

Curriculum Vitae

Name: Yun Kang
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Education

Arizona State University	Mathematics (math biology)	Ph.D	2008 (August)
University of Arizona	Mathematics (random graphs)	M.S.	2004 (August)
Shanghai Jiaotong University, China	Financial math and Computation special program for gifted youngth	B.S.	2002 (July)

Employments

2008–Present Assistant Professor, Applied Sciences and Mathematics,
Arizona State University
2008–Present Affiliate, Mathematical, Computational & Modeling Sciences Center,
Arizona State University
2008–Present Adjunct faculty, School of Mathematical and Statistical Sciences,
Arizona State University
2004–2008 Teaching/Research Assistant, School of Mathematical and Statistical Sciences,
Arizona State University
2003–2004 Research Assistant, Department of Mathematics,
University of Arizona

Research interests

My main areas of study are Dynamical Systems and Mathematical Biology. My research interests have both theoretical and modeling components which covers the following topics:

- Nonlinear dynamical systems (ODEs, Difference Equations, PDEs, DDEs and Integro-Difference Equations).
- Mathematical biology (Population Dynamics, Food-web Structures, Ecological Stoichiometry, Spatial Ecology).
- Modeling in ecology, epidemiology and social dynamics.

Publications in peer-reviewed journals: * means that the coauthor is a graduate students and ** means that the coauthor is an undergraduate student.

10. **Yun Kang**, Rebecca Clark*, Michael Makiyama** and Jennifer Fewell, 2011. Obligate mutualism modeling: leaf-cutter ants and fungus growth during early colony expansion, *Journal of Theoretical Biology*, **289**, 116-227.
9. **Yun Kang**, 2011. Pre-images of invariant sets of a discrete competition model, *the Journal of Difference Equations and Applications*, in press.
8. **Yun Kang** and Yakubu Abdul-Aziz, 2011. Dynamics of competition model subject to Allee Effects. *Journal of Nonlinear Analysis: Real World Applications*, DOI: 10.1016/j.nonrwa.2011.05.031.
7. **Yun Kang** and Nicolas Lanchier, 2011. The role of space in the exploitation of resources. *Bulletin of Mathematical Biology*, DOI: 10.1007/s11538-011-9649-1.
6. **Yun Kang** and Hal Smith, 2011. Global Dynamics of a Discrete Two-species Lottery-Ricker Competition Model, *the Journal of Biological Dynamics*, DOI: 10.1080/17513758.2011.586064.
5. **Yun Kang** and Dieter Armbruster, 2011. Dispersal effects on a discrete two-patch model for plant-insect interactions, *Journal of Theoretical Biology*, **268**, 84-97.
4. **Yun Kang** and Nicolas Lanchier, 2011. Dispersal effect on a deterministic and a stochastic two-patch model with Allee effect, *Journal of Mathematical Biology*, **62**, 925-73.
3. **Yun Kang** and Dieter Armbruster, 2011. Noise and seasonal effects on the dynamics of plant-herbivore models with monotone plant growth functions, *International Journal of Biomathematics*, **4**, 1-20. DOI: 10.1142/S1793524511001234.
2. **Yun Kang** and Peter Chesson, 2010. Relative nonlinearity and permanence, *Theoretical Population Biology*, **78**, 26-35.
1. **Yun Kang**, Dieter Armbruster and Yang Kuang, 2008. Dynamics of a plant-herbivore model, *Journal of Biological Dynamics*, **2**, 89-101.

Recent submissions:

2. **Yun Kang**. Permanence of a general discrete two-species interaction model with nonmonotone per capita growth rates.
1. **Yun Kang**. Competition can rescue endangered species subject to strong Allee effects.

Awards and Funded Grants since 2008:

1. 2011-2016, **Collaboration funds for mathematician**, Simons Foundation, \$35,000 (Grant starts in July 2011).
2. 2011, **Travel grants from SIAM/NSF for ICIAM2011**, \$1500.
3. 2010—2011, **Project NExt Fellow**, Mathematical Association of America (MAA). *Project NExt* (New Experiences in Teaching) is a professional development program of the MAA for

new or recent Ph.D.s in the mathematical sciences.

4. Feb, 2011, College SSE Competition Grant:
5. March, 2011, Department research grant:
6. May, 2010— Department research grant:
7. May, 2009— Department research grant:

Teaching Activities

- Summer, 2011: **ABS 590** Reading and Conference and **ABS 599** Thesis
- January, 2011-May, 2011: **MAT 265** Calculus for Engineers I, **ABS 590** Reading and Conference and **ABS 599** Thesis and a new graduate course **ABS 560 Ecological Modeling**.
- August, 2010-December, 2010: **MAT 265** Calculus for Engineers I, **MAT 275** Modern Differential Equations and **ABS 489** Undergraduate Research.
- January, 2010-May, 2010: **MAT 265** Calculus for Engineers I (two sections).
- August, 2009-December, 2009: **MAT 210** Brief Calculus (two sections), **ABS 489** Undergraduate Research.
- January, 2009-May, 2009: **APM 265** Mathematics of Change I. (two sections)
- August, 2007 - May, 2008: **MAT 117** Pre-Calculus.
- August, 2005 - May, 2007: **Teaching assistant** in Advanced Math Analysis, Calculus for Business and Pre-Calculus at ASU.
- June, 2005 - August, 2005: **Tutor** in the SUMS Institute, a summer program for High School students.

Mentoring Graduate Students

- Rebecca Clark: She is a Ph.D student in School of Life Sciences. I mentored her on mathematical modeling of leaf-cutter ants and fungus. We have a co-authored paper has been submitted to *Journal of Theoretical Biology*.
- Lauren Wedekin: She is a master student in Applied Biology. She has been working on the food-web dynamics. I am her committee chair.

Mentoring Undergraduate Students:

1. Thesis Committee

- Chair of Honor Thesis Committee: Wenyu Zheng (majoring in financial and mathematics)
- Honor Thesis Committee: Jared Neuffer and Jeremy White

2. Research Projects Directed:

- Makiyama Michael (2010): His research project is parameter estimation on an obligate mutualism model. Partial results of this research is a subsection of our co-authored

paper on mathematical modeling of leaf-cutter ants and fungus that has been submitted to *Journal of Theoretical Biology*.

- Zheng Wenyu (2010): Her research project is to study the dynamics of “Good Win” business cycles.
- Cody Ben (2009): His research project is to use graph theory to do a social network analysis of players in the national basketball association.
- Katic Michael (2009): His research project is to model plant-herbivore interactions in seasonal environment.
- Ren Hanning (2009): His research project is to use discrete systems to model the population dynamics of leave cutter ants.

3. Obama Scholar Mentor (starting Fall 2010) for two new undergraduate students at CTI: Kayla Burkholder and Alexandra Morris.

Invited Talks/Working group since 2008

- Invited talk: *The role of space in the exploitation of resources* in the minisymposium on *Modeling of Ecological Systems* at ICIAM 2011, July 18 - 22, Vancouver, BC, Canada.
- Lecture: *Interplay between Allee effects and competition* at workshop III on *Heterogeneity and Ecologies* organized by MCMSC, June 29, 2011, 10:00 am -11:30 am, ASU.
- Lectures: *population dynamics of one and two dimensional discrete time models* at *Mathematical and theoretical biology institute*, June 15 - 26, 2011, 9:00 am -12:30 am, ASU.
- Invited talk: *Modeling an Obligate Mutualism: Leaf-cutter ants and its fungus garden* in the minisymposium on *Recent applications of dynamical systems in ecology* at *SIAM Conference on Applications of Dynamical Systems*, May 22-26, Snowbird, Utah, USA.
- Invited talk: *Relative Permanence in Biological Systems* in the international conference of *Fifth International Conference on Recent Advances in Applied Dynamical Systems*, May 16-18, Shanghai Normal University, Shanghai, China.
- Invited talk: *Expansion or extinction: deterministic and stochastic two-patch models with Allee effects* in the special section on the Applications of Differential and Difference Equations in Mathematical Biology and Ecology. FIRST JOINT MEETING: AMERICAN MATHEMATICAL SOCIETY - SOCIEDAD DE MATEMÁTICA DE CHILE, December 2010 15-18, Pucón, Chile.
- Invited talk: *A discrete two-patch model of plant-insect interactions with Allee-like effects* in the special session on *Continuous and Discrete Dynamical Systems* in American Mathematical Society Meeting, 2010 Fall Western Section, Los Angeles, CA, October 9-10, 2010 .
- Seminar talk: *Relative nonlinearity and permanence*, Math Biology Seminar of School of Mathematical and Statistical Sciences, Arizona State University, December 04, 2009.
- Invited talk: *Dynamics of plant-herbivore models with monotone plant growth rate*, 2009 Fall Eastern Section Meeting University Park, PA, October 24-25, 2009.
- Invited talk: *Stochastic and deterministic two-patch models with Allee effect*, First Joint Meeting of the Society for Mathematical Biology and the Chinese Society for Mathematical Biology, June 14-17, 2009, Hangzhou, P.R. China.

- Invited talk: *Dynamics of plant-herbivore models with monotone plant growth rate*, AMS 2009 Spring Southeastern Section Meeting Raleigh, NC April 4-5, 2009.

Contributed Talks and Poster Presentations since 2008:

- Workshop 2: *Circadian Clocks in Plants and Fungi*, Mathematical Biosciences Institute, Ohio State University, October 25-29, 2010.
- Contributed talk: *Dynamics of a discrete two-patch model on plant-insect interactions*, Mathfest 2010, Mathematical American Association, Pittsburgh, Pennsylvania, August 5-7.
- Poster: *Dynamics of a plant-herbivore model*, 2009 Workshop for Young Researchers in Mathematical Biology (WYRMB), August 24-26, Mathematical Biosciences Institute, Ohio State University,
- Contributed talk: *Dispersal effects of a plant-herbivore interaction two-patch models*, SIAM Conference on Control & Its Applications, July 6-8, 2009, Colorado Convention Center, Denver, Colorado.

Department Services since 2008

- Current: I am serving on the committee of *Graduate Degree Program*—ABS Master's degree and *Undergraduate Research Committee*, committee of minor in math and physics.
- 2010 Summer: Served in the *Committee for Hiring Math Lecturer*.
- 2009-2010: I was serving on three committees: the *Graduate Committee*, the committee of *Professional Sciences Masters* and the committee of *Instructional Specialist Evaluation*.

College Services since 2008

- SMACS Ph.D Admission Committee (March, 2011)
- Obama Scholar Mentor: mentoring two new undergraduate students in the *College of Technology & Innovation*.
- Committee member of Academic Standards of *College of Technology & Innovation* (3-year term of service).

Community Services since 2008

- Since 2009, I am serving on the *Committee of Association for Women in Mathematics (AWM) Mentor Network*.
- Since 2009, I am mentoring an undergraduate student through *AWM network*.
- 2010 Summer, I served as a Judge for *AWM Essay Contest: Biographies of Contemporary Women in Mathematics*.
- Participant in mathematical outreach program for high school kids. The recent activity is *Math Circles on the Road at ASU*, from March 13-15, 2010. I volunteer for holding a table on the topic "Index and Harry Ball" for high school kids.

- Provide a 2.5 hour hands-on STEM session (math biology) for 12 high school girls in Women in Science and Engineering (WISE) Symposium, June 8-9, 2011.

Professional Services since 2008

- Organize a minisymposium on *Modeling of Ecological Systems at the 7th International Congress on Industrial and Applied Mathematics (ICIAM 2011)*, July 18 - 22, Vancouver, BC, Canada (with Yang Kuang and Hao Wang).
- Organize a minisymposium on *Recent applications of dynamical systems in ecology at SIAM Conference on Applications of Dynamical Systems (SIAM DS11)*, May 22 - 26, Snowbird, Utah, USA (with Andrea Bruder and Racheal Miller Neilan).
- Organize a minisymposium on *Applications of Difference and Differential Equations in Ecology and Epidemiology I& II* at *Joint Mathematics Meetings*, New Orleans, January 6-9, 2011 (with Zhilan Feng).
- *Ad hoc* reviewer for NSF proposals on *Population and Community Ecology*.
- Since 2008, I have served as reviewer for over **9** journals including *Ecology Modeling*, *Theoretical Population Biology*, *Journal of Theoretical Biology*, *Mathematical Biosciences*, *Mathematical Biosciences and Engineering*, *Journal of Mathematical Biology*, *Proceedings of Royal Society B*, *Journal of Biological Dynamics*, *Journal of Oikos*, *Journal of Difference Equations and Applications* and *Journal of Mathematics and Computers in Simulation*.
- Fall, 2007 — Spring, 2008: Participate in the program *Preparing Future Math Faculty (PFMF)*. Organize a series seminars for Graduate Student Research.
- Member of the *Society of Mathematical Biology (SMB)*, the *American Mathematical Society (AMS)* and the *Society for Industrial and Applied Mathematics (SIAM)*.

Programming Skills: Matlab, Maple, C and C++ and R.