

Department of Mathematics, BGU

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# Colloquium

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*On Sunday, December ,7 2025*

*At 12:00 – 13:00*

*In Math 101-*

Yaakov Malinovsky (University of Maryland)

will talk about

## **Negative Dependence in Tournaments, Distribution of Extreme Scores, and Uniqueness of the Maximum**

Abstract: Negative dependence among participants' outcomes arises naturally in probabilistic models of tournaments and plays an important role in various asymptotic results, including limit theorems, Poisson approximations, and the behavior of extremal scores. In particular, the property of negative orthant dependence has been shown in several works for different tournament models, usually requiring a separate proof in each case. In this work, we present a unified and more general approach by establishing the stronger property of negative association. This stronger notion of dependence allows us to derive limit distributions for order statistics, such as the maximum and the second-highest scores, even though their exact distributions are not available for general tournament sizes. We illustrate our approach using the round-robin tournament model

(paired-comparison model in statistics). We also resolve an open problem and prove that the probability of having a unique winner tends to one as the number of players grows.

**Please Note the Unusual Day and Time!**