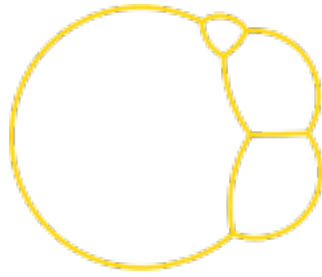


## Isoperimetric Problems



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### The charged liquid drop: a dynamic approach

*Tuesday, 21 June 2022 17:00 (50 minutes)*

We study the motion of charged liquid drop in three dimensions where the equations of motions are given by the Euler equations with free boundary with an electric field. This is a well-known problem in physics going back to the famous work by Rayleigh. Due to experiments and numerical simulations one may expect the charged drop to form conical singularities called Taylor cones, which we interpret as singularities of the flow. In this paper, we study the well-posedness and regularity of the solution. Our main theorem is in the spirit of the Beale-Kato-Majda criterion and roughly states that if the flow remains  $C^{1,\alpha}$ -regular shape and the velocity remains Lipschitz-continuous, then the flow remains smooth.

This is a joint work with Vesa Julin.

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