

PROJECT SUMMARY

This project concerns deep connections between fundamental questions in number theory, analytic properties of L-functions, and random matrix theory. The investigators will undertake a series of projects aimed at proving explicit arithmetic consequences of, and equivalences to, the random matrix conjectures for zeros of L-functions. These results will lead to significant progress on long-standing questions in arithmetic. Conversely, progress on these arithmetic questions will lead to new results in random matrix theory.

The work in this proposal is motivated by questions in number theory. However, the projects touch on several areas of mathematics and mathematical physics, leading to benefits far beyond the initial scope. This work will also benefit the wider mathematical community through the training of graduate students and postdoctoral fellows, the opportunity for students to participate in undergraduate research, and through a workshop and conference designed to introduce graduate students and postdocs to new developments in these fields.