

## Academic Promotion Letter of Recommendation

Sept. 10, 2016

Professor Hugo J. Junghenn  
Department of Mathematics  
George Washington University  
Washington, D.C., 20052

Dear Professor Junghenn,

This is a letter of recommendation on behalf of Dr. Rodica Simion, in support of her promotion to full Professor at GW.

Let me start with a word about Rodica's field, algebraic combinatorics. This field is one of the fastest growing areas in mathematics both in volume, quality, and prestige. What can be a better proof of the centrality of this area than the fact that this full year, it is the subject matter of the prestigious Mathematical Science Research Institute (MSRI) at Berkeley, sharing the honor with low-dimensional topology. And what can be a better proof of the eminence of Rodica than the fact that she is one of the main organizers of this special year, along with Richard Stanley and several other distinguished combinatorialists.

I have known Rodica since her Ph.D., and watched her professional development from promise to fulfillment. She was always very deep, and has gotten deeper and deeper as the years went by. She also became broader and broader and now is one of the greatest experts in the world in MIT-style, abstract, combinatorics, while at the same time is still one of the leaders in classical enumeration and bijective combinatorics.

Her breadth and depth were manifest this June when she gave a plenary talk at the SIAM meeting on Discrete Mathematics, in front of an audience of several hundred participants, that I was fortunate to attend. In a spell-binding lucid talk, she outlined the fascinating connection between convex polytopes and enumeration. I just received the paper that was based on the lecture. It is a masterpiece of exposition and research.

Rodica was a pioneer in enumerating permutations with forbidden patterns. Her seminal paper with Frank Schmidt is often cited, and lead to much further work by many researchers. This is now a full-fledged area in enumerative combinatorics.

Rodica is also a great expert in combinatorial special function theory. Her work with Dennis Stanton is first-class. They probably hold the world-record for the number of meaningful combinatorial parameters one can put on special functions: the octa-basic Laguerre polynomials are amazing.

Rodica has also mastered the powerful Schutzenberger methodology as can be witnessed by her very elegant papers with Alain Denise and Serge Dulucq.

Another recent breakthrough, that will make Rodica immortal, is the simsun permutations, so named by Richard Stanley, after Rodica simion and Sheila sundram. These permutations are widely studied and discussed by Stanley and his students, and I am sure will find many more applications.

Yet another noteworthy recent work is the one on  $q$ -Schroeder numbers with Bonin and Shapiro. The Schroeder numbers are of great importance in computer science and logic (and even linguistics!), and the  $q$ -analogs that they found are very natural and fruitful, and I am sure would lead to much further research.

It is very rare to find somebody as creative and strong in research as Rodica, who at the same time is a superb organizer. Rodica has organized many important conferences, in addition to the MRSI special year that I mentioned above. All the conferences chaired or co-chaired by Rodica are paradigms of perfect organization. She emerged as a true leader in her field in more than one sense.

To sum up, Rodica Simion is an extremely successful and active researcher in an important and difficult field, who has reached world-class prominence. She is also a conscientious human being, a gifted teacher, and superb organizer. Her stature and prominence make her very eligible to be promoted to Professor.

If you have any further questions, I will be glad to answer them. My phone numbers are (609)921-7873 (home), (215)204-7588 (office), and my e-mail address is [zeilberg@math.temple.edu](mailto:zeilberg@math.temple.edu).

Doron Zeilberger