
Workshop on Hyperbolic Problems: Theory, Numerics and Applications

Universidad de Concepción, January 16 and 17, 2025
Centro de Investigación en Ingeniería Matemática (CI²MA),
Auditorio Hermann Alder Weller
Organizers¹: Raimund Bürger and Luis Miguel Villada

Thursday, January 16, 2025

11.00–11.30 **Cristóbal E. Castro** (Departamento de Ingeniería Mecánica, Facultad de Ingeniería, Universidad de Tarapacá, Arica, Chile):

Flux-vector splitting approach for the Shallow Water equation and applications

11.30–12.00 **Gino I. Montecinos** (Departamento de Ingeniería Matemática, Universidad de La Frontera, Temuco, Chile):

A universal scheme for hyperbolic PDE in both conservative and non-conservative form

12.00–12.30 **Manuel A. Sánchez**, Cristhian Núñez (Instituto de Ingeniería Matemática y Computacional, Facultad de Matemáticas y Escuela de Ingeniería, Pontificia Universidad Católica de Chile, Santiago):

Symplectic Hamiltonian Hybridizable Discontinuous Galerkin Methods for shallow-water equations

12.30–13.00 **Andrés I. Ávila** (Departamento de Ingeniería Matemática, Universidad de La Frontera, Temuco, Chile):

An Oliver's approach to second-order MPRK schemes for some time-dependent hyperbolic equations

13.00–14.30 **Lunch break** (lunch not included)

14.30–15.00 **Jaime A. Hernández** (Departamento de Ingeniería Matemática, Universidad de La Frontera, Temuco, Chile):

ENO-ET reconstruction for finite volume methods applied to sediment transport in shallow water flows

15.00–15.30 **Cesar Alberto Rosales-Alcantar** (CIMAT Mérida, Mexico):

A new two-dimensional blood flow model with arbitrary cross-sections

15.30–16.00 **Coffee break**

¹Supported by ANID (Chile) through CMM, project BASAL FB210005; CRHIAM; project ANID/FONDAP/1523A0001; Anillo ANID/ACT210030; and Fondecyt project 1210610

16.00–16.30 Luis Miguel Villada (GIMNAP-Departamento de Matemática, Universidad del Bío-Bío and CI²MA, Universidad de Concepción, Concepción, Chile):

Well-posedness of a nonlocal reaction traffic flow model with on-off ramps

16.30–17.00 Claudio Muñoz (Departamento de Ingeniería Matemática and Centro de Modelamiento Matemático (UMI 2807 CNRS), Universidad de Chile, Santiago):

Interaction of jamitons in second-order macroscopic traffic models

17.30–18.00 Juan Barajas-Calonge (Departamento de Matemática, Universidad del Bío-Bío, Concepción, Chile):

Invariant-region-preserving central WENO schemes for one-dimensional multi-species kinematic flow models

Friday, January 17, 2025

09.30–10.00 Pep Mulet (Departamento de Matemáticas, Universitat de València, Spain):

Numerical methods for the compressible Cahn-Hilliard-Navier-Stokes equations

10.00–10.30 Jaime Manríquez (Centre for Mathematical Sciences, LTH Faculty of Engineering, Lund University, Sweden):

Modelling biofilm in slow sand filters: one- and two-dimensional models

10.30–11.00 Raimund Bürger (CI²MA and Departamento de Ingeniería Matemática, Universidad de Concepción, Concepción, Chile):

Hyperbolic and related problems in mineral processing and wastewater treatment

11.00–11.30 Coffee break

11.30–12.00 Mauricio Sepúlveda (CI²MA and Departamento de Ingeniería Matemática, Universidad de Concepción, Concepción, Chile):

Well-posedness and numerical analysis of an elapsed time model with strongly coupled neural networks

12.00–12.30 Rodrigo Véjar (Departamento de Matemáticas, Universidad de La Serena, Chile):

Finite volume scheme for a Kawahara equation with time-delayed boundary control

12.30–13.00 Trinidad Gatica (Pontificia Universidad Católica de Chile, Santiago):

Classifying acoustic cavitation with machine learning trained on multiple physical models

13.00–13.30 Carlos Torres-Ulloa (Departamento de Ciencias Matemáticas y Físicas, Universidad Católica de Temuco, Chile):

Foam front dynamics in improved oil recovery: comparing pressure-driven growth with Darcy flow

13.30–13.45 Closing remarks and discussion