



RICE UNIVERSITY

# CINEMA

## Workshop on Clinical and Environmental Metagenome Analysis

July 3rd - 9th, 2023  
Rice Global Paris Center

# Acknowledgements

- Rice Global Paris Center
  - Dr. Garry White, Camille Evans, Meredith Bonner, Lisa Ross, Estelle Dubernard
- Keynote
  - Dr. Nicola Segata
- All of our instructors and invited speakers
- All of you for registering to attend!

# Course Directors



**Todd Treangen**

Computer Science, Rice University

[treangenlab.com](http://treangenlab.com)

Expertise: Computational tools for analyzing  
microbiome communities



**Lauren Stadler**

Civil & Environmental Engineering, Rice University

[stadler.rice.edu](mailto:stadler.rice.edu)

Expertise: Water and wastewater microbiomes

# Treangen Lab @ Rice University



Advait Balaji

Rice University  
PhD student



Bioinformatics, Graph Theory,  
Pathogen Detection and  
Analysis, Machine Learning,  
Microbial genomics and  
Metagenomics



Bryce Kille

Rice University  
PhD student



String algorithms,  
Pangenomics, High  
performance computing,  
Cheminformatics



Kristen Curry

Rice University  
PhD student



Computational Biology,  
Bioinformatics, Microbial  
genomics and Metagenomics



Michael Wang

Rice University  
PhD student



Computational Biology,  
Bioinformatics, Microbial  
genomics and Metagenomics



Nicolae Sapoval

Rice University  
PhD student



Computational Biology,  
Bioinformatics, Microbial  
genomics and Metagenomics,  
Graph algorithms and data  
structures, Deep learning



**SEQSCREEN**  
Sequence of Interest Screening



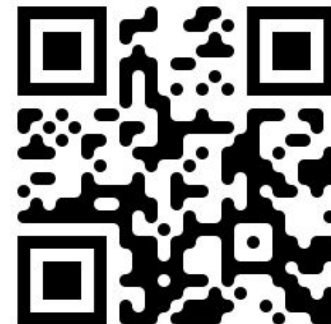
Yilei Fu

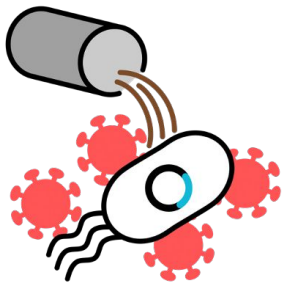
Rice University  
PhD student



Yunxi Liu

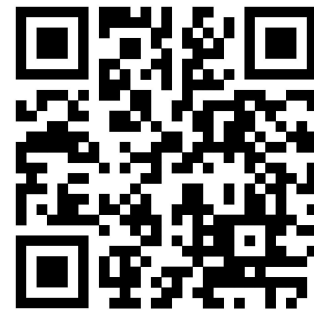
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PhD student





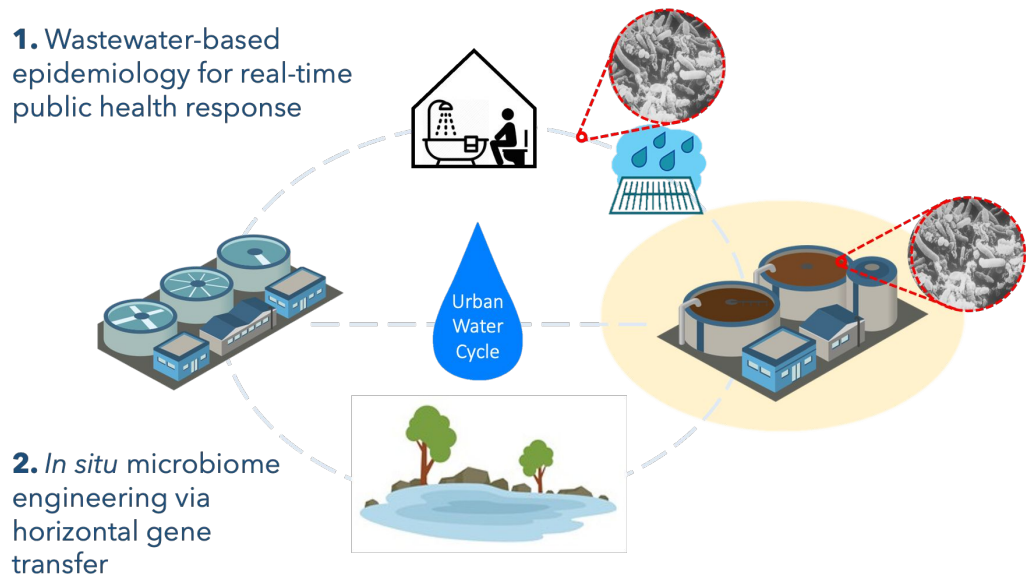
STADLER GROUP  
@RICE

**Vision:** Advance sustainable and safe urban water systems to protect human and environmental health



[Lauren.Stadler@rice.edu](mailto:Lauren.Stadler@rice.edu)

**1.** Wastewater-based epidemiology for real-time public health response



**2.** *In situ* microbiome engineering via horizontal gene transfer

[stadler.rice.edu](http://stadler.rice.edu)

# Course TAs



**Kristen Curry**  
PhD Student, Computer Science  
Rice University  
Houston, TX, USA



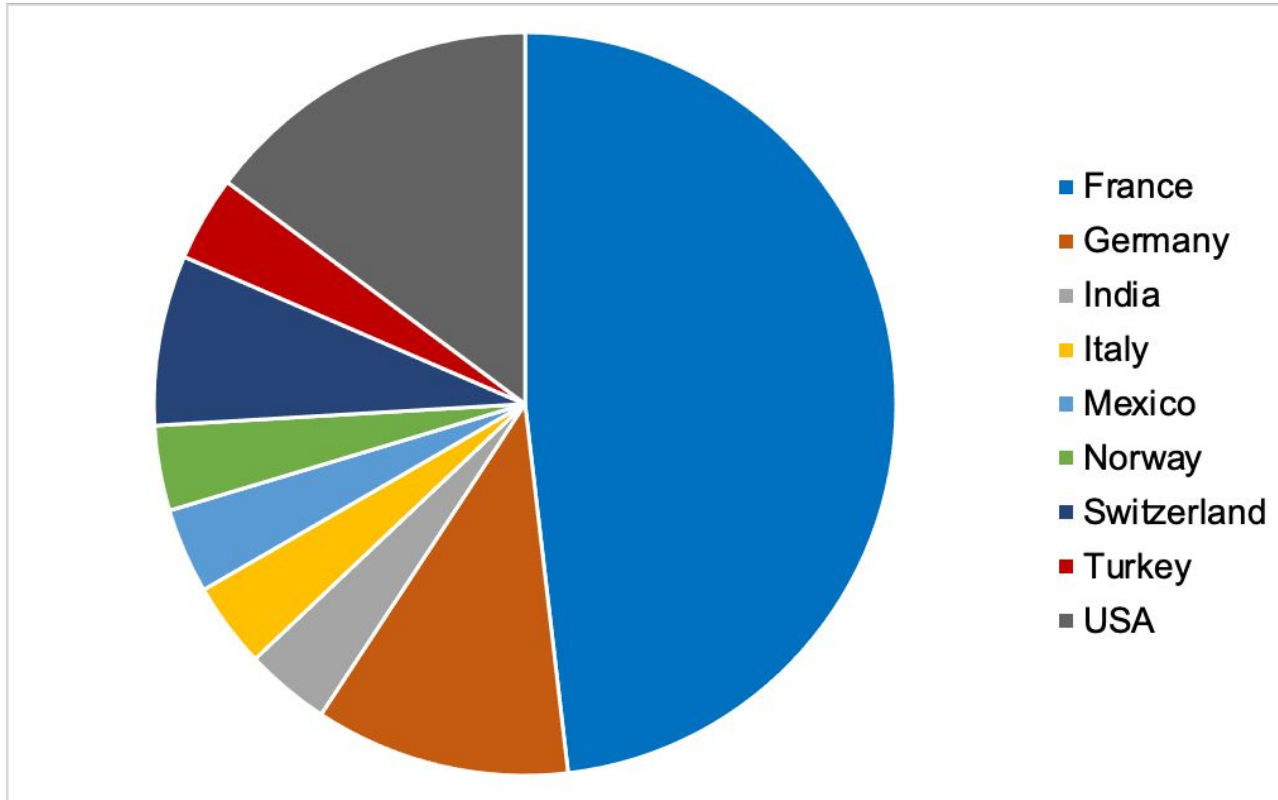
**Ryan Doughty**  
BS/MS Student, Computer Science  
Case Western Reserve College  
Cleveland, OH, USA

# Why organize a workshop on metagenomics in Paris?

1. Serve as a primer on foundational topics in microbiome analysis from leaders in the field;
2. Discuss cutting edge approaches, tools, and applications of microbiome analysis of clinical and environmental samples;
3. Encourage discussion, engagement, and collaboration



# Participants: Where are you from?





# **Agenda for the week**

# Today, Monday, July 4: Welcome and Keynote

Keynote:

**Dr. Nicola Segata**

Cellular, Computational, and Integrative  
Biology

University of Trento, Italy



# Tuesday, July 4: Sampling and Sequencing

Instructor:

**Dr. Joshua Quick**

School of Biosciences

Institute of Microbiology and Infection

University of Birmingham, UK



# Wednesday, July 5: Environmental Microbiome Analysis

Instructor:

**Dr. Jeseth Delgado Vela**

Civil & Environmental Engineering

Duke University, USA



# Thursday, July 6: Clinical Microbiome Analysis

Instructor:

**Dr. Sara Vieira-Silva**

University Medical Center

Johannes Gutenberg University Mainz,  
Germany



# Friday, July 7: Bioinformatic Tools and Approaches

Instructor:

**Dr. Alex Dilthey**

Institute of Medical Microbiology

University Hospital of Dusseldorf,  
Germany



# Invited Speakers



**Wednesday July 5**

**Dr. Lucie Bittner**  
Sorbonne Université

*“Bridging the gap between  
(meta-)omics and  
biodiversity perceptions  
-Can we ignore the “dark”  
sequences?”*



**Thursday July 6**

**Dr. Sonia Villapol**  
Houston Methodist

*“Changes in the gut  
microbiome in  
Alzheimer's disease”*



**Friday July 7**

**Dr. Zam Iqbal**  
EMBL-EBI

*“Using revived 100-year old  
bacteria and new  
algorithms to study plasmid  
evolution”*



**Saturday July 8**

**Dr. Laurent Moulin**  
Eau de Paris

*“SARS-CoV-2 genome  
monitoring in wastewater by  
the French OBEPINE network,  
deciphering the viral dynamics  
and VOC evolution”*



# Daily schedule

9:30 - 10:30 am | **Morning session**

9:15 - 9:30 am | Check-in/Breakfast

9:30 - 10:30 am | Lecture part 1

10:30 - 11:00 am | Coffee break

11:00 - 12:00 pm | Lecture part 2

12:00 - 1:30 pm | **Lunch/Networking**

1:30 - 4:00 pm | **Afternoon session**

1:30 - 2:30 pm | Practical session or hands-on demo part 1

2:30 - 3:00 pm | Coffee break

3:00 - 4:00 pm | Practical session or hands-on demo part 1

4:00 - 6:00 pm | **Invited speaker and social**

## Saturday, July 8: Putting it all together

Bring your own data and research questions!

**We will provide datasets for those who don't have one.**

**Workshop dinner!** 6:00 - 8:00pm near Bibliothèque Nationale, details to come.

## Sunday, July 9: Closing

Half day (end before lunch).

# Software and hardware

- Rstudio, bioconda, and command line terminal will be required for those that would like to run the interactive demos and training
  - Detailed instructions will be posted to slack on Tuesday/Wednesday
- Unable to run on your laptop? Rice University has allocated two servers for CINEMA 2023 usage
  - We will provide login details to all participants on Friday (see Kristen or Ryan for details)

# Important details

**Front door code:** 15B87

**Wifi info:** RGP Center Guest

**PW:** RICE\*Guest

CINEMA Slack will be used to communicate updates and workshop information. Please join ASAP if you have not yet!

Detailed schedule and information for each day will be posted on our workshop github site:

<https://github.com/cinemaparis/2023>



# Details for tomorrow

- Dr. Joshua Quick will be covering sampling, sequencing, and more
- We will have lightning presentations at 16h (everyone should prepare a 2 minute presentation describing your research interests!)
- We plan to have a group photo tomorrow (Tuesday) after the lightning presentations