Some "exotic" solutions to a nonlinear elliptic equation, and applications to plasma equilibria

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This talk will cover two unusual types of solution to the equation $-\Delta u = e^{-u}$, and variants of it, in two dimensions.

1. Large solutions (aka boundary blow-up solutions) are defined on a bounded domain, but take infinite values on the boundary. Previous existence and uniqueness results are extended to polygonal domains.
2. The second type of solution is defined in an unbounded domain with infinite area, and does not fit in a variational framework. Existence follows from an ad hoc argument and uniqueness fails.

Both types of solution appear when dealing with asymptotic questions in plasma equilibria in presence of a sharp conducting end.

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