



Showcasing research on a review on particle manipulation from the laboratories of Professor Guoqing Hu, Zhejiang University, and Professor Chungong Xue, Central Hospital of Dalian University of Technology, China.

Particle Manipulation Under X-Force Fields

We review groundbreaking advances in particle manipulation under X-force fields in microfluidics. With a comprehensive examination of hydrodynamic, gravitational, optical, magnetic, electrical, and acoustic forces, the article illustrates both individual and combined applications of these forces. Emphasis is placed on the integration of AI and autonomous systems, which are poised to significantly enhance the efficiency, precision, and scope of microfluidic platforms. This review not only highlights technological advances but also maps the likely trajectory of innovation, providing critical insights essential for moving the field forward.

As featured in:



See Guoqing Hu *et al.*,
Lab Chip, 2025, **25**, 956.