Foundations of General-Relativistic Gauge Field Theory

Tuesday, March 17, 2026 - Thursday, March 19, 2026

Politecnico di Torino

Scientific Program

The topic of this conference school is **General-Relativistic Gauge Field Theory**: its mathematical foundations, its first principle conceptual and technical development, state-of-the-art applications, and model building.

The event also features **contributed oral contributions by young researchers**, each with a maximum duration of 15 minutes (including questions).

Organization: Lucrezia Ravera (Politecnico di Torino, Italy)
Scientific Advisement: Jordan François (University of Graz, Austria)

The **Scientific Program** includes the following modules (**18 hours of lectures in total**):
[Module DG, 4.5h], 3 lectures, by **Jordan François** (University of Graz, Austria);
[Module AS, 4.5h], 3 lectures, by **T.B.A.** ();
[Module SR, 4.5h], 3 lectures, **Lucrezia Ravera** (Politecnico di Torino, Italy);
[Module FA, 4.5h], 3 lectures, by **Philipp Berghofer** (University of Graz, Austria).

Lectures DG

Three lectures on Bundle Differential Geometry (DG) of Gauge Field Theory, to provide the mathematical and geometric tools underpinning classical gauge theories: Ehresmann connection and Yang-Mills Gauge Field Theory, Cartan connection and gauge gravity, twisted connections on field space and anomalies, differential geometry of field space and gauge-fixing.

Detailed program of Module DG: T.B.A.

Lectures AS

Three lectures on Asymptotic Symmetries (AS) in General Relativity and applications to gravitational (and electromagnetic) radiation and gravitational waves physics.

Detailed program of Module AS: T.B.A.

Lectures SR

Three lectures on Symmetry Reduction (SR) schemes – in particular, the Dressing Field Method (DFM) and its relational interpretation – in General-Relativistic Gauge Field Theory, including state-of-the-art model building and applications (among which, e.g., General Relativity, Supersymmetric Field Theories, etc.).

Detailed program of Module SR: T.B.A.

Lectures FA

Three lectures on Foundational Aspects (FA) of General-Relativistic Gauge Field Theory, to allow a clearer understanding of the current state of general-relativistic physics and gauge theories, starting from first principles and conceptual analysis.

Detailed program of Module FA: T.B.A.

Contributed talk 1

T.B.A.

Contributed talk 2

T.B.A.

Contributed talk 3

T.B.A.

Contributed talk 4

T.B.A.

Contributed talk 5

T.B.A.

Contributed talk 6

T.B.A.