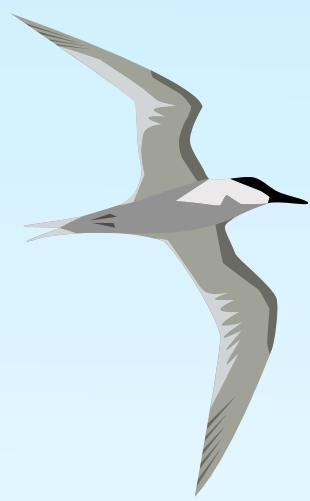


FLUID & ELASTICITY

17 - 19 JUNE 2024
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Welcome to Fluid & Elasticity 2024

On behalf of the organizing committee, it is our pleasure to welcome you in Arcachon for the fifth edition of the Fluid & Elasticity conference. We do hope that you will enjoy intense and stimulating discussions as well as an unforgettable stay in Arcachon.

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Fluid & Elasticity 2024

17-19 June 2024, Arcachon, France

■ Practical Information	p. 7
■ Maps	p. 11
■ Scientific Programme	p. 13
■ Index of Authors	p. 17



UNIVERSITY OF
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Practical Information

Venue - The conference will take place at the second floor of the *Palais des Congrès d'Arcachon* (6 Boulevard Veyrier Montagnères - 33120 Arcachon, Tel.: +33 (0)5 56 22 47 00) on the beachfront, in the seaside resort of Arcachon. Participants will be accommodated in hotels located only a short walk away from the conference center.

How to get there - The city of Arcachon is serviced by a direct train line from Bordeaux (Bordeaux Saint-Jean train station) that runs every hour (one way ticket 12.20 €). Train tickets from Bordeaux to Arcachon can be purchased online. However, whether you land in Paris (Roissy-Charles de Gaulle international airport) or directly in Bordeaux (Bordeaux-Mérignac airport), you will have to get to Bordeaux Saint-Jean train station first.

From Paris to Bordeaux Saint-Jean train station (if you land at Roissy-Charles de Gaulle international airport) - There is a direct train line from Roissy-Charles de Gaulle international airport (TGV train station) to Bordeaux Saint-Jean train station. (duration 3h45, from 120 €). Train tickets can be purchased on the SNCF website (<https://www.sncf-connect.com/app/home/search>).

Bordeaux/Mérignac airport to Bordeaux Saint-Jean train station (if you land directly at Bordeaux-Mérignac airport) - There are three ways to reach the Bordeaux Saint-Jean train station from Bordeaux/Mérignac airport.

- **By tramway (55 mn):** the tram station Aéroport Mérignac (tram line A) is located in front of the arrivals area (Hall B). Tram tickets (1.70 €) can be purchased online (<https://boutique.infotbm.com>) or at the ticket vending machines available at the airport tram station. From the airport, the tram line A does not go directly to the train station; take tram line C to the Saint-Jean train station at the connecting tram station *Porte de Bourgogne* (details of the tram journey from Bordeaux Mérignac Airport to Bordeaux Saint-Jean train station available at <https://www.infotbm.com>).
- **By direct bus shuttle (30 mn):** a direct shuttle (bus stop located in front of the arrivals area, Hall B, Bordeaux/Mérignac airport) connects the airport to the train station (8 €) every 30 to 60 mn, depending on the date and time. Tickets can be purchased on-board or online (<https://www.bordeaux.aeroport.fr/acces-transports/navette-directe-aeroport-gare>) ; time schedule can be consulted by following the link <https://30direct.com/horaires/>.
- **By regular bus (1h10):** the bus station Aéroport Mérignac (bus line 39) is located 1 mn walk from the arrivals area (Hall B). Bus tickets (1.70 €) can be purchased online (<https://boutique.infotbm.com/products/1>), at the tram vending machines or in the bus. From the airport, the bus line 39 does not go directly to the train station; take bus line 11 to the Bordeaux Saint-Jean train station at the connecting bus station *Dassault* (details of the bus journey from Bordeaux/Mérignac Airport to Bordeaux Saint-Jean train station available at <https://www.infotbm.com>).

- **By taxi (30 mn):** from the airport, taxi services to the train station are available. Fares can fluctuate from 50 to 150 €, depending on the date and time.

■ **Hotels** - The participants will be accommodated in two hotels located very close to the Palais des Congrès (and very close to each other as well) :

- **Hôtel de la plage (Arcanse),** 10 Av. Nelly Deganne, 33120 Arcachon, Tel.: +33 (0)5 56 83 06 23, e-mail: infos@hotelarcachon.com.
- **Hôtel B d'Arcachon,** 4 rue du Professeur Jolyet, 33120 Arcachon, Tel.: +33 (0)5 56 83 99 91, e-mail: reservations@hotel-b-arcachon.com.

Participants will be notified of their hotel and room number by email one week before the conference. The room keys will be collected at the reception desk of the hotel upon arrival on Sunday afternoon/evening.

■ **Registration on site** - Registration will take place at the entrance hall of the Palais des Congrès (26 Blvd Veyrier Montagnères - 33120 ARCACHON) and will start on Monday 17 of June, 8:00 am (NB: there will be a standby service at the entrance of the Palais des Congrès between 4:30 pm to 7:00 pm on Sunday 16). A nominative badge, a paper version of the scientific programme and a USB key containing a full electronic version of the booklet (including abstracts), will be issued to the participants upon registration.

■ **Lunches** - Lunches will take place in two different restaurants on Monday and Tuesday. On Monday 17 (12:30), lunch will be served at:

Le Café de la Plage – Restaurant chez Pierre,
1 Boulevard Veyrier Montagnères,
33120 Arcachon
Tel.: +33 (0)6 85 53 54 64.

On Tuesday 18 (12:30), lunch will be served at:

Le Grang Café Victoria,
26 Boulevard Veyrier Montagnères,
33120 Arcachon
Tel.: +33 (0)6 85 53 54 64

Both restaurants are located close to the Palais des congrès (see Map 1, p.11). Participants will be free to enjoy the beach till 15:30 everyday.

■ **Evening reception** - The evening reception will take place on Tuesday 18 at 8:00 pm in the restaurant *Les Terrasses du Port*, 2 km from the Palais des Congrès (25 mn walk, see Map 2, p.12):

Les Terrasses du Port,
Quai Goslar, Pôle Nautisme (1st floor),
33120 Arcachon
Tel.: +33 (0)5 40 25 03 84

■ **Eat & drink** - There are many restaurants in Arcachon, most of them being located on the bay beach (*la Plage du Bassin*), just a stone throw from the hotels. You will find a wide choice of restaurant, ranging from pizzerias to sea food restaurants. Here are some good places you can try:

- Pizza Nofa Arcachon, 25 Boulevard du Général Leclerc, Tel.: +33 (0)6 99 20 00 33
- La Cabane du Breton (crêpes & galettes, vegan options), 4 Rue Maréchal de Lattre de Tassigny, Tel.: +33 (0)6 37 13 69 51.
- La Saison 3 (sea food), 21 Rue du Maréchal de Lattre de Tassigny, Tel.: +33 (0)5 56 83 24 05.
- Le Bistro'chon Arcachon (cuisine française), 29 Rue du Maréchal de Lattre de Tassigny, Tel.: +33 (0)5 56 83 08 44
- Ko-Sometsuke 2K (fusion asian food), 156 Boulevard de la Plage, Tel.: +33 (0)5 56 83 67 69.

■ Visiting the surroundings

Sailing to the Cap Ferret - It is worth spending an evening in the Cap-Ferret, a small town located at the end of a peninsula, on the other side of the bay. There, you will be able to visit the old town and enjoy oysters, a glass of white wine, or tapas on a terrace right by the sea. To go to the Cap Ferret, you will have to sail on a “pinasse”, a typical boat of the Arcachon bay. Tickets may be booked in advance (recommended) on the website of the “Union des bateliers Arcachonnais” (<https://bateliers-arcachon.com/welcome/>) or directly purchased on the Thiers pier (return ticket: 20 €)

Sailing to “L’Île aux Oiseaux” - L’Île aux Oiseaux (Birds’ Island) can be visited in a thousand different ways. The most common, however, is the guided tour by boat. Many service providers offer tickets to get to l’Île aux Oiseaux. Again, tickets can be purchased on the website of the “Union des bateliers Arcachonnais” or directly on the Thiers pier (single tour without stopover, 2 h, 24 €; single tour with a stopover at the Cap Ferret, 2 h, 31 €).

Going to the Oceanside and the Dune du Pilat - The Palais des Congrès and the hotels are located in front of the bay, but the other side of the town (a neighbourhood named Le Mouleau) faces the Cap-Ferret. If you push a bit further south, you will reach the highest sand dune in Europe - the Dune du Pilat - and eventually the Ocean beaches (plage de la Salie etc). You can get easily to both places by means of the local bus lines (ligne 3 and ligne 101, 1.70 €, bus schedules at <https://www.bassin-arcachon-info.com/dune-du-pilat-arcachon-baia1/>, tickets can be bought from the driver or at <https://www.bus-baia.fr/titres-et-tarifs.html>).

FLUID & ELASTICITY

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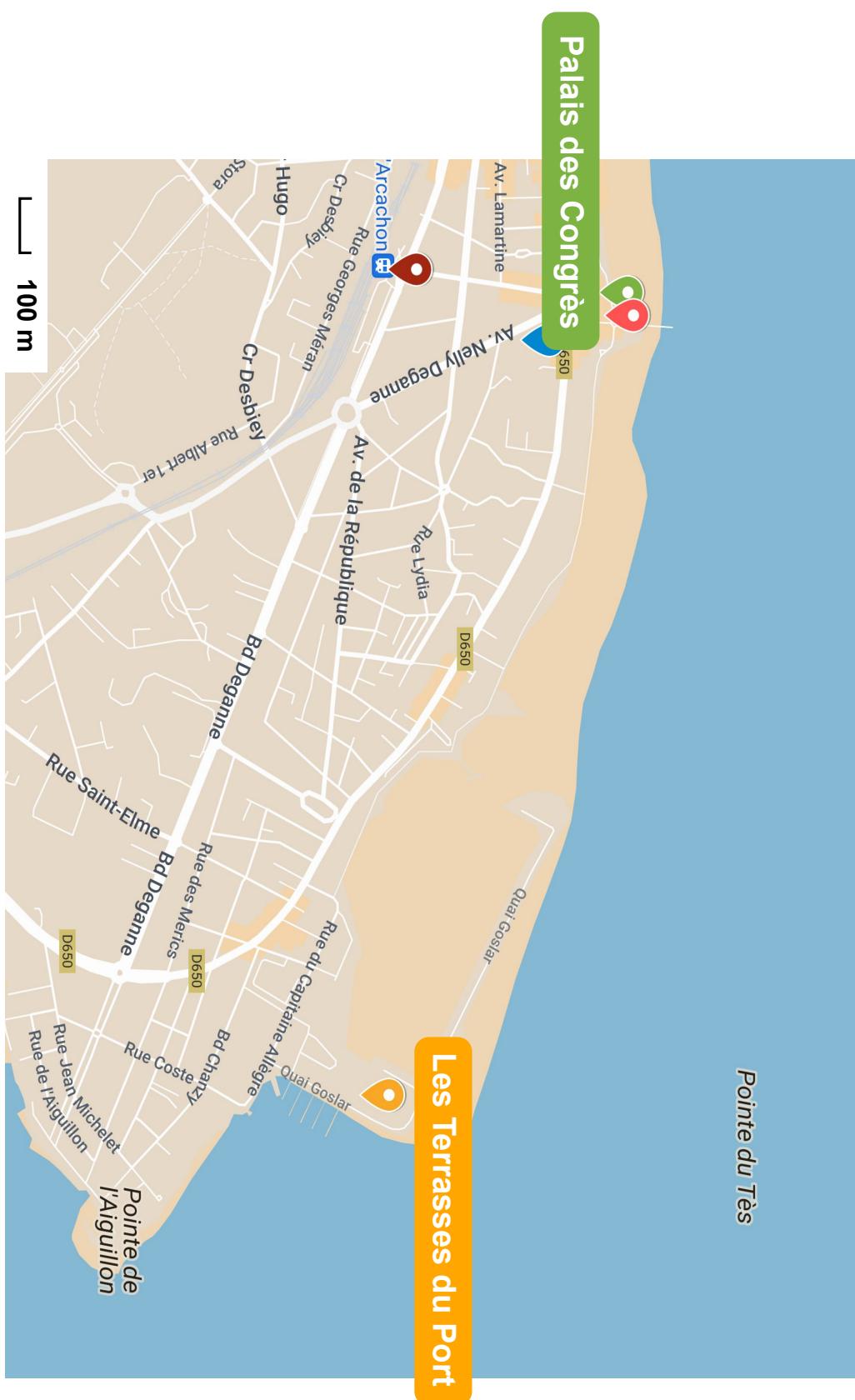


Maps



Map 1 - Main area. Access to the Palais des Congrès and to the hotels from the train station. Monday and Tuesday lunches will take place in two different restaurants : **Le Café de la Plage** (Monday) and **Le Grand Café Victoria** (Tuesday).

Map 2 - The Tuesday evening reception will take place at Les Terrasses du Port. The restaurant is located on the sea front, 2 km (25 mn walk) far from the Palais des Congrès (East dir.).



Scientific programme

NB - The last column of the programme table ('p. . .') refers to the electronic version of the booklet available on the USB Key.

Monday, June 17

8:00–9:00	Registration and opening	
9:00–9:45	<u>Invited speaker: Sophie Ramananarivo (Chair: C. Eloy)</u> <i>Harnessing kirigami technique for tunable deformation and forces in flows</i>	p.18
9:45–10:45	Session 1: Plants and flows (Chair: C. Eloy)	
9:45–10:00	Dominic Vella <i>Coupling turgor pressure and elastic deformation : two examples from plants</i>	p.19
10:00–10:15	Sungwhan Jung <i>Coherent vortices shed from an elastic leaf</i>	p.20
10:15–10:30	Frederick P. Gosselin <i>Soft coral vibrations, modelling and water-tunnel experiments</i>	p.21
10:30–10:45	Bastian Löhner <i>Investigation of the flow over a canopy consisting of highly flexible blades</i>	p.22
10:45–11:15	Coffee break	
11:15–12:30	Session 2: Swimming & flying at high Re (Chair: M. Polin)	
11:15–11:30	Ramiro Godoy-Diana <i>Waves in the wake of a surface swimming snake</i>	p.23
11:30–11:45	Éric Ibarra <i>Transport and deformation of flexible discs in homogeneous isotropic turbulence</i>	p.24
11:45–12:00	Thomas Barois <i>An aerodynamic trap : contactless manipulation of heavy objects by turbulent jets</i>	p.25
12:00–12:15	Médéric Argentina <i>Optimum control strategies for maximum thrust production in underwater undulatory swimming</i>	p.26
12:15–12:30	Lucas Gey <i>Fiber aggregation in flows</i>	p.27
12:30–13:30	Lunch	
13:30–15:30	Free Time	
15:30–16:15	<u>Invited speaker: Marco Polin (Chair: T. Bickel)</u> <i>Eukaryotic flagellar synchronisation from mechanics to hydrodynamics</i>	p.28
16:15–16:45	Short 3 mn talks (Chair: T. Bickel)	
	Luc Zorrilla <i>Inferring viscoelastic properties of eukaryotic flagella or</i>	p.29

<i>solving an inverse problem</i>	
Anaëlle Givaudan	p.30
<i>Roil formation in a bio-active fluid</i>	
Julien Bouvard	p.31
<i>Controlling the transport of passive beads in a suspension of phototactic microalgae</i>	
Alexander Chamolly	p.32
<i>Viscoelastic Rheology of Early Avian Embryos</i>	
Étienne Loiseau	p.33
<i>Understanding mucus transport in airways by using a reconstituted human bronchial epithelium</i>	
Simon Hadjaje	p.34
<i>How insects expand their wings</i>	
Mathieu Rivière	p.35
<i>Fast movements of Mimosa pudica: an osmotic muscle?</i>	
Ludovic Jami	p.36
<i>Embolism spreading in real & synthetic leaves</i>	
Lukas Hauer	p.37
<i>Membrane shapes, liquid-liquid interfaces, and elastocapillarity</i>	
Isabell Noichl	p.38
<i>Wall-bounded sedimentation of particles with elastohydrodynamic interaction at $Re_P \lesssim 0.1$</i>	

16:45–17:15 Coffee break and posters

Session 3: Elasticity-Capillarity coupling (Chair: M. Gomez)	
Ambre Bouillant	p.39
<i>Dew formation on soft substrate</i>	
Gwynn Elfring	p.40
<i>Capillarity nonuniform flexible channels</i>	
Jiayu Wang	p.41
<i>Elasto-capillary wrinkling in thin liquid-infused membranes</i>	
Aurélie Hourlier-Fargette	p.42
<i>Foams and soft intruders : exploiting elastocapillarity towards novel foam structures</i>	
Henri Lhuissier	p.43
<i>Jet Solidification</i>	
Vincent Bertin	p.44
<i>Sticking without contact : elastohydrodynamic adhesion</i>	

Tuesday, June 18

Invited speaker: Pierre-Thomas Brun (Chair: E. Lauga)	p.45
<i>Building with liquids: a lazy approach to fabrication</i>	
Session 4: Elastic filaments (Chair: E. Lauga)	
Raphaël Jeanneret	p.46
<i>Droplet and buckling instabilities in active fluid jets</i>	
Ehud Yariv	p.47
<i>Shape of a highly-compliant tethered filament in a uniform Hele-Shaw flow</i>	
Blaise Delmotte	p.48
<i>Dynamics of flexible fibers in structured environments</i>	
Marc Durand	p.49
<i>Deflection and oscillations of an anchored elastic fiber in a quasistatic foam flow</i>	

10:45–11:15	Coffee break	
11:15–12:30	Session 5: Colloidal systems (Chair: P. Meunier)	
11:15–11:30	Thomas Powers <i>Mechanics of colloidal membranes</i>	p.50
11:30–11:45	Emilie Verneuil <i>Particle-laden drops flowing through a pore</i>	p.51
11:45–12:00	Gabriel Amselem <i>Hydrogel beads flowing and clogging microchannels</i>	p.52
12:00–12:15	Diego Baresch <i>Active microrheology of soft materials using acoustical tweezers</i>	p.53
12:15–12:30	Andréa Feasson <i>Optical investigation of the dynamics of ultrasound contrast agents during insonification in the kHz range</i>	p.54
12:30–13:30	Lunch	
13:30–16:00	Free time	
15:30–16:15	Invited speaker: Anne-Laure Biance (Chair: F. Nadal) <i>Droplet impact on deformable hydrophobic textures</i>	p.55
16:15–16:45	Short 3 mn talks (Chair: F. Nadal)	
	Rodolfo Brandao Macena Lira <i>Sedimentation of elastic filaments</i>	p.56
	Karim Ayoubi <i>Settling of a Flexible Ribbon in a Viscous Fluid</i>	p.57
	Katie Wu <i>Dynamics of the transition to a coalesced equilibrium of elastic fibers withdrawn from a liquid bath</i>	p.58
	Manon L'Estimé <i>Elastocapillary drying of flexible fibres suspensions</i>	p.59
	Étienne Jambon-Puillet <i>Fluid flow in hairy channels</i>	p.60
	Alexander Gehrke <i>Unsteady forces and flows behind a poro-elastic membrane disk</i>	p.61
	Stéphane Poulin <i>Elastohydrodynamic of adhesion and translation of vibrating flexible foils near surfaces</i>	p.62
	Rishabh Nain <i>Tunable drag drop in origami</i>	p.63
	Lila Séguy <i>Deformation of hydrogels during freezing</i>	p.64
	Chandler Thomas <i>Fluid–body interactions in elastic anisotropic fluids</i>	p.65
16:45–17:15	Coffee break and posters	
17:15–18:45	Session 6: Swimming of microorganisms (Chair: S. Ramananarivo)	
17:15–17:30	Hélène de Maleprade <i>Micro-organisms catching by aerosols</i>	p.66
17:30–17:45	Céline Cohen <i>Swimming of plant pathogens zoospores</i>	p.67
17:45–18:00	Michael Gomez <i>Twist dynamics of bacteria flagella</i>	p.68
18:00–18:15	Albane Thery	p.69

18:15–18:30	<i>Bacterial upstream swimming is enhanced in non newtonian fluids</i>	
	Saverio Spagnolie	p.70
18:30–18:45	<i>Self-buckling and self-writhing of semi-flexible microorganisms</i>	
	John Lister	p.71
	<i>The dynamics of elastic coupling in a two-link swimmer</i>	

Wednesday, June 19

9:00–9:45	Invited speaker: Alain Goriely (Chair: S. Michelin)	p.72
	<i>The geometry and mechanics of chirality, hard and soft</i>	
9:45–10:45	Session 7: Biological flows (Chair: S. Michelin)	
9:45–10:00	Ranabir Dey	p.73
	<i>Soft makes it hard to swim: Dynamics of self-propelled swimmers in soft micro-confinements</i>	
10:00–10:15	Martin Brandebourger	p.74
	<i>Transport induced by nonlinear flow response in vessels with flexible leaflets</i>	
10:15–10:30	Francesco Picella	p.75
	<i>Symmetry breaking through confinement in biological fluids</i>	
10:30–10:45	Annie Viallat	p.76
	<i>Exploring the link between the spatial organisation of ciliated cells and the supported physiological function in Xenopus embryo</i>	
10:45–11:15	Coffee break	
11:15–12:30	Session 8 : Fluid-structure instabilities (Chair: A. Goriely)	
11:15–11:30	Finn Box	p.77
	<i>Flow-induced choking of soft channels</i>	
11:30–11:45	Patrice Meunier	p.78
	<i>Fluid-structure interaction of a cylinder in a stratified fluid</i>	
11:45–12:00	Maryam Boukor	p.79
	<i>Instability Limitation of Drag Reduction by Elastic Reconfiguration</i>	
12:00–12:15	Mazi Jalaal	p.80
	<i>Elasto-Visco-Plastocapillarity</i>	
12:15–12:30	François Gallaire	p.81
	<i>Buoyant porous thin disks fall straighter than solid disks</i>	
12:30	Closing speech	

Index of Authors

NB - The last column of the table ('p. . .') refers to the electronic version of the booklet available on the USB Key.

Amselem Gabriel	Tuesday 18/06	11:45–12:00	p.52
Argentina Médéric	Monday 17/06	12:00–12:15	p.26
Ayoubi Karim	Tuesday 18/06	Short talks	p.57
Baresh Diego	Tuesday 18/06	12:00–12:15	p.53
Barois Thomas	Monday 17/06	11:45–12:00	p.25
Bertin Vincent	Monday 17/06	18:30–18:45	p.44
Biance Anne-Laure	Tuesday 18/06	15:30–16:15	p.55
Bouillant Ambre	Monday 17/06	17:15–17:30	p.39
Boukor Maryam	Wednesday 19/06	11:45–12:00	p.79
Bouvard Julien	Monday 17/06	Short talks	p.31
Box Finn	Wednesday 19/06	11:15–11:30	p.77
Brandao Macena Lira Rodolfo	Tuesday 18/06	Short talks	p.56
Brandeboerger Martin	Wednesday 19/06	10:00–10:15	p.74
Brun Pierre-Thomas	Tuesday 18/06	9:00–9:45	p.45
Chamolly Alexander	Monday 17/06	Short talks	p.32
Chandler Thomas	Tuesday 18/06	Short talks	p.65
Cohen Céline	Tuesday 18/06	17:30–17:45	p.67
Delmotte Blaise	Tuesday 18/06	10:15–10:30	p.48
De Maleprade Hélène	Tuesday 18/06	17:15–17:30	p.66
Dey Ranabir	Wednesday 19/06	9:45–10:00	p.73
Durand Marc	Tuesday 18/06 ,	10:30–10:45	p.49
Elfring Gwynn	Monday 17/06	17:30–17:45	p.40
Feasson Andréa	Tuesday 18/06	12:15–12:30	p.54
Gallaire François	Wednesday 19/06	12:15–12:30	p.81
Gehrke Alexander	Tuesday 18/06	Short talks	p.61
Gey Lucas	Monday 17/06	12:15–12:30	p.27
Givaudan Annaëlle	Monday 17/06	Short Talks	p.30
Godoy-Diana Ramiro	Monday 17/06	11:15–11:30	p.23
Gomez Michael	Tuesday 18/06	17:45–18:00	p.68
Goriely Alain	Wednesday 19/06	9:00–9:45	p.72
Gosselin Frederick	Monday 17/06	10:15–10:30	p.21
Hadjaje Simon	Monday 17/06	Short talks	p.34
Hauer Lukas	Monday 17/06	Short talks	p.37
Hourlier-Fargette Aurélie	Monday 17/06	18:00–18:15	p.42
Ibarra Éric	Monday 17/06	11:30–11:45	p.24
Jalaal Mazi	Wednesday 19/06	12:00–12:15	p.80
Jambon-Puillet Étienne	Tuesday 18/06	Short talks	p.60
Jami Ludovic	Monday 17/06	Short talks	p.36
Jeanneret Raphaël	Tuesday 18/06	9:45–10:00	p.46
Jung Sungwhan	Monday 17/06	10:00–10:15	p.20
L'Estimé Manon	Tuesday 18/06	Short talks	p.59
Lhuissier Henri	Monday 17/06	18:15–18:30	p.43
Lister John	Tuesday 18/06	18:30–18:45	p.71
Löhrer Bastian	Monday 17/06	10:30–10:45	p.22
Loiseau Etienne	Monday 17/06	Short talks	p.33
Meunier Patrice	Wednesday 19/06	11:30–11:45	p.78
Nain Rishabh	Tuesday 18/06	Short talks	p.63
Noichl Isabell	Monday 17/06	Short talks	p.38
Picella Francesco	Wednesday 19/06	10:15–10:30	p.75
Polin Marco	Monday 17/06	15:30–16:15	p.28

Poulain Stéphane	Tuesday 18/06	Short talks	p.62
Powers Thomas	Tuesday 18/06	11:15–11:30	p.50
Ramananarivo Sophie	Monday 17/06	9:00–9:45	p.18
Rivière Mathieu	Monday 17/06	Short talks	p.35
Seguy Lila	Tuesday 18/06	Short talks	p.64
Spagnolie Saverio	Tuesday 18/06	18:15–18:30	p.70
Thery Albane	Tuesday 18/06	18:00–18:15	p.69
Vella Dominic	Monday 17/06	9:45–10:00	p.19
Viallat Annie	Wednesday 19/06	10:30–10:45	p.76
Verneuil Emilie	Tuesday 18/06	11:30–11:45	p.51
Wang Jiayu	Monday 17/06	17:45–18:00	p.41
Wu Katie	Tuesday 18/06	Short talks	p.58
Yariv Ehud	Tuesday 18/06	10:00–10:15	p.47
Zorrilla Luc	Monday 17/06	Short Talks	p.29

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