



Prof. Luca Calatroni

COMPUTATIONAL IMAGING & LEARNING: FROM PHYSICS TO DATA-DRIVEN METHODS

INSTRUCTOR: LUCA CALATRONI
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COURSE DESCRIPTION

The school introduces the mathematical and computational foundations of **computational imaging**, emphasizing the modeling, formulation, and solution of **inverse problems** in modern imaging systems. It begins with physical models of image acquisition in contexts such as **microscopy** and **tomography**, which are discretized into ill-posed inverse problems.

To address these, the course explores **regularization** and **Bayesian methods** like **maximum a posteriori (MAP) estimation**. Optimization techniques for image reconstruction, including **gradient-based** and **proximal algorithms**, are then presented. The course concludes with **data-driven** and **learning-based methods** that integrate with **model-based approaches** to enhance performance and interpretability.

FIRST LECTURE:

May 11 2026
14:30 - 16:30

ROOM 1BC45

PERIOD: 11-14 May 2026

Further details on the complete schedule (dates, times, and locations) will be communicated in due course.