

CLEAR SESSION: CONTROL DESIGN FOR ENVIRONMENTAL ADVANCEMENT AND RESEARCH

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Abstract of the session

*The pressing challenges of environmental degradation call for innovative approaches in research and technology. This mini-symposium, titled "**CLEAR** session: **Control** Design for **Environmental Advancement and Research**", aims to bring together experts to discuss advancements in control theory and green engineering tailored to address environmental challenges.*

The focus will be on cutting-edge methods in control design, optimization, and system modeling for sustainable energy systems. Special attention will be given to managing pollution growth and stock, optimizing water allocation in irrigation systems, and ensuring ecological balance in lake ecosystems.

The goal is to demonstrate how results from theoretical mathematics, non linear control design approaches, and tools inspired by developments in artificial intelligence can be articulated to provide new solutions.

Key topics include:

- *Modeling and control of lake ecosystems for pollution mitigation and ecological preservation.*
- *Optimal and robust control strategies.*
- *Integration of environmental sustainability into control frameworks for water systems.*

The symposium aspires to foster interdisciplinary collaboration, bridging the gap between theoretical mathematical research and practical implementation.

Presentations of the session (totally 2 hours)

1. **Catherine Choquet, A machine learning algorithm for water quality control (25+5 min)**
2. **Éloïse Comte, Optimal control for lake eutrophication: A Dirichlet boundary control problem (25+5 min)**
3. **Souad Bezzaoucha, Polytopic approach for stability and control design of Saint-Venant equations (25+5 min)**
4. **Ruben Chenevat, Optimizing crop irrigation under biological and operational constraints with meteorological uncertainty (25+5 min)**