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On the distribution of the maximum of exponential and Kloosterman sums

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In this talk, we shall present recent results concerning the distribution of the maximum of partial sums of certain cubic exponential sums, commonly known as "Birch sums". The proofs use a blend of probabilistic methods, Fourier analytic techniques, and deep tools from algebraic geometry. We also discuss ongoing work with D. Bonolis, where we obtain similar results for the maximum of partial sums of Kloosterman sums. As an application, we exhibit large values of partial sums of Birch and Kloosterman sums, which we believe are best possible.

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