

C&O 631 PROJECT, Spring term 2017

Please select a research paper on symmetric functions or a related topic, either a preprint on the arXiv, or that has appeared in a mathematics or physics journal, and check with me that your paper is OK. Read the paper and write an analysis of it (say, 10 or more typeset pages, or 20 or more handwritten pages), and submit it to me by 4:30 pm, Friday, July 28; please schedule a half hour interview with me for the following week, when we can discuss your analysis and insights about the paper. As on the Course Outline, this will be worth 30% of your CO 631 grade.

This is a very active research area, so there is lots of choice - indeed, you may already be studying such a paper as part of your own thesis work. However, if you're not sure where to start, here are some papers that I have found quite notable myself. You may find that one of these gives you a pointer to a paper that you like, or you may even choose one of these for your project.

- Per Alexandersson and Valentin Feray, Shifted symmetric functions and multirectangular coordinates of Young diagrams, *Journal of Algebra* 483, pages 262 – 305, 2017.
- Jean-Christophe Aval, Valentin Feray, Jean-Christophe Novelli and Jean-Yves Thibon., Quasi-symmetric functions as polynomial functions on Young diagrams, with *Journal of Algebraic Combinatorics* 41, pages 669 – 706, 2015.
- Valentin Feray and with Piotr Sniady, Asymptotics of characters of symmetric groups related to Stanley character formula, *Annals of Mathematics* 173, pages 887 – 906, 2011.
- J. Haglund, K. Luoto, S. Mason, and S. Van Willigenburg, Refinements of the Littlewood-Richardson rule, *Trans. Amer. Math. Soc.* 363, 1665 – 1686, 2011.
- Phil Hanlon, Richard Stanley and John Stembridge, Some combinatorial aspects of the spectra of normally distributed random matrices, *Contemporary Math.* 138, pages 151 – 174, 1992.
- Sho Matsumoto and Jonathan Novak, Jucys-Murphy Elements and Unitary Matrix Integrals, *Int. Math. Res. Not.* 2, pages 362 – 397, 2013.
- Andrei Okounkov, Infinite wedge and random partitions, *Selecta Math. New Series* 7, pages 57 – 81, 2001.
- Richard Stanley, Some combinatorial properties of Jack symmetric functions, *Advances Math.* 77, pages 76 – 115, 1989.
- John Stembridge, Nonintersecting paths, pfaffians, and plane partitions, *Advances Math.* 83, pages 96 – 131, 1990.

May 24, 2017