

Important Note for the chairpersons:

Since all sessions are transmitted online, chairpersons will have to play the role of moderator for the Zoom sessions. In particular

- all online questions should be posted in the chat and read by the chairperson.
- chairpersons are responsible for allowing the online speakers to share their screen. Online speakers are explicitly indicated by **Zoom session** in the corresponding session.

Login and password will be given in due time.

Plenary lectures

Monday 18 July 9:10-10:05: Chair — M. Rausch de Traubenberg

- Opening: S. Courtin & M. del Olmo
- Gazeau: Dark matter as a QCD effect in an Anti de Sitter background

Monday 18 July 10:35-12:25: Chair — A. Marrani

- Bossard: Kac-Moody Exceptional field theory
- Chanu: Geometry of regular and not regular separation: the example of the bi-Helmoltz equation

Tuesday 19 July 9:10-10:05: Chair — M. del Olmo

- Reshetikhin: Two dimensional QCD revisited again

Tuesday 19 July 10:35-12:25: Chair — P. van Isacker

- Gannon: What comes after Cappelli-Itzykson-Zuber's A-D-E?
- Launey, Kristina Emergent symmetries in nuclei: Probing physics beyond the standard model
Zoom Session

Wednesday 20 July 9:10-10:05 Chair — G. Goldin

- Panzer: Cosmic Galois group and ϕ^4 theory

Wednesday 20 July 10:35-12:25: Chair — T. Gannon

- Saleur: Global symmetry and conformal bootstrap in the two-dimensional $O(n)$ model
- van Suijlekom: Noncommutative spaces at finite resolution

Thursday 20 July 9:20-10:05 Chair — N. Soilova

- Piet van Isacker (In Memoriam, D. Rowe)
- M. del Olmo (In Memoriam, K. Bernardo)

Thursday 20 July 10:35-12:25: Chair — I. Marquette

- Marrani: Jordan meets Freudenthal : a black hole exceptional story
- Dunkl: The Harmonic Oscillator, Enhancements and Applications **Zoom Session**

Friday 22 July 9:10-10:05: Chair — A. Vourdas

- Vallejo: An overview of perturbation theory and its applications

Friday 22 July 10:35-12:20: Chair — J. P. Gazeau

- Loebbert: Integrability for Feynman Integrals
- Vinet: (In Memoriam, Jiri Patera and Pavel Winternitz)
- Stoilova: (In Memoriam, Tchavdar Palev)

50th Anniversary Ceremonies

Tuesday 19 July 20:30-21:30 Chair — M. Rausch de Traubenberg

1. J. M. Lévy-Leblond: L'évolution de la théorie des groupes et ses applications en sciences (in French)

Wednesday 20 July 16:30-18:00 Chair — M. del Olmo

1. J. M. Lévy-Leblond: On the unexpected fate of scientific ideas — a personal account
2. G. Goldin: The Prediction of Anyons: Its History and Wider Implications

Room 104

Contact: Michel Rausch de Traubenberg (Michel.Rausch@iphc.cnrs.fr)

Monday 18 July 14:00-16:00: Q-algebras and groups, q-special functions

Chair: M. Rausch de Traubenberg

- Gutiérrez Sagredo: Noncommutative spaces of worldlines from quantum groups: Construction and phenomenological implications
- Herranz: From quantum deformations to noncommutative spaces: Application to quantum (A)dS and Poincaré groups
- Lledó Barrena: $N = 2$ supersymmetry, quantization and quantum superbundles
- Gourevitch: Reflection Equation Algebra as quantum analog of $U(\mathfrak{gl}(N))$

Monday 18 July 16:30-17:30: Superstrings, cosmology and quantum gravity

Chair: M. Rausch de Traubenberg

- Marrani: Vinberg special T-algebras : from black hole entropy to “exceptional periodicity
- Valenzuela: On the spin contents of the massless Rarita–Schwinger system

Tuesday 19 July 14:00-16:00: Superstrings, cosmology and quantum gravity

Chair: M. Valenzuela

- Ben Geloun: Dimensional flow from nonlocality: some results in Tensor Field Theory
- Rios: Beyond M-theory with Nested Braneworlds
- Sasakura: Splitting-merging transitions in a tensor-vectors system in exact large-N limits
- Ramada: A novel scenario for the emergence of geometry and gravity from random multitrace matrix models

Tuesday 19 July 16:30-17:30: Superstrings, cosmology and quantum gravity

Chair: A. Marrani

- Smigla: Noether’s theorem, conservation of momentum, and gravitation in multiparticle systems
- Suszek: Towards higher super- σ -model categories

Wednesday 20 July 14:00-16:00: Conformal field theory

Chair: F. J. Herranz.

- Yokoyama: A recent development of spin CFT and level-rank duality
- Popov: Jordan algebras and Conformal Dynamical Symmetries
- Kuwata: Spin degrees of freedom incorporated in conformal group

Friday 22 July 14:00-16:00: Infinite dimensional symmetries and supersymmetries

Chair: M. de Montigny

- Ducrocq: New perspectives in Gravity Mediated SUSY Breaking
- Kiselev: Kontsevich graphs in Poisson bracket deformations: open problems **Zoom Session**
- Campoamor-Stursberg: Generalisation of affine Lie algebras on compact real manifolds **Zoom Session**

Room 346

Contact: Kamila Sieja (kamila.sieja@iphc.cnrs.fr)

Monday 18 July 14:00-16:00: Symmetries in particle physics

Chair: K. Sieja

- Gresnigt: Standard Model symmetries from Cayley-Dickson algebras
- Kumar: Yang–Mills solutions on Minkowski space via non-compact coset spaces
- Pietrzak: Clocking mechanism from a minimal spinning particle model
- Thierry-Mieg: Towards a self-dual super-chiral QFT of the weak interactions gauging the simple Lie-Kac superalgebra $SU(2/1)$ **Zoom Session**

Monday 18 July 16:30-17:30: Symmetries in molecular, atomic and nuclear physics

Chair: K. Sieja

- Ricotta: A Mathematical Model for the Statistics of Tri-Stable Potentials
- Mayorgas: Role of mixed permutation symmetry sectors in the thermodynamic limit of critical three-level Lipkin-Meshkov-Glick atom models

Tuesday 19 July 14:00-16:00: Symmetries in particle physics

Chair: E. Panzer

- Schubert: Group invariants for Feynman diagrams
- Thierry-Mieg: Chiral Casimirs and indecomposable representations of the $sl(m/n)$ superalgebras **Zoom Session**
- Quadri: Renormalizable Extension of the Abelian Higgs-Kibble Model with a Dim. 6 Derivative Operator

Tuesday 19 July 16:30-17:30: Symmetries in molecular, atomic and nuclear physics

Chair: R. M. Ricotta

- Van Isacker: Seniority and particle-hole conjugation in atomic nuclei
- Gavrielov: An algebraic approach to intertwined quantum phase transitions in the Zr isotopes **Zoom Session**

Wednesday 20 July 14:00-16:00: PT-symmetries, dynamical symmetries and superintegrability

Chair: M. de Montigny

- Latini: Polynomial algebras of superintegrable systems separating in Cartesian coordinates from higher order ladder operators **Zoom Session**
- Snobl: Pairs of commuting quadratic elements in the universal enveloping algebra of Euclidean algebra and integrals of motion **Zoom Session**
- Quesne: Ladder operators and Lie algebras for a model with quadratic complex interaction **Zoom Session**
- Marquette: Exact solvability and superintegrability : Algebraic constructions

Friday 22 July 14:00-16:00: Loop algebras, W-algebras, polynomial algebras

Chair: P. Moylan

- Mavaddat Nezhaad: On Möbius Gyrogroups

Amphitheatre Fresnel

Contact: Marcus Slupinski (marcus.slupinski@math.unistra.fr)

Monday 18 July 14:00-16:00: Representation theory

Chair: M. Slupinski

- Ben Geloun: A combinatorial interpretation of the Kronecker coefficient via quantum mechanics of bipartite ribbon graphs
- Aizawa: Irreducible representations of Z_2^2 -graded supersymmetry algebra and their applications
- Bisbo: Dirac operators, vector variables and bases for parastatistical Fock space representations
- Claerebout: A minimal representation of the exceptional Lie superalgebra $D(2, 1, \alpha)$

Monday 18 July 16:30-17:30: Representation theory

Chair: M. Slupinski

- del Olmo: Symmetry Groups, Quantum Mechanics and Generalized Hermite Functions
- Goncharov: Traceless projection of tensors of any rank and symmetry via Brauer algebra

Tuesday 19 July 14:00-16:00: Representation theory

Chair: J. van der Jeugt

- Kozić: Associating quantum vertex algebras with quantum affine algebras
- Langlois-Rémillard: Monogenic representations of the algebra of symmetries of the generalised Dirac operator
- Postnova: Tensor powers of vector representation of quantum $sl(2)$ at roots of unity

Tuesday 19 July 16:30-17:30: Representation theory

Chair: N. Aizawa

- Stoilova: A class of representations of the infinite-rank $Z_2 \times Z_2$ -graded Lie superalgebra $psl(\infty|\infty)$
- Van der Jeugt: Parabosons: basis constructions

Wednesday 20 July 14:00-16:00: Quantum optics, coherent states and quantum information

Chair: J. Guerrero

- Chiribella: Optimal programming of quantum gates **Zoom Session**
- Vourdas: A study of multipartite quantum systems based on Markov matrices and the Gini index
- Mancini: p-adic qubits from irreducible representations of $SO(3)_p$
- Woods: Optimal Universal Quantum Error Correction via Bounded Reference Frames

Friday 22 July 14:00-16:00: Quantum optics, coherent states and quantum information

Chair: M. Woods

- Guerrero: Parity adapted coherent states for symmetric multiqubits
- Nahmad-Achar: Wigner Function Analysis of Finite Matter-Radiation Systems **Zoom Session**

Room 150

Contact: Fabrice Thalmann (fabrice.thalmann@ics-cnrs.unistra.fr)

Monday 18 July 14:00-16:00: Symmetries in differential, difference and nonlinear equations

Chair: F. Thalmann

- Yehorchenko: Extension of Realisations for Low-Dimensional Lie Algebras
- Buring: How Kontsevich's (affine) star product is associative up to order 6 (respectively 7)
- Kiselev: Kontsevich's universal graph flows on the spaces of Nambu–Poisson brackets: their hidden symmetry **Zoom Session**
- Campoamor-Stursberg: Symmetry algebras of ODEs and the embedding problem for Lie algebras **Zoom Session**

Monday 18 July 16:30-17:30: Foundations of quantum physics

Chair: F. Thalmann

- Toppan: Inequivalent multiparticle quantizations from nontrivial braidings
- Yau: Quantum Fluctuations of a Particle's Arrival Time

Tuesday 19 July 14:00-16:00: Noncommutative field theories

Chair: D. Gourevitch

- Beggs: Quantum geodesics in quantum mechanics
- Nieuviarts: Non Commutative Gauge Field Theory on Approximately Finite C*-algebras and GUT

Tuesday 19 July 16:30-17:30: Symmetries in biophysics, chemical physics and natural sciences

Chair: M. Toda

- Planat: Infinite groups and symmetries in biophysics at the DNA/RNA scale

Wednesday 20 July 14:00-16:00: Foundations of quantum physics

Chair: F. Toppan

- Moylan: Relativistic Kinematics in Flat and Curved Space-Times
- Nisticò: Group Theoretical Derivation of Consistent Free Particle
- Schuch: On a Reformulation of Bohmian Mechanics

Friday 22 July 14:00-16:00: Foundations of quantum physics

Chair: D. Schuch

- Campobasso: The Klein paradox in the Wigner phase-space formulation
- Dahm: On Old Relations of Lie Theory, Classical Geometry and Invariant Theory
- Hassanabadi H.: Investigation of the Dunkl-Schrödinger equation for Position Dependent Mass in the presence of a Lie algebraic approach
- Ibort: On Schwinger's picture of Quantum Mechanics: Groupoids and their algebras

Amphitheatre Carnot

Contact: Guillaume Weick (Guillaume.Weick@ipcms.unistra.fr)

Monday 18 July 14:00-16:00: Condensed matter and statistical physics

Chair: G. Weick

- Calixto: Hilbert Space Structure of the Low Energy Sector of $U(N)$ Quantum Hall Ferromagnets and Their Classical Limit
- Vinet: Entanglement of free Fermions on graphs
- Horzela: Subordination and memory dependent kinetics in diffusion and relaxation phenomena **Zoom Session**
- Gorska: Do the solutions of the generalized Cattaneo-Vernotte equation vanish outside the compact region? **Zoom Session**

Monday 18 July 16:30-17:30: Symmetries in integrable systems

Chair: G. Weick

- de León: Reduction of contact Hamiltonian systems **Zoom Session**

Tuesday 19 July 14:00-16:00: Symmetries in integrable systems

Chair: J. F. Gomes

- Hussin: Differential realization of ladder operators for the Rosen-Morse systems
- Hounkonnou: Newton mechanics, Galilean relativity and special relativity in α -deformed binary operation setting
- Toda: Generalized Willmore Energies and Elastic Surfaces with Applications to Biophysics **Zoom Session**
- Tempesta: Generalized Nijenhuis tensors and integrable systems **Zoom Session**

Tuesday 19 July 14:00-16:00: Symmetries in integrable systems

Chair: V. Hussin

- Rastelli: Complete separability of the Hamilton-Jacobi equation for the charged particle orbits in a Liénard-Wiechert field
- Yoneyama: Tetrahedron and 3D reflection equation from PBW bases of the nilpotent subalgebra of quantum superalgebras

Wednesday 20 July 14:00-16:00: Symmetries in integrable systems

Chair: M. N. Hounkonnou

- Gomes: Twisted Affine Integrable Hierarchies and Soliton Solutions
- Hoque: A family of three-dimensional classical Hamiltonian systems in magnetic field
- López-Gordón: Non-conservative systems can have conserved quantities! Symmetries, reduction and Hamilton-Jacobi theory for forced mechanical systems

Friday 22 July 14:00-16:00: Representation theory

Chair: I. Yehorchenko

- Girard: Hyperquaternions and Physics
- Muarem: The orthogonal branching problem for symplectic monogenics

Demande de modification

- Naruhiko Aizawa, Not Monday and Friday
- Patrick R. Girard, Not Friday
- Fazlul Hoque (Wednesday 20 July 14.30-15.00 in room Carnot) (wants to listen Libor Snobl, same time of him).