

**9th CI<sup>2</sup>MA Focus Seminar  
“Modelling and Numerical Simulation in Wastewater Treatment”**

**April 22, 2014**

**Auditorio Alamiro Robledo**

**Facultad de Ciencias Físicas y Matemáticas, Universidad de Concepción**

Organizers: Fernando Betancourt (CI<sup>2</sup>MA & Departamento de Ingeniería Metalúrgica UdeC)  
Raimund Bürger (CI<sup>2</sup>MA & Departamento de Ingeniería Matemática UdeC)  
Alex Schwarz (Departamento de Ingeniería Civil UdeC)

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**Programme**

**09.15 Raimund Bürger** (Universidad de Concepción): Welcome

**Session 1: Introduction to Modelling of Secondary Settling Tanks (SSTs) and Biological Wastewater Treatment**

**09.30 Stefan Diehl** (Lund University, Sweden):  
A Consistent Modelling Methodology (CMM) for  
secondary settling tanks in wastewater treatment

**10.00 Ingmar Nopens** (BIOMATH, Ghent University, Belgium):  
Practical application of the Bürger-Diehl settling model: state of the art

**10.30 David Jeison** (Universidad de La Frontera, Temuco, Chile):  
Modelling biological wastewater treatment: challenges and perspectives

**11.00** Coffee Break

**Session 2: Engineering, Reactions and Local Experience**

**11.30 Alex Schwarz** (Universidad de Concepción):  
Assessment of the Activated Sludge Process at Biobío wastewater treatment plant  
using BSM1-based modeling

**12.00 Ingmar Nopens** (BIOMATH, Ghent University, Belgium):  
KALLISTO: cost effective and integrated optimization  
of the urban wastewater system Eindhoven

**12.30 Javier Nannig and Néstor Rojas** (Akros Servicios de Ingeniería Ltda., Santiago)  
Verifying traditional secondary clarifier design for real influent variations  
under dynamic conditions

**13.00** Lunch break  
Refreshments will be offered in the *sala multiuso*,  
4th floor of faculty building (courtesy of project CRHIAM)

### Session 3: Flocculation, Model Calibration, and Control

- 14.30 Elena Torfs** (BIOMATH, Ghent University, Belgium):  
Towards a novel methodology for the calibration of a coupled flocculation-CFD model
- 15.00 Stefan Diehl** (Lund University, Sweden):  
Denoising experimental batch-settling data by optimization and numerical identification of the hindered settling and compression functions in PDE models for sedimentation
- 15.30 Fernando Betancourt** (Universidad de Concepción, Chile):  
On the control of clarifier-thickener units using mathematical models
- 16.00 Sebastian Farås** (Lund University, Sweden):  
Numerical simulation of sedimentation in clarifier-thickeners fed by suspensions with time-dependent settling properties
- 16.30** Coffee break

### Session 4: Advanced Topics of Numerical Analysis

- 17.00 Héctor Torres** (Universidad de La Serena, Chile):  
A stabilized finite volume element formulation for sedimentation-consolidation processes
- 17.30 Ricardo Ruiz-Baier** (Université de Lausanne, Switzerland):  
A general mathematical model and numerical approximation of multiphase flow in porous media
- 18.00 Erwan Hingant** (Universidad de Concepción):  
Systems of water-soluble polymer and metal ions
- 18.30 Closing remarks**
- 20.30** Seminar Dinner  
(speakers invited courtesy of project ACT1118)

## Practical information

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Seminar participants who would like to join dinner should register with CI<sup>2</sup>MA secretary:

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