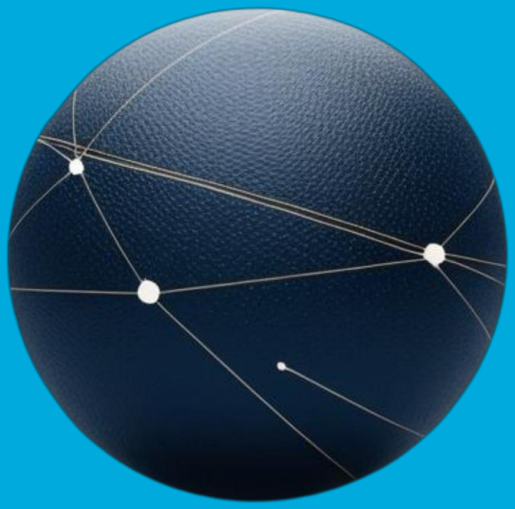
ADVANCES IN DIRECTIONAL STATISTICS

CELEBRATING KANTI MARDIA'S 90TH BIRTHDAY



ADISTA

LUXEMBOURG

10-12 SEPTEMBER

PROGRAM AND NOTES

UNIVERSITY OF LUXEMBOURG
Department of Mathematics

LUXEMBOURG STATISTICAL SOCIETY

ADISTA 2025, Luxembourg
Celebrating Kanti Mardia's 90^{th} birthday

Contents

About

ADISTA 2025

Welcome to the 2025 International Workshop on Advances in Directional Statistics – a premier event dedicated to fostering advancements in Directional Statistics. Since our inaugural meeting in 2014, a vibrant and growing community of researchers has emerged, driven by a shared passion for both theoretical and applied aspects of our dynamic field.

This year, we are honored to celebrate the illustrious career of Professor Kanti Mardia, whose pioneering contributions have significantly shaped the landscape of statistical science. In tribute to Professor Mardia 90th birthday, this workshop aims to catalyze research, inspire innovative approaches, and cultivate lasting collaborations among experts in Directional Statistics.

To learn more about the conference, venue and program, check the ADISTA 2025 website (or scan the QR code below).

Organizing committee

Prof. Christophe Ley
Prof. Francesco Lagona
Prof. Giovanna Jona Lasinio
Prof. Rosa María Crujeiras Casais
Prof. Andrea Meilan Vila
Dr. Gaspard Bernard
Dr. Ola Rønning
Sophia Loizidou

Useful Information

History of Belval

Esch-sur-Alzette has become the second largest city in the country through a history as rich as it is eventful, which dates back more than 5 millennia.

The steelworks in Belval
Photo credits: belval.lu

From Middle Age to the 20th century

It was on April 12, 1128, in a bull from Pope Honorius II, that the name “Asch” appeared for the first time, the first name for what was soon to become the City of Esch-sur-Alzette. On May 16, 1328, John the Blind (John 1st of Luxembourg, King of Bohemia, 1296-1346) gave it the status of “free city”.

Numerous enemy incursions and major fires followed. In 1677, the fortifications of the City were destroyed by order of Louis XIV and during the French Revolution of July 1830, the City became a simple village again. Esch rose from its ashes to become, by Grand-Ducal decree of October 12, 1841, capital of the canton of Esch.

The 19th century was a prosperous period for the industrial development of the "Iron Metropolis". It was around the middle of this century that the discovery of iron ore would influence the whole of the Grand Duchy and especially the southern region. Open-pit mines, galleries and the first iron and steel factories were not long in coming to light in Esch-sur-Alzette and its surroundings.

University of Luxembourg

Founded in 2003, the University of Luxembourg is the only public university of the Grand Duchy of Luxembourg. Multilingual, international and research-oriented, it welcomes more than 8,000 students and 300 professors from 150 nationalities.

The initial goal of the Belval campus was to create an "environment for research" without any plan for welcoming students. It took several years for the idea of transforming the old steel mills in Belval not just as a research centre, but as a university to take shape. The project encountered numerous difficulties for revitalising Belval partly driven by the arduous process of decontaminating

the soil at the site. Initially the idea was that the university would draw inspiration from other new universities in the surrounding areas, specifically Louvain-la-Neuve with the aim of drawing in roughly 30,000 students.

When founded in 2003, the university was a combination of four separate education and research institutions: the Centre universitaire, Institut supérieur d'études et de recherches pédagogiques, Institut supérieur de technologie, and Institut d'études éducatives et sociales. The main academic life would remain spread over 3 spots: Campus Limpertsberg, Campus Kirchberg and Campus Walferdange.

In 2015, the university management and central administration moved to Belval which became the new headquarters of University as a symbol of the country's vision to invest in high-quality public research, a major contribution to Luxembourg's economic future.

The values of the university are driven by excellence, agility, inclusiveness and fairness, independence and an international and multilingual environment grounded in the society.

Sources: `https://wwwen.uni.lu/university/about_the_university` / ROUX Student Magazine 1st issue, November 2022

Venue

Talks will be held at the "Maison du Savoir" on the Belval Campus in Esch-sur-Alzette, Luxembourg. The amphitheater is **MSA 3.110**, on the third floor of the building.

Coffee breaks and lunches will be offered on the third floor of the building.

Wi-Fi information: The University of Luxembourg provides access to an eduroam network.

The **conference dinner** will be held at "Schmelz" restaurant, located between the conference building "Maison du Savoir" and the hotel "Ibis Esch Belval".

The **reception** will take place at the ground floor of "Maison du Nombre".

The **karaoke** will take place at Cafe Coyote Belval, located at 10-12 Av. du Swing, 4367 Esch-Belval Belvaux Belval.

Hotel for speakers and attendees will be at "Ibis Esch Belval" located at 12 Avenue du Rock'n'Roll, 4361 Esch-sur-Alzette, Luxembourg. It is 9 minutes walking distance (800m) from the conference building "Maison du Savoir".

Sponsors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Timetable

Wednesday, September 10

8:30–8:45	Registration
8:45–9:00	Opening event
9:00–10:15	Session 1, Chair: John T. Kent **Kanti V. Mardia** – The projected normal signal-to-noise ratio distribution with applications to biomedical signal analysis. **Thomas Hamelryck** – AlphaFold's roots in directional statistics and probability kinematics. **Christophe Ley** – A versatile trivariate wrapped Cauchy copula with applications to toroidal and cylindrical data.
10:15–10:45	Coffee break
10:45–12:00	Session 2, Chair: Francesco Lagona **Toshihiro Abe** – Expectation-Maximization for circular Cauchy distributions: a compact representation. **Sophia Loizidou** – Optimal symmetry test on the torus. **Yolanda Larriba** – FMM-Based modeling of peak width and wave duration in oscillatory signals over the circular domain.
12:00–13:30	Lunch
13:30–14:20	Session 3, Chair: Arthur Pewsey **Andrew Wood** – Robust spherical regression in an extrinsic semiparametric framework. **Hang Liu** – Quantiles and Quantile Regression on Riemannian Manifolds: a measure-transportation-based approach.
14:20 – 15:30	Poster flash presentations, Chair: Andrea Meilan Vila
15:30–16:00	Coffee break
16:00–16:50	Session 4, Chair: Christophe Ley **Davy Paindaveine** – Spherical Oja means. **Thomas Verdebout** – Hypothesis testing around the uniform distribution on spheres.
19:00–	Reception (Ground floor of Maison du Nombre)

Poster presentations: 2-minutes flash presentations

1. Marco Mingione, Copula-based hidden semi-Markov models for cylindrical time series.

1. Chiara Passamonti, Bias reduced kernel estimator with contaminated angles.

2. Dario Palumbo, The Dynamic Torus: with an application to wind and wave direction in the Adriatic.

3. Yoichi Miyata, A Hidden Markov Model with the Weibull-Extended Sine-Skewed von Mises Distributions as Emission Densities.

4. Priyanka Nagar, Regularized directional regression models: An environmental data application.

5. Diego Bolon Rodriguez, A likelihood ratio test for circular multimodality.

6. Najmeh Nakhaei Rad, Model-based clustering using a new mixture of circular regressions.

7. Yasuhito Tsuruta, Bias correction for kernel density estimation with spherical data.

8. Alberto Fernandez de Marcos, Testing uniformity on the sphere: from pairs to m-tuples.

9. Delene van Wyk, Insights into the construction of an alternative bivariate cardioid distribution.

10. Xiangyu Wu, Asymmetry Analysis of Bilateral Shapes.

11. Houyem Demni, Robust measures of circular dispersion with an outlier detection rule.

12. Adelaide Figueiredo, Estimation and classification for a folded directional distribution.

13. José E. Chacón, Unconstrained kernel density estimation on the sphere.

14. Nicolas Conanec, Nonparametric estimation for censored circular data.

15. Adrian Fischer, Stein's method of moments on the sphere.

16. Alfred Kume, Rolled Gaussian process models for curves on manifolds.

17. Peter Jupp (online presence), Testing uniformity of orbits of binary stars.

Thursday, September 11

9:00 – 10:15	Session 5, Chair: Shogo Kato **Francesco Lagona** – Wrapped Cauchy copulas for bivariate directional densities. **Arthur Pewsey** – On Jeffreys's cardioid distribution. **Tomoaki Imoto** – Method for constructing tractable distributions on the cylinder and its application to time series modelling.
10:15–10:45	Coffee break
10:45–11:35	Session 6, Chair: Toshihiro Abe **Thanh Mai Pham Ngoc** – Adaptive estimation for nonparametric circular regression with errors in variables. **John Kent** – Extreme behavior in the frequency modulated Möbius periodic regression model.
11:35–12:00	Coffee break
12:00–12:50	Session 7, Chair: José Ameijeiras-Alonso **Andrea Meilan Vila** – Nonparametric density estimation for polyspherical data. **Maria Alonso-Peña** – Parametrically guided kernel density estimation on the sphere.
12:50–14:00	Lunch
15:00–19:00	Tour of Luxembourg city
19:00–	Karaoke (Cafe Coyote)

Friday, September 12

09:00–10:15	Session 8, Chair: Giovanna Jona Lasinio **Claudia Redenbach** – Mathematical Morphology on directional data. **Stephan Huckemann** – Non-Euclidean Statistics for Learning Structural Biology. **Florian Pfaff** – Recursive Bayesian Estimation on Cartesian Products of Periodic and Euclidean Domains.
10:15–10:45	Coffee break
10:45–12:00	Session 9, Chair: Gaspard Bernard **Giovanni Peccati** – Functional convergence of geometric functionals of Gaussian fields. **Alessia Caponera** – Reproducing Kernel approach to low-dose tomographic data. **Eduardo Garcia Portugues** – Diffusions on the torus with exact likelihood inference.
12:00–13:30	Lunch
13:30–14:45	Session 10, Chair: Sophia Loizidou **Shogo Kato** – Regression for spherical responses with linear and spherical covariates using a scaled link function. **Andriette Bekker** – Regularized directional regression models: A simulation study. **José Ameijeiras-Alonso** – A Semiparametric framework for circular regression with application to bird orientation.
14:45–15:15	Coffee break
15:15–16:30	Session 11, Chair: Davy Paindaveine **Marco Geraci** – Generalized Laplace regression for cylindrical responses with an application to road traffic accidents. **Stefania Fensore** – Reducing boundary bias on curved support via domain transformation. **Ashis Sengupta** – High volatility flexible families of probability distributions for directional data.
16:30–17:00	Closing words
17:30–19:30	Visit to the blast furnace
19:30–	Conference dinner (Schmelz)

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