The number of Gallai colorings

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An edge coloring of the complete graph $K_n$ is called a Gallai coloring if it does not contain any rainbow triangle, that is, a triangle in which all three edges have distinct colors. Given a set of $k$ colors and integer $n$, we are interested in the number of Gallai colorings of $K_n$ with colors from the given set. In particular, we show that for $k$ at most exponential in $n$, namely, $k < 2^{n/4300}$, almost all Gallai colorings use at most 2 colors. Interestingly, this statement fails for $k > 2^{n/2}$.

This is joint work with Josefran O. Bastos and Fabrício S. Benevides (University of Ceará, Brazil).

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