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Splash Dynamics of Watercolors on Dry, Wet, and Cooled Surfaces DAVID BARON, ASHWIN VAIDYA, HAIYAN SU, Montclair State University — In his classic study in 1908, A.M. Worthington gave a thorough account of splashes and their formation through visualization experiments. In more recent times, there has been renewed interest in this subject, and much of the underlying physics behind Worthington's experiments has now been clarified. One specific set of such recent studies, which motivates this paper, concerns the fluid dynamics behind Jackson Pollock's drip paintings. The physical processes and the mathematical structures hidden in his works have received serious attention and made the scientific pursuit of art a compelling area of exploration. Our work explores the interaction of watercolors with watercolor paper. Specifically, we conduct experiments to analyze the settling patterns of droplets of watercolor paint on wet and frozen paper. Variations in paint viscosity, paper roughness, paper temperature, and the height of a released droplet are examined from time of impact, through its transient stages, until its final, dry state. Observable phenomena such as paint splashing, spreading, fingering, branching, rheological deposition, and fractal patterns are studied in detail and classified in terms of the control parameters.

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