



Brandenburg
University of Technology
Cottbus - Senftenberg

ICTW 19

19th International Couette-Taylor Workshop

June 22–24, 2015, Cottbus

Useful Information & Programme



19th International Couette-Taylor Workshop

June 22–24, 2015

Local Organizing Committee:

(BTU Cottbus – Senftenberg, Germany)

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- Christoph Egbers
- Rodica Borcia
- Uwe Harlander
- Silke Kaschwich
- Andreas Krebs
- Sebastian Merbold
- Andreas Stöckert

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- Dwight Barkley,
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- Michael Burin,
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- Rainer Hollerbach,
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- Hantao Ji,
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- Daniel Lathrop,
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- Patrice Le Gal, IRPHE,
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- Detlef Lohse, University of
Twente, The Netherlands
- Juan Lopez,
Arizona State University, USA
- Richard M. Lueptow,
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- Francisco Marques,
UPC, Barcelona, Spain
- Innocent Mutabazi, LOMC, CNRS-
University of Le Havre, France
- Yasushi Takeda,
Tokyo Inst. Technology, Japan
- Laurette Tuckermann, PMMH,
CNRS-EPSCI, Paris, France

Sponsor:



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General Schedule

Monday, June 22	Tuesday, June 23	Wednesday, June 24
S1. Taylor-Couette 09:00–10:30 Keynote 1 <i>D. Lohse</i> : The phase space of turbulent Taylor-Couette flow	S6. Taylor-Couette 08:30–10:00 Keynote 3 <i>F. Busse</i> : New results for the Taylor-Couette system in the small-gap limit	S10. Taylor-Couette 08:30–10:00 Keynote 5 <i>R. Hollerbach</i> : Magnetically modulated Taylor-Couette flows
Coffee break 10:30–11:00	Coffee break 10:00–10:30	Coffee break & Poster Session 10:00–11:15
S2. Taylor-Couette 11:00–12:15	S7. Taylor-Couette 10:30–12:00	S11. Taylor-Couette 11:15–12:15
Lunch break 10:30–11:00	Lunch break 11:00–11:30	Lunch break 11:00–11:30
S3. Geophysical flows / Waves 13:30–15:00 Keynote 2 <i>U. Achatz</i> : Baroclinic waves and gravity waves in the differentially heated rotating annulus	S8. Spherical gap flows 13:15–14:45 Keynote 4 <i>D. Lathrop</i> : Waves, turbulence and magnetic fields in spherical Couette flow	S12. Strato-rotating flows 13:15–14:45 Keynote 6 <i>F. Moisy</i> : What is the energy dissipation rate in rotating turbulence?
Coffee break 15:00–15:30	Coffee break 14:45–15:15	Coffee break 14:45–15:15
S4. Taylor-Couette 15:30–16:30	S9. Spherical gap flows 15:15–16:30	S13. Strato-rotating flows 15:15–16:45
Coffee break 16:30–16:45	Guided Tour & Conference Dinner 17:00–23:00 Buses start next to conference location (ZHG) at 17:00	Closing 16:45–17:00
S5. Couette flows 16:45–17:45		
Lab Tour & Barbecue 17:45–22:30		

Instructions for Speakers

In the spirit of trouble-free sessions, we kindly request the speakers to transmit a pdf file of their beamer presentation **at least two hours** before the talk to the technical team of the ICTW 19.

The technical team is located close to the registration desk.

The transfer of the file can be done using a USB stick or by writing an email to `ictw19@tu-cottbus.de`.

Registration Fee and Payment

All participants have to pay the registration fee of 300 Euro. If a participant does not register and does not pay the registration fee, we have to remove the presentation from the scientific program, and cannot publish the abstract.

Online registration is possible until June 14, 2015. Payment information for the online registration: All payments must be made in Euro. Payments by bank transfer are accepted. Please transfer the conference fee to the following bank account:

Account name:

Landeshauptkasse Land Brandenburg / BTU Cottbus-Senftenberg

Bank: Landesbank Hessen Thuringen (Helaba)

IBAN: DE573005 0000 7110 402950

BIC /SWIFT-Code: WELADEDXXX

Reason for payment: Please indicate your first and last name followed by the number 1506600000239 (e.g. Erika Mustermann 1506600000239)

Unfortunately, we are not allowed to accept credit cards due to the regulations of our government. Instead of credit card payment, we kindly request you to pay cash at the onsite registration. An ATM is located in the mensa building (see p. 5).

Participants who did not register until June 14, 2015 must register on-site and pay cash at the registration desk.

Conference Location

East 14.3263

North 51.7674

The 19th International Couette-Taylor Workshop takes place at the Brandenburg University of Technology, Cottbus, Germany in the **Hörsaal C** of the **ZHG** (Zentrales Hörsaalgebäude) [Lecture Hall C of the Central Auditorium Building].

The **Conference Desk** will be organized in the foyer of this building. It will be open **from 7:45 am to 8:45 am** on all three conference days.



Important Localities on and close to Campus

Mensa & ATM E 14.3264 N 51.7662

During the three conference days you can have lunch on the upper floor of the mensa. Drinks and smaller dishes like salads, snacks, cakes are available on the ground floor of the mensa and can be consumed there in a coffee shop atmosphere.

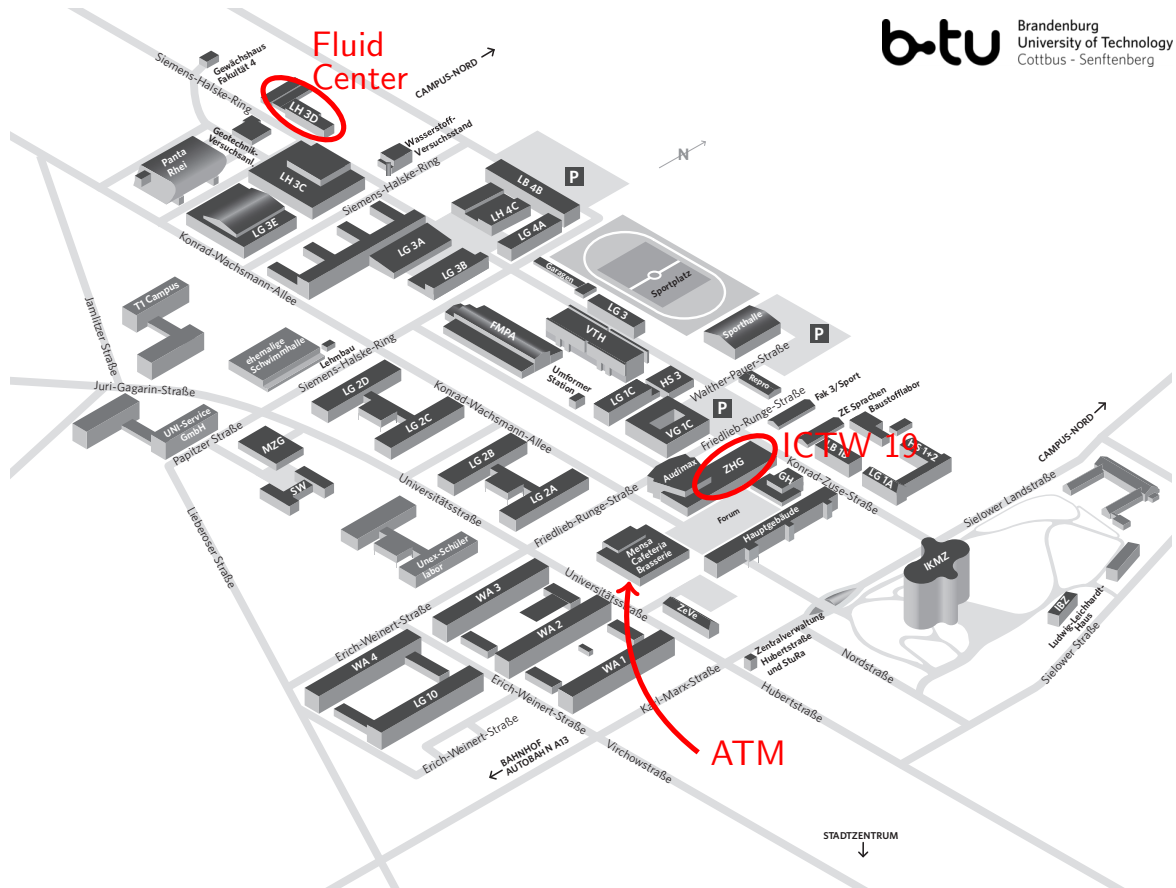
The mensa accepts only cash money.

An ATM of the bank *Sparkasse* is located in mensa building. The entrance door to this ATM is close to the displayed corner of the building.



Fluidzentrum [Fluid Center] E 14.3188 N 51.7693

In the first evening, we invite you to join us for a tour through the rooms where our experimental facilities are located. Of course, we will present these experiments and we are happy to answer and discuss practical aspects of turbulence measurements. After the lab tour, we have the pleasure to offer you a barbecue next to this site.



b-tu Brandenburg University of Technology
Cottbus - Senftenberg

Map of Campus

Guided Spreewald Tour & Conference Dinner

On Tuesday, June 23, we invite you for a punt trip in the wonderful universe of water landscape *Spree Forest*. The shuttle buses to the punt haven will start

at 5 pm next to the ZHG [Central Auditorium Building].



Programme

Monday — June 22, 2015

SESSION 1 — Taylor-Couette flows 9:00 – 10:30 **Chair:** Bruno Eckhardt

- K 1** 09:00 DETLEF LOHSE
 The phase space of turbulent Taylor-Couette flow
- 1.1 09:30 SANDER G. HUISMAN
 The boiling Twente Taylor-Couette (BTTC) facility: temperature controlled
 turbulent flow between independently rotating cylinders
- 1.2 09:45 ROELAND C. A. VAN DER VEEN
 Multiple states in highly turbulent Taylor-Couette flow
- 1.3 10:00 RUBEN A. VERSCHOOF
 High Reynolds number decay of turbulent Taylor-Couette flow
- 1.4 10:15 JUAN M. LOPEZ
 Precession of a rapidly rotating cylinder flow: traverse through resonance

SESSION 2 — Taylor-Couette flows 11:00 – 12:15 **Chair:** Chao Sun

- 2.1 11:00 BRUNO ECKHARDT
 Marginally stable and turbulent boundary layers in low-curvature Taylor-
 Couette flow
- 2.2 11:15 SEBASTIAN MERBOLD
 Turbulent Taylor-Couette flow of very wide gaps
- 2.3 11:30 ANDREAS FROITZHEIM
 Wide gap Taylor-Couette flow
- 2.4 11:45 BORJA MARTÍNEZ-ARIAS
 Influence of the radius ratio on the torque in turbulent Taylor-Couette flow
- 2.5 12:00 JOSE M. LOPEZ
 Boundary-layer turbulence and optimal boundary conditions in experiments
 of quasi-keplerian flows

SESSION 3 — Geophysical flows / waves 13:30 – 15:00 **Chair:** Uwe Harlander

- K 2** 13:30 ULRICH ACHATZ
 Baroclinic waves and gravity waves in the differentially heated rotating
 annulus.
- 3.1 14:00 WOLF-GERRIT FRÜH
 Spectral features of the transition to Structural Vacillation in the baroclinic
 annulus

- 3.2 14:15 ANTHONY RANDRIAMAMPINANINA
Inertia gravity waves linked to baroclinic waves in a rotating, differentially heated annulus with an upper free surface
- 3.3 14:30 THOMAS VON LARCHER
Multiple scales in the thermally driven rotating annulus: time-series data analysis of experiments and numerics
- 3.4 14:45 ION DAN BORCIA
Inertial wave mode excitation in a liquid bounded by two concentric cylinders

SESSION 4 — Taylor-Couette flows 15:30 – 16:30 **Chair:** Francisco Marques

- 4.1 15:30 RICHARD M. LUEPTOW
The transition to wavy vortices
- 4.2 15:45 JAN ABSHAGEN
Symmetry breaking in Taylor-Couette flow with rotating end plates
- 4.3 16:00 ARNAUD PRIGENT
Stereo-PIV measurements in the subcritical Taylor-Couette flow
- 4.4 16:15 LEA POKORNY
Stroboscopic two-dimensional ultrasonic velocity profiling for measuring flow transition in Taylor couette systems

SESSION 5 — Couette flows 16:45 – 17:45 **Chair:** Masato Nagata

- 5.1 16:45 TAKAHIRO ISHIDA
Numerical investigation of high rotation effects on laminar flow in rotating plane Couette flow
- 5.2 17:00 TAKUYA KAWATA
Experimental Study of Roll-Cell Structure in Laminar Plane Couette Flow under System Rotation
- 5.3 17:15 LUKASZ KLOTZ
New experiments in shears flows with zero mean velocity
- 5.4 17:30 ASHLEY P. WILLIS
Structure in the dynamics of turbulent pipe flow revealed by symmetry reduction.

Tuesday — June 23, 2015

SESSION 6 — Taylor-Couette flows 08:30 – 10:00 **Chair:** Richard M. Lueptow

- K 3** 08:30 FRIEDRICH H. BUSSE
 New Results for the Couette-Taylor System in the Small Gap Limit
- 6.1 09:00 CHRISTOPHER J. CROWLEY
 Experimental observations of direct laminar-turbulent transition in counter-rotating Taylor-Couette flow
- 6.2 09:15 ROMAN O. GRIGORIEV
 Numerical investigation of direct laminar-turbulent transition in counter-rotating Taylor-Couette flow
- 6.3 09:30 PALOMA GUTIERREZ-CASTILLO
 Three-dimensional instabilities of the sidewall boundary layer in a rapidly rotating split cylinder
- 6.4 09:45 YUICHI MURAI
 Reciprocal dominance between toroidal liquid vortices and spiral bubble trajectories in a vertical bubbly Taylor-Couette flow

SESSION 7 — Taylor-Couette flows 10:30 – 12:00 **Chair:** Gerd Pfister

- 7.1 10:30 FRANCISCO MARQUES
 Complex dynamics of axially localized states in Taylor Couette flows.
- 7.2 10:45 BRUNO VAN RUYMBEKE
 Mechanisms of toroidal - spiral transitions in Taylor-Couette system with spherical bubbles injection
- 7.3 11:00 CÉLINE GABILLET
 Bubbles induced modifications of the Taylor Vortices
- 7.4 11:15 OLIVIER CRUMEYROLLE
 Drag enhancement in subcritical transition to inertio-elastic flows in the Couette-Taylor system
- 7.5 11:30 SEYED AMIR BAHRANI
 Taylor Couette flow of a non-Newtonian fluid: Influence of shear-thinning effects
- 7.6 11:45 YANG BAI
 Viscoelastic instability in differentially rotating Couette-Taylor system: theory and experiment

SESSION 8 — Spherical gap flows 13:15 – 14:45 **Chair:** Wolf-Gerrit Früh

- K 4** 13:15 DANIEL P. LATHROP
 Waves, turbulence and magnetic fields in spherical Couette flow

- 8.1 13:45 SANTIAGO ANDRÉS TRIANA
Inertial modes driven by differential rotation in a spherical-Couette configuration
- 8.2 14:00 MICHAEL HOFF
Experimental study of the fluid flow in a spherical shell induced by librations of the inner sphere: Linear and non-linear features
- 8.3 14:15 FLORIAN ZAUSSINGER
Convection in the spherical gap with high viscosity contrasts.
- 8.4 14:30 PHILIPPE BELTRAME
Onset of intermittent octahedral patterns in spherical Bénard convection

SESSION 9 — Spherical gap flows 15:15 – 16:30 **Chair:** Karl Bühler

- 9.1 15:15 FRED FEUDEL
Multistability in rotating spherical shell convection
- 9.2 15:30 ANKIT BARIK
Flow instabilities in the Spherical Couette System
- 9.3 15:45 STANISLAV SUBBOTIN
Inertial waves and flows excited by free inner core in rotating cavity
- 9.4 16:00 MASATO NAGATA
Convection in a rotating annulus with radial temperature gradient
- 9.5 16:15 ROGER KHAYAT
Microscale thermal convection

Wednesday — June 24, 2015

SESSION 10 — Taylor-Couette flows 8:30 – 10:00 **Chair:** Juan M. Lopez

- K 5** 08:30 RAINER HOLLERBACH
Magnetically modulated Taylor-Couette flows
- 10.1 09:00 MARTIN SEILMAYER
Challenges and recent results of magnetized liquid metal Taylor Couette experiments
- 10.2 09:15 MARCUS GELLERT
Enhanced viscosity and mixing in TC flows influenced by toroidal magnetic fields
- 10.3 09:30 ALEJANDRO PAREDES
Mixing of a passive scalar by the instability of a rotating pinch
- 10.4 9:45 SEBASTIAN ALTMAYER
Transition to turbulence in Taylor-Couette ferrofluidic flow

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- SESSION 11 — Taylor-Couette 11:15 – 12:15 **Chair:** Michael F. Schatz
- 11.1 11:15 MARCUS SCHMIDT
Investigation of the Taylor-Couette Flow with Cavitation
- 11.2 11:30 DENIS POLEZHAEV
Flows and structures in liquid layer inside a rotating horizontal cylinder
- 11.3 11:45 YUJI TASAKA
Elliptic deformations in rotating free surface flows induced by resonance of waves and quadrupole vortices
- 11.4 12:00 TORSTEN SEELIG
Study of transitional and turbulent flows in rotor/stator cavities
- SESSION 12 — Strato-rotating flows 13:15 – 14:45 **Chair:** Patrice Le Gal
- K 6** 13:15 FRÉDÉRIC MOISY
What is the energy dissipation rate in rotating turbulence?
- 12.1 13:45 MARTEN KLEIN
DNS of inertial wave attractors in a librating annular cavity with a height-dependent gap
- 12.2 14:00 ABOUZAR GHASEMI V.
Mean Flow Generation Mechanisms in a Rotating Annular Cavity with Librating Walls
- 12.3 14:15 COLIN LECLERCQ
End-effects versus stratification in quasi-Keplerian Taylor–Couette flow
- 12.4 14:30 ARANTXA ALONSO
Numerical simulation of the genesis of superhighway convection in a slightly inclined layer of a binary liquid mixture
- SESSION 13 — Strato-rotating flows 15:15 – 16:45 **Chair:** Innocent Mutabazi
- 13.4 15:15 NATHANAËL MACHICOANE
Influence of the multipolar order of the source on the viscous decay of inertial waves
- 13.1 15:30 PATRICE LE GAL
The Barostrat Instability: combining double-diffusive convection and baroclinic instability in a rotating stratified fluid
- 13.2 15:45 UWE HARLANDER
Stratorotational Instability: nonlinear aspects at higher Reynolds numbers

- 13.3 16:00 JUNHO PARK
Stratorotational and centrifugal instabilities of the Couette-Taylor flow
- 13.5 16:15 ANTOINE MEYER
Effect of the centrifugal buoyancy on the stability of Taylor-Couette flow
- 13.6 16:30 HARUNORI N. YOSHIKAWA
Wave generation in a circular Couette flow in thermoelectric radial buoyancy

POSTER SESSION

10:00 – 11:15

- P.1 Flow inversion in small-aspect-ratio counterrotating Taylor-Couette flow
- P.2 Streamwise-Localized Solutions with natural 1-fold symmetry
- P.3 Spatial distribution and motion of finite-sized particles in turbulent Taylor-Couette flow
- P.4 Swirl boundary layer and flow separation at the inlet of a rotating pipe
- P.5 The gravity effect on the Taylor-Dean Flow between two horizontal rotating coaxial cones
- P.6 Effect of the Working Fluid on the Onset of Taylor Vortices in a Cylindrical Annulus: Analyze and Comparison Between Different Liquids
- P.7 Modeling rotating flows in narrow gaps
— Approach towards a general clearance-averaged pressure model
- P.8 Absolute and convective instabilities in eccentric Taylor–Couette–Poiseuille flow
- P.9 Experimental Investigations of Two Immiscible Fluids and Free Surface Effects in Cylindrical Taylor-Couette Flow
- P.10 Hydrodynamic Instability of Liquid Metal Flow in Conical Taylor-Couette System
- P.11 The generalized Onsager model for a binary gas mixture with swirling feed
- P.12 Harmonic and subharmonic instabilities on modulated Taylor-Couette flow in the limit of low frequency
- P.13 Effect of perturbation on turbulence in a gradual expansion pipe flow
- P.14 Experimental investigation on the rheology of Non-Brownian dense suspensions
- P.15 Effect of the Free Surface in Tilted Conical Taylor-Couette Flow System
- P.16 An applied Couette-Taylor system as a simplified bearing model.