Tenth IUTAM Symposium on Laminar-Turbulent Transition

September 2-6, 2024 Shinshu University, Nagano, Japan

Programme







Timetable Tenth IUTAM Symposium on Laminar-Turbulent Transition SASTec (E1) 3rd floor, Shinshu University, Wakasato 4-17-1, Nagano, Japan

Monday	Tuesday	Wednesday	Thursday	Friday
September 2nd	September 3rd	September 4th	September 5th	September 6th
8:00-8:30	8:00-8:30	8:00-8:30	8:00-8:30	8:00-8:30
Welcome coffee	Welcome coffee	Welcome coffee	Welcome coffee	Welcome coffee
8:30-8:50				
Opening	8:30-9:15	8:30-9:15	8:30-9:15	
Prof. Ayumu Inasawa	Plenary lecture 2	Plenary lecture 3	Plenary lecture 4	
8.50-9.35	Prof. Taraneh Sayadi	Prof. Rich Kerswell	Prof. Marios Kotsonis	
Plenary lecture 1				
Dr. Pedro Paredes	9:15-9:45	9:15-9:30	9:15-9:45	8:30-10:30
	Keynote lecture 2	Coffee break	Keynote lecture 3	Oral session 10
9:35-10:05	Prof. Takahiro		Prof. P. Henrik	Hypersonic flows
Keynote lecture 1	Tsukahara		Alfredsson	
Prof. Daniel Rodríguez	9:45-10:00		9:45-10:00	
	Coffee break		Coffee break	
10:05-10:20		9:30-11:30		
Coffee break		Oral session 7		40.00.40.45
	10:00-12:00	Instability	10:00-11:40	Coffoo brook
10:20-12:00	Oral session 4		Oral session 8	Conee break
Oral session 1	Boundary layer		Gross flows 2	
Supersonic and	transition			10:45-12:25
transonic flows			41.40.40.00	Oral session 11
			11:40-12:00	Subcritcal transition
			Group photography	
12:00-13:10	12:00-13:00		12:00-13:00	
Lunch	Lunch		Lunch	12:25-13:10
				Drof Hormonn E Eacol
	40.00.44.00		13:00-13:30	
	13:00-14:20		Keynote lecture 4	
	Poster A (P1-P18)		Dr. Georgios Rigas	
13:10-15:10				
Oral session 2			13:30-14:50	
Roughness	14:20-15:00		Short presentation 2	
	Poster & Coffee break		Poster B (P19-P35)	
			14:50-15:30	
15:10 15:20			Poster & Coffee break	
Coffee break	15:00-17:00			
	Oral session 5			
	Cross flows 1			
15:30-17:10			15:30-17:30	
Oral session 3			Oral session 9	
Complex flows	17:00-17:20		Free stream turbulence	
	Coffee break			
				l
	17:20-19:00			
	Oral session 6			
	Separation			
17:45-20:00]	11-40-18-30	18:30-21:00	1
Welcome reception		Excursion	Banquet	
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- 1 -

Monday, September 2nd

- 8:00-8:30 Welcome coffee
- 8:30-8:50 Opening Ayumu Inasawa (Tokyo Metropolitan University)
- 8:50-9:35 Plenary lecture 1 Chair: Marcello Medeiros (University of São Paulo) Bluntness effects on hypersonic boundary-layer transition Pedro Paredes (National Institute of Aerospace)
- 9:35-10:05 Keynote lecture 1 Chair: Marcello Medeiros (University of São Paulo) New perspectives on instability of laminar separation bubbles: have we been missing something important? Daniel Rodríguez (Universidad Politécnica de Madrid)
- 10:05-10:20 Coffee break
- 10:20-12:00 Session 1 Chair: Ardeshir Hanifi (Royal Institute of Technology) Supersonic and transonic flows
- S1-1 Nonlinear dynamics in transitional shock wave/boundary-layer interaction: towards an explanatory scenario of low frequency dynamics Ismaïl Ben Hassan Saïdi, <u>Jean-Christophe Robinet</u> (Arts et Métiers Institute of Technology)
- S1-2 Linear and nonlinear response of high-speed boundary layers to continuous stochastic forcing <u>Neil D. Sandham</u>, Pushpender K. Sharma (University of Southampton), David Lusher (JAXA)
- S1-3 Excitation and evolution of radiating modes in supersonic boundary layers in the presence of impinging sound waves Fufeng Qin, <u>Xuesong Wu</u> (Imperial College London)
- S1-4 Features of transition control by streaks in Mach-2 and Mach-4.5 boundary-layer flow Markus J. Kloker (University of Stuttgart)
- S1-5 **Numerical study of laminar, transitional, and turbulent transonic shock-buffet on supercritical aerofoils** <u>David James Lusher</u>, Andrea Sansica, Atsushi Hashimoto (JAXA)
- 12:00-13:10 Lunch
- 13:10-15:10 Session 2 Chair: Neil D. Sandham (University of Southampton) Roughness
- S2-1 Development of a multifidelity analysis system for roughness-induced transition in high Re flow over infinite swept TAMU wing Keisuke Ohira (Ryoyu Systems), Takahiro Ishida (JAXA)

- S2-2 Numerical simulation of transition over a transonic swept wing with distributed roughness Yuji Mori, <u>Aiko Yakeno</u>, Takuto Ogawa, Shigeru Obayashi (Tohoku University)
- S2-3 **Roughness induced subcritical transitions of attachment-line boundary** *layers over a hypersonic blunt body* <u>Youcheng Xi</u>, Song Fu (Tsinghua University)
- S2-4 **Generative machine-learning methods to predict the wake of a distributed roughness patch in a hypersonic boundary-layer flow** Friedrich Ulrich, <u>Christian Stemmer</u> (Technical University of Munich)
- S2-5 **Trailing edge tonal noise reduction using surface roughness elements** <u>Zhenyang Yuan</u> (Royal Institute of Technology), Elias Alva, Tiago. B. Araujo, André. V. G. Cavalieri (Instituto Tecnológico de Aeronáutica), Ardeshir Hanifi (Royal Institute of Technology)
- S2-6 **Shear layer instabilities created by wall vibrations** Jerzy M. Floryan, Nafisha N. Haq (University of Western Ontario)
- 15:10-15:30 Coffee break
- 15:30-17:10 Session 3 Chair: Genta Kawahara (Osaka University) Complex flows
- S3-1 Linear and nonlinear receptivity of rotor-stator flow <u>Yohann Duguet</u>, Artur Gesla (Université Paris-Saclay), Laurent Martin Witkowski (Université Lyon), Patrick Le Quéré (Université Paris-Saclay)
- S3-2 **Transition to turbulence in conduits with compliant walls** Viswanathan Kumaran (Indian Institute of Science)
- S3-3 **Transitional phenomena on an elliptic profile** <u>Marco Costantini</u>, Benjamin D. Dimond, Christian Klein (DLR), Stephan Sattler (Technical University of Braunschweig), Massimo Miozzi (CNR)
- S3-4 Role of acoustic waves in optimal perturbation for supersonic two-dimensional channel flow <u>Nobutaka Taniguchi</u> (University of Tokyo), Yuya Ohmichi (JAXA), Kojiro Suzuki (University of Tokyo)
- S3-5 **Global stability analysis of jet flows in a confined cavity** <u>Manas Vashishtha</u>, B. R. Vinoth (Indian Institute of Space Science and Technology)

17:45-20:00 Welcome reception

Tuesday, September 3rd

8:00-8:30 Welcome coffee

8:30-9:15 Plenary lecture 2 Chair: Martin Oberlack (TU Darmstadt) An ensemble-based (non-intrusive) method for instability analysis and control of complex fows Taraneh Sayadi (Conservatoire National des Arts et Métiers)

Chair: Martin Oberlack (TU Darmstadt) 9:15-9:45 Kevnote lecture 2 Subcritical transition in annular pipe flows Takahiro Tsukahara (Tokyo University of Science)

- 9:45-10:00 Coffee break
- 10:00-12:00 Session 4 Chair: Jerzy M. Floryan (University of Western Ontario) Boundary layer transition
- S4-1 Spatial and temporal symmetry breaking in K-type transition Cong Lin, Oliver T. Schmidt (University of California San Diego)
- S4-2 DNS of K-type transition in a flat-plate boundary layer with supercritical fluids

Pietro Carlo Boldini (Delft University of Technology), Benjamin Bugeat (University of Leicester), Jurriaan Peeters (Delft University of Technology), Markus Kloker (University of Stuttgart), Rene Pecnik (Delft University of Technology)

S4-3 Boundary layer bypass transition due to gaps Felipe Oliveira Aguirre, Victor Barcelos Victorino, Marlon Sproesser Mathias (Universidade de São Paulo), Oliver T. Schmidt (University of California San Diego), Marcello Augusto Faraco de Medeiros (University of São Paulo)

S4-4 Stability transitions in a jet in crossflow Ricardo A. S. Frantz, Jean-Christophe Loiseau, Jean-Christophe Robinet (Arts et Métiers ParisTech)

- Simulation of K-type and H-type transition using the nonlinear one-way S4-5 Navier-Stokes approach Michael K. Sleeman (California Institute of Technology), Matthew T. Lakebrink (Boeing Research & Technology), Tim Colonius (California Institute of Technology)
- S4-6 Experimental study on the mechanism of lateral growth of developed turbulent wedge Ayumu Inasawa, Masahito Asai (Tokyo Metropolitan University)

- 12:00-13:00 Lunch
- 13:00-14:20 Short presentation 1 Chair: Masaharu Matsubara (Shinshu University) Poster A (P1-P18)
- 14:20-15:00 Poster & Coffee break

15:00-17:00 Session 5 Chair: Naoko Tokugawa (JAXA) Cross flows 1

- S5-1 Interaction of crossflow modes with forward-facing steps: insights gained from DNS <u>Francesco Tocci</u> (DLR), Guillaume Chauvat (Royal Institute of Technology), Alberto F. Rius-Vidales, Marios Kotsonis (Delft University of Technology), Stefan Hein (DLR), Ardesir Hanifi (Royal Institute of Technology)
- S5-2 **Swept wing transition delay by a surface hump** <u>Alberto F. Rius-Vidales</u>, Sven Westerbeek, Luis Morais, Jordi Casacuberta (Delft University of Technology), Mustafa Soyler (Osmaniye Korkut Ata University), Marios Kotsonis (Delft University of Technology)
- S5-3 Numerical investigation of crossflow-driven-transition delay through local sharp surface modification Jordi Casacuberta, Stefan Hickel, <u>Alberto F. Rius-Vidales</u>, Marios Kotsonis (Delft University of Technology)
- S5-4 **Experimental study of instability amplitude and pressure distribution** effects on critical step heights in crossflow-dominated transition <u>Hans Peter Barth</u>, Stefan Hein (DLR)
- S5-5 **Stability and transition of crossflow vortices in non-adiabatic wall** conditions <u>Marina Barahona</u>, Alberto Felipe Rius Vidales, Marios Kotsonis (Delft University of Technology)
- S5-6 Interscale energy transfer in a transitional swept-wing boundary layer <u>Tomotaka Ichikawa</u> (Shibaura Institute of Technology), Kosuke Nakagawa (Tokyo University of Science), Takahiro Ishida (JAXA), Takuya Kawata (Shibaura Institute of Technology), Takahiro Tsukahara (Tokyo University of Science)
- 17:00-17:20 Coffee break
- 17:20-19:00 Session 6 Chair: Jeffrey D. Crouch (Boeing Company) Separation
- S6-1 Numerical and experimental investigations of transition in a laminar separation bubble David Borgman, Shirzad Hosseinverdi (University of Arizona), Jesse Little (Ohio State University), Hermann Fasel (University of Arizona)
- S6-2 Linear and nonlinear analysis of wavy-surface induced laminar separation bubbles <u>Mohammad Moniripiri</u> (Royal Institute of Technology), Daniel Rodriguez (Universidad Politécnica de Madrid), Ardeshir Hanifi (Royal Institute of Technology)
- S6-3 **Separation-bubble instability in transonic flows over symmetric airfoils** Debleena Das, <u>Pradeep Moise</u> (Indian Institute of Technology Kanpur)
- S6-4 **Transition control for separated flow over airfoil by periodic body forcing** <u>Takuto Ogawa</u>, Aiko Yakeno (Tohoku University), Kozo Fujii (Tokyo University of Science)

S6-5 **Experiment on a laminar separation in a longitudinally oscillating freestream** Erwin Picky Gowree, Julian Sablon, Thierry, Jardin, Valérie, Ferrand

<u>Erwin Ricky Gowree</u>, Julien Sablon, Thierry Jardin, Valérie Ferrand (ISAE-SUPAERO)

Wednesday, September 4th

- 8:00-8:30 Welcome coffee
- 8:30-9:15 Plenary lecture 3 Chair: Takahiro Tsukahara (Tokyo Univ. of Science) **Recent progress in rectilinear viscoelastic flows** Rich Kerswell (University of Cambridge)
- 9:15-9:30 Coffee break
- 9:30-11:30 Session 7 Chair: Jens H. M. Fransson (Royal Institute of Technology) Instability
- S7-1 **Bluff bodies's wake: a universal sequence of bifurcations before chaos** Ricardo Frantz (Arts et Métiers), <u>Chloé Mimeau</u> (Conservatoire National des Arts et Métiers), Mikail Salihoglu (Sorbonne Université), Jean-Christophe Loiseau, Jean-Christophe Robinet (Arts et Métiers)
- S7-2 **Global stability analysis of installed jets** <u>Alessandro Franchini</u> (Dynfluid Arts et Métiers), Nicolas Alferez (Dynfluid CNAM), Jean-Christophe Robinet (Dynfluid Arts et Métiers)
- S7-3 **Taylor-Couette flow in the narrow-gap limit** Masato Nagata (Kyoto University)
- S7-4 Various information and complexity measures for analyzing the laminar-turbulent transition process in mixing layer <u>Masashi Ichimiya</u> (Tokushima University), Ikuo Nakamura (Nagoya University)
- S7-5 **Real-time control of Tollmien Schlichting waves with single-step deep** reinforcement learning <u>Babak Mohammadikalakoo</u>, Marios Kotsonis, Nguyen Anh Khoa Doan (Delft University of Technology)
- S7-6 **Control of the late stages of laminar-turbulent transition using deep reinforcement learning** Juan Guzman-Inigo (University of London)

11:40-18:30 Excursion

Thursday, September 5th

- 8:00-8:30 Welcome coffee
- 8:30-9:15 Plenary lecture 4 Chair: Markus J. Kloker (University of Stuttgart) Swept wing transition over geometrical wall features: recent work and next steps

Marios Kotsonis (Delft University of Technology)

9:15-9:45 Keynote lecture 3 Chair: Markus J. Kloker (University of Stuttgart) Instability, transition and turbulence on rotating disks and cones - Quo vadis?

P. Henrik Alfredsson (Royal Institute of Technology)

- 9:45-10:00 Coffee break
- 10:00-11:40 Session 8 Chair: Marios Kotsonis (Delft University of Technology) Cross flows 2
- Numerical and experimental study on the freestream-turbulence S8-1 dependency of turbulent transition processes on a swept flat plate Kosuke Nakagawa (Tokyo University of Science), Takahiro Ishida (JAXA), Takahiro Tsukahara (Tokyo University of Science)
- S8-2 Swept-wing boundary-layer receptivity to free-stream vortical disturbances Zhengfei Guo, Markus J. Kloker (University of Stuttgart)
- Demonstration of natural laminar vertical tail at flight Reynolds number S8-3 in ETW Naoko Tokugawa, Takahiro Ishida (JAXA), Keiji Ueshima, Keisuke Ohira (Ryoyu Systems)
- S8-4 Transitional boundary-layer modes on a rotating slender cone Sumit Sunil Tambe (Indian Institute of Science), Ferry Schrijer (Delft University of Technology)
- S8-5 Axial flow influence on boundary-layer transition on rotating slender cones Kentaro Kato, Kyosuke Yamada, Kosuke Takahara (Shinshu University), P. Henrik Alfredsson (Royal Institute of Technology), Masaharu Matsubara (Shinshu University)
- 11:40-12:00 Group Photography
- 12:00-13:00 Lunch
- Chair: Hermann F. Fasel (University of Arizona) 13:00-13:30 Keynote lecture 4 Non-linear transition mechanisms in wall-bounded flows in the frequency domain

Georgios Rigas (Imperial College London)

- 8 -

13:30-14:50 Short presentation 2

Chair: Ayumu Inasawa (Tokyo Metropolitan University) Poster B (P19-P35)

- 14:50-15:30 Poster & Coffee break
- 15:30-17:30 Session 9 Chair: Xuesong Wu (Imperial College London) Free stream turbulence
- S9-1 **Experiments on the influence of grid-generated free-stream turbulence on boundary-layer streaks** <u>Tristan M. Römer</u>, Markus Kloker, Ulrich Rist, Christoph Wenzel (University of Stuttgart)
- S9-2 **Transition modeling based on recent experimental free-stream turbulence boundary-layer data** <u>Jens H. M. Fransson</u>, André Weingärtner, S. B. Mamidala (Royal Institute of Technology)
- S9-3 Infrared thermographic evaluation of wall-temperature streak in boundary-layer transition with free-stream turbulence Shumpei Hara, Shinya Nagino, Kyoji Inaoka (Doshisha University)
- S9-4 **Experimental study of turbulent spots in free-stream turbulence induced boundary layer transition** <u>André Weingärtner</u>, Imge Yigili, Jens H. M. Fransson (Royal Institute of Technology)
- S9-5 **Direct numerical simulations on disturbance growth in high-enthalpy** hypersonic flows with freestream disturbances Shuto Yatsuvanagi, Hideyuki Tanno (JAXA)
- S9-6 **Receptivity modelling of freestream turbulence effects with a harmonic Navier Stokes model** Shahid Mughal (Imperial College London)

18:30-21:00 Banquet

Friday, September 6th

- 8:00-8:30 Welcome coffee
- 8:30-10:30 Session 10 Chair: Stuart Craig (University of Arizona) Hypersonic flows
- S10-1 Hot streak development in hypersonic boundary layer transition on a blunt cone with cooled walls: shock tunnel experiments and numerical simulations <u>Divek Surujhlal</u>, Alexander Wagner (DLR), Christoph Hader, Hermann Fasel (University of Arizona)
- S10-2 Hypersonic transition over the BOLT geometry Loïc Sombaert, François Nicolas, Mathieu Lugrin (ONERA-DAAA), Sébastien Esquieu (CEA-CESTA), Reynald Bur (ONERA-DAAA)
- S10-3 **Coherent structure tracking of vortical, acoustic and thermal components in transitional hypersonic boundary layers** <u>Riwan Hammachi</u>, Estelle Piot, Jean-Philippe Brazier, Hugues Deniau (DMPE, ONERA), Guillaume Daviller (CFD, CERFACS), José Cardesa (DMPE, ONERA)
- S10-4 **Receptivity of travelling crossflow mode in hypersonic three-dimensional boundary layers** <u>Caihong Su</u>, Lin Han (Tianjin University)

5 Numerical investigations of the ponlinear stage

- S10-5 Numerical investigations of the nonlinear stages of hypersonic boundary-layer transition for an ogive geometry Christoph Hader, Hermann Fasel (University of Arizona)
- S10-6 **Concluding the development of C/C-SiC based thermal protection** material with random porosity for hypersonic transition suppression <u>Alexander Wagner</u>, Viola Wartemann, Carolin Rauh, Fiona Kessel (DLR)
- 10:30-10:45 Coffee break
- 10:45-12:25 Session 11 Chair: Yohann Duguet (Université Paris-Saclay) Subcritical transition
- S11-1 **The recurrent generation of turbulent bands in rectangular-duct flow** Natsuki Suzumi, <u>Genta Kawahara</u>, Masaki Shimizu (Osaka University)
- S11-2 Oblique 3D modes as a new path to subcritical instability exemplified by plane Couette flow <u>Martin Oberlack</u>, Simon Görtz, Kilian Wilhelm, Lara De Broeck, Yongqi Wang, Alparslan Yalcin, Johannes Conrad (TU Darmstadt)
- S11-3 Dancing with the ghost: transient quiescence in square-duct turbulence and its link to an invariant solution <u>Stanisław Wojciech Gepner</u> (Warsaw University of Technology), Genta Kawahara (Osaka University)

- S11-4 Adjoint-based approach for prediction of non-modal growth in spatially evolving flows Duncan Marius Ohno, Michael Karp
- S11-5 **The dual presence of streamwise elongated structures in the post-transition state in channel flow** <u>Masaharu Matsubara</u>, Ryo Takai, Rin Sasaki (Shinshu University), Sattaya Yimprasert (Naresuan University)
- 12:25-13:10 Closing talk Chair: Masahito Asai (Tokyo Metropolitan University) IUTAM Symposia Laminar-Turbulent Transition: History of employing CFD Hermann F. Fasel (University of Arizona)

- 11 -

Poster A (Short presentation 1)

P1 Random micron surface roughness effects on swept wing boundary layer transition

Jenna Eppink (NASA)

- P2 An asymptotic description of fundamental resonance in hypersonic boundary layers and a low-order dynamical model Ming Dong (Chinese Academy of Sciences)
- P3 **Computations of turbulent transition in hypersonic boundary layer with reduced artificial dissipation** <u>Minjae Jeong</u>, Suhun Cho, Jiseop Lim, Jaehyeon Park, Solkeun Jee (Gwangju Institute of Science and Technology)
- P4 Emergence of edge state in suspension of self-propelled particles and its role in dynamics Yoshiki Hiruta, Kenta Ishimoto (Kyoto University)
- P5 Characteristic fluctuations observed in boundary layer transition around rotating dimpled sphere <u>Shoji Sakaue</u>, Yusuke Tominaga, Takakage Arai (Osaka Metropolitan University), Masahide Onuki, Takahiro Sajima (Sumitomo Rubber Industries)
- P6 **Convective regimes in differential spherical shell rotation with electric central force field** Yann Gaillard, <u>Peter S.B. Szabo</u>, Christoph Egbers (Brandenburg University of Technology Cottbus-Senftenberg)
- P7 Generalised resonance and acoustic radiation of subharmonic modes on a subsonic jet: a high-Reynolds-number asymptotic approach Zhongyu Zhang (Tianjin University), Xuesong Wu (Imperial College London)
- P8 **Stability analysis of recirculation bubble flow of a viscoelastic fluid** Beatriz Liara Carreira (Universidade de São Paulo), Elmer Mateus Gennaro (Campus de São João da Boa Vista), Daniel Rodríguez (Universidad Politécnica de Madrid), <u>Leandro Franco de Souza</u> (Universidade de São Paulo)
- P9 Numerical simulation of turbulent transition in hypersonic boundary layer for ground tests Suhun Cho, Minjae Jeong, Minwoo Kim, Jiseop Lim, Solkeun Jee (Gwangju Institute of Science and Technology)
- P10 Consideration of transition to unstable and turbulent vortex layer using hyperfunction Yuya Taki, Yoshio Ishii (Soka University)
- P11 **Numerical investigations of stability and transition for a blunt swept flat plate at Mach 10** Andrew Hartman, Christoph Hader, Hermann Fasel (University of Arizona)
- P12 Investigation of turbulent wedge intermittency with time-resolved temperature-sensitive paint Benjamin Dimond, Marco Costantini, Christian Klein (DLR)

- P13 **Steady traveling-wave solutions in permeable-channel flow** <u>Shingo Motoki</u>, Genta Kawahara, Masaki Shimizu (Osaka University)
- P14 **Finite amplitude scaling in transitional pipe flows** Ravindran Vishnu (Okinawa Institute of Science and Technology)
- P15 **Deep reinforcement learning for the thermal control of a marginally turbulent square-duct flow, targeting an edge travelling-wave solution** <u>Atsushi Sekimoto</u>, Takashi Mitani (Okayama University)
- P16 Application of the one-way Navier-Stokes equations to laminar separation bubbles in boundary layer flows <u>Elliot James Badcock</u>, Shahid Mughal (Imperial College London)
- P17 Effect of wall cooling on the stability and transition of swept wing boundary layers

Yifu Chen, Davide Modesti, Marios Kotsonis (Delft University of Technology)

P18 **Boundary layer transition in a very wide gap Taylor-Couette flow (η = 0.1)** <u>Mohammed Hussein Hamede</u> (BTU Cottbus-Senftenberg), Sebastian Merbold (DLR), Christoph Egbers (BTU Cottbus-Senftenberg)

Poster B (Short presentation 2)

- P19 Boundary-layer instability characteristics of supersonic and hypersonic flows over rotating cones Alexander Theiss, Jonas Penning, Stefan Hein (DLR)
- P20 **Roughness-induced laminar-turbulent transition in hypersonic ramp flows** <u>Giuseppe Chiapparino</u>, Christian Stemmer (Technical University Munich)
- P21 Active boundary-layer control via non-Newtonian fluid injection Liam Escott, <u>Paul Griffiths</u> (Aston University)
- P22 **On entropy-layer instabilities in hypersonic flows** <u>Iliya Milman</u>, Michael Karp
- P23 Transition phenomena and intermittency on a Mach 6 flat plate evaluated by three independent flow parameters Jens Lunte, Erich Schülein (DLR)
- P24 Experimental study of the impact of surface roughness on boundary-layer transition over a flat plate <u>Victoria Prieto</u> (ONERA and ISAE-SUPAERO), Félix Ducaffy, Maxime Forte (ONERA), Erwin R. Gowree (ISAE-SUPAERO)
- P25 Investigation of bluntness effects on transition on a 7-degree cone at Mach 5 Adam Emmanuel Skora, Stuart Alex Craig (University of Arizona)
- P26 **Pressure based NLF design for vertical tail of conventional aircraft and wind tunnel test model** <u>Takahiro Ishida</u> (JAXA), Keiji Ueshima, Keisuke Ohira (Ryoyu Systems), Naoko Tokugawa (JAXA)
- P27 **DNS study of flow mechanism contributing to drag reduction over** distributed micro roughness <u>Takuto Ogawa</u>, Aiko Yakeno (Tohoku University)
- P28 Non-linear interactions between stability modes in a compressible subsonic open cavity <u>Marlon Sproesser Mathias</u>, Felipe Oliveira Aguirre, Victor Barcelos Victorino, Marcello Augusto Faraco de Medeiros (Universidade de São Paulo)
- P29 **Effect of partial-slip on unsteady crossflow vortices** <u>Sharon Olivia Stephen</u>, Zoe Elizabeth Woodard (University of Sydney), C.Thomas (Macquarie University)
- P30 A far-from-equilibrium approach for predicting flow transition <u>Mattias Karl Gustavsson</u> (Hot Disk AB), Lennart Löfdahl (Chalmers University of Technology)
- P31 **Delay of laminar-turbulent transition on special shaped bodies of revolution and technology applications** Igor Nesteruk (National Academy of Sciences of Ukraine)

P32 **Turbulent spot measurements: wall-pressure and streamwise-velocity correlation** <u>Imge Yigili</u>, André Weingärtner, Jens H. M. Fransson (Royal Institute of

<u>Imge Yigili</u>, André Weingärtner, Jens H. M. Fransson (Royal Institute of Technology)

- P33 **Model order reduction for unsteady dielectrophoretic force-driven flows** Jonas Roller, Vincent Heuveline (Heidelberg University)
- P34 **Flow state transition process and oblique pattern of Taylor-Couette-Poiseuille flow at a medium cylinder ratio** <u>Yuki Matsukawa</u>, Ryo Araki, Takahiro Tsukahara (Tokyo University of Science)
- P35 **Recurrent motion in double-diffusive fingering convection** Shinya Okino (Kyoto University)

Lunch

- The cafeteria is open for lunch from 11:30 to 13:30.
- Meal tickets for three days (Sept. 2nd, 3rd, and 5th) are distributed at the reception desk. These tickets are only valid in the cafeteria. The ticket is not available on Sept. 4th.
- Each meal ticket is worth 1,000 yen, allowing you to select dishes up to that amount.
- Menu: https://gakushoku.coop/search
- If the total cost of the meal is less than 1,000 yen, no change will be given. If the total cost exceeds 1,000 yen, the balance will be charged. We accept either cash or credit cards.
- Please refer to the menu cards for a list of ingredients in each dish.

Example: Menu card and pictograms of ingredients.



Banquet

Venue:

Chateraise Hotel Nagano, 3rd floor, Banquet hall "Hakuho" at Nanase 1-1, Nagano, 380-0922, Japan

Date and time:

Thursday, September 5th, 18:30-21:00 (reception open at 18:00)

Note:

Please bring your name tag with the neck strap. We have different menus for different dietary needs. The color of the neck strap shows which menu you should get.





Excursion

We will take the bus around <u>11:40</u>, <u>Wednesday</u>, <u>September 4th</u> at bus stops for three courses [A], [B] and [C] shown in the Campus Map (next page).

Time*	[A] Togakushi**	[B] Matsushiro		[C] Azumino-Matsumoto	
12:00	Bus	Bus		Bus	
13:00		Lunch			
	Lunch			Lunch	
14:00		Matsushiro castle ruins		Daio Wasabi Farm	
		Sanada Residence	Bunbu School		
15:00	Togakushi Chusha	Bunbu School	Sanada Residence	Bus	
16:00	and Okusha Shrines including Hiking in the forest (approx. 2 hours)	Bus		Matsumoto Castle	
17:00		Hot spring Bus			
	Bus			Bus	
18:00	Duo				

Timetable for each course

We will return to Nagano station around 18:30.

* Expected time. Please follow the local instructions.

** For "[A] Togakushi" course, we recommend bringing enough drinking water, rain gear, and proper shoes (usual sneakers are fine, but no high heels) for the hiking (approx. 2 hours). In case of heavy weather conditions, we will visit Zenkoji temple instead of hiking to Togakushi Okusha shrine.

Shinshu University Nagano (Engineering) Campus Map



- 19 -

Access



From Station to Nagano (Engineering) Campus

- <u>On Foot (recommended)</u>: Approx. 20 minutes from East exit of JR Nagano Station to campus.
- <u>Taxi</u>: There is a taxi stand at East exit and at Zenkoji exit of JR Nagano Station. Approx. 5 minutes and approx. 1,000 yen. Please be careful that the conference venue is "Engineering Campus" ("Kougakubu" in Japanese), NOT "Education Campus".
- <u>Bus</u>: There are two bus stands (Nagano Dentetsu Bus at East exit, and Alpico Bus at Zenkoji exit). The bus fare is cheap (approx. 200 yen), but it is difficult to get on, so it is not recommended. You can find the detail information in the following links:
 - ✓ Nagano Dentetsu Bus: <u>https://www.nagaden-net.co.jp.e.yv.hp.transer.com/</u>
 - ✓ Alpico Bus: <u>https://www.alpico.co.jp/en/</u>