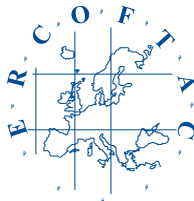




ETMM|9
Thessaloniki | Greece

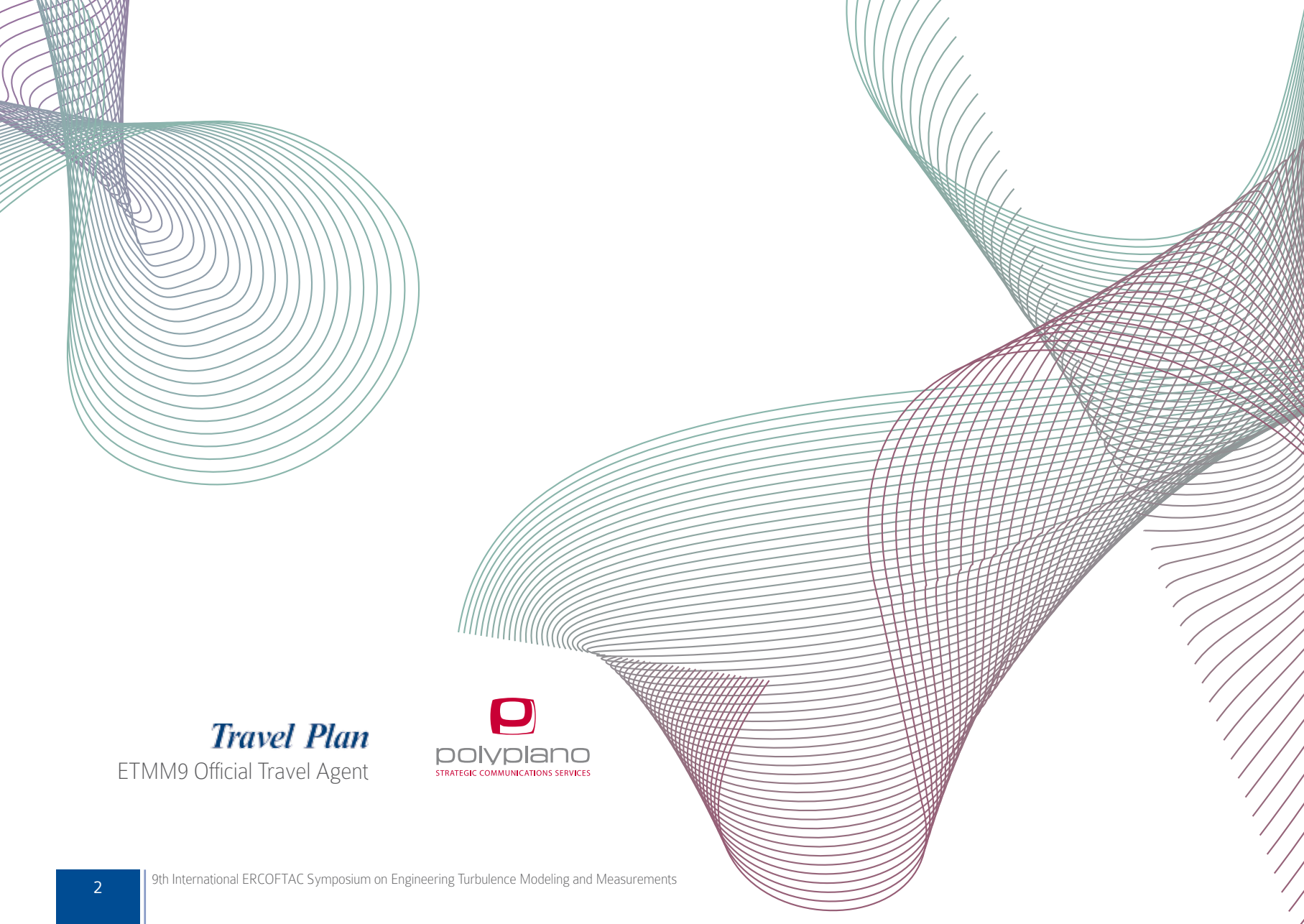


programme **6-8 JUNE** 2012



Makedonia Palace
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European Research Community On Flow, Turbulence and Combustion



Travel Plan

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Welcome

We would like to extend a warm welcome to all participants of ETMM-9 on behalf of the Organising Committee. We hope that you will find ETMM-9 interesting, informative, and that you will also enjoy the city of Thessaloniki as well as the surrounding countryside. ETMM-9 continues the tradition set by previous ETMM Symposia in being held at attractive locations on the Mediterranean coast. The Symposium is organised under the auspices of ERCOFTAC (European Research Community on Flow Turbulence and Combustion), which also acts as one of the principal sponsors of the Symposium. This association is a natural outcome of the close thematic alignment of ETMM with the technical focal points of ERCOFTAC, represented by its many Special Interest Groups on a variety of engineering fluid-flow topics (<http://www.ercoftac.org>). The hope is that the relaxed and congenial atmosphere of the venue will enhance the scholarly experience offered by the Symposium itself.

The technical programme of ETMM-9 consists of 24 oral sessions, divided into three parallel strands, one poster session and six plenary lectures presented by leading international experts in their respective fields. In total, the programme contains 116 papers, reflecting the current state of the art in turbulence modelling, simulation and measurement, in the context of fluids-engineering applications and related topics. The papers are collected in a USB memory device in the form of electronic proceedings. The proceedings are intentionally not archival in nature, giving authors complete freedom to publish material presented at ETMM-9 in journals of their choice.

The Organising Committee are very grateful to the several sponsors who have provided generous financial support to the Symposium. These sponsors are identified on the back cover of this programme. The sponsors' support has allowed the Symposium fee to be kept relatively low, and to still be able to offer lunches as well as the conference dinner at no additional cost.

Finally, we gratefully acknowledge the efficient handling of the administration of the Symposium by Eurostar S.A. - Travel Plan in particular, Mrs. Anna Goulas and Ms. Fani Spirou, as well as Ms. Antonia Voyatzi and Mr. Theo Deligiannidis from Polyplano.

Bernard Geurts, Chairman
Ananias Tomboulides
Dominic von Terzi



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Ananias Tomboulides, University of Western Macedonia
Dominic von Terzi, GE Global Research, Munich

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S. Kassinos
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M. Leschziner

W. Rodi
D. von Terzi
A. Tomboulides
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R. Manceau (France)	R. Verzicco (Italy)

Invited Plenary Speakers

1. **Charles Meneveau** (John Hopkins University)
LES of Turbulent Flows Over Multi-scale Rough Surfaces Using a Dynamic Roughness Model
2. **Paul Fischer** (Argonne National Laboratories)
Large-scale Spectral Element Based DNS of Complex Turbulent Flows
3. **Andreas Dreizler** (TU Darmstadt)
Transients in Turbulent Combustion
4. **J.A.M. (Hans) Kuipers** (TU Eindhoven)
Multi-Scale Modelling of Dense Gas-Particle Flows
**joint keynote speaker with EUROMECH*
5. **Vincenzo Armenio** (University of Trieste)
The Role of Large Eddy Simulation in Environmental Fluid Mechanics
6. **Tamer Zaki** (Imperial College London)
From Streaks to Spots and on to Turbulence: Exploring the Dynamics of Boundary Layer Transition

Major themes

- Novel modelling and simulation methods for practically relevant turbulent flows, including interaction with heat and mass transfer, rotation, combustion and multi-phase transport
- Novel experimental techniques for flow, turbulence and combustion and new experimental studies and data sets
- Innovative applications of modelling, simulation and experimental techniques to complex flows, industrial configurations and optimisation problems
- High-speed aerodynamics, acoustics and flow control
- Modelling, simulation and measurements of environmental flows

The conference programme includes two special sessions on Multiphase Turbulence organized in collaboration with EUROMECH and two special sessions on Turbomachinery organized in collaboration with EUROTURBO

programme OVERVIEW

Tuesday, June 5

16.00 - 19.00: Registration	(FOYER, ALEXANDROS)
19.00 - 21.00: Welcome Reception	(FOYER, ALEXANDROS I)

Wednesday, 6 June

08.45 - 09.00: Welcome and orientation	(ALEXANDROS II)
09.00 - 09.45: C. Meneveau: LES of turbulent flows over multi-scale rough surfaces using a dynamic roughness model	
Chairman: B. Geurts	(ALEXANDROS II)
09.45 - 10.30: P. Fischer: Large-scale spectral element based DNS for complex turbulent flows	
Chairman: A. Tomboulides	(ALEXANDROS II)
10.30 - 10.50: COFFEE BREAK	(ALEXANDROS I)
10.50 - 12.30: PARALLEL SESSIONS	
S1: LES Methods & Applications 1 (C. Meneveau)	(ALEXANDROS II)
S2: Hybrid RANS 1 (S. Jakirlic)	(AMPHITRION II)
S3: Experiments, 1 (A. Pollard)	(AMPHITRION II)
12.30 - 14.00: LUNCH BREAK	(ALEXANDROS I)
14.00 - 15.40: PARALLEL SESSIONS	
S4: LES Methods & Applications 2 (B. Geurts)	(ALEXANDROS II)
S5: RANS Modeling (A. Goulas)	(AMPHITRION II)
S6: Experiments 2 (S. Obi)	(AMPHITRION II)
15.40 - 16.10: COFFEE BREAK	(ALEXANDROS I)
16.10 - 17.50: PARALLEL SESSIONS	
S7: LES Methods & Applications 3 (E. Dick)	(ALEXANDROS II)
S8: Flow Control I (M. Leschziner)	(AMPHITRION II)
S9: Heat & Mass Transfer 1 (P. Fischer)	(AMPHITRION II)
19.30 - 21.00: MAYOR'S RECEPTION AT CITY HALL	

programme OVERVIEW

Thursday, 7 June

09.00 - 09.45:	Andreas Dreizler: Transients in turbulent combustion Chairman: A. Tomboulides	(ALEXANDROS II)
09.45 - 10.20:	POSTER-PRESENTATION SESSION (B. Geurts)	(ALEXANDROS II)
10.20 - 10.50:	COFFEE BREAK AND POSTER - VIEWING SESSION	(ALEXANDROS I & II)
10.50 - 12.30:	PARALLEL SESSIONS	
	S10: Combustion 1 (A. Dreizler)	(ALEXANDROS II)
	S11: Flow Control 2 (M. Braza)	(AMPHITRION I)
	S12: LES Methods & Appl's 4 (J. Frohlich)	(AMPHITRION II)
12.30 - 14.10	LUNCH BREAK	(ALEXANDROS I)
14.10 - 14.55	J.A.M. Kuipers: Multi-Scale Modeling of Dense Gas-Particle Flows (J.G.M. Kuerten)	(ALEXANDROS II)
14.55 - 15.30:	COFFEE BREAK AND POSTER-VIEWING SESSION	(ALEXANDROS I & II)
15.30 - 17.10:	PARALLEL SESSIONS	
	S13: Multiphase Flows 1 Jointly with EUROMECH (J.A.M. Kuipers)	(ALEXANDROS II)
	S14: Transition (T. Zaki)	(AMPHITRION I)
	S15: Hybrid RANS 2 (L. Davidson)	(AMPHITRION II)
20.30:	CONFERENCE DINNER, ROOF GARDEN THE MET HOTEL	

Friday, 8 June

09.00 - 09.45:	V. Armenio: The role of Large Eddy Simulation in Environmental Fluid Mechanics Chairman: B. Geurts	(ALEXANDROS II)
09.45 - 10.30:	T. Zaki: From streaks to spots and on to turbulence: Exploring the dynamics of boundary layer Transition Chairman: D. von Terzi	(ALEXANDROS II)
10.30 - 10.50:	COFFEE BREAK	(ALEXANDROS I)
10.50 - 12.30:	PARALLEL SESSIONS	
	S16: Turbomachinery 1 Jointly with EUROTURBO (W. Rodi)	(ALEXANDROS II)
	S17: Turbulence Fundamentals (V. Armenio)	(AMPHITRION I)
	S18: Combustion 2 (P. Domingo)	(AMPHITRION II)
12.30 - 14.00:	LUNCH BREAK	(ALEXANDROS I)
14.00 - 15.40:	PARALLEL SESSIONS	
	S19: Turbomachinery 2 Jointly with EUROTURBO (M. Leschziner)	(ALEXANDROS II)
	S20: Compressible Flows 1 (J. Sesterhenn)	(AMPHITRION I)
	S21: Multiphase Flows 2 Jointly with EUROMECH (M. Sommerfeld)	(AMPHITRION II)
15.40 - 16.10:	COFFEE BREAK	(ALEXANDROS I)
16.10 - 17.30:	PARALLEL SESSIONS	
	S22: Engine Cold Flows (C. Angelberger)	(ALEXANDROS II)
	S23: Compressible Flows 2 (D. von Terzi)	(AMPHITRION I)
	S24: Heat & Mass Transfer 2 (K. Suga)	(AMPHITRION II)
17.30 - 17.50:	CLOSING SESSION	(ALEXANDROS II)

DAY 1 // JUNE 6, 2012

08.45 - 09.00:	Welcome and orientation	(ALEXANDROS II)
09.00 - 09.45:	Plenary: LES of turbulent flows over multi-scale rough surfaces using a dynamic roughness model Charles Meneveau (John Hopkins) Chairman: B. Geurts	(ALEXANDROS II)
09.45 - 10.30:	Plenary: Large-scale Spectral Element based DNS of complex Turbulent flows Paul Fischer (Argonne National Laboratories) Chairman: A. Tomboulides	(ALEXANDROS II)
10.30 - 10.50:	Coffee Break	(ALEXANDROS II)

10.50 - 12.30: PARALLEL SESSIONS

ALEXANDROS II	AMPHITRION I	AMPHITRION II
S1: LES Methods & Applications 1 Chairman: C. Meneveau	S2: Hybrid RANS 1 Chairman: S. Jakirlic	S3: Experiments 1 Chairman: A. Pollard
Large Eddy Simulation of Supercritical Fluid Flow Injection PETIT X., RIBERT G., DOMINGO P.	Hybrid RANS/LES of flow in a rib-roughened channel with rotation KUBACKI S., ROKICKI J., DICK E.	PIV and DNS analysis of viscoelastic turbulent flows behind a rectangular orifice TSUKAHARA T., MOTOZAWA M., KAWASE T., TSURUMI D., KAWAGUCHI Y.
Zonal Detached Eddy Simulation of the Dynamics of an Axisymmetric Separating/Reattaching Flow in Presence of Side-Cylinders PAIN R., WEISS P., DECK S.	A new Approach of Zonal Hybrid RANS-LES Based on a Two-equation k- ϵ Model DAVIDSON L.	A test facility for assessing simulations of jets in cross flow configurations BRUEL P., FLORENCIANO J.-L., KOUSKSOU T., LEDERLIN T.
Testing different advection schemes for coarse high-Re LES simulations of a jet in crossflow and weak coflow DE WIT L., VAN RHEE C.	Anisotropic linear forcing for synthetic turbulence generation in hybrid RANS/LES modelling De LAAGE De MEUX B., AUDEBERT B., MANCEAU R.	PIV Measurement and Force Estimation of the Flow Induced by a Heaving Elastic Plate KATO K., OBI S.

DAY 1 // JUNE 6, 2012

On the unsteady aerodynamics of road vehicles in the dynamic motions

CHENG S.Y., TSUBOKURA M., OKADA Y., NAKASHIMA T., NOUZAWA T., KOBAYASHI T.

Hybrid RANS/LES and PANS computations of plane impinging jets

KUBACKI S., ROKICKI J., DICK E.

Experimental and computational study of a wind flow over a hill covered with forest

AGAFONOVA O., MITYAKOV A., CHAUDHARI A., HAMALAINEN J.

Application of r-adaptation to LES of turbulent flow

HERTEL C., SCHUMICHEN M., FROHLICH J.

Effect of the separation wall in the mixing properties of coaxial jets

TALAMELLI A., ORLU R., SEGALINI A.

12.30 - 14.00: **Lunch Break**

14.00 - 15.40: **PARALLEL SESSIONS**

ALEXANDROS II

AMPHITRION I

AMPHITRION II

S4: LES Methods & Applications 2

S5: RANS Modelling

S6: Experiments 2

Chairman: B. Geurts

Chairman: A. Goulas

Chairman: S. Obi

Large Eddy Simulation of wind turbine wakes

CHATELAIN P., BACKAERT S., WINCKELMANS G., KERN S.

An explicit algebraic Reynolds stress and scalar flux model for stably stratified turbulent flows

LAZEROMS W.M.J., BRETHOUWER G., WALLIN S, JOHANSSON A.V.

LDA measurements in the development region of low Reynolds Number Turbulent Pipe Jet

VOUROS AI., PANIDIS Th.

Wall-modeled large-eddy simulation of transitional separated flow over an airfoil at high Reynolds number

ASADA K., KAWAI S.

Effects of cross sectional shape on the motion of 3D turbulent gravity currents

M. TSAKIRI, KOFTIS T., PRINOS P., SOULIOTIS D.

Application of PIV Technique for the Study of Turbulent Structure of Cavitating Flows around a NACA0015 Series Hydrofoil

ALEKSEENKO S.V., KRAVTSOVA A.Yu., MARCOVICH D.M., PERVUNIN K.S., TIMOSHEVSKIY M.V.

DAY 1 // JUNE 6, 2012

Explicit Algebraic subgrid-scale models for LES

RASAM A., BRETHOUWER G., JOHANSSON A.V.

A Boundary Condition for RANS
Simulation of Riblets

MELE B., TOGNACCINI R.

Wavelet analysis to study scalar transport in
coaxial square air jets

**ROUMBAS G.D., KASTRINAKIS E.G.,
NYCHAS S.G**

Towards Engineering LES at High Reynolds Num-
bers

HOWARD R.J.A.

Application of the finite-volume
method to unsteady fluid-structure
interaction analysis

**CRAFT T.J., IACOVIDES H.,
YATES M.N.**

Comparison of turbulence characteristics for
selected tidal stream power extraction sites

TOGNERI M., MASTERS I.

15.40 - 16.10: **Coffee Break**

(ALEXANDROS I)

DAY 1 // JUNE 6, 2012

16.10 - 17.50: PARALLEL SESSIONS

ALEXANDROS II	AMPHITRION I	AMPHITRION II
S7: LES Methods & Applications 3 Chairman: E. Dick Developments in a Divergence Free Synthetic Eddy Method POLETTO R., REVELL A., CRAFT T.	S8: Flow Control 1 Chairman: M. Leschziner Re-evaluation of Control Performance for Turbulent Skin Friction Drag Reduction in Terms of Energy Saving and Convenience HASEGAWA Y., FROHNAPFEL B., QUADRIO M.	S9: Heat and Mass Transfer 1 Chairman: P. Fischer An Analytical Wall Function for Recirculating and Impinging Turbulent Heat Transfer SUGA K., ISHIBASHI Y.
LES Study of Flow between Shrouded Co-rotating Disks WASHIZU T., OBI S.	Experimental investigation of the drag on superhydrophobic surfaces GRUNCELL B.R.K., SANDHAM N.D., CAMPBELL I.M.	One-phase Large Eddy Simulation of the flow in a subchannel of a fuel rod bundle SEVERAC E., FROHLICH J.
Computational Modeling of Turbulent Mixing in a Jet in Crossflow CUNHA GALEAZZO F.C., HABISREUTHER P., BECK C., ZARZALIS N.	Mixing Transition in a Round Free Turbulent Jet: Effect of Passive Ring SADEGHIH H., POLLARD A.	Experimental Investigation on the Effects of Different Nozzles Shapes on Mixing Enhancement HASHIEHBAF A., ROMANO G.P., LACAGNINA G.
Improving speed-up and efficiency in simulation of stationary turbulent flows by parallelization of statistical averaging ONDER A., WU P., MEYERS J.	Optimization of winglet vortex generators combined with riblets for wall/fluid heat exchange enhancement COLLEONI A., TOUTANT A., OLALDE G., FOUCAUT J.M.	LES and URANS Numerical Analysis of Turbulent Natural Convection Flow Inside 3-D Rectangular Tilted Differentially Heated Cavities AMMOUR D., CRAFT T.J., IACOVIDES H.
Assessment of LES modeling with a high order Discontinuous Galerkin solver CARTON DE WIART C., HILLEWAERT K., DUPONCHEEL M., WINCKELMANS G., GEUZAIN P.	Arrangement of sensors and actuators in reactive turbulence control schemes STROH A., HASEGAWA Y., FROHNAPFEL B.	

19:30 - 21.00 Mayor's Reception - City Hall

DAY 2 // JUNE 7, 2012

09.00 - 09.45:	Plenary: Transients in turbulent combustion Andreas Dreizler (TU Darmstadt) Chairman: A. Tomboulides	(ALEXANDROS II)
09.45 - 10.20:	Poster-presentation session: 8 papers x 4 mins Chairman: B. Geurts	(ALEXANDROS II)
10.20 - 10.50:	Coffee Break and poster-viewing session	(ALEXANDROS I & II)

10.50 - 12.30: PARALLEL SESSIONS

ALEXANDROS II	AMPHITRION I	AMPHITRION II
S10: Combustion 1 Chairman: A. Dreizler	S11: Flow Control 2 Chairman: M. Braza	S12: LES Methods & Applications 4 Chairman: J. Frohlich
DNS of large scale forcing in premixed Bunsen flames	Experimental and computational study of the flow induced by a plasma actuator	Large-Eddy Simulation of the transient processes in water tanks for thermal energy storage
DE SOUZA C.T., BASTIAANS R.J.M., GEURTS B.J., DE GOEY L.P.H.	MADEN I., MADUTA R., KRIEGSEIS J., JAKIRLIC S., SCHWARZ C., GRUNDMANN S., TROPEA C	KALOUDIS E., GRIGORIADIS D.G.E., PAPANICOLAOU E., PANIDIS T.
Effects of Shear on Flame and Eddy Structures in Hydrogen-Air Turbulent Plane Jet Premixed Flames	Large-scale secondary flows caused by highly ordered and directional surface roughness in a turbulent boundary layer	Study of stall development around airfoil by means of high fidelity LES
SHIMURA M., KATADA Y., SHIM Y.S., TANAHASHI M., MIYAUCHI T.	HUTCHINS N., NUGROHO B., MONTY J.	ALFEREZ N., MARY I.
Direct Numerical Simulation of turbulent premixed flames to study Flame Surface Density Equation	Experimental Study on Traveling Wavy Wall for Turbulent Drag Reduction	LES of oscillating turbulent boundary layer over rippled bed
CHEVILLARD S., PERA C., KNOP V., REVILLON J.	URANO S., IWAMOTO K., MURATA A.	GRIGORIADIS D.G.E., DIMAS A., BALARAS E.

DAY 2 // JUNE 7, 2012

Multiple cycle LES simulations of a direct injection methane engine

SCHMITT M., WRIGHT Y.M., FROUZAKIS C.E., BOULOUCOS K.

Experimental Investigations on Frictional Resistance and Velocity Distribution of Rough Wall with Regularly Distributed Triangular Ribs

ITO T., MATSUMOTO A., MOTOZAWA M., IWAMOTO K., KAWASHIMA H., ANDO H., SENDA T. TSUJI Y., KAWAGUCHI Y.

Comparison of subgrid scale viscosity models and selective filtering strategy

AUBARD G., VOLPIANI P., GLOERFELT X., ROBINET J.C.

Self-ignition scenarios after rapid compression of a turbulent mixture weakly-stratified in temperature

LODIER G., MERLIN C., DOMINGO P. VERVISCH L., RAVET F.

The streamwise drag-reduction response of a boundary layer subjected to a sudden imposition of transverse oscillatory wall motion

LESCHZINER M., LARDEAU S.

12.30 - 14.10: **Lunch Break**

14.10 - 14.55: Plenary: **Multi-Scale Modelling of Dense Gas-Particle Flows** J.A.M. (Hans) Kuipers (TU Eindhoven)
Chairman: J.G.M. Kuerten

(ALEXANDROS II)

14.55 - 15.30: **Coffee Break and poster-viewing session**

(ALEXANDROS I & II)

PROGRAMME

DAY 2 // JUNE 7, 2012

15.30 - 17.10: **PARALLEL SESSIONS**

ALEXANDROS II

AMPHITRION I

AMPHITRION II

S13: Multiphase Flows 1
Jointly with EUROMECH
 Chairman: J.A.M. Kuipers

S14: Transition
 Chairman: T. Zaki

S15: Hybrid RANS 2
 Chairman: L. Davidson

Numerical Prediction of Sand Erosion
 with Two-Way Coupling

Active Compliant Wall for Skin Friction Reduction

Investigation of a Dynamic Hybrid RANS/LES Model-
 ing Methodology for Finite-Volume CFD Simulations

IMAGAWA Y., SUZUKI M., YAMAMOTO M.

PÄTZOLD A., PELTZER I., NITSCHKE W.,
 GODIN N., KING R., HALLER D., WOIAS P.

WALTERS D.K., BHUSHAN S., ALAM M.F.,
 THOMPSON D.S.

Determination of stochastic forcing for the
 motion of inertial particles in turbulent flow

Implicit Large Eddy Simulation of Transition and
 Turbulence in Suddenly Expanded Flows

Performance assessment of the scale-adaptive
 Reynolds stress model by reference to
 tandem-cylinder flow configurations

KUERTEN J.G.M., GEURTS B.J

KARANTONIS K., THORNER B.J.R.,
 DRIKAKIS D.

JAKIRLIC S., MADUTA R., ULLRICH M.

Comparison of DNS of compressible and
 incompressible turbulent droplet-laden
 heated channel flow with phase transition

Phenomenological RANS Modeling of Transitional
 Flow: An Alternative to the Laminar Kinetic Energy
 Approach

DES and Acoustic Prediction of Rudimentary
 Landing Gear Experiment using Unstructured
 Finite Volume Methods

BUKHOVOSTOVA A., RUSSO E., KUERTEN
 J.G.M., GEURTS B.J

LOPEZ M., WALTERS D.K.

WINKLER C.M., DORGAN A.J., MANI M.,
 LARSEN J.V., LANGTRY R.B.

Lagrangian modeling of agglomeration for
 applications to spray drying

Numerical Investigation of flow through a triangular
 duct: the coexistence of laminar and turbulent flow

A Hybrid temporal LES approach-Application to
 flows around rectangular cylinders

SOMMERFELD M., STUBING S.

DASCHIEL G., JOVANOVIC J., FROHNAPFEL B.

TRAN THAN T., MANCEAU R., PERRIN R.,
 BOREE J., NGUYEN A.T.

Sub-grid modeling in LES of droplet-laden
 turbulent pipe flow

Physical analysis of instabilities in a tube bundle flow
 at high Reynolds number in the context of fluid-
 structure interaction, by means of statistical and
 hybrid turbulence modelling

MICHALEK W.R., KUERTEN J.G.M.,
 ZEEGERS J.C.H., LIEW R.

MARCEL T., BRAZA M., HOARAU Y., BAJ F., MAG-
 NAUD J.P., LONGATTE E., HARRAN G.

20.30: **Conference Dinner - Roof Garden THE MET Hotel (Bus Transfer)**

DAY 3 // JUNE 8, 2012

09.00 - 09.45:	Plenary: The role of Large Eddy Simulation in Environmental Fluid Mechanics Vincenzo Armenio (University of Trieste) Chairman: B. Geurts	(ALEXANDROS II)
09.45 - 10.30:	Plenary: From streaks to spots and on to turbulence: Exploring the dynamics of boundary layer transition Tamer Zaki (Imperial College London) Chairman: D. von Terzi	(ALEXANDROS II)
10.30 - 10.50:	Coffee Break	(ALEXANDROS I)

10.50 - 12.30: PARALLEL SESSIONS

ALEXANDROS II	AMPHITRION I	AMPHITRION II
S16: Turbomachinery 1 Jointly with EUROTURBO Chairman: W. Rodi	S17: Turbulence Fundamentals Chairman: V. Armenio	S18: Combustion 2 Chairman: P. Domingo
Experimental Investigation of Boundary Layer Instability Mechanisms in Two Ultra-High-Lift Low-Pressure Turbine Cascades with Different Loading Distributions SATTA F., SIMONI D., UBALDI M., ZUNINO P., BERTINI F.	Inertial-range anisotropy in Rayleigh-Taylor Turbulence SOULARD O., GRIFFOND J.	Development of a numerical model to predict emissions of nitrogen oxides in turbulent flames PECQUERY F., LARTIGUE G., MOUREAU V., VERVISCH L.
High fidelity simulation and modelisation of heat transfer between a turbulent flow and a wall MAHEU N., DOMINGO P., MOUREAU V.	The Topology of the footprints of wall-bounded turbulence MONTY J.P., CHIN C., CHONG M.S., MARUSIC I.	An Investigation of the characteristics of planar and axisymmetric bluff-body stabilized turbulent stratified flames close to the lean blow-off limit PATERAKIS G., KOUTMOS P.

DAY 3 // JUNE 8, 2012

Comparison of turbulence models with hybrid mesh adaptation for shock boundary layer interaction

COUALLIER V., DE LA LLAVE PLATA M.,
LE PAPE M.C., MARMINGON C.

Self-similarity of variable acceleration Rayleigh-Taylor turbulent mixing layers

REDFORD J., LLOR A., WATTEAUX R.

Chemistry Tabulation for Methane-Air Turbulent Flames via the RCCE-ANNs Approach

CHATZOPOULOS A.K., RIGOPOULOS St.

Turbulence modeling of the flow in an exhaust gas turbine diffuser with two-equation turbulence models

VOLKMER S., HIRSCHMANN A., CASEY M.,
MAYER J.F., MONTGOMERY M.

Structure detection in a turbulent Rayleigh-Taylor instability

WATTEAUX R., LLOR A.,
REDFORD J. A.

Reconstruction of an entropy source by point-wise temperature measurements with adjoint in a fully turbulent three-dimensional channel flow

LEMKE M., SCHULZE J., SESTERHENN J.

Theoretical Modelling of the turbulent flow in a rotor-stator cavity subjected to a superimposed centripetal flow

DEBUCHY R., BOIS G., ABDEL NOUR F., PAVESI G.

A Numerical Investigation of Coaxial Jets with Complex Nozzle Geometries

TSIOLI E., ALBETS-CHICO X.,
KASSINOS S.

The Generation of Resonant Turbulence for a premixed burner

VERBEEK A.A., POS R.C., STOFFELS G.G.M.,
GEURTS B.J., VAN DER MEER Th. H.

12.30 - 14.00: **Lunch Break**

14.00 - 15.40: **PARALLEL SESSIONS**

ALEXANDROS II

S19: Turbomachinery 2
Jointly with EUROTURBO

Chairman: M. Leschziner

Numerical and Experimental investigation of the turbulent heat transfer along turbine trailing-edge

SCHNEIDER H., HORBACH T., SCHULZ A., BAUER H.J.,
VON TERZI D.

AMPHITRION I

S20: Compressible Flows 1
Chairman: J. Sesterhenn

Numerical Investigation of the Robustness of an Axisymmetric Separating/Reattaching Flow to an External Perturbation Using ZDES

WEISS. P.-E., DECK S.

AMPHITRION II

S21: Multiphase Flows 2
Jointly with EUROMECH

Chairman: M. Sommerfeld

Anisotropic stochastic dispersion model for large-EDDY simulations of particle-laden turbulent flows

POZORSKI J., KNORPS M., MINIER J.-P.,
KUERTEN J.G.M.

DAY 3 // JUNE 8, 2012

Experimental Study of the Periodic Incoming Wake Effects on Instability and Transition in Laminar Separated Flow

SIMONI D., UBALDI M., ZUNINO P., BERTINI F.

Numerical simulation of High-Speed Compressible Turbulent Flows Over Wavy/Rough Surfaces

TYSON C.J., SANDHAM N.D.

Comparison of Particle-Laden Air Flow in Realistic and Semi-realistic Model of Human Airways

JEDELSKY J., FRANTISEK L., ELCNER J., MIROSLAV J.

Urans Modeling of the Wake-Flow produced by a low pressure turbine blade

VLAHOSTERGIOS Z., SIDERIDIS A., YAKINTHOS K., GOULAS A.

Analysis of Boundary Layer Structure Downstream of a Shock Impingement

SHAHAB M.F., COMTE P. († 2011), LEHNASCH G., GATSKI T.B.

Multi-scale interface modeling for multi-phase turbulent flows

HU X. Y., HAN L. H., ADAMS N. A.

Comparison of Proper Orthogonal Decomposition and Fourier Filtering for the Determination of the Stochastic Unsteadiness in Time Signals

LENGANI D., SPATARO R., GÖTTLICH E.

Air, Helium and Co₂ Transverse Sonic Jets in Mach 5 Cross Flow

ERDEM E., KONTIS K., SARAVANAN S.

Turbulence Modulation by Phase Change in a Cavitating Shear Layer

EGERER C.P., HICKEL S., SCHMIDT S.J., ADAMS N.A.

The evolution of the turbulent field in a streaming corner inclined to the mainstream by 20°

GEORGIU D.P., MILIDONIS K.F., DEMIRIS G.P.

Prediction of flow and aerosol deposition in the extra-thoracic airways using an implicit immersed boundary method

NICOLAOU L., ZAKI T.

15.40 - 16.10: **Coffee Break**

(ALEXANDROS I)

PROGRAMME

DAY 3 // JUNE 8, 2012

16.10 - 17.30: **PARALLEL SESSIONS**

ALEXANDROS II

AMPHITRION I

AMPHITRION II

S22: Engine Cold Flows

Chairman: C. Angelberger

Direct Numerical Simulation of turbulent pipe flows at moderately high Reynolds numbers

EL KHOURY G.K., NOORANI A., SCHLATTER P., BRETHOUWER G., JOHANSSON A.V.

Large-Eddy Simulation of the Flow in IC Engines: effects of numerical and modeling errors on the prediction of cyclic variability

BAUMANN M., DI MARE F., JANICKA J.

Experimental investigation on the secondary motion downstream a pipe bend with and without swirl

KALPAKLI A., ORLU R., ALFREDSSON H.P.

Evolution of turbulence characteristics from straight to curved pipes

NOORANI A., EL KHOURY G., SCHLATTER P.**S23: Compressible Flows 2**

Chairman: D. von Terzi

Optimal Control to Reduce Supersonic Jet Noise

SCHULZE J., SESTERHENN J.

Direct numerical simulation of spatially developing supersonic turbulent boundary layer for skin friction drag reduction

KAMETANI Y., FUKAGATA K.

Numerical simulation and turbulence modeling of the transonic buffet over a supercritical airfoil at high Reynolds number

GROSSI F., SZUBERT D., BRAZA M., SEVRAIN A., HOARAU Y.**S24: Heat & Mass Transfer 2**

Chairman: K. Suga

DNS and Predictions for Turbulent Heat Transfer in Boundary Layer with Suddenly Changing Wall Thermal Conditions

HATTORI H., YAMADA S., TANAKA M., HOURA T., NAGANO Y.

Turbulent statistics in a mixing junction

NDOMBO J.-M., HOWARD R., SERRE E.

Experimental and Numerical Study of Cooling Air Flow in Hydroelectric Generators

MORADNIA P., CHERNORAY V., NILSSON H.17.30 - 17.50: **Closing session**

(ALEXANDROS II)

P1 Modeling of a Flow in Vortex Furnace

**ANUFRIEV I.S., ANIKIN YU.A., KRASINSKY D.V.,
SALOMATOV V.V., SHARYPOV O.V.**

P2 Flow simulation in a gas compressor

KOSMACHEVA A., FROLOV A., HAMALAINEN J.

P3 Intermittency Algebraic Model for RANS-based Prediction of Transitional Boundary Layers on a Flat Plate with Zero Pressure Gradient

JUNTASARO E., NGIAMSOONGNIRN K., JUNTASARO V.

P4 Influence of geometrical and operational conditions on the performance of pneumatic conveying systems: A numerical study by the Euler/Lagrange approach

LAIN S., SOMMERFELD M.

P5 Multi-Objective Parameter Optimization of the Realizable k-E Turbulence Model

De SOUZA L.G.M., JANIGA G., THEVENIN D.

P6 Engineering LES on Tetrahedral Grids

HOWARD R.J.A., HIEU L.T.

P7 Numerical Simulation of Vortex Dominated Flows with a Curvature Sensitized Eddy-Viscosity Model

DHAKAL T.D., WALTERS D.K.

P8 Study of Suppression Effect of Vortex Generators on Shock Wave Buffet on a OAT15A Airfoil

HUANG J.B., XIAO Z.X., LIU J., FU S.

information

VENUE // The ETMM9 Conference is taking place at the Hotel Macedonia Palace, in Thessaloniki, Greece.

LANGUAGE // The official language of the Symposium is English

PRESENTATION OF PAPERS //

Presentation of papers will be in oral or poster form. As the time allocated for each paper is 20 minutes, speakers are requested to time their presentation in 17 minutes leaving 3 for questions/discussion. Session chairs will be strict with time to ensure the good running of the parallel sessions and the flow of attendees from one session to another.

POSTER SESSIONS - POSTERS PRESENTATION // Dimensions of poster boards: 1m width by 1.50 m height. Material for hanging posters will be available at the Secretariat. Authors will be able to make a three-four minute oral presentation of their work during the Poster Session, on Thursday, June 7, 09.45-10.20. Posters will be on display in the foyer in front of the Alexandros II Hall.

TECHNICAL ASSISTANCE // Lap tops and projectors for power point presentation will be available at the conference venue.

INTERNET ACCESS // There is free Wi Fi at the conference areas.

REGISTRATION //

Ercoftac Members *	500€
Non members *	550€
Accompanying persons **	120€

*** Registration fees include**

- Entrance to all sessions
- Conference bag
- USB stick with conference proceedings
- Coffee breaks
- Lunch
- Welcome reception
- Conference dinner

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- Welcome reception
- Conference dinner

SECRETARIAT - REGISTRATION DESK

The Secretariat will be open on Tuesday, 5th June at 16.00-19.00 for registration and will continue to be open throughout the duration of the Conference as follows:

Tuesday 5th June:

From 16.00 to 19.00 hours

Wednesday, 6th June:

From 08.30 to 18.00 hours

Thursday, 7th June:

From 08.30 to 18.00 hours

Friday, 8th June:

From 08.30 to 17.00 hours

All conference documents (programme, proceedings, etc) will be included in the participant's bag.

The badge of each participant gives access to all sessions, coffee breaks and lunch breaks as well as conference dinner.

SOCIAL PROGRAMME //

- On **Wednesday, 6th June, 19.30-21.00**, all ETMM9 participants are invited to an evening reception – with drinks and hors d'œuvre - at the City Hall, which is only about a 5-10 minute walk from the conference venue.
- On **Thursday, 7th June, 20.30** the Conference dinner will be offered at the Roof Garden of the MET Hotel.

Buses will depart from MACEDONIA PALACE HOTEL at around 8.00pm to transfer you to the MET Hotel.

CLIMATE // The climate is Mediterranean and June is usually warm and sunny. Average temperature for June is 24oC with an average of 9.5 h. of sun.

CURRENCY // The official currency is the Euro (€). Other currencies will not be accepted during the conference.

ELECTRICITY // Electricity used in Greece is 220 volts. Frequency is 50Hz and the plugs have two male contact points. You need an adaptor for your electrical appliances or electronic equipment if using different voltage.

LIABILITY AND INSURANCE // It is regretted that neither the Organizers nor EUROSTAR Travel Plan can accept any responsibility whatsoever for injury or damage to persons or properties during the Conference. Participants are kindly requested to arrange for their own insurance.

TELEPHONE // For international calls from Greece, dial 00 followed by the correspondent's international code and number.

LOCAL TRANSFERS // Public bus transportation is available from a bus stop at about a 5 min walk from the hotel for the town center. Taxis can be requested at the Hotel reception.

SHOPPING HOURS // Shop opening times vary depending on their type and location, though shops normally open between 08:00 and 21:00. Shops close at 21:00 on Tuesday, Thursday and Friday, at 15:00 on Monday, Wednesday and Saturday. During the period June 1 - August 31st there is an optional two hour afternoon break from 15:00 - 17:00.

BANKING HOURS FOR THE PUBLIC //

Monday-Friday 08.00-14.00. There are many Automated Teller Machines (ATMs) outside most branches of banks. Hotels, large shops and restaurants normally accept credit cards and traveler's cheques.

CREDIT CARDS // All major credit cards are accepted widely, but not everywhere. If in doubt, ask in advance.

SERVICES

1. Tourist Information
2. Tourist Police
3. Traffic Police
4. Central Post Office
5. National Tel. Company (OTE)
6. Town Hall
7. International Fair Grounds

CULTURAL INSTITUTIONS

8. University Campus
9. University Library
10. Royal Theatre

HOTELS

11. Makedonia Palace
12. The Met
13. Kinisi Palace
14. Capsis Hotel





**MONUMENTS
MUSEUM - GALERIES**

- 15. Roman Forum
- 16. Roman Palace
- 17. Hippodrome
- 18. Arch of Galerius
- 19. White Tower - Byzantine Museum
- 20. Archaeological Museum
- 21. Museum of Byzantine Cultures

**PRINCIPAL BYZANTINE
CHURCHES MONASTERIES**

- 22. Ayia Sofia
- 23. Ayios Demetrios
- 24. Ayios Georgios (Rotonda)

TRANSPORT HUBS

- 25. Railroad Station
- 26. Main Port

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