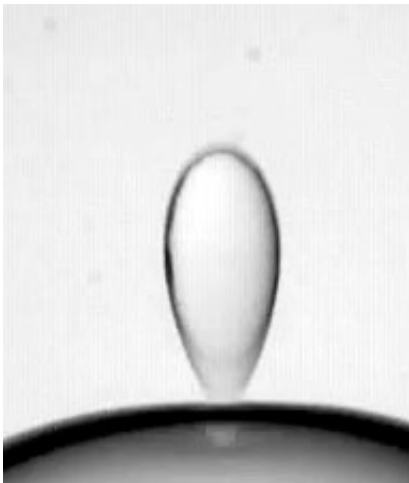# Award funds research on the mysteries of charged droplets

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This pictures shows a water droplet bouncing due to an applied electric field. Credit: William Ristenpart/UC Davis

A UC Davis chemical engineer has won a five-year, $420,000 early career development award from the National Science Foundation to support research on electrical charges of fluid droplets.

William Ristenpart, an assistant professor who has appointments in both the UC Davis Department of Food Science and Technology and the Department of Chemical Engineering and Materials Science, uses high-speed video and a high-resolution electrochemical measuring technique known as "chronocoulometry" to answer fundamental questions about how droplets of various liquids acquire an electrical charge.

Findings from these studies are expected to have applications in a number of fields including petroleum and food-oil processing, and manufacture of microchips that are capable of performing multiple laboratory functions.

"The amount of charge obtained by metal spheres has been known since the time of Maxwell in the 1860s, but 150 years later, we still don't understand charge transfer into liquid drops," Ristenpart said. "I'm excited that this research will shed light on a fundamental problem with applications ranging from food science to atmospheric science."

Ristenpart's research team investigates the physical, chemical and biological phenomena of fluids, including fluid motion caused by electrical fields, how different food metabolites affect red blood cells, and the behavior of fluids at the microminiaturized scale.

Provided by UC Davis