

## CURRICULUM VITAE

### Kağan Kurşungöz

Associate Professor of Mathematics

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#### Personal Information:

Date of Birth: June 18, 1981  
Place of Birth: Eskişehir, Turkey  
Citizenship: Republic of Turkey

#### Education:

PhD Mathematics, The Pennsylvania State University, May 2009  
Thesis Adviser: George Andrews  
Thesis Title: Parity Considerations in Andrews-Gordon Identities and the  $k$ -Marked Durfee Symbols

B.S. (High Honor) Computer Science and Engineering (with Minor in Mathematics)  
Sabancı University, İstanbul, Turkey, May 2004

#### Employment:

2015- Associate Professor, Faculty of Engineering and Natural Sciences, Sabancı University, İstanbul.

2012-2015 Assistant Professor, Faculty of Engineering and Natural Sciences, Sabancı University, İstanbul.

2011 - 2012 Visiting Assistant Professor, Faculty of Engineering and Natural Sciences, Sabancı University, İstanbul.

2009 - 2011 Lecturer, Department of Mathematics, The Pennsylvania State University

Summer 2006 Graduate Lecturer, Department of Mathematics, The Pennsylvania State University

## Curriculum Vitae, Kağan Kurşungöz

2004 - 2009 Graduate Teaching Assistant, Department of Mathematics,  
The Pennsylvania State University

### **Scholarships and Grants:**

Fall 2015 -  
Spring 2017 Researcher in TÜBİTAK 1001 Project no. 114E569  
(Principal Investigator: Hüsnü Yenigün, Sabancı Üniv.)

Spring 2010 First Year Experience Faculty Appreciation Award,  
Office of Residence Life, The Pennsylvania State University.

Spring 2009 Pritchard Dissertation Fellowship, Department of Mathematics,  
The Pennsylvania State University.

Summer 2007,  
Summer 2008 Graduate Researcher, Department of Mathematics,  
The Pennsylvania State University.

1999-2004 Honor Scholarship, Sabancı University, Istanbul, Turkey.

### **Teaching Experience:**

#### **Sabancı University:**

Undergraduate: Calculus I-II, linear algebra, discrete mathematics, introduction to combinatorics, introductory or graduation project courses, (MATH 101, 102, 201, 204, 318, PROJ 102, ENS 491, 492).

Graduate: Number Theory, Algebraic combinatorics (MATH 517, 561).

#### **Penn State:**

Undergraduate: College algebra, single and multivariable calculus to engineers, multivariable business calculus, linear algebra (MATH 021, 022, 111, 140, 141, 220, 230, 232).

#### **TA Training:** (All events took place at Penn State University, Dept. of Math.)

November 2008 “Observations on Some Things That Work”, George E. Andrews,

November 2006 “How to Engage Your Students and Assess Their Learning at the Same Time”  
Neill Johnson, Schreyer Institute for Teaching Excellence.

March 2006 Panel Discussion “Mathematician at the Liberal Arts College: Challenges and Rewards”  
David Bressoud, Rachel Hall, James Sellers.

November 2005 “Teaching Development Using Case Studies Method”,  
Solomon Friedberg, Boston College.

August 2004 Completed the TA training program in Department of Mathematics.

**Research:**

Enumerative combinatorics, and its applications to partition theory and  $q$ -series. This includes combinatorial explanations to existing partition and  $q$ -series identities and interpretations to partition generating functions, sieve theoretic or other interpretations of  $q$ -series with arbitrary coefficients (coefficients that are not necessarily positive integers, such as rational functions of one or more parameters). Classical analysis of  $q$ -series. My PhD thesis is on a new construction of the series side of the Andrews-Gordon Identities and the proof of a conjecture by Andrews as an application.

**Publications:**

(with Ae Ja Yee) A Generalization of Algorithm-Z with an Application, in preparation.

Bressoud Style Identities for Regular Partitions and Overpartitions, submitted.  
<http://arxiv.org/abs/1409.5221>

Radial Limits of Partial Theta and Similar Series, accepted, The Ramanujan Journal.  
<http://arxiv.org/abs/1507.00198v2>

Andrews Style Partition Identities, The Ramanujan Journal, 16(1-2), pp.249—265, February 2015.  
<http://dx.doi.org/10.1007/s11139-014-9603-6>  
<http://arxiv.org/abs/1302.6702>

(with James Sellers) Variations on a Theorem of Bressoud, Annals of Combinatorics, 18(1), 2014, pp. 117—126.  
<http://link.springer.com/article/10.1007%2Fs00026-013-0215-4>

(with Ae Ja Yee) Alternating Permutations and the  $m$ th Descents, Discrete Mathematics, 311(22), 2011, pp.2610—2622.  
<http://dx.doi.org/10.1016/j.disc.2011.08.005>

Counting  $k$ -Marked Durfee Symbols, Electronic Journal of Combinatorics, 18(1), 2011, P41.  
[http://www.combinatorics.org/Volume\\_18/PDF/v18i1p41.pdf](http://www.combinatorics.org/Volume_18/PDF/v18i1p41.pdf)

(with Cilanne Boulet) Symmetry of  $k$ -Marked Durfee Symbols, International Journal of Number Theory, 7(1), 2011, pp. 215—230.  
<http://dx.doi.org/10.1142/S1793042111003971>

Cluster Parity Indices of Partitions, the Ramanujan Journal, 23(1-3), pp. 195—213.  
DOI: 10.1007/s11139-009-9209-6.

Parity Indices of Partitions, Acta Arithmetica, 144(2), 2010, pp. 105—124.

Parity Considerations in Andrews-Gordon Identities, European Journal of Combinatorics, 31(3), April 2010, pp. 976—1000.  
<http://dx.doi.org/10.1016/j.ejc.2009.06.002>

**Attended Conferences:**

AMS Fall Southeastern Sectional Meeting, Nov. 2015, Rutgers University, NJ.  
Special Session on Multiple Combinatorial Numbers and Associated Identities.

XXVIII. Ulusal Matematik Sempozyumu (28<sup>th</sup> National Mathematics Symposium), Sep. 2015, Akdeniz Üniversitesi, Antalya, Turkey.

Antalya Algebra Days XVII, May 2015,  
Nesin Mathematics Village, Şirince, İzmir, Turkey.

SASTRA Ramanujan Conference, Dec. 2014,  
SASTRA University, Srinivasa Ramanujan Centre, Kumbakonam, Tamil Nadu, India.

Geometric and Enumerative Combinatorics, Nov. 2014.  
IMA, University of Minnesota, MN.

AMS Fall Southeastern Sectional Meeting, Nov. 2014, University of North Carolina Greensboro, NC.  
Special Session on Multiple Combinatorial Numbers and Associated Identities.

Workshop on Graph Theory and its Applications IV, Oct. 2014,  
IMBM, Boğaziçi University, İstanbul, Turkey.

International Conference on Algebra and Number Theory, Aug. 2014,  
Samsun Ondokuz Mayıs University, Samsun, Turkey.

Antalya Algebra Days XVI, May 2014, Antalya, Turkey.

AMS Fall Eastern Sectional Meeting, Oct. 2013, Temple University, Philadelphia, PA.  
Special Session on Multiple Analogues of Combinatorial Special Numbers and Associated Identities.

The Combinatorics of  $q$ -Series and Partitions, conference in honor of G. Andrews' 75<sup>th</sup> birthday, Aug. 2013, Nankai University, Tianjin, P.R. China.

Ramanujan 125, University of Florida, Nov. 2012, Gainesville, FL.

XXV. Ulusal Matematik Sempozyumu (25<sup>th</sup> National Mathematics Symposium), Sep. 2012, Niğde Üniversitesi, Niğde, Turkey.

INTEGERS Conference, University of West Georgia, Carrollton, GA, Oct. 2011.

2010 Joint Mathematical Meetings, New Orleans LA, Jan. 2011,  
AMS Session on Combinatorics and Graph Theory, IV.

Z=60, Conference in Honor of Doron Zeilberger's 60<sup>th</sup> Birthday, May 2010, Rutgers University, New Jersey.

2010 Joint Mathematical Meetings, San Francisco CA, Jan. 2010,  
AMS Session on Discrete Mathematics, I.

AMS Fall Eastern Section Meeting, October 2009, The Pennsylvania State University.

Curriculum Vitae, Kağan Kurşungöz

Special Session on  $q$ -Series and Related Areas in Enumerative Combinatorics and Number Theory, II.

Higher Degree Forms Conference, May 2009, University of Florida, Gainesville.

5<sup>th</sup> Annual Graduate Student Combinatorics Conference, March 2009, University of Kentucky.

Quadratic Forms, Sums of Squares, Theta Functions, and Integral Lattices Workshop and Conference, March 2009, University of Florida, Gainesville.

2009 Joint Mathematical Meetings, Washington DC, Jan. 2009,  
AMS Session on Combinatorics, I.

Combinatory Analysis 2008: Partitions,  $q$ -series, and Applications,  
A Conference in Honor of George Andrews' 70th Birthday, December 2009,  
The Pennsylvania State University.

4<sup>th</sup> Annual Graduate Student Combinatorics Conference, April 2008, University of California Davis.

3<sup>rd</sup> Annual Graduate Student Combinatorics Conference, April 2007, University of Washington.

6<sup>th</sup> International Conference on Lattice Path Combinatorics and Applications,  
East Tennessee State University.

**Presentations:**

Toplamalı sayılar teorisi

Jan. 2016, İstanbul Erkek Lisesi Numune-i Terakki Bilim Günleri, İstanbul.  
(this talk was delivered in Turkish)

Ramanujan'ın Hayatı ve Matematiği,

... Dec. 2015, Gazi Üniversitesi Matematik Topluluğu Seminerleri.  
(this talk was delivered in Turkish)

... Mar. 2015, İstanbul Üniversitesi Matematik Bölümü Genel Seminerleri.  
(this talk was delivered in Turkish)

Andrews and Bressoud Style Identities for Partitions and Overpartitions,

... Nov. 2015, Rutgers University, DIMACS Experimental Math. Seminar  
(this talk is videotaped, and posted on <https://vimeo.com/146412991> )

... Nov. 2015, Number Theory Seminar, Department of Mathematics,  
University of Illinois at Urbana-Champaign.

... Sep. 2015, XVIII. National Mathematics Symposium, Akdeniz Univ., Antalya, Turkey.  
(this talk was delivered in Turkish)

... May 2015, Antalya Algebra Days XVII, Şirince, İzmir, Turkey.

... Dec. 2014, SASTRA Ramanujan Conference, Kumbakonam, India.

... Nov. 2014, Geometric and Enumerative Combinatorics, IMA, U of M, Minnesota, MN.  
(poster presentation)

Regular Partition - Overpartition identities via Rogers-Ramanujan dissections.

Nov. 2015, AMS Fall Southeastern Sectional Meeting, Rutgers Univ, NJ.

Radial Limits of False Theta and Similar Series,

... Nov. 2015, Graduate Student Seminar, Department of Mathematics,  
University of Illinois at Urbana-Champaign.

... Nov. 2015, PSU Department of Math.

... Mar. 2015, MSGSÜ Matematik Bölümü Genel Seminerleri.

... Feb. 2015, Boğaziçi Univ. Department of Mathematics Colloquium.

... Aug. 2014, ICA, Samsun Ondokuzmayıs Üniversitesi, Samsun.

Ramanujan meşrebinde sayılar teorisi (Number theory in the spirit of Ramanujan)

(following the book by Bruce C. Berndt)

Jul.-Aug. 2015, Nesin Matematik Köyü Üniversite Yaz Okulu, Şirince.  
(the lectures were delivered in Turkish)

Örneklerle problem çözme (Problem solving through problems)

(following the book by Loren C. Larson)

Jul.-Aug. 2015, Nesin Matematik Köyü Lise Yaz Okulu, Şirince.  
(the lectures were delivered in Turkish)

Cerny Conjecture and Recent Developments,

Feb. 2015, Gebze Teknik Üniversitesi Genel Seminer.

A One-Parameter Generalization of Dilcher's Identity,

Nov. 2014, AMS Fall Southeastern Sectional Meeting, UNC Greensboro, NC.

Curriculum Vitae, Kağan Kurşungöz

Tamsayı Parçalanışları ve  $q$ -serileri (Integer Partitions and  $q$ -series)

Oct. 2014, Workshop on Graph Theory and its Applications IV, IMBM, İstanbul.  
(the lectures were delivered in Turkish)

Sahiden Sayılan İspatlar (Proofs That Really Count)

(following the book by A. Benjamin and J. Quinn)

Aug. 2014, Nesin Matematik Köyü Üniversite Yaz Okulu, Şirince.  
(the lectures were delivered in Turkish)

Sözsüz İspatlar (Proofs without Words)

(following the book by R. Nelsen)

Aug. 2014, Nesin Matematik Köyü Lise Yaz Okulu, Şirince.  
(the lectures were delivered in Turkish)

Rogers - Ramanujan Identities in Historical and Combinatorial Perspective,

... Mar. 2014, Gebze Yüksek Teknoloji Enstitüsü Matematik Bölümü, Gebze.  
(this talk was delivered in Turkish)

... Mar. 2014, Ankara Üniversitesi Matematik Bölümü, Ankara.  
(this talk was delivered in Turkish)

... Apr. 2013, Koç University Department of Mathematics.

Andrews' Style Partition Theorems,

... Dec. 2013, Bilkent University Department of Mathematics, Ankara.

... Oct. 2013, PSU Department of Math.

... Aug. 2013,  $q$ -2013, Nankai University, Tianjin.

On Andrews' Formula Relating Symmetrized Moments of Ranks and the  $k$ -Marked Durfee Symbols,

... Nov. 2013, Sabancı University Mathematics Colloquium, İstanbul.

... Dec. 2012, Matematik Mühendisliği Bölümü, İTÜ, İstanbul.

... Nov. 2012, İstanbul Number Theory Meetings, İstanbul.

$q$ -Multinomial Coefficients in the Context of Rogers-Ramanujan Identities,

... Oct. 2013, AMS Fall Eastern Sectional Meeting, Temple Univ., Philadelphia.

A unified method to prove Rogers-Ramanujan generalizations,

... Jan 2013, METU Cyprus, Güzelyurt.

... Jan 2013, RISC, Linz.

A combinatorial construction of the series side of the Andrews-Gordon Identities,

... Nov. 2012, Matematik Bölümü, ODTÜ, Ankara.

... March 2012, Matematik Bölümü, Yeditepe Üniversitesi, İstanbul.

... December 2011, Mathematics Colloquium, Sabancı University, İstanbul.

... January 2011, Michigan Technological University, Department of Mathematics.

Andrews Style Partition Theorems for Regular and Overpartitions,

Nov. 2012, Ramanujan 125, University of Florida, Gainesville.

Hypergeometric Series, Basic Hypergeometric Series, and Permutation Statistics,

Oct. 2012, Sabancı University Mathematics Colloquium, İstanbul.

A Generalization of Algorithm-Z with an Application,

Curriculum Vitae, Kağan Kurşungöz

- ... September 2012, XXV. Ulusal Matematik Sempozyumu, Niğde (in Turkish).
- ... February 2011, CAGE: Drexel/Penn/Swarthmore Combinatorics and Algebraic Geometry.
- ... February 2011, Rutgers University, DIMACS Experimental Math. Seminar  
(this talk is videotaped, and posted on <http://www.youtube.com/watch?v=5c5ZrekbySY>  
and <http://www.youtube.com/watch?v=MP2M4zoXUIY> ).
- ... January 2011, AMS-MAA Joint Meetings, New Orleans LA.
- ... December 2010, Department of Mathematics, The Ohio State University.
- ... October 2010, Number Theory Seminar, Department of Mathematics,  
University of Illinois at Urbana-Champaign.
- ... August 2010, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

Combinatorial vs. analytic methods in integer partitions,  
March 2012, Matematik Bölümü, Mimar Sinan Güzel Sanatlar Üniversitesi, İstanbul.

Factorization in Free Monoids,  
(following Stanley's book Enumerative Combinatorics)  
April 2011, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

Towards Generalizing the Rogers-Ramanujan-Gordon Identities,  
March 2011,  $q$ -Series 2011 Conference, Georgia Southern University, Statesboro, GA.

Rational Generating Functions in One Variable,  
(following Stanley's book Enumerative Combinatorics)  
January 2011, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

The Working Principles of Omega Package and Magic Squares,  
(following Andrews and Paule's series of papers on partition analysis)  
April 2010, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

Five Guidelines for Partition Analysis with Applications to Lecture Hall-type Theorems,  
(following paper with the same name by Corteel et.al.)  
February 2010, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

Alternating Permutations and the  $m$ th Descents,  
... January 2010, AMS-MAA Joint Meetings, San Francisco CA.  
... October 2009, AMS Fall Eastern Section Meeting, The Pennsylvania State University.  
... September 2009, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

$k$ -Marked Durfee Symbols and Ramanujan's Mock-Theta Functions,  
April 2009, Algebra and Number Theory Seminar, Department of Mathematics,  
The Pennsylvania State University

Parity Considerations in Andrews-Gordon Identities,  
... March 2009, Quadratic Forms, Sums of Squares, Theta Functions, and Integral Lattices  
Workshop and Conference, University of Florida, Gainesville.



Curriculum Vitae, Kağan Kurşungöz

... October 2008, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University

A  $q$ -Analog of Beckwith's Identity,

March 2009, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University

Counting  $k$ -Marked Durfee Symbols,

January 2009, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University

Two Results on Symmetry of  $k$ -Marked Durfee Symbols,

...June 2008, Mathematics Colloquium, Sabancı University, İstanbul.

...January 2008, Combinatorics and Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University

**Organized Events:**

- Sep. 2015 Junior Mathematicians Convention (Genç Matematikçiler Toplantısı),  
Nesin Mathematics Village, Şirince, İzmir.
- May 2014 Antalya Algebra Days XIV, co-organizer.
- 2008 - 2011 Combinatorics/Partitions Seminar, Department of Mathematics,  
The Pennsylvania State University.

**Memberships:**

- 2013 - Türk Matematik Derneği
- 2009 - 2011 The Pennsylvania State University Alumni Society
- 2005 - Sabanci University Alumni Society
- 2004 - 2011 American Mathematical Society

**Other Professional Activity:**

Refereed numerous research papers for various journals of mathematics (including The Ramanujan Journal, Advances in Mathematics, Journal of Combinatorial Theory Series A, Hacettepe Journal of Mathematics and Statistics, Turkish Journal of Mathematics).

Served as a member in a TÜBİTAK project evaluation panel.

Committee member in

- ... Haydar Can Kaya's MS thesis "Littlewood-Richardson kuralı ve grassmanianların kohomolojisi" (MSGSÜ, Jan. 2016).
- ... Ayşe Selçuk's MS thesis "Private Search over Big Data Leveraging Distributed File System and Parallel Processing" (Jan. 2015).
- ... Türkü Özlüm Çelik's MS thesis "A Drinfeld Modular Interpretation of an Asymptotically Optimal Tower of Curves over Finite Fields" (Jan. 2015).
- ... Ahmed Fuad Abdalal's PhD thesis "Privacy Preserving Data Publishing with Multiple Sensitive Attributes" (Jul. 2012).
- ... Leyla Parlar's MS thesis "Linearized Polynomials over Finite Fields" (May. 2012).
- ... Mehmet Sarıyüce's MS thesis "On Bent and Hyper-Bent Functions" (Feb. 2012).

Co-supervised high-school mathematics projects:

- ... Alara Su Mildan, Kerem Gürbey (TEVİTÖL) "Pascal Üçgenini Kullanarak Çokgen Tabanlı Pascal Piramidi Oluşturma ve Formülize Etme" (2014) (supervisor: Özge Özsoy)
- ... Dicle Ece Nacitarhan (TEVİTÖL) "Kısıtlanmış Izgara Problemlerinde Izgara Köşegeninin Yolların Sayılmasıyla İlişkilendirilmesi", (2012) (supervisor: Özge Özsoy)  
(this project was a clear 3<sup>rd</sup> in İstanbul Area in TÜBİTAK project competition)

Curriculum Vitae, Kağan Kurşungöz

**Additional Information:**

Computer Skills        C,C++, LaTeX, MATLAB (advanced),  
Mathematica, MAXIMA, Java, VBasic (intermediate)

Languages Spoken     Turkish (native), English (fluent)

**References:**

Dr. George Andrews,

Department of Mathematics, The Pennsylvania State University,  
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University Park, PA, 16802  
tel: +1 (814) 865 6642  
e-mail: [andrews@math.psu.edu](mailto:andrews@math.psu.edu)

Dr. Peter Paule

Research Institute for Symbolic Computation, University of Linz,  
Schloss Hagenberg, 4232 Hagenberg, Austria  
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e-mail: [Peter.Paule@risc.uni-linz.ac.at](mailto:Peter.Paule@risc.uni-linz.ac.at)

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