Modeling Type Ia Supernovae Hydrodynamics using Walking Droplets

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After a star has shined for the last time, its core can disintegrate to become a Supernova. Type I Supernova occurs in binary systems stars, which contains a white dwarf star and a companion star. When the companion star transfers too much mass onto the white dwarf, it collapses in on itself. The purpose of this project was to see if oil droplets in a non-coalescence system will behave like a Supernova I in the presence or absence of a double-slit obstacle. My hypothesis was that when a droplet encounters another droplet after passing by the slit, it will change its position and it will disintegrate resembling a supernova. Using a vibrating oil bath, the droplets demonstrated that the ratio of mass and density of the binary star system along with the angle of incidence would cause the stars to split. Since this is just a simulation, we can assume that in a real binary star system, the force of gravity would not allow them to split apart, and instead, the mass transfer would create a supernova. The usage of quantum-like mechanics in a classical system has proven to be highly effective in the acquisition of this knowledge. Through a medium of replicating quantum-like mechanics in classical systems, it may be possible to understand the exact point a low mass star will supernova and at what angle.

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