

GLOBE Italia News **MICROPLASTICS AT FESTIVALLETTERATURA 2020**

Festivaletteratura is the first, and remains the most important, Italian literary festival. In its wake, festivals were launched all over Italy in areas such as economics, philosophy, music, etc.

Festivaletteratura takes place in Mantova, in the heart of northern Italy. For five days in September, Festivaletteratura lights up and shakes up the city with hundreds of events, during which the public meets the authors – well known ones as well as emerging – of books from all fields of knowledge, from the sciences to the humanities.

This year, due to the COVID-19 pandemic and local government public health safety directives, Festivaletteratura's events and the number of permitted attendees have been reduced. <https://www.festivaletteratura.it/it/2020/eventi>



*Figure 1*The Lago Superiore (Upper Lake) in Mantova. In the background the SCIENCEGROUND Permanent Laboratory being set up.

Over the last three years, Festivaletteratura has hosted a scientific section called SCIENCEGROUND, ideated by eXtemporanea, “a small scientific community, no longer temporary, of University students, PhD candidates and researchers from Industry and Universities, scattered all over Europe and Italy”. At Festivaletteratura, eXtemporanea curates scientific meets, laboratories, book reading groups, live radio and online interviews, a podcast and a reasoned library, fostering fertile ground in which to sow the values of scientific methodology.



Figure 2 Student volunteers at the Permanent Laboratory site, being trained on the microplastics monitoring protocol.

Each SCIENCEGROUND edition has a dedicated theme: such as “Data” in 2018, “Microbes” in 2019 and “Ecosystems” in 2020. Each edition sees a permanent laboratory focus on the key theme, with specific laboratories (2-3 hour events) dedicated to a range of subthemes. www.scienceground.it

The public has free access to the permanent laboratory over three days. The laboratory is managed in a very informal manner: with students and volunteers available to help the public to discuss aims, scientific content and methodology of the various laboratory activities. The team is also available to discuss more generally the role of science and technology as social factors in everyday life.

The specific laboratory sessions – two to three hours in duration – are reserved for a limited number of participants, typically limited to 20.

For the 2020 edition, the permanent laboratory had a magnificent backdrop: the banks of the Lago Superiore (Upper Lake) in Mantova. The specific laboratory sessions were hosted in the same splendid location: Macrophytes (10 September), Macroinvertebrates (11 September), and... on September 12th. The first two events were curated and hosted by the University of Parma, while the third...well...that’s a different story, as there’s a new “species” in town. It all starts with 2019.



Figure 3 A volunteer student illustrates the types of microplastics found in Italian and Australian water samples.

In October 2019 Globe Italia introduced a draft Protocol for Microplastics monitoring in surface waters, in the context of the 2019 Science Market, organised as part of the Globe Europe-Eurasia meeting in Trieste (Italy). The protocol was ideated in 2019 by Deakin University's Associate Professor Alessandra Sutti (PhD, Institute for Frontier Materials – Victoria, Australia) and Stuart Robottom (MEng, MArts, BEngHons, Deakin University), and was tested in collaboration with Labter-Crea Mantova at Isola d'Elba (Elba Island, Italy) in the summer of 2019.

The protocol combines the use of low-cost materials, easily sourced or self-built by students and teachers, with a field-ready filtration device, already in use by schools in Mantova and Friuli within a few existing environmental education projects (Progetto Mincio, At School on the River, etc), and optical microscopes, which are most common in local schools.

On the wave of positive peer review in Trieste, the proposers had planned to test the protocol at a larger scale as part of World Water Day activities in Mantova, to test its limits and potential. The COVID-19-caused, whole-of-Italy, lockdown sadly blocked this initiative. But only until July 2020, when Labter-Crea Mantova, GLOBE Italia, and Deakin University took it upon themselves to increase the scale of the activity, and headed off at full steam by collecting:

- 49 samples from Italian water bodies, including 39 from Mincio and its tributaries, four from mountain streams (Val di Casies, Sudtiro), and six from the Adriatic sea (Lido di Spina);
- 60 samples from Australian rivers and oceans in the state of Victoria, around the Great Ocean Road and Bellarine Peninsula.

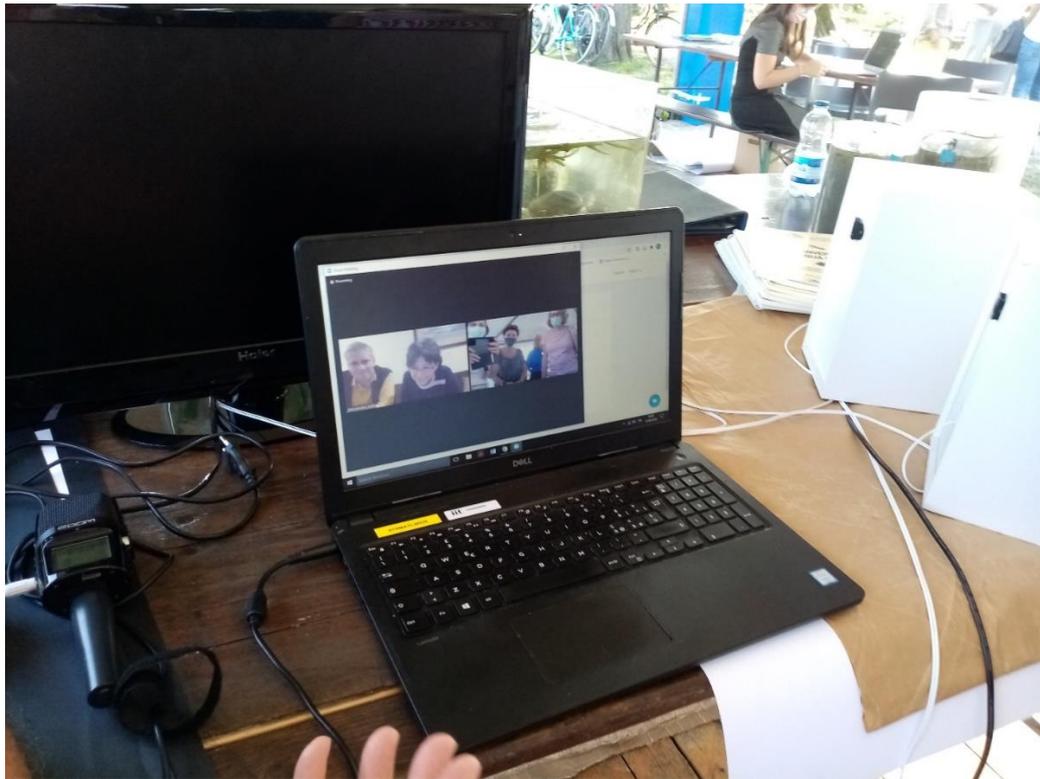


Figure 4 Citizen Science: citizens participating in the Microplastics Laboratory dialogue with A/Prof. Alessandra Sutti and Eng. Stuart Robottom of Deakin University, Geelong, Victoria, Australia.

The Italian samples were filtered, analysed under an optical microscope and sent to the Australian partners for:

- a deeper morphological analysis through optical microscopy, helpful to identify microplastics from other natural-origin materials,
- preparation of a high-definition photographic gallery, to serve as educational and training material for teachers and trainers; the images collected also supported a small – but very significant gallery – for use as communication aid during Festivaletteratura.

<https://www.festivaletteratura.it/it/2020/eventi/59-tre-lezioni-di-sopravvivenza-in-acqua-dolce-2358>

Yes, that's right! The third specific laboratory activity was dedicated to Microplastics, the "new species in town". Mr Marco Faggioli (B/MEng) and PhD candidate Maria Elena Antinori (BSc, MSc) are key members of eXtemporanea and are responsible for the SCIENCEGROUND laboratories. They invited Deakin University's Institute for Frontier Materials, Labter-Crea and GLOBE Italia to present the new methodology to the community, by setting up a specific laboratory and a photographic exhibition, duly integrated by infographics prepared by eXtemporanea to help communicate with the public.

The permanent laboratory and the specific laboratories were managed by key figures of the University of Parma and Labter-Crea, in collaboration with eXtemporanea's PhD students and 10 students from three high-schools in Mantova, one of which a GLOBE school (IS

Fermi), and two (IS Manzoni Suzzara and Liceo Scientifico Belfiore Mantova) which we hope will soon also join the GLOBE Program.

During the three days of activities, ZOOM meetings were organised with the Australian researchers, who, in the middle of the night, made themselves available to discuss details of the project with citizens and students, in real GLOBE Program spirit, which supports and encourages interaction between researchers, students and citizens.

The specific Microplastics laboratory was attended by 20 very enthusiastic participants, from Mantova and surroundings.



Figure 5 Citizen Science: a group of citizens participating in the Microplastics Laboratory is preparing to sample the waters of Lake Superiore

Besides the scientific results yielded by this activity, which we'll cover separately, we'd like to highlight some take-home aspects of this experience:

- The experience confirmed the relevance and significance of microplastics to the community, with microplastics perceived as a real, contemporary and developing environmental emergency;
- adults, children and students all showed great interest in the theme;
- with just a few days' training, the volunteer students mastered the technical aspects associated with the running of the activities, as well as the knowledge required to engage on the topics, such that they managed all phases of the protocol (sampling, filtration, observations under optical microscopes) with great confidence and technical skill. With such

great drive and enthusiasm, we can definitely say the students put on a fair show, and that the methodology is readily embraced by motivated and interested participants!

- IS Manzoni students will adopt the protocol and manage a Microplastics laboratory during the Science Festival in Suzzara, in November 2020;

- the public who enrolled in the specific Microplastics laboratory tested the various phases of the Protocol which could form large part of future possible GLOBE Italia events with schools; the public road-tested and demonstrated its practicality and confirmed its suitability to Citizen Science type activities.

- the same public agreed that there is a strong need to divulgate throughout the Community the results of these investigations, to instigate public debate on the need for behavioural change in terms of use of plastics (especially single-use);

- the team is planning to launch a microplastics monitoring campaign within the GLOBE Italia network, after training and educational meetings and workshops, delivered as webinars.

- in the interim, the team from Deakin University's Institute for Frontier Materials (in the context of the ARC Research Hub for Future Fibres) and Labter-Crea are completing the drafting of the Protocol, while at the same time evaluating the analytical and statistical significance of the method and collected data.



Figure 6 Volunteer students assist citizens in identifying microplastics under the microscope.

The Mantuan experience at Festaletteratura also yielded an extra output: two Master students (Master in Journalism and Institutional Communication, University of Ferrara) will

develop two videos as their final year project: one to introduce the topic of microplastics, one to present how the protocol was developed.

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