On the Hasse principle for cubic surfaces

Homogeneous cubic forms differ from quadratic forms in many aspects. One of them is that the Hasse principle does not always hold.

In this talk, I will report on constructions for cubic forms in four variables, geometrically corresponding to cubic surfaces, for which the Hasse principle fails. The first such examples have been devised by Swinnerton-Dyer in 1962, but many more were found recently.