

YUE CAI

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EDUCATION

University of Kentucky, Lexington, Kentucky, USA
Ph.D. Mathematics, May 2016 (expected)

- Advisor: Professor Margaret Readdy
- Dissertation title: “New Perspectives of Quantum Analogues”

Zhejiang University, Hangzhou, China

- B.A., Mathematics, June 2010

ACADEMIC EXPERIENCE

University of Kentucky, Lexington, Kentucky, USA

- Teaching Assistant and Research Assistant

Zhejiang University, Hangzhou, China

- Student Research and Training Program in Zhejiang University, Summer 2007–Fall 2008.

AWARDS AND FELLOWSHIPS

University of Kentucky, Lexington, Kentucky

- Recipient of the 2014 *Wimberly C. Royster Teaching Assistant Award*, 2014. This annual award is presented by the University of Kentucky Department of Mathematics for excellence in teaching and research potential.
- *Summer Research Assistant* supported by Prof. Richard Ehrenborg’s National Security Agency grant H98230-13-1-0280, June–July 2013
- Recipient of the *Max Steckler Fellowship*, 2013–2014. This annual award is presented by the University of Kentucky Department of Mathematics for doctoral students in good standing.
- *Summer Research Fellowship*, June–July 2012 supported by the University of Kentucky Department of Mathematics.

- Recipient of *Daniel R. Reedy Quality Achievement Award*, 2010–2013. This award is presented by the University of Kentucky for outstanding first-year graduate students. Award is renewable for a total of three years for doctoral students in good standing.

Zhejiang University, Hangzhou, China

- University Scholarship, 2006–2009
- Honors student, Chu-Kochen Honors College, Fall 2006–Summer 2008

RESEARCH INTERESTS

Algebraic combinatorics, q -analogues, poset topology

RESEARCH VISITS

Princeton University Mathematics Department

- May 2015 (5 days), partially supported by Prof. Margaret Reedy’s Simons Foundation grant #206001 and the Princeton University Mathematics Department.
- December 2014 (5 days), partially supported by Prof. Margaret Reedy’s Simons Foundation grant #206001 and the University of Kentucky Mathematics Department.

CONFERENCE ORGANIZATION

- Teaching Assistant for Prof. Reedy’s one-week lecture course on Polytopes, Women and Mathematics Program, **Institute for Advanced Study**, Princeton NJ, May 2013

PUBLICATIONS

- [1] “ q -Stirling numbers: A new view”, with M. Reedy, submitted to *Journal of Combinatorial Theory, Series A*. arXiv:1506.03249, 30 pages.
- [2] “Negative q -Stirling numbers”, with M. Reedy, *Proceedings of the 27th International Conference on Formal Power Series and Algebraic Combinatorics*, Daejeon, South Korea, July 2015, pp. 583–594.
- [3] “ q -Stirling identities revisited”, with M. Reedy, in preparation, 12 pages.
- [4] “A q -($1 + q$) analogue of the major index”, in preparation.

PRESENTATIONS AND TALKS

- “On q -($1+q$)-analogues”, *Lake Michigan Combinatorics Workshop*, **Purdue University**, March 2016.
- “ q -Stirling numbers: A new view”, *Poster Session, Triangle Lectures in Combinatorics*, **Duke University**, October 2015.
- “Negative q -Stirling numbers”, *Poster Session, FPSAC 2015*, **Korea Advanced Institute of Science and Technology**, Daejeon, South Korea, July 2015.
- “ q -Combinatorics: A new view”, *Combinatorics Seminar*, **Princeton University**, May 2015.
- “Negative q -Stirling numbers”, *Graduate Student Combinatorics Conference*, **Auburn University**, April 2014.
- “Negative q -analogues”, *AMS Southeastern Spring Sectional Meeting*, Special Session on Geometric and Algebraic Combinatorics, **University of Tennessee, Knoxville**, Knoxville, TN, March 2014.
- “Negative q -analogues”, *Discrete CATS seminar*, **University of Kentucky**, March 2014.
- “A combinatorial approach for q -Stirling numbers”, *Discrete CATS seminar*, **University of Kentucky**, November 2012.
- “The negative q -binomial”, *Discrete CATS seminar*, **University of Kentucky**, April 2012.

CONFERENCES ATTENDED

- *The 27th International Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2015)*
 - **Korea Advanced Institute of Science and Technology**, Daejeon, South Korea, July 2015
- *The 2015 Midwest Combinatorics Conference*
 - **University of Minnesota**, Minneapolis MN, May 2015
- *Wachsfest, Conference in honor of Michelle Wachs*
 - **University of Miami**, Coral Gable FL, January 2015
- *Stanley@70 Conference*
 - **Massachusetts Institute of Technology**, Cambridge MA, June 2014
- *2013 Program for Women and Mathematics*
 - **Institute for Advanced Study**, Princeton NJ, May 2013

- *Graduate Student Combinatorics Conference*
 - **Auburn University**, Auburn AL, April 2014
 - **University of Minnesota**, Twin Cities MN, April 2013
- *Triangle Lectures in Combinatorics*, travel funded by NSF conference grant
 - **Duke University**, Durham NC, October 2015
 - **High Point University**, High Point NC, October 2014
 - **North Carolina State University**, Raleigh NC, September 2013
 - **Wake Forest University**, Winston-Sale NC, February 2013
 - **North Carolina State University**, Raleigh NC, September 2012
 - **Duke University**, Durham NC, February 2012

TEACHING EXPERIENCE

Primary Instructor: Duties included designing syllabi, writing and grading homework and exams, lecturing and leading class discussions, and holding office hours.

- *Math 162, Finite Math*, University of Kentucky, Spring 2013

Workshop Leader: Math Excel Program. Held enriched problem-solving workshops for 26 students 4.5 hours a week.

- *Math 113, Calculus I, Math Excel*, University of Kentucky, Spring 2015
- *Math 113, Calculus I, Math Excel*, University of Kentucky, Fall 2014

Recitation Leader: Duties included leading recitation sections, grading quizzes and exams, and holding office hours.

- *Math 213, Calculus III*, University of Kentucky, Fall 2015
- *Math 213, Calculus III*, University of Kentucky, Spring 2014
- *Math 213, Calculus III*, University of Kentucky, Fall 2013
- *Math 162, Finite Math*, University of Kentucky, Spring 2013
- *Math 213, Calculus III*, University of Kentucky, Fall 2012
- *Math 213, Calculus III*, University of Kentucky, Spring 2012
- *Math 114, Calculus II*, University of Kentucky, Fall 2011
- *Math 114, Calculus II*, University of Kentucky, Spring 2011
- *Math 113, Calculus I*, University of Kentucky, Fall 2010

SEQUENCES

I have a sequence in *The On-Line Encyclopedia of Integer Sequences*, ed. by N. J. A. Sloane.

- **A256161** (Triangle of allowable Stirling numbers of the second kind $a(n, k)$): 1, 1, 1, 1, 2, 1, 1, 3, 4, 1, 1, 4, 11, 6, 1, 1, 5, 26, 23, 9, 1, 1, 6, 57, 72, 50, 12, 1, 1, 7, 120, 201, 222, 86, 16, 1, 1, 8, 247, 522, 867, 480, 150, 20, 1, 1, 9, 502, 1291, 3123, 2307, 1080, 230, 25, 1, . . .

OUTREACH

- Committee Member of Math Movie of the Month. Duties include advertising, pre-show set up, after-show clean up.
- Panel Member for first year graduate orientation session “Becoming a Professional”, Fall 2015.
- Assisted Graduate Student Recruitment in Spring 2015.
- Assisted with mentoring portion of the 2013 Women and Mathematics program at the Institute for Advanced Study.
- Assisted Faculty Recruitment in Spring 2013.

PROFESSIONAL MEMBERSHIPS

- American Mathematical Society.
- Association for Women in Mathematics, University of Kentucky chapter.

REFERENCES

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