



'Sculpting' fluid flow

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Simple harmonic oscillation of cylinders in a fluid additionally lead to low magnitude time-steady (over many oscillations) fluid flow structures due to a mechanism called viscous streaming. By using a robust and accurate computational technique, we perform the first simulations of streaming. Using collectives to sculpt the flow, we obtain checker-board structures (visualized by fluid streamlines - blue: clockwise rotating, orange: counter clockwise rotating structures) which we can use, for example, to trap and manipulate particles. We envision high-impact bio-medical applications such as localized drug delivery using this technology.