

P R O G R A M



Fifteenth Australasian Fluid Mechanics Conference

13 – 17 December 2004

The University of Sydney, New South Wales, Australia

www.aeromech.usyd.edu.au/15afmc

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Transport

Sydney Buses is the most economical way to get to Sydney University and takes approx up to 15 mins. from the Sydney CBD.

Further information can be found at
<http://www.131500.info/newJourney.asp>

Sydney University has “pay and display” parking. Parking after 3pm will cost \$6.00. Ticket machines accept \$1 and \$2 coins only.

Registration Desk

The registration desk will be situated in the Peter Nicol Russell (PNR) Building and will commence from the Reception on Sunday 12 December and continue each day for the length of the Conference at the same location.

Social Program

Sunday Registration

An informal cocktail reception will follow the afternoon registration on Sunday 12 December (5pm – 8pm).

Harbour Cruise

A cruise across Sydney Harbour has been arranged for the afternoon of Wednesday 15 December. Details will be provided at the conference.

Banquet Dinner

The conference banquet dinner will be held at Wesley College on the University’s Camperdown campus (see map on page 5), Thursday 16 December from 7pm. Dress: Casual.

Technical Information

The parallel sessions will allow 25 minutes for each presentation, consisting of:

Presentation: 15 minutes

Questions: 5 minutes

Changeover: 5 minutes.

Each room will be equipped with a computer with USB port and CD reader running Windows 2000 with PowerPoint and Acrobat Reader, a data projector connected to the computer and an overhead projector. Presenters may plug the data projector into their own laptops if they wish.

Catering

Morning tea, afternoon tea and lunch are included in the registration fee and will be served daily. Meals will be served at the PNR Building. Those wishing to dine elsewhere during the conference should consider nearby metropolitan Newtown and Glebe.

If you have any special dietary requirements, please check at the Registration desk to ensure that your needs are being met.

Banking & Currency

Banks are open Monday to Friday 0930 – 1600. Three major banks are located on the University's main campus and several Automatic Teller Machines are on campus. While numerous foreign currency exchanges operate in the Sydney CBD, the most convenient to the University is International Currency Services Aust., Shop 13 - Central Station, Eddy Avenue.

Internet & Telephones

Participants will be able to access on-site computing facilities for the purpose of checking emails, etc. in Rm S322, Mechanical Engineering Building (userid and password: 15afmc). A number of public telephones can be found on campus. Please see Conference organisers.

Name Badges

Admission to all sessions, morning and afternoon teas, lunches and banquet dinner is by name badge only.

Organizing Committee

Prof. M. Behnia, *Chair*
Dr G. D. McBain, *Co-Chair & Secretary*
Dr K. Srinivas, *Co-Chair*
A/Prof. S. W. Armfield, *Treasurer*
Dr D. Auld
Dr W. Lin

Sponsors



**Air Force Office of Scientific Research,
The United States Air Force**



**School of Aerospace, Mechanical & Mechatronic
Engineering, The University of Sydney**

Dean of Graduate Studies, The University of Sydney



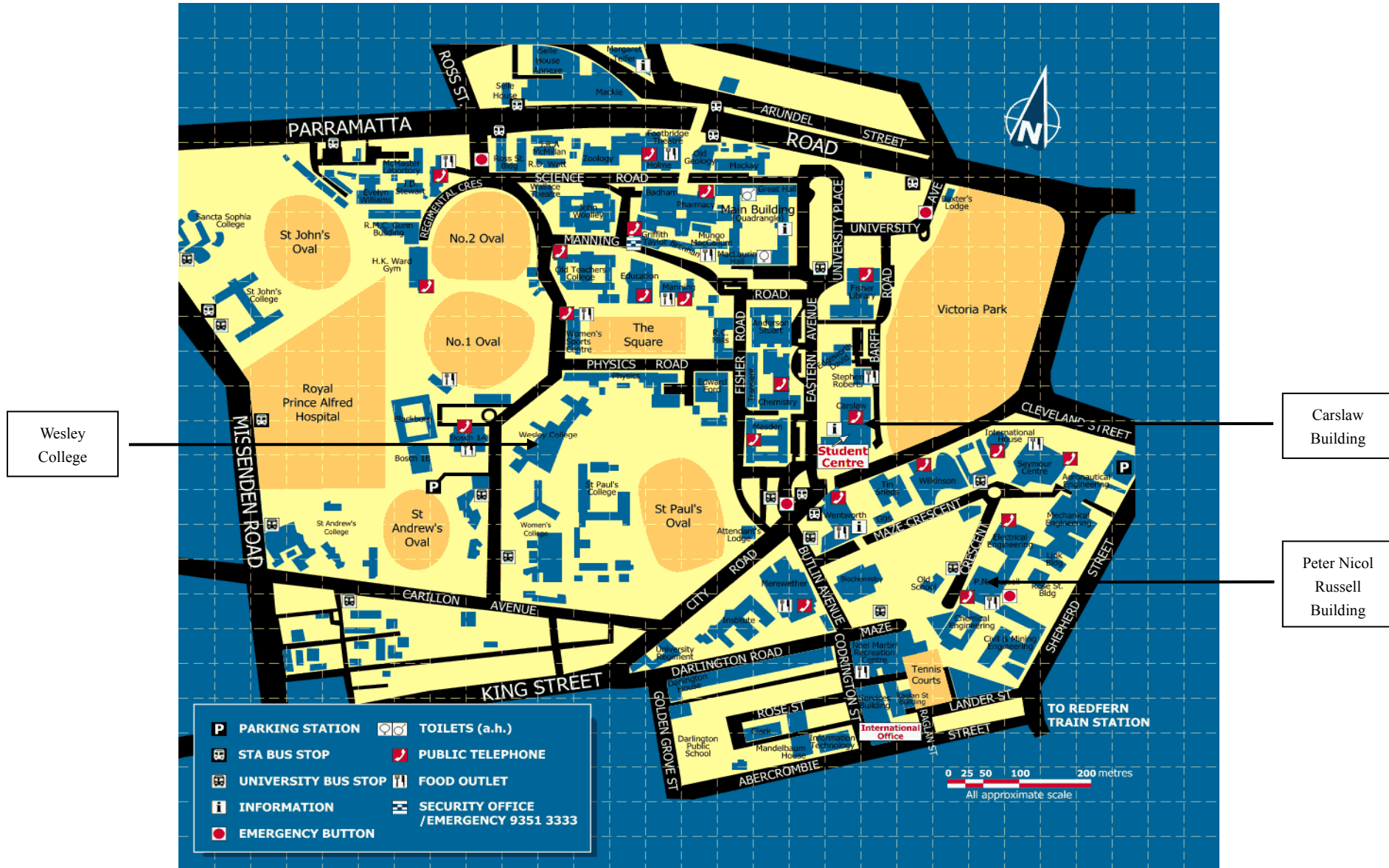
The University of Sydney

Scientific Advisory Committee

Professor Julio Soria (*Chair*), Monash University, Australia
Professor Robert Antonia, University of Newcastle, Australia
Dr Hugh Blackburn, CSIRO, Australia
Professor Min Chong, University of Melbourne, Australia
Dr Farid Christo, Defence Science & Technology Organisation, Australia
Dr Bassam Dally, University of Adelaide, Australia
Professor Graham de Vahl Davis, University of New South Wales, Australia
Dr Jim Denier, University of Adelaide, Australia
Dr Bruce Fairlie, Australian Defence Staff Australian High Commission, Australia
Professor David Fletcher, University of Sydney, Australia
Dr Simon Henbest, Defence Science & Technology Organisation, Australia
Dr Damon Honnery, Monash University, Australia
Professor Kerry Hourigan, Monash University, Australia
Professor Jae Min Hyun, Korea Advanced Institute of Science & Technology, Korea
Professor Toshiaki Ikohagi, Institute of Fluid Science Tohoku University, Japan
Professor Jorg Imberger, University of Western Australia, Australia
Professor Peter Jackson, University of Auckland, New Zealand
Professor Nobuhide Kasagi, University of Tokyo, Japan
Dr Richard Kelso, The University of Adelaide, Australia
Dr Charles Lemckert, Griffith University, Australia
Professor Eddie Leonardi, University of New South Wales, Australia
Professor Yuguo Li, University of Hong Kong, Hong Kong
Professor Gordon Mallinson, University of Auckland, New Zealand
Professor Bill Melbourne, Monash University, Australia
Major Tony Mitchell, Asian Office of Aerospace Research & Development, Japan
Professor Graham Morrison, University of New South Wales, Australia
Professor Gus Nathan, University of Adelaide, Australia
Dr Andrew Ooi, University of Melbourne, Australia
Professor John Patterson, James Cook University, Australia
Dr Sundara Rajagopalan, University of Newcastle, Australia
Professor John Reizes, University of Technology, Sydney, Australia
Mr Ian Shepherd, CSIRO Manufacturing and Infrastructure Technology, Australia
Professor Chew Yong Tian, National University of Singapore, Singapore
Professor Stewart Turner, The Australian National University, Australia
Dr Gregory Walker, University of Tasmania, Australia

Venues and Maps

Most conference activities will be held in the Peter Nicol Russell Building (PNR) on the University's Darlingtown Campus. The official opening and Keynote talks will take place at the Carslaw Building on the Camperdown campus.



Sunday 12 December		Monday 13 December	Tuesday 14 December	Wednesday 15 December	Thursday 16 December	Friday 17 December
	0845-0900	Opening Address Carslaw Lecture Theatre 157				
	0900-1000	Batchelor Lecture Carslaw Lecture Theatre 157	Keynote Lecture Carslaw Lecture Theatre 157	Keynote Lecture Carslaw Lecture Theatre 157	Keynote Lecture Carslaw Lecture Theatre 157	Keynote Lecture Carslaw Lecture Theatre 157
	1000-1045	Morning Tea PNR Building	Morning Tea PNR Building	Morning Tea PNR Building	Morning Tea PNR Building	Morning Tea PNR Building
	1045-1250	Parallel Sessions	Parallel Sessions	Parallel Sessions	Parallel Sessions	Parallel Sessions
	Room 1	Turbulent boundary layer	Turbulent mixing	Turbulence & instability control	Jets & wakes	Acoustics
	Room 2	Rotating flows	Multiphase & particle-laden flows	Multiphase & particle-laden flows	Non-Newtonian flows	Separated flows
	Room 3	Convection & turbulent boundary layers	Convection & turbulent boundary layers	Vortex dynamics	Micro-fluid dynamics	Geophysical fluid dynamics
	Room 4	General fluid dynamics	General fluid dynamics	Experimental techniques	Experimental techniques	Turbulence simulations
	Room 5	Computational fluid dynamics	Computational fluid dynamics	Reacting flows	Aerodynamics	Aerodynamics
	1250-1400	Lunch	Lunch	Lunch	Lunch	
	1400-1500	Invited Lectures PNR Lecture Theatre, Farrell Lecture Theatre	Invited Lectures PNR Lecture Theatre, Farrell Lecture Theatre		Invited Lectures PNR Lecture Theatre, Farrell Lecture Theatre	
	1500-1530	Afternoon Tea	Afternoon Tea		Afternoon Tea	
	1530-1735	Parallel Sessions	Parallel Sessions		Parallel Sessions	
Arrival & Registration of Conference Delegates PNR Building	Room 1	Turbulent boundary layer	Turbulence Theory	1400 - 1800 Harbour Cruise on the MV Constellation @ King St Wharf, Darling Harbour	Jets & wakes	
	Room 2	Bubbles and drops	Multiphase & particle-laden flows		Free-surface flows	
	Room 3	Convection & buoyancy-driven flows	Vortex dynamics		Industrial applications	
	Room 4	General fluid dynamics	Bio-fluid dynamics		Turbulence modeling	
	Room 5	Computational fluid dynamics	Computational fluid dynamics		Aerodynamics	
	1900 - 2000 Cocktail Reception				1900 - 2130 Conference Banquet Dinner Wesley College	

PLENARY LECTURES TIMETABLE

Date	Time	Venue	Lecture	Title	Speaker	Chair
13 Dec Mon	08:45 – 09:00	Carslaw Lecture Theatre 157	Opening Address			M. Behnia
	09:00 – 10:00	Carslaw Lecture Theatre 157	Batchelor Lecture	Small-Scale Turbulence: How Universal Is It?	R. A. Antonia	M. Behnia
	14:00 – 15:00	PNR Lecture Theatre	Invited Lecture	The Energetics of Horizontal Convection	R. W. Griffiths	A. Ooi
		Farrell Lecture Theatre	Invited Lecture	Back to the Sandbox! Driven Granular Flows for Segregation and Mixing	G. Metcalfe	J. Reizes
14 Dec Tue	09:00 – 10:00	Carslaw Lecture Theatre 157	Keynote Lecture	Gravity Currents in Nature and Industry	H. E. Huppert	S. W. Armfield
	14:00 – 15:00	PNR Lecture Theatre	Invited Lecture	Spin-up Flow of an Incompressible Fluid	J. M. Hyun	M. S. Chong
		Farrell Lecture Theatre	Invited Lecture	Effects of Subtle and Dramatic Changes to Initial Conditions on a Jet's Turbulent Structure, Mixing and Combustion	G. Nathan	T. Mitchell
15 Dec Wed	09:00 – 10:00	Carslaw Lecture Theatre 157	Keynote Lecture	Computing Turbulent Channels at Experimental Reynolds Numbers	J. Jimenez	K. Srinivas
16 Dec Thu	09:00 – 10:00	Carslaw Lecture Theatre 157	Keynote Lecture	Biofluid Dynamics Simulation, a 21st Century Challenge	T. David	G. McBain
	14:00 – 15:00	PNR Lecture Theatre	Invited Lecture	Very Large-Scale Structures Observed in DNS of Turbulent Channel Flow with Passive Scalar Transport	H. Kawamura	J. C. Patterson
		Farrell Lecture Theatre	Invited Lecture	Medical Application of Shock Wave Research	K. Takayama	J. Soria
17 Dec Fri	09:00 – 10:00	Carslaw Lecture Theatre 157	Keynote Lecture	The Use of Expansion Tubes for the Study of Re-entry Aerodynamics	R. Morgan	W. Lin

PARALLEL SESSIONS TIMETABLE

Date: 13 December 2004, Monday

Session: Turbulent Boundary Layer

Chair: I. Marusic

Venue: PNR Room 1

Time	Title	Author(s)
10:45 – 11:10	Influence of Vegetation Height and Density on a Turbulent Boundary Layer	P. Gualtieri, G. P. Doria, L. Taglialatela
11:10 – 11:35	A Physical Model of the Turbulent Boundary Layer Consonant with the Structure of the Mean Momentum Balance	J. Klewicki, P. McMurtry, P. Fife, T. Wei
11:35 – 12:00	Experimental Review of Devices to Artificially Thicken Wind Tunnel Boundary Layers	J. E. Sargison, G. J. Walker, V. Bond, G. Chevalier
12:00 – 12:25	The Entrance Length for Fully Developed Turbulent Channel Flow	K. Lien, J. P. Monty, M. S. Chong, A. Ooi
12:25 – 12:50	Effect of Localised Wall Suction on the Small-Scale Motion in a Turbulent Boundary Layer	O. Oyewola, L. Djenidi, R. A. Antonia

Date: 13 December 2004, Monday

Session: Turbulent Boundary Layer

Chair: M.S. Chong

Venue: PNR Room 1

Time	Title	Author(s)
15:30 – 15:55	Evidence of the -1-Law in a High Reynolds Number Turbulent Boundary Layer	T. B. Nickels, S. Hafez, I. Marusic, M. S. Chong
15:55 – 16:20	Dominant Spanwise Fourier Modes, and the Existence of Very Large Scale Coherence in Turbulent Boundary Layers	N. Hutchins, B. Ganapathisubramani, I. Marusic
16:20 – 16:45	Dual-Plane PIV Investigation of Structural Features in a Turbulent Boundary Layer	I. Marusic, B. Ganapathisubramani, E. K. Longmire
16:45 – 17:10	Observations on High Reynolds Number Turbulent Boundary Layer Measurements	S. Hafez, M. S. Chong, I. Marusic, M. B. Jones
17:10 – 17:35	A New Solution for Ocean Waves Propagating over a Sloping Beach	D.-S. Jeng, B. R. Seymour

PARALLEL SESSIONS TIMETABLE

Date: 13 December 2004, Monday

Session: Rotating Flows

Chair: S. Clarke

Venue: PNR Room 2

Time	Title	Author(s)
10:45 – 11:10	The External Flow Structure of a Naturally Precessing Fluidic Jet	C. Y. Wong, R. M. Kelso, G. J. Nathan
11:10 – 11:35	Periodic Forcing of Baroclinic Basin-Scale Waves in a Rotating Stratified Basin	G. W. Wake, J. Gula, G. N. Ivey
11:35 – 12:00	Thin-Film Flow in Open Helically-Wound Channels	Y. M. Stokes, S. K. Wilson, B. R. Duffy
12:00 – 12:25	Further Study of Spray Combustion in a Simple Turbulent Jet Flow	Y. C. Chen, S. H. Starner, A. R. Masri
12:25 – 12:50	An Investigation of the Influence of Nozzle Aspect Ratio on the Velocity Field of Turbulent Plane Jet	R. C. Deo, J. Mi, G. J. Nathan

Date: 13 December 2004, Monday

Session: Bubbles and Drops

Chair: A. Ooi

Venue: PNR Room 2

Time	Title	Author(s)
15:30 – 15:55	Behaviour of Water Droplets Falling in Oil under the Influence of an Electric Field	M. Chiesa, J. A. Melheim
15:55 – 16:20	The Effect of Turbulence on Cloud Droplet Collision Rates	C. N. Franklin, P. A. Vaillancourt, M. K. Yau, P. Bartello
16:20 – 16:45	Bubble Entrapment during Water Drop Impacts	D. E. Cole, J. L. Liow
16:45 – 17:10	Radiant Heating of a Bio-Oil Droplet: a Quest for a Suitable Model and Scaling of Pre-Explosion Conditions	J. Y. Hristov, V. Stamatov, D. R. Honnery, J. Soria
17:10 – 17:35	Electrocoalescence Modeling: An Engineering Approach	M. Chiesa

PARALLEL SESSIONS TIMETABLE

Date: 13 December 2004, Monday Session: Convection & Turbulent Boundary Layers Chair: D. Fletcher Venue: PNR Room 3

Time	Title	Author(s)
10:45 – 11:10	The Effect of Coriolis Force on Marangoni Convection	I. Hashim, W. Sarma
11:10 – 11:35	Exchange Flow between Continuously Stratified Reservoirs	A. M. Hogg, P. D. Killworth
11:35 – 12:00	Outflow from a Plume Impinging on a Horizontal Boundary	N. B. Kaye, G. R. Hunt
12:00 – 12:25	On Transient Flow in a Ventilated Filling Box	G. R. Hunt, N. B. Kaye
12:25 – 12:50	Scaling Analysis and Direct Simulation of Unsteady Natural Convection Cooling of Fluid with $Pr < 1$ in a Vertical Cylinder	W. Lin, S. W. Armfield

Date: 13 December 2004, Monday Session: Convection & Turbulent Boundary Layers Chair: W. Lin Venue: PNR Room 3

Time	Title	Author(s)
15:30 – 15:55	Topographically Trapped Finite-Amplitude Kink Solitons	S. R. Clarke
15:55 – 16:20	Convective Exchange between Two Connected Chambers	M. A. Coman, G. O. Hughes, R. C. Kerr
16:20 – 16:45	A Simple Approach for Oscillatory Free Convection in the Inner Boundary-Layer	A. W. Jusoh, R. Roslan, H. J. Zainodin
16:45 – 17:10	A Steady 'Filling Box' Solution with Zero Net Buoyancy Flux	G. O. Hughes, R. W. Griffiths, J. C. Mullarney
17:10 – 17:35	Linear Stability of Natural Convection on an Evenly Heated Vertical Wall	G. D. McBain, S. W. Armfield

PARALLEL SESSIONS TIMETABLE

Date: 13 December 2004, Monday

Session: General Fluid Dynamics

Chair: G. Walker

Venue: PNR Room 4

Time	Title	Author(s)
10:45 – 11:10	The Stability of Decaying Pipe Flow	N. Jewell, J. P. Denier
11:10 – 11:35	Laminar-Turbulent Transition of a Boundary Layer by a Single Roughness Element in an Inlet Region of a Circular Pipe	M. Ichimiya
11:35 – 12:00	Flow Past a Cylinder with Free Hemispherical Ends: Comments on Grid Independence and Wake Symmetry Characteristics	G. J. Sheard, M. C. Thompson, K. Hourigan
12:00 – 12:25	2D Velocity-Field Analysis Using Triple Decomposition of Motion	V. Kolář
12:25 – 12:50	Detonation Modelling of Corner-Turning Shocks in PBXN-111	J. P. Lu, F. C. Christo, D. L. Kennedy

Date: 13 December, 2004, Monday

Session: General Fluid Dynamics

Chair: J. Denier

Venue: PNR Room 4

Time	Title	Author(s)
15:30 – 15:55	Low-Reynolds-Number Stirring in Simple Devices	S. M. Cox
15:55 – 16:20	Influence of Free-Stream Turbulence on Wake-Wake Interaction in an Axial Compressor	A. D. Henderson, G. J. Walker, J. D. Hughes
16:20 – 16:45	Evolution of a Turbulent Wedge from a Streamwise Streak	J. H. Watmuff
16:45 – 17:10	Three-Dimensional Quasi-Periodic Instabilities of Two-Dimensional Time-Periodic Flows	H. M. Blackburn, J. M. Lopez, F. Marques
17:10 – 17:35	Stabilisation of a Trapped Vortex for Enhancing Aerodynamic Flows	A. Bouferrouk

PARALLEL SESSIONS TIMETABLE

Date: 13 December 2004, Monday

Session: Computational Fluid Dynamics

Chair: M. C. Thompson

Venue: PNR Room 5

Time	Title	Author(s)
10:45 – 11:10	Partially-Reflecting Characteristic-Based Boundary Conditions	R. Olsen, I. R. Gran
11:10 – 11:35	Feasibility Study Using Computational Fluid Dynamics for the Use of a Turbine for Extracting Energy from the Tide	D. A. Egarr, T. O'Doherty, S. Morris, R. G. Ayre
11:35 – 12:00	A Numerical Study of the Application of Radial Basis Function and Generalised Smoothed Particle Hydrodynamics to CFD	J. Ha
12:00 – 12:25	Numerical Study of Moist Air Flow through the Ludwig Tube	M. Tanaka, S. Matsuo, R. Nishizaki, H. D. Kim, T. Setoguchi
12:25 – 12:50	Numerical Investigation of Unsteady Flow and Heat Transfer in Wavy Channels	M. Z. Hossain, A. K. M. Sadrul Islam

Date: 13 December 2004, Monday

Session: Computational Fluid Dynamics

Chair: K. Hourigan

Venue: PNR Room 5

Time	Title	Author(s)
15:30 – 15:55	Experimental-Numerical Investigation of a Bend Diffuser-Configuration	A. J. Simonsen, P. -A. Krogstad
15:55 – 16:20	Numerical Studies of Contoured Shock Tube for Murine Powdered Vaccine Delivery System	Y. Liu, N. K. Truong, M. A. F. Kendall
16:20 – 16:45	A Numerical Comparison of Forced and Free Vibration of Circular Cylinders at Low Reynolds Number	J. S. Leontini, M. C. Thompson, K. Hourigan
16:45 – 17:10	Vortex Wake and Energy Transitions of an Oscillating Cylinder at Low Reynolds Number	B. E. Stewart, J. S. Leontini, K. Hourigan, M. C. Thompson
17:10 – 17:35	Direct Injection of Natural Gas/Liquid Diesel Fuel Sprays	T. R. White, B. E. Milton, M. Behnia

PARALLEL SESSIONS TIMETABLE

Date: 14 December 2004, Tuesday

Session: Turbulent Mixing

Chair: J. Reizes

Venue: PNR Room 1

Time	Title	Author(s)
10:45 – 11:10	Differential Diffusion: Often a Finite-Mixing Length Effect	P. Nielsen, I. A. L. Teakle
11:10 – 11:35	Mixing Characteristics of a Notched-Rectangular Jet and a Circular Jet	J. Mi, P. Kalt, G. J. Nathan
11:35 – 12:00	The Effect of Density Ratio on the Mean Spread Rate of a Low Pressure Drop Oscillating Jet Nozzle	G. England, P. A. M. Kalt, G. J. Nathan, R. M. Kelso
12:00 – 12:25	An Experimental Study of the Jet of a Boat Propeller	A. Loberto, R. J. Brown, M. K. Kwek, A. Iida, H. Chanson, S. Komori
12:25 – 12:50	Dynamics of a Transient Wave Group Breaking on a Beach	T. E. Baldock

Date: 14 December 2004, Tuesday

Session: Turbulence Theory

Chair: R. A. Antonia

Venue: PNR Room 1

Time	Title	Author(s)
15:30 – 15:55	The 'Zeroth Law' of Turbulence in Steady Isotropic Turbulence	B. R. Pearson, T. A. Yousef, N. E. L. Haugen, A. Brandenburg, P.-A. Krogstad
15:55 – 16:20	Effect of Grid Geometry on the Scale-by-Scale Budget of Decaying Grid Turbulence	P. Lavoie, R. A. Antonia, L. Djenidi
16:20 – 16:45	Model for Anomalous Scaling of Turbulent Structure Functions	T. S. Lundgren
16:45 – 17:10	How To Describe Turbulent Energy Distributions without the Fourier Transform	P. A. Davidson, B. R. Pearson, P. Staplehurst
17:10 – 17:35	The Cut-off Frequency of Constant Temperature Hot-Wire Systems in Turbulent Velocity Measurements	J. D. Li

PARALLEL SESSIONS TIMETABLE

Date: 14 December 2004, Tuesday

Session: Multiphase & Particle-Laden Flows

Chair: G. Metcalfe

Venue: PNR Room 2

Time	Title	Author(s)
10:45 – 11:10	Towards a Valveless Electro-Rheological Valve	T. D. Truong, S. E. Semercigil, Ö. F. Turan
11:10 – 11:35	Velocity Measurement in Turbulent Boundary Layer of Drag-Reducing Surfactant Solution	M. Itoh, S. Tamano, K. Yokota, M. Ninagawa
11:35 – 12:00	The Transport of Sediment Over a Sloping Breakwater	A. J. Hogg, D. Pritchard
12:00 – 12:25	The Effect of Particle Concentration on the Coefficient of Drag of a Spherical Particle	D. Dodds, J. Naser
12:25 – 12:50	On Collective Oscillations of Bubble Chains and Arrays	E. M. B. Payne, R. Manasseh, A. Ooi

Date: 14 December 2004, Tuesday

Session: Multiphase & Particle-Laden Flows

Chair: D. Honnery

Venue: PNR Room 2

Time	Title	Author(s)
15:30 – 15:55	Shedding Some Light on Beta-Factors	I. A. L. Teakle, P. Nielsen
15:55 – 16:20	Modelling Gas-Liquid Bubbly Flows	G. H. Yeoh, J. Y. Tu
16:20 – 16:45	CFD Investigation of Particle Deposition around Bends in a Turbulent Flow	A. Hossain, J. Naser
16:45 – 17:10	Numerical Analysis of a Hydrocyclone in a Recirculating Aquaculture System	E. Kim, G. C., J. I. Yoon
17:10 – 17:35	Air Entrainment by Free Falling Streams of Particles	Z. Liu, P. Cooper, P. W. Wypych

PARALLEL SESSIONS TIMETABLE

Date: 14 December 2004, Tuesday

Session: Convection & Buoyancy-Driven Flows

Chair: R. W. Griffiths

Venue: PNR Room 3

Time	Title	Author(s)
10:45 – 11:10	Numerical Simulation of Heat and Mass Transfer in a Natural Draft Wet Cooling Tower	N. Williamson, M. Behnia, S. W. Armfield
11:10 – 11:35	Three-Dimensional Transition in the Buoyancy Boundary Layer on An Evenly Heated Vertical Wall	S. W. Armfield, G. D. McBain
11:35 – 12:00	The Transient Behaviour of a Differentially Heated Cavity with Isoflux Boundaries	S. Jiracheewanun, S. W. Armfield, M. Behnia, G. D. McBain
12:00 – 12:25	Adverse Pressure Gradient Turbulent Boundary Layer Flows: Part 1: Flow Development	C. M. Anderson, Ö. F. Turan, B. Brzek, L. Castillo
12:25 – 12:50	Adverse Pressure Gradient Turbulent Boundary Layer Flows: Part 2: Scaling of Reynolds Stresses	B. Brzek, L. Castillo, C. M. Anderson, Ö. F. Turan

Date: 14 December, 2004, Tuesday

Session: Vortex Dynamics

Chair: T. T. Lim

Venue: PNR Room 3

Time	Title	Author(s)
15:30 – 15:55		
15:55 – 16:20	The Effect of Zero-Mean Suction on Gortler Vortices: a Receptivity Approach	J. Denier
16:20 – 16:45	Effect of Delta Wing's Leading Edge Geometry to Vortex Breakdown	S. Srigrarom
16:45 – 17:10	Effects of Axial Pulsing on Unconfined Vortex Breakdown	S. Khalil, K. Hourigan, M. C. Thompson
17:10 – 17:35	Analysis of the Propeller Wake by Pressure and Velocity Correlation	M. Felli, F. Di Felice, G. Guj, R. Camussi

PARALLEL SESSIONS TIMETABLE

Date: 14 December 2004, Tuesday

Session: General Fluid Dynamics

Chair: H. Blackburn

Venue: PNR Room 4

Time	Title	Author(s)
10:45 – 11:10	Flow Visualisation of a Pitching and Heaving Hydrofoil	T. C. W. Lau, R. M. Kelso, E. R. Hassan
11:10 – 11:35	An Investigation of Flow over a Two-Dimensional Spherical Cavity	C. C. Beves, T. J. Barber, E. Leonardi
11:35 – 12:00	Role of Plant Buildings in a Power Station Acting as Barriers to the Wind Affecting the Natural Draft Cooling Tower Performance	G. Amur, B. Milton, J. Reizes, J. Madadnia, P. Brady, H. Koosha
12:00 – 12:25	Spreading Radius of Fountains after Impinging on a Free Surface	C. J. Lemckert
12:25 – 12:50	Preliminary Estimation Methods for Sizing Detention Basins in Queensland	C. J. Scraggs, C. J. Lemckert

Date: 14 December 2004, Tuesday

Session: Bio-Fluid Dynamics

Chair: T. David

Venue: PNR Room 4

Time	Title	Author(s)
15:30 – 15:55	Study of Micro Shock Waves and Cavitation Generated by Ho:YAG Laser Beam for Medical Application	S. H. R. Hosseini, K. Takayama
15:55 – 16:20	Comparison of Flow Characteristics of 45-deg Forward and 45-deg Backward Facing Proximal Anastomosis Models: A Particle Image Velocimetry Study	W. F. Ji, L. P. Chua, T. M. Zhou, S. C. M. Yu
16:20 – 16:45	Flows within a Cylindrical Cell Culture Bioreactor with a Free-Surface and a Rotating Base	J. Dusting, J. Sheridan, K. Hourigan
16:45 – 17:10	Three-Dimensional Instabilities and Transition in Pulsatile Stenotic Flows	H. M. Blackburn, S. J. Sherwin

PARALLEL SESSIONS TIMETABLE

Date: 14 December 2004, Tuesday

Session: Computational Fluid Dynamics

Chair: M. Rudman

Venue: PNR Room 5

Time	Title	Author(s)
10:45 – 11:10	Unsteady RANS Simulation of High Reynolds Number Trailing Edge Flow	D. Ang, L. Chen, J. Tu
11:10 – 11:35	Design and Calibration of a Wind Tunnel with a Two-Dimensional Contraction	J. E. Sargison, G. J. Walker, R. Rossi
11:35 – 12:00	Towards a Universal Criterion for Predicting Vortex Breakdown in Swirling Jets	A. J. Fitzgerald, K. Hourigan, M. C. Thompson
12:00 – 12:25	A Numerical Study of Heat Transfer from a Cylinder in Cross Flow	K. Szczepanik, A. Ooi, L. Aye, G. Rosengarten
12:25 – 12:50	Numerical Studies on Turbulent Separated Flows in High-Velocity Transient Motors	V. R. S. Kumar, H. D. Kim, B. N. Raghunandan, T. Setoguchi

Date: 14 December 2004, Tuesday

Session: Computational Fluid Dynamics

Chair: A. Ooi

Venue: PNR Room 5

Time	Title	Author(s)
15:30 – 15:55	Impact of Outlet Boundary Conditions on the Flow Properties within a Cyclone	S. Schmidt, H. M. Blackburn, M. Rudman
15:55 – 16:20	Laminar Flow in a Periodic Serpentine Channel	N. R. Rosaguti, D. F. Fletcher, B. S. Haynes
16:20 – 16:45	Skin Friction Calculation Using CFD Code Fluent for Complex Flow: Turbulent Flow along an External Corner	K. A. M. Moinuddin, P. N. Joubert, M. S. Chong

Date: 14 December, 2004, Tuesday

Session: Reacting Flows

Chair: A. Ooi

Venue: PNR Room 5

Time	Title	Author(s)
16:45 – 17:10	Modelling Chemical Reaction in a Scalar Mixing Layer	B. L. Sawford
17:10 – 17:35	Experiments and Modeling of Impinging Jets and Premixed Stagnation Flames	J. M. Bergthorson, D. G. Goodwin, P. E. Dimotakis

PARALLEL SESSIONS TIMETABLE

Date: 15 December 2004, Wednesday

Session: Turbulence & Instability Control

Chair: H. Blackburn

Venue: PNR Room 1

Time	Title	Author(s)
10:45 – 11:10	Axisymmetric Jet Control Using Passive Grids	R. Lehman, S. Rajagopalan, P. Burattini, R. A. Antonia
11:10 – 11:35	Active Flow Control over a NACA 0015 Airfoil Using a ZNMF Jet	A. Tuck, J. Soria
11:35 – 12:00	Velocity Distribution in an Asymmetric Diffuser with Perforated Plates	M. N. Noui-Mehidi, J. Wu, I. Sutalo
12:00 – 12:25	Flow Visualisation of Forced Flow Control over Inclined Aerofoils	K. L. Powell, K. Parker, J. Soria
12:25 – 12:50	Instability of Fluid Material Systems	H.S. Dou, N. Phan-Thien

Date: 15 December 2004, Wednesday

Session: Multiphase & Particle-Laden Flows

Chair: R. Manasseh

Venue: PNR Room 2

Time	Title	Author(s)
10:45 – 11:10	The Influence of Mass Loading on Particle Distribution in the Near Field of a Co-Annular Jet	C. H. Birzer, P. A. M. Kalt, G. J. Nathan, N. L. Smith
11:10 – 11:35	Dam Break Wave Propagation on Abrupt Drops: An Experimental Study	H. Chanson
11:35 – 12:00	Dynamic Analysis of Airflow Features in a 3D Real-Anatomical Geometry of the Human Nasal Cavity	H. Tang, J. Y. Tu, H. F. Li, B. Au-Hijleh, C. C. Xue, C. G. Li
12:00 – 12:25	Transient Behaviour of the Fuel Spray from an Air-Assisted Direct Fuel Injector	S. H. Jin, M. J. Brear, G. Zakis, H. C. Watson, C. Zavier
12:25 – 12:50	Simulating the Deformation of Newtonian and Non-Newtonian Drops through a Micro-Fluidic Contraction	D. J. E. Harvie, M. R. Davidson, J. J. Cooper-White

PARALLEL SESSIONS TIMETABLE

Date: 15 December 2004, Wednesday

Session: Vortex Dynamics

Chair: R. Kelso

Venue: PNR Room 3

Time	Title	Author(s)
10:45 – 11:10	Gap Effect on Taylor Vortex Size between Rotating Conical Cylinders	M. N. Noui-Mehidi, N. Ohmura, K. Kataoka
11:10 – 11:35	A Blob Insertion Technique for the Vortex Blob Method	C. Macaskill
11:35 – 12:00	Flow Structure around a Finite-Length Square Prism	H. F. Wang, Y. Zhou, C. K. Chan, W. O. Wang, K. S. Lam
12:00 – 12:25	Preliminary Investigations of Vortex Rings and Jets in Cross Flow	E. R. Hassan, R. M. Kelso, G. M. Schneider, T. C. W. Lau

Date: 15 December 2004, Wednesday

Session: Experimental Techniques

Chair: J. H. Watmuff

Venue: PNR Room 4

Time	Title	Author(s)
10:45 – 11:10	Radial Turbine with Pitch-Controlled Guide Vanes for Wave Energy Conversion	M. Takao, Y. Fujioka, H. Ito, T. Setoguchi
11:10 – 11:35	Autocorrelation Functions and the Determination of Integral Length with Reference to Experimental and Numerical Data	P. L. O'Neill, D. Nicolaides, D. Honnery, J. Soria
11:35 – 12:00	Measurements of Temperature and Water Vapour Concentration in a Scramjet Combustor	A. D. Griffiths, A. F. P. Houwing
12:00 – 12:25	The Development and Use of Dynamic Pressure Probes with Extended Cones of Acceptance (ECA)	S. Watkins, P. Mousley, G. Vino
12:25 – 12:50	Dynamic Measurement of Differential Buffet Pressure	J. H. Watmuff, G. Vino, S. Watkins, B. Hill

PARALLEL SESSIONS TIMETABLE

Date: 15 December 2004, Wednesday

Session: Reacting Flows

Chair: B. Sawford

Venue: PNR Room 5

Time	Title	Author(s)
10:45 – 11:10	Fire Behaviour Studies of Combustible Wall Linings Applying Fire Dynamics Simulator	A. Z. Moghaddam, K. Moinuddin, I. R. Thomas, I. D. Bennetts, M. Culton
11:10 – 11:35	Nonlinear Dynamics of Thermoacoustic Instability Using a Kinematic Premixed Flame Model	N. Karimi, M. J. Brear, S. H. Jin
11:35 – 12:00	Analysis of Local Flame Propagation in Gas Explosions with Multiple Obstacles	D. J. Park, A. R. Green, Y. C. Chen
12:00 – 12:25	Application of Transport PDF Approach for Modelling MILD Combustion	F. C. Christo, B. B. Dally
12:25 – 12:50	A Study of the Global Differences between Axisymmetric Turbulent Free Jet Flames From a Smooth Contraction and a Pipe with Well Defined Boundary Conditions	A. S. Langman, G. J. Nathan, P. J. Ashman

PARALLEL SESSIONS TIMETABLE

Date: 16 December 2004, Thursday

Session: Jets & Wakes

Chair: P. O'Neill

Venue: PNR Room 1

Time	Title	Author(s)
10:45 – 11:10	Experimental Investigation of Impinging Axisymmetric Turbulent Fountains	P. Cooper, G. R. Hunt
11:10 – 11:35	Surface-Flow Patterns in Oscillating-Triangular-Jet Nozzles	S. K. Lee, P. V. Lanspeary, G. J. Nathan, R. M. Kelso
11:35 – 12:00	Preliminary Identification of Flow Regimes in a Mechanically Oscillated Planar Jet	M. Riese, G. J. Nathan, R. M. Kelso
12:00 – 12:25	Coherent Structure Dynamics in Jets from Irregular Shaped Nozzles	J. Hart, J. Naser, P. Witt
12:25 – 12:50	Turbulent Stress Invariant Analysis: Clarification of Existing Terminology	A. J. Simonsen, P. -Å. Krogstad

Date: 16 December 2004, Thursday

Session: Jets & Wakes

Chair: J. Mi

Venue: PNR Room 1

Time	Title	Author(s)
15:30 – 15:55	Effect of Initial Conditions on the Far Field of a Round Jet	P. Burattini, R. A. Antonia, S. Rajagopalan
15:55 – 16:20	Mean Flow Characteristics of a Micro-Injector Induced Swirling Jet	I. K. Toh, P. O'Neill, D. Honnery, J. Soria
16:20 – 16:45	Effect of Pulsation Rate on Spray-Spreading Rate in an Isothermal Environment	L. Stamatova, D. Honnery, V. Stamatov, J. Ghojel, J. Soria
16:45 – 17:10	Investigation of the Mean Flow Pattern in Zero-Net-Mass-Flux Elliptical-Jets in Cross-Flow Using Planar-Laser-Induced Fluorescence	J. Arnaud, S. Tomar, J. Soria
17:10 – 17:35	Structure of a Zero-Net-Mass-Flux Round Jet in Cross-Flow	S. Tomar, J. Arnaud, J. Soria

PARALLEL SESSIONS TIMETABLE

Date: 16 December 2004, Thursday

Session: Non-Newtonian Flows

Chair: G. Rosengarten

Venue: PNR Room 2

Time	Title	Author(s)
10:45 – 11:10	Flow of Nonlinear Viscoelastic Fluid in Concentric Rotating Cylinders with Relative Rotation	M. Mirzazadeh, F.Rashidi, S. H. Hashemabadi
11:10 – 11:35	Numerical Study of Flow and Forced Heat Transfer of Robertson-Stiff Fluid Flowing Axially through Concentric Annuli	A. H. Gorji, F. Rashidi
11:35 – 12:00	Non-Newtonian Flow Behaviour in Particulate Suspensions under Magnetic Fields	H. See
12:00 – 12:25	Numerical Method for the Simulation of Front Evolving Fibre Suspension Flow using Level Set Method	H.-S. Dou, N. Phan-Thien, B. C. Khoo, K. S. Yeo, R. Zheng
12:25 – 12:50	An Experimental Study of Sudden Release of Bentonite Suspensions Down an Inclined Chute	H. Chanson, S. Jarny, L. Tocquer, P. Coussot

Date: 16 December 2004, Thursday

Session: Free-Surface Flows

Chair: K. P. Thiagarajan

Venue: PNR Room 2

Time	Title	Author(s)
15:30 – 15:55	Simulation of the Dam Break Problem and Impact Flows Using a Navier-Stokes Solver	K. Abdolmaleki, K. P. Thiagarajan, M. T. Morris-Thomas
15:55 – 16:20	Effects of Turbulence Manipulation in Skimming Flows: An Experimental Study	C. A. Gonzalez, H. Chanson
16:20 – 16:45	Free Surface Monitoring Using Image Processing	P. D. M. Brady, M. Boutounet, S. Beecham
16:45 – 17:10	Control of Liquid Sloshing in Flexible Containers: Part 1. Added Mass	B. U. Güzel, M. Gradinscak, S. E. Semercigil, Ö. F. Turan
17:10 – 17:35	Control of Liquid Sloshing in Flexible Containers: Part 2. Top Straps	M. Gradinscak, B. U. Güzel, S. E. Semercigil, Ö. F. Turan

PARALLEL SESSIONS TIMETABLE

Date: 16 December 2004, Thursday

Session: Micro-Fluid Dynamics

Chair: M. Behnia

Venue: PNR Room 3

Time	Title	Author(s)
10:45 – 11:10	Numerical Simulation of Drop Formation in a T-Shaped Microchannel	J. L. Liow
11:10 – 11:35	Flow Measurements in Microchannels Using a Micro-PIV System	W. T. Lai, R. K. Menon
11:35 – 12:00	A Numerical Study of Enhanced Micro-Channel Cooling Using a Synthetic Jet Actuator	V. Timchenko, J. Reizes, E. Leonardi
12:00 – 12:25	Design and Experimental Issues with Heat Exchangers for Microfluidics	G. Rosengarten, J. Cooper-White, G. Metcalfe

Date: 16 December 2004, Thursday

Session: Industrial Applications

Chair: J. Soria

Venue: PNR Room 3

Time	Title	Author(s)
15:30 – 15:55	The Safe Basin Erosion of a Ship in Waves with Single Degree of Freedom	X. Wu, L. Tao, Y. Li
15:55 – 16:20	Modelling of Transient Behaviour in a Francis Turbine Power Plant	T. B. Ng, G. J. Walker, J. E. Sargison
16:20 – 16:45	Some Hydrodynamic Characteristics of an Air-Cushion Supported Concrete Gravity Structure	B. Chenu, M. T. Morris-Thomas, K. P. Thiagarajan
16:45 – 17:10	Hydrodynamic Performance of a Surfboard Fin	P. A. Brandner, G. J. Walker
17:10 – 17:35	Characterising Roof Ventilators	A. Revel, B. P. Huynh

PARALLEL SESSIONS TIMETABLE

Date: 16 December 2004, Thursday

Session: Experimental Techniques

Chair: S. Watkins

Venue: PNR Room 4

Time	Title	Author(s)
10:45 – 11:10	A Directional Event Detector for Conditional Laser Imaging	P. V. Lanspeary, S. K. Lee
11:10 – 11:35	Experimental Investigation of Flow-Induced Vibration in a Parallel Plate Reactor Fuel Assembly	M. Ho, G. Hong, A. N. F. Mack
11:35 – 12:00	PIV Measurements in a Square Backward Facing Step	M. Piirto, A. Karvinen, H. Ahlstedt, P. Saarenrinne, R. Karvinen
12:00 – 12:25	Development of a Fast Response Pressure Probe for Use in a Cavitation Tunnel	P. A. Brandner, D. B. Clarke, G. J. Walker
12:25 – 12:50	Stereoscopic PIV Measurements of the Flow Past a Circular Cylinder at Reynolds Number 15000	K. Parker, K. D. von Ellenrieder, J. Soria

Date: 16 December 2004, Thursday

Session: Turbulence Modelling

Chair: L. Djenidi

Venue: PNR Room 4

Time	Title	Author(s)
15:30 – 15:55	Preliminary Examination of a "Round Jet Initial Condition Anomaly" for the k-epsilon Turbulence Model	E. J. Smith, J. Mi, G. J. Nathan, B. B. Dally
15:55 – 16:20	DNS of Turbulent Heat Transfer in a Channel Flow with a Streamwisely Varying Thermal Boundary Condition	Y. Seki, H. Kawamura
16:20 – 16:45	Turbulence Models and Boundary Conditions for Bluff Body Flow	M. E. Young, A. Ooi
16:45 – 17:10	Comparing RANS Models for Flow and Thermal Analysis of Pin Fin Heat Sinks	B. Moshfegh, R. Nyiredy
17:10 – 17:35	Simultaneous Field Measurements of Turbulence and Water Quality in a Sub-Tropical Estuary in Australia	H. Chanson, R. Brown, J. Ferris

PARALLEL SESSIONS TIMETABLE

Date: 16 December 2004, Thursday

Session: Aerodynamics

Chair: L. Erm

Venue: PNR Room 5

Time	Title	Author(s)
10:45 – 11:10	Drag Reduction on Bluff Bodies Using a Rotating Device	S. E. Robson, N. A. Ahmed
11:10 – 11:35	A Study of Base Drag Optimization Using Mass Bleed	Y. K. Lee, H. D. Kim, S. Raghunathan
11:35 – 12:00	The Anomalous Refraction of Shock Waves in Gases	L. F. Henderson, E. G. Puckett, P. Colella
12:00 – 12:25	The Aerodynamic Forces on a Series of Tennis Balls	F. Alam, S. Watkins, A. Subic
12:25 – 12:50	Pressure Measurements on an Automobile Side Rear View Mirror	R. Jaitlee, F. Alam, S. Watkins

Date: 16 December 2004, Thursday

Session: Aerodynamics

Chair: T. Mitchell

Venue: PNR Room 5

Time	Title	Author(s)
15:30 – 15:55	The Turbulent Wind Environment of Birds, Insects and MAVs	S. Watkins, G. Vino
15:55 – 16:20	An Experimental Investigation on Aerodynamics of a Rectangular Slot-Burner in the Presence of Cross-Flow for Different Jet Velocity Ratio	S. Ahmed, J. Hart, J. Naser
16:20 – 16:45	Simulation of Vehicle A-Pillar Aerodynamics of Various Yaw Angles	N. M. Murad, J. Naser, F. Alam, S. Watkins
16:45 – 17:10	Stereoscopic PIV Measurements Behind a 3D Flapping Foil Producing Thrust	K. Parker, K. D. von Ellenrieder, J. Soria
17:10 – 17:35	A Numerical Study of a Circular Cylinder in the Wake of an Airfoil	C. Y. Zhou, C. W. Sun, Y. Zhou, L. Huang

PARALLEL SESSIONS TIMETABLE

Date: 17 December 2004, Friday

Session: Acoustics

Chair: G. McBain

Venue: PNR Room 1

Time	Title	Author(s)
10:45 – 11:10	Identification of Aerodynamic Sound Source in the Wake of a Rotating Circular Cylinder	A. Iida, A. Mizuno, R. J. Brown
11:10 – 11:35	Linear and Nonlinear Acoustic Behaviour of Outlet Nozzles	W. H. Moase, M. J. Brear, C. Manzie
11:35 – 12:00	Noise Emission in Large Aspect Ratio Cavities	G. Guj, R. Camussi, A. Di Marco, A. Ragni
12:00 – 12:25	Modelling of Solid Wall Boundaries in Computational Acoustics	R. C. Z.Cohen, A. Ooi, R. Widjaja
12:25 – 12:50	Active Control of Vortex-Airfoil Interactions	M. M. Zhang, Y. Zhou, L. Cheng

Date: 17 December 2004, Friday

Session: Separated Flows

Chair: J. P. Gostelow

Venue: PNR Room 2

Time	Title	Author(s)
10:45 – 11:10	Optimal Nose Shaping for Delayed Boundary-Layer Separation in Laminar Plane-Symmetric and Axisymmetric Flow	T. W. Mattner, E. O. Tuck, J. P. Denier
11:10 – 11:35	The Unsteady Near-Wake of a Simplified Passenger Car	G. Vino, S. Watkins, P. Mousley, J. Watmuff, S. Prasad
11:35 – 12:00	Numerically Modeling Blockage Effects on the Flow between Flat Plates	M. D. Griffith, K. Hourigan, M. C. Thompson
12:00 – 12:25	Investigations on the Closure of Laminar Separation Bubbles	R. L. Thomas, J. P. Gostelow

PARALLEL SESSIONS TIMETABLE

Date: 17 December 2004, Friday

Session: Geophysical Fluid Dynamics

Chair: P. Cooper

Venue: PNR Room 3

Time	Title	Author(s)
10:45 – 11:10	Flow Response to Periodic Heating and Cooling in a Reservoir	C. Lei, J. C. Patterson, Y. Sha
11:10 – 11:35	An Internal Solitary Wave Parameterization for Hydrodynamic Lake Models	L. Boegman, G. N. Ivey, J. Imberger
11:35 – 12:00	The Internal Wave Field Generated by the Body and Wake of a Horizontally Moving Sphere in a Stratified Fluid	J. W. Rottman, D. Broutman, G. Spedding, P. Meunier
12:00 – 12:25	Response of Ocean Circulation to Variable Wind Forcing	A. E. Kiss, C. Menesguen
12:25 – 12:50	Measurement and Modelling of Controlled Beach Groundwater Levels under Wave Action	L. S. Ang, C. H.Y. Sum, T. E. Baldock, L. Li, P. Nielsen

Date: 17 December 2004, Friday

Session: Turbulence Simulations

Chair: K. Srinivas

Venue: PNR Room 4

Time	Title	Author(s)
10:45 – 11:10	Lamb Vector Properties of Swirling Jets	W. Kollmann, G. Umont
11:10 – 11:35	Direct and Large Eddy Simulation of a Turbulent Channel Flow with Roughness on One Wall	S. Leonardi, F. Tessicini, P. Orlandi, R. A. Antonia
11:35 – 12:00	Numerical Analysis of Turbulent Convective Heat Transfer Processes in a Square-Sectioned U-Bend Duct	S. Etemad, B. Sunden
12:00 – 12:25	Simulation of Turbulence Pressure Fluctuations on Cylinders in Axial Flow	M. J. Woods, M. K. Bull
12:25 – 12:50	Oscillations of the Horizontal Intrusion in a Side-Heated Cavity	F. Xu, J. C. Patterson, C. Lei

PARALLEL SESSIONS TIMETABLE

Date: 17 December 2004, Friday

Session: Aerodynamics

Chair: B. Fairlie

Venue: PNR Room 5

Time	Title	Author(s)
10:45 – 11:10	Airflow Distribution Through the Radiator of a Typical Australian Passenger Car	H. Jama, S. Watkins, C. Dixon, E. Ng
11:10 – 11:35	Flow Past an Impulsively Started Oscillating Elliptical Cylinder	T. L. Chng, T. T. Lim, J. Soria, K. B. Lua, K. S. Yeo
11:35 – 12:00	Wake Structures of a Heaving Airfoil	G. Y. Oo, K. B. Lua, K. S. Yeo, T. T. Lim
12:00 – 12:25	Dynamic Testing of Aircraft Models in a Water Tunnel	L. P. Erm
12:25 – 12:50	A Two-Dimensional Analysis of the Effect of a Rotating Cylinder on an Inverted Aerofoil in Ground Effect	S. Diasinos, T. J. Barber, E. Leonardi, S. D. Hall