

## Supplemental Materials for

### Integrated evaluation of indoor particulate exposure: the VIEPI project

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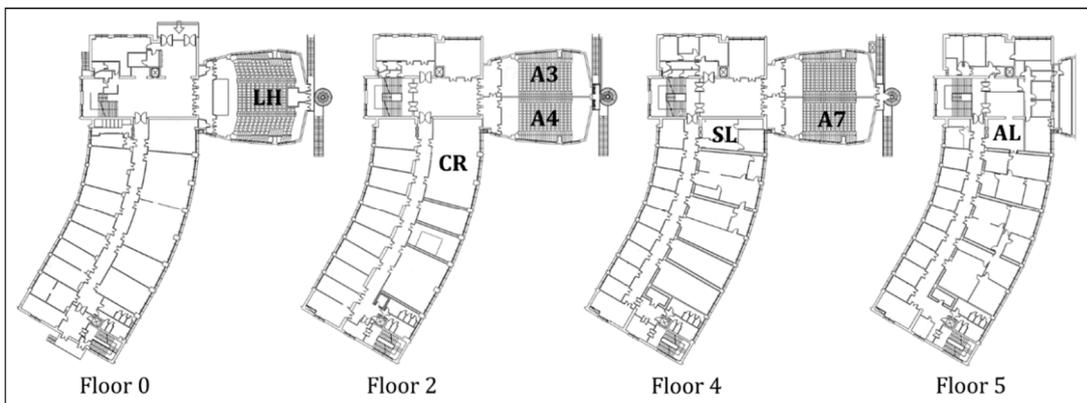
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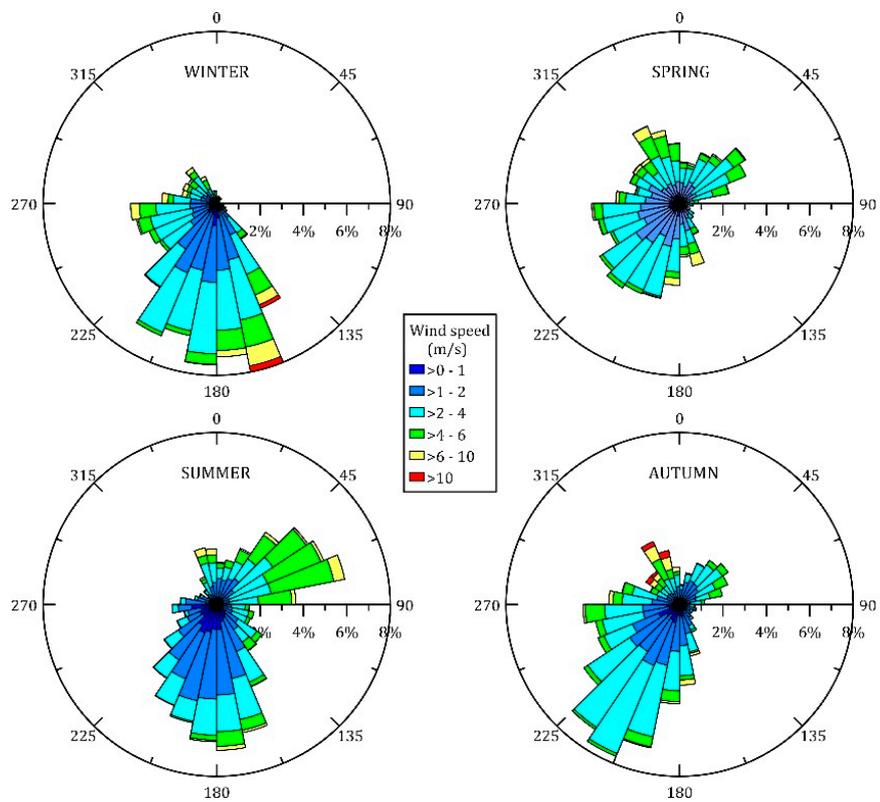
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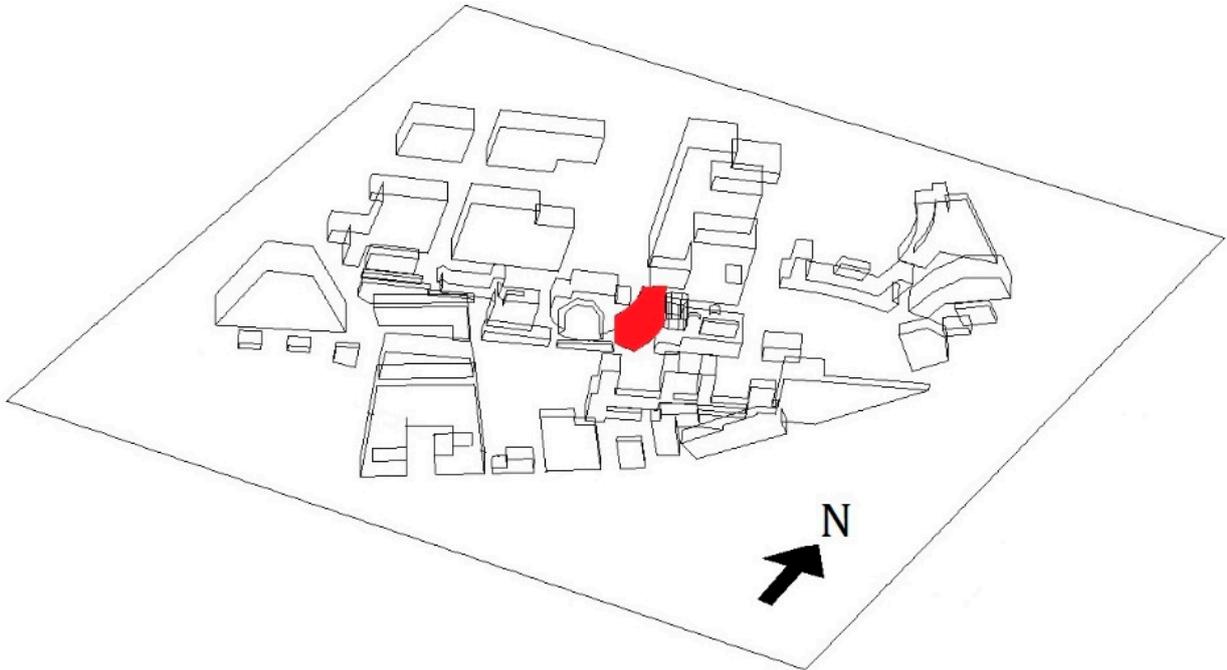
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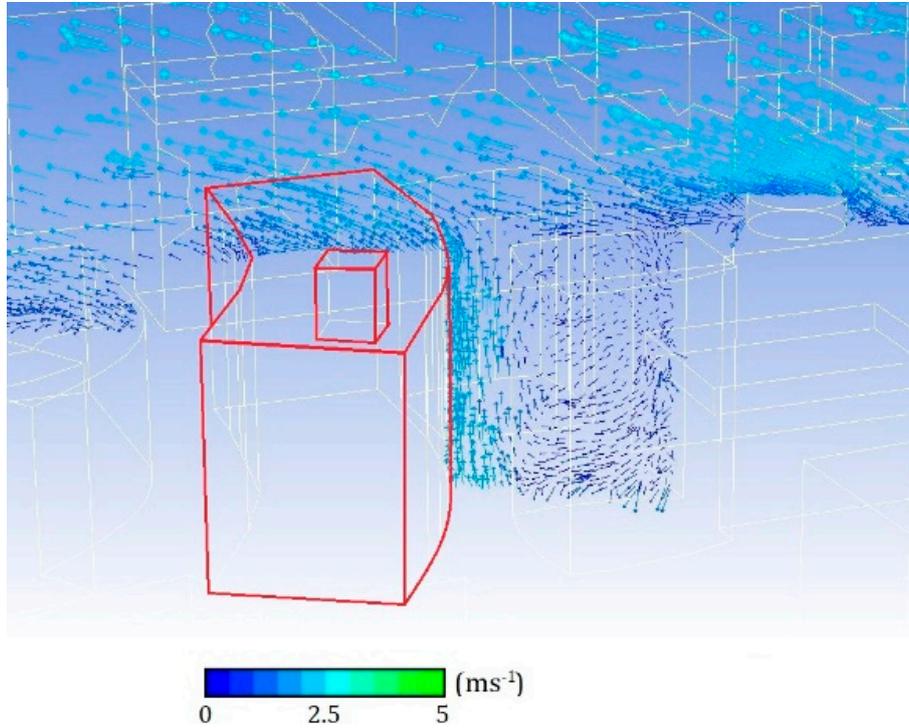
**Figure S1.** Maps of the Physics Department and of the sites chosen for the experimental activity.



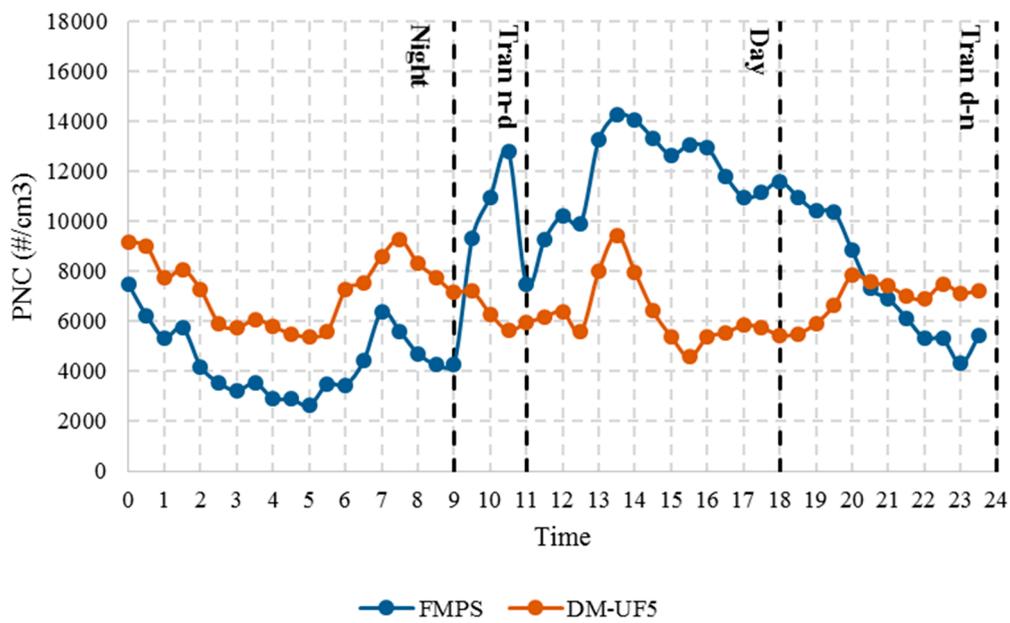
**Figure S2.** Wind roses showing the seasonal distribution of the horizontal wind speed measured at  $z=1.4H$  by the SODAR (30-min average).  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$  and  $270^\circ$  correspond to wind coming from N, E, S, and W, respectively.



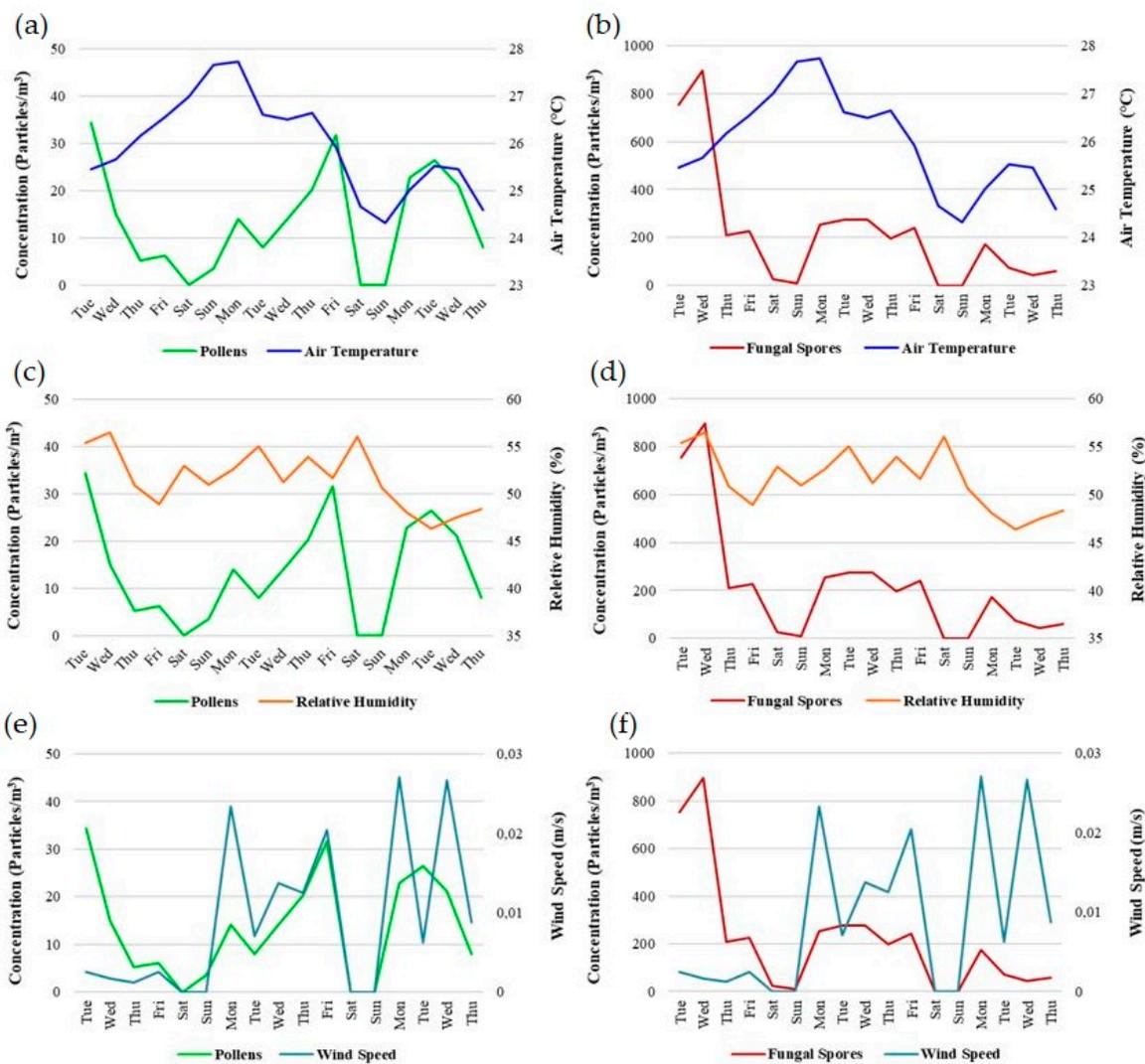
**Figure S3.** Numerical setup. The red feature denotes the PD building. The inner domain is  $24H \times 22H$  along E-W and S-N directions, respectively, while its vertical extension is  $10H_{\max}$  ( $H_{\max}=35$  m is the maximum height of the buildings in the investigated area). The outer domain ( $15H$  high, not shown) is centered on the inner one and has a planar area equal to  $39H \times 37H$ . ANSYS Modeler is used for the mesh generation. The grid consists of unstructured, prismatic, elements. A grid-convergence test was performed to choose the suitable grid size, comparing the results obtained using three different grids (i.e., mesh interval size 3-30 m, 0.25-25 m, and 1.5-20 m). The numerical simulations have been performed using the second grid, where the cell size varies between 0.25 m (close to the surfaces) and 25 m (at the external region of the domain). The total number of nodes is about  $2.5 \cdot 10^6$ . Momentum, turbulent kinetic energy, dissipation rate and energy equations are discretized using the second order scheme. Pressure-velocity coupling is carried out using the PISO scheme, while pressure interpolation is standard. The wind-speed at the inlet follows the log law  $U(z) = (u_*/k)\ln(z/z_0)$ , where  $u_*$  is the friction velocity,  $k=0.41$  is the von Karman constant and  $z_0=0.1$  m is the aerodynamic roughness length. Wind speed ( $3.1 \text{ ms}^{-1}$ ) and direction ( $220^\circ$ ) at  $z=10$  m used to reconstruct the logarithmic profile were taken from the meteorological station located at G.B. Pastine Airport in Ciampino.



**Figure S4.** Wind velocity vector field, simulated over the vertical plane passing through the anemometer located at the second floor, at 16 LST on April 21, 2018. The red feature denotes the PD building.



**Figure S5.** Daily trends of UFPs PNC as measured at level  $z/H=1.1$  by FMPS and DM-UF5.



**Figure S6.** Trends of pollens and fungal spores in relation to air temperature (a, b), relative humidity (c, d), and wind speed (e, f), with daily time resolution during working days and non-working days in a summer campaign (26 July - 11 August 2016).

		<b>WS (ms<sup>-1</sup>)</b>	<b>WD (°)</b>
z=1.4H	CFD	3.98	230
	Observed	4.50	230
z=1.14H	CFD	3.59	230
	Observed	3.84	230
z=0.8H	CFD	0.65	175
	Observed	0.06	305
z=0.4H	CFD	0.28	165
	Observed	0.22	210

**Table S1.** Comparison between simulated (CFD) and observed wind speed (WS) and direction (WD). 0°, 90°, 180° and 270° correspond to wind coming from N, E, S, and W, respectively.