**Five-Year Plan: Research, Teaching, and Service**

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**Research**

Over the next five years, I plan to continue my longstanding program of advancing experimental and computational mathematics, with particular emphasis on algorithmic and automated approaches to discovery and proof. My work has consistently aimed to challenge traditional boundaries between human and computer-generated mathematics, and I intend to deepen this direction.

A central focus will be the further development of symbolic and semi-rigorous methods for discovering and proving identities, especially in combinatorics, special functions, and discrete probability. I plan to expand existing software tools and create new ones that automate conjecture generation, asymptotic analysis, and even full proofs where feasible. These tools will be made publicly available, continuing my commitment to open mathematics.

In addition, I will pursue several thematic research directions:

Automated proof techniques in combinatorics and number theory, extending the scope of computer-assisted mathematics.

Experimental mathematics approaches to longstanding enumeration problems.

The development of new paradigms for semi-rigorous mathematics, where overwhelming computational evidence plays a central role.

Continued collaboration with colleagues and students on projects that blend classical combinatorics with modern computational tools.

I also plan to continue disseminating my work through both traditional journal publications and less conventional platforms, including my personal website and electronic journals, maintaining my commitment to rapid and open communication of mathematical ideas.

**Teaching**

My teaching philosophy emphasizes clarity, enthusiasm, and the integration of research and education. Over the next five years, I will continue teaching a range of undergraduate and graduate courses, including combinatorics, discrete mathematics, and experimental mathematics.

A major goal is to further integrate computational and experimental methods into the curriculum. I plan to:

Develop new course materials that introduce students to symbolic computation and experimental

mathematics early in their training.

Incorporate programming and algorithmic thinking into traditional mathematics courses.

Mentor undergraduate and graduate students in research projects that can lead to publications, continuing my strong record of student collaboration.

I am particularly committed to making advanced mathematical ideas accessible and engaging. My courses will continue to emphasize active learning, exploration, and the use of computers as a legitimate tool for mathematical discovery.

I also plan to expand online resources, including lecture notes, software, and recorded lectures, to reach a broader audience beyond Rutgers. This aligns with my long-term commitment to democratizing access to mathematical knowledge.

**Service**

My service activities will continue to support the department, the university, and the broader mathematical community.

In particular, the Experimental Mathematics Seminar, now via Zoom, is running continuously since 2003 and had lots of good talks. I plan to continute it and get good speakers.