



# Photo report GSI'25

Geometric Science of Information

<https://conference-gsi.org/>





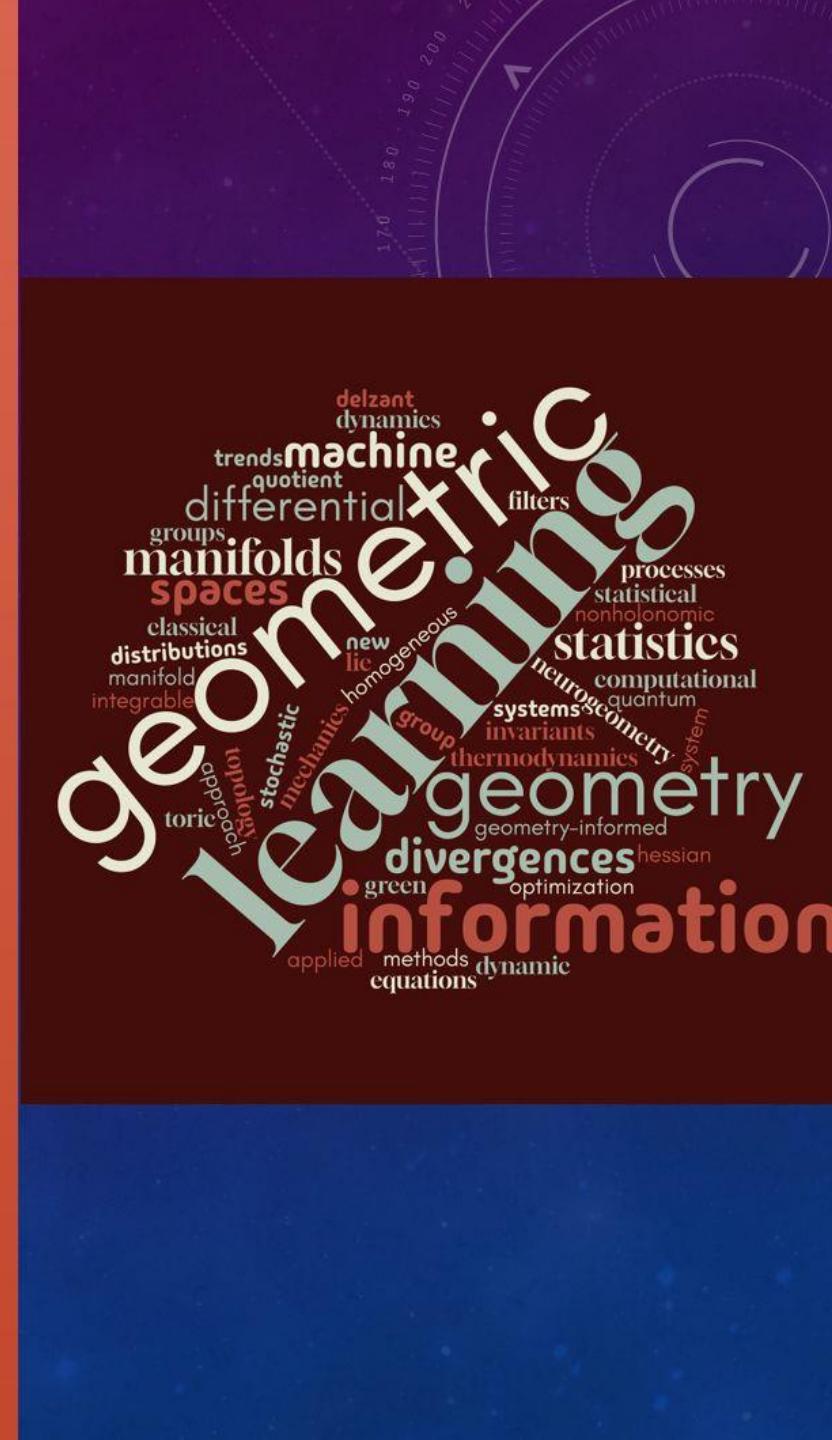
# GSI'25 Conference

## 7th Conference from Classical to Quantum Information Geometry



# The GSI'25 conference was structured in 18 sessions of more than 120 papers:

- 1.** Geometric Learning and Differential Invariants on Homogeneous Spaces
- 2.** Statistical Manifolds and Hessian information geometry
- 3.** Applied Geometry-Informed Machine Learning
- 4.** Geometric Green Learning on Groups and Quotient Spaces
- 5.** Divergences in Statistics and Machine Learning
- 6.** Geometric Statistics
- 7.** Computational Information Geometry and Divergences
- 8.** Geometric Methods in Thermodynamics
- 9.** Classical & Quantum Information, Geometry and Topology
- 10.** Geometric Mechanics
- 11.** Stochastic Geometric Dynamics
- 12.** New trends in Nonholonomic Systems
- 13.** Learning of Dynamic Processes
- 14.** Optimization and learning on manifolds
- 15.** Neurogeometry
- 16.** Lie Group in Learning Distributions & in Filters
- 17.** A geometric approach to differential equations
- 18.** Information Geometry, Delzant Toric Manifold & Integrable System



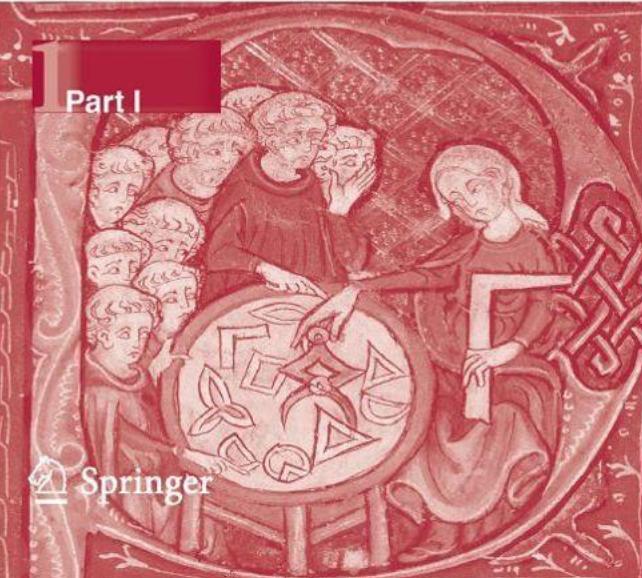
# Proceedings

Frank Nielsen  
Frédéric Barbaresco (Eds.)

LNCS 16033

## Geometric Science of Information

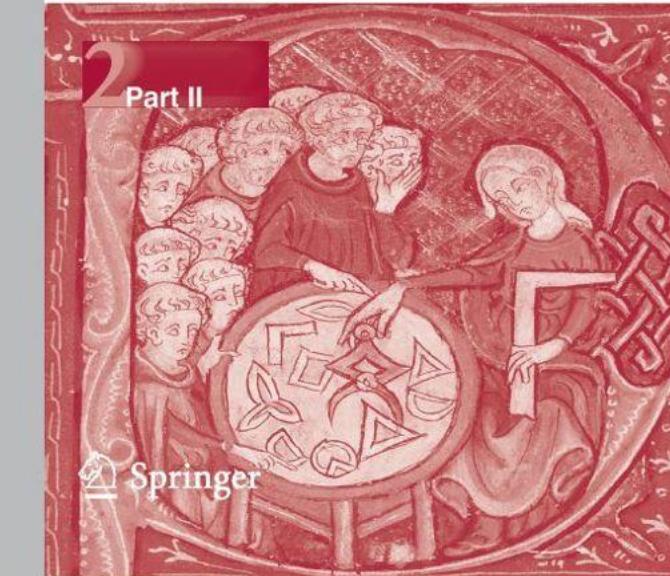
7th International Conference, GSI 2025  
Saint-Malo, France, October 29–31, 2025  
Proceedings, Part I



Frank Nielsen  
Frédéric Barbaresco (Eds.)

## Geometric Science of Information

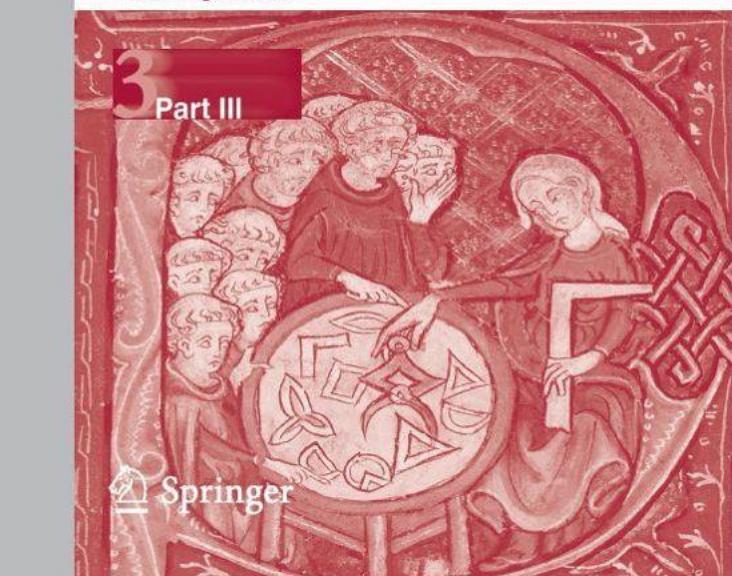
7th International Conference, GSI 2025  
Saint-Malo, France, October 29–31, 2025  
Proceedings, Part II



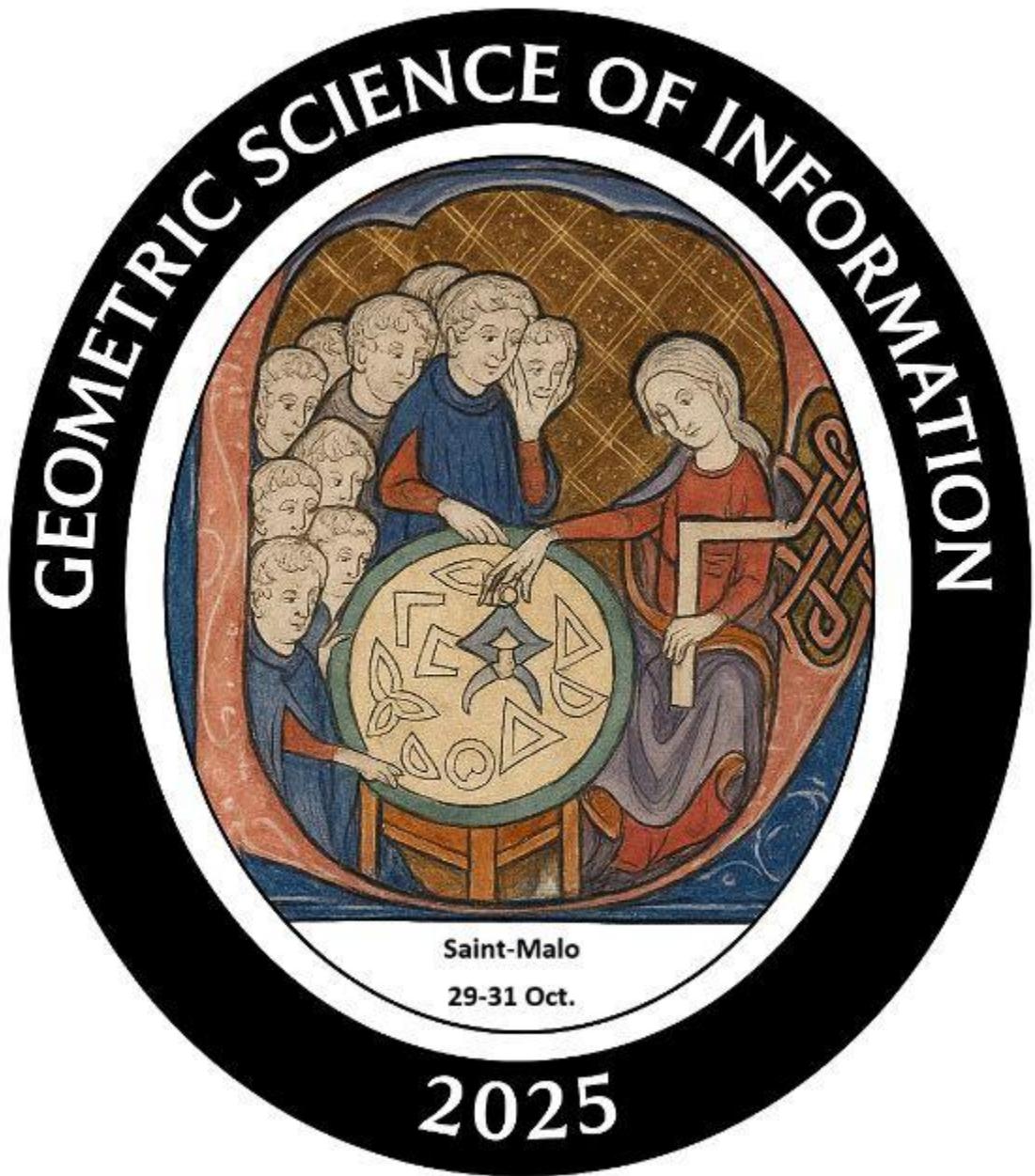
Frank Nielsen  
Frédéric Barbaresco (Eds.)

## Geometric Science of Information

7th International Conference, GSI 2025  
Saint-Malo, France, October 29–31, 2025  
Proceedings, Part III

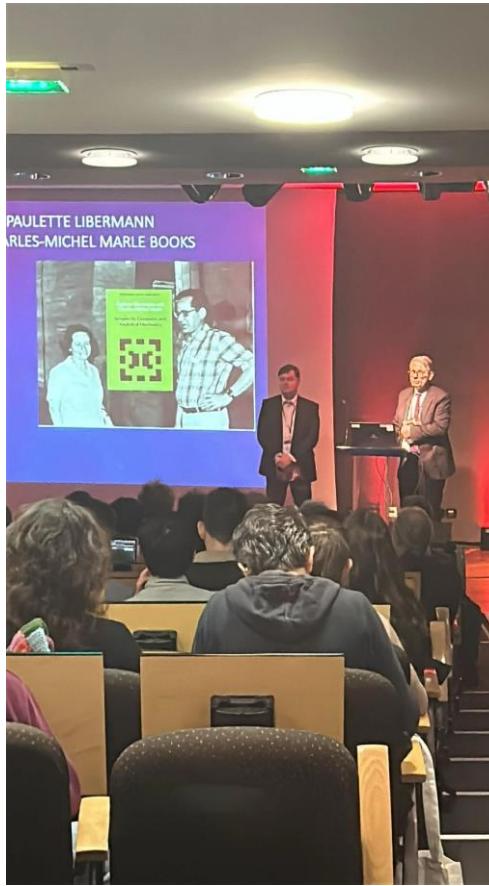


Springer Nature LNCS, links: [vol 16033](#), [vol 16034](#), [vol 16035](#).



# Opening session

Slides: <https://franknielsen.github.io/GSI/SEE-GSI'25-Opening.pdf>





# From Classical to Quantum Information Geometry

## KEYNOTES:



**Prof. Nina MIOLANE**

Assistant Professor, AI, UC Santa Barbara.  
Co-Director, AI Center, Bowers Women's Brain  
Health Initiative, Affiliate, Stanford SLAC

*Topological Deep Learning: Unlocking  
the Structure of Relational Systems*



**Philip J. MORRISON**

The University of Texas at Austin,  
Physics Department

*Metriplectic Dynamics: A Geometrical Framework for  
Thermodynamically Consistent Dynamical Systems*



**Mário A.T. FIGUEIREDO**

Instituto de Telecomunicações and Instituto Superior  
Técnico Universidade de Lisboa, Portugal

*Extended Variational Learning  
via Fenchel-Young Losses*



**Rita FIORESI**

FaBiT, University of Bologna, Italy

*A Noncommutative perspective of Graph Neural  
Networks*



**Alice LE BRIGANT**

Université Paris 1 Panthéon-Sorbonne

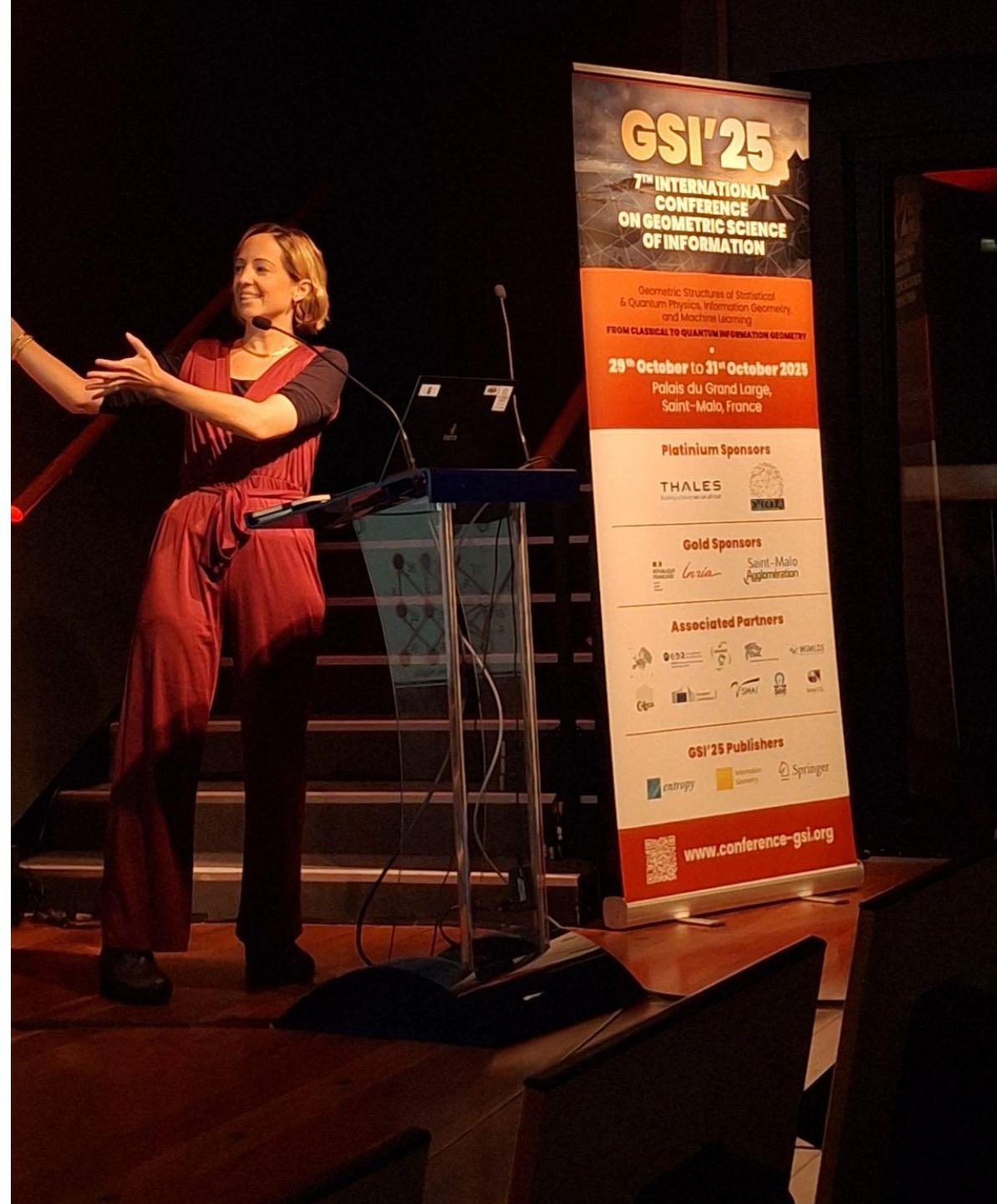
*The  $L^p$  Fisher-Rao metrics a  
nd the alpha-connections*



**Frédéric BARBARESCO**

THALES, Campus de Paris-Saclay, Palaiseau, France

*Bicentenary of Thermodynamics and Sadi Carnot's  
Seminal Work: From Constantin Carathéodory's  
Contact Geometry Model to Jean-Marie Souriau's  
Symplectic Foliation Structure*

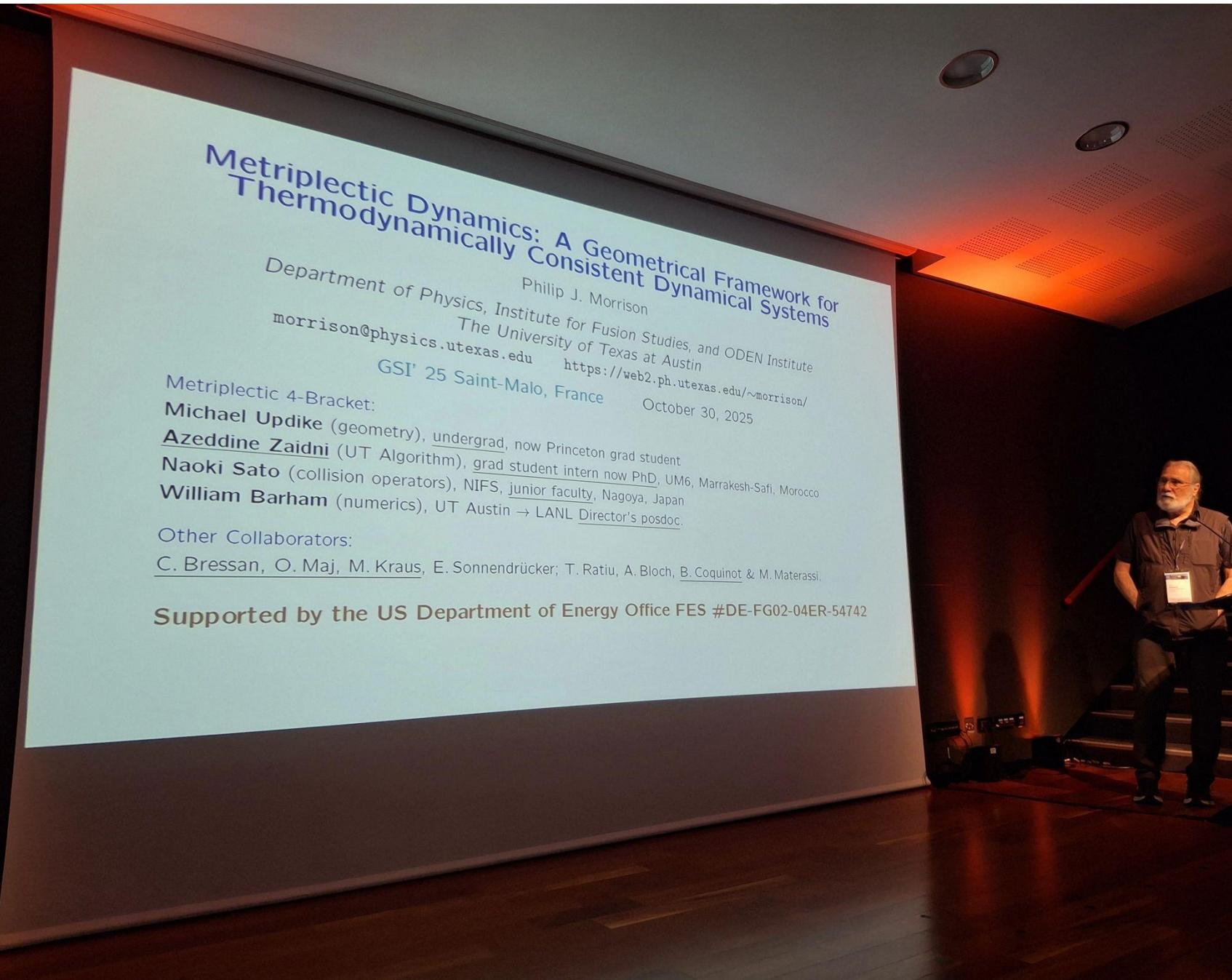


# Non parametric information geometry: the $L^p$ -Fisher-Rao metrics and the $\alpha$ -connections

Alice Le Brigant  
SAMM, University Paris 1  
Joint work with Martin Bauer, Yuxiu Lu and Cy Maor

GSI 2025



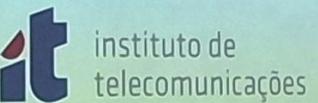






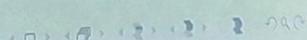
# Extended Variational Learning via Fenchel-Young Losses

Mário A. T. Figueiredo  
... with Sophia Sklaviadis and André F. T. Martins



e l l i s

7th International Conference on Geometric Science of Information



# Cocktail reception in la Rotonde Surcouf



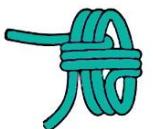


Group photo in Maupertuis Auditorium

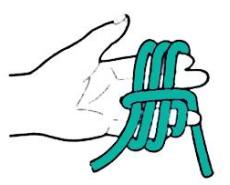


# Demeure du Corsaire, Hôtel Magon, Saint-Malo

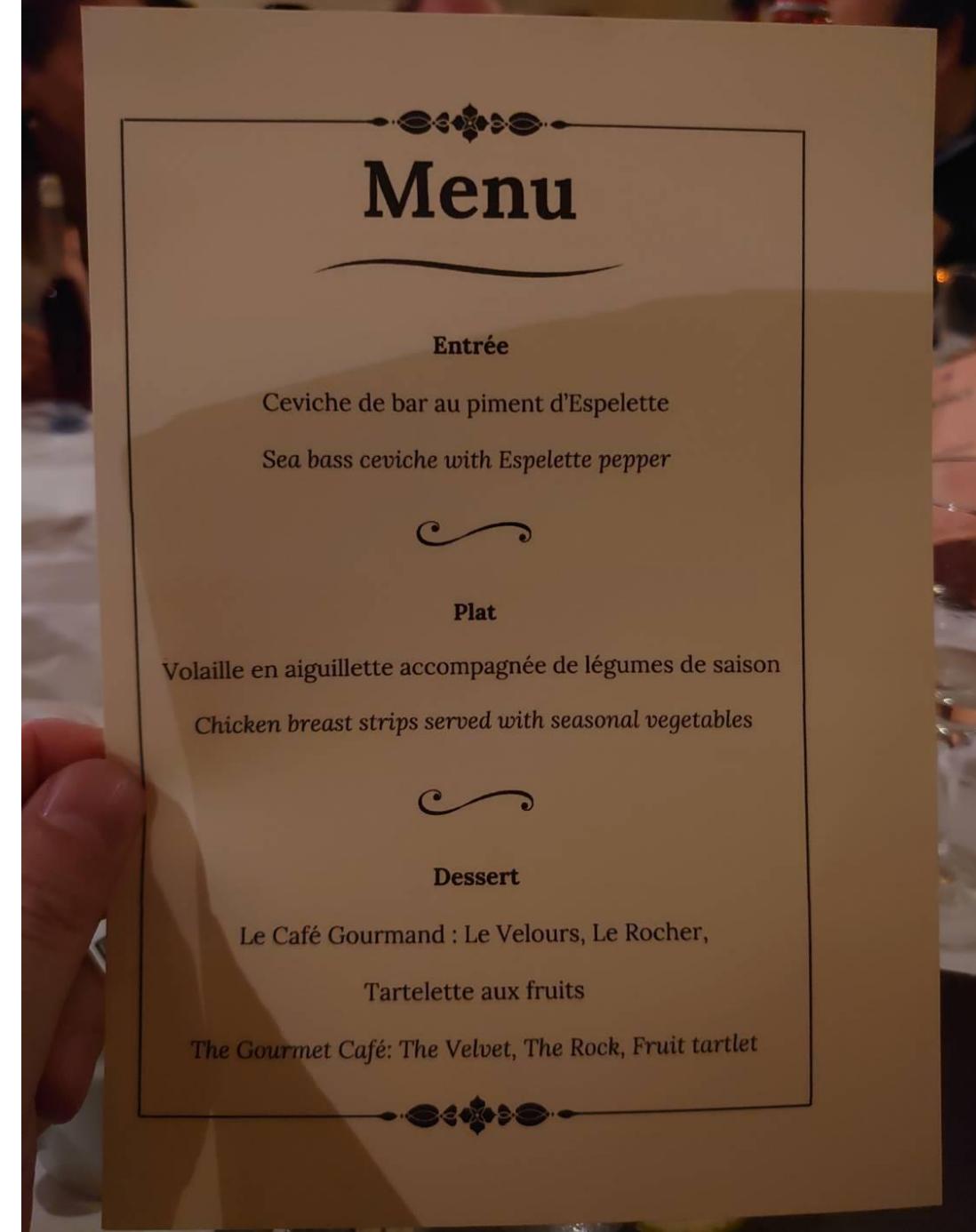




**Marine knot**



**Noeud marin: pomme de touline**  
**(etymology: from English towline)**



# Gala dinner





# Paper Awards

2025



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Computer Science  
LNCS LNAI LNBI



Jury, president: Alice Barbara Tumpach







**GSI 2025**

October 29<sup>th</sup>-31<sup>st</sup>  
2025  
Saint-Malo

# The 7<sup>th</sup> international conference on Geometric Science of Information

## Best Student Paper Award

PRESENTED TO

Ines Garcia-Redondo, Anthea Monod, Qiquan Wang



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AUTHORS OF THE  
PAPER  
*Confidence Bands for Multiparameter  
Persistence Landscapes*

Frank Nielsen

Sony Computer Science Laboratories, Japan  
General co-chair

Alice Barbora Tumpach  
Lille University, France  
CNRS Pauli Institute,  
Austria  
Prize committee, President



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OF INFORMATION

Geometric Structures of Statistical  
& Quantum Physics, Information Geometry  
and Machine Learning

FROM CLASSICAL TO QUANTUM INFORMATION DESIGN  
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GSI 2025

October 29<sup>th</sup>-31<sup>st</sup> 2025  
Saint-Malo

**Frédéric Barbaresco**  
Thales, France  
General co-chair

# The 7<sup>th</sup> international conference on Geometric Science of Information

# Best Paper Award

PRESENTED TO  
Géry de Saxcé

## AUTHOR OF THE PAPER

# A new symmetry group for Physics to revisit the Kaluza-Klein theory

A large, ornate initial letter 'F' containing a circular medallion with a star and geometric patterns.

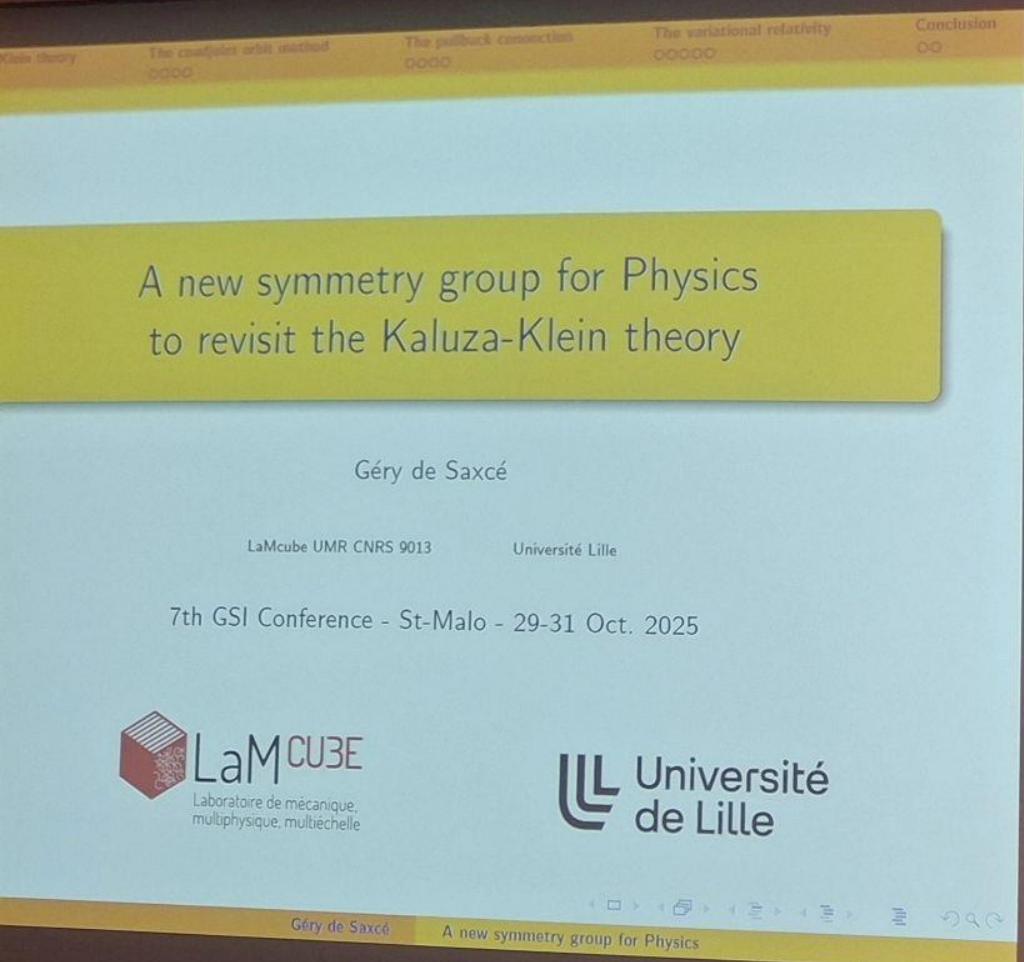
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Frank Nielsen  
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General co-chair







**The 7<sup>th</sup> international conference on  
Geometric Science of Information  
Best Paper Award**

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**PRESENTED TO**  
Géry de Saxcé



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**AUTHOR OF THE PAPER**

*A new symmetry group for Physics to revisit the  
Kaluza-Klein theory*

Frédéric Barbaresco  
Thales, France  
General co-chair

Frank Nielsen  
Sony Computer Science Laboratories, Japan  
General co-chair

Alice Barbora Tumpach  
Lille University, France  
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Prize committee, President



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*Confidence Bands for Multiparameter  
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Thales, France  
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Alice Barbora Tumpach  
Lille University, France  
CNRS Pauli Institute, Austria  
Prize committee, President

<p><b>The 7<sup>th</sup> international conference on Geometric Science of Information Honorable Mention</b></p> <p>Category: Questioning the World</p> <p><b>GSI 2025</b> October 29<sup>th</sup>-31<sup>st</sup> 2025 Saint-Malo</p> <p><b>PRESENTED TO</b> Mireille Boutin, Rob Eggermont, Gregor Kemper</p> <p><b>AUTHORS OF THE PAPER</b> <i>Global Positioning on Earth</i></p> <p>Frédéric Barbaresco Thales, France General co-chair</p> <p>Frank Nielsen Sony Computer Science Laboratories, Japan General co-chair</p> <p>Alice Barbora Tumpach Lille University, France CNRS Pauli Institute, Austria Prize committee, President</p>	<p><b>The 7<sup>th</sup> international conference on Geometric Science of Information Honorable Mention</b></p> <p>Category: Questioning History</p> <p><b>GSI 2025</b> October 29<sup>th</sup>-31<sup>st</sup> 2025 Saint-Malo</p> <p><b>PRESENTED TO</b> Olivier Rioul</p> <p><b>AUTHOR OF THE PAPER</b> <i>A Historical Perspective on the Schützenberger-van-Trees Inequality: A Posterior Uncertainty Principle</i></p> <p>Frédéric Barbaresco Thales, France General co-chair</p> <p>Frank Nielsen Sony Computer Science Laboratories, Japan General co-chair</p> <p>Alice Barbora Tumpach Lille University, France CNRS Pauli Institute, Austria Prize committee, President</p>	<p><b>The 7<sup>th</sup> international conference on Geometric Science of Information Honorable Mention</b></p> <p>Category: Building Bridges</p> <p><b>GSI 2025</b> October 29<sup>th</sup>-31<sup>st</sup> 2025 Saint-Malo</p> <p><b>PRESENTED TO</b> Julia Lange, Bartosz Zawora</p> <p><b>AUTHORS OF THE PAPER</b> <i>Reduction of exact symplectic manifolds and energy hypersurfaces</i></p> <p>Frédéric Barbaresco Thales, France General co-chair</p> <p>Frank Nielsen Sony Computer Science Laboratories, Japan General co-chair</p> <p>Alice Barbora Tumpach Lille University, France CNRS Pauli Institute, Austria Prize committee, President</p>
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<p><b>The 7<sup>th</sup> international conference on Geometric Science of Information Honorable Mention</b></p> <p>Category: Marvelous Presentation</p> <p><b>GSI 2025</b> October 29<sup>th</sup>-31<sup>st</sup> 2025 Saint-Malo</p> <p><b>PRESENTED TO</b> Vasiliki Liontou</p> <p><b>AUTHOR OF THE PAPER</b> <i>Geometry of Cells Sensible to Curvature and Their Receptive Profiles</i></p> <p>Frédéric Barbaresco Thales, France General co-chair</p> <p>Frank Nielsen Sony Computer Science Laboratories, Japan General co-chair</p> <p>Alice Barbora Tumpach Lille University, France CNRS Pauli Institute, Austria Prize committee, President</p>	<p><b>The 7<sup>th</sup> international conference on Geometric Science of Information Honorable Mention</b></p> <p>Category: Fundamental Tools</p> <p><b>GSI 2025</b> October 29<sup>th</sup>-31<sup>st</sup> 2025 Saint-Malo</p> <p><b>PRESENTED TO</b> Cyrus Mostajeran, Franziskus Steinert, Salem Said</p> <p><b>AUTHORS OF THE PAPER</b> <i>Universal kernels via harmonic analysis on Riemannian symmetric spaces</i></p> <p>Frédéric Barbaresco Thales, France General co-chair</p> <p>Frank Nielsen Sony Computer Science Laboratories, Japan General co-chair</p> <p>Alice Barbora Tumpach Lille University, France CNRS Pauli Institute, Austria Prize committee, President</p>
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- BEST PAPER AWARD:

"**A new symmetry group for Physics to revisit the Kaluza-Klein theory**", Géry de Saxcé

- BEST STUDENT PAPER AWARD:

"**Confidence Bands for Multiparameter Persistence Landscapes**", Ines Garcia-Redondo, Anthea Monod, Qiquan Wang

- FUNDAMENTAL TOOLS:

"**Universal kernels via harmonic analysis on Riemannian symmetric spaces**", Cyrus Mostajeran, Franziskus Steinert, Salem Said

- MARVELOUS PRESENTATION:

"**Geometry of Cells Sensible to Curvature and Their Receptive Profiles**", Vasiliki Lontou

- QUESTIONING HISTORY:

"**A Historical Perspective on the Schützenberger-van Trees Inequality: A Posterior Uncertainty Principle**", Olivier Rioul



The 7<sup>th</sup> international conference on  
Geometric Science of Information

## GSI Achievement Award

Recognizing outstanding achievement in geometric science of information

PRESENTED TO

**Dr. Xavier Pennec**  
Senior Research Scientist  
INRIA, Sophia-Antipolis, France

Frédéric Barbaresco  
Thales, France  
General co-chair

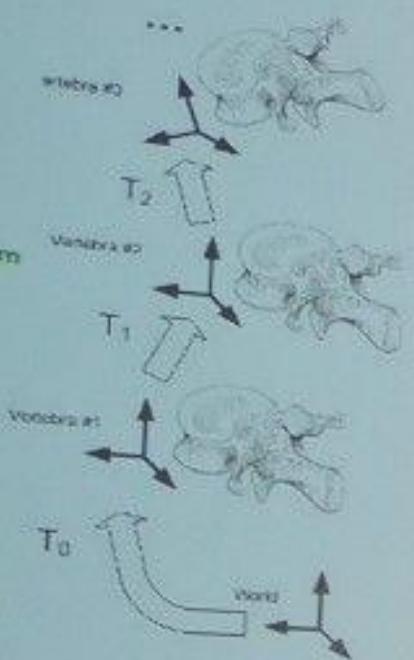
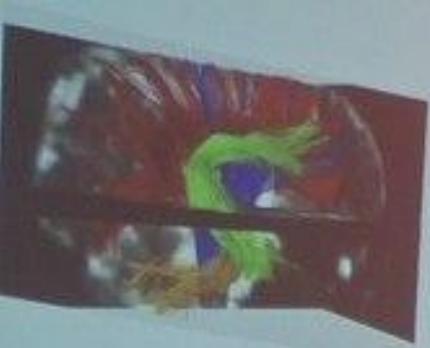
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The logo for GSI 2025 features a stylized blue and white circular emblem with the letters "GSI" and the year "2025". Below the emblem, the text "since 1883" is visible. To the right of the emblem, the text "GSI 2025" is printed in bold black letters, followed by the dates "October 29<sup>th</sup>-31<sup>st</sup> 2025" and the location "Saint-Malo, France".



3



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Prize ceremony



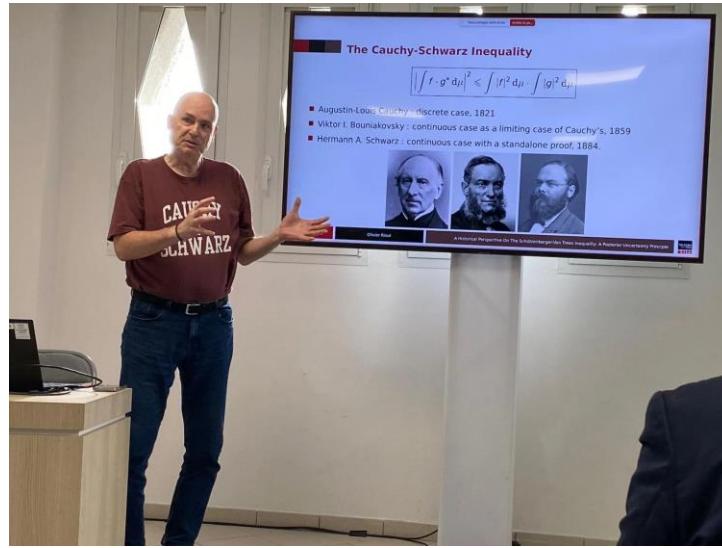
Prize committee

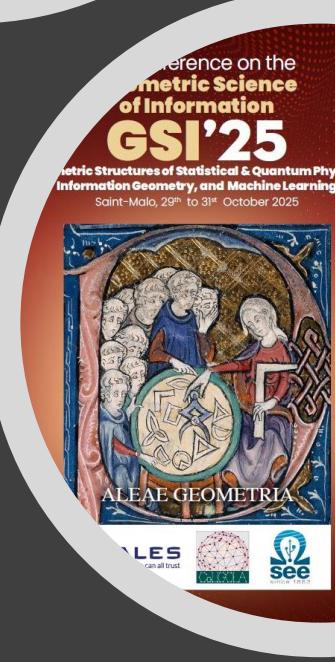
## Souvenirs from Saint-Malo



Closing session

Slides: <https://franknielsen.github.io/GSI/SEE-GSI'25-Closing.pdf>





See you in 2027!

Photo report prepared by Frank Nielsen  
with photos from various sources!

<https://franknielsen.github.io/GSI/>