Experimental activities at ChAMBRe

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ChAMBRe: Chamber for Aerosol Modelling and Bio-aerosol Research

ITINERIS

- ChAMBRe ASC is installed at the **National Institute of Nuclear Physics** in **Genoa** in collaboration with the **Environmental Physics Laboratory** at the Physics Department of Genoa University. The facility is part of the **ERIC-ACTRIS**.

ASC

- Study of atmospheric processes under realistic but controlled conditions
- Conditions could be and monitored in real time

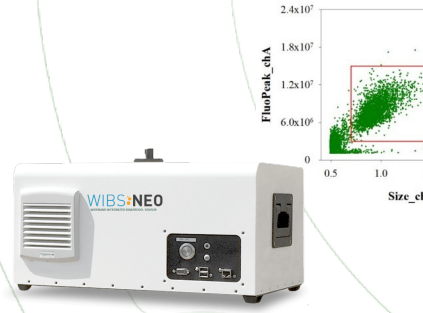
Massabò et al., (2018). Atmos. Meas. Tech., 11, 5885-5900

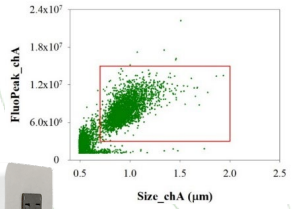
- Volume ≈ 2.3 m^3
- Stainless steel

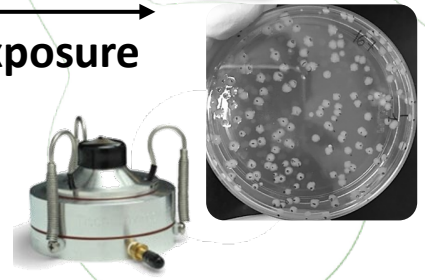
Facility with high versatility!

Bioaerosol studies

2 h exposure







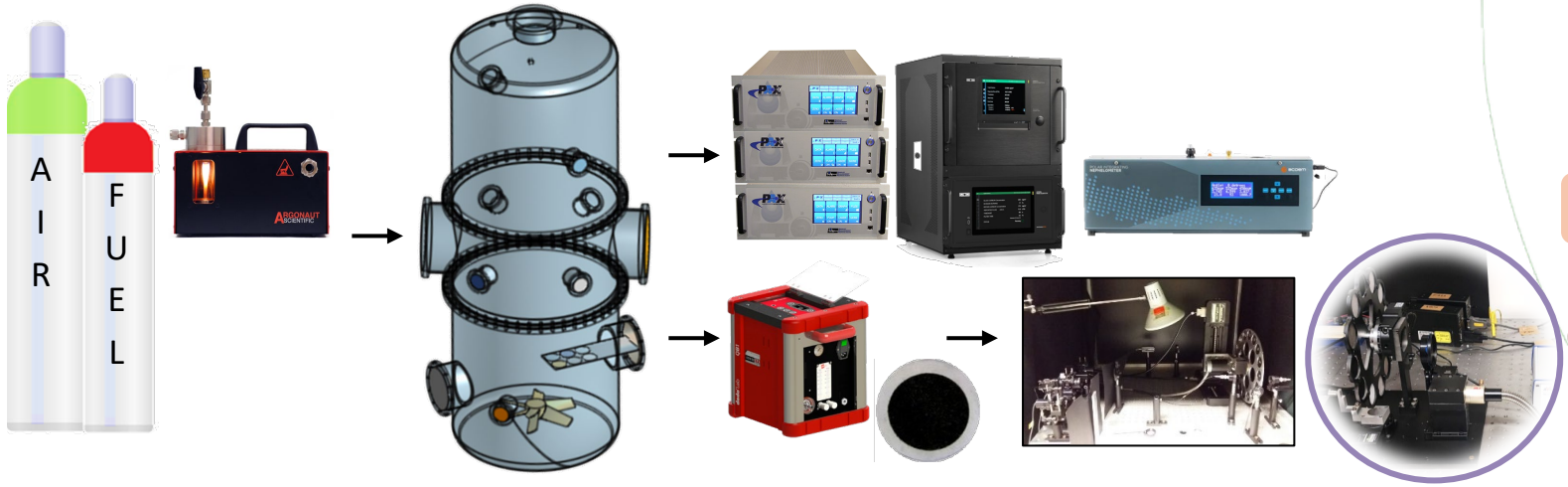
- Bacteria total concentration (time)
- Bacteria viable concentration (time)

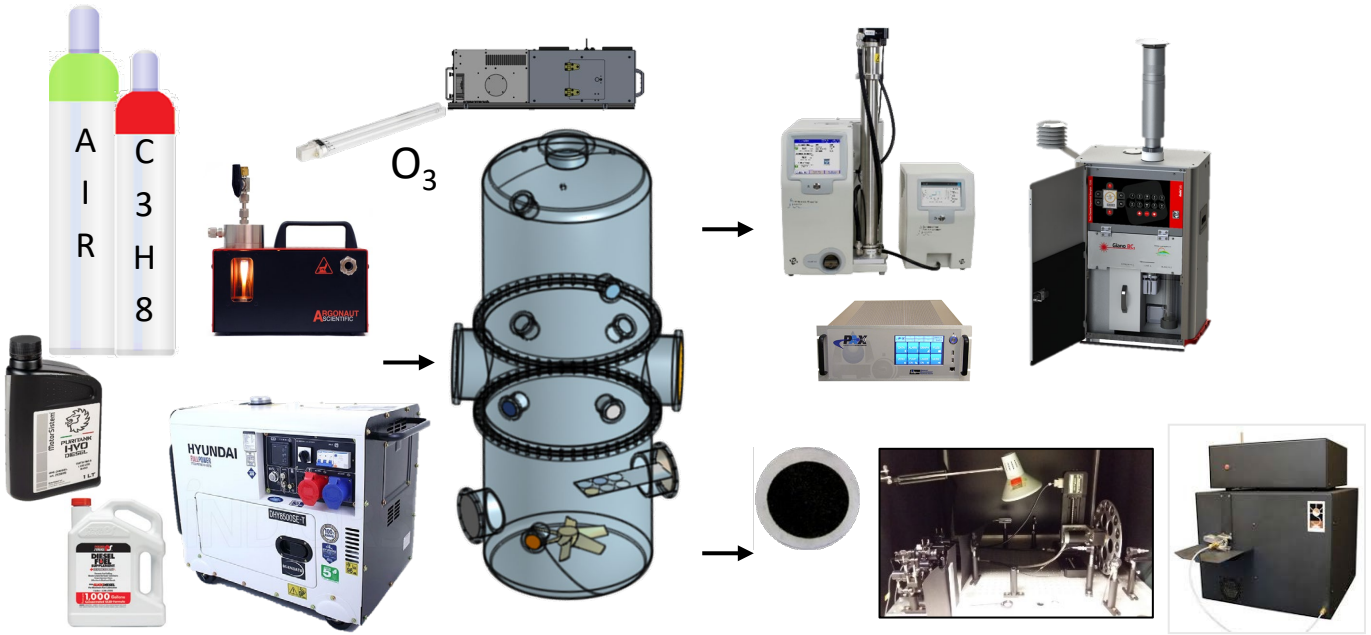
- Impact of air quality on bacteria viability: effects of different atmospheric conditions and/or anthropogenic pollutants (standard-model bacteria)

Vernocchi et al., (2023). Atmos. Meas. Tech., 16, 5479-5493

Gatta et al., (2025). Sci. Rep., 15, 10320

Carbonaceous aerosols





Production of “aerosol standards”

Vernocchi et al., (2022). Atmos. Meas. Tech., 15, 2159-2175

Focus on optical properties

- Test of new instruments (online / offline)
- Comparison of different optical techniques (online / offline)
- Test of models for optical apportionment

Isolabella et al., (2024). Atmos. Meas. Tech., 17, 1363-1373

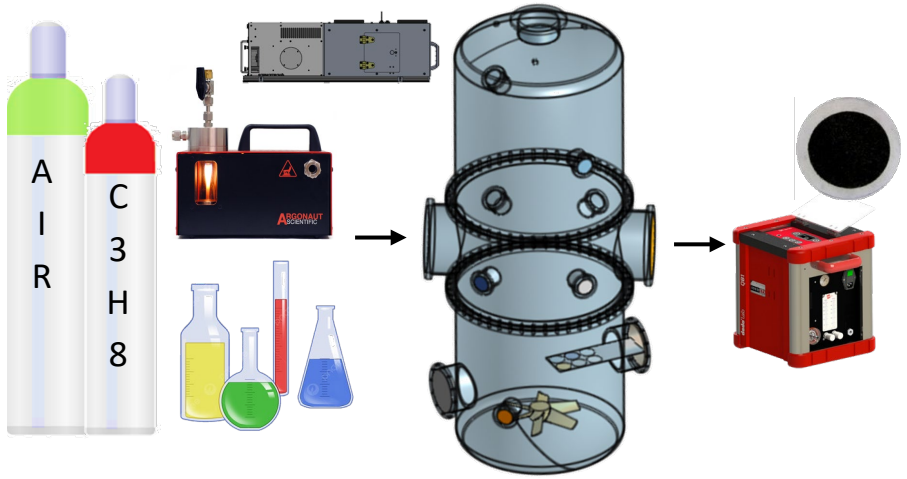
Isolabella et al., (2025). Atm. Env., 121341

Comparison of different aerosols

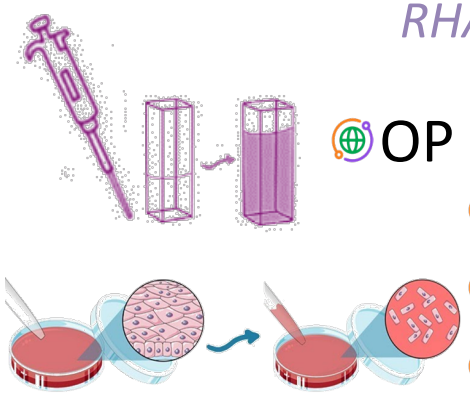
- Combustion of different fuels
- Aging processes

Danelli et al., (2025). Atmos. Chem. Phys., 25, 9387

Standard samples for OP and Toxicological assays



RHAPS Collaboration



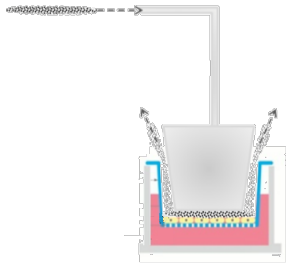
- OP
  - Cytotoxicity
  - Genotoxicity
  - Oxidative stress

- WINTER, BB emissions
- SUMMER, TRAFFIC emissions

Vernocchi et al., (2025). Toxicol. Appl. Pharmacol, 505, 117573

- Particles characterization by ChAMBRe instruments

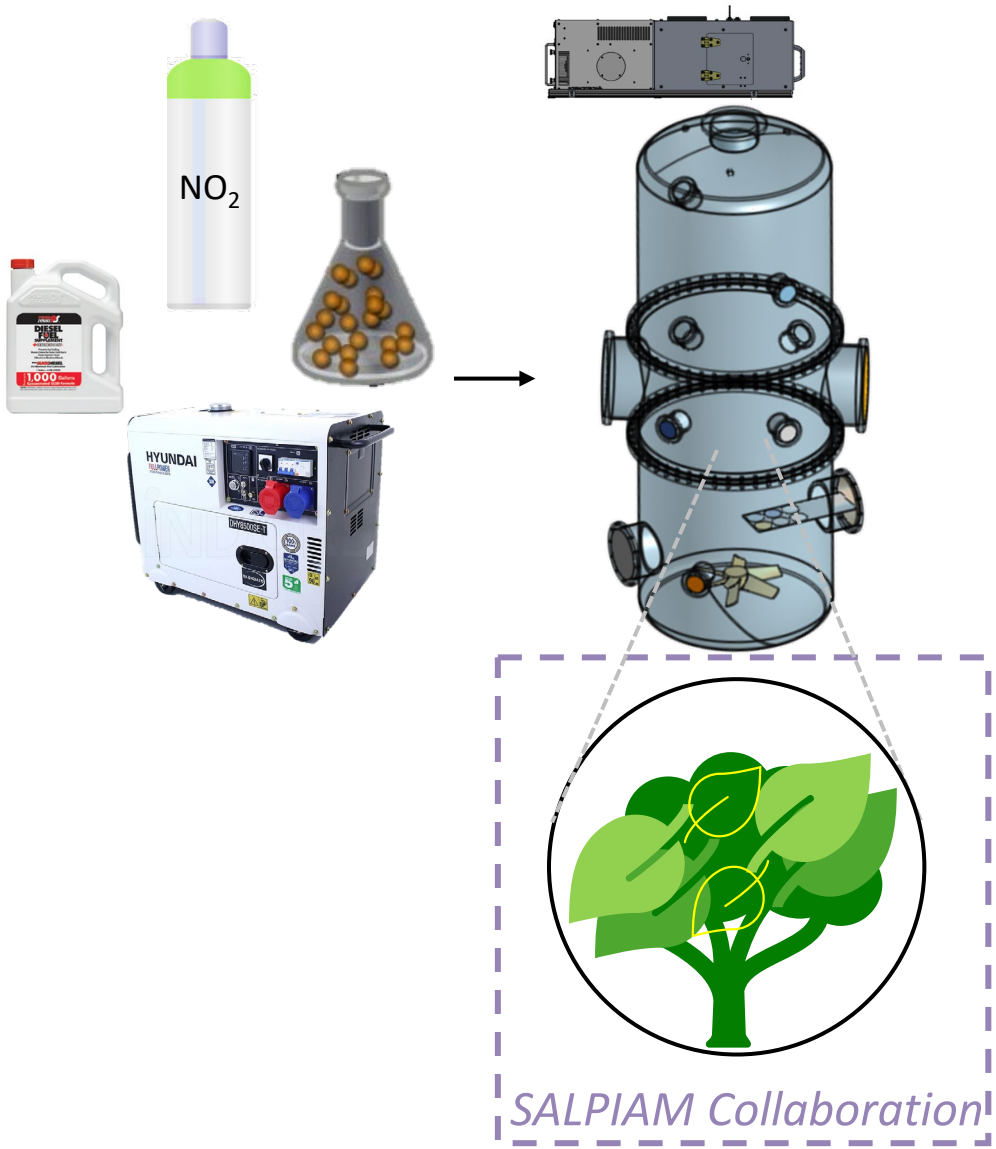
IT-BEST Collaboration



- Cells inflammatory response
- Cells Oxidative stress

- ULTRAFINE particles
- Aging processes
- Compare fossil fuels and biofuels blends emissions

Plants interactions with airborne pollutants



- NO_2 consumption
- Capacity to capture airborne PM

Bosio et al., (2025). Atm. Env. X, 27, 100355

SALPIAM Collaboration

- *N. oleander*
- *M. communis*
- *T. baccata*

ITINERIS-access to ChAMBRe

Multidisciplinary!

- MICRObial adaptations and Antimicrobial Resistance Genes in the ocean-atmOsphere continuum - MICROARGO
- Bioaerosols' Evaluation And Machine-learning – BEAM
- Toxicological hazard assessment of combustion emission under different aging processes by direct exposure of lung in vitro models at the air liquid interface - Tox-CEAPs
- Characterization of Aerosols Emitted by the Burning of Textile Waste in Atacama and their Relevance to Air Quality - ATEXAQ
- Single scattering albedo and asymmetry PARameter retrieval by photometric Analysis of atmospheric aerosol deposited on filters - SPARA
- Degradation of Benzothiazoles: From Urban to Polar Atmosphere Conditions - UPAC-BTH
- Calibration at varying relative humidity of the ACSM – CINEMA

THANKS!

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