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Collective Motion of Magnetotactic Bacteria SOLOMON BARKLEY, CECILE FRADIN, KARI DALNOKI-VERESS, Department of Physics and Astronomy, McMaster University — Magnetotactic bacteria produce magnetic crystals that align the cells with an external magnetic field. Due to the field these bacteria preferentially swim along magnetic field lines in a behaviour known as magnetotaxis. Previous work has focused on bacteria in isolation, with investigations into the degree of orientation with the magnetic field as well as the response to magnetic field reversal. However, the motion of a cell in isolation cannot be extended to a cell with many neighbours, where collisions and collective effects cannot be ignored. The increased interaction between magnetotactic bacteria at very high concentrations alters the ability of any individual cell to align with an applied magnetic field. We will present experiments on the interplay between magnetotaxis and collectivity and the effects on the spatial and temporal organization of cells.

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