SPT2026
Titles & Abstracts

(version of 3 April 2026)

1 Invited talks

All the speakers listed below are confirmed; titles could change.

1. **Fabio Bagarello** (Università di Palermo, I)

   TBA

2. **Claudia Chanu** (Università della Valle d'Aosta, I)

   Separability conditions for Schroedinger-type equations with scalar and vector potential.

3. **Maciej Dunajski** (Cambridge University, UK)

   Instantons from Harmonic Maps.

   I will present a counter example to the Euclidean Black Hole Uniqueness conjecture which explores an integrable harmonic map formulation of the Einstein-Maxwell equations. This is an Euclidean analogue of the Belinski-Zakharov method of constructing gravitational solitons.

4. **Franco Magri** (Università di Milano Bicocca, I)

   Jacobi meets Lax.

   In search of the elusive links between two different theories of integrable systems of Classical Mechanics, I will delve into Jacobi's work on separable systems in order to shed light on the classical roots of Lax's representation of integrable systems.

5. **Antonella Marchesiello** (Czech Technical University in Prague, CZ)

   Perturbed isotropic oscillators with inversion symmetry.

6. **Franco Oliveri** (Università di Messina, I)

   Conditional symmetries and substitution principle in ideal gas dynamics and magneto gas dynamics.

7. **Jesus Palacián** (Universidad de Navarra, Pamplona, E)
   Nekhoroshev-type stability for multi-scale Hamiltonian systems.

8. **Gianluca Panati** (Università Sapienza, Roma, I)
   TBA

9. **Chara Pantazi** (Universitat Politécnica de Catalunya (UPC), E)
   Semiclassical quantification of some two degree of freedom potentials.
   arXiv:2307.09318

10. **Giuseppe Pucacco** (University of Rome Tor Vergata, I)
    Equilibrium and Stability of the Laplace Resonance.
    arXiv:2410.12768

11. **Miguel A. Rodríguez** (Universidad Complutense, Madrid, E)
    TBA

12. **Andrea Sacchetti** (Università di Modena e Reggio Emilia, I)
    Resonances crossing.

    If we consider a quantum system dependent on one or more parameters, its eigenvalues generally do not intersect as these parameters vary, exhibiting avoided crossing patterns. This scenario changes if we consider the behavior of quantum resonances; in fact, in this case, two different types of crossings are possible and, depending on the type of crossings, the dynamics of the quantum system radically change. In this talk I discuss a quantitative criterion to determine whether the parameters of the quantum system fall into one type of resonances crossing or into the other. This analysis is essential for designing a quantum sensor made by heterostructures that easily and quickly measures whether an electric field has a predefined intensity.

    Physica Scripta 99 (2024), 1-8

    Ann. Phys. 480 (2025) 170122

    J. Phys. C 38 (2026), 1-12

13. **Nicola Sansonetto** (Università di Verona, I)
    From Broad-integrability to Euler-Jacobi Theorem and back

    Integrability has been and still is an active field of research in the Hamiltonian framework (both in finite and infinite dimensions). On the other hand its investigation drove less attention outside the Hamiltonian setup, at least until the last decades, when has attracted the attention of the community interested in nonholonomic mechanics and more recently in plasma. Despite being less studied, there are notions of integrability that extend to non-Hamiltonian framework. In this talk I will focus on two

notions of non-Hamiltonian integrable systems: Broad and Euler-Jacobi integrability. We first show that the first notion is stronger. We then investigate which possible 'non-evident' properties one can add to the Euler-Jacobi Theorem to make the dynamics broadly integrable.

`https://arxiv.org/abs/2503.21950`

`https://iopscience.iop.org/article/10.1088/1361-6544/ae341c`

14. **Paolo Santini** (Università Sapienza, Roma, I)

    Anomalous (rogue) waves in multidimensions.

    `Eur. Phys. J. Plus 141 (2026) 99`

    `Mechanics Res. Comm. 153 (2026) 104639`

15. **Libor Snobl** (Czech Technical University in Prague, CZ)

    On the incompleteness of the classification of quadratically integrable Hamiltonian systems in the three-dimensional Euclidean space.

    We present an example of an integrable Hamiltonian system with scalar potential in the three-dimensional Euclidean space whose integrals of motion are quadratic polynomials in the momenta, yet its Hamilton-Jacobi / Schrodinger equation cannot separate in any orthogonal coordinate system. This demonstrates a loophole in the derivation of the list of quadratically integrable Hamiltonian systems in [Makarov et al., A systematic search for nonrelativistic systems with dynamical symmetries. Nuovo Cimento A Series 10, 52:1061-1084, 1967] where only separable systems were found, and the need for its revision.

    `J. Phys. A 58 (2025) 115203 (DOI 10.1088/1751-8121/)`

16. **Alexander P. Veselov** (Loughborough University, UK)

    Darboux chain in quantum and classical Mechanics

17. **Ferdinand Verhulst** (RijksUniversiteit Utrecht, NL)

    New aspects of the Hénon-Heiles System.

    The Hénon-Heiles system is an iconic Hamiltonian system that deserves new analysis. Explicit applications of the Poincaré-Birkhoff theorem can be shown and in the chaotic regime bifurcation sequences will be discussed.

18. **Raffaele Vitolo** (Università del Salento, I)

    Bi-Hamiltonian systems from homogeneous operators.

    `https://arxiv.org/abs/2602.14739`

    `https://arxiv.org/abs/2407.17189`

19. **Patricia Yanguas** (Universidad de Navarra, Pamplona, E)

    Quasi-periodic solutions in the N-body problem.

2 Contributed talks

The speakers and talks below are confirmed

1. **Matteo Gorgone** (Università di Messina, I)

   Substitution principles in ideal gas dynamics derived as conditional symmetries.

2. **Giorgio Gubbiotti** (Università di Milano, I)

   Discretising a symmetry algebra: the Calogero-Moser case.

   Stimulated by our previous work on discretisation of the harmonic oscillators and their symmetry algebra, we determine the complete structure of the symmetry algebras associated with the N-body Calogero-Moser system and its maximally superintegrable discretisation. We prove that, differently from the previously known examples, the discretisation naturally leads to a nontrivial deformation of the continuous symmetry algebra, with the discretization parameter playing the rôle of a deformation parameter. This phenomenon shows how discrete superintegrable systems can be a sources of deformed polynomial algebraic structures.

   `https://arxiv.org/abs/2601.10625`

3. **Cesare Tronci** (University of Surrey, UK)

   Koopmon trajectories in nonadiabatic quantum-classical dynamics.

   `https://arxiv.org/abs/2312.13878`

3 Other pre-registered participants

1. **Giuseppe Gaeta** (Università di Milano, I)
2. **Xiaoman Luo** (Università del Salento, I)
3. **Sebastian Walcher** (RWTH Aachen, D)

`3 April 2026`