



Dear Readers,

We are happy to announce the release of our fourth SanDAL newsletter.

During the last months, the SanDAL team has been busy continuing to perform great research within the Mathematical Statistics and Data Science (MS&DS) group at the University of Luxembourg, focusing on the following two scientific areas:

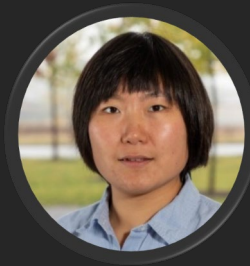
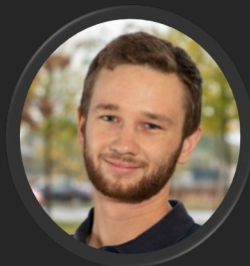
- 1. High-Dimensional Data Analysis**
- 2. New Mathematical Tools for Contemporary Statistics**

In this newsletter you will learn about the advancement of project activities and other initiatives taken by our motivated and dedicated SanDAL team:

- ❖ Organization of the 2nd SanDAL Summer School
- ❖ First Master student promotion in Data Science
- ❖ Organisation of Scientific Seminars

To be up to date with the latest project news and forthcoming events, visit our SanDAL website at: <https://sandal.uni.lu>

Meet the SanDAL Team



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2nd SANDAL Summer School



3-Day Meeting of
statisticians in Paris

18-20 July 2022

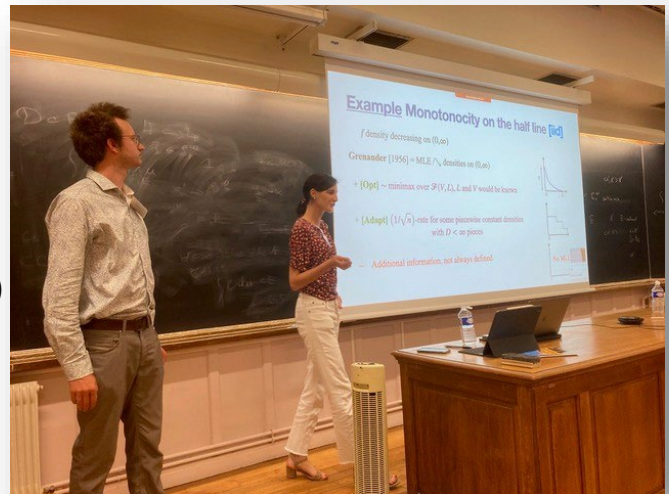
From July 18 to 20, 2022, around 40 statisticians gathered in Paris for a dynamic 3-day meeting hosted by the *Institut Henri Poincaré*. The event offered participants an invaluable opportunity to engage with the latest developments in **Statistical Learning** and **Shape-Constrained Estimation**.

Organized and funded by the *University of Luxembourg* and *SANDAL*, the meeting featured two insightful mini-courses:

- *Nonparametric Inference under Shape Constraints* by **Richard Samworth** (University of Cambridge)
- *Mathematical Aspects of Gaussian Processes for Machine Learning* by **Ingo Steinwart** (University of Stuttgart)

In addition to these mini-courses, attendees enjoyed a series of talks and sessions by distinguished researchers, including:

- **Gilles Blanchard** (University of Paris Saclay)
- **Olivier Catoni** (CREST)
- **Alain Celisse** (Université Paris 1 Panthéon-Sorbonne)
- **Oliver Feng** (University of Cambridge)
- **Hélène Halconruy** (University of Luxembourg)
- **Guillaume Maillard** (University of Luxembourg)
- **Martin Wahl** (Humboldt-Universität zu Berlin)



Beyond the academic sessions, the event also featured a social gathering: a charming boat tour on the Seine. Participants had the chance to experience Paris from a new perspective, and as Hélène Halconruy noted, *“Everyone seemed really happy with the quality of the presentations and the friendly and warm atmosphere.”*

The meeting not only showcased cutting-edge research but also fostered lively discussions among statisticians and young researchers, creating a platform for future collaborations in these evolving fields.





First Master student promotion in Data Science

Launched in September 2021 with 17 students from across the globe, the Master in Data Science was officially inaugurated on February 7, 2022, at the University of Luxembourg's Belval campus. The event highlighted the program's innovative, multidisciplinary approach, emphasizing deep learning and practical workshops. Prof. Yannick Baraud, Course Director, presented the comprehensive curriculum, which includes modules in big data analytics, mathematical statistics, data mining, and network analysis. The program aims to equip students with the skills to become high-profile data scientists, ready for careers in research, insurance, economics, and healthcare. Student testimonials were shared by Max Sinner from Luxembourg and Claire Wang Ya from China, both highlighting the program's broad career potential and focus on cutting-edge technologies like machine learning. The inaugural event concluded with a festive gathering, fostering networking and exchange among attendees. The first cohort will graduate in 2023.



Project seminars

Dr. Yannick Baraud has launched a series of seminars through SanDAL, dedicated to exploring the latest topics in mathematical statistics, probability, and data science. Here's a look at two of this year's seminars:

❖ **Christophe Ley** – *Statistics Meets Sports. When Figures Are More Than Numbers.*

The speaker introduced participants to the dynamic and expanding world of sports analytics. He began with an overview of how data analysis in sports took shape, followed by real-world applications that showcase how statistical modeling, particularly in football, can predict game outcomes with impressive accuracy. By integrating probability models and machine learning, these methods have even shown an edge over traditional betting predictions. He also explored potential applications in sports medicine, especially in predicting and managing injury risks for athletes.

❖ **Yassine Nachit** (*Cadi Ayyad University*) – *Local Times for Systems of Non-Linear Stochastic Heat Equations.*

The speaker explored non-linear stochastic heat equations and the conditions under which certain mathematical properties, like "local time," can be defined for these systems in lower dimensions. His work highlights the distinct differences between non-linear and linear systems in modeling irregularities. A key outcome of his research is a new method for estimating changes in density over time, offering valuable insights for future studies in stochastic processes.