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**Reverse coffee-ring effect** BYUNG MOOK WEON, LEI XU, Department of Physics, School of Engineering and Applied Sciences, Harvard University, JUNG HO JE, X-ray Imaging Center, Department of Materials Science and Engineering, Pohang University of Science and Technology, YEUKUANG HWU, Academia Sinica, GIORGIO MARGARITONDO, Ecole Polytechnique Fédérale de Lausanne, DAVID A. WEITZ, Department of Physics, School of Engineering and Applied Sciences, Harvard University — When a coffee drop dries on a solid surface, it commonly leaves a ring-like deposit along the edge, known as the coffee-ring effect. We present a reverse motion of particles in drying droplets, opposite to the coffee-ring effect. We reveal that the particle motion, initially toward the edge by the typical coffee-ring effect, is reversed to the droplet center owing to the capillary interaction generated by the droplet surface. The reverse coffee-ring effect always occurs whenever the capillary interaction prevails over the net outward force by the coffee- ring effect. The interaction predicts an inverse power-law time growth of moving distance from the edge, depending mostly on particle size and contact angle. The reverse coffee-ring effect may contribute to multiple ring formation by sweeping particles toward the center. We prove the mechanism with real-time optical, confocal, and X-ray microscopic observations of colloidal fluids.

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