

# 6<sup>th</sup> International Conference on GEOMETRIC SCIENCE OF INFORMATION GSI'23 Saint-Malo, France 30<sup>th</sup> August to 1<sup>st</sup> September 2023



## From Classical to Quantum Information Geometry

# CALL FOR PAPERS

### Conference Co-chairs:

**Frank Nielsen**  
Sony Computer Science Laboratories Inc, Japan

**Frédéric Barbaresco**  
President of SEE ISIC Club  
Thales Land & Air Systems, Velizy, France

### Local organizing committee:

**GROUPE REGIONAL SEE GRAND-OUEST**

**Christophe LAOT**  
IMT Atlantique

**Alain ALCARAS**  
THALES SIX

**Jacques CLAVERIE**  
CREC St-Cyr Cöetquidan

### First announcement and call for papers:

As for GSI'13/GSI'15/GSI'17/GSI'19/GSI'21, the objective of this 6<sup>th</sup> SEE GSI'23 conference, hosted in Saint-Malo, is to bring together pure/applied mathematicians and engineers, with common interest for Geometric tools and their applications for Information analysis and Learning. It emphasizes an active participation of young researchers to discuss emerging areas of collaborative research on "Geometric Science of Information and their Applications".

GSI presents a panorama of Geometric Tools emphasizing mathematical theory, physical model, computational methods, and applications in mathematics, physics, statistics, engineering, signal/image processing, machine learning and data science.

The Conference will be therefore held in areas of topics of mutual interest with the aim to:

- Provide an overview on the most recent state-of-the-art
- Exchange mathematical information/knowledge/expertise in the area

This conference will be an interdisciplinary event and will unify skills from Geometry, Probability and Information Theory. *Proceedings are published in Springer's Lecture Note in Computer Science series.* MDPI will sponsor best paper & best poster Awards.

Gala Diner will take place in Saint-Malo

### Important Dates:

- Deadline for 8 pages SPRINGER LNCS format: Monday 20<sup>th</sup> of February 2023
  - Notification of acceptance: 21<sup>st</sup> April 2023
  - Final paper submission: 2<sup>nd</sup> June 2023
- Paper templates and Guideline on GSI'23 website at "author instructions"

### Sessions include but are not limited to:

#### GEOMETRY & MACHINE LEARNING

- Alice Barbara TUMPACH, DIARRA Fall & Guillaume CHARPIAT - *Geometric Green Learning*
- Remco DUITS & Erik BEKKERS, Alessandro SARTI - *Neurogeometry Meets Geometric Deep Learning*
- Santiago VELASCO-FORERO & Teodora PETRISOR - *Equivariant Classical & Quantum Neural Network*
- Michel BRONIATOWSKI & Wolfgang STUMMER - *Divergences in Statistics & Machine Learning*
- Biswa SENGUPTA - *Information Geometry for Applied Machine Learning problems*

#### DIVERGENCE, TRANSPORT & INFORMATION GEOMETRY

- Frank NIELSEN - *Computational Information Geometry and Divergences*
- Jun ZHANG & Hiroshi MATSUZOE - *Geometry of Deformed Exponential Families*
- Michel NGUIFFO BOYOM - *Statistical Manifolds and Hessian information geometry*
- Wuchen LI - *Transport Information Geometry with Computations*

#### STATISTICS, TOPOLOGY & SHAPE SPACES

- Pierre BAUDOT & Grégoire SEARGEANT-PERTHUIS - *Statistics, Information and Topology*

- Olivier RIOUL - *Information Theory and Statistics*
- Stephan HUCKEMANN - *Statistical Shape Analysis and more Non-Euclidean Statistics*
- Cyrus Sam MOSTAJERAN - *Probability and Statistics on manifolds*
- Eliana DUARTE & Elias TSIGARIDAS - *Computing Geometry & Algebraic Statistics*

#### GEOMETRY & MECHANICS

- Pierre BIELIAVSKY & Jean-Pierre GAZEAU - *Geometric and Analytical Aspects of Quantization and Non-Commutative Harmonic Analysis on Lie Groups*
- Elena CELLEDONI, James JACKAMAN, Davide MURARI and Brynjulf OWREN - *Deep learning: Methods, Analysis and Applications to Mechanical Systems*
- Ana Bela CRUZEIRO & Jean-Claude ZAMBRINI - *Stochastic Geometric Mechanics*
- Gery DE SAXCE & Zdravko TERZE - *Geometric Mechanics*
- Lyudmila GRIGORYEVA - *Learning of Dynamic Processes*

#### GEOMETRY & THERMODYNAMICS

- Frédéric BARBARESCO & Pierre BIELIAVSKY - *Symplectic Structures of Heat & Information Geometry*
- Manuel de LEON - *Geometric structures in Thermodynamics*
- François GAY-BALMAZ et Hiroaki YOSHIMURA - *Geometric Methods in Mechanics and Thermodynamics*
- François GAY-BALMAZ et Cesare TRONCI - *Fluid Mechanics and Symmetry*

#### QUANTUM INFORMATION GEOMETRY

- Florio M. CIAGLIA - *The Geometry of Quantum States*
- Jean-Pierre FRANCOISE, Daisuke TARAMA - *Integrable Systems and Information Geometry (From Classical to Quantum)*
- Goffredo CHIRCO - *Lie Groups Thermodynamics and Quantum Extension*

#### GEOMETRY & BIOLOGICAL STRUCTURES

- Nina AMINI - *Quantum Information Geometry*
- Alessandro SARTI - *Neurogeometry*
- Antonio MUCHERINO - *Bio-Molecular Structure Determination by Geometric Approaches*
- Michel BERTHIER & Edoardo PROVENZI - *Geometry of Color Perception*
- Stéphanie JEHAN-BESSON - *Geometric Features Extraction in Medical Imaging*

#### GEOMETRY & APPLICATIONS

- Pierre-Yves LAGRAVE - *Geometric Quantitative Finance*
- Hatem HAJRI & Martin GONZALEZ - *Trustworthy AI (I & II)*
- Nina MIOLANE, Nicolas GUIGUI, Alice LE BRIGANT - *Geometric Structures Coding & Learning Libraries*
- Mohamed A. DJAFARI & Martino TRASSINELLI - *Geometry of Conditional Probabilities and Inverse Problems*

### Keynote Speakers:

#### CONFIRMED

- Eva MIRANDA (UPC, SP) - *From Alan Turing to Contact geometry: towards a "Fluid computer"*
- Hervé SABOURIN (Poitiers Univ., FR) - *Transverse Poisson Structures to adjoint orbits in a complex semi-simple Lie algebra*
- Francis BACH (ENS Paris & INRIA, FR) - *Information Theory with Kernel Methods*
- Diarra FALL (Orléans Univ., FR) - *Statistics Methods for Medical Image Processing and Reconstruction*
- Bernd STURMFELS (MPI-MIS Leipzig, DE) - *Algebraic Statistics and Gibbs Manifolds*
- Juan-Pablo Ortega (NTU, SG) - *Learning of Dynamic Processes*

### Sponsors & editors:



### Secretariat:

Mrs. Imene AHMED  
SEE, France imene.ahmed@see.asso.fr

# <https://gsi2023.org>

