



## Caustics, Collisions and the Stokes Trap

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The relative velocity of particles suspended in a turbulent flow increase very abruptly when the Stokes number (ratio of stopping time to correlation time) exceeds unity. We explain this effect in terms of the generation of fold caustics in the velocity field of the particles. We show that the production of caustics is an activated process, related to the Kramers model for chemical reactions. The results are applied to rainfall from cumulus clouds. We also describe a new theory, the Stokes trap, describing collisions of particles which may fragment on impact. This may be help to explain the formation of planets.