



**Third International Symposium on Instabilities and Bifurcations in Fluid Dynamics**

**10-13 August 2009, Nottingham, UK**

**Preliminary program**

## Monday, August 10

Time	Sessions	Sessions
8:30 – 9:30	Opening	
9:30 – 10:30	<b>Invited lecture: Tom Mullin</b> , "Bifurcation Phenomena in Pipes and Channels" (chair A. Cliffe)	
10:30 – 11:00	Coffee break	
	<b>Flows around bodies</b> (chair N. Pelekasis)	<b>Natural convection</b> (chair P.Bar-Yoseph)
11:00 – 11:20	<i>J.E. Garratt, K.A. Cliffe, S.Hibberd and H.Power</i> , "Non-linear modelling of fluid-structure interactions in high-speed air-riding face seals"	<i>A. El Gallaf, R. Touihri, D. Henry and H. Ben Hadid</i> , "Instabilities and bifurcations in a circular container heated from below and with a free surface"
11:20 – 11:40	<i>S. Baxter, H. Power, K. A. Cliffe, and S. Hibberd</i> , "Multiple solutions of thin film flows over and around obstacles"	<i>F. Marques, A. Rubio, and J. M. Lopez</i> , "Rotating convection: transitions from wall modes to quasi-geostrophic turbulence"
11:40 – 12:00	<i>H.A.Khaledi, V.D.Narasimhamurthy, H.I.Andersson</i> , "Cellular vortex shedding in the wake of a tapered plate"	<i>A. Kozlov, N. Kolchanov and G. Putin</i> , "Chaos and oscillating convective modes in triaxial ellipsoid"
12:00 – 12:20	<i>D. Khattar</i> , "Bifurcation in a bubble expanding and translating in a sound field"	<i>M. López, J. Nuñez, G. Hernández, M. Vargas, S. Cuevas and E. Ramos</i> , "Natural Convective Flow in a Cylindrical Container"
12:20 – 12:40	<i>F. Mikami, R. Toyota, N. Nishikawa</i> , "Observation of the instability in the shear layer behind a paraboloidal-nose cylinder"	<i>M.C. Navarro, L. Martin Witkowski, L. Tuckerman, and P. Le Quéré</i> , "Reduced models to study Rayleigh-Benard convection in cylindrical geometry"
12:40 – 14:40	Lunch	

14:40 – 15:00	<p><b>Films &amp; Drops: keynote lecture</b> (chair A. Oron)</p> <p><i>E. Knobloch</i>, "Pinning and self-pinning of localized structures".</p>		
15:00 – 15:20			
15:20 – 15:40	<p><b>Films &amp; Drops</b> (chair S. Wilson)</p> <p><i>P. Beltrame, P. Hanggi, E. Knobloch and U. Thiele</i>, "The depinning transition of 3D driven drops on a heterogeneous substrate"</p>		<p><b>Bifurcations and Instabilities in MHD flows</b> (chair Th. Boeck)</p> <p><i>N. A. Pelekasis, D. Dimopoulos</i>, "Magnetic field effects on three dimensional stability of natural convection flows in differentially heated cavities"</p>
15:40 – 16:00	<p><i>R. Borcia, S. Menzel and M. Bestehorn</i>, "Coalescence of droplets with miscible liquids: lubrication and phase field theories"</p>		<p><i>F. Pétrélis</i>, "Mechanism for reversals"</p>
16:00 – 16:20	<p><i>A.B. Mikishev and A.A. Nepomnyashchy</i>, "Long-scale evolution of parametrically excited Marangoni convection"</p>		<p><i>J. Priede, S. Aleksandrova and S. Molokov</i>, "Linear stability of Hunt's flow"</p>
16:20 – 16:50	Coffee break		

	<b>Films &amp; Drops</b> (chair E. Knobloch)	<b>Shear flows: pipes, channels, jets and layers</b> (chair F. Marques)
16:50 -17:10	<i>M.A. Herrada, A. M. Gañán-Calvo</i> , "Swirl flow-focusing: a new way for the massive production of monodisperse microbubbles"	<i>Y. Duguet and L. Brandt</i> , "Minimal perturbations in plane Couette flow"
17:10 -17:30	<i>A. Juel</i> , "Symmetry-breaking in partially occluded tubes: directing bubbles with tube geometry"	<i>J.M. Ortiz de Zárate</i> , "Nonequilibrium transverse velocity fluctuations in planar Couette flow"
17:30 -17:50	<i>S.V. Alekseenko, A.V. Cherdantsev, S.M. Kharlamov, and D.M. Markovich</i> , "Secondary instability of waves in annular two-phase flow with and without entrainment"	<i>P. Valluri, K.C. Sahu, H. Ding, P.D.M. Spelt and O.K. Matar</i> , "Convective and absolute instabilities in stratified two-layer flow"
17:50 -18:10		<i>S.C. Generalis, T. Itano, S. Toh and J.P. Fletcher</i> , "New equilibrium Couette states-the hairpin vortex solution (HVS)"

**Tuesday, August 11**

Time	Sessions	Sessions
8:30 – 9:30	<b>Invited lecture:</b> Dwight Barkley, “Direct optimal growth analysis for timesteppers” (chair A. Gelfgat)	
	<b>Natural convection</b> (chair A. Juel)	<b>Computational modeling</b> (chair D. Barkley)
9:30 – 9:50	<i>V.V. Kolmychkov, O.S. Mazhorova, O.V. Shcheritsa</i> , “Computer simulation for Rayleigh-Bernard convection in finite container”	<i>G.Y. Ouaknin and P. Z. Bar-Yoseph</i> , “On stochastic movement of collective cells and fingering morphology”
9:50 – 10:10	<i>G.V. Kuznetsov, and M.A. Sheremet</i> , “The Rayleigh-Benard instability in an enclosure having finite thickness walls”	<i>A. Meseguer, F. Mellibovsky, F. Marques, and M. Avila</i> , “Laminar and turbulent spirals in counter-rotating Taylor-Couette Flow”
10:10 – 10:30	<i>T.W.H. Sheu and R. K. Lin</i> , “Three-dimensional bifurcations in the cavity due to natural convection”	<i>Yu. Feldman, L. Tuckerman and A. Yu. Gelfgat</i> , “Time-marching-based CFD for modeling instabilities and bifurcations of 3D flows: full pressure-velocity coupled multigrid approach”
10:30 – 10:50	<i>K.G. Shvarts and A. Boudlal</i> , “Effect of rotation on stability of advective flow in horizontal liquid layer with a free upper boundary”	<i>X.X. Lu , L. Li , X.B. Ren , X.F. Yan and Y.C. Dong</i> , “Numerical simulations of interactions between shock wave and gas-liquid-air interfaces”
10:50 – 11:10	<i>B.L. Smorodin and M. Lücke</i> , “Binary fluid mixture convection with modulated heating”	<i>A. Salhi, J. M. Brooke</i> , “Detecting bifurcations in numerical simulation of fluid flow”
11:10 – 11:40	Coffee break	

	<b>Shear flows</b> (chair O.M.H. Rodriguez)	<b>Miscellaneous topics</b> (chair T. Mullin)
11:40 – 12:00	<i>S. Jung, S.D. Hoath, G.D. Martin and I.M. Hutchings</i> , “Collision of two Newtonian impinging jets”	<i>X.B. Ren, L. Li, J.S. Wang, X.X. Lu, X.F. Yan, Y.C. Dong</i> , “The experimental research and numerical simulation of nanometer granular flow in vacuum tube”
12:00 – 12:20	<i>O.M.H. Rodriguez and M. S. de Castro</i> , “Temporal and spatial stability of parallel liquid-liquid pipe flow”	<i>E. Khain</i> , “Instabilities and fluid-solid coexistence in dense shear granular flow”
12:20 – 12:40	<i>V. Kumaran</i> , “Stability of fluid flow past flexible surfaces”	<i>J.A. Miranda</i> , “Ferrofluid pattern formation induced by a radial magnetic field”
12:40 – 14:40	Lunch	
	<b>Films &amp; Drops</b> (chair U. Thiele)	<b>Shear flows</b> (chair F. Waleffe)
14:40 – 15:00	<b>Keynote lecture:</b> <i>S.K. Wilson, B.R. Duffy and J.M. Sullivan</i> , “The Break-up of a Sheet and of a Rivulet on a Vertical Substrate in the Presence of a Uniform Surface Shear Stress”	<i>K. C. Sahu, H. Ding, P. Valluri and O. K. Matar</i> , “Density stratification in pressure-driven miscible two-fluid channel flow”
15:00 – 15:20		<i>P.S. Stewart, S.L. Waters, J. Billingham, O.E. Jensen</i> , “Local and global instabilities of flow in a flexible-walled channel”
15:20 – 15:40	<i>H. Gadêlha and J. A. Miranda</i> , “Role of viscous stresses on the radial viscous fingering problem”	<i>H. Vitoshkin and A.Yu.Gelfgat</i> , “Non-modal energy and enstrophy norm growth in the viscous mixing layer flow”
15:40 – 16:00	<i>A. A. Nepomnyashchy, I. B. Simanovskii</i> , “Instabilities of non-isothermic ultra-thin two-layer films”	<i>E. Kit, D. Gerstenfeld, A. Yu. Gelfgat, and N.A. Nikitin</i> , “Bending and bulging secondary instabilities of Kelvin-Helmholtz billows”
16:00 – 16:20	<i>V.A. Batishev</i> , “Asymptotics of secondary regimes for junction of bifurcation points in a thermocapillary flow”	<i>L.O. Naraigh, O.K. Matar, P.D.M. Spelt and T.A. Zaki</i> , “Interfacial instability of turbulent two-phase stratified flow: Multi-equation turbulent modelling”
16:20 – 16:50	Coffee break	

	<b>Films &amp; Drops</b> (chair M. Bestehorn)	<b>Rotating flows</b> (chair M. Brøns)
16:50 -18:10	<i>O. Baumchen and K. Jacobs</i> , Sliding fluids: Dewetting experiments reveal the solid/liquid boundary condition	<i>Ch. Davies and Ch. Thomas</i> , "Disturbance evolution in rotating-disk boundary layers: competition between local instability and global stability"
16:50 -18:10	<i>A. Muench</i> , The dynamics of thin films with varying degree of slippage	<i>S. Altmeyer, Ch. Hoffmann, M. Lücke</i> , "Transitions between Taylor vortices and spirals via wavy Taylor vortices and wavy spirals"
16:50 -18:10	<i>M. B. Gratton and T.P. Witelski</i> , "Transient and self-similar dynamics in thin film coarsening"	<i>Merah, A. Bouabdallah and F. Mokhtari</i> , "Theoretical study on Taylor Couette flow between concentric cylinder and cone"
16:50 -18:10	<i>N. Savva and S. Kalliadasis</i> , "Influence of spatial heterogeneities on spreading dynamics"	<i>H. Oualli, O. Mahfoud, A. Bouabdallah, S. Hanchi and M. Gad-el-Hak</i> , "Taylor-Couette flow control using a radially oscillating inner cylinder"
20:00 – 22:00	Dinner	

**Wednesday, August 12**

Time	Sessions	Sessions
8:30 – 9:30	<b>Invited lecture: <i>Fabian Waleffe</i>, “The coherence of turbulence: 3D unstable coherent states in canonical shear flows”</b> (chair P. Bar-Yoseph)	
9:30 – 9:50	<p><b>Films &amp; Drops</b> (chair O.K. Matar)</p> <p><i>E. Novbari and A. Oron</i>, “Energy integral method model for the nonlinear dynamics of an axisymmetric thin liquid film falling down a vertical cylinder”</p>	<p><b>Natural convection</b> (chair L. Martin Witkowski)</p> <p><i>A. Westhoff, D. Schmeling, J. Bosbach and C. Wagner</i>, “Oscillations of heat transfer and large-scale circulation in turbulent mixed convection”</p>
9:50 – 10:10	<i>C. Lee and P. H. Gaskell</i> , “The dynamics of thin film flow on flexible surfaces containing micro-scale topography”.	<i>K. Boronska, L.S. Tuckerman</i> , “Bifurcations in cylindrical Rayleigh-Benard convection: trigonometric and roll states”
10:10 – 10:30	<i>J. Hu, B. Zhou, Y. Hang, Q. Yu</i> , “Linear temporal and spatiotemporal stability of ice growth under a falling water film”.	<i>I. Mercader, A. Alonso, O. Batiste, and E. Knobloch</i> , “Steady localized states in binary fluid convection. The influence of the boundary condition on the bifurcation diagrams”
10:30 – 10:50	<i>I. D. Borcia and M. Bestehorn</i> , “Surface structures on thin fluid layers of a binary mixture”	<i>V. Haslavsky, E. Kit, A. Yu. Gelfgat</i> , “Experimental study of temperature instabilities in Czochralski configuration”
10:50 – 11:10	<i>H.-Ch. Tsai and Ch.-L. Lai</i> , “Stability analysis of thin liquid film in a micro-pipette”	
11:10 – 11:40	Coffee break	

	<b>Films &amp; Drops</b> (chair K. Jacobs)	<b>Theoretical issues</b> (chair L. Tuckerman)
11:40 – 12:00	<i>M. Bestehorn</i> , “Turing surface patterns on volatile heated thin films”	<i>I.V. Lebed</i> , “About the cause of discrepancy between the classic instability development scenario and experiment”
12:00 – 12:20	<i>D. Merkt</i> , “Convective instabilities and evaporation”	<i>D. Tseluiko, S. Saprykin and S. Kalliadasis</i> , “Coherent structures theory for the generalized Kuramoto-Sivashinsky equation”
12:20 – 12:40	<i>B. Uma</i> , “Evolution of thin condensate / evaporating power-law liquid films on an inclined plane in the presence of wind stress”	<i>Th. Sapsis, and G. Haller</i> , “Instabilities in the Dynamics of Neutrally Buoyant Particles”
12:40 – 14:40	Lunch	
	<b>Bifurcations and Instabilities in MHD flows</b> (chair S. Molokov)	<b>Marangoni convection</b> (chair A. Nepomnyashchy)
14:40 – 15:00	<i>B. Knaepen, M. Kinet, S. Molokov</i> “Numerical simulation of the instability of side jets in MHD square ducts with walls of finite conductivity”	<i>F. Mokhtari, A. Bouabdallah, M. Zizi, S. Hanchi and A. Alemany</i> , “Forced and thermocapillary convection in silicon Czochralski crystal growth in hemispherical crucible”
15:00 – 15:20	<i>A. Potherat</i> “Transition between two-dimensional and three-dimensional forced MHD turbulence”	<i>M. K. Ermakov</i> , “Stability analysis of axisymmetric thermocapillary flows”
15:20 – 15:40	<i>Th. Boeck, D. Krasnov D., M. Rossi, O. Zikanov</i> , “Optimal growth and transition in MHD duct flow”	<i>L. Martin Witkowski, L. Kahouadji, J. S. Walker</i> , “Thermocapillary instabilities with crystal and feed rod rotation in laterally heated liquid bridge”
15:40 – 16:00	<i>D. Gonzalez-Forero, M. A. Miranda, A. de la Torre, and J. Burguete</i> , “Instabilities of conducting fluid flows in cylindrical cavities”	<i>S. Shklyaev, A. A. Nepomnyashchy, and A. Oron</i> , “Longwave oscillatory Marangoni convection in a layer of a binary liquid at small Lewis numbers”
16:00 – 16:20	<i>P. Delmont, R. Keppens</i> , “On regular shock refraction in ideal MHD”	<i>M. Medale and P. Cerisier</i> , “Pattern bifurcation in Bénard-Marangoni Convection inside small to moderate vessels”
16:20 – 16:50	Coffee break	

	<b>Bifurcations and Instabilities in MHD flows</b> (chair J. Priede)	<b>Miscellaneous topics</b> (chair E. Kit)
16:50 -17:10	<i>Y. Laghouati, A. Bouabdallah, M. Zizi and A. Alemany</i> , “Effects of the viscosity and magnetic field on the Kelvin-Helmholtz instability”	<i>Y. Hattori, K. Hijiya and Y. Fukumoto</i> , “Curvature instability of vortical structures”
17:10 -17:30	<i>A.P. Likhachev and S.A. Medin</i> , “On a coupled development of MHD instabilities of Rayleigh-Taylor and Kelvin-Helmholtz types in nonuniform gas-plasmas flows”	<i>V. Kolesov, L. Shapakidze</i> , “Instabilities and transition in flows between two porous concentric cylinders with radial flow and a radial temperature gradient”
17:30 -17:50	<i>A. Pedchenko, S. Molokov, J. Priede, A. Lukyanov, and P.J. Thomas</i> , “Experimental results on instability in aluminium reduction cells”	<i>R. Chabreyrie, C. Chandre and N. Aubry</i> , “Targeting complete chaotic mixing in an electro-osmotic mixer”
17:50 -18:10		<i>E.I. Suetnova</i> , “Instability of porous fluid flow during viscoelastic compaction of layered sediments”

**Thursday, August 13**

Time	Sessions	Sessions
<p>9:00 – 9:20</p> <p>9:20 – 9:40</p> <p>9:40 – 10:00</p> <p>10:00 – 10:20</p> <p>10:20 – 10:40</p>	<p><b>Instability in geophysical fluid dynamics</b> (chair E. Heifez)</p> <p><i>H. de Vries, J. Methven, B. Hoskins and T. Frame</i>, “Viewing baroclinic initial value problems in terms of Rossby wave components”</p> <p><i>E. Heifetz, N. Harnik, A. Rabinovich, O.M. Umurhan, and F. Lott</i>, “A gravity-vorticity wave interaction approach to stratified shear flow instability”</p> <p><i>O.M. Umurhan</i>, “Barotropic stratified shear instabilities in astrophysical discs”</p> <p><i>A.E. Sterk, R. Vitolo, H.W. Broer, C. Simó, and H.A. Dijkstra</i>, “Low-Frequency variability in a low-order shallow water atmospheric model”</p> <p><i>J. Methven, P. Berrisford, B. Hoskins, H. de Vries and T. Frame</i>, “Wave-mean flow interaction in nonlinear baroclinic wave life cycles”</p>	<p><b>Instabilities in Czochralski flow benchmark</b> (chairs A. Cliffe, A. Gelfgat)</p> <p><i>A. Gelfgat</i>, “Motivation, formulation and preliminary results of the benchmark”</p> <p><i>M. Ermakov</i>, "Flow analysis for high-Prandtl liquid in CZ benchmark"</p> <p><i>O. Bessonov, S. Nikitin, V.I. Polezhaev</i> “Benchmark on the numerical modeling of instability and oscillatory states in a Czochralski model system of oxide melts”(will be delivered by A. Gelfgat)</p> <p><i>H. Wilke, A. Cliffe</i> "Continuation techniques in crystal growth"</p> <p><i>H. Wilke</i> "Importance of supercomputers and numerical efficiency for numerical crystal growth"</p> <p>Discussion and future benchmarking plan</p>
<p>10:40 – 11:10</p>	<p>Coffee break</p>	

	<b>Films &amp; Drops</b> (chair A. Oron)	<b>Bifurcations and Instabilities in MHD flows</b> (chair A. Potherat)
11:10 – 11:30	<i>K. Uguz and N. Aubry</i> , “Electro-hydrodynamic instabilities in microchannels”	<i>M. Ruderman, N.A. Belov</i> , “Stability of MHD tangential discontinuities: Application to space physics”
11:30 – 11:50	<i>R. V. Craster, O. K. Matar, and D. T. Papageorgiou</i> , “Dynamics of thin annular films with electrokinetic effects”	<i>Beltrán, S. Cuevas, E. Ramos, M. Brons</i> , “Vortex generation by an oscillatory magnetic obstacle”
11:50 – 12:10	<i>R. V. Craster, O. K. Matar, and D. T. Papageorgiou</i> , “Jet breakup with surfactant above the critical micelle concentration”	<i>M. Amaouche and F. Nait Bouda</i> , “The onset of instability of an axisymmetric stagnation flow on a rotating cylinder in magnetohydrodynamics”
12:10 – 12:30	Closure	