

Bike Particle Accelerator



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updated 13. 7. 2023 | published 13. 7. 2023

Summary

An add-on for your bike to collect airborne microparticles (pollen, spores, microplastics) while you bike around.



4.18 hrs



1 pcs



0.20 mm



0.40 mm



PLA



47 g



Prusa MINI /
MINI+

[Learning](#) > [Chemistry & Biology](#)

Tags: [bike](#) [microscope](#) [microscopy](#) [particles](#) [pollenating](#)

Video of the project here:

No, no, you will not open a black hole and tear the universe apart. Well, hopefully not. We will see.

This is an add-on for your bike to collect airborne particles on a microscope glass slide. It's literally a particle accelerator, but well, for microparticles. While biking around, you will be able to collect pollen, spores, microplastics, and other particles of 50-100 micrometers.

It forces the air into a funnel with a slit at the end, which will accelerate the particles, which then will be collected on a microscope glass slide. This specific one is called a “single impactor”:

<https://www.sciencedirect.com/science/article/pii/000469817690144X>

https://en.wikipedia.org/wiki/Cascade_impactor

In laboratories, the airflow is constant to separate particles based on their sizes. This is more or less random, and it will depend on how fast you'll bike around. The best time to use this is in spring, when you'll be collecting plenty of different pollens. In cities, you'll most probably collect plastic microparticles from tires....

Perfect for citizen science projects :D

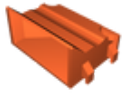
How to use it:

- 1 - put some double-sided scotch tape on a standard microscope slide. Instead of the scotch, you can also use some drops of mineral oil. The scotch tape will lose its stickiness over time, while mineral oil will be stable for a longer time.
- 2 - push the microscope slide in the allocated slot. Pay attention and work carefully not to break the glass....
- 3 - align the scotch tape on the glass slide with the slit
- 4 - fix the particle accelerator on your bike using rubber bands
- 5 - bike around and enjoy the day
- 6 - use a cheap microscope, for example <https://www.youtube.com/watch?v=UgT52XoQGQQ&lc> and study the catch of the day.

Printing:

Easy peasy PLA, 15% infill, no support, but there is a pretty long bridge, so keep your printer sharp! 0.20mm layers, the fins for keeping the microscope glass slide are printed mid-air.

Model files



impactor-bike.stl



prt_acc_large_slit.step



prt_acc_small_slit.step

Print files



impactor-bike_02mm_pla_mini_4h11m.gcode

🌀 PLA 📏 0.40 mm 📐 0.20 mm ⌚ 4.18 hrs ⚖️ 47 g 🖨️ Prusa MINI / MINI+

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