

Workshop on microplastics in the atmosphere

[Link to the meeting](#)

The workshop will be held online on the following link :

<https://rendez-vous.renater.fr/microplastic-air-workshop>

Program

The workshop will take place on Monday, November 22nd 2021.

Time	Speaker	Topic
8:30 – 8:40		Welcome & opening of the workshop
8:40 – 9:10	Grégory Lécivain	Particle deposition and resuspension in turbulent gas flows - An industrial and environmental application
9:10 – 9:40	Katy Nicastro	Unexplored effects of plastic contamination on coastal marine habitats
9:40 – 10:10	Max Beaurepaire	Microplastics in total atmospheric fallout: review and monitoring in the Paris region
10 minutes break		
10:20 – 10:50	Uwe Schlink	Research for healthy urban environments
10:50 – 11:20	Monica Passananti & Angelica Bianco	Reactivity of nanoplastics in the environment and challenges in analysis
11:20 – 11:50	Christophe Henry	Modelling of the transport and fate of particles in the atmosphere
11:50 – 12:15		Closing words & exchange on future collaborations

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Organised by Christophe Henry, researcher at Inria Sophia Antipolis Méditerranée,
2004 Route des Lucioles, 06902 Valbonne, France

Speakers & abstract

In the following, the list of speakers (together with the abstract of their presentation) is provided.

- **Grégory Lécrivain**

Affiliation: Helmholtz-Zentrum Dresden-Rossendorf, Institut für Fluidodynamik

Title: Particle deposition and resuspension in turbulent gas flows - An industrial and environmental application

Abstract: The talk will focus on the transport, deposition and resuspension of particles in the micron size in air systems. Expertise of the Helmholtz-Zentrum Dresden-Rossendorf in the experimental and numerical investigation of particle-laden flow will be presented. A first application includes the transport of dust particles in industrial systems. A second application is the resuspension of toxic micronparticles in urban system by strong winds. In these two scenarios, experimental tests are first used to study small-scale mechanisms. Simulations are then used to extrapolate the much larger systems.

- **Katy Nicastro**

Affiliation: CCMAR, Centre of Marine Sciences

Title: Unexplored effects of plastic contamination on coastal marine habitats

Abstract: Coastal habitats are often created by ecosystem engineers which build biogenic habitats. The formation of these structures is key to protect coasts from erosion, regulate sediment transport, serve as carbon sinks, provide habitat for many fish and invertebrates, and produce goods and services that support human well-being. Plastic pollution is our new, global threat to biodiversity. I will present some examples of the studies investigating the consequences of plastic contamination on coastal habitats.

- **Max Beurepaire**, Rachid Dris, Johnny Gasperi, Bruno Tassin

Affiliation: LEESU - Laboratoire Eau Environnement et Systèmes Urbains

Title: Microplastics in total atmospheric fallout : review and monitoring in the Paris region

Abstract: Although the topic of microplastic pollution has been a source of scientific interest since 2004, microplastics in the atmospheric compartment and urban areas have only been studied for a few years. After a summary of the state of literature on the atmospheric compartment, this work compares the methods and results of the first evaluation of microplastic pollution in the Paris region to a more recent monitoring campaign conducted in 2021. In the early study, conducted by Dris and coworkers, total atmospheric fallout samples were collected in two sites in the East of the Paris region between February 2014 and February 2015. Samples were collected over periods ranging from one week to a month. Analyses focused on fibres and relatively large particles, primarily because of methodological limitations. An estimate of 2 to 355 particles/m²/d were measured, largely fibers.

In the current work, sampling methods were kept similar to the earlier campaigns. Samples were collected over a 5 months period in 2021. Sample acquisition times varied between three and ten days, following rain events and tendencies. Samples underwent a treatment prior to analysis, and were characterized using an automated mapping-based micro-FTIR analysis. Microplastic fragments of smaller sizes were identified and quantified. Preliminary results show an estimate of ~100 particles/m²/d.

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- **Uwe Schlink**

Affiliation: Department Urban & Environmental Sociology, Helmholtz Centre for Environmental Research – UFZ

Title: Research for healthy urban environments

Abstract: Based on our very interdisciplinary experience and previous research projects, the UFZ can participate with two types of contributions. First, refinement and application of urban climate models that can be linked to regional climate projections, to local process models, and involve air flow as well as energy fluxes (sensible and latent heat, evapotranspiration, radiation). For the consideration of case studies, different scenarios and mitigation/adaptation measures these model simulations are beneficial. Second, our work is focussed on the personal exposure to environmental stressors, including particulate matter, heat, and noise. Personal exposure is important for health effects. In addition, our department contributes to social sciences and is familiar gathering population data on socio-economic conditions, behaviour, and intentions of city inhabitants.

- **Monica Passananti & Angelica Bianco**

Affiliation: Università degli Studi di Torino, Dipartimento di Chimica & Laboratoire de Météorologie Physique (LaMP CNRS)

Title: Reactivity of nanoplastics in the environment and challenges in analysis

Abstract: Microplastics (MPs) and nanoplastics (NPs) pollution nowadays is a serious environmental problem. To evaluate the environmental fate and impact of NPs is important to know their reactivity and quantify their presence in environmental matrices. An overview on reactivity of MPs and NPs towards light and oxidants in gas phase and liquid phase will be given and will be discussed the main challenges in NPs analysis in the environment.

- **Christophe Henry**

Affiliation: Team CaliSto, Inria Sophia Antipolis Méditerranée

Title: Particle deposition and resuspension in turbulent gas flows - An industrial and environmental application

Abstract: The purpose of the presentation is to provide an overview of a stochastic modelling approach for microscopic particles suspended in turbulent flows. The topic is addressed as a combination of the elementary phenomena at play: transport, deposition, resuspension and agglomeration. A specific emphasis will be put on recent developments of models for particle resuspension, including both effects of complex surface topologies (e.g. roughness) and the interactions between particles.

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