Wednesday, 15 Sep 2021

8:00 - 8:30 Support Desk hours: 08:00-13:00 and 14:00-17:30

8:45 - 9:00 Welcome and Orientation - Dominic von Terzi, Bernard J. Geurts `Room A`

9:00 - 9:45 Keynote Lecture - Jochen Fröhlich (TU-Dresden) Direct Numerical Simulations of bedload transport with non-spherical particles Chair: Markus Klein (UniBW) `Room A`

9:45 - 10:30 Keynote lecture - Catherine Gorlé (Stanford University) Physics-based and Data-Driven Methods for Turbulence Model Form Uncertainty Quantification - Chair: Johan Meyers (KU Leuven) `Room A`

10:30 - 11:00 Break

11:00 - 12:40 Parallel Sessions

12:40 - 14:00 Lunch

14:00 - 15:40 Parallel Sessions

15:40 - 16:10 Break

16:10 - 17:50 Parallel Sessions

18:00 - 19:30 Social gathering

Thursday, 16 Sep 2021

8:00 - 8:30 Support Desk hours: 08:00-13:00 and 14:00-17:30

8:30 - 9:15 Keynote Lecture - Johan Meyers (KU Leuven) Real-time LES and fast flow models for wind-farm applications - Chair: Prof. Ananias Tomboulides (Aristotle University of Thessaloniki) `Room A`

9:15 - 10:55 Parallel Sessions

10:55 - 11:25 Break

11:25 - 13:05 Parallel Sessions

13:05 - 14:25 Lunch

14:25 - 16:25 Parallel Sessions

16:25 - 17:00 Break

17:00 - 17:45 Keynote Lecture - Markus Hultmark (Princeton University) Revealing the details of wind turbine wakes through high Reynolds number experiments - Chair Dominic von Terzi (TU Delft) `Room A`

17:45 - 18:30 Keynote Lecture - Alison Marsden (Stanford University) Computational modeling of coronary artery hemodynamics for personalized medicine in children and adults - Chair: Alistair Revell (University of Manchester) `Room A`

19:00 - 21:00 Conference Dinner

Friday, 17 Sep 2021

8:00 - 8:30 Support Desk hours: 08:00-13:00 and 14:00-17:30

8:30 - 9:15 Keynote Lecture - Philipp Schlatter (KTH Stockholm) Pressure gradient turbulent boundary layers: Simulations and Experiments Chair: Prof. Andrzej Boguslawski (Czestochowa University of Technology) `Room A`

9:15 - 10:00 Keynote Lecture - Andreas Kempf (U Duisburg-Essen) Nano-particle formation from turbulent flames - Chair: Prof. Lars Davidson (Chalmers) `Room A`

10:00 - 10:30 Break

10:30 - 12:30 Parallel Sessions

12:40 - 14:00 Lunch

14:00 - 15:40 Parallel Sessions

15:40 - 16:10 Break

16:10 - 17:50 Parallel Sessions

18:00 - 18:20 Closing Address - Announcing ETMM14 - Stefan Hickel, Bernard Geurts `Room A`

Wednesday, 15 Sep 2021

11:00 - 12:40 Parallel Sessions

Wings
Chair: Prof. Marianna Braza

ROOM A

Near Wall Reactive Flows:
Numerical Modelling and
Validation Experiments - 1
Chair: Prof. Amsini Sadiki

ROOM B

Bubbly multiphase flows
Chair: Prof. Jochen Fröhlich

ROOM C

Hybrid RaNS-LES
Chair: Prof. Suad Jakirlic

ROOM D

11:00 Aerodynamic and Aeroacoustic Investigation of a Circulation Controlled High-Lift Wing by Zonal Overset-LES
Rinie Akkermans, Varun Bharadwaj Ananthan.

11:00 Simultaneous flow, flame and wall temperature measurements in an IC engine for the investigation of flame-wall interactions
Carl-Philipp Ding, Marius Schmidt, Andreas Dreizler, Benjamin Boehm

11:00 A novel generalized multifluid modelling approach for the simulation of multiphase flows: model development and validation
Marco Colombo, Andrea De Santis, Bruce Hanson, Michael Fairweather

11:00 A rational hybrid RANS-LES approach to prediction of air flow and pollutant dispersion in real urban configurations
Mahir Hafizović, Muhamed Hadziabdic, Bojan Niceno, Kemal Hanjalić

11:20 Active flow control of an aircraft in full stall
Oriol Lehmkuhl, Ivette Rodriguez, Adrian Lozano-Duran

11:20 A comparison between head- on quenching of turbulent methane-air and hydrogen-air flames using detailed chemistry Direct Numerical Simulations
Jiawei Lai, Umair Ahmed, Markus Klein, Nilanjan Chakraborty

11:20 DNS of mass transfer in turbulent bubbly flow in a vertical pipe
Néstor Vinicio Balcázar Arciniega, Joaquim Rigola, Assensi Oliva

11:20 Data-driven modeling of the pressure-strain term in second-moment closure RANS models
Felix Köhler, Suad Jakirlic, Sebastian Wegt, Michael Schäfer

11:40 Towards adaptive simulations of turbulent wings at high Reynolds numbers
Fermin Mallor, Alvaro Tanarro, Nicolas Offermans, Adam Peplinski, Ricardo Vinuesa, Philipp Schlatter

11:40 Effects of turbulent boundary layer on the near-wall flame dynamics in the case of adiabatic walls
Umair Ahmed, Nilanjan Chakraborty, Markus Klein

11:40 Assessment of High-Resolution Numerical Simulation of Bubble-Wall Collision
Sagy Ephrati, Paolo Cifani, Benjamin Krull, Jochen Fröhlich, Bernard Geurts

11:40 Advanced RANS and hybrid RANS/LES simulations of a turbulent boundary layer under pressure gradients
Jaime Vaquero, Nicolas Renard, Sébastien Deck

12:00 Energy budgets and performance development of turbulent boundary-layer control on airfoils
Georg Fahland, Alexander Stroh, Davide Gatti, Marco Atzori, Ricardo Vinuesa, Philipp Schlatter, Bettina Frohnapfel

12:00 Parametric forcing approach for secondary motions formation over inhomogeneous rough surfaces
Alexander Stroh, Kay Schäfer, Bettina Frohnapfel, Pourya Forooghi

12:00 Microbubble-laden flows with bubble breakup and coalescence: An Euler-Lagrange LES study
Michael Breuer, Felix Hoppe

12:00 Development and validation of Explicit Algebraic Reynolds stress modelling for hybrid RANS-LES computations
Matteo Montecchia, Stefan Wallin

12:20 Aerodynamic Performance of Biomimetic Wings in Soaring Flight - a Numerical Study
Eike Tangermann, Gianantonio Ercolani, Markus Klein

12:20 Towards LES of bubble-laden channel flows: Sub-grid scale closures for momentum advection
Elias Trautner, Josef Hasslberger, Paolo Cifani, Roel Verstappen, Markus Klein, Theresa Trummler

12:20 A new formulation of Hybrid Temporal Large-Eddy Simulation
Vladimir Duffal, Benoît de Laage de Meux, Rémi Manceau

Wednesday, 15 Sep 2021

14:00 - 15:40 Parallel Sessions

Transition Chair: Prof. Witold Elsner **ROOM A**	Heat Transfer Engineering Chair: Prof. Wolfgang Rodi **ROOM B**	Direct and large-eddy simula- tions: numerical methods, modeling and validation Chair: Prof. Maria Vittoria Salvetti **ROOM C**	Near Wall Reactive Flows: Numerical Modelling and Validation Experiments - 2 Chair: Prof. Amsini Sadiki **ROOM D**
14:00 Turbulent flow over rough to smooth surface transition under adverse pressure gradient *Paweł Niegodajew, Witold Elsner, Artur Tyliszczak, Ewa Szymanek, Artur Dróżdż*	**14:00 Direct numerical simulation of turbulent heat transfer of surfaces with regularly distributed hemispheres** *Rika Nagura, Kazuhiko Suga, Yusuke Kuwata*	**14:00 Application of the ILSA model to passive scalar transport** *Zvi Hantsis, Ugo Piomelli*	**14:00 Application of large eddy simulation technique to derive correlations of Nusselt numbers for designing exhaust gas systems** *Yongxiang Li, Florian Ries, Kaushal Nishad, Amsini Sadiki*
14:20 Dynamic Mode Decomposition and Koopman spectral analysis comparison in boundary layer separationinduced transition study *Alessandro Dotto, Daniele Simoni, Davide Lengani, Alberto Tacchella*	**14:20 DNS Study of Turbulent Heat Transfer in a Channel under Combined Influences of Buoyancy and Wall-Normal System Rotation** *Cale Bergmann, Bing-Chen Wang*	**14:20 Large Eddy Simulation of Cavity Stabilized Supersonic Flow** *Christer Fureby*	**14:20 AdBlue Spray-Wall Impingement Process and Wall Film Formation in a SCR De-NOx System: Thermal and Conversion Analysis using Large Eddy Simulation** *Kaushal Nishad, Nikhil Mutalik, Florian Ries, Yongxiang Li, Federica Ferraro, Amsini Sadiki*
14:40 An algebraic LCTM Transition Model *Florian Menter, Richard Lechner*	**14:40 Towards High-Fidelity Simulation of Wall Turbulence Subjected to Conjugate Heat Transfer in Complex Geometry** *Rodrigo Vicente Cruz, Eric Lamballais, Rodolphe Perrin*	**14:40 Cost of low-and high-order direct numerical simulation of turbulent convection** *Bernard Geurts*	**14:40 Highly Resolved Near-Wall Boundary Layer Measurements in a Side-Wall Quenching Burner** *Florian Zentgraf, Pascal Johe, David Escofet-Martin, Robert Barlow, Benjamin Böhm, Brian Peterson, Andreas Dreizler*
15:00 A sub-grid activity sensor applied to a-posteriori LES modeling of laminar-turbulent transition *Josef Hasslberger, Markus Klein*	**15:00 Pulsed slot jets in crossflow for heat transfer enhancement** *Rodrigo Castellanos, Gianfranco Salih, Marco Raiola, Andrea Ianiro, Stefano Discetti*	**15:00 Numerical simulation and experiment of the three-dimensional leading-edge vortex generated by a plunging wing** *Ankang Gao, Chris D. Cantwell, Spencer Sherwin, Onur Son, Zhijin Wang, Ismet Gursul*	**15:00 Thermoacoustic Instabilities of Hydrogen- enriched Partially Premixed Flames in a Swirl Combustor** *Yu Gong, Daniel Fredrich, William Jones, Andrew Marquis*
15:20 Transitional ddes study over a circular cylinder and an airfoil profile *Özgür Yalçın, Kenan Cengiz, Yusuf Özyörük, Lars Wein, Joerg R. Seume*	**15:20 Radiative modification to general turbulent heat transfer models** *Simone Silvestri, Dirk Roekaerts, Rene Pecnik*	**15:20 Proper SGS heat flux models and numerical methods for LES** *F.Xavier Trias, Daniel Santos, Firas Dabbagh, Andrey Gorobets, Assensi Oliva*	**15:20 PIV/PLIF investigation of unsteady turbulent mixing in a model GT-combustor** *Dmitriy Sharaborin, Alexey Savitskii, Alexey Lobasov, Dmitriy Markovich, Vladimir Dulin*

16:10 - 17:50 Parallel Sessions

Convection
Chair: Prof. Xavier Trias

ROOM A

Flow over complex terrain
Chair: Prof. Stefan Hickel

ROOM B

Innovations in LES modeling: AI and UQ
Chair: Prof. Ricardo Garcia Mayoral

ROOM C

Flame Interactions
Chair: Prof. Luc Vervisch

ROOM D

16:10 Determination of numerical errors in les of turbulent rayleigh- bénard convection
Sahin Yigit, Josef Hasslberger, Markus Klein, Philipp Wenig

16:10 CFD evaluation of airflow patterns around beach houses with different wind facing sides
Paran Pourteimouri, Geert Campmans, Kathelijne Wijnberg, Suzanne Hulscher

16:10 CPU-based Deployment Neural Networks for LES of Reacting Flows in OpenFOAM
Paola Breda, Elias Trautner, Markus Klein, Maximilian Hasinger, Michael Pfitzner

16:10 Combustion regime identification in turbulent flames from machine learning trained by Raman/Rayleigh line measurements
Kaidi Wan, Sandra Hartl, Luc Vervisch, Pascale Domingo, Robert Barlow, Christian Hasse

16:30 Natural Convection between Vertically Heated Smooth and Rough Walls Using Fully Navier-Stokes Equations Simulation
Boqi Ren, ChungGang Li, Makoto Tsubokura

16:30 Computational modelling of vegetation in urban areas and its impact on air quality, temperature and velocity'
Azin Hosseinzadeh, Amir Keshmiri, Andrea Bottacin Busolin

16:30 Physics-informed neural networks for solving Reynolds -averaged Navier-Stokes equations
Hamidreza Eivazi, Philip Schlatter, Ricardo Vinuessa

16:30 Effects of buoyancy on turbulent kinetic energy transport in turbulent premixed flames
Arun Ravi Varma, Umair Ahmed, Nilanjan Chakraborty

16:50 Turbulent heat and momentum transfer in heated and cooled pipe flow with temperature-dependent fluid properties
Helfried Steiner, Lorenzo Sufrà

16:50 Reynolds Average Navier- Stokes simulations of atmo- spheric boundary layer flows around building-like obstacles using nek5000
Dimitrios Fytanidis, Ananias Tom- boulides, Ramesh Balakrishnan, Rao Kotamarthi, Paul Fischer

16:50 Application of gene expres- sion programming to a-posteriori les modelling of a taylor green vortex
Maximilian Reissmann, Josef Hasslberger, Richard Sandberg, Markus Klein

16:50 DNS and les of a syngas turbulent oxy-flame with side- wall effects using machine learning based chemistry
Kaidi Wan, Camille Barnaud, Luc Vervisch, Pascale Domingo

17:10 Analysis of the reverse teardrop shape of the velocity gradient tensor invariants joint pdf close to walls in turbulent rayleigh- bénard convection
Sahin Yigit, Josef Hasslberger, Nilanjan Chakraborty, Markus Klein

17:10 The effect of a micro- cavity array on burst events in a turbulent boundary layer
Van Thuan Hoang, Azadeh Jafari, Anton Silvestri, Benjamin Cazzolato, Maziar Arjomandi

17:10 Towards Uncertainty Quantification of LES and URANS for Internal Natural Convection - Differentially Heated Cavity of Aspect Ratio 4
Philipp Wenig, Ruiyun Ji, Stephan Kelm, Markus Klein

17:10 Low-order modeling of ignition in annular combustors
Leo C. C. Mesquita, Roberto Ciardiello, Epaminondas Mastorakos

17:30 Unstable phenomena of vertical natural convection in an open-ended channel with hot-cold wall configuration
ChungGang Li, Makoto Tsubokura

Thursday, 16 Sep 2021

9:15 - 10:55   Parallel Sessions

Flames
Chair: Prof. Epaminondas Mastorakos

ROOM A

Sprays and Jets
Chair: Prof. Gregoire Winckelmans

ROOM B

DES and LES
Chair: Prof. Helfried Steiner

ROOM C

Data-driven modeling
Chair: Dr. Florian Menter

ROOM D

9:15 LES study of the impact of fuel composition on a swirl spray flame approaching blow-off
Ambrus Both, Daniel Mira, Oriol Lehmkuhl

9:15 Numerical investigation of a turbulent reacting kerosene spray in vitiated cross-flow
Daniel Fredrich, W. P. Jones, Andrea Giusti

9:15 Detached Eddy Simulation coupled with steady RANS in the wall region
Lars Davidson

9:15 Predicting the near-wall region of turbulence through convolutional neural networks
Luca Guastoni, Alejandro Güemes, Andrea Ianiro, Stefano Discetti, Philipp Schlatter, Hossein Azizpour, Ricardo Vinuesa, GB

9:35 Numerical prediction of soot formation in a turbulent diffusion flame using the LES- PBE-PDF approach
Binxuan Sun, Stelios Rigopoulos

9:35 Assessment of chemistry reduction in high-pressure spray flames of oxymethylene ethers using largeeddy simulations
Daniel Mira, Anurag Surapaneni, Eduardo J. Perez-Sanchez, Ambrus Both, Oriol Lehmkuhl, Guillaume Houzeaux

9:35 Detached Eddy Simulations: Analysis of a limit on the dissipation term for increased stability
Lars Davidson, Christophe Friess

9:35 A New Approach to Using Artificial Neural Networks in LES-PDF Simulations: Application to Sydney Flame L
Tom Readshaw, Tianjie Ding, Stelios Rigopoulos

9:55 Modelling of Nanoparticle Synthesis from Flames
Andreas Kempf, Johannes

9:55 LES deduced TKE and dissipation rate for acoustic modelling of subsonic jets
Alex Howlett, Hao Xia, Chris Ellis, Gary Page

9:55 Bi-species ZDES Computation of a Four-Nozzle Space Launcher Configuration
Jolan Reynaud, Pierre-Elie Weiss, Sébastien Deck

9:55 Artificial Neural Networks for LES of Turbulent Combustion and Application to Sandia D Flame
Tianjie Ding, Tom Readshaw, Stelios Rigopoulos

10:15 A digital-twin population balance equation for solving soot PSD
Andrea SELTZ, Alexandre Bouaniche, Pascale Domingo, Luc Vervisch

10:15 Detailed chemistry LES-CMC simulations of lean blow-off in kerosene spray flames
Jenna Foale, Andrea Giusti, Epaminondas Mastorakos

10:15 Numerical simulation of the 3d effects of a morphing wing using electroactive trailing-edge actuations by means of hybrid turbulence model
Abderahmane Marouf, Nikolaos Simiriotis, Jean- François Rouchon, Yannick Hoarau, Marianna Braza

10:15 Data-driven Incompletely Stirred Reactor Network Modeling of an Aero-Engine Model Combustor
Salvatore Iavarone, Savvas Gkantonas, Andrea Giusti, Epaminondas Mastorakos

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10:35 Global instability in counter-current round jets - a numerical study
Karol Wawrzak, Andrzej Boguslawski, Artur Tyliszczak

10:35 Filtering and Log-layer Mismatch in Wall-Modeled Large Eddy Simulation
Hadi Hosseinzade, Donald J. Bergstrom

11:25 - 13:05 Parallel Sessions

Roughness 1 Chair: Prof. Bernard Geurts **ROOM A**	Pipe and Junction flow Chair: Prof. Rinie Akkermans **ROOM B**	Particles in flow Chair: Prof. Michael Breuer **ROOM C**	Decomposition and reconstruction from data Chair: Prof. Andreas Kempf **ROOM D**
11:25 Surface Roughness Effects On Cavity Flows *Ganesh N, Ananth SM, NR Vadlamani, Sriram R, K Kontis*	**11:25 Emerging structures of low turbulent flow in a 90° pipe bend** *Katrin Bauer, Johannes Burkert, Rüdiger Schwarze*	**11:25 Aerosol separation in different fibre matrices under laminar and turbulent flow conditions** *Martin Sommerfeld, Manuel Taborda, Guzel Shaikhutdinova, Lars Pasternek*	**11:25 Analysis of space- time correlations for the two-dimensional periodic hill problem to support the development of wall models** *Margaux Boxho, Koen Hillewaert, Grégoire Winckelmans, Michel Rasquin, Thomas Toulorge, Sophie Mouriaux, Renaud Mercier*
11:45 Turbulent channel flow over ratchet-type roughness *Angela Busse, Oleksandr Zhdanov*	**11:45 Thermal mixing processes in horizontal and vertical t-junction configurations** *Cenk Evrim, Eckart Laurien*	**11:45 Secondary flow effects on preferential concentration and clustering of inertial particles in a turbulent square duct flow** *Yanzhi Wang, Michael Fairweather, Lee Mortimer, Yanlin Zhao, Jun Yao*	**11:45 The flow inside a scour hole around a circular cylinder: comparison between Particle Image Velocimetry and Large Eddy Simulation** *Ulrich Jenssen, Wolfgang Schanderl, Lukas Unglehrt, Alaa Bashir, Michael Manhart*
12:05 Riblets in the Rough Regime *Lars H. von Deyn, Davide Gatti, Bettina Frohnapfel*	**12:05 DNS study on development of turbulent boundary layer in entrance region of pipe** *Hirofumi Hattori, Hiroyuki Baba, Tomoya Houra, Masato Tagawa*	**12:05 Numerical Investigation of the Effect of Humid Air on Inhaled Hygroscopic Particles in the Human Airways** *Fotos Stylianou, Stavros Kassinos, Pantelis Koullapis, Constantinos Panagiotou, Charalambos Frantzis, Dimokratis Grigoriadis*	**12:05 Reconstruction of 3D meso-scale structures inside a stirred tank from limited velocity measurements** *Kirill Mikhaylov, George Papadakis, Stelios Rigopoulos*
12:25 Study of irregular roughness in minimal channels *Jiasheng Yang, Alexander Stroh, Suad Jakirlic, Bettina Frohnapfel, Pourya Forooghi*	**12:25 Analysis Of Mass Transfer In A Turbulent Pipe Flow Using Extended Proper Orthogonal Decomposition** *Rasmus Korslund Schlander, George Papadakis, Stelios Rigopoulos*	**12:25 Study of turbulent precipitation in a T-mixer with DNS and DPB** *Hin Yan Tang, Stelios Rigopoulos, George Papadakis*	**12:25 Decomposition Of The Two Point Correlations And The Dissipation From Filtered Data** *Massimo Germano, Josef Hasslberger, Markus Klein*
		12:45 Large-eddy Euler- Lagrange simulation of breakup of dry powder agglomerates due to fluid forces and wall impact *Ali Khalifa, Michael Breuer*	

14:25 - 16:25 Parallel Sessions

Computational engineering methods Chair: Prof. Artur Tyliszczak **ROOM A**	Wind energy Chair: Prof. Catherine Gorle **ROOM B**	Flow and Heat Chair: Prof. Philipp Schlatter **ROOM C**	Multiphase Flow Chair: Prof. Martin Sommerfeld **ROOM D**
14:25 On the discontinuous Galerkin ILES of incompressible flows *Andrea Crivellini, Alessandra Nigro*	**14:25 Can windbreaks increase the power production of wind farms?** *Luoqin Liu, Richard Stevens*	**14:25 Assessment and comparison of large eddy simulations in asymmetrically heated and highly turbulent channel flows** *Martin David, Adrien Toutant, Françoise Bataille*	**14:25 Simulation of multiphase turbulent channel flow modulation by polymer additives** *Lee Mortimer, Michael Fairweather*
14:45 Assessment of CFD approaches for the numerical simulation of a 3D single- phase natural circulation loop for nuclear passive cooling applications *Dean Wilson, Hector Iacovides, Tim Craft*	**14:45 Injection of Wind Gusts in Large-Eddy Simulations** *Michael Breuer, Guillaume De Nayer*	**14:45 An explicit algebraic closure for passive scalar-flux: Applications in heated channel flows at a wide range of Reynolds numbers** *Konstantinos Panagiotou, Fotos Stylianou, Evangelos Akylas, Panos Papanastasiou, Stavros Kassinos*	**14:45 A novel generalized multifluid modelling approach for the simulation of multiphase flows: application to intensified liquid-liquid extraction** *Andrea De Santis, Marco Colombo, Bruce Hanson, Michael Fairweather*
15:05 Numerical viscosity model for implicit large eddy simulations of wllbounded turbulent flows. *Omar Mahfoze, Sylvain Laizet*	**15:05 Modeling wind direction changes in large-eddy simulations using a rotating reference frame** *Anja Stieren, Srinidhi N. Gadde, Richard J. A. M. Stevens*	**15:05 Effect of thermal boundary conditions in forced convective flow with temperature- dependent material properties** *Lorenzo Sufrà, Helfried Steiner*	**15:05 Investigation of turbulence statistics in two-phase gas-liquid flow** *Radouan Boukharfane, Saad Benjelloun, Matteo Parsani, Nilanjan Chakraborty*
15:25 PITM simulations of passive scalar transport fields in turbulent flow at low, medium and high Prandtl numbers *Bruno Chaouat, Roland Schiestel*	**15:25 Large eddy simulation study of extended wind farms with large inter turbine spacing** *Richard Stevens, Charles Meneveau*	**15:25 Automatic surface and volume mesh generation for roughness-resolved LES of additive-manufacturing heat exchangers** *Serge Meynet, Vincent MOUREAU, Ghislain Lartigue, Abdellah Hadjadj*	**15:25 Aerodynamically driven rupture of a liquid film by turbulent shear flow** *Melissa Kozul, Pedro S. Costa, James R. Dawson, Luca Brandt*
	15:45 A novel conservative immersed boundary method for wind turbine simulations *Iason Tsetoglou, Pierre Benard, Ghislain Lartigue, Vincent Moureau, Julien Reveillon*	**15:45 On sub-grid scale modeling in a differentially heated cubical cavity using coarse large eddy simulation** *Mohamed Sayed, Abdel Dehbi, Bojan Niceno, Muhamed Hadziabic, Konstantin Mikityuk*	**15:45 Development of an effective stochastic collision method for use in four-way coupled turbulent flows** *David Rupp, Lee Mortimer, Michael Fairweather*
			16:05 Analysis of fine particle deposition in swirl-type dry powder inhalers *Martin Sommerfeld*

10:30 - 12:30 Parallel Sessions

Jet flow Chair: Prof. Stefan Wallin **ROOM A**	Roughness 2 Chair: Prof. Koji Fukagata **ROOM B**	Wall-bounded flows Chair: Prof. Yannick Hoarou **ROOM C**	Interacting flow mechanisms near walls Chair: Prof. Ricardo Vinuesa **ROOM D**
10:30 Experimental Studies Of Free Jets Issuing From Non- Circular Nozzles *Agnieszka Pawlowska, Andrzej Bogusławski, Artur Tyliszczak*	**10:30** Direct Numerical Simulation On The Influence Of Slope And Skewness On Turbulent Flows Over Irregular Rough Surfaces *Yusuke Kuwata*	**10:30** Modification Of The Ssg/ Lrr-Omega Rsm For Adverse Pressure Gradients Using Turbulent Boundary Layer Experiments At High Re *Tobias Knopp, Matteo Novara, Erich Schuelein, Daniel Schanz, Christian Willert, Andreas Schroeder, Nico Reuther, Rainer Hain, Christian Kaehler*	**10:30** Modelling Of Turbulent Kinetic Energy Equation In Spherical Shockturbulence Interaction *Song Fu, Boxuan Chen, Bowen Yan*
10:50 Advanced Techniques For Gray Area Mitigation In Des Simulations And Their Effects On The Subsonic Round Jet Acoustic Spectra *Alexey Duben, Jesus Ruano, Joaquim Rigola, Francesc Xavier*	**10:50** Experimental Study On Torque Enhancementand Changes In Taylor-Couette Turbulencedue To Wall Roughness *Yukihiro Ihara, Yasufumi Horimoto, Yasuo Kawaguchi*	**10:50** Direct Numerical Simulation Of Adverse Pressure Gradient Turbulent Boundary Layer Up To $Re_\theta \sim 8000$ *Hussein Rkein, Jean-Philippe Laval*	**10:50** Unsteady Interaction Between Shock Wave And Separated Boundary Layer Over A Forward/Backwardfacing Step *Weibo Hu, Stefan Hickel, Bas Van Oudheusden*
11:10 A Study Of Turbulent Coagulation In A Jet With Discretised Population Balance And Dns *Malamas Tsagkaridis, Stelios Rigopoulos, George Papadakis*	**11:10** Effect Of Wavy Surface On Turbulent Boundary Layer Separation *Artur Dróżdż, Paweł Niegodajew, Witold Elsner, Mathias Romańczyk*	**11:10** An Adapted One- Equation Model For Large Eddy Simulations Of Wall-Bounded Turbulent Flows *Florian Ries, Louis Dressler, Yongxiang Li, Kaushal Nishad, Amsini Sadiki*	**11:10** Reduction In The Near-Wall Turbulence By Using Micro-Cavities *Shantanu Bhat, Anton Silvestri, Benjamin Cazzolato, Maziar Arjomandi*
11:30 Les Of Jet Flows Issuing From Long, Contracted And Orifice Type Triangular Nozzles At Various Aspect Ratios *Jakub Stempka, Łukasz Kuban, Andrzej Boguslawski, Artur Tyliszczak, Bernard Geurts*	**11:30** Turbulence Over Acoustic- Liner Roughness *Stefan Hickel, Davide Modesti, Haris Shahzad*	**11:30** The Influence Of Wall Directional Permeability On Turbulent Boundary Layer *Azadeh Jafari, Benjamin Cazzolato, Maziar Arjomandi*	**11:30** Wall-Resolved Les Of Turbulent Flow In A Supersonic Nozzle *Romain Debroeyer, Thomas Toulorge, Michel Rasquin, Grégoire Winckelmans, Yann Bartosiewicz*
11:50 Dns Of Turbulent Impinging Jets On Rough Surfaces Using A Parametric Forcing Approach *Francesco Secchi, Davide Gatti, Bettina Frohnapfel*		**11:50** A New Tripping Method For Rans Simulations Of Complex Turbulent Boundary Layers *Narges Tabatabaei, Georg Fahland, Alexander Stroh, Davide Gatti, Bettina Frohnapfel, Marco Atzori, Ricardo Vinuesa, Philipp Schlatte*	**11:50** Implementation And Validation Of An Algebraic Wall Model For Les In Nek5000 *Emmanuel Gillyns, Grégoire Winckelmans, Sophia Buckingham*
		12:10 Suppression Of Either Large-Scale Modulation Or Superposition In Wall Turbulence *Andrea Andreolli, Davide Gatti, Ricardo Vinuesa, Ramis Örlü, Philipp Schlatter*	

14:00 - 15:40 Parallel Sessions

Wakes
Chair: Prof. Marlene Sanjose

ROOM A

Canopies
Chair: Dr. Eike Tangermann

ROOM B

Environmental flows
Chair: Prof. Richard Stevens

ROOM C

14:00 Effects Of Micromixing In The Near-Field Evolution Of A Chemically-Reactive Plume Behind A Ship
Savvas Gkantonas, Epaminondas Mastorakos

14:00 Large Eddy Simulation Of Different Regimes In Canopy Flows
Shane Nicholas, Mohammad Omidyeganeh, Alfredo Pinelli

14:00 Approximation of near-wall velocity profiles at flow over periodic hills using the Falkner-Skan solutions
Daniel Quosdorf, Lukas Unglehrt, Michael Manhart

14:20 A Wake-Triggered Double- Secondary Vortex Topology Over A Multi-Element Airfoil: A Sensitized-Rans Modelling Study
Jiangsheng Wang, Robert Maduta, Sebastian Wegt, Jinjun Wang, Suad Jakirlic

14:20 Flow Structure And Turbulence During Sweep And Ejection Events In A Heterogeneous Canopy
Lior Shig, Alex Liberzon, Ron Shnapp, Yardena Bohbot-Raviv, Valery Babin, Eyal Fattal

14:20 Large Eddy Simulation of Isothermal and Non-isothermal Turbulent Flows in Ventilated Classrooms
Ramesh Balakrishnan, Rao Kotamarthi, Paul Fischer

14:40 Turbulent Wake Flow Of Light-Duty Truck: Comparison Of Les And Experiments
Jingwei Xie, Fei Wang, Chun-Ho Liu

14:40 Drag Reduction Effect Of Wave-Machine-Like Traveling Waves In Turbulent Channel Flow
Yusuke Nabae, Koji Fukagata

14:40 Direct Numerical Simulation of the turbulent wind over waves
Federica Romoli, Andrea Cimarelli, Enrico Stalio

15:00 Assessment Of Flow Prediction For The Flow Around A Finite Rectangular Prism: Influences Of The Turbulence Model And The Mesh
Xutong Zhang, Maxime Savoie, Ben Parslew, Alistair Revell

15:00 Scaling And Dynamics Of Turbulence In Sparse Canopies
Akshath Sharma, Ricardo Garcia-Mayoral

15:00 Application of Hybrid Meteorological Model/ Engineering LES Analysis to Very Strong Typhoon Jebi 2018
Masaharu Kawaguchi, Tetsuro Tamura, Wataru Mashiko

15:20 Improved Clauser Chart Method For Decelerating Flows
Paweł Niegodajew, Artur Dróżdż, Witold Elsner

16:10 - 17:50 Parallel Sessions

Flow forcing
Chair: Dr. Josef Hasslberger

ROOM A

16:10 A Simple Immersed Boundary Method For High- Fidelity Simulations Of Moving Objects On A Cartesian Mesh
Athanasios Giannenas, Sylvain Laizet, Georgios Rigas

16:30 Addressing Challenges Of Confined Embedded Les
Andrew Mole, Alex Skillen, Tim Craft, Alistair Revell

16:50 Skin-Friction Contributions Modified By A Large-Eddy Break- Up Device
Chi Ip Chan, Cheng (Rey) Chin,

17:10 A New Linear Forcing Method For Isotropic Turbulence With Controlled Lengthscale
Jérémie Janin, Fabien Duval, Christophe Friess, Pierre Sagaut

Flow simulation in complex domains
Chair: Prof. Oriol Lehmkuhli

ROOM B

16:10 Numerical Simulation of Sibilant Sound Generation of Human Voice Using Implicit LES of Compressible Flow and Hierarchical Grid System
HsuehJui Lu, ChungGang Li, Akiyoshi Iida, Tsukasa Yoshinaga,

16:30 Large Eddie Simulation of CS0 Defuser on Resolved and Under-Resolved Meshes
Dmitry Kolmogorov, Andrey Viktorovich Garbaruk, Andrey Sergeevich Stabnikov, Florian Menter

16:50 Symmetry-preserving discretizations in unstructured staggered meshes
Nicolas Valle, F.Xavier Trias, Roel Verstappen

17:10 Fluid dynamics of right ventricular filling in the presence of pulmonary regurgitation
Francesco Capuano, Yue-Hin Loke, Laura Olivieri, Elias Balaras

17:30 Unsteadiness In A Pressure-Induced Laminar Separation Bubble
Abdelouahab Mohammed-Taifour, Marlene Sanjose, Julien Weiss

Boundary layers affecting particle transport and combustion
Chair: Dr. Matteo Montecchia

ROOM C

16:10 Concentration And Preferential Orientation Of Inertial Ellipsoids In Channel Flows At Re_\Tau=180 And 550
Antoine Michel, Boris Arcen

16:30 Simultaneous High Speed Micro Piv And Heat Flux Measurements Near Piston Top Under Tumble Enhanced Engine Condition
Eiji Yokoyama, Makoto Kamata, Masayasu Shimura, Osamu Nakabeppu, Takeshi Yokomori, Mamoru Tanahashi

16:50 Auto-Ignition In An Isotropic And Anisotropic Turbulence
Agnieszka Wawrzak, Artur Tyliszczak

Separation and buoyancy
Chair: Prof. Daniel Quosdorf

ROOM D

16:10 Dynamics Of The Shear Layers Detaching From The Front Edges And Flow Features On The Side Of A 5:1 Rectangular Cylinder
Alessandro Mariotti, Benedetto Rocchio, Elena Pasqualetto, Gianmarco Lunghi, Maria Vittoria Salvetti

16:30 Reliability Of Large-Eddy Simulations Of The Flow Around A 5:1 Rectangular Cylinder: Sharp Vs. Rounded Front Edges
Maria Vittoria Salvetti, Benedetto Rocchio, Alessandro Mariotti

16:50 Use Of 2-D And 3-D Unsteady Rans In The Computation Of Buoyant Flows *Constantinos Katsamis, Timothy Craft, Hector Iacovides, Juan Uribe*

17:10 Effect Of Reynolds Number On Turbulent Boundary Layer Approaching Separation *Witold Elsner, Artur Dróżdż, Paweł Niegodajew, Mathis Romańczyk*

17:30 Assessment Of Scale- Resolving Turbulence Models To Capture The Drag Crisis Around A Circular Cylinder At High Reynolds Numbers
Michael Mays, Sylvain Laizet, Sylvain Lardeau