



1st IFAC Workshop on

**Control of Systems Governed
by Partial Differential
Equations, CPDE 2013**

Institut Henri Poincaré
Paris, France, 25-27 September, 2013



**- 1st IFAC Workshop CPDE -
25-27 September 2013, Institut Henri Poincaré Paris - France
First Announcement and Call for Papers**

Organized by: INRIA Saclay, France

Location: Henri Poincaré Institute, Paris

Sponsored by: IFAC International Federation of Automatic Control, IFAC TC on Distributed Parameters Systems

Co-sponsored by: IFAC TC on Control Design, IFAC TC on Linear Control Systems, IFAC TC on Non-Linear Control Systems, IFAC TC on Optimal Control

Scope: Distributed parameter systems, which are mathematically described by partial differential equations, impose a formidable challenge in many applications coming from classical industrial fields as well as emerging fields related to energy, transport, communication or medical science. Herein, the distributed parameter description becomes an essential ingredient of the modeling and analysis process if the spatial or property distribution of the system variables cannot be neglected. Typical examples comprise chemical or biochemical reactors, thermal and electrochemical systems, smart and vibrating structures, flow problems, propagating waves, or systems for energy production, distribution and storage. The dynamic operation of these distributed parameter systems essentially relies on the incorporation of suitable control and estimation strategies to influence the system dynamics and to enlarge the dynamic operating range. Starting from these observations new approaches to the control of distributed parameter systems directly exploit the structural system properties to develop dedicated analysis and design techniques to address the spatial-temporal system dynamics. The control design for systems modeled by partial differential equations hence resides at the intersection of mathematics, systems and control theory, control systems technology, and computer and information science making it essential to provide a joint forum to foster and evolve this important and emerging field of research.

Topics: The topics of the workshop will address new and state-of-the-art developments in modeling and control of distributed parameter systems and their application. This covers approaches and techniques for the modeling, analysis, control, and observer/estimator design for systems governed by partial differential equations and includes (but is not limited to) methods such as differential geometric and algebraic approaches, semigroup and operator theory, Lyapunov-based and backstepping techniques, passivity and dissipativity, optimal control, controllability and observability analysis, stability theory, model reduction for control, computational methods, real-time control, actuator and sensor placement, experimental design. In addition, applications are considered covering, e.g., smart and adaptive structures in mechatronics, marine systems and aerospace engineering, flow control, energy generation, distribution and storage, process intensification and process systems engineering, adaptive optics, quantum systems, distributed cooperative systems, communication, embedded actuators and sensors, traffic control and network congestion, and flexible micro-structures.

Location

The workshop will be held at the Institut Henri Poincaré in Paris, France. The Institut Henri Poincaré (IHP), created in 1928, is one of the oldest and most active international bodies dedicated to mathematics and theoretical physics. It is located on the campus Pierre et Marie Curie, in the fifth arrondissement of Paris: a place full of history that is also associated with the first steps of atomic physics, the discovery of radioactivity and the birth of the [National Center for Scientific Research](http://www.cnrs.fr) (CNRS). More details can be found on <http://www.ihp.fr/en>

Important dates

Submission of draft papers: **January 18, 2013**

Author notification: **March 29, 2013**

Final paper: **May 17, 2013**

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