Universidad Carlos III de Madrid
Department of Mathematics

# COLLOQUIA

## Martes, 14 de marzo de 2017.


## Prof. Volker Mehrmann (Technical University of Berlin, Germany)


# Numerical analysis and control of port-Hamiltonian systems


**Abstract:**

We will discuss the concept of energy based modeling via port-Hamiltonian systems. These models have many advantages: the mathematical model is close to the physics (by incorporating the available conservation laws), these conservation laws and the system properties like stability and passivity are directly encoded in the algebraic and geometric properties of the equations, such models can be connected to bigger systems, and structure preserving model reduction and discretization is achievable. We present several real world examples from gas transport, mechanical multibody dynamics, and combustion that can be modelled in this way. Then we discuss the (local) geometric and algebraic properties and the consequences for the analysis of the modelling and numerical errors, as well as the resulting pertubation theory. We finally show how to use the structure effectively in optimal control of PDE constrained port-Hamiltonian systems.


**Univ. Carlos III de Madrid**

**Coordenadas**

**Hora** 11:00 - 12:00
**Lugar** Seminario del Departamento
Aula 2.2D08 Edificio Sabatini.

**Dirección**

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