

PhD Program in Genetics, Molecular and Cellular Biology

Advanced Course in Genomics and Evolution

The evolution of genomes, epigenomes and their 3D organization

Apr 22 – May 08, 2026

Organizers (in alphabetical order)

Proff. Alessandro Achilli, Elena Giulotto, Anna Olivieri - Department of Biology and Biotechnology, University of Pavia

Program

The course explores how genomes, epigenomes, and their three-dimensional organization evolve and how evolutionary processes generate genomic and epigenomic diversity. Through a series of lectures ranging from the mechanisms of genome evolution to modern long-read sequencing technologies, students will learn how chromatin folding, DNA methylation, structural variation, and chromosome architecture shape genome function.

Oliver Ryder

Conservation Science Wildlife Health, San Diego Zoo Wildlife Alliance, Escondido, CA, USA

Title: The evolution of genomes and the evolution of all life

April 22, 4-6 pm (online – in streaming in Aula Falaschi)

Aurora Ruiz-Herrera

Departament de Biologia Cel·lular, Fisiologia i Immunologia, Universitat Autònoma de Barcelona (UAB), Cerdanyola del Vallès, Spain

Title: Evolution of 3D chromatin folding across time scales and cell types

April 23, 4-6 pm (Aula Buzzati-Traverso)

April 24, 9-11 am (Aula Buzzati-Traverso)

Nicolas Altemose

Department of Genetics, Stanford University, Palo Alto, CA, USA

Title: Long-read, single-molecule sequencing methods for studying chromatin biology

April 27, 4-6 pm (online – in streaming in Aula Jucci)

Theodore Kalbfleisch

Department of Veterinary Science, Martin-Gatton College of Agriculture, Food, and Environment, University of Kentucky, Lexington, KY, USA

Title: The post-genome era: how did we get here, and what can we now study?

May 4: 9-11 am (Aula Falaschi IGM-CNR)

Eleonora Cappelletti

Department of Biology and Biotechnology, University of Pavia, Pavia, Italy

Title: Centromere evolution in mammals

May 5, 4-6 pm (Aula Buzzati-Traverso)

Alessandro Raveane

Department of Biology and Biotechnology, University of Pavia, Pavia, Italy

Title: Recurrent evolution and selection shape structural diversity at the amylase locus

May 6, 2-4 pm (Aula Jucci)

John Lindo

Department of Anthropology, Emory University, Atlanta, GA, USA

Title: Understanding Epigenetics in the context of Human Evolution

May 6, 4-6 pm (online – in streaming in Aula Jucci)

Mario Ventura

Dipartimento Bioscienze, Biotecnologie ed Ambiente, Università degli Studi di Bari, Bari, Italy

Title: Next-generation sequencing in cytogenetics: uncovering the mystery of segmental duplications, centromeres and neocentromeres

May 7, 4-6 pm (Aula Buzzati-Traverso)

May 8, 9-11 am (Aula Buzzati-Traverso)