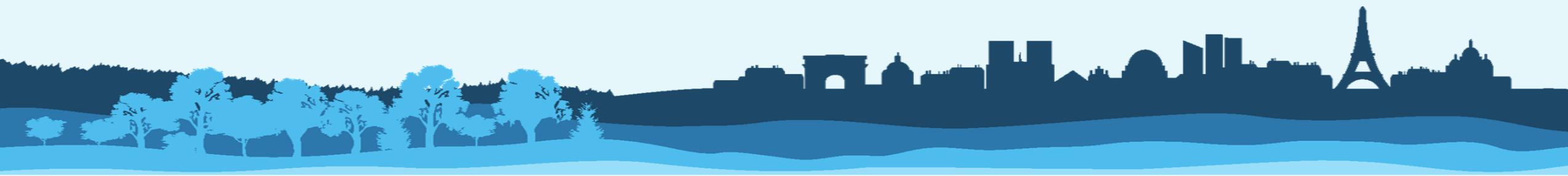


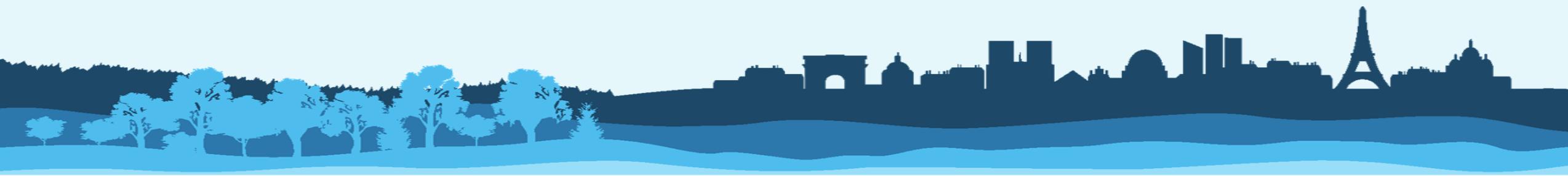


# PR[AI]RIE

PaRis Artificial Intelligence Research InstitutE



# Overview



# Our partners

- A “3IA” institute, created on September 1<sup>st</sup>, 2019
- Academic partners



- Industry partners



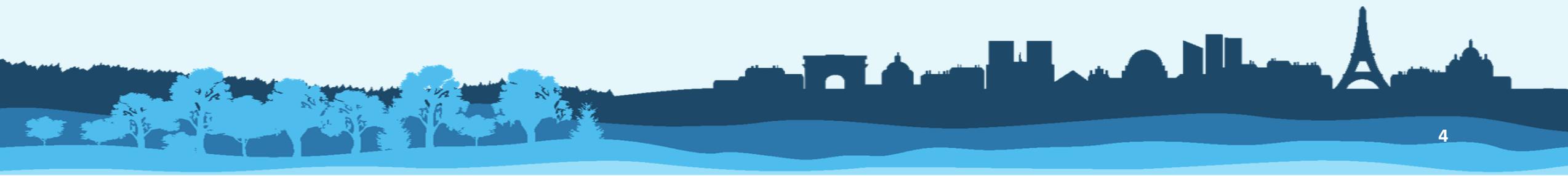
👉 Specificity: transverse project, federating several institutions within Paris



# Support from many actors of the ecosystem



And many others...



# Research ambition and strategy

## Ambition

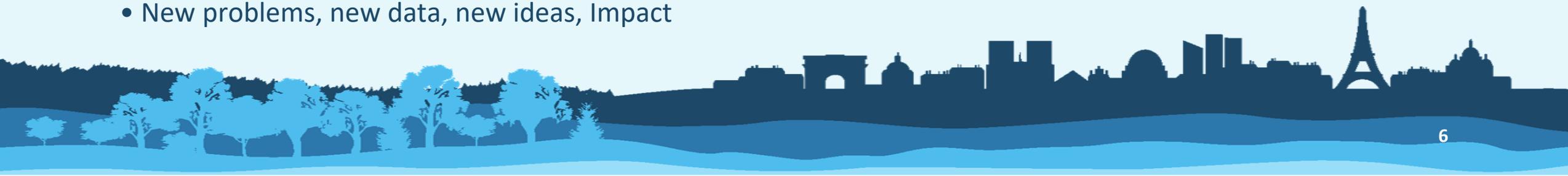
- Be a recognized international leader in AI research and education, with true socio-economic impact

## Strategy

- Excellence in research and education
  - Individuals: bring together, attract and retain top talents
  - Academic, industrial, and international partners
- A virtuous circle
  - Core and interdisciplinary fundamental AI research
  - Collaborative research with industry and applications

## Collaborative research for

- New problems, new data, new ideas, Impact



# Main focus: Science

## Core of the institute: the chairs

- Selected by the international jury:
  - 36 chairs
  - 9 springboards
- Research on core AI, at the interface with other disciplines, related to applications
  - **Core research** (12): Machine learning and optimization (3+2), Autonomous agents and multi-agent systems (2), Network data management (4), Cognition (1),
  - **Integration** (17): Computer vision (4), Data science (5+2), Natural language processing (2), Robotics (1), Statistical physics (2), Agents, HCI, NLP, psychology (1)
  - **Applications** (16): Biological imaging (2), Medical imaging (3+1), Clinical decision support (3+1), Genomics (3+3)
  - Open to SSH, ethics, and law

## Applications fields

- Health, transport, environment, but not only

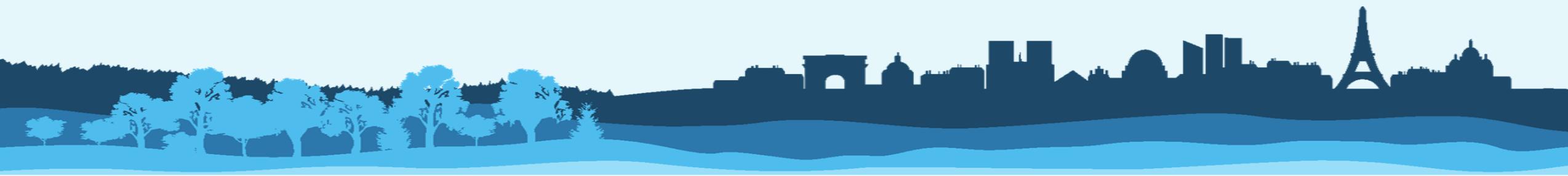
## Outreach

- Focus on diversity

<https://prairie-institute.fr/chairs/>



# Health focus



*Leveraging the potential of different medical imaging modalities*

*Challenges: “features” extraction, radiomic, multi-modale joint analysis*

*What for: early diagnosis, treatment response prognosis*

*Which diseases: neurodegenerative, onology*



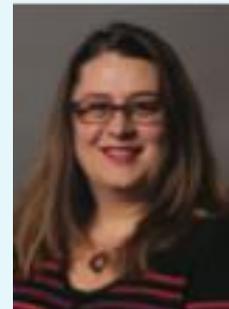
**Ninon Burgos**, Junior Research scientist  
CNRS,  
*Multimodal image analysis with deep learning.*



**Stanley Durrleman**, Senior Research scientist INRIA,  
Dir. ICM Centre for Neuroinformatics,  
*Disease modeling, neuroimagery.*



**Olivier Colliot**, Senior Research scientist  
CNRS,  
ARAMIS Lab Director.  
*Multimodal image analysis,  
Interpretable ML for neuroradiology.*



**Laure Fournier**, MD-PhD UP,  
*AI for radiomic, mutliscale image analysis.*

# Biological Imaging

*Model, analyze and process images of experimental biology*

*Challenges:* neural networks modeling, statistical learning with few annotations ...

*What for:* deciphering how evolution optimizes decision making

*Which diseases:* oncology, Alzheimer's disease



**Jean-Baptiste Masson**, Junior Research scientist Pasteur, *Bayesian inference, neural architecture and decision making.*



**Thomas Walter**, Junior Research scientist Mines ParisTech/Curie, *Microscopy, histopathology, Computational phenotyping.*

# Decision support systems

*Process, model, analyze clinical and real world data*

*Challenges: NLP on EHR, real world data,*

*What for: optimizing the patient pathway, evaluating responses, assembling cohorts for trials*

*Which diseases: cardiac failures, rare disease and chronic diseases*



**Stéphanie Allasonnière**, Pr. UP,  
PR assoc. Ecole Polytechnique  
*Bayesian modeling and stochastic  
optimization for health data.*



**Anita Burgun**, MD-PhD UP,  
*Medical informatics for personalized  
medicine.*



**Eloi Marijon**, MD-PhD UP,  
*AI for cardiac dysfunction detection.*



**Raphael Porcher**, MD-PhD UP  
*Personalized therapies, causale inference.*



## *Leveraging the potential of different medical imaging modalities*

*Challenges: large scale analysis of heterogeneous data*

*What for: understanding the biology of cancer, classifying tumors, predicting therapeutic response, proposing therapeutic targets*



**Chloé-A. Azencott** Ass. Prof. Mines, Founder of Paris Women in ML, *Statistical genetics.*



**Emmanuel Barillot**, Research scientist, Curie institute, *Computational biology for precision medicine.*



**Rayan Chikhi**, CNRS, *ADN Sequencing for Alzheimer's disease.*



**Eric Letouzé**, Junior research scientist INSERM, *Cancer Genomics.*

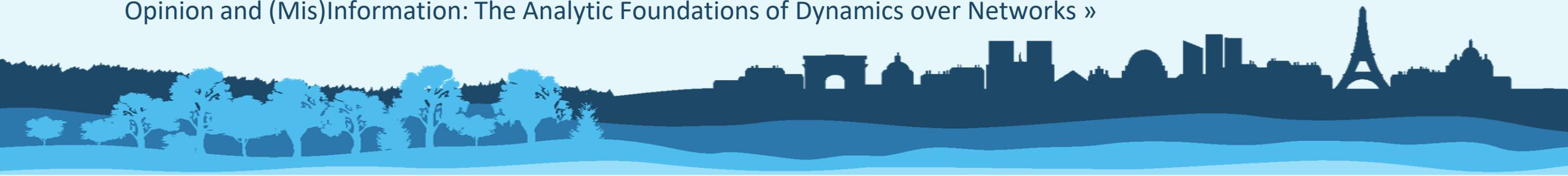


**Andrei Zinovyev**, Senior research scientist Curie, *Multi-omics and single cell.*



# Focus Healthcare: special news on COVID19

- « Face Au Virus »: exploitation of data from Facebook, (<https://www.psl.eu/initiative-scientifique-face-au-virus>)
- M-PRESTO: Modèles PRédictifs multi-Echelles Spatio-TempOrels (multi-scale spatio-temporel predictive models), for the management of the Covid-19 epidemic. Jamal ATIF, Emmanuel Bacry, Olivier Cappé, **Stéphane Gaiffas**, Laurent Massoulié, etc.
- Reverse folding of RNA with Monte-Carlo research. Tristan Cazenave
- Global business recovery assessment, using environmental and business data. Alexandre d'Aspremont via Kayrros
- Research tool to search DNA sequencing Covid data. Rayan Chikhi
- Simulations of customized prevention strategies for SARS-Cov2 infections. **Raphaël Porcher**, collaboration with CRESS, l'INSEAD, l'ENS Paris Saclay and UP
- Statistics for the clinical trial platform CORIMUNO-19: **Raphaël Porcher**
- Ministerial workshops. Emmanuel Bacry, including several Prairie fellow (LM, SA, SD, RP)
- Cross-institution research team for real life data analysis. **Stéphanie Allasonnière**, Stanley Durrleman, **Raphaël Porcher**, collaboration avec UP, ENS Paris Saclay, Ecole Polytechnique
- Laurent Massoulié: invited speaker at the C3.ai workshop from the Digital Transformation Institute on « Epidemics, Opinion and (Mis)Information: The Analytic Foundations of Dynamics over Networks »



# Education



# Education programs

## Goals

- Increase the number of people receiving AI training
- Promoting awareness of ethical and legal issues
- Lifelong professional education

## 👉 Synergies between PSL and UP

- Master 2 : Bioentrepreneurs, MVA Health track, IASD, MASH
- MD-PhD selective program: new track on IA
- Executive masters and lifelong training programs

# Conclusion

- Originality and strengths
  - Bringing together top academic institutions in Paris
  - Club of major industry partners
  - Excellence in research and education
  - Fertile field for innovation in Paris
- Short terms plans
  - plan new chairs
  - Increase women participation
  - Involve start-ups

## Newsletter:

- mail to: [sympa@inria.fr](mailto:sympa@inria.fr)
- subject:subscribe prairie\_news

