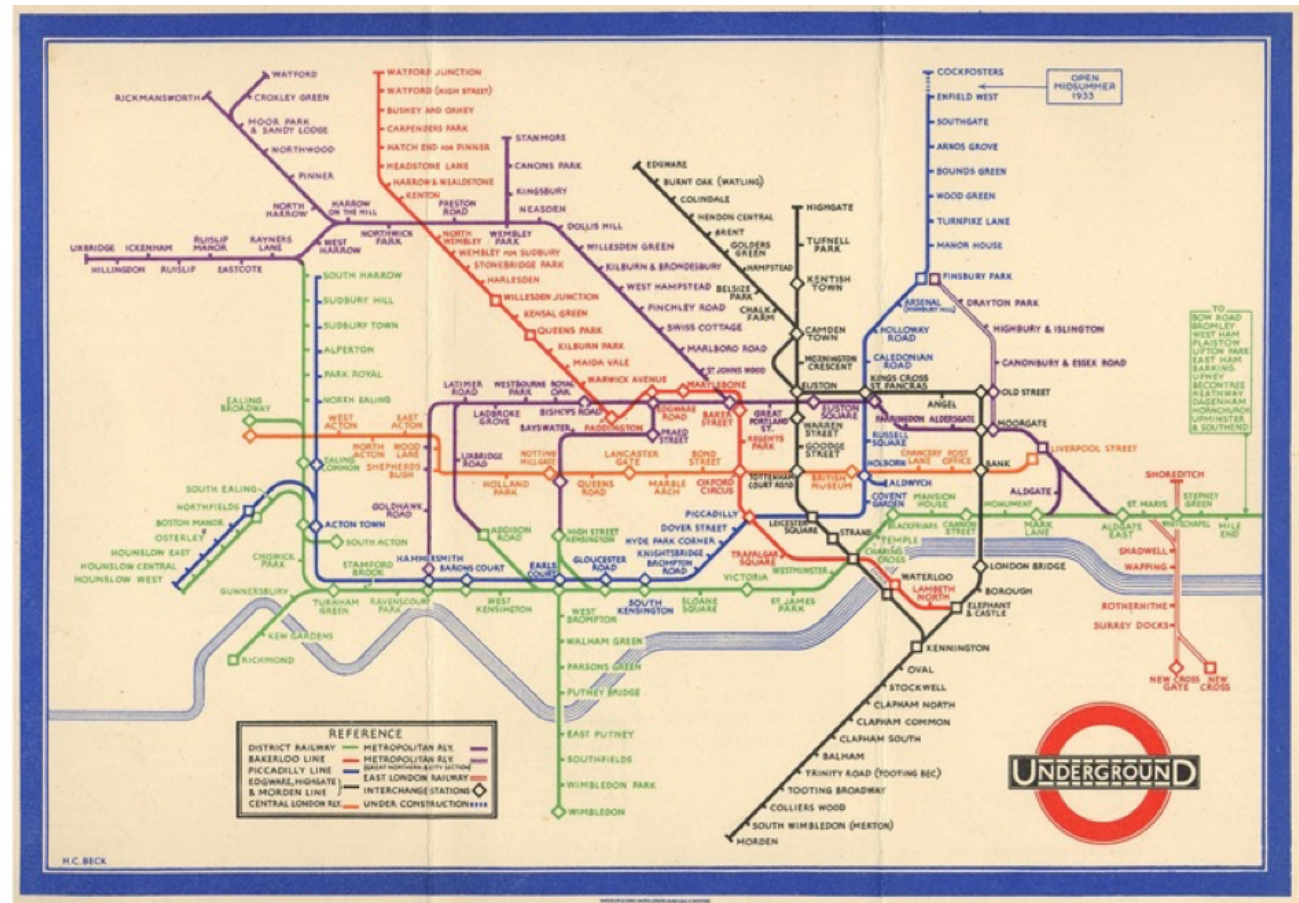
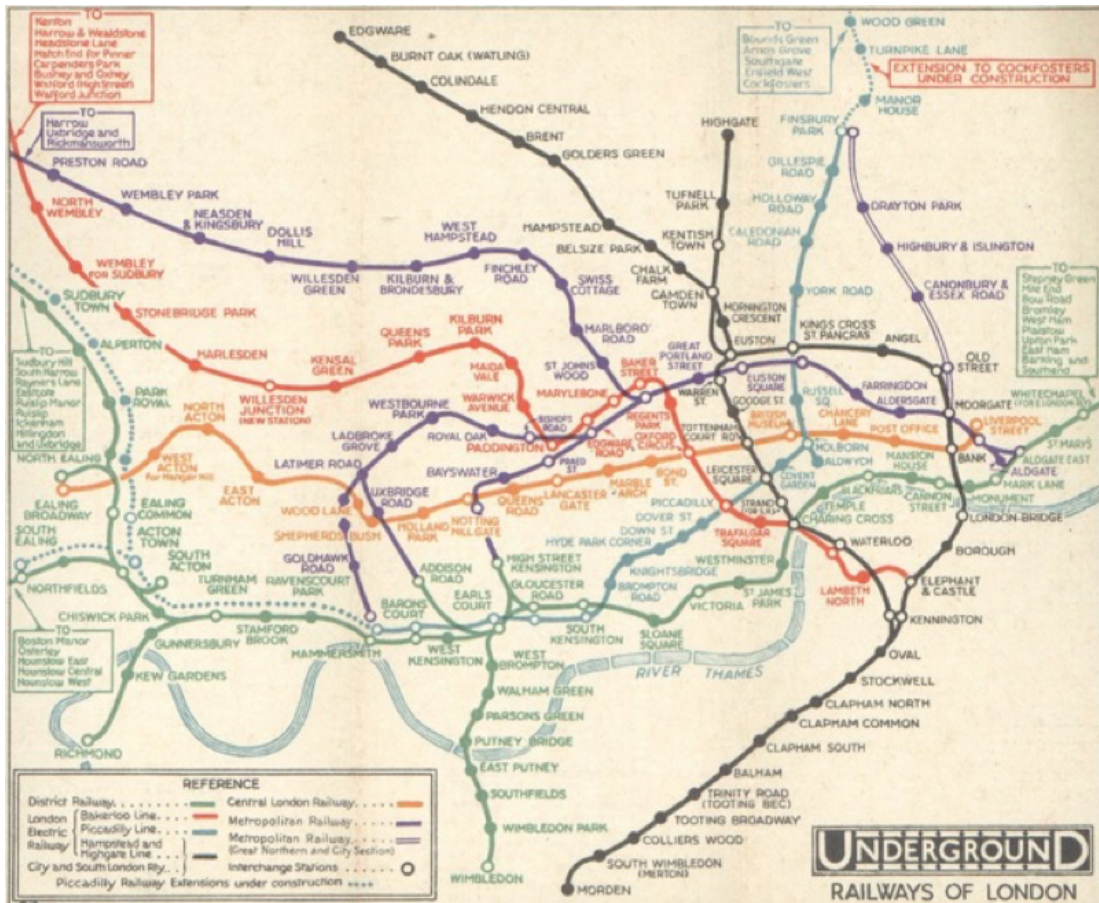
Education (Supervision and Courses)



Publications

*“Design is the conscious and intuitive effort to impose **meaningful order**. [...] Our delight in the order we find in frost flowers on a window pane, in the hexagonal perfection of a honeycomb, in leaves, or in the architecture of a rose, reflects man’s preoccupation with pattern.”*

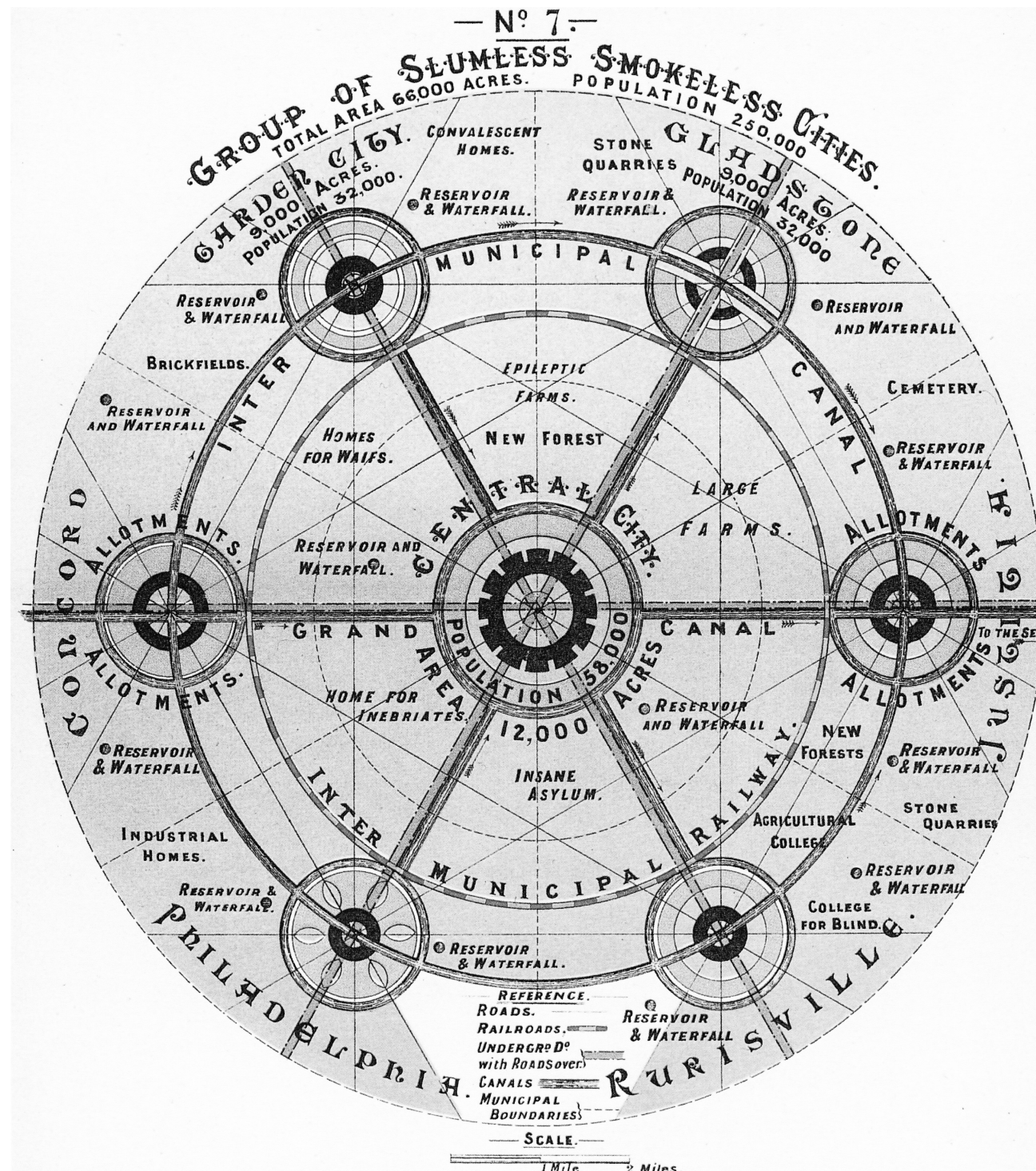




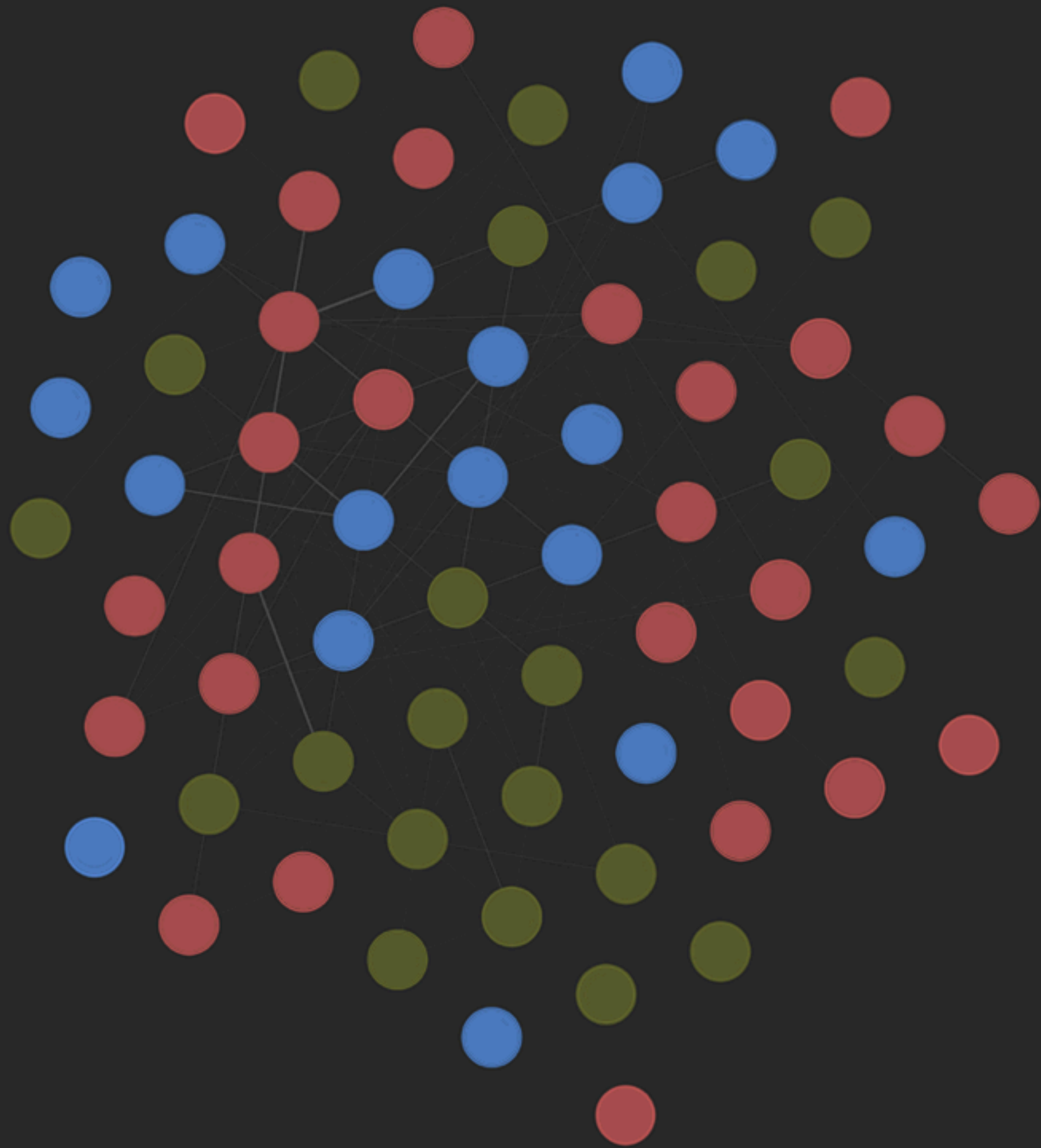
Pre and post Harry Beck's London underground map.

*“Regular graphs are unique in that each node has exactly the same number of links. Indeed, in a two-dimensional mesh of perpendicular lines forming a simple square lattice each node has exactly four links, or in a **hexagonal lattice of a beehive** each node is connected to exactly three others [links].”*



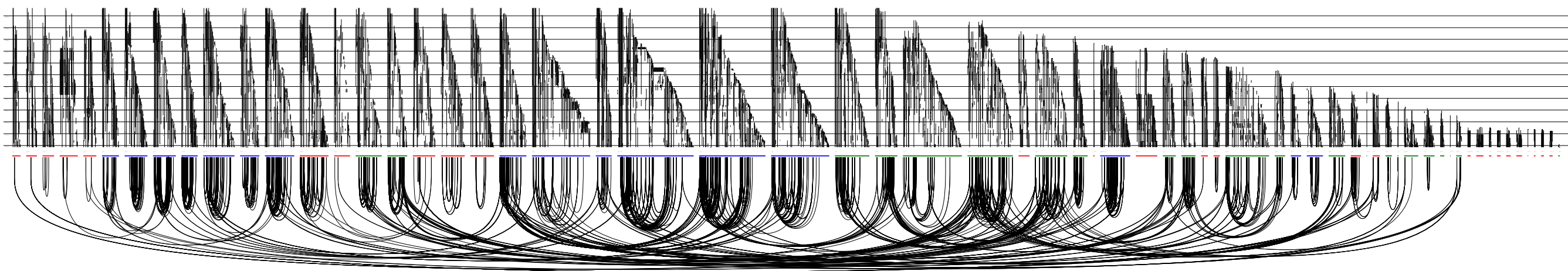


Beevers, Robert. 1988. The Garden City Utopia: a Critical Biography of Ebenezer Howard.

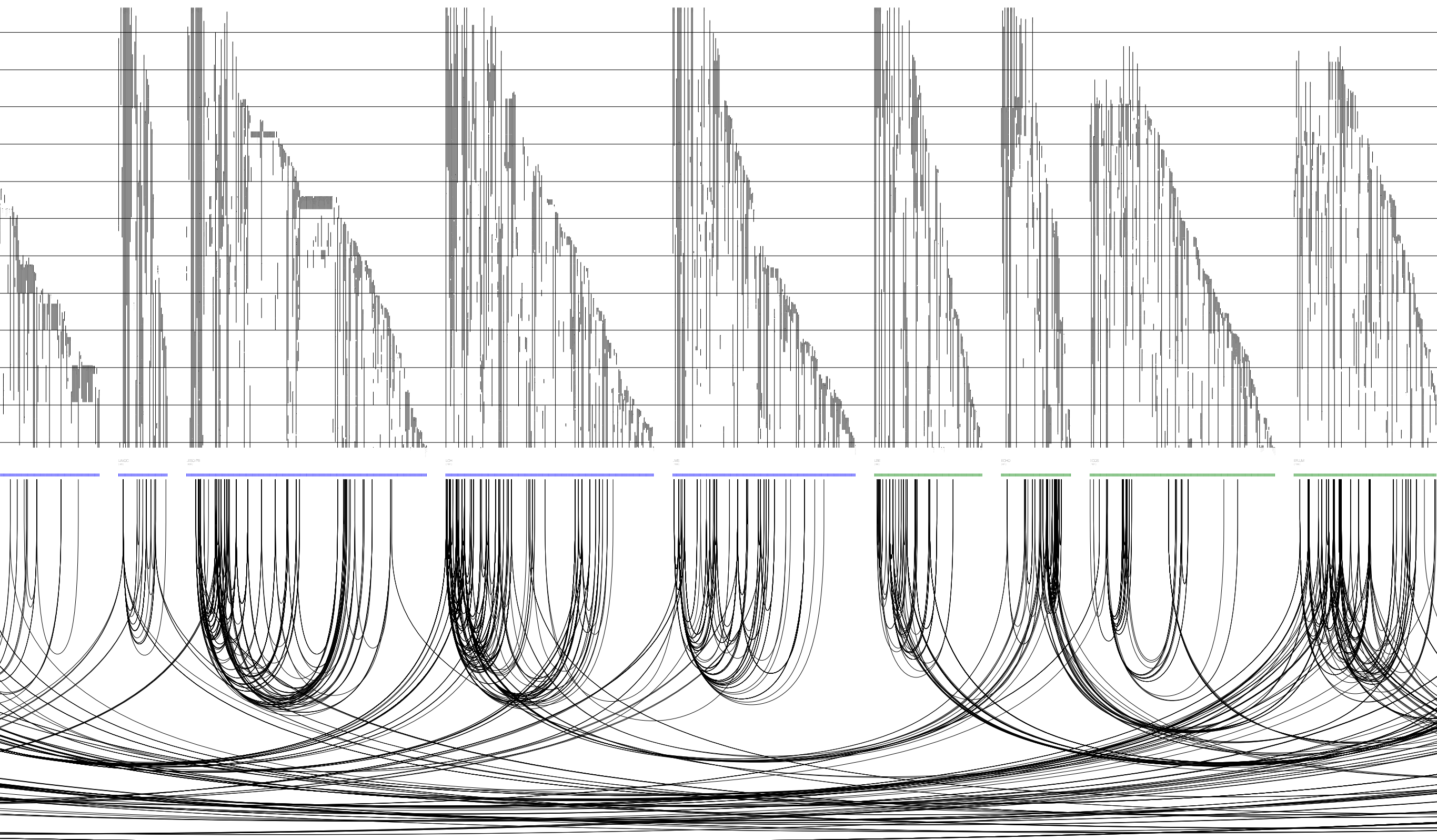


# Back to Individual

*the whole is different than the sum of its parts*



Making individuals and affinities visible together.

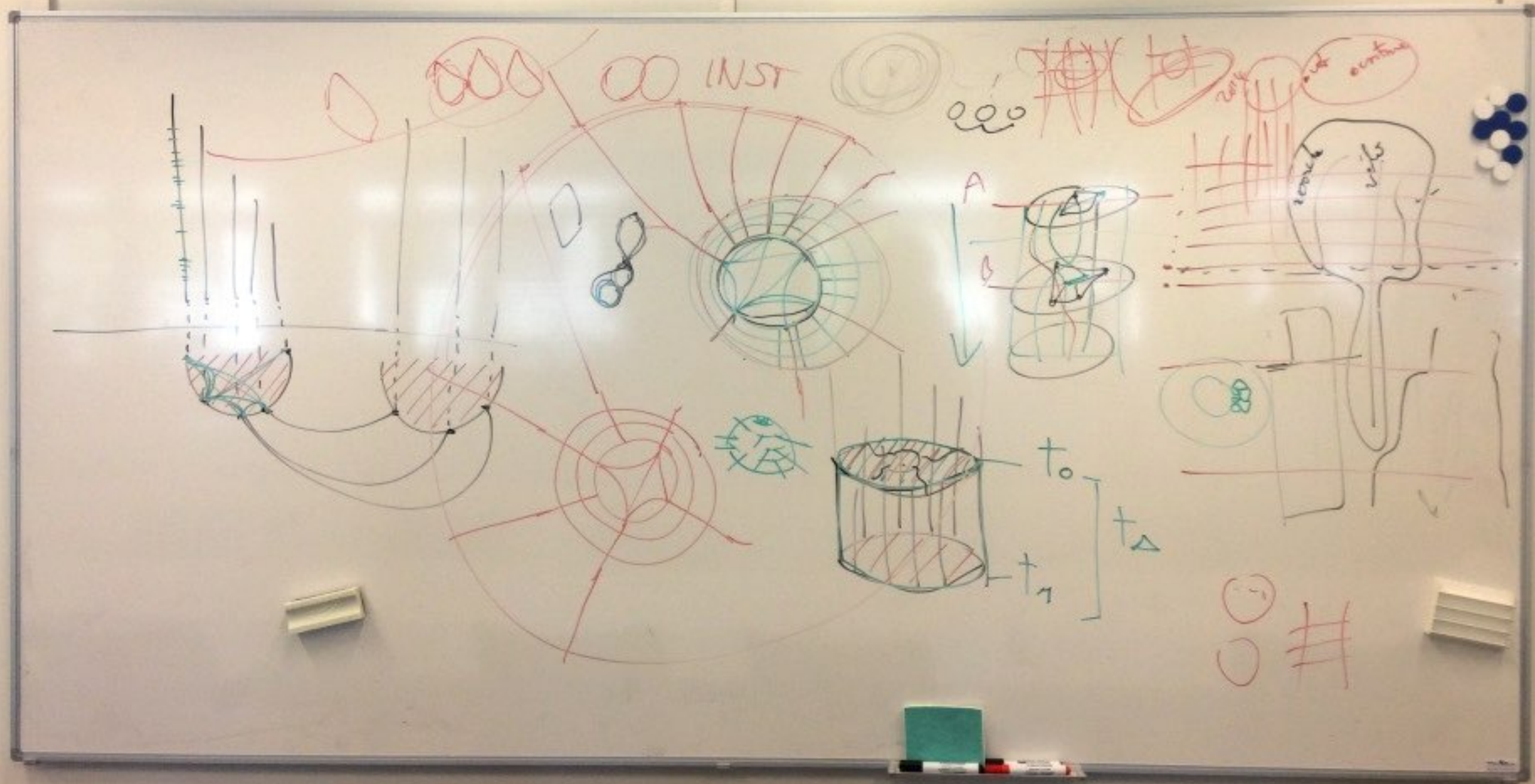


Making individuals and affinities visible together.

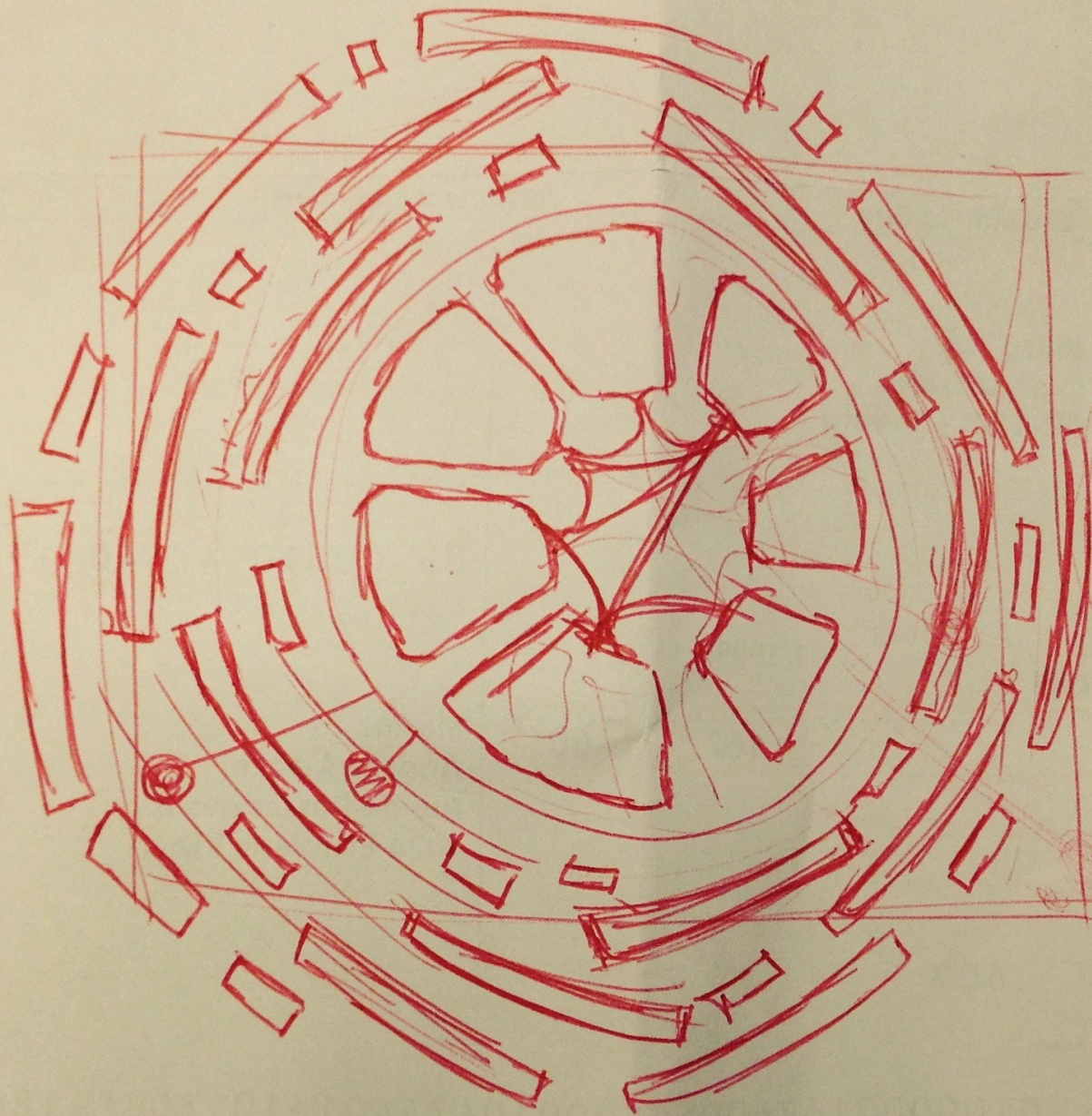




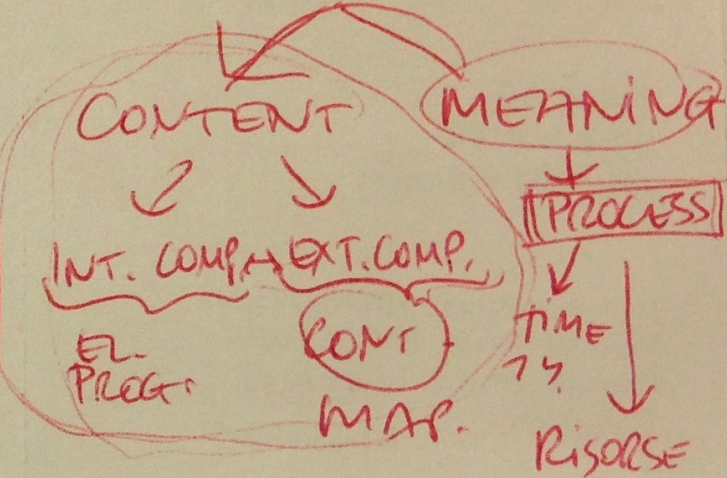






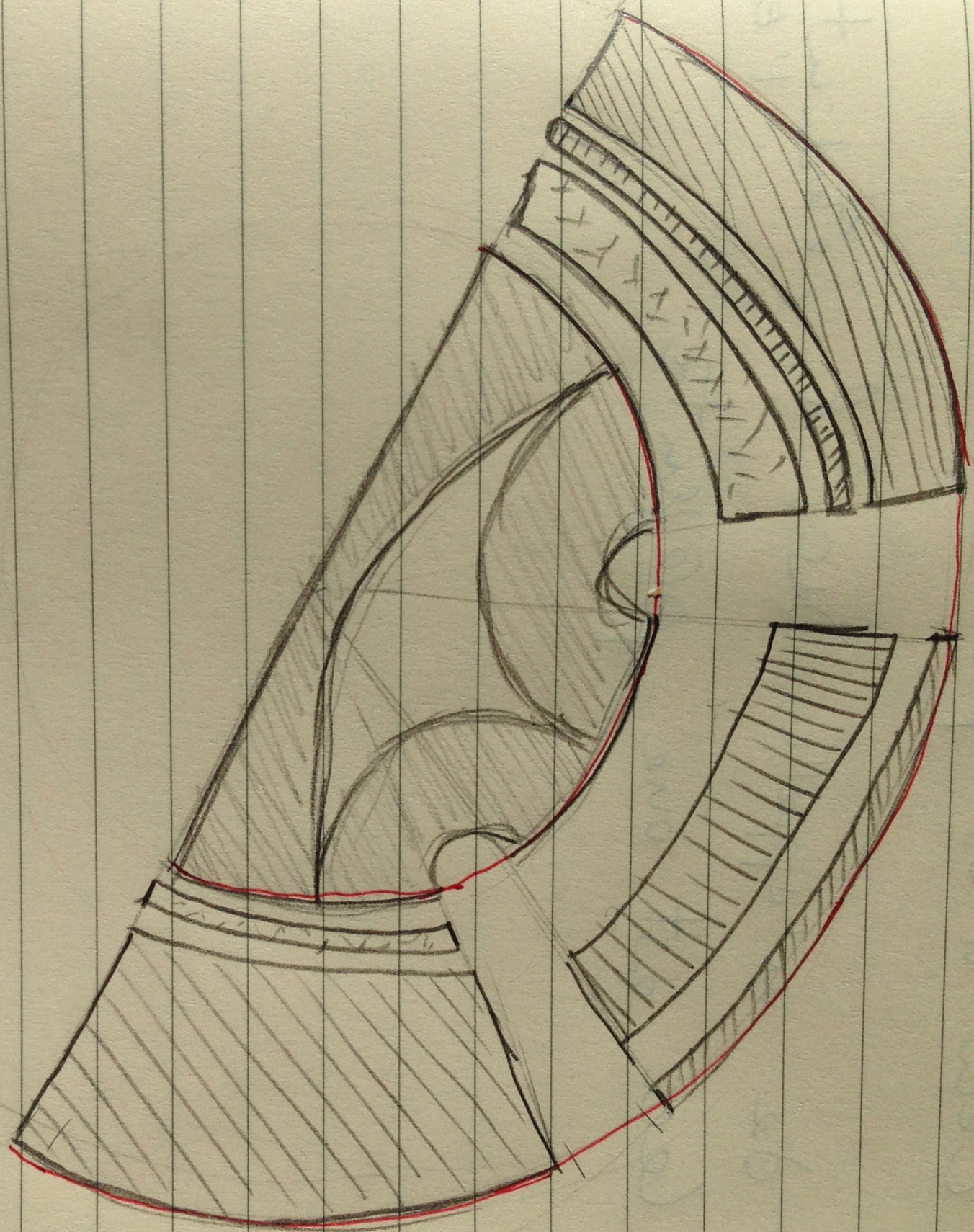
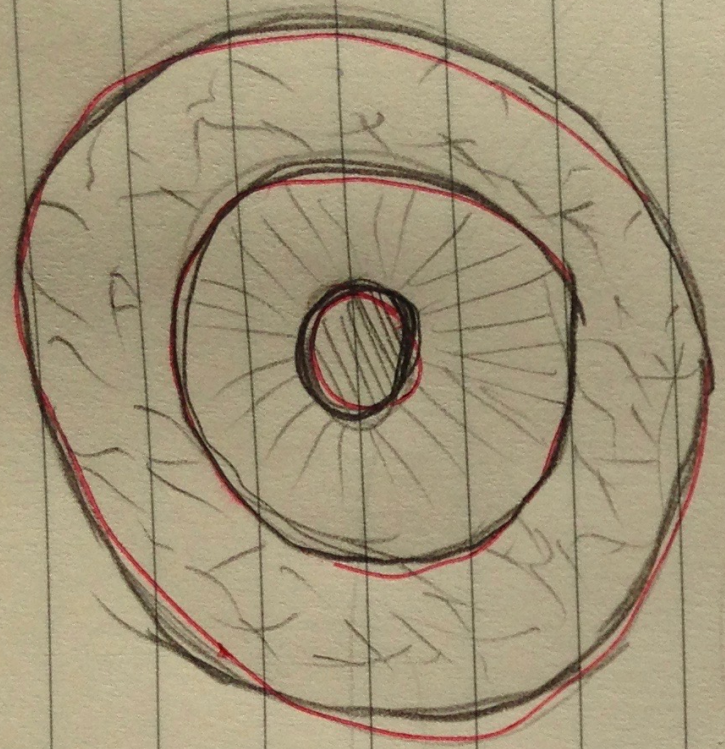
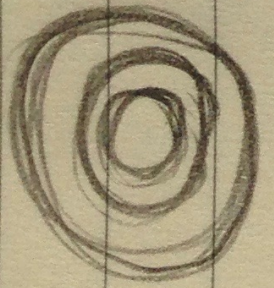


ONTOLOGIA



DORF & GRICK (1994)



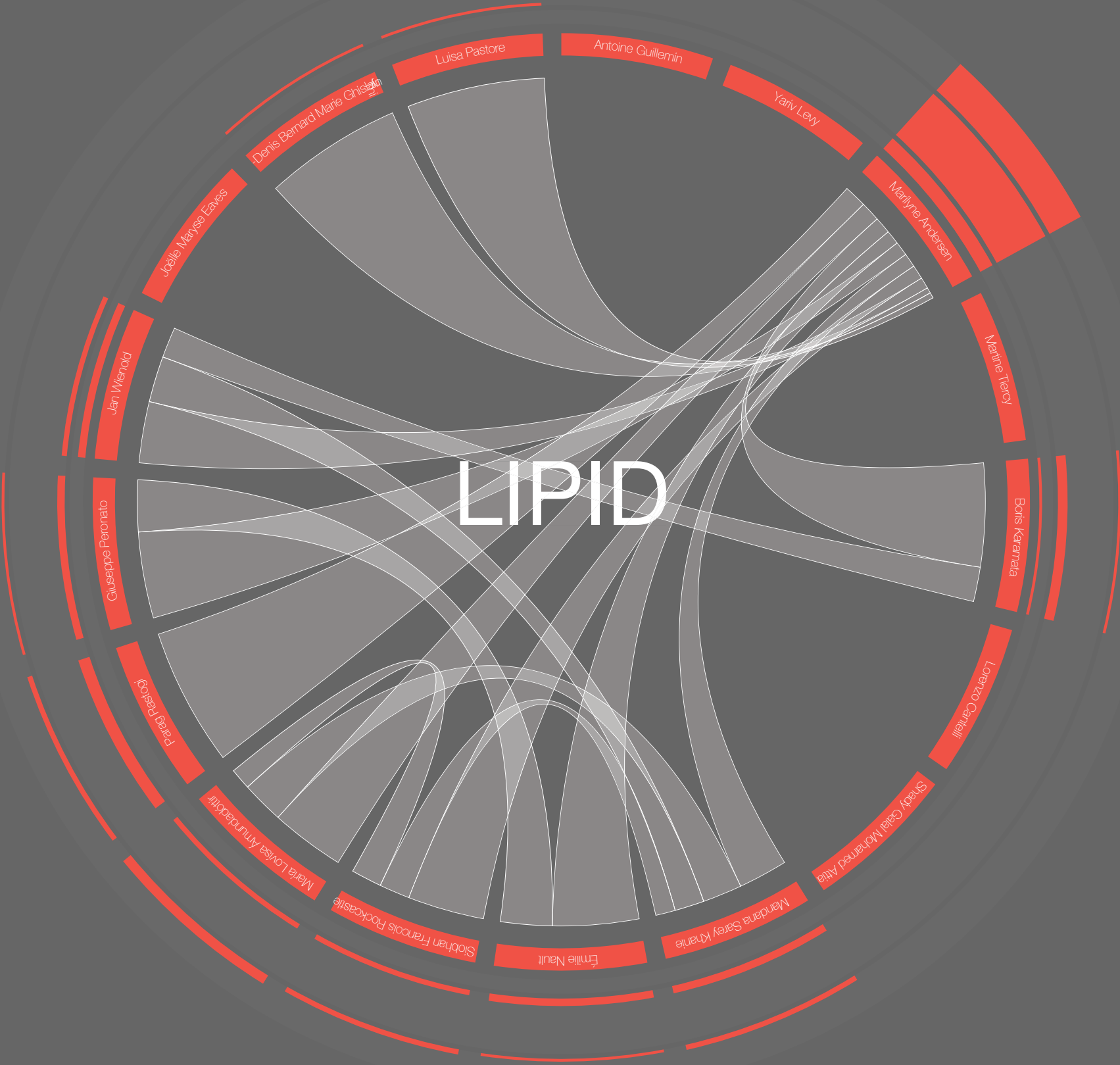


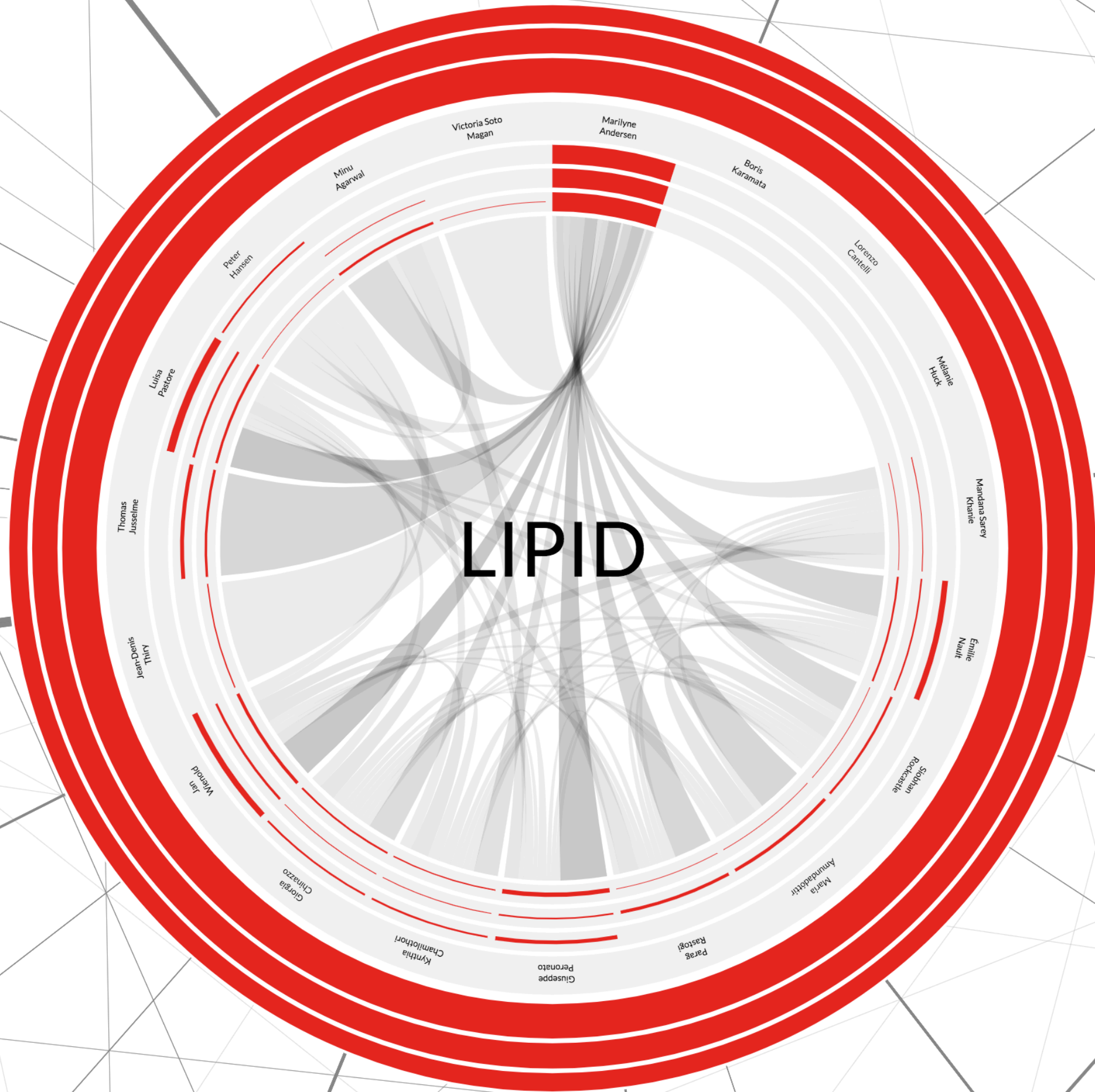


# LIPID



# LIPID

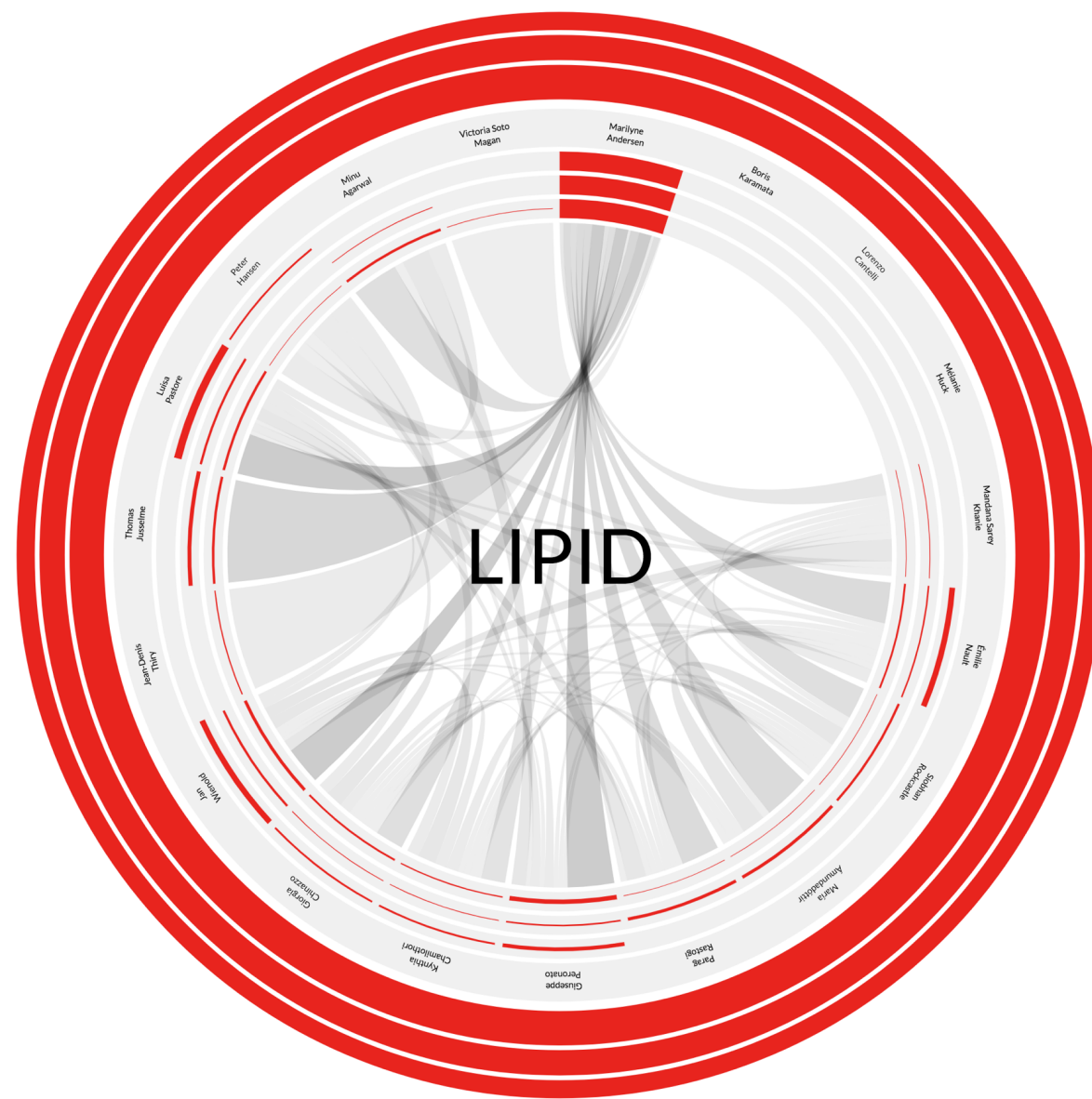
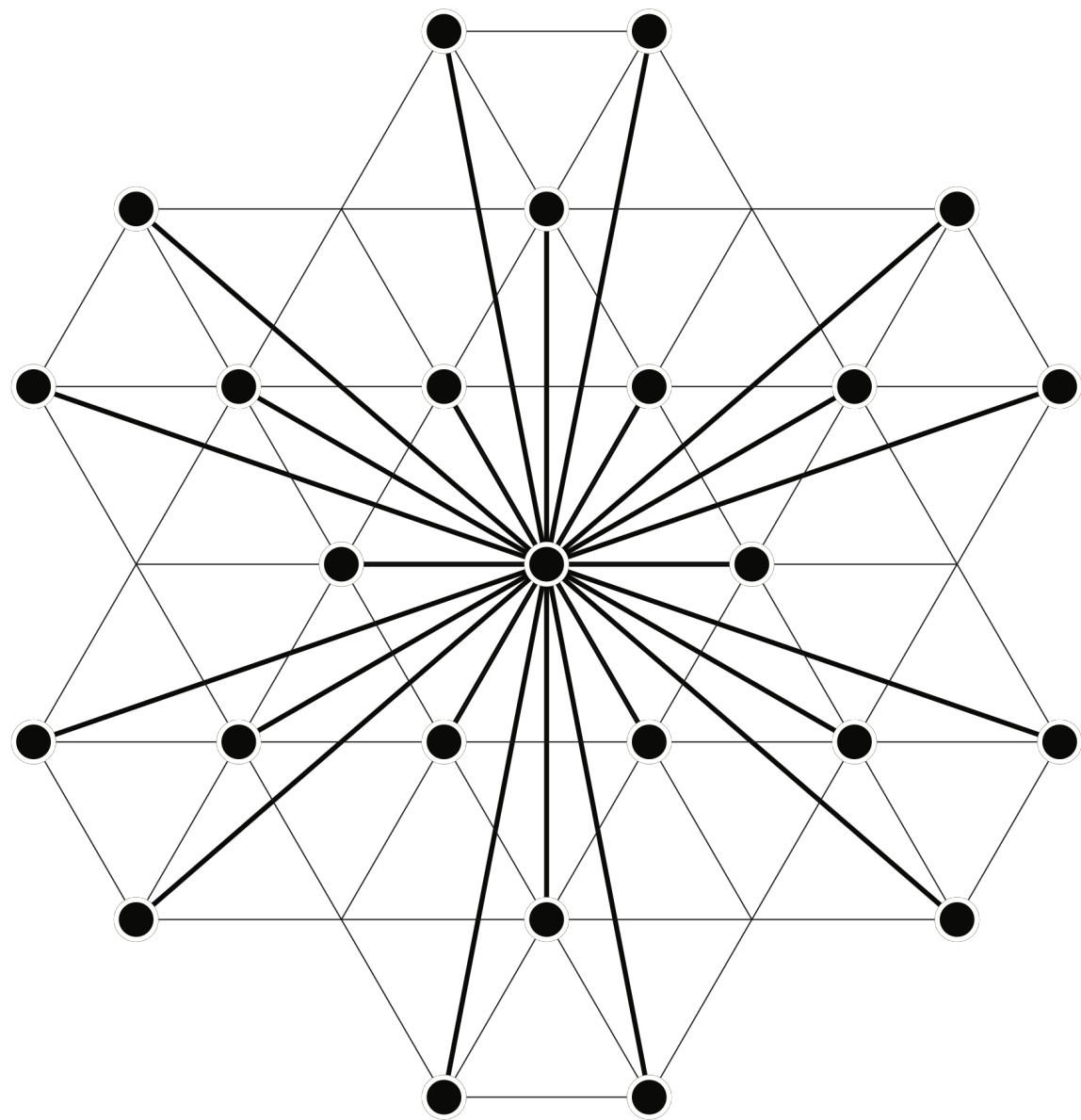




# Satellites

*intermediary connectivity level*

*“Visual Information-Seeking Mantra: overview first, **zoom** and filter, then details on demand.”*



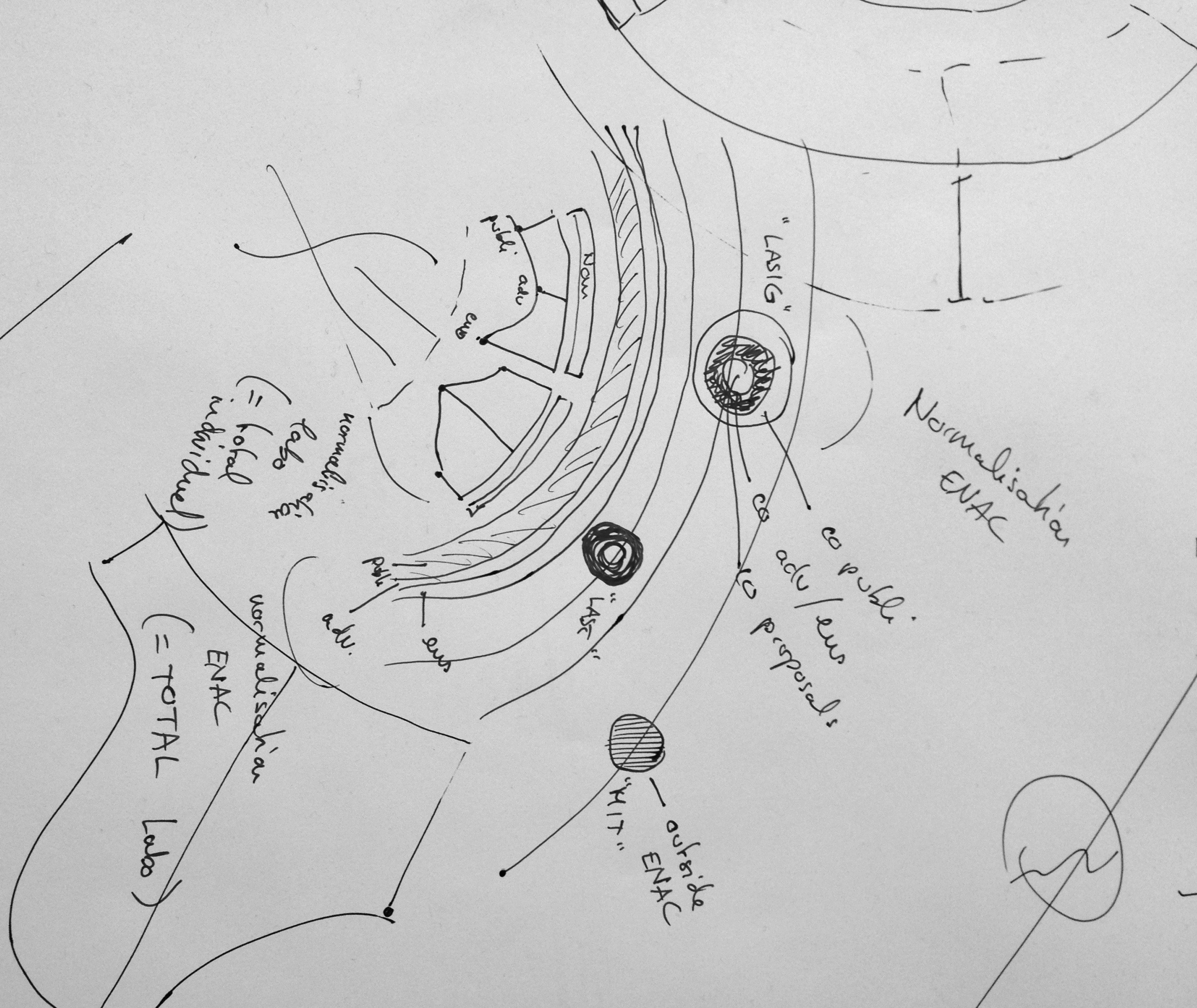
Intermediary level: Meso

*“In this awesome journey to the ends of the universe, you have learned an immense amount **about its structure and the beings and things** that occupy it, and above all **about the relationships of things** to each other, in their various scales of dimension, with a vividness that words cannot express.”*









Normalisasion  
ENAC

"LASIG"

"LASE"

"MIT"

outside  
ENAC

co papilli  
co adu / eus  
co proposals

(= TOTAL Laka)

ENAC

Normalisasion

Normalisasion

Laka

(= kofal  
individual)

papilli  
adu  
eus

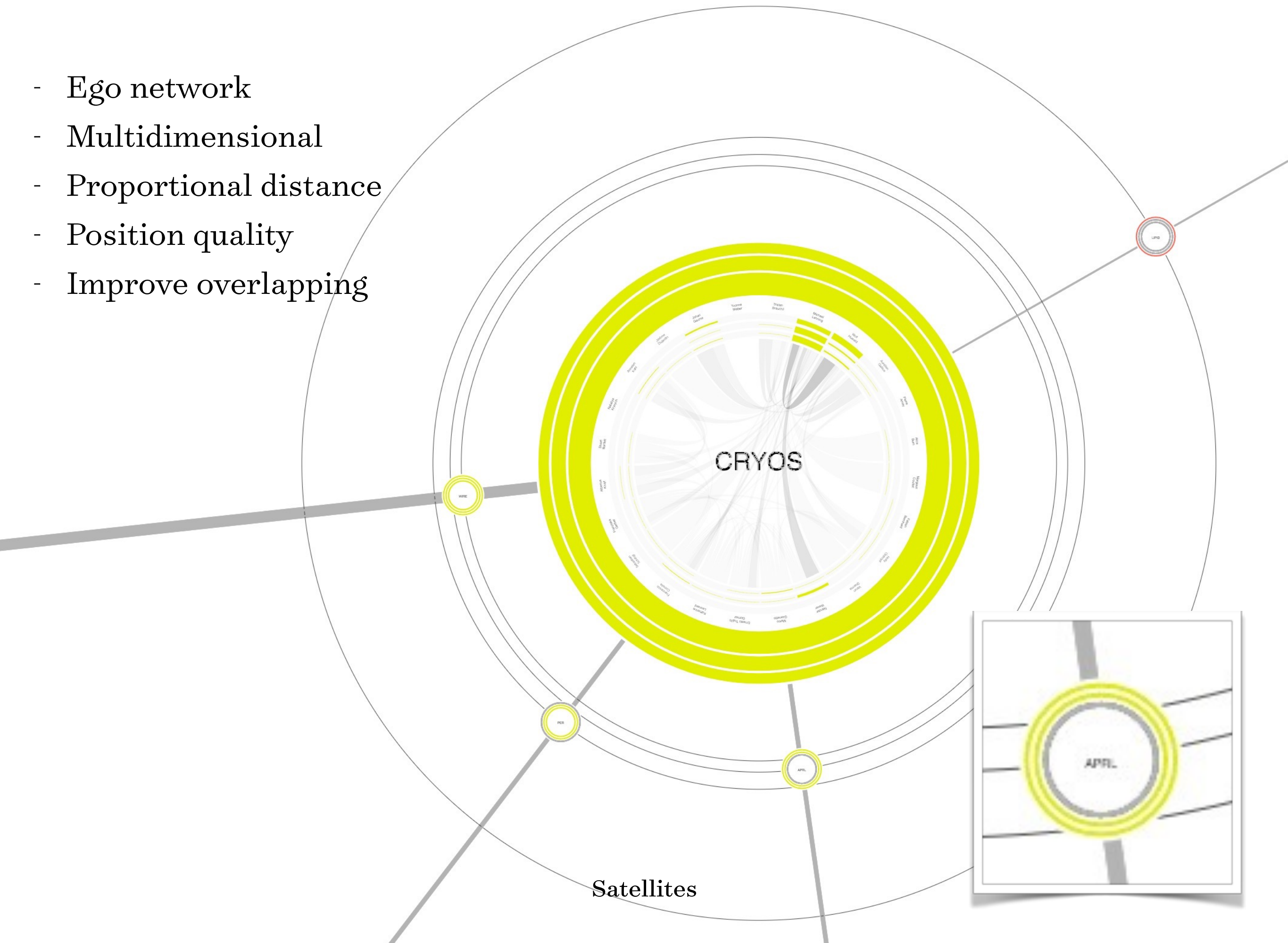
lam

papilli  
ad. eus





- Ego network
- Multidimensional
- Proportional distance
- Position quality
- Improve overlapping



Satellites

# Semantic Background

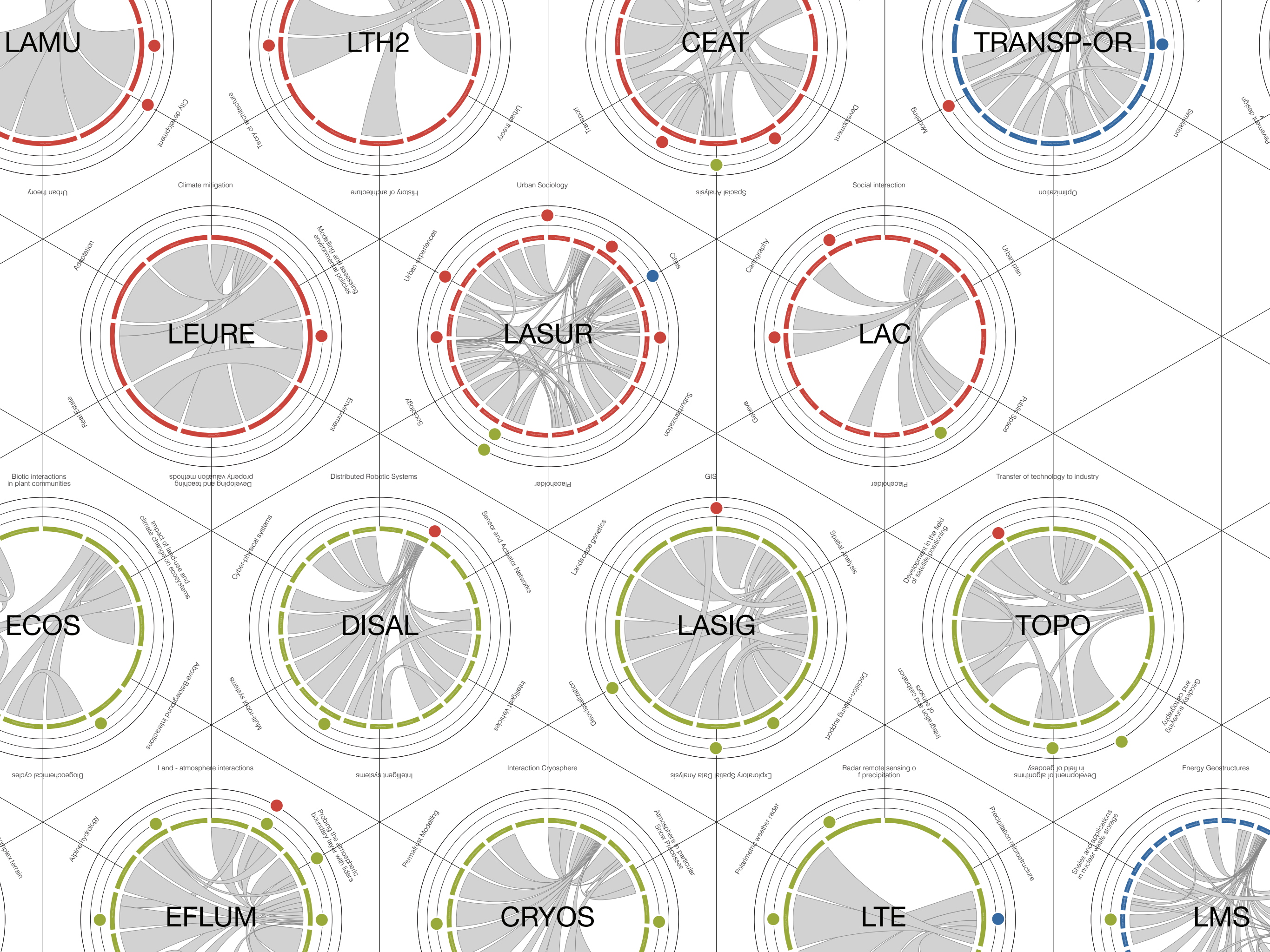
*defining potential affinities*

*“In information retrieval,  $tf-idf$  or  $TFIDF$ , short for term frequency–inverse document frequency, is a numerical statistic that is intended to reflect how important a word is to a document in a collection or corpus.”*

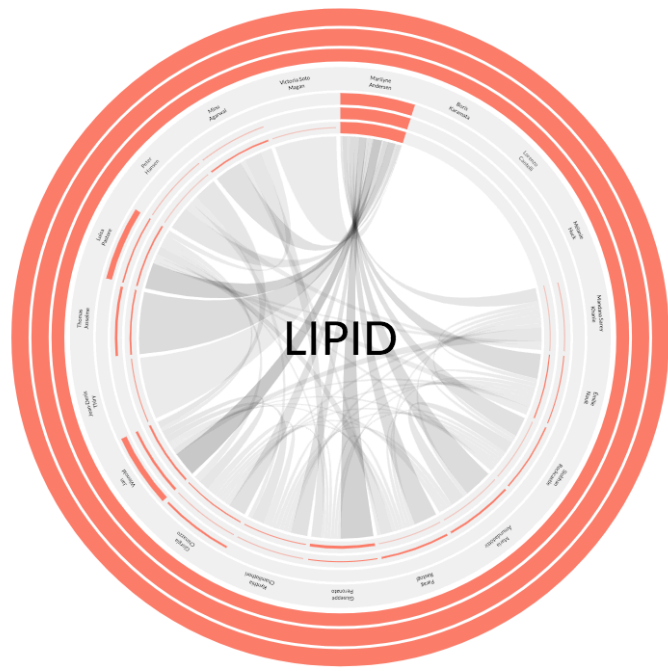
*— Wikipedia 2018*

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1  [{
2    "id": 53310,
3    "authors": ["Bradley, Joseph", "Loucks, Jeff", "Macaulay, James", "Noronha, Andy", "Wade, Mi
4    "title": "Digital vortex: How digital disruption is redefining industries",
5    "description": "Digital business transformation is a journey to adopt and deploy digital tec
6    "keywords": ["DIGITAL DISRUPTION", "DIGITAL BUSINESS TRANSFORMATION", "DIGITAL VORTEX"],
7    "terms": {
8      "digital": 13.493059996310013,
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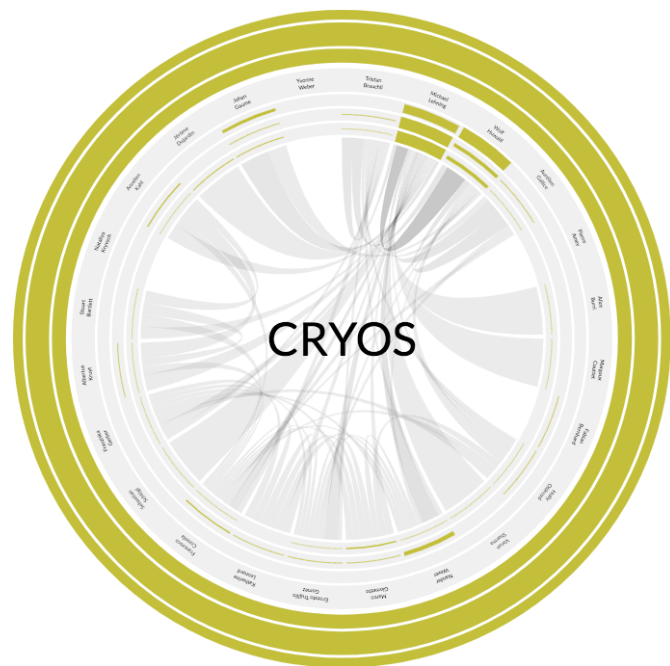


solar  
thermal  
climate  
energy

bipv  
solar  
energy  
buildings  
assessment  
neighborhood  
architectural  
irradiation  
prototype  
workflow  
design  
urban

## Characteristics

- Use of hexagonal grid
- Justification of closeness
- Semantic layer on links
- Color meaning

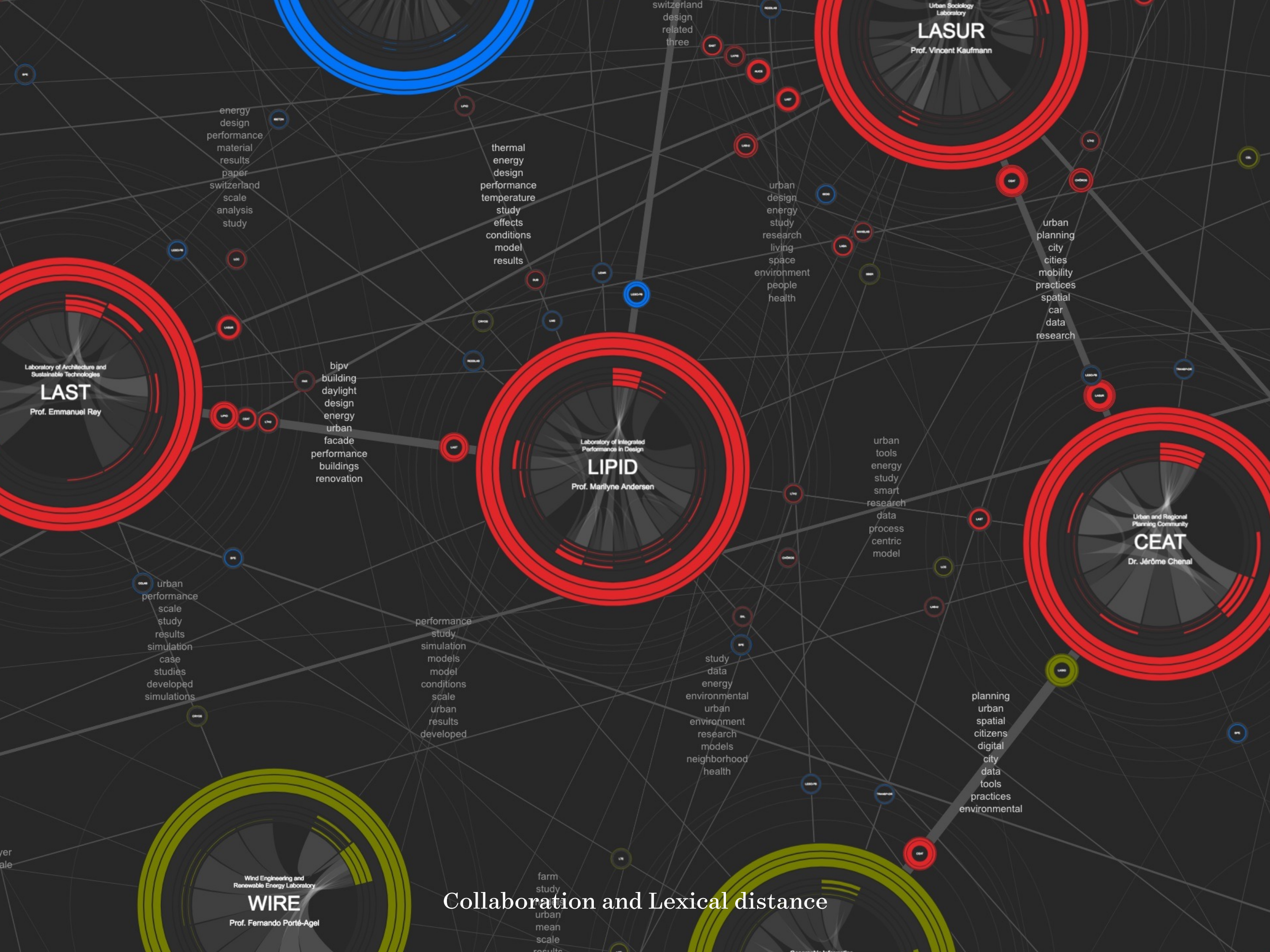


solar  
energy



Keywords as potential affinities.





Collaboration and Lexical distance

# Walkable Visualization























# Conclusions

Process of design

Collage

New visual grammars

Reduction and amplification

Self-recognition

Ethics

Threshold of privacy

Assembling individuals