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# Henri Gouin (Université d'Aix-Marseille) - A theoretical model of Leidenfrost's temperature

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The Leidenfrost effect is a phenomenon in which a liquid, poured onto a surface significantly hotter than the liquid's boiling point, produces a layer of vapor that prevents the liquid from rapid evaporation. Rather than making physical contact, a drop of water levitates above the surface.

The temperature above which the phenomenon occurs is called Leidenfrost's temperature. The reason for the existence of Leidenfrost's temperature, which is much higher than the boiling point of the liquid, is not fully understood and predicted. Here we prove that Leidenfrost's temperature corresponds to a bifurcation in the solutions of equations describing evaporation of a non-equilibrium liquid–vapor interface. For water, the theoretical values of obtained Leidenfrost's temperature, and that of the liquid bulk which is smaller than the boiling point of liquid, fit the experimental results found in the literature.