



ENAC General Assembly

**Clusters: a tool at the service of collective intelligence,
interdisciplinarity and excellence in academic research.**

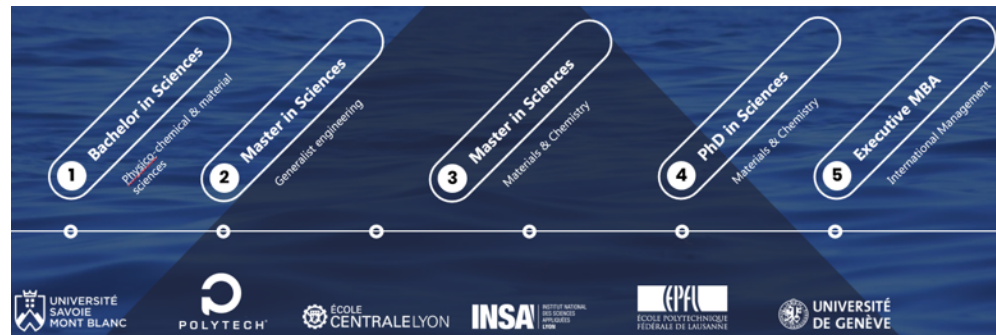
F. Dreyer

2nd December 2020

Cluster manager: Frederic Dreyer



- Academic background



- 10 years in industry + 2 years in Swiss Public Sector (Geneva State – head of Economy- research & Innovation department)

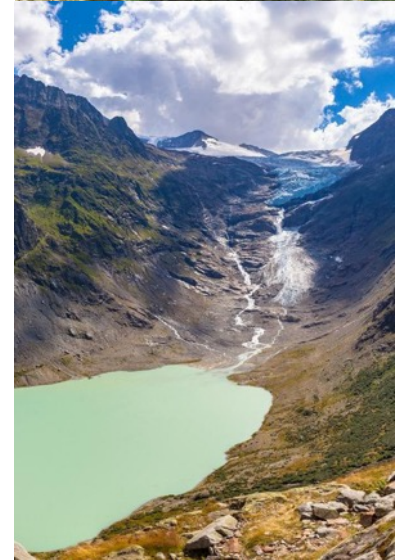
- 4.0/Digital Expertise



- Coach & Mentor for Innosuisse and Platinn
- Co-founder & President @Swiss Aware Association

ENAC School of Architecture, Civil and Environmental Engineering

Towards **finding solutions** for a **sustainable future** by engaging **together** to improve the **quality of our natural and built environment**



EPFL ENAC organizational structure

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- 3 Research Institutes
- 3 Teaching Sections (BA/MA)
- Tech transfer & Innovation support programs

- 2238 students
- 732 collaborators
- 54 nationalities

ENAC: Faculty for sustainability in the built and natural environment



ENAC

Tackle sustainability challenges

A unique model

Excellence in disciplinary research

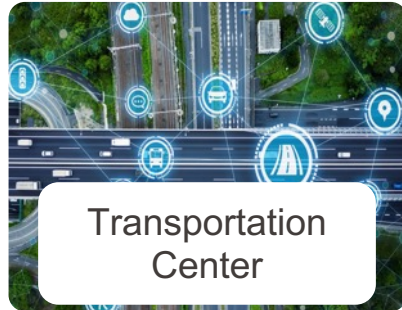
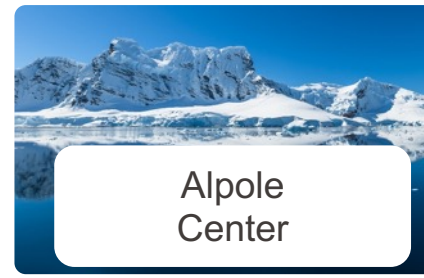
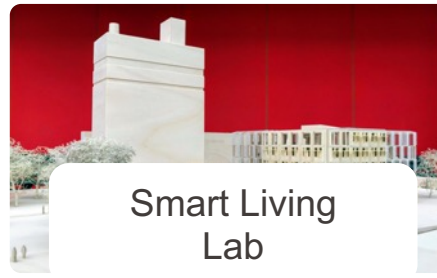
Challenges

- Inter- and transdisciplinarity
- Digital tools
- Innovation

ARTUANI BUNDOLEMBEN NG

EPFL ENAC related centers

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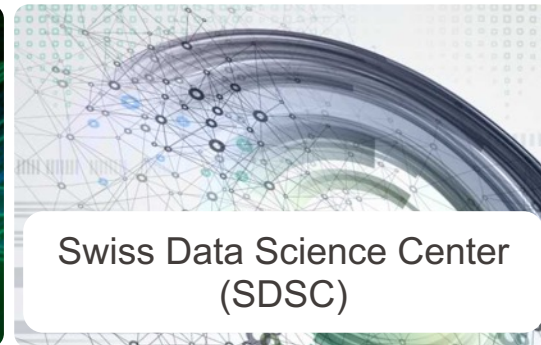




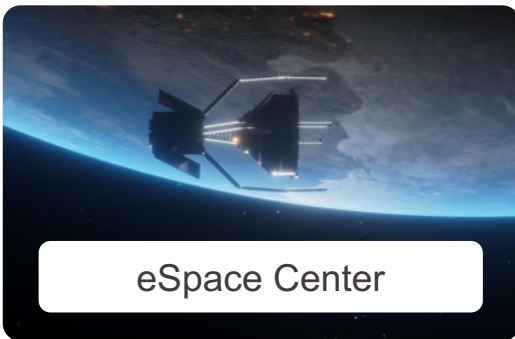
NCCR Robotics



Center for Digital Trust
(C4DT)



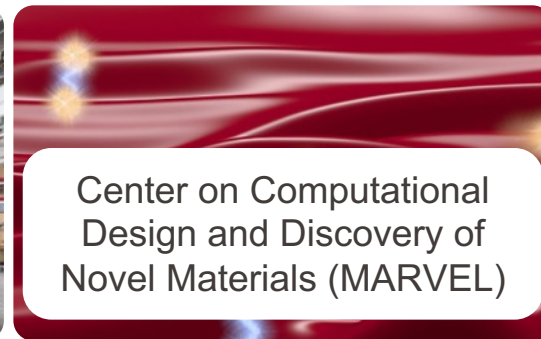
Swiss Data Science Center
(SDSC)



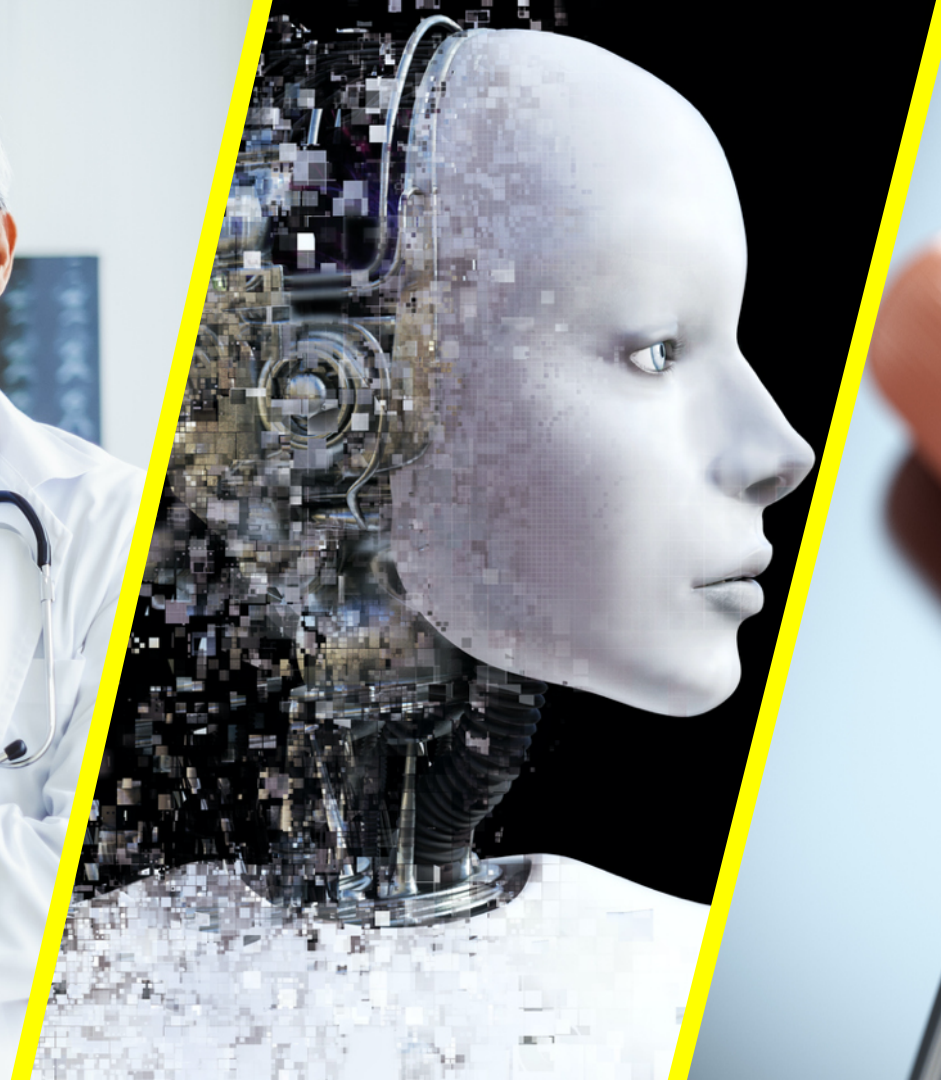
eSpace Center



NCCR Digital Fabrication



Center on Computational
Design and Discovery of
Novel Materials (MARVEL)





Car Rent





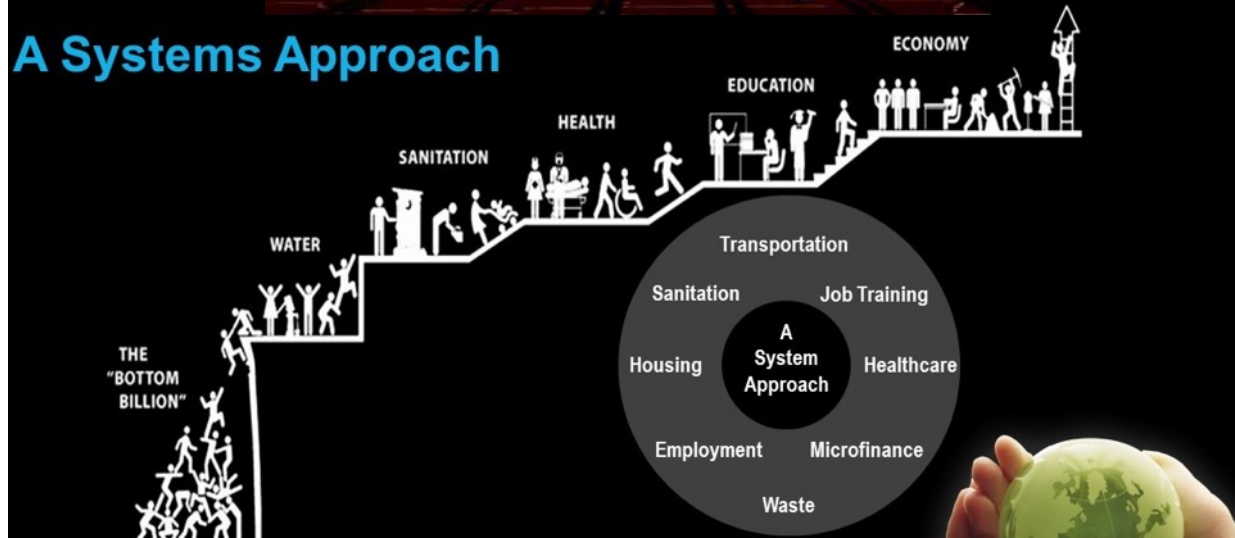


WHAT
NOW?

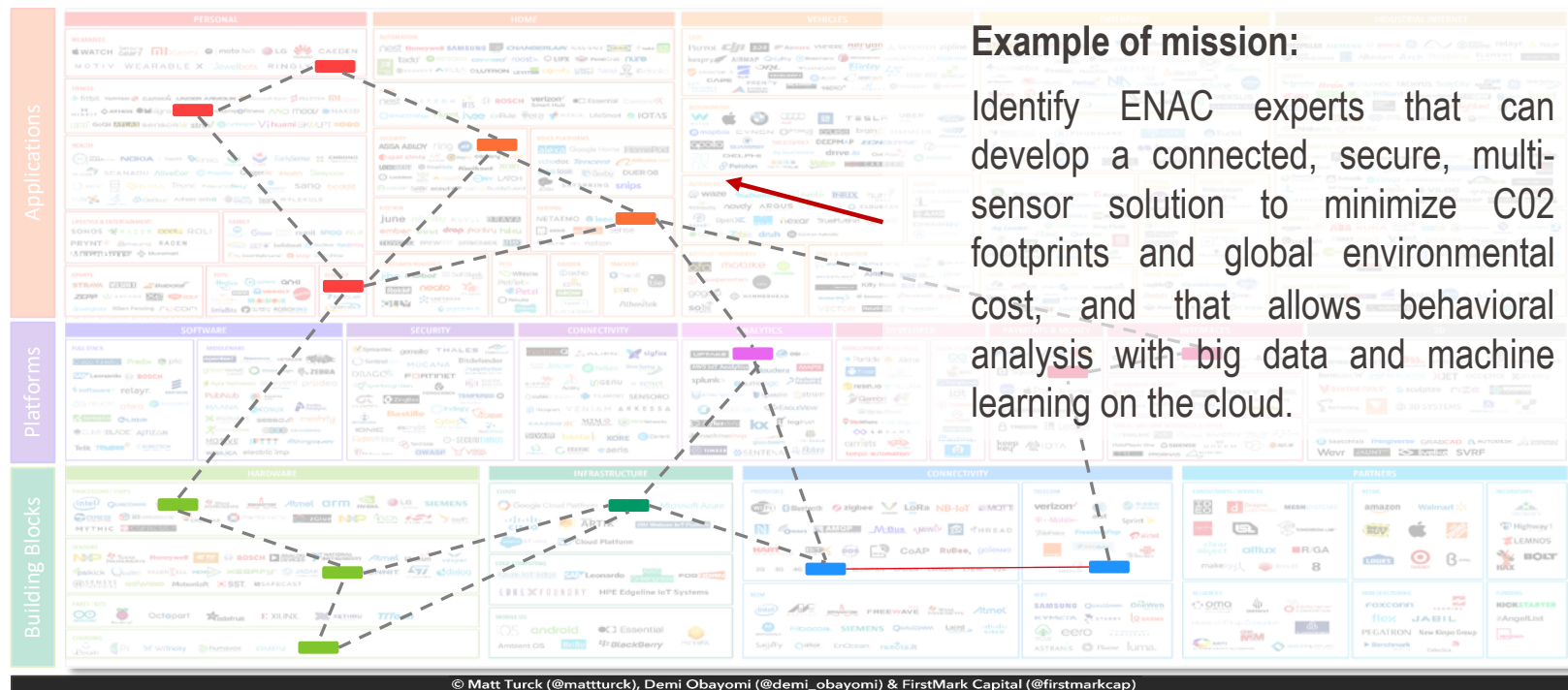




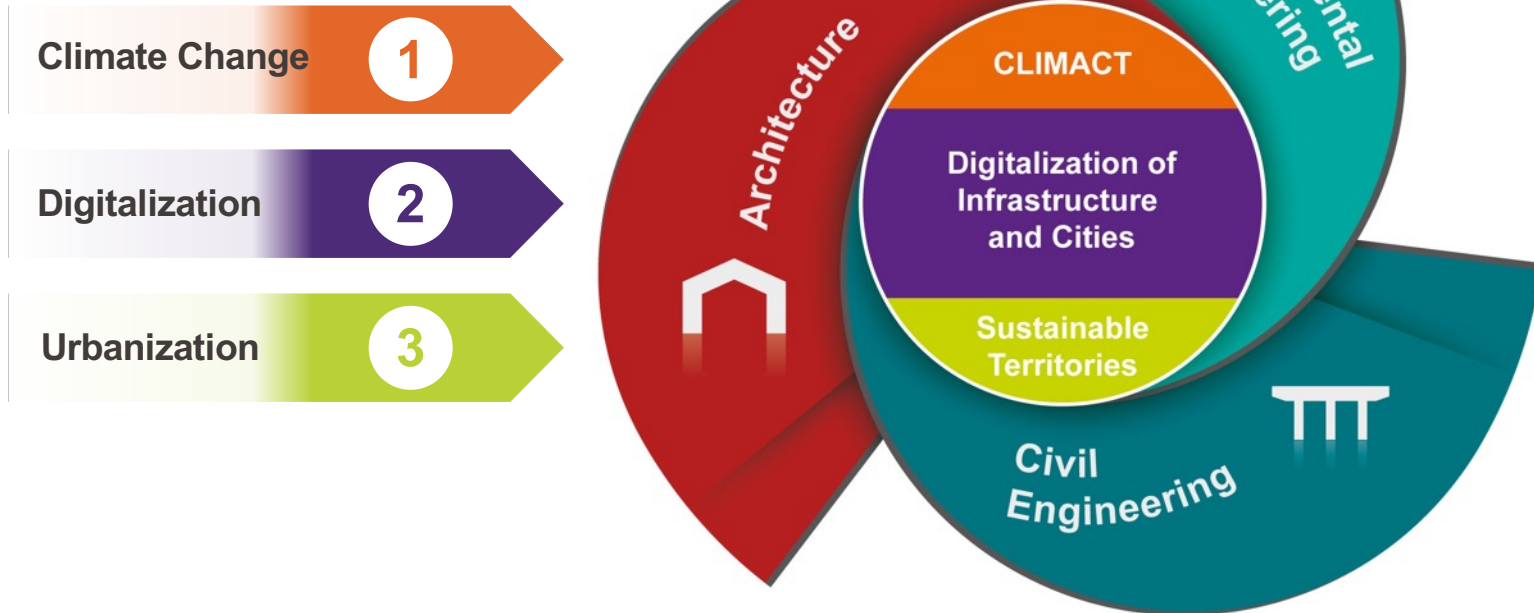
A Systems Approach



Value chain - oriented research excellence & "solutions"

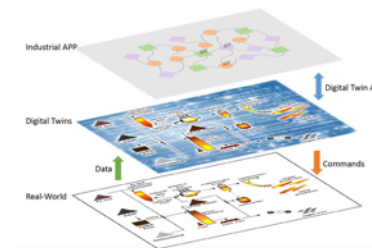


Fostering interdisciplinary research, teaching and innovation: 2 clusters and 1 center



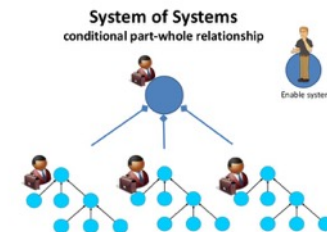
- **Digitalization of infrastructure and cities**

Leverage **digital tools** to provide **new ways of designing, constructing** and **sensing infrastructure and buildings**



- **Sustainable territories**

Integrate the **interdependencies** of the mobility of people and goods, energy production and efficiency, urban planning, urban ecology and urban metabolism



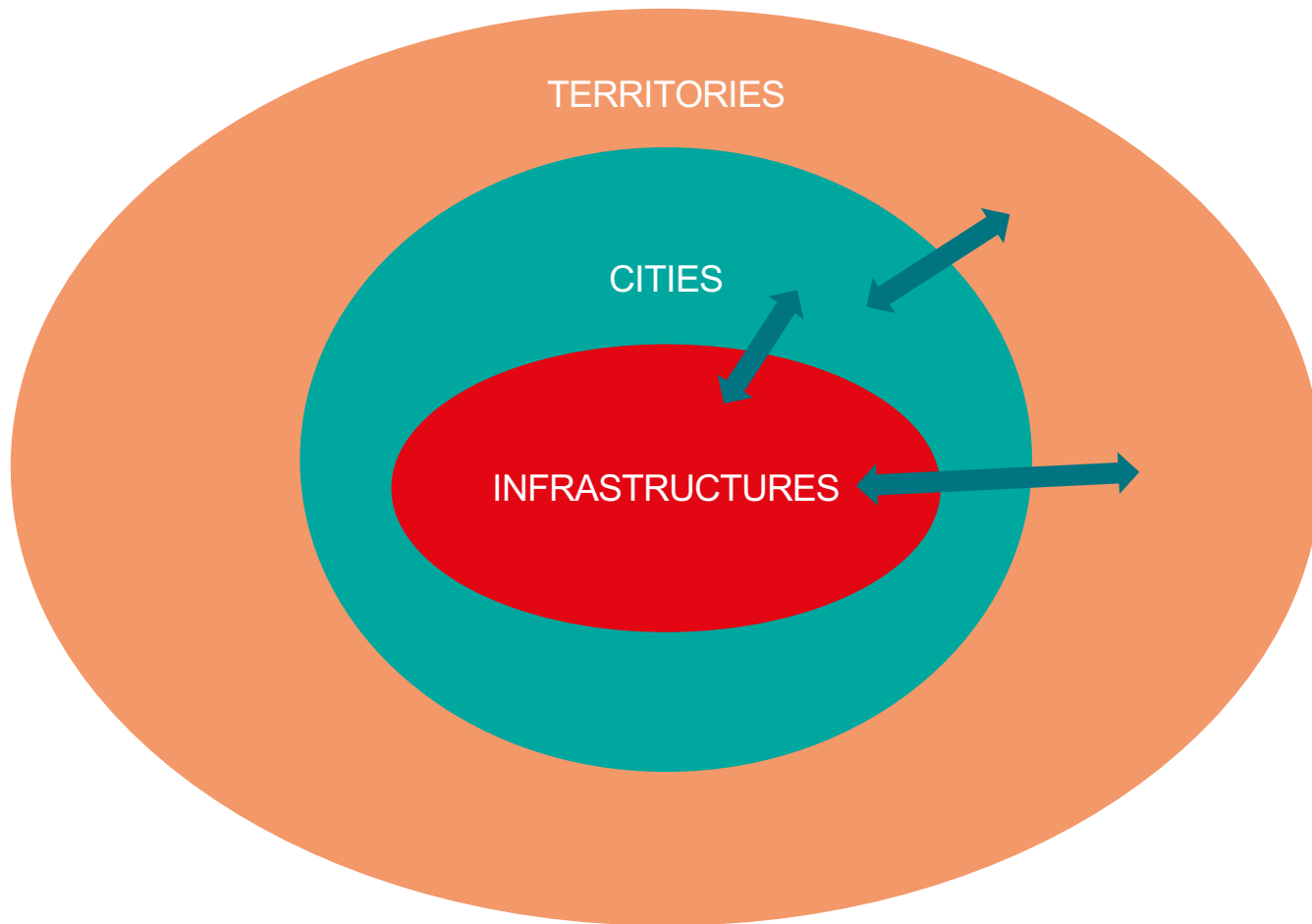
- **Climate Impact and Action Center (CLIMACT)**

Joint center with UNIL – under development

Anticipate, adapt to and mitigate climate change

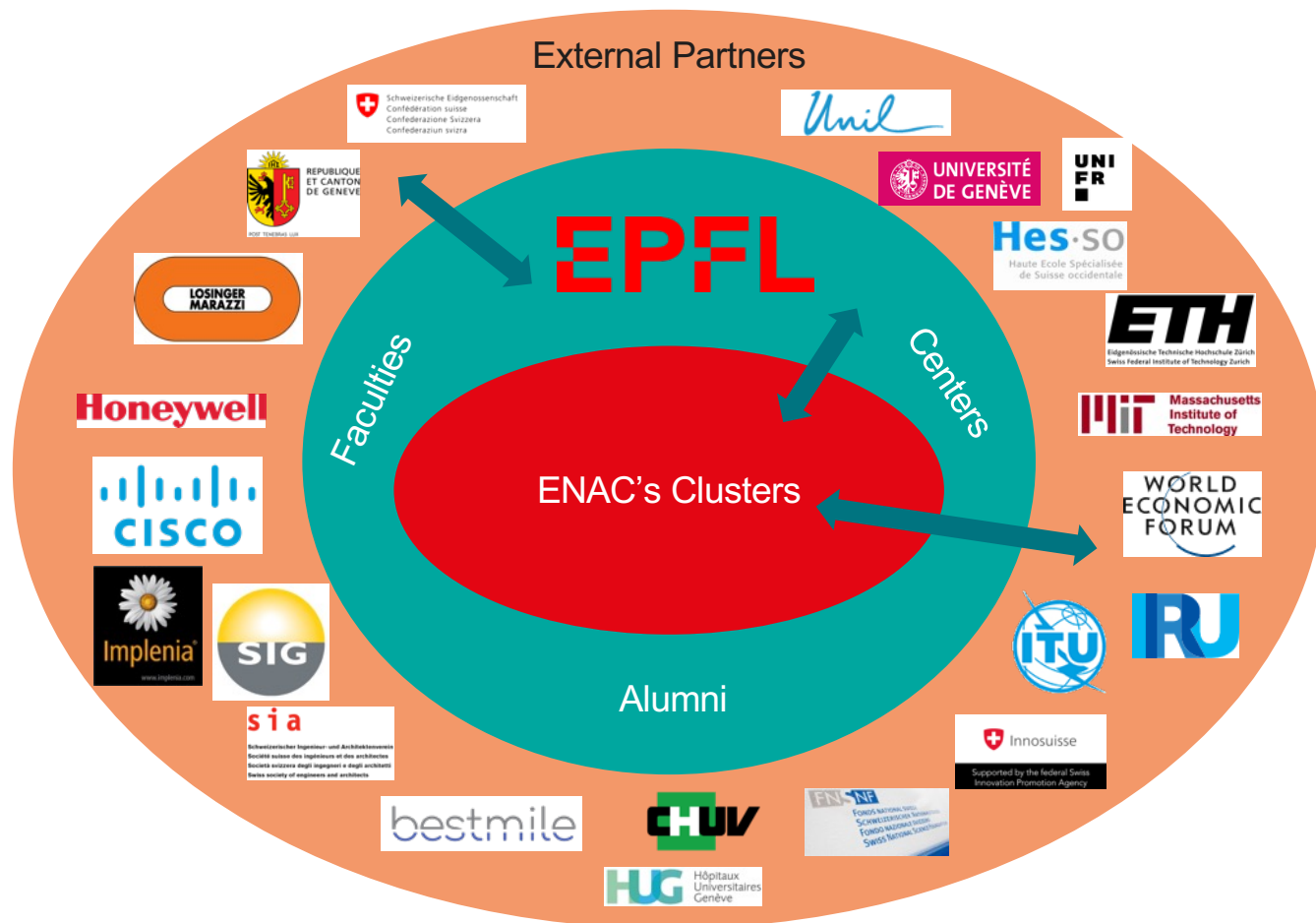


Ecosystem is key & ... permeable

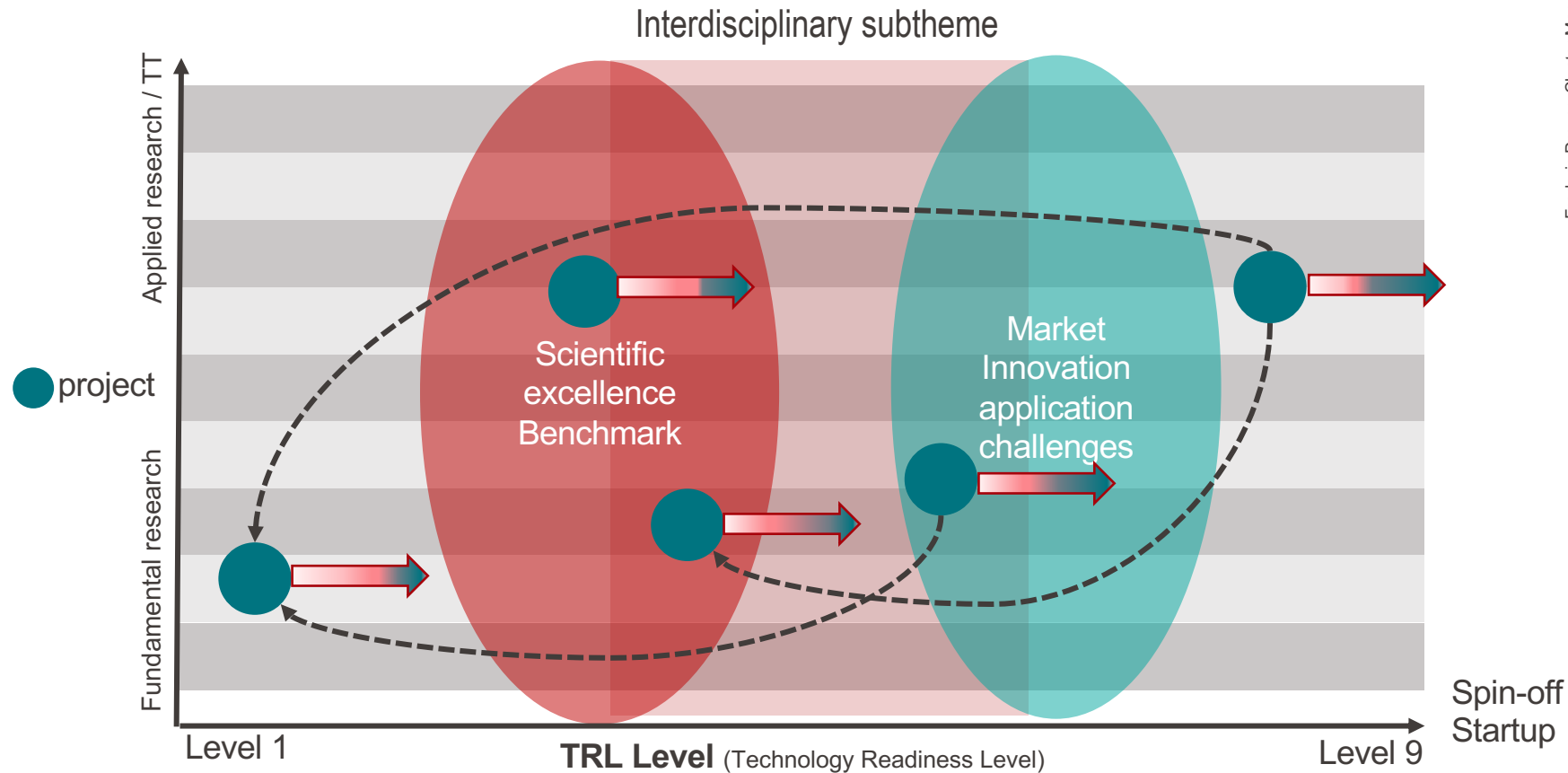


Ecosystem is key

From academics to private/public sectors (non-exhaustive)



An iterative project mode process



Fostering academic excellence by projects mode

A concrete case

GENEVA STATE Territory: Praille Acacias Vernets (PAV)

Extract from Geneva State website :

“The large Praille Acacias Vernets (PAV) project located on the territories of the cities of Geneva, Carouge and Lancy, represents the greatest housing potential in the canton and a unique development opportunity in the heart of the city. It is about transforming the largest and oldest industrial and craft zone in Geneva into a mixed urban district where it will be good to live and work.”

PAV : 6 main challenges

- 1- **Living spaces** (use, culture, climatic comfort, living)
- 2- **Housing for all** (housing performance, selection criteria for residents, etc.)
- 3- **Rethink travel** (pooling, sharing, etc.)
- 4- **Invite Nature to the city** (such as the water cycle).
- 5- **Sustainable city** (labeling, agriculture in the city)
- 6- **Economic activities**, transitional economy



- › **digitalization** (drone-based + indoor point-cloud scanning + BIM)
of an entire neighborhood
to inform its **sustainable** transition

Integrated interests:

- › from **public services** to get decision support data
 - Canton of Geneva: Département du Territoire, Fondation des terrains industriels, ...
- › from **industry** to showcase their technology
 - Scanways sarl, SwissBim, ...
- › from **ENAC labs** to get real-life data for case-studies
 - integration of scans and bims, CNPA?, ...?
 - assessment of reuse potential of building components, SXL, EAST?, ...
 - indoor/outdoor simulations of pedestrian mobility, LASUR?, VITA?, TRANSP-OR?, ...?
 - urban studies, HERUS?, LABU?, ...?
 - indoor/outdoor energy+comfort simulations, LIPID?, TEBEL?, HOBEL?, ...?
 - ... ?

SESSION PLÉNIÈRE

Cliquez sur le lien dans le
chat pour rejoindre la salle

*Click on the link in the chat
to join the room*

<https://go.epfl.ch/AG-ENAC-plenary>



THANK YOU!