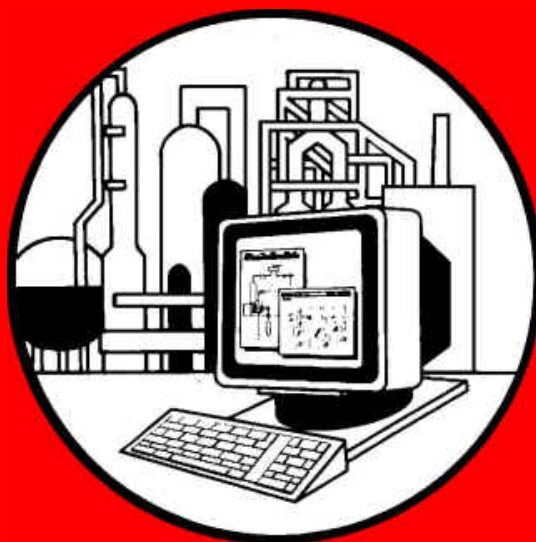


Final Programme

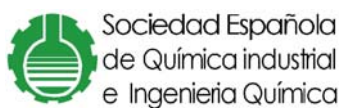


ESCAPE-15

29 May – 1 June 2005

Barcelona – Spain

EFCE event n° 642



UNIVERSITAT DE BARCELONA



Scientific Programme Summary

Time	Sunday, 29 May	Time	Monday, 30 May	Time	Tuesday, 31 May	Time	Wednesday, 1 June
		08:20	Registration Hall A	08:20	Registration Hall A	08:20	Registration Hall A
		09:00	Opening Session	09:00	PL 2 I.T. Cameron S6	09:00	PL 3 R. Gani S6
		09:20	PL 1 G.V. Reklaitis S6				
10:00	CAPE WP Workshop (members only) S8	10:00	<i>Coffee Break</i> Hall B	10:00	<i>Coffee Break</i> Hall B	10:00	<i>Coffee Break</i> Hall B
		10:20	<u>IA S5</u> <u>PO S6</u>	10:20	<u>IA S5</u> <u>MS S6</u>	10:20	<u>PD S5</u> <u>PO S6</u>
		10:40	oral 1	10:40	oral 7	10:40	oral 1
		11:00	oral 2	11:00	oral 8	11:00	oral 2
		11:20	oral 3	11:00	oral 9	11:00	oral 3
		11:40	<u>IA S5</u> <u>PO S6</u>	11:20	<u>IA S5</u> <u>MS S6</u>	11:20	<u>PD S5</u> <u>PO S6</u>
		12:00	oral 4	11:20	oral 10	11:20	oral 4
		12:20	oral 5	11:40	oral 11	11:40	oral 5
			oral 6	12:00	oral 12	12:00	oral 6
				12:20	ESCAPE-16 S6	12:20	oral 7
12:40	<i>LUNCH</i> Hall C	12:40	<i>LUNCH</i> Hall C	12:40	<i>LUNCH</i> Hall C	12:40	<i>LUNCH</i> Hall C
14:00	CAPE WP Meeting (members only) S8	14:00	<u>CM S5</u> <u>PO S6</u>	14:00	POSTER Session Hall B EURECHA Session S8	14:00	POSTER Session Hall B
		14:20	oral 1				
		14:40	oral 2				
			oral 3				
		15:00	<u>CM S5</u> <u>PO S6</u>	15:00	<u>PO S6</u> <u>MS S5</u>	15:00	<u>PD S5</u> <u>MS S6</u>
		15:20	oral 4	15:00	oral 19	15:00	oral 8
		15:40	oral 5	15:20	oral 20	15:20	oral 9
			oral 6	15:40	oral 21	15:40	oral 10
16:00	Registration Hall A	16:00	<i>Coffee Break</i> Hall B	16:00	<i>Coffee Break</i> Hall B	16:00	<u>PD S5</u> <u>MS S6</u>
		16:20	<u>CM S5</u> <u>PO S6</u>	16:00	<u>PO S6</u> <u>MS S5</u>	16:00	oral 11
		16:40	oral 7	16:20	oral 22	16:20	oral 12
		17:00	oral 8	16:40	oral 23	16:40	oral 13
			oral 9	17:00	oral 24	17:00	<i>Coffee Break</i> Hall B
		17:20	<u>CM S5</u> <u>PO S6</u>	17:20	<u>PO S6</u> <u>MS S5</u>	17:20	Awards (Oral, Poster)
		17:40	oral 10	17:20	oral 25		
		18:00	oral 11	17:40	oral 26	17:40	Closing Session
18:00	Get Together Hall A	18:00	oral 12	18:00	oral 27		
				19:30	Banquet		

Sx = Room x

Welcome

The ESCAPE (European Symposium on Computer Aided Process Engineering) series brings the latest innovations and achievements by leading professionals from the industrial and academic communities. The series serves as a forum for engineers, scientists, researchers, managers, and students from academia and industry to present and discuss progress being made in research and application of CAPE. The most recent ESCAPE Symposia were organised in Finland (2003), The Netherlands (2002), and Portugal (2004). The previous edition of ESCAPE-15 in Barcelona was COPE-91 (1991).

The main objectives of ESCAPE-15 are:

- to present the current state of the art in the field of computer aided methods, algorithms and techniques related to process and product engineering,
- to facilitate the debate on new challenges and trends with a main theme: Integrated approaches in CAPE for sustainable development,
- to give the opportunity for young researchers to present valuable contributions to CAPE by lowering the Symposium fees and facilitating their participation.

ESCAPE-15 has focused on recent developments of New Systems Methodologies and Computer Aided Applications in Process Engineering in general and in the following areas of chemical engineering in particular:

- ✓ computing methods for CAPE,
- ✓ modelling and simulation,
- ✓ process and product design,
- ✓ process operation and control,
- ✓ integrated approaches in CAPE.

More than 600 abstracts were submitted to the conference. Out of them 325 were invited to submit a full paper and 284 were finally selected for presentation. Their authors came from 43 different countries. The selection of papers was carried by an International Scientific Committee consisting of 54 reviewers. In addition to the contributed papers, three plenary lectures of international stature and recognition were invited to present the achievements and future needs in various areas covered by the Symposium topics.

The Proceedings of ESCAPE-15 consist of two volumes, which include the contributed papers organised in five classes paralleling the five themes of the Symposium. We hope that this book will serve as a valuable reference document to the scientific and industrial community.

Luis Puigjaner
Antonio Espuña

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Scientific Programme

Sunday, 29 May 2005

10:00-12:40	CAPE-WP Workshop (members only)	Room 8
12:40-14:00	Lunch	Hall C
14:00-16:00	CAPE-WP Meeting (members only)	Room 8
16:00-18:00	Registration	Hall A
18:00	Get together	Hall A

Monday, 30 May 2005

09:00-09:20	Opening	Room 6
Session Chairs: F. Belil, R. Nomen, R. Gani, J. Soley, L. Puigjaner & A. Espuña		

Session PL-01		Room 6
Session Chairs: I. Cameron & S. Pistikopoulos		

09:20-10:20	Enterprise-wide Decision Support Systems: PSE Contributions & Promise <i>G. V. Reklaitis</i>	1
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10:20-10:40	Coffee-Break	Hall B
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Session IA-01: Integrated Approaches in CAPE		Room 5
Session Chairs: D. Bogle & L. Jiménez		

10:40-11:00	Integrated Process and Product Design Optimization: A Cosmetic Emulsion Application <i>F. P. Bernardo and P. M. Saraiva</i>	1507
11:00-11:20	Design Synthesis for Simultaneous Waste Source Reduction and Recycling Analysis in Batch Processes <i>I. Halim and R. Srinivasan</i>	1513
11:20-11:40	Design and Control Structure Integration from a Model-Based Methodology for Reaction-Separation with Recycle Systems <i>E. Ramírez and R. Gani</i>	1519

Session PO-01: Process Operation and Control **Room 6**
Session Chairs: **N. Shah & S. Engell**

- 10:40-11:00 A Framework for the Mixed Integer Dynamic Optimisation of Waste Water Treatment Plants using Scenario-Dependent Optimal Control
J. Busch, M. Santos, J. Oldenburg, A. Cruse and W. Marquardt 955
- 11:00-11:20 On-line Fault Diagnosis Support for Real Time Evolution applied to Multi-Component Distillation
S. Ferrer-Nadal, I. Yélamos-Ruiz, M. Graells and L. Puigjaner 961
- 11:20-11:40 Real-Time Feasibility of Nonlinear Predictive Control for Semi-batch Reactors
H. Arellano-Garcia, T. Barz, M. Wendt and G. Wozny 967

Session IA-02: Integrated Approaches in CAPE **Room 5**
Session Chair: **G. Heyen**

- 11:40-12:00 Modelling and Optimisation of Industrial Absorption Processes: An EC Collaborative Research Project
P. Seferlis, N. Dalaouti, E. Y. Kenig, B. Huepen, P. Patil, M. Jobson, J. Klemes, P. Proios, M. C. Georgiadis, E. N. Pistikopoulos, S. Singare, C. S. Bildea, J. Grievink, P. J. T. Verheijen, M. Hostrup, P. Harper, G. Vlachopoulos, C. Kerasidis, J. Katsanevakis, D. Constantinidis, P. Stehlik and G. Fernholz 1525
- 12:00-12:20 An Integrated Approach to Modelling of Chemical Transformations in Chemical Reactors
T. Salmi, D. Yu. Murzin, J. Wärnä, M. Kangas, E. Toukoniitty and V. Nieminen 1531
- 12:20-12:40 An MILP Model for the Optimal Design of Purification Tags and Synthesis of Downstream Processing
E. Simeonidis, J. M. Pinto and L. G. Papageorgiou 1537

Session PO-02: Process Operation and Control **Room 6**
Session Chairs: **C. Floudas & G. Henning**

- 11:40-12:00 Control of Integrated Process Networks - A Multi-Time Scale Perspective
M. Baldea and P. Daoutidis 973
- 12:00-12:20 Minimum-Cost Operation in Heat-Exchanger Networks
A. H. González and J. L. Marchetti 979
- 12:20-12:40 An Online Decision Support Framework for Managing Abnormal Supply Chain Events
M. Bansal, A. Adhitya, R. Srinivasan and I. A. Karimi 985

12:40-14:00 Lunch Hall C

Session CM-01: Computing Methods for CAPE Room 5
Session Chair: **P. Linke**

- 14:00-14:20 The Statistical Simplex Method for Experimental Optimization with Process Data
E. C. Martínez 31
- 14:20-14:40 Robust Parameter Estimation in Nonlinear Dynamic Process Models
M. Rodríguez-Fernández, A. A. Alonso and J. R. Banga 37
- 14:40-15:00 State Space Analysis: a Tool for Progress
J. Villa Briongos and J. Guardiola Soler 43

Session PO-03: Process Operation and Control Room 6
Session Chairs: **A. Karimi & M. Graells**

- 14:00-14:20 Novel Scheduling of a Mixed Batch/Continuous Sugar Milling Plant using Petri nets
M. Ghaeli, P. A. Bahri and P. L. Lee 991
- 14:20-14:40 A Rigorous MINLP for the Simultaneous Scheduling and Operation of Multiproduct Pipeline Systems
R. Rejowski Jr. and J. M. Pinto 1063
- 14:40-15:00 Multi-scale Planning and Scheduling in The Pharmaceutical Industry
H. Stefansson and N. Shah 1003

Session CM-02: Computing Methods for CAPE Room 5
Session Chairs: **A. Flores & Z. Kravanja**

- 15:00-15:20 About the Relevance of Mathematic Programming and Stochastic Optimisation Methods: Application to Optimal Batch Plant Design Problems
A. Ponsich, C. Azzaro-Pantel, S. Domenech and L. Pibouleau 49
- 15:20-15:40 A Lagrangean Duality based Branch and Bound for Solving Linear Stochastic Programs with Decision Dependent Uncertainty
V. Goel and I. E. Grossmann 55
- 15:40-16:00 Stochastic MINLP Optimization using Simplicial Approximation
V. Goyal and M. G. Ierapetritou 61

Session PO-04: Process Operation and Control **Room 6**
Session Chairs: **J. M. Pinto & S. Espugas**

15:00-15:20	Initiation and Inhibiting Mechanisms for Multi-tasking Control in Discrete Event Systems <i>S. Macchietto, N. J. Alsop, R. J. Baird, Z. P. Feng and B. H. Chen</i>	1009
15:20-15:40	Model Based Parametric Control in Anaesthesia <i>P. Dua, V. Dua and E. N. Pistikopoulos</i>	1015
15:40-16:00	Anti-Slug Control Experiments on a Small-Scale Two-Phase Loop <i>H. Sivertsen and S. Skogestad</i>	1021

16:00-16:20 Coffee-Break **Hall B**

Session CM-03: Computing Methods for CAPE **Room 5**
Session Chairs: **M. Ierapetritou & J.R. Banga**

16:20-16:40	A Robust and Efficient Mixed-Integer Non-Linear Dynamic Optimization Approach for Simultaneous Design and Control <i>A. Flores-Tlacuahuac and L. T. Biegler</i>	67
16:40-17:00	Towards an Efficient Mathematical Procedure for Calculating Dynamic Adsorption Process <i>A. P. Scheer, E. C. V. Toledo, R. M. Filho and M. R. Wolf-Maciel</i>	73
17:00-17:20	The Numerical Solution of Moving Boundary Problems Using the Moving Finite Element Method <i>R. Robalo, C. Sereno, M. C. Coimbra and A. Rodrigues</i>	79

Session PO-05: Process Operation and Control **Room 6**
Session Chair: **M. Georgiadis**

16:20-16:40	Using CLP and MILP for Scheduling Commodities in a Pipeline <i>L. Magatão, L. V. R. Arruda and F. Neves Jr.</i>	1027
16:40-17:00	Scheduling of a Pipeless Multi-Product Batch Plant using Mixed-Integer Programming Combined with Heuristics <i>S. Panek, S. Engell and C. Lessner</i>	1033
17:00-17:20	On the State-Task Network Formulation: Time Representations <i>C. T. Maravelias</i>	1039

Session CM-04: Computing Methods for CAPE **Room 5**
Session Chair: **A. Rodrigues & X. Joulia**

- 17:20-17:40 A Novel Feasibility Analysis Approach Based on Dimensionality Reduction and Shape Reconstruction
I. Banerjee and M. G. Ierapetritou 85
- 17:40-18:00 Identification of Vertex and Nonvertex Critical Points for Large-Scale Approximate Stochastic Optimization
Z. Novak Pintari and Z. Kravanja 91
- 18:00-18:20 Infinite/infinite Analysis as a Tool for an Early Oriented Synthesis of a Reactive Pressure Swing Process
J. Bonet, R. Thery, X. Meyer, M. Meyer, J. M. Reneaume, M. I. Galan and J. Costa 97

Session PO-06: Process Operation and Control **Room 6**
Session Chairs: **J. Grievink & A.P. Barbosa-Povoa**

- 17:20-17:40 Optimization of Biopharmaceutical Manufacturing with Scheduling Tools - Experiences from the Real World
C. A. Siletti, D. Petrides and A. Koulouris 1045
- 17:40-18:00 Advances in Robust Optimization Approaches for Scheduling under Uncertainty
S. L. Janak and C. A. Floudas 1051
- 18:00-18:20 Proactive Approach to address Robust Batch Process Scheduling under Short-Term Uncertainties
A. Bonfill, A. Espuña and L. Puigjaner 1057

Tuesday, 31 May 2005

Session PL-02 **Room 6**
Session Chairs: **W. Marquardt & R. Gani**

- 09:00-10:00 Modelling across the Process Life-Cycle: A Risk Management Perspective
I. T. Cameron 3

10:00-10:20 Coffee-Break **Hall B**

Session IA-03: Integrated Approaches in CAPE **Room 5**
Session Chair: **L. Von Wedel & R. Srinivasan**

- 10:20-10:40 An Upper Ontology based on ISO 15926
R. Batres, M. West, D. Leal, D. Price and Y. Naka 1543

- 10:40-11:00 Multi-agent Systems for Ontology-Based Information Retrieval
R. Bañares-Alcántara, L. Jiménez Esteller and A. Aldea 1549
- 11:00-11:20 An Agent-Based Approach for Supply Chain Retrofitting under Uncertainty
G. Guillén, F. D. Mele, F. Urbano, A. Espuña and L. Puigjaner 1555

Session MS-01: Modelling and Simulation **Room 6**
Session Chairs: **P. Barton & M. Olazar**

- 10:20-10:40 A Dynamic Approach to the Dimension Reduction of Chemical Kinetic Schemes
H. Huang, M. Fairweather, A. S. Tomlin, J. F. Griffiths and R. B. Brad 229
- 10:40-11:00 New Approaches for Representing, Analyzing and Visualizing Complex Kinetic Mechanisms
I. P. Androulakis 235
- 11:00-11:20 A Kinetic Generator of Hydrocarbon Pyrolysis Mechanisms
S. Pierucci, E. Ranzi, M. Dente and S. Barendregt 241

Session IA-04: Integrated Approaches in CAPE **Room 5**
Session Chairs: **Y. Naka & R. Batres**

- 11:20-11:40 Pharmaceutical Informatics: A Novel Paradigm for Pharmaceutical Product Development and Manufacture
C. Zhao, G. Joglekar, A. Jain, V. Venkatasubramanian and G. V. Reklaitis 1561
- 11:40-12:00 A Web Service Based Framework for Information Integration of the Process Industry Systems
Xiangyu Li, Xiuxi Li and Y. Qian 1567
- 12:00-12:20 A Library for Equation System Processing based on the CAPE-OPEN ESO Interface
G. Schopfer, J. Wyes, W. Marquardt and L. von Wedel 1573

Session MS-02: Modelling and Simulation **Room 6**
Session Chairs: **Y. Kenig & A. Garea**

- 11:20-11:40 An Adaptive Reduction Scheme to Develop Flexible Reduced Chemistry Models for Reactive Flow Simulations
I. Banerjee and M. G. Ierapetritou 247
- 11:40-12:00 Simulation of the o-Xylene Oxidation into Phthalic Anhydride: Rigorous Multitubular Catalytic Reactor Modelling and Exportation into the Process Flowsheet
J. A. Jara, A. Garea and J. A. Irabien 253

12:00-12:20 Gas Flow Distribution Modelling in Conical Spouted Beds
R. Aguado, S. Alvarez, M. J. San José, M. Olazar and J. Bilbao 613

12:20-12:40 ESCAPE-16 Room 6

12:40-14:00 Lunch Hall C

14:00-15:00 Poster Session: CM, MS, PD, PO, and IA Hall B

14:00-15:00 EURECHA Session Room 8

Session PO-07: Process Operation and Control Room 6
Session Chair: **E. Kondili**

15:00-15:20 Improving Short-Term Planning by incorporating Scheduling
Consequences
P. Heijnen, I. Bouwmans and Z. Verwater-Lukszo 997

15:20-15:40 Multicommodity Transportation and Supply Problem with
Stepwise Constant Cost Function
Z. Lelkes, E. Rev, T. Farkas, Z. Fonyo, T. Kovacs and I. Jones 1069

15:40-16:00 Design and Planning of Supply Chains with Reverse Flows
M. I. Gomes Salema, A. P. Barbosa-Póvoa and A. Q. Novais 1075

Session MS-03: Modelling and Simulation Room 5
Session Chair: **S. Pierucci & C. Kiparissides**

15:00-15:20 Process Modelling Goals: Concepts, Structure and Development
I. T. Cameron, E. S. Fraga and I. D. L. Bogle 265

15:20-15:40 Computer-aided modelling: A study on the dynamic flash
H. A. Preisig 271

15:40-16:00 Identifying Equations that Represent Properties in Homologous
Series using Structure-Structure Relations
G. Cholakov, R. Stateva, M. Shacham and N. Brauner 277

16:00-16:20 Coffee-Break Hall B

Session PO-08: Process Operation and Control **Room 6**
Session Chairs: **S. Skogestad & R. Nomen**

16:20-16:40	Heterogeneous Batch Distillation Processes: Real System Optimization <i>S. Pommier, S. Masseur, V. Gerbaud, O. Baudouin, P. Baudet and X. Joulia</i>	1081
16:40-17:00	Modelling and Optimisation of Distributed-Parameter Batch and Semi-batch Reactor Systems <i>X. Zheng, Robin Smith and C. Theodoropoulos</i>	1087
17:00-17:20	Optimal Start-up of Micro Power Generation Processes <i>P. I. Barton, A. Mitsos and B. Chachuat</i>	1093

Session MS-04: Modelling and Simulation **Room 5**
Session Chairs: **H.S. Preisig & J.B. Belaud**

16:20-16:40	CAPE-OPEN Consultancy Scheme <i>M. E. Pons</i>	283
16:40-17:00	An Environment for the Development of Operator Training Systems (OTS) from Chemical Engineering Models <i>V. C. Hass, F. Kuhnen and K.-M. Schoop</i>	289
17:00-17:20	Techno-Economic Modelling and Cost Functions of CO ₂ Capture Processes <i>J. Klemes, I. Bulatov and T. Cockerill</i>	295

Session PO-09: Process Operation and Control **Room 6**
Session Chair: **M. Bagajewicz**

17:20-17:40	Performance Monitoring of Industrial Controllers Based on the Predictability of Controller Behavior <i>R. A. Ghraizi, E. Martínez, C. de Prada, F. Cifuentes and J. L. Martínez</i>	1099
17:40-18:00	A Systematic Approach to Plant-Wide Control Based on Thermodynamics <i>L. T. Antelo, I. Otero-Muras, J. R. Banga and A. A. Alonso</i>	1105
18:00-18:20	A Multiple Model, State Feedback Strategy for Robust Control of Nonlinear Processes <i>F. Y. Wang, P. A. Bahri, P. L. Lee and I. T. Cameron</i>	1111

Session MS-05: Modelling and Simulation **Room 5**
Session Chair: **J. Repke**

17:20-17:40	Dynamic Simulator for Dosing of Water Treatment Chemicals <i>I. Joensuu, M. Piironen and E. Juuso</i>	301
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17:40-18:00	Dynamic Model of MAb Production and Glycosylation for the purpose of Product Quality Control <i>C. Kontoravdi, S.P. Asprey, E N. Pistikopoulos and A. Mantalaris</i>	307
18:00-18:20	Modelling and Validated Simulation of Solvent-Gradient Simulated Moving Bed (SG-SMB) Processes for Protein Separation <i>K. Wekenborg, A. Susanto and H. Schmidt-Traub</i>	313
19:30	Banquet	<i>La Miranda del Museu</i>

Wednesday, 1 June 2005

Session PL-03 Room 6 Session Chairs: **G.V. Reklaitis & I. Grossmann**

09:00-10:00 Integrated Chemical Product-Process Design: CAPE Perspectives
R. Gani 21

10:00-10:20 **Coffee-Break** Hall B

Session PD-01: Process and Product Design Room 5 Session Chairs: **A. Kokossis & J. Aittamaa**

10:20-10:40 Design and Control of Recycle Systems by Non-Linear Analysis
A. A. Kiss, C. S. Bildea and A. C. Dimian 637

10:40-11:00 Novel Group Contribution Based Approach in Process Flowsheet
Synthesis, Design and Modelling
L. d'Anterrosches and R. Gani 643

11:00-11:20 Optimal Synthesis of an Emulsion Pertraction Process for the
Removal of Pollutant Anions in Industrial Wastewater Systems
M. F. San Román, E. Bringas, I. Ortiz and I. E. Grossmann 649

Session PO-10: Process Operation and Control Room 6 Session Chairs: **S. B. Jorgensen & C. de Prada**

10:20-10:40 A Robust Discriminate Analysis Method for Process Fault
Diagnosis
D. Wang and J. A. Romagnoli 1117

10:40-11:00 Learning in Intelligent Systems for Process Safety Analysis
C. Zhao and V. Venkatasubramanian 1123

11:00-11:20 Multivariate Decision Trees for the Interrogation of Bioprocess
Data
K. Kipling, G. Montague, E. B. Martin and A. J. Morris 1129

Session PD-02: Process and Product Design Room 5 Session Chairs: **P. Glavic & H.A. Matos**

11:20-11:40 Modelling and Simulation of Operation for the TAEE Synthesis by
Catalytic Distillation
C. Ciornei, G. Bumbac and V. Plesu 655

11:40-12:00	Use of Interval Optimization for finding Limiting Flows of Batch Extractive Distillation <i>E. R. Frits, M. Cs. Markót, T. Csendes, Z. Lelkes, Z. Fonyo and E. Rev</i>	661
12:00-12:20	Modelling Fermenters with CFD <i>P. Moilanen, M. Laakkonen and J. Aittamaa</i>	709
12:20-12:40	Particle-scale Heat Removal in Fixed-bed Catalytic Reactors: Modelling and Optimisation of a Desorptive Cooling Process <i>M. Richrath, S. Lohse, M. Grünewald and D. W. Agar</i>	673

Session PO-11: Process Operation and Control **Room 6**
Session Chair: **Z. Fonyo**

11:20-11:40	On a New Definition of a Stochastic-Based Accuracy Concept of Data Reconciliation-Based Estimators <i>M. Bagajewicz</i>	1135
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Session Chair: **Honorable Conseller Carles Solà**

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Special Events

CAPE-WP Workshop

The CAPE-WP Workshop will take place on Sunday, 29th May, in Room 8 of the Congress Centre from 10h00-12h30.

CAPE-WP Business Meeting

The CAPE-WP Business Meeting will be held on Sunday, 29th May, in Room 8 of the Congress Centre from 14h00-17h00.

EURECHA Session

The EURECHA Session will take place on Tuesday, 31st May, in Room 8 of Congress Centre from 14h00-15h00. A keynote lecture: “Recommendations for Chemical Engineering Education in a Bologna Two Cycle Degree System” will be presented by Dr. Martin Molzan.

CACE Editorial Advisory Board Meeting

The CACE Editorial Advisory Board Meeting will be held on Tuesday, 31st May, at Lunch Time from 12h40-14h00 in the restaurant “La Pérgola”.

Satellite Courses

Four training courses will be held in Barcelona in connection with ESCAPE-15:

- **AspenTech** is pleased to collaborate with **ESCAPE-15** Organizing Committee elaborating an offer of CAPE Courses in its Barcelona Training Facilities. The courses are closely related to the content of the Congress.
- **Batch / Bio Process Modeling, Scheduling & Optimization**, by Demetri Petrides, Ph.D., president of Intelligen, Inc.
- **Process Modelling, Simulation, Optimisation and Model Validation with gPROMS**, organized by PSE Ltd.
- **Process Design and Optimization: Discrete/Continuous Optimization Models and Techniques and their application in Process Systems Engineering**, by Prof. Ignacio Grossmann, Carnegie Mellon. Organized by UPC, Chemical Engineering Department-CEPIMA.

In order not to interfere with the sessions, all courses are starting the day after the congress finishes. Attendants who demonstrate a paid registration to ESCAPE-15 will get **50%** discount on regular prices. Please, refer to ESCAPE-15 Web site for further information.

Practical Information

ESCAPE-15 will take place in the “Palacio de Congresos de Barcelona” (Fira de Barcelona), well communicated with any place in Barcelona Metropolitan area by bus, metro and train, and at 8 km from the Barcelona International Airport. Please see “Congress Centre” for the detailed location of Congress Rooms and Halls. Also please refer to <http://www.ub.es/escape15/venue.htm>



Cancellation, refunds and substitution

Written requests for cancellation and refund of registration fees should be addressed to Escape-15 secretariat. A deduction of EUR 75,00 for administrative costs will be made for registration cancellations received before 11 May 2005. For cancellations after 11 May 2005 no refund can be made.

A registered participant who is subsequently unable to attend may nominate a substitute by informing Escape-15 Secretariat.

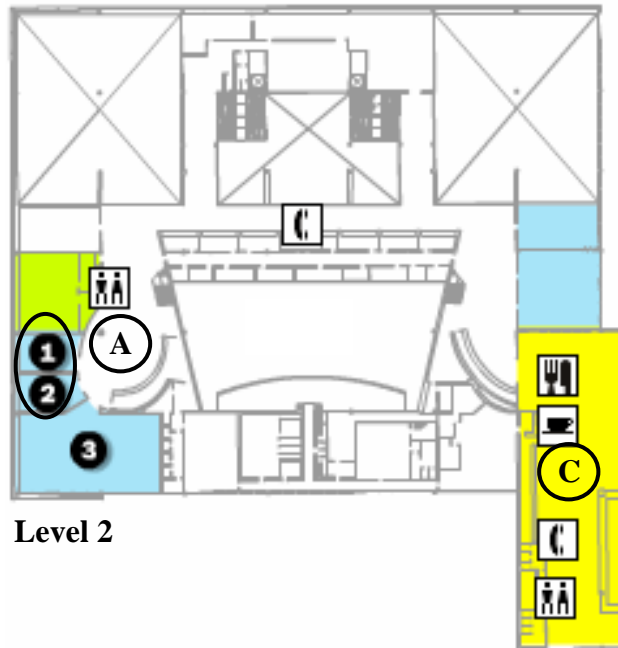
Communications

During the symposium participants can be reached as follows:

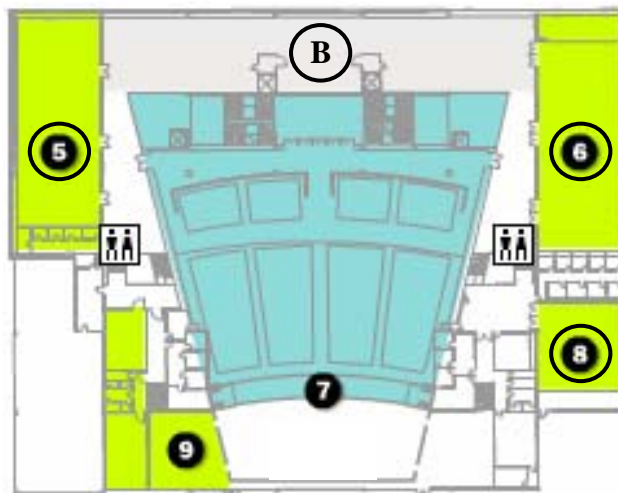
by telephone: + 34 93 233 23 92
by telefax: + 34 93 233 24 57
by e-mail: escape15@angel.qui.ub.es

Congress Centre

The Congress Centre different levels, where Room numbers and Hall letters are identified with circles, is shown in the maps below:



Level 2



Level 3

Gala Dinner

Gala dinner will be celebrated at 20:30h in the restaurant *La Miranda del Museu*, located at the traditional harbour of Barcelona, at the top of the building *Palau de Mar*, on the [Museum of History of Catalonia](#) (Pl. Pau Vila 3, 08039 Barcelona).

Monday 30th of May last day to register in the registration desk.

The price of the ticket is 87,40 €person, Gala dinner and visit to the Museum of History of Catalonia is included. The visit to museum will start at 19:30h.

Internet Points

During the conference there will be available 8 computers, situated at the **Room 2** (Secretariat Office), which can be used for connection to the internet.

Meals

The Conference fee includes the Monday to Wednesday lunches and all coffee breaks. The tickets for these meals can be found inside the conference bag. People who wish to buy additional tickets (€25/lunch/day) can do so at registration until 11:15 Monday, 30th of May.

The conference lunches will be served at the Self Service of the restaurant facilities, just a short walk from the Congress Centre.

Registration

The registration of the conference participants will start on Sunday afternoon, May 29, at 16:00, at the Main Hall of the “Palacio de Congresos de Barcelona” (Fira de Barcelona). It will close on Sunday at 19:30 and reopen Monday morning at 08:00.

Welcome Party & ESCAPE-15 presentation

All the participants are invited to a Welcome Party which will take place at the first floor of the Congress Center “Palacio de Congresos de Barcelona” (Fira de Barcelona).

General Information

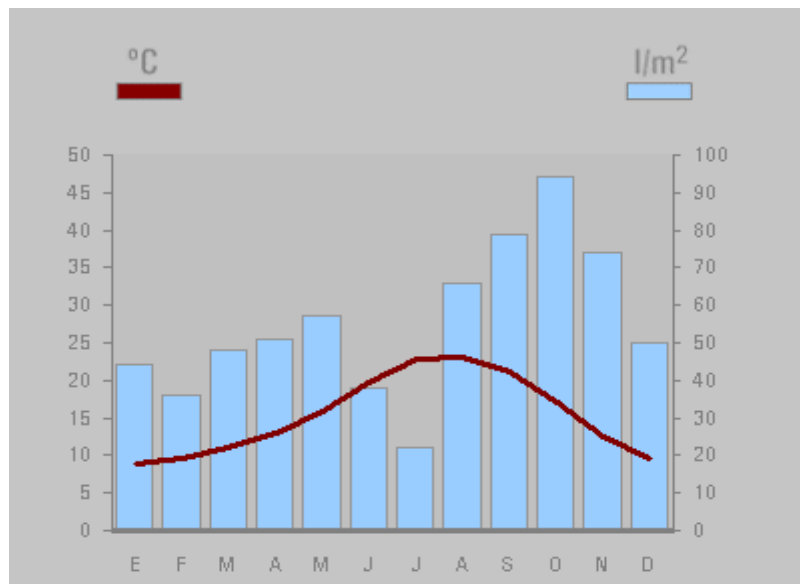
Accommodation

Accommodation in Barcelona is available in all price categories, but early booking is highly recommended as Barcelona is a main tourist destination. If you wish to arrange your accommodation, you may contact Grupo Pacifico, who is in charge of the booking services during the ESCAPE15 Conference.

For further information concerning accommodation and tours, please contact directly to Grupo Pacífico (e-mail: escape15@pacifico-meetings.com).
<http://www.ub.es/escape15/travel.htm>

Climate

Being located on the shores of the Mediterranean, Barcelona enjoys a warm, welcoming climate and pleasant temperatures all year round.



Please, refer to the Barcelona Official Web-page (<http://www.bcn.es/temps/english>) for further updated information.

Currency & exchange

As a member of the European Monetary System the €[euro] is the Spanish currency. http://www.bcn.es/turisme/english/turisme/pla_sis_hom.htm

Major credit cards are accepted in most hotels, shops and restaurants. Traveller cheques and currency can be changed at hotels or at a bank - these are open Monday to Friday from 08h30 to 14h00. Automatic changing and cash dispensing machines linked to international networks are also widely available.

Electrical current

European type 2 pin sockets with 220 volts AC at 50 cycles are used.

How to reach Barcelona

Barcelona International Airport located 12 kms. from the city centre, and linked to it via bus and train services. It is served by all major international airlines from all over the world.

Barcelona can be also reached by sea or by land. Please, see http://www.bcn.es/turisme/english/turisme/pla_arr_hom.htm for further details.

Language

The official languages are both Spanish and Catalan. English and French are widely spoken in touristic services.

Local time

Mainland Spain is the Central European Standard Time [Paris – Roma – Berlin -....]

Meals, shopping, etc.

In Barcelona, as in the rest of Spain, people normally have their meals later than in other European countries. People sit down for lunch between 13:00 and 15:00 in and for dinner between 21:00 and 22:00.

Shops in Barcelona open their doors between 9:00 and 10:00 in the morning, and generally close for lunch at 13:30 or 14:00. They open again in the afternoon between 16:00 and 17:00 and remain open until 20:00 or 20:30 in the evening. Nevertheless, it should be noted that many shopping centres and larger establishments do not close at midday. Many shops and all department stores and shopping centres open Saturday afternoons, while all shops close Sundays, except for a few dates when they are permitted to open.

Sales tax [VAT] is included in prices quoted. For non E.U. residents, tax free shopping schemes are available in many shops, which gives substantial savings to visitors.

Please, see

http://www.bcn.es/turisme/english/turisme/pla_cos_hom.htm

http://www.bcn.es/turisme/english/turisme/ser_hom_fr.htm

http://www.bcn.es/turisme/english/turisme/ser_com_hom.htm

for further details

Medical care

Clinics and hospitals provide round the clock emergency service. The national emergency phone number is 112. Please refer to

http://w3.bcn.es/V26/Home/V26HomeLinkPI/0,3004,5527827_5535092_3,00.html for detailed information on Barcelona Medical Services.

Spain has reciprocal health care agreements with EU and many other countries. Please, check that you carry the corresponding documents with you.

Museums, parks, gardens, remarkable churches & palaces, cultural activities, etc.

Barcelona's reputation as a world centre for art, architecture and design is growing yearly with a plethora of cultural activities on offer.

Please, refer to Barcelona Official Web-page for updated detailed information

(<http://www.bcn.es/turisme/english/turisme/welcome.htm>,

http://w3.bcn.es/V01/Home/V01HomeLinkPI/0,2460,7610_52378_3,00.html or

http://www.bcn.es/turisme/english/turisme/vis_hom_fr.htm).

Once you are in Barcelona, Barcelona's main tourist offices can be found in Plaça de Catalunya, Plaça Sant Jaume and in Barcelona International Airport. Opening hours vary, but are generally between 9:00-20:00. English speaking staff will always be available. There is a cultural information desk at Palau de la Virreina, La Rambla 99 (tel: (+34) 93 301 7775).

Passport and Visas

Additionally to a valid passport (or identity card for EU nationals), a VISA may be also required. If you are in any doubt as to whether or not you may need a VISA to enter Spain, you should contact the Spanish Embassy in your home country.

Post & telecommunications

Automatic direct dial telephone service is available to and from most countries in the world. Spanish International CountryCode is (+34); International access code dialling from Spain is "00" (then dial CountryCode, AreaCode, etc.). Additionally, to make a phone call from Hotels, etc. you may need to dial first specific codes to get external line.

Public phones accept either a pre-paid card, or coins. Credit systems such as AT&T are also available in specific places like airports, etc.

Barcelona Central Post office is located in Pza. Antonio López and it is open to the public from 08:30 to 21:30 from Monday to Saturday.

Public transportation

Barcelona boasts a very comprehensive public transport network made up of a metro system plus trains, buses, cable cars and funicular railways. Please, refer to http://www.tmb.net/en_US/home.jsp for complete information about transport in the metropolitan area... and notice that you can take profit of several multi-journey combinations.

Trains and express bus services also link the main towns of the country. Please refer to your travel agency and/or to the Tourist Information Services.

Religious services

At http://www.iese.edu/studenthome/AH/htmls/hba44_06.html you will find some places of worship, which may have services in languages other than Spanish and Catalan.

Security

Barcelona is a touristic city. Although it is very unlikely to suffer from any act of

