**ERCOFTAC WORKSHOP**
**Direct and Large-Eddy Simulation 9**
**Dresden, Germany, April 2 – 5, 2013**

**DETAILED PROGRAM**  (15 MARCH 2013)

### Tuesday, April 2

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<td>17.30 – 19.30</td>
<td>EARLY REGISTRATION AND WELCOME RECEPTION</td>
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### Wednesday, April 3

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<td>9.10 – 9.50</td>
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<td>9.10 – 9.50</td>
<td>INVESTIGATIONS OF STABILITY AND TRANSITION OF A JET IN CROSSFLOW USING DNS</td>
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<td>D. Henningson</td>
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<td>9.50 – 10.30</td>
<td>DNS AND LES OF TWO-PHASE FLOWS WITH CAVITATION</td>
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<td>S. Hickel</td>
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<td>10.30 – 10.50</td>
<td>COFFEE BREAK</td>
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<td>10.50 – 12.30</td>
<td>LES MODELLING I</td>
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<td>10.50 – 11.10</td>
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<td>10.50 – 11.10</td>
<td>NUMERICAL EXPERIMENTS WITH A NEW DYNAMIC MIXED SUBGRID-SCALE MODEL</td>
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<td>P. Lampitella, F. Inzoli, E. Colombo</td>
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<td>IMPLICIT LARGE-EDDY SIMULATION OF ISOTROPIC TURBULENT MIXING</td>
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<td>10.50 – 11.10</td>
<td>FOUR-WAY COUPLED LES PREDICTIONS OF DENSE PARTICLE–LADEN FLOWS IN HORIZONTAL SMOOTH AND ROUGH PIPES</td>
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<td>10.50 – 11.10</td>
<td>M. Alletto, M. Breuer</td>
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<td>11.10 – 11.30</td>
<td>BIOMASS PYROLYSIS IN DNS OF TURBULENT PARTICLE–LADEN FLOW</td>
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<td>11.10 – 11.30</td>
<td>E. Russo, J.G.M. Kuerten, B.J. Geurts</td>
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| 11.30 – 11.50 | NEW DIFFERENTIAL OPERATORS FOR LARGE-EDDY SIMULATION AND REGULARIZATION MODELING  
F.X. Trias, A. Gorobets, A. Oliva, R.W.C.P. Verstappen |
| | MODULATION OF ISOTROPIC TURBULENCE BY RESOLVED AND NON-RESOLVED SPHERICAL PARTICLES  
A.H. Abdelsamie, D. Thévenin |
| 11.50 – 12.10 | ASSESSMENT OF IMPLICIT SUBGRID-SCALE MODELING FOR TURBULENT SUPERCritical MIXING  
C.A. Niedermeier, S. Hickel, N.A. Adams |
| | A HYBRID DECONVOLUTION-STOCHASTIC MODEL FOR LES OF PARTICLE-LADEN FLOW  
| 12.10 – 12.30 | Poster Talks LES Modelling (3 min each)  
A COMPARISON OF INFLOW GENERATION METHODS FOR LARGE-EDDY SIMULATION  
F.T. Pronk, S.J. Hulshoff  
POOR MAN’S LES – LATTICE BOLTZMANN BASED LARGE EDDY SIMULATION EMBEDDED INTO CLASSICAL CFD  
S. Pirker, P. Seil  
DESIGN OF HIGH-ORDER IMPLICIT FILTERS ON UNSTRUCTURED GRIDS FOR THE IDENTIFICATION OF LARGE-SCALE FEATURES IN LARGE-EDDY SIMULATIONS  
L. Guedot, G.dartigue, V. Moureau  
FORCED MAGNETOHYDRODYNAMIC TURBULENCE IN LARGE EDDY SIMULATION OF COMPRESSIBLE FLUID  
A.A. Chernyshov, K.V. Karelsky, A.S. Petrovyan  
A SUBGRID-SCALE MODEL DRIVEN BY DNS DATA  
S. Hoßbach, J.J. Peña Fernández, J.L. Sesterhenn |
| | Poster Talks Multiphase & FSI (3 min each)  
LES OF THE RANQUE-HILSCH VORTEX TUBE  
W.R. Michalek, J.G.M. Kuerten, R. Liew, J.C.H. Zeegers  
DIRECT NUMERICAL SIMULATION OF HEAT TRANSFER IN COLLIDING DROPLETS BY A COUPLED LEVEL SET AND VOLUME OF FLUID METHOD  
N. Talebanfard, B.J. Boersma  
CALCULATION OF FLOW PAST STATIONARY AND VIBRATING CIRCULAR CYLINDER AT RE=3900  
M.C. Kara, M. Cevheri, S. Kara, Th. Stoesser  
ON THE NUMERICAL MODELING OF ACTIVE FLOW CONTROL FOR AERODYNAMICS APPLICATIONS AND ITS IMPACT ON THE PRESSURE FIELD  
M. El-Alti, P. Kjellgren, L. Davidson  
DIRECT NUMERICAL SIMULATION OF IMMISCIBLE RAYLEIGH–TAYLOR TURBULENCE  
F. Yu, X. Hu, S. Hickel, N.A. Adams |
| | LUNCH |
| 13.25 – 14.05 | KEYNOTE LECTURE  
Session Chair: V. Armenio  
IMPACTS OF SURFACE WAVES ON MARINE BOUNDARY LAYERS: LARGE EDDY SIMULATION RESULTS  
P.P. Sullivan |
| 14.10 – 15.30 | ENVIRONMENTAL I  
Session Chair: J. Stiller  
SIMULATION OF BREAKING ATMOSPHERIC GRAVITY WAVES  
S. Remmler, S. Hickel |
| | TURBULENCE I  
Session Chair: D. Henningson  
VERY LARGE SCALE MOTIONS IN THE DIRECT NUMERICAL SIMULATION OF TURBULENT PIPE FLOW  
B.J. Boersma |
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| 14.30 – 14.50| DNS OF A RADIATIVELY DRIVEN CLOUD-TOP MIXING LAYER AS A MODEL FOR STRATOCUMULUS CLOUDS  
A. de Lózar, J.P. Mellado | ASSESSMENT OF DIRECT NUMERICAL SIMULATION DATA OF TURBULENT PIPE FLOWS  
G.K. El Khoury, Ph. Schlatter, A. Noorani, G. Brethouwer, A.V. Johansson |                                                                         |
| 14.50 – 15.10| EFFECT OF EKMAN LAYER ON WINDFARM ROUGHNESS AND DISPLACEMENT HEIGHT  
J.P. Goit, J. Meyers | DIRECT NUMERICAL SIMULATIONS OF OSCILLATORY PIPE FLOWS  
C. Wagner, D. Feldmann |                                                                         |
| 15.10 – 15.30| Poster Talks Environmental (3 min each)  
DIRECT AND LARGE-EDDY SIMULATION OF NON-OBERBECK-BOUSSINESQ EFFECTS IN A TURBULENT DIFFERENTIALLY HEATED CAVITY  
D. Kizildag, F.X. Trias, I. Rodriguez, A. Oliva  
LARGE-EDDY SIMULATION OF WIND FLOWS AND POLLUTANT TRANSPORTS INSIDE AND ABOVE IDEALIZED URBAN STREET CANYONS UNDER UNSTABLE THERMAL STRATIFICATION  
M.-C. Chan, C.-H. Liu  
CONVECTION IN A STRATIFIED ATMOSPHERE: FROM ISOLATED PLUMES TO THE CONVECTIVE BOUNDARY LAYER  
C.C. van Heerwaarden, J.P. Mellado  
WIND-WAVE INTERACTION STUDIES BASED ON LES  
A. AlSam, J. Revstedt, R.Z. Szasz  
LARGE-EDDY SIMULATION OF TURBULENT FLOW OVER AN ARRAY OF WALL-MOUNTED CUBIC OBSTACLES  
M. Saeedi, B.-C. Wang  
DIRECT NUMERICAL SIMULATION OF THE 3D STRATIFIED SEPARATED VISCOUS FLUID FLOWS  
P.V. Matyushin, V.A. Gushchin | Poster Talks Transition & Turbulence (3 min each)  
SEPARATED FLOW TRANSITION UNDER FREE-STREAM TURBULENCE  
M. Langari, Z. Yang  
ON THE LARGE-EDDY SIMULATIONS OF THE FLOW PAST A CYLINDER AT CRITICAL REYNOLDS NUMBERS  
O. Lehmkuhl, I. Rodriguez, J. Chiva, R. Borrell  
LARGE EDDY SIMULATION OF FLUIDIC INJECTION INTO SUPERSONIC CONVERGENT-DIVERGENT DUCT  
B. Semlitsch, M. Mihaescu, L. Fuchs |                                                                         |
| 15.30 – 16.10| **COFFEE & POSTERS** |                                                                         |                                                                         |
| 16.10 – 16.30| **NUMERICS I**  
Session Chair: R. Verstappen | **REACTIVE FLOWS & COMBUSTION I**  
Session Chair: H. Pitsch |                                                                         |
|               | DIRECT NUMERICAL SIMULATION OF CANONICAL FLOWS USING THE MODAL DISCONTINUOUS GALERKIN METHOD  
J.-B. Chapelier, M. De La Llave Plata, F. Renac, E. Lamballais | LES OF TURBULENCE-RADIATION INTERACTION IN PLANE REACTING AND INERT MIXING LAYERS  
S. Ghosh, R. Friedrich, Ch. Stemmer |                                                                         |
| 16.30 – 16.50| LES USING A DISCONTINUOUS GALERKIN METHOD: ISOTROPIC TURBULENCE, CHANNEL FLOW AND PERIODIC HILL FLOW  
C. Carton de Wiart, K. Hillewaert, L. Bricteux, G. Winckelmans | A PRIORI ANALYSIS OF DYNAMIC MODELS FOR LARGE EDDY SIMULATIONS OF TURBULENT PREMIXED COMBUSTION  
D. Veynante, V. Moureau, M. Boileau, T. Schmitt |                                                                         |
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| 16.50 – 17.10| UNDERRESOLVED TURBULENCE SIMULATIONS WITH STABILIZED HIGH-ORDER DISCONTINUOUS GALERKIN METHODS  
A.D. Beck, G.J. Gassner, C.D. Munz                                                          | LAGRANGIAN ANALYSIS OF MIXING AND SOOT TRANSPORT IN A TURBULENT JET FLAME  
A. Attili, F. Bisetti, M.E. Mueller, H. Pitsch                                             |                                                                  |
| 17.10 – 17.30| A NEW HIGH ORDER METHOD FOR THE ACCURATE SIMULATION OF INCOMPRESSIBLE WALL-BOUNDED FLOWS  
P. Lenaers, Ph. Schlatter, G. Brethouwer, A. Johansson                                      | THE INFLUENCE OF DIFFERENTIAL DIFFUSION IN TURBULENT OXYGEN ENHANCED METHANE FLAMES  
F. Dietzsch, G. Fru, D. Thévenin, C. Hasse                                                  |                                                                  |
| 17.30 – 17.40| Poster Talks Numerics (3 min each)                                                           | Poster Talks Combustion (3 min each)                                  |                                                                        |
|              | DIRECT NUMERICAL SIMULATION OF SQUARE-CYLINDER FLOW USING HYBRID WAVELET-COLLOCATION/VOLUME-PENALIZATION METHOD  
G. De Stefano, O.V. Vasilyev                                                                  | LES OF PRE-VAPORIZED N-HEPTANE AUTOIGNITION WITH TABULATED CHEMISTRY AND STOCHASTIC FIELDS COMBUSTION MODEL  
R. Kulkarni, W. Polifke                                                                      |                                                                  |
|              | GENERATION OF INTERMITTENT TURBULENT INFLOW AND INITIAL CONDITIONS BASED ON A WAVELET CONSTRUCTION METHOD  
L. Zhou, J. Grilliat, A. Delgado                                                               |                                                                       |
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<td>WHY YOU NEED LES FOR PREDICTING SOOT EMISSIONS IN TURBULENT COMBUSTION</td>
<td>H. Pitsch</td>
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<td>ON SCALE SEPARATION IN LARGE EDDY SIMULATIONS</td>
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<td>Session Chair: M.V. Salvetti</td>
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<td>LARGE-EDDY SIMULATION OF WALL JETS WITH AN EXTERNAL STREAM</td>
<td>MACH NUMBER INFLUENCE ON VORTEX BREAKDOWN IN SUBSONIC SWIRLING NOZZLE-JET FLOWS</td>
<td>APPLICATION OF FLAMELET GENERATED MANIFOLDS APPROACH WITH HEAT LOSS INCLUSION TO A TURBULENT HIGH-PRESSURE PREMIXED CONFINED JET FLAME</td>
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<td>10.40 – 11.00</td>
<td>TURBULENT BOUNDARY LAYERS IN LONG COMPUTATIONAL DOMAINS</td>
<td>A SYMMETRY-PRESERVING DISCRETIZATION AND REGULARIZATION SUBGRID MODEL FOR COMPRESSIBLE TURBULENT FLOW</td>
<td>DIRECT NUMERICAL SIMULATIONS OF TURBULENT H2-AIR PRE-MIXTURES</td>
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<td>LES AND LDV ANALYSIS OF THE COHERENT STRUCTURES IN THE NEAR WAKE OF A SQUARE CYLINDER</td>
<td>COMPARISON OF ACOUSTIC PROPERTIES IN DNS OF A SUPERSONIC JET WITH THREE DIFFERENT INLET BOUNDARY CONDITIONS</td>
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<td>INVESTIGATION OF DUAL-SOURCE PLUME INTERACTION IN A TURBULENT WALL-BOUNDED SHEAR LAYER</td>
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<td>F. Battista, F. Picano, G. Troiani, C.M. Casciola</td>
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<td>LES OF THE FLOW IN A RIB-ROUGHEUED DUCT</td>
<td>IMPLICIT LES OF NOISE REDUCTION FOR A COMPRESSIBLE DEEP CAVITY USING PULSED NANOSECOND PLASMA ACTUATOR</td>
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<td>Z.L. Chen, B.O. Zhang, S. Hickel, N.A. Adams</td>
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<td>PETASCALE AND BEYOND IN SIMULATIONS OF GEOPHYSICAL AND ASTROPHYSICAL TURBULENCE</td>
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13.40 – 15.00

**MHD**
Session Chair: A. Pouquet

**AERODYNAMICS**
Session Chair: T. Colonius

**NUMERICS II / STABILITY & TRANSITION**
Session Chair: N.N.

- **LINEAR INSTABILITY ANALYSIS OF 3D MAGNETOHYDRODYNAMIC FLOW BY DIRECT NUMERICAL SIMULATION**
  I. Grants, G. Gerbeth

- **SPECTRAL/FINITE ELEMENT SOLVER FOR INCOMPRESSIBLE MAGNETOHYDRODYNAMIC FLOWS - APPLICATION TO DEVELOPED PIPE FLOW WITH TRANSVERSE MAGNETIC FIELD**
  X. Dechamps, M. Rasquin, G. Degrez

- **LINEAR INSTABILITY ANALYSIS OF 3D MAGNETOHYDRODYNAMIC FLOW BY DIRECT NUMERICAL SIMULATION**
  I. Grants, G. Gerbeth

- **LARGE-EDDY SIMULATIONS FOR WIND TURBINE BLADE: ROTATIONAL AUGMENTATION AND DYNAMIC STALL**
  Y. Kim, I.P. Castro, Z.T. Xie

- **UNSTEADY CHARACTERISTIC OF STALL AROUND AIRFOIL BY QUASI-DNS**
  N. Alferez, I. Mary, E. Lamballais

- **COMPRESSIBLE DNS OF A LOW PRESSURE TURBINE SUBJECTED TO INLET DISTURBANCES**
  L. Chen, R. Pichler, R.D. Sandberg

- **SPECTRAL/FINITE ELEMENT SOLVER FOR INCOMPRESSIBLE MAGNETOHYDRODYNAMIC FLOWS - APPLICATION TO DEVELOPED PIPE FLOW WITH TRANSVERSE MAGNETIC FIELD**
  X. Dechamps, M. Rasquin, G. Degrez

- **DES OF TURBULENT BUBBLY DOWNWARD FLOW IN A VERTICAL PLANE CHANNEL WITH A COUPLED LEVEL-VOLUME-OF-FLUID METHOD**
  M. Kwakkel, W.-P. Breugem, B.J. Boersma

- **EULERIAN AND LAGRANGIAN APPROACH TO MULTISCALE MODELING OF AEROSOL FORMATION**
  A.K. Kuczaj, M. Nordlund, C. Winkelmann, I. Zinovik, L. Ghazaryan, B.J. Geurts

- **SIMULATION OF INSTABILITIES IN LIQUID METAL BATTERIES**
  N. Weber, V. Galindo, T. Weier, F. Stefani

- ** HUGE EDDY SIMULATION MODEL FOR URBAN AREAS WITH THERMAL AND HUMID STRATIFICATION EFFECTS**
  A. Petronio, F. Roman, V. Armenio, F. Stel, D. Giaiotti

**COFFEE & POSTERS**

15:00 – 15.30

**ENVIRONMENTAL II**
Session Chair: P. Sullivan

**MULTIPHASE II**
Session Chair: S. Hickel

**ROTATING TURBULENCE**
Session Chair: E. Serre

- **ENERGY BUDGET ANALYSIS OVER TWO-DIMENSIONAL URBAN-LIKE IDEALIZED ROUGHNESS ELEMENTS WITH HEIGHT VARIATION**
  C.C.C. Wong, Chun-Ho Liu

- **POLLUTANT DISPERSION IN THE URBAN BOUNDARY LAYER**

- **FRACTALITY OF TREES & INTERMITTENT CANOPY TURBULENCE IN LES**
  J. Schröttle, S. Gisinger, A. Dörnbrack

- **LES OF A THREE-DIMENSIONALLY RESOLVED FOREST WITH TOPOGRAPHY**
  F. Schlegel, J. Stiller, A. Bienert, H.-G. Maas, R. Queck, Ch. Bernhofer

- **EFFECT OF SPAN-WISE RESOLUTION FOR LES OF FLOW OVER A ROTATING CYLINDER AT HIGH REYNOLDS NUMBER**
  S. Rolfo, A. Revell

- **ENVIRONMENTAL II**
  Session Chair: P. Sullivan

15.30 – 17.10

**MULTIPHASE II**
Session Chair: S. Hickel

**ENVIRONMENTAL II**
Session Chair: P. Sullivan

- **COMPARISON OF DNS OF COMPRESSIBLE AND INCOMPRESSIBLE TURBULENT DROPLET-LADEN HEATED CHANNEL FLOW WITH PHASE TRANSITION**
  A. Bukhvostova, E. Russo, J.G.M. Kuerten, B.J. Geurts

- **DIRECT NUMERICAL SIMULATION OF A COMPRESSIBLE MULTIPHASE FLOW THROUGH THE FAST EULERIAN APPROACH**
  M. Cerrinara, L.C. Berselli, T. Esposito Ongaro, M.V. Salvetti

- **ROTATION-MODULATED TURBULENT CONVECTIVE HEAT TRANSFER**
  B.J. Geurts, R.P.J. Kunnen

- **EFFECTS OF ROTATION ON THE OSCILLATORY FLOW OVER RIPPLES**
  D.G.E. Grigoriadis, V. Armenio

- **EFFECTIVENESS OF SPAN-WISE RESOLUTION FOR LES OF FLOW OVER A ROTATING CYLINDER AT HIGH REYNOLDS NUMBER**
  S. Rolfo, A. Revell

**COFFEE & POSTERS**

15.00 – 15.30

**ENVIRONMENTAL II**
Session Chair: P. Sullivan

**MULTIPHASE II**
Session Chair: S. Hickel

**ROTATING TURBULENCE**
Session Chair: E. Serre

- **ENERGY BUDGET ANALYSIS OVER TWO-DIMENSIONAL URBAN-LIKE IDEALIZED ROUGHNESS ELEMENTS WITH HEIGHT VARIATION**
  C.C.C. Wong, Chun-Ho Liu

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**ENVIRONMENTAL II**
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**COFFEE & POSTERS**

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**MULTIPHASE II**
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**ENVIRONMENTAL II**
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15.50 – 16.10

**POLLUTANT DISPERSION IN THE URBAN BOUNDARY LAYER**

**DIRECT NUMERICAL SIMULATION OF A COMPRESSIBLE MULTIPHASE FLOW THROUGH THE FAST EULERIAN APPROACH**
M. Cerrinara, L.C. Berselli, T. Esposito Ongaro, M.V. Salvetti

**NUMERICAL SIMULATIONS OF A NARROW GAP TURBULENT TAYLOR-COUETTE-POISEUILLE FLOW**
S. Viazio, S. Poncet, R. Oguc

**NUMERICAL SIMULATIONS OF A NARROW GAP TURBULENT TAYLOR-COUETTE-POISEUILLE FLOW**
S. Viazio, S. Poncet, R. Oguc

**ROTATING TURBULENCE**
Session Chair: E. Serre

- **EFFECTS OF ROTATION ON THE OSCILLATORY FLOW OVER RIPPLES**
  D.G.E. Grigoriadis, V. Armenio

- **NUMERICAL SIMULATIONS OF A NARROW GAP TURBULENT TAYLOR-COUETTE-POISEUILLE FLOW**
  S. Viazio, S. Poncet, R. Oguc

- **ROTATION-MODULATED TURBULENT CONVECTIVE HEAT TRANSFER**
  B.J. Geurts, R.P.J. Kunnen

16.10 – 16.30

**FRACTALITY OF TREES & INTERMITTENT CANOPY TURBULENCE IN LES**
J. Schröttle, S. Gisinger, A. Dörnbrack

**DNS OF TURBULENT BUBBLY DOWNWARD FLOW IN A VERTICAL PLANE CHANNEL WITH A COUPLED LEVEL-SET/VOLUME-OF-FLUID METHOD**
M. Kwakkel, W.-P. Breugem, B.J. Boersma

**A FIRST APPROACH TO “NUMERICAL VON KARMAN” FLOW**
C. Jause-Labert, F.S. Godeferd

16.30 – 16.50

**LES OF A THREE-DIMENSIONALLY RESOLVED FOREST WITH TOPOGRAPHY**
F. Schlegel, J. Stiller, A. Bienert, H.-G. Maas, R. Queck, Ch. Bernhofer

**EULERIAN AND LAGRANGIAN APPROACH TO MULTISCALE MODELING OF AEROSOL FORMATION**
A.K. Kuczaj, M. Nordlund, C. Winkelmann, I. Zinovik, L. Ghazaryan, B.J. Geurts

**A FIRST APPROACH TO “NUMERICAL VON KARMAN” FLOW**
C. Jause-Labert, F.S. Godeferd

16.50 – 17.10

**LARGE-EDDY SIMULATION MODEL FOR URBAN AREAS WITH THERMAL AND HUMID STRATIFICATION EFFECTS**
A. Petronio, F. Roman, V. Armenio, F. Stel, D. Giaiotti

**EFFECT OF SPAN-WISE RESOLUTION FOR LES OF FLOW OVER A ROTATING CYLINDER AT HIGH REYNOLDS NUMBER**
S. Rolfo, A. Revell

**19.00**

**BUS TRANSFER TO CONFERENCE DINNER**
## Friday, April 5

### 8.30 – 9.50 KEYNOTE LECTURES

Session Chair: J. Fröhlich

- **8.30 – 9.10**  
  COMPUTATION AND PHYSICS OF TURBULENT DISPERSED FLOWS  
  A. Soldati

- **9.10 – 9.50**  
  SIMULATION AND MODELING OF TURBULENT JET NOISE  
  T. Colonius

### 9.50 – 10.20 COFFEE & POSTERS

### 10.20 – 12.00 LES MODELLING II & HYBRID

Session Chair: D. Borello

- **10.20 – 10.40**  
  VALIDATION OF AN ENTROPY-VISCOSITY MODEL FOR LES  
  J.-L. Guermond, A. Larios, P. Minev, T. Thompson

- **10.40 – 11.00**  
  A STOCHASTIC CLOSURE APPROACH TO LARGE EDDY SIMULATION WITH APPLICATION TO TURBULENT CHANNEL FLOW DNS DATA  
  A. Beck, G. Gassner, I. Horenko, D. Igdalov, R. Klein, Th. von Larcher, Ph. Metzner, C.-D. Munz, M. Waidmann

- **11.00 – 11.20**  
  COMPARISON OF URANS, PANS, LES AND DNS OF FLOWS AROUND SIMPLIFIED GROUND VEHICLES WITH FLOW CONTROL  
  S. Krajnović, X. Han, C.H. Bruneau, I. Mortazavi

- **11.20 – 11.40**  
  HYBRID LES–URANS METHODOLOGY FOR WALL–BOUNDED FLOWS  
  S. Schmidt, M. Breuer

- **11.40 – 12.00**  
  A DUAL-MESH HYBRID LES/RANS FRAMEWORK WITH IMPLICIT CONSISTENCY  
  H. Xiao, P. Jenny

### 10.20 – 11.00 MULTIPHASE III

Session Chair: W.-P. Breugem

- **10.20 – 11.00**  
  PARTICLE-LADEN TURBULENT CHANNEL FLOW WITH WALL-ROUGHNESS  
  B. Milici, M. De Marchis, G. Sardina, E. Napoli

### 11.00 – 12.00 QUALITY OF LES

Session Chair: J. Meyers

- **11.00 – 12.00**  
  DNS OF THERMAL CONVECTION IN RECTANGULAR DOMAINS WITH DIFFERENT DEPTHS  
  S. Wagner, O. Shishkina

### 12.00 – 12.55 LUNCH

### 12.55 – 14.35 HEAT TRANSFER & NATURAL CONVECTION

Session Chair: A. Giesecke

- **12.55 – 13.15**  
  DNS OF THERMAL CONVECTION IN RECTANGULAR DOMAINS WITH DIFFERENT DEPTHS  
  S. Wagner, O. Shishkina

- **13.15 – 13.35**  
  REYNOLDS SCALING OF SCALES AT VARIOUS TURBULENCE RESOLUTIONS  
  A.R. Nejadmalayeri, O.V. Vasilyev, A. Vezolainen

### 12.55 – 13.15 QUALITY OF LES

Session Chair: J. Meyers

- **12.55 – 13.15**  
  INVESTIGATIONS ON THE EFFECT OF DIFFERENT SUBGRID MODELS ON THE QUALITY OF LES RESULTS  
  F. Proch, M.W.A. Pettit, T. Ma, M. Rieth, A.M. Kempf
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<td>QUANTIFYING THE IMPACT OF SUBGRID SCALE MODELS IN ACTUATOR-LINE BASED LES OF WIND TURBINE WAKES H. Sarlak, C. Meneveau, J.N. Sørensen, R. Mikkelsen</td>
<td>LARGE-EDDY SIMULATIONS OF FLOW AND HEAT TRANSFER AROUND A LOW-MACH NUMBER BLADE N. Maheu, V. Moureau, P. Domingo</td>
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<td>14.55 – 15.35</td>
<td>LES MODELLING III</td>
<td>FSI &amp; FLOW CONTROL</td>
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<td>Session Chair: G. Grötzbach</td>
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<td>14.55 – 15.15</td>
<td>VARIATIONAL MULTISCALE LES INVESTIGATION OF DRAG AND NEAR-WAKE FLOW OF AN AXISYMMETRIC BLUNT-BASED BODY A. Mariotti, M.V. Salvetti, G. Buresti</td>
<td>LARGE-EDDY SIMULATION OF A FSI-INDUCED OSCILLATION TEST CASE IN TURBULENT FLOW M. Münsch, A. Delgado, M. Breuer</td>
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<td>SVV-LES OF FLOW AROUND THE SQUARE BACK AHMED BODY N. Peres, R. Pasquetti</td>
<td>ACTIVE FLOW CONTROL AND SHAPE OPTIMIZATION FOR TRUCK-TRAILERS USING LARGE-EDDY SIMULATION AND RESPONSE SURFACES P. Kjellgren, M. El-Alti, L. Davidson</td>
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<td>ELEMENTS AND APPLICATIONS OF SCALE-RESOLVING SIMULATION METHODS IN INDUSTRIAL CFD F. Menter</td>
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