

## INVITATION

### IKTrace Seminar (IMAT–CCM)

Coffee, discussion, and academic exchange

#### FIRST SEMINAR TALK

## On Operators Inspired by the Fractional Context and their Consequences in Complex Analysis and Control Theory

Antonio Nicola di Teodoro Cotua

#### Abstract

In this coffee and discussion session, we explore the influence of fractional calculus on the study of integro-differential operators and its implications for complex analysis and control theory. In particular, we analyze how the combination of classical and fractional operators leads to new classes of functions, including quasi-analytic, fractional anisotropic functions, and other extensions of the concept of analyticity.

We will discuss the consequences of these structures on representation formulas of the Cauchy and Cauchy–Pompeiu type, as well as on the characterization of harmonicity and its generalizations. Furthermore, we will present recent advances in the use of fractional operators within applied control problems, including representations inspired by Podlubny-type models.

Finally, we will discuss the importance of Mozart’s work amidst fractional chaos and how everything that is applied must be learned, or everything abstract must be understood in practical terms.

#### Seminar spirit

The IKTrace Seminar is conceived as a regular forum for exchange across research lines, teaching interests, and interdisciplinary initiatives. This first session opens a space for mathematical discussion, informal questions, and possible future collaborations.

#### Event details

##### WHEN

May 7, 2026, 16:00-18:00

##### WHERE

Logistar Room  
DeustoTech, 4th floor

##### FORMAT

Coffee and discussion session

#### Keywords

- Fractional calculus
- Integro-differential operators
- Complex analysis
- Cauchy–Pompeiu formulas
- Harmonicity and generalized analyticity
- Control theory

#### Participation

Colleagues and students are warmly invited to attend, take part in the discussion, and share ideas related to their own research interests.