

# Sang-hyun Kim

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## Education

Ph.D. Mathematics, Yale University, May 2007.

*Dissertation:* Surface Subgroups of Graph Products of Groups and Right-Angled Artin Groups.

*Thesis Advisor:* Andrew J. Casson.

*Readers:* Yair Minsky and Darren Long.

B.S. (1st place) Mathematics, Seoul National University, August 1997.

## Fields of Interest

Geometric and Combinatorial Group Theory, Low-Dimensional Topology.

## Academic Positions

R. H. Bing Instructor, Department of Mathematics, the University of Texas at Austin, Spring 2008 – Current.

Post-Doctoral Fellow (Geometric Group Theory), Mathematics Sciences Research Institute (MSRI), Fall 2007.

## Publications

### *Published/Accepted*

Sang-hyun Kim, On Right-Angled Artin Groups Without Surface Subgroups, *Groups, Geometry and Dynamics*, accepted; arXiv:0811.1946v2.

Sang-hyun Kim, Co-Contractions of Graphs and Right-Angled Artin Groups, *Alg. Geom. Top.* 8 (2008).

### *Preprints (Submitted)*

Sang-hyun Kim, Geometricity and Polygonality in Free Groups, *International Journal of Algebra and Computation*, accepted pending minor revision; arXiv:0910.5019v1.

Sang-hyun Kim and Henry Wilton, Polygonal Words in Free Groups, submitted, arXiv:0910.4709v1.

### *Paper in Preparation*

Sang-hyun Kim, Surface Subgroups of Graph Products of Groups, in preparation.

*Published/Accepted:Related Area*

Chan-Byoung Chae, Sang-hyun Kim and Robert W. Heath Jr., Linear Network Coordinated Beamforming for Cell-Boundary Users, *Proc. of IEEE Workshop on Signal Processing Advances in Wireless Communications (SPAWC), June 21-24, 2009 (Perugia, Italy)* (2009).

Chan-Byoung Chae, Sang-hyun Kim and Robert W. Heath Jr., Network Coordinated Beamforming for Cell-Boundary Users: Linear and Non-linear Approaches, *IEEE Journal of Selected Topics in Signal Processing (J-STSP), Special Issue on Managing Complexity in Multiuser MIMO Systems*, vol. 3, no. 6 (2009).

**Invited Talks***Conference Presentations*

## Gromov's Conjecture on Doubles of Free Groups

*Joint Meeting of Korean Mathematical Society and American Mathematical Society, Special Session on Geometric Structures and Geometric Group Theory, Ewha Womans University, Seoul, Korea, December 18, 2009.*

## Surface Subgroups of Doubles of Free Groups

*International Conference on Geometric & Combinatorial Methods in Group Theory & Semigroup Theory, the University of Nebraska-Lincoln, 20 May 2009.*

## On Polygonal Words and Doubles of Free Groups

*AMS Special Session on Recent Progress in Geometric Group Theory, San Francisco State University, 25 April 2009.*

## Surface Subgroups of Groups Defined by Graphs (poster session)

*Groups and Infinite Graphs, Erwin Schrödinger International Institute, Vienna, Austria, 26 August, 2008.*

*University/Institute Seminars*

*Geometric Group Theory Seminar, Tufts University, 19 January 2010.*

*Joint Topology and Discrete Math Seminar, KAIST, 28 December 2009.*

*Topology Seminar, Konkuk University, 22 December 2009.*

*Topology/Geometry Seminar, Yale University, 27 October 2009.*

*Topology Seminar, The University of Texas at Austin, 31 August, 2009.*

*Topology Seminar, The University of Texas at Austin, 13 April, 2009.*

*Groups and Dynamics Seminar, Texas A&M University, 25 March, 2009.*

*Topology Seminar, The University of Texas at Austin, 27 October, 2008.*

*Topology Seminar, Seoul National University, Korea, 2 June, 2008.*

*Topology Seminar, The University of Texas at Austin, 28 January, 2008.*

*Joint Postdoc Seminar, Mathematics Sciences Research Institute, 19 October 2007.*

*Group Actions Seminar, Yale University, 16 October 2006.*

## Colloquia

*Department Colloquium*, Trinity University, San Antonio, Texas, 18 November, 2008.

## Graduate Student Seminars

Surface Subgroups of Right-Angled Artin Groups

*Graduate Student Seminar*, Yale University, 28 April 2006.

Subgroup Separability of Certain Reflection Groups in Hyperbolic Spaces

*Topology Student Seminar*, Yale University, November 2003.

Surface Groups are LERF

*Topology Student Seminar*, Yale University, March 2003.

## Teaching Experiences

### *the University of Texas at Austin, Department of Mathematics*

Instructor, Differential and Integral Calculus I, Spring 2008, Fall 2008 and Fall 2009.

Instructor, Introduction to Number Theory, Summer 2009.

Instructor, Probability I, Summer 2008 and Spring 2009.

Instructor, Discrete Mathematics, Spring 2008.

(Instructor, Topics in Geometric Group Theory (Graduate Course), *scheduled for Spring 2010.*)

### *Yale University, Department of Mathematics*

Lecturer, Calculus of Functions of One Variable, Fall 2006 and Spring 2007.

Lecturer, Introduction to Functions of Several Variables, Summer 2006.

Lecturer, Calculus of Functions of Several Variables, Fall 2002, Fall 2003, Fall 2004 and Spring 2006.

## Professional Activities

### *Conferences and Workshops Attended*

*Joint Meeting of Korean Mathematical Society and American Mathematical Society*, Ewha Womans University, Seoul, Korea, December 2009.

*International Conference on Geometric & Combinatorial Methods in Group Theory & Semigroup Theory*, the University of Nebraska-Lincoln, May 2009.

*AMS Special Session on Recent Progress in Geometric Group Theory*, San Francisco State University, April 2009.

*Groups and Infinite Graphs*, Erwin Schrödinger International Institute, Vienna, Austria, August 2008.

*Group Theory: Generations*, The City College of New York and The CUNY Graduate Center, September 2007.

*Connections for Women: Geometric Group Theory/Introduction to Geometric Group Theory/Topics in Geometric Group Theory*, MSRI, Fall 2007.

*Connections for Women: Teichmüller Theory and Kleinian Groups/Introduction to Teichmüller Theory and Kleinian Groups/Topics in Teichmüller Theory and Kleinian Groups*, MSRI, Fall 2007.

*Geometric Group Theory (a semester program)*, MSRI, August – December 2007.

*Topology Festival*, Cornell University, May 2006.

*Conference in Hyperbolic Geometry and Geometric Analysis*, Wesleyan University, October 2005.

*Braids, Links, and Mapping Class Groups (conference honoring Joan Birman)*, Columbia University, March 2005.

*Combinatorial Group Theory, Discrete Groups and Number Theory (conference in honor of Professor Gerhard Rosenberger)*, Fairfield University, December 2004.

*Albany Group Theory Conference*, University at Albany, October 2004.

*Non-positive Curvature in Group Theory (principal lecturer: Martin Bridson)*, CBMS Conference, The Rensselaerville Institute, August 2004.

*Topology Festival*, Cornell University, May 2004.

*Topology of Manifolds of Dimensions 3 and 4 (conference honoring Andrew J. Casson)*, the University of Texas at Austin, May 2003.

*AMS Special Session on Geometric Group Theory*, Northeastern University, October 2002.

*Georgia Topology Conference*, the University of Georgia, May 2002.

### *Selected Graduate Courses Attended*

Geometry of Mapping Class Groups I, II, by Yair Minsky, Yale University, Fall 2006, Spring 2007.

Asymptotic Geometry of Groups, by Bruce Kleiner, Yale University, Fall 2006.

Tameness of Hyperbolic 3-Manifolds, by Yair Minsky, Yale University, Fall 2005.

Geometric Group Theory, by Tim Riley, Yale University, Spring 2005.

Ends of Hyperbolic 3-Manifolds, by Yair Minsky, Yale University, Fall 2004.

Surfaces, by Yair Minsky, Yale University, Spring 2004.

Geometry of the Word Problem, by Tim Riley, Yale University, Spring 2003.

### *Referee for*

*Bulletin of the London Mathematical Society*

## Grants, Honors and Membership

R. H. Bing Fellowship, the University of Texas at Austin, 2008–Current.

Post-Doctoral Fellowship (Geometric Group Theory), Mathematical Sciences Research Institute, Fall 2007.

University Fellowship/Part-Time Acting Instructor, Yale University, 1997–1998, 2001–2007.

University Tuition Scholarship, Seoul National University, 1994–1997.

Fellowship for Selected College Students, Korea Foundation for Advanced Studies, 1994–1997.

Second Prize in Mathematics Competition for College Students, Korean Mathematical Society, 1994.

Silver Medal in International Mathematical Olympiad, Turkey, 1993.

Member of American Mathematical Society.

## Training

Baker Lunch: A semester-long teaching training, Department of Mathematics, Yale University, Fall 2001.

## Other Skills

Languages: Fluent in English and Korean; reading knowledge of German and French.

Computer Skills: Mathematica<sup>®</sup>, Matlab<sup>®</sup>, C, C++, Fortran, L<sup>A</sup>T<sub>E</sub>X, MetaPost.

## Personal

Citizenship: Republic of Korea.

Public Service: Korean Augmentation to the US Army, December 1998 – February 2001.

## References

Andrew J. Casson  
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Yale University  
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<http://kim.sh/skim2cv.pdf>