

Abstract Submitted  
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**Collective organization in aerotactic motion** MARCO G. MAZZA,  
Max Planck Institute for Dynamics and Self-Organization — Some bacteria exhibit interesting behavior in the presence of an oxygen concentration. They perform an aerotactic motion along the gradient until they reach their optimal oxygen concentration. But they often organize collectively by forming dense regions, called bands, that travel towards the oxygen source. We have developed a model of swimmers with stochastic interaction rules moving in proximity of an air bubble. We perform molecular dynamics simulations and also solve advection-diffusion equations that reproduce the aerotactic behavior of mono-flagellated, facultative anaerobic bacteria. If the oxygen concentration in the system sinks locally below a threshold value, the formation of a migrating aerotactic band toward the bubble can be observed.

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