# 20th International Couette-Taylor Workshop
## Final Program

**July 11 -13 2018, Marseilles, FRANCE**

<table>
<thead>
<tr>
<th>Time</th>
<th>8:00</th>
<th>9:00</th>
<th>9:30</th>
<th>10:15</th>
<th>10:45</th>
<th>12:15</th>
<th>13:45</th>
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<th>16:00</th>
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<th>17:30</th>
<th>20:00</th>
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<tbody>
<tr>
<td>Day</td>
<td>Keynotes</td>
<td>Sessions</td>
<td>Break</td>
<td>Sessions</td>
<td>Lunch</td>
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<td>Break</td>
<td>Keynotes</td>
<td>Sessions</td>
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<td>Wednesday</td>
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<tr>
<td>July 11</td>
<td>Opening</td>
<td>B. Pier</td>
<td>TC1</td>
<td>TC2</td>
<td>CPX</td>
<td>P. Ghendrih</td>
<td>MHD</td>
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<tr>
<td>Thursday</td>
<td>B. Hof</td>
<td>INS1</td>
<td>INS2</td>
<td>TC3</td>
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<td>K. Julien</td>
<td>CV</td>
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<tr>
<td>Friday</td>
<td>F. Marquez</td>
<td>MIX1</td>
<td>MIX2</td>
<td>GEO</td>
<td>End ICTW</td>
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<td>July 12</td>
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<td>Banquet</td>
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### Wednesday, July 11

**8:00** | Registration
---|---
**8:45 – 9:00** | Eric Serre
| Opening Lecture for the 20th International Couette Taylor Workshop

**Poster Session: Workshop duration**

| **Isabelle Raspo**, Stéphane Viazzo, Anthony Randriamampianina, Gabriel Melett, Uwe Harlander, Torsten Seelig, Andreas Krebs | Low Mach Number Modeling of Stratorotational Instability in a water-filled Taylor-Couette cavity
| **Sebastian Altmeyer** | Alternating ‘flip’ solutions in ferrofluid Taylor-Couette flow
| Sebastian Merbold, Uwe Harlander, **Christoph Egbers** | DFG Core Facility Center: Physics of rotating Fluids
| **Zahia Tigrine**, Ahcene Bouabdallah | Experimental and Numerical Modelling of fluid flow between rotating spheres

**9:00 – 9:30** | **Keynote Lecture 1**
| Chairman: D. Martinand | **Benoît Pier**: Complex dynamics in eccentric Taylor-Couette-Poiseuille flow

**Session: Taylor Couette Flow 1 - Chairman: D. Martinand**

| 9:45 – 10:00 | **Arnaud Prigent**, Clement Savaro, Innocent Mutabazi | Experimental study of the flow produced in a vertical Taylor-Couette system submitted to a large radial temperature gradient
| 10:00 – 10:15 | **Innocent Mutabazi**, Changwoo Kang, Arnaud Prigent | Numerical investigation of the flow structures in a vertical Taylor-Couette system with a large radial temperature gradient

**Coffee Break: 10:15 – 10:45**
### Session: Taylor Couette Flow 2 - Chairman: D. Martinand

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Title</th>
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<tbody>
<tr>
<td>10:45 – 11:00</td>
<td>Pieter Berghout, Rick Dingemans, Xiaojue Zhu, Roberto Verzicco, Richard J.A.M. Stevens, Wim van Saarloos, Detlef Lohse</td>
<td>Direct Numerical Simulations of a Finite-Wavelength Modulation within Taylor-Couette Flow</td>
</tr>
<tr>
<td>11:00 – 11:15</td>
<td>Yasushi Takeda, Lea Pokorny, Erich J. Windhab</td>
<td>Symmetry in Taylor Couette Flow</td>
</tr>
<tr>
<td>11:15 – 11:30</td>
<td>Xiaojue Zhu, Ruben A. Verschoof, Dennis Bakhuis, Sander G. Huisman, Roberto Verzicco, Chao Sun, Detlef Lohse</td>
<td>Wall roughness induces asymptotic ultimate Taylor-Couette turbulence</td>
</tr>
<tr>
<td>11:30 – 11:45</td>
<td>Konstantin Ilin, Andrey Morgulis</td>
<td>On the stability of a Couette-Taylor flow between rotating porous cylinders to three-dimensional perturbations</td>
</tr>
<tr>
<td>11:45 – 12:00</td>
<td>Juan M. Lopez</td>
<td>Subcritical instability of Taylor-Couette flow with stationary inner cylinder</td>
</tr>
<tr>
<td>12:00 – 12:15</td>
<td>Mehdi Riahi, Said Aniss, Mohamed Ouazzani Touhami</td>
<td>Subharmonic instabilities on modulated Taylor-couette</td>
</tr>
</tbody>
</table>

### Lunch: 12:15 – 13:45

### Session: Free surface, bubbly and complex flows - Chairman: R. M. Lueptow

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<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Title</th>
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<tbody>
<tr>
<td>13:45 – 14:00</td>
<td>Wen Yang, Ivan Delbende, Yann Fraigneau, Laurent Martin Witkowski</td>
<td>Structures in a rotating flow with free surface: simulations and experiments</td>
</tr>
<tr>
<td>14:00 – 14:15</td>
<td>Harunori Yoshikawa, Shu Satoh, Christian Mathis</td>
<td>Formation of spiral liquid curtains in a Rayleigh-Taylor system</td>
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<tr>
<td>14:15 – 14:30</td>
<td>Cecile Lemaitre, Cherif Nouar, Yao Agbessil, Philippe Marchal, Lionel Choplin</td>
<td>Instability of the Taylor-Couette-Poiseuille flow with radial flux of a shear-thinning fluid</td>
</tr>
<tr>
<td>14:30 – 14:45</td>
<td>Peter Reinke, Tom Beckmann, Marcus Schmidt</td>
<td>Taylor-Couette Flow with Cavitation</td>
</tr>
<tr>
<td>14:45 – 15:00</td>
<td>Jia Heng Teoh, Rensheng Deng, Chi-Hwa Wang</td>
<td>From Bubbles to Cells: A decade of investigation into the phenomenon of object motion in the Taylor-Couette flow</td>
</tr>
<tr>
<td>15:00 – 15:15</td>
<td>Antoine Faugaret, Laurent Martin Witkowski, Yohann Duguet, Yann Fraigneau</td>
<td>Influence of boundary conditions on instabilities in free surface rotating</td>
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<td>Coffee Break : 15:30 – 16:00</td>
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<tr>
<td>16:00 – 16:30</td>
<td>Keynote Lecture 2 Chairmen : E. Serre</td>
<td>Philippe Ghendrih : Burning plasma turbulence driven by a Rayleigh-Bénard like instability</td>
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**Session : Magneto - Electro- Dynamics - Chairman : E. Serre**

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>16:30 – 16:45</td>
<td>Martin Seilmayer, Frank Stefani, Thomas Gundrum</td>
<td>Recent Developments of the Liquid Metal Taylor Couette Experiment PROMISE</td>
</tr>
<tr>
<td>16:45 – 17:00</td>
<td>Sebastian Altmeyer, Younghae Do, Soorok Ryu</td>
<td>Transient behavior between multi-cell flow states in ferrofluidic Taylor-Couette flow</td>
</tr>
<tr>
<td>17:00 – 17:15</td>
<td>Kengo Deguchi</td>
<td>High-speed standard magneto-rotational instability</td>
</tr>
<tr>
<td>17:15 - 17:30</td>
<td>Yuji Tasaka, Takatoshi Yanagisawa, Tobias Vogt, Sven Eckert</td>
<td>2D oscillatory convections in a bounded liquid metal layer under an imposed horizontal magnetic field</td>
</tr>
<tr>
<td>17:30 – 17:45</td>
<td>S. Lecheheb, A. Bouabdallah, Z. Tigrine</td>
<td>Effect of aspect ratio on steady liquid metal through the Gratz system in MHD</td>
</tr>
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### Thursday, July 12

<table>
<thead>
<tr>
<th>Time</th>
<th>Session: Instability and Transition 1</th>
<th>Speaker(s)</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>9:00 – 9:30</td>
<td>Keynote Lecture 3</td>
<td>Chairman: P. Le Gal</td>
<td><strong>Björn Hof</strong>: Directed percolation transition to turbulence</td>
</tr>
<tr>
<td>9:30 – 9:45</td>
<td>Joran Rolland</td>
<td></td>
<td>Numerical and theoretical study of extremely rare collapse and build-up of turbulence in stochastic models of wall flows</td>
</tr>
<tr>
<td>9:45 – 10:00</td>
<td><strong>Rodrigo Ezeta</strong>, Sander G. Huisman, Dennis Bakhuis, Sander Bonestroo, Chao Sun, Detlef Lohse</td>
<td></td>
<td>Drag reduction due to vapor bubbles in high-Reynolds number Taylor-Couette</td>
</tr>
<tr>
<td>10:00 – 10:15</td>
<td><strong>Tim Gebler</strong>, Judith Kahle, Martin Oberlack</td>
<td></td>
<td>New non-modal stability analysis and algebraic growth rate of a Taylor Couette model problem in an infinite domain</td>
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**Coffee Break: 10:15 – 10:45**

### Session: Instability and Transition 2 - Chairman: P. Le Gal

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
<th>Topic</th>
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<tbody>
<tr>
<td>10:45 – 11:00</td>
<td><strong>Alvaro Meseguer</strong>, Francisco Marques, Fernando Mellibovsky, Patrick Weidman</td>
<td>Shear flow instabilities in stretching channels and twisted pipes</td>
</tr>
<tr>
<td>11:00 – 11:15</td>
<td><strong>Eunok Yim</strong>, J.-M. Chomaz, D. Martinand, E. Serre</td>
<td>Transition to turbulence in the rotating disk boundary layer of a rotor-stator cavity</td>
</tr>
<tr>
<td>11:15 – 11:30</td>
<td>Ruben A. Verschoof, Dennis Bakhuis, Pim A. Bullee, <strong>Sander G. Huisman</strong>, Chao Sun, Detlef Lohse</td>
<td>The influence of wall roughness on bubble drag reduction in Taylor-Couette turbulence</td>
</tr>
<tr>
<td>11:30 – 11:45</td>
<td><strong>Roger Ayats</strong>, Alvaro Meseguer, Fernando Mellibovsky</td>
<td>On a new family of Tollmien-Schlichting Waves</td>
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<tr>
<td>11:45 – 12:00</td>
<td>Masato Nagata, Darren P. Wall, Takashi Noguchi</td>
<td>Bifurcation in rotating plane Couette revisited</td>
</tr>
<tr>
<td>12:00 – 12:15</td>
<td>Giulio Facchini, Benjamin Favier, Meng Wang, Michael Le Bars, Patrice Le Gal</td>
<td>The linear instability of the stratified plane Couette flow</td>
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<td>Lunch: 12:15 – 13:45</td>
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<td><strong>Session: Taylor-Couette Flows 3</strong></td>
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<td><strong>Chairman: I. Mutabazi</strong></td>
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<td>13:45 – 14:00</td>
<td>Michael F. Schatz, Christopher J. Crowley, Michael Krygier, Roman O. Grigoriev</td>
<td>Exact Coherent Structures in Weakly Turbulent Couette-Taylor Flow: Experiments and Numerics</td>
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<tr>
<td>14:00 – 14:15</td>
<td>Andreas Froitzheim, Sebastian Merbold, Christoph Egbers, Rodrigo Ezeta, Detlef Lohse, Chao Sun</td>
<td>Large scale vortices in the Taylor-Couette</td>
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<tr>
<td>14:15 – 14:30</td>
<td>Pim A. Bullee, Ruben A. Verschoof, Dennis Bakhuis, Sander G. Huisman, Chao Sun, Rob G. H. Lammertinkand Detlef Lohse</td>
<td>Drag reduction in Taylor-Couette turbulence with a superhydrophobic inner cylinder</td>
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<tr>
<td>14:30 – 14:45</td>
<td>Yacine Bengana, Laurette Tuckerman</td>
<td>Spirals, ribbons and RZIF</td>
</tr>
<tr>
<td>14:45 – 15:00</td>
<td>Denis Martinand, Nils Tilton</td>
<td>Global modes in Taylor-Couette-Poiseuille flow with a permeable inner cylinder</td>
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<tr>
<td>15:00 – 15:15</td>
<td>Denni Chaimaa, Aniss Said, Eljaouahiry Abdelouahab</td>
<td>Instability of a quasi-periodic pulsed Taylor-Couette flow</td>
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<td><strong>Coffee Break: 15:15 – 15:45</strong></td>
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<td>15:45 – 16:15</td>
<td>Keynote Lecture 4</td>
<td>Chairman : M. Médale</td>
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<td>16:15 – 16:30</td>
<td><strong>Convection</strong> - Chairman : M. Médale</td>
<td>Philipp Gerstner, Martin Baumann, Vincent Heuveline</td>
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<td>16:30 – 16:45</td>
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<td>Torsten Seelig, Marcel Jongmanns, Antoine Meyer, Martin Meier, Christoph Egbers</td>
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<tr>
<td>16:45 – 17:00</td>
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<td>Changwoo Kang, Innocent Mutabazi</td>
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<tr>
<td>17:00 – 17:15</td>
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<td>Antoine Meyer, Marcel Jongmanns, Martin Meier, Torsten Seelig, Changwoo Kang, Innocent Mutabazi, Christoph Egbers</td>
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<td>17:15 – 17:30</td>
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<td>Marc Médale, Bruno Cochelin</td>
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<tr>
<td>17:30 – 17:45</td>
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<td>Antoine Meyer, Harunori Yoshikawa, Innocent Mutabazi, Christoph Egbers</td>
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**Banquet** : 20:00
**Friday, July 13**

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<th>Time</th>
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| 9:00 – 9:30   | **Keynote Lecture 5**  
Chairman : S. Viazzo  
Francisco Marques : Dynamics of thermal plumes in a uniform and a stratified ambient |
| 9:30 – 9:45   | **Yusuke Ochi**, Takafumi Horie, Naoto Ohmura  
Aggregation of silica micro particles in chaotic mixing field |
| 9:45 – 10:00  | **Rouae Ben Dhia**, Denis Martinand, Nils Tilton  
Dynamics and transport of a solute in Taylor-Couette |
| 10:00 – 10:15 | **Kanwar Nain Singh**, Jamie Partridge, Stuart Dalziel, C. P. Caulfield  
Quasi-periodic mixing events in two-layer stably-stratified turbulent Taylor-Couette flow |
|               | **Coffee Break** : 10:15 – 10:45                                                        |
| 10:45 – 11:00 | **Madhu V. Majji**, Sanjoy Banerjee, Jeffrey F. Morris  
Taylor-Couette Flow of Fluid-Particle Suspension |
| 11:00 – 11:15 | **Philipp Brockmann**, Hamid Tabaei Kazerooni, Luca Brandt, Jeanette Hussong  
Particle separation in a narrow-gap Taylor-Couette setup |
| 11:15 – 11:30 | **Geert Brethouwer**  
The effect of spanwise rotation on turbulence and passive scalar transport in channel flow |
| 11:30 – 11:45 | **Dennis Bakhuis**, Rodrigo Ezeta, Pim A. Bullee, Raymond H. J. Kip, Sander G. Huisman, Alvaro Marin, Detlef Lohse, Chao Sun  
Mayonnaise Taylor-Couette Turbulence |
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<tr>
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<tbody>
<tr>
<td>11:45 – 12:00</td>
<td>Hayato Masuda1, Saho Yoshida, Takafumi Horie, Naoto Ohmura, Makoto Shimoyamada</td>
<td>Vortex Dynamics in Couette-Taylor Flow with Axial Distribution of Temperature</td>
</tr>
<tr>
<td>12:00 – 12:15</td>
<td>Nabila Ouazib, Yacine Salhi, El-Khider Si-Ahmed, Jack Legrand, Abdellah Arhaliass, Gérard Degrez</td>
<td>Numerical Simulation of passive scalar transport in turbulent Taylor-Couette Flows in short annulus with rotating outer wall</td>
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**Lunch : 12:15 – 13:45**

### Session : Geophysical flows - Chairman : C. Egbers

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<tbody>
<tr>
<td>13:45 – 14:00</td>
<td>Stéphane Abide, Stéphane Viazzo, Isabelle Raspo, Anthony Randriamampianina, Gabriel Meletti, Uwe Harlander, Andreas Krebs</td>
<td>High-Order Compact scheme for High-Performance Computing of stratified rotating flows</td>
</tr>
<tr>
<td>14:00 – 14:15</td>
<td>Gabriel Meletti, Uwe Harlander, Torsten Seelig, Stéphane Viazzo, Stéphane Abide, Andreas Krebs, Anthony Randriamampianina, Isabelle Raspo</td>
<td>Experimental Confirmation of Linear Stability Results on Stratified Taylor-Couette Flows</td>
</tr>
<tr>
<td>14:15 – 14:30</td>
<td>Christoph Egbers, Florian Zaussinger, Peter Haun, Peter Canfield, Vadim Travnikov, Andreas Froitzheim</td>
<td>Convection in the spherical gap under micro-gravity conditions: From Earth's mantle to atmospheric</td>
</tr>
<tr>
<td>14:30 – 14:45</td>
<td>Uwe Harlander, Costanza Rodda, Ion Borcia, P.Le Gal</td>
<td>Gravity waves in baroclinic jet flows : a survey of laboratory experiments</td>
</tr>
<tr>
<td>14:45 – 15:00</td>
<td>Patrice Le Gal, Raùl Cruz Gomez, Anne Cros</td>
<td>On the coalescence of anticyclones in stratified rotating flows</td>
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**Coffee  and End of Workshop**