

# **PROGRAMME FOR BAIL 2010 CONFERENCE**

**June 22, 2010**

The opening of the Conference will take place in the Salón de Actos of Agustin de Betancourt Building in **EUITIZ** (Escuela Universitaria de Ingeniería Técnica Industrial de Zaragoza).

All lectures are in room 0.02 of the Agustin de Betancourt Building.

During the Conference the participants can use the computer room 2.12 which has an internet connection. Alternatively, participants can use wifi facilities to connect their personal computers to the internet.

Lunches and coffee breaks will be in the Agustin de Betancourt Building.

On Monday 5 July, the welcome reception will be held at 20:00 in the Palacio de la Aljafería, Calle de los Diputados.

On Thursday 8 July at 19:30, in Plaza del Pilar we will begin the tourist visit to the Centre of the City.

On Thursday 8 July, after the tourist visit, the Conference dinner will take place at Restaurante Elíseos, Paseo de Sagasta, 4.

## Monday July 5

**08:00-08:55** Reception of the conference participants

**09:00-09:25** Opening of Conference by His Excellency D. José Luis Serrano Ostariz, Director General of Department of Science, Technology and University of the Government of Aragón, His Excellency Dr Manuel López Pérez, Rector of the University of Zaragoza, Professor John Miller, Founder of the BAIL Conferences and Chairman of the International Steering Committee and Professor Carmelo Clavero, Chairman of the Local Committee of the BAIL 2010 Conference.

**09:25-10:25** Plenary lecture: Claes Johnson

“The mathematical secret of flight”

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**10:25-10:50** J.R. Kweon: “For compressible viscous Navier-Stokes flows over a grazing corner”

**10:50-11:15** I.I. Vigdorovich: “Selfsimilar turbulent boundary layer in pressure gradient. The phenomenon of hysteresis in near-separating flow”

**11:15-11:45** Coffee break

**11:45-12:10** P. Louda, J. Prihoda, K. Kozel: “Numerical simulation of turbulent incompressible and compressible flows over rough walls”

**12:10-12:35** P. Svacek: “Numerical approximations of flow induced vibrations of vocal folds”

**12:35-13:00** L. Boguslawski: “Local pressure distribution on sphere in high turbulent flow”

**13:00-13:25** J. Casado, M. Luna, F.J. Suárez: “Asymptotic behavior of a viscous fluid near a rough boundary”

**13:25-15:00** Lunch

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*Mini-symposium on finite element methods using layer-adapted grids.*

*Part 1*

**15:00-15:25** S. Franz, R.B. Kellogg, M. Stynes: “Galerkin and streamline diffusion finite element methods on a Shishkin mesh for a convection-diffusion problem with corner singularities”

**15:25-15:50** P. Solin, O. Certik: “Adaptive multimesh hp-FEM for coupled problems with boundary layers”

**15:50-16:15** S. Franz, G. Matthies: “Local projection stabilisation on layer-adapted meshes for convection-diffusion problems with characteristic layers (Part I)”

**16:15-16:40** S. Franz, G. Matthies: “Local projection stabilisation on layer-adapted meshes for convection-diffusion problems with characteristic layers (Part II)”

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**16:40-17:10** Coffee break

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*Mini-symposium on finite element methods using layer-adapted grids.*

*Part 2*

**17:10-17:35** H.G. Roos: “Analysis of finite element methods for convection-diffusion problems in 2D on Bakhvalov-type meshes”

**17:35-18:00** Z. Xie: “A numerical method for multiple solutions of a singularly perturbed semilinear Neumann problem”

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**20:00** Reception in Palacio de la Aljafería

## **Tuesday July 6**

**09:00-10:00** Plenary lecture: Amable Liñan

“The role of multiple scales in the analysis of combustion processes”

*Mini-symposium on finite element methods using layer-adapted grids.*

*Part 3*

**10:00-10:25** L. Rohe, G. Lube: “Large-eddy-simulation of wall-bounded turbulent flows- Layer-adapted meshes vs. weak Dirichlet boundary conditions”

**10:25-10:50** R.G. Durán, A.L. Lombardi, M.I. Prieto: “Superconvergence for finite element approximation of a convection-diffusion equation using graded meshes”

**10:50-11:15** Z. Zhang: “Finite element superconvergence under anisotropic meshes”

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**11:15-11:45** Coffee break

**11:45-12:10** P. Cathalifaud, M. Zagzoule, J. Couxteix, J. Mauss: “High Reynolds channel flows: upstream interaction of various wall deformations”

**12:10-12:35** M. Zagzoule, P. Cathalifaud, J. Couxteix, J. Mauss: “High Reynolds channel flows: variable curvature”

**12:35-13:00** L. Benes, J. Furst, Ph. Fraunie: “Numerical Modeling of the moving body in the stratified medium”

**13:00-13:25** R.S. Alassar: “Modeling acoustic streaming on a vibrating particle”

**13:25-15:00** Lunch

**15:00-15:25** J.M.L. Bernard: “On novel properties of multimode boundary conditions in electromagnetism and their consequences”

**15:25-15:50** J. Lowe, G. Lube: “A variational multiscale method for the non-isothermal incompressible Navier-Stokes problem”

**15:50-16:15** N.V. Chemetov: “Boundary layer problem: Navier Stokes and Euler equations”

**16:15-16:40** B. Rasuo: “Accuracy test results in 2D transonic wind tunnels: problem of boundary layer control”

**16:40-17:10** Coffee break

**17:10-17:35** R. Celorrio, E. Apiñaniz, A. Mendioroz, A. Salazar: “Numerical solution of an inverse problem in nondestructive evaluation of materials”

**17:35-18:00** J.L. López, E. Pérez, N.M. Temme: “The error function in the study of singularly perturbed convection-diffusion problems with discontinuous boundary data”

## Wednesday July 7

**09:00-10:00** Plenary lecture: Ricardo G. Durán

“Approximation of singularly perturbed problems using anisotropic elements”

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**10:00-10:25** R. Schneider: “Anisotropic mesh adaptation based on a posteriori estimates”

**10:25-10:50** G.I. Shishkin: “Robust finite difference schemes approximating the solutions and derivatives with improved accuracy”

**10:50-11:15** F. Schieweck “A stable discontinuous Galerkin-Petrov method in space and time for the non-stationary convection-diffusion problem”

**11:15-11:45** Coffee break

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*Mini-symposium on robust methods for time-dependent singularly perturbed problems. Part 1*

**11:45-12:35** J.C. Jorge: “Robust time integrators and uniformly convergent spatial discretizations for singularly perturbed parabolic problems: state of art, pending tasks and challenges”

**12:35-13:00** T. Linss, N. Kopteva: “Robust pointwise a posteriori errors estimates for time-dependent singularly perturbed problems”

**13:00-13:25** N. Chadha, N. Madden: “An optimal time-stepping for a time dependent advection-diffusion problem”

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**13:25-15:00** Lunch

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*Mini-symposium on robust methods for time-dependent singularly perturbed problems. Part 2*

**15:00-15:25** M. Viscor, M. Stynes: “A singularly perturbed parabolic problem that degenerates on one boundary”

**15:25-15:50** N. Kopteva, S.Franz: “Maximum norm a posteriori error estimates for time-dependent convection-diffusion equations”

**15:50-16:15** J.L. Gracia, E. O’Riordan: “A singularly perturbed time dependent convection diffusion problem with a interior layer”

**16:15-16:40** K.K. Mondal, N. Madden: “A computational study of an interior layer in a fluid flow problem”

**16:40-17:05** C. Clavero, J.L. Gracia: “Uniformly convergent finite difference schemes for singularly perturbed 1D parabolic reaction-diffusion problems”

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**17:05-17:35** Coffee break

**17:35-18:00** L. Shishkina, G.I. Shishkin: “Flux difference schemes for singularly perturbed parabolic equations: approximations of solutions and derivatives”

**18:00-18:25** D. Branley, A.F. Hegarty: “A priori estimates for a convection diffusion problem with a corner discontinuity”

## **Thursday July 8**

**09:00-10:00** Plenary lecture: Ramón Codina

“Finite element approximation of the convection-diffusion equation: subgrid-scale spaces, local instabilities and anisotropic space-time discretizations”

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**10:00-10:25** L. Tobiska: “The two-level local projection stabilization as an enriched one-level approach”

**10:25-10:50** M. Bause: “Stabilized higher-order finite element approximation of convection-dominated problems with nonlinear reaction”

**10:50-11:15** V. John: “On the SUPG method for time-dependent problems”

**11:15-11:45** Coffee break

**11:45-12:10** P. Knobloch: “Local projection stabilization with projection spaces defined on overlapping sets”

**12:10-12:35** J. Principe, R. Codina: “Finite element approximation of the convection-diffusion-reaction equation on distorted meshes using orthogonal subscales”

**12:35-13:00** M. Benitez, T. Chacón, M. Gómez, G. Narbona: “Numerical approximation of convection-diffusion problems through the PSI method”

**13:00-13:25** J. Fuhrmann, A. Linke: “On finite volume methods for coupled flows on Delaunay meshes and the preservation of the local maximum principle”

**13:25-15:00** Lunch

**15:00-15:25** S. Fuentes, M.H. Doweidar, G. Hauke: “Mesh adaptivity using the VMS error estimator. Application to the transport equation”

**15:25-15:50** F. Gaspar, F. Lisbona, C. Rodrigo: “The use of staggered grids as stabilization technique of the poro-elasticity problem and its efficient resolution by multigrid”

**15:50-16:15** F. Gaspar, F. Lisbona, C. Rodrigo: “About a stabilized finite element method for the the poro-elasticity problem and its efficient resolution by multigrid”

**16:15-16:40** M. Braack, B. Tews: “Finite element discretizations of optimal control flow problems with boundary layers”

**16:40-17:05** Coffee break

**19:00-21:00** Tourist visit to the city of Zaragoza

**21:30** Conference dinner

## **Friday July 9**

**09:00-10:00** Plenary lecture: Raytcho Lazarov

“Galerkin finite element approximation of elliptic problems and their hybridization”

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**10:00-10:25** S. Chandra, S. Kumar: “A uniformly convergent numerical method for a coupled system of singularly perturbed initial-value problems”

**10:25-10:50** M. Paramasivan, V. Franklin, S. Valarmathi, J.J.H. Miller: “Parameters-uniform numerical methods for a partially singularly perturbed linear system of equations of reaction-diffusion type- a special case”

**10:50-11:15** V. Franklin, M. Paramasivan, S. Valarmathi, J.J.H. Miller: “A fitted mesh method for a linear system of singularly perturbed time dependent equations of reaction-diffusion type”

**11:15-11:45** Coffee break

**11:45-12:10** I. Boglaev: “Uniform convergence of monotone Newton-like iterates for semilinear singularly perturbed problems”

**12:10-12:35** E. O’Riordan, J. Quinn: “Some singularly perturbed nonlinear convection diffusion problems”

**12:35-13:00** D. Konaté: “Higher order solution for a singularly perturbed diffusion-convection problem in two dimensions”

**13:00-13:25** M. Brera, C. de Falco, J.W. Jerome, Y. Mori, R. Sacco: “A conservative and monotone mixed-hybridized finite element approximation of transport problems in heterogeneous domains”

**13:25-13:30** Closing of Conference

**13:30** Lunch

## Chairpersons of sessions

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|------------------|-------------|--------------------------|
| <b>Monday</b>    | 09:25-10:25 | M. Stynes                |
|                  | 10:25-11:15 | V. John                  |
|                  | 11:45-13:25 | G.I. Shishkin            |
|                  | 15:00-16:40 | H.G. Roos                |
|                  | 17:10-18:00 | M. Stynes & Z. Zhang     |
| <b>Tuesday</b>   | 09:00-10:00 | R. Codina                |
|                  | 10:00-11:15 | H.G. Roos & M. Stynes    |
|                  | 11:45-13:25 | J.M.L. Bernard           |
|                  | 15:00-16:40 | Z. Xie                   |
|                  | 17:10-18:00 | J.L. Gracia              |
| <b>Wednesday</b> | 09:00-10:00 | P. Solin                 |
|                  | 10:00-11:15 | E. O’Riordan             |
|                  | 11:45-13:25 | J.L. Gracia & N. Kopteva |
|                  | 15:00-17:05 | T. Linss                 |
|                  | 17:35-18:25 | I. Boglaev               |
| <b>Thursday</b>  | 09:00-10:00 | L. Tobiska               |
|                  | 10:00-11:15 | G. Hauke                 |
|                  | 11:45-13:25 | G. Lube                  |
|                  | 15:00-16:40 | R. Celorrio              |
| <b>Friday</b>    | 09:00-10:00 | J.J.H. Miller            |
|                  | 10:00-11:15 | J.C. Jorge               |
|                  | 11:45-13:25 | A. Hegarty               |

All chairpersons of sessions are asked to stay as close as possible to the published timetable.

In particular each talk should end a few minutes before its timeslot ends, to allow time for questions and for changeover to the next speaker.