Marissa Renardy

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Work Experience

- **University of Michigan, Department of Microbiology & Immunology** Ann Arbor, MI
  Postdoctoral Research Fellow *May 2018 – present*
  - Computational Tuberculosis Laboratory, supervised by Denise Kirschner
- **The Ohio State University, Department of Mathematics** Columbus, OH
  Graduate Teaching Associate *July 2013 – May 2018*
  - Recitation instructor for the following courses:
    * 6 sections of MATH 1151 (Calculus I)
    * 2 sections of MATH 1156 (Calculus for the Biological Sciences)
    * 2 sections of MATH 1148 (College Algebra)
    * 9 sections of MATH 2177 (Mathematical Topics for Engineers)
  - Instructor for Headstart program
    * Introduction to Computational PDEs, Summer 2015
    * Introduction to Computational ODEs and PDEs, Summer 2016
    * Computational Mathematics, Summer 2017
- **Virginia Tech, Department of Mathematics** Blacksburg, VA
  Graduate Teaching Associate *August 2012 – May 2013*
  - Instructional assistant at the Virginia Tech Math Emporium
    * Proctored exams and assisted in tutoring for the following courses: Precalculus with Transcendental Functions, Elementary Calculus, Elementary Calculus with Matrices, Linear Algebra, and Geometry and the Mathematics of Design.
- **Naval Surface Warfare Center, Carderock Division** Philadelphia, PA
  Intern *May 2012 – July 2012*
  - Naval Research Enterprise Internship Program
  - Supervised by Domenic Urzillo. Developed and implemented a code to compute the Empirical Mode Decomposition of time series data, for applications in signals processing.

Education

- **The Ohio State University** Columbus, OH
  PhD, Mathematics *2013-2018*
  - GPA: 4.0
  - Advisor: Ching-Shan Chou
  - Dissertation: Parameter analysis in models of yeast cell polarization and stem cell lineage.

- **Virginia Tech** Blacksburg, VA
  MS, Mathematics *2011-2013*
  - GPA: 3.94
  - Advisor: Eric de Sturler
  - Thesis: Analysis of the BiCG Method
- **Virginia Tech** Blacksburg, VA
  BS, Mathematics *2008 - 2012*
  - GPA: 3.59

Technical Skills

- Languages & Software: MATLAB, Fortran, Wolfram Mathematica, LaTeX, Microsoft Office (Word, Excel, Powerpoint). Some experience with Python and R.
- Methods: Finite difference methods, finite volume methods, spectral methods, iterative methods for linear systems, parameter sensitivity, Bayesian parameter estimation, Latin hypercube sampling, polynomial fitting. Some experience in finite element methods and image processing.

Fellowships and Awards

- Outstanding Graduate/Professional Student Award (OSU Office of Student Life) 2018
- Career Development Grant (OSU Council of Graduate Students) 2018
- Rhodus Graduate Fellowship (OSU Department of Mathematics) Spring 2017, Spring 2018

Publications

1. **Marissa Renardy**, Alexandra Jilkine, Leili Shahriyari, and Ching-Shan Chou. Control of cell fraction and population recovery during tissue regeneration in stem cell lineages. Journal of Theoretical Biology. 2018; 445: 33–50.
2. **Marissa Renardy**, Tau-Mu Yi, Dongbin Xiu, and Ching-Shan Chou. Parameter uncertainty quantification using surrogate models applied to a spatial model of yeast mating polarization. PLoS Computational Biology. 2018; 14(5): e1006181.
3. Jill Gallaher, Kamila Larripa, Urszula Ledzewicz, **Marissa Renardy**, Blerta Shtylla, Nessy Tania, Diana White, Karen Wood, Li Zhu, Chaitali Passey, Michael Robbins, Natalie Bezman, Suresh Shelat, Hearn Jay Cho, and Helen Moore. A mathematical model for tumor-immune dynamics in multiple myeloma. In Ami Radunskaya, Rebecca Segal, and Blerta Shtylla, editors, *Understanding Complex Biological Systems with Mathematics*, pages 89–122. Springer, 2018.
4. Jill Gallaher, Kamila Larripa, **Marissa Renardy**, Blerta Shtylla, Nessy Tania, Diana White, Karen Wood, Li Zhu, Chaitali Passey, Michael Robbins, Natalie Bezman, Suresh Shelat, Hearn Jay Cho, and Helen Moore. Methods for determining key components in a mathematical model for tumor-immune dynamics in multiple myeloma. Journal of Theoretical Biology. 2018; 458: 31–46.

5. Muhammed Emin Ozturk, **Marissa Renardy**, Yukun Li, Gagan Agrawal, and Ching-Shan Chou. A novel approach for handling soft error in conjugate gradients. Proceedings of the 25th International Conference on High Performance Computing (HiPC). IEEE, 2018.
6. **Marissa Renardy** and Denise Kirschner. Evaluating vaccination strategies for tuberculosis in endemic and non-endemic settings. Journal of Theoretical Biology. 2019; 469: 1–11.
7. **Marissa Renardy**, Timothy Wessler, Silvia Blemker, Jennifer Linderman, Shayn Peirce-Cottler, and Denise Kirschner. Data-driven model validation across dimensions. Bulletin of Mathematical Biology. 2019.

Conferences and Workshops

APS Conference on the Interface of Mathematical Models and Experimental Physiology: Organ Function from the Microvascular Perspective, invited talk. *Navigating biological research as an early-career mathematician.* 09/2019

SIAM Great Lakes Sectional Meeting, contributed talk. *Evaluating vaccination strategies for tuberculosis in endemic and non-endemic settings.* 04/2019

AWM Research Symposium, contributed talk. *Modeling Tumor Immune Dynamics in Multiple Myeloma.* 04/2019

Joint Mathematics Meetings (JMM), invited talk (minisymposium). *Modeling Tumor Immune Dynamics in Multiple Myeloma.* 01/2019

Joint Mathematics Meetings (JMM), contributed talk. *Evaluating vaccination strategies for tuberculosis in endemic and non-endemic settings.* 01/2019

SIAM Life Sciences Meeting, invited talk (minisymposium). *Control of cell fraction and population recovery during tissue regeneration in stem cell lineages.* 08/2018

SIAM Annual Meeting, invited talk (minisymposium). *Modeling tumor immune dynamics in multiple myeloma.* 07/2018

AMS Spring Central Sectional Meeting, invited talk (minisymposium). *Parameter uncertainty quantification using surrogate models applied to a spatial model of yeast mating polarization.* 03/2018

Symposium on Multi-scale Bioimaging in Systems Biology, University of Michigan, poster. *Parameter uncertainty quantification for a spatial model of cell polarization.* 01/2018

Joint Mathematics Meetings (JMM), contributed talk. *A method for sensitivity analysis and parameter estimation applied to a large reaction-diffusion model of cell polarization.* 01/2018

International Symposium on Biomathematics and Ecology Education and Research (BEER), invited talk (minisymposium). *A method for sensitivity analysis and parameter estimation applied to a large reaction-diffusion model of cell polarization.* 10/2017

SIAM Annual Meeting, AWM Workshop, poster. *A reaction-diffusion model of cell polarization in yeast.* 07/2017

Biology and Medicine through Mathematics (BAMM!), poster. *A reaction-diffusion model of cell polarization in yeast.* 05/2017

Women Advancing Mathematical Biology, Understanding Complex Biological Systems with Mathematics, workshop participant. 04/2017

5th International Conference on Computational and Mathematical Biomedical Engineering (CMBE), contributed talk [last minute entry, not on program]. *Stem cell lineages: Control of cell fraction and population recovery.* 04/2017

5th Annual Midwest Women in Mathematics Symposium (WIMS), poster. *A reaction-diffusion model of cell polarization in yeast.* 02/2017

19th Nebraska Conference for Undergraduate Women in Mathematics (NCUWM), invited panelist. 02/2017

Other Talks

Invited lecture, University of Michigan Department of Microbiology and Immunology 2/1/2018
Parameter analysis in yeast cell polarization and stem cell lineages
Biomath seminar series (invited), North Carolina State University 1/26/2018
Parameter analysis in yeast cell polarization and stem cell lineages
Science Lecture Series (invited), Ohio Wesleyan University 11/09/2017
Parameter estimation for a large model of yeast cell polarization
Math Graduate Student seminar, The Ohio State University 10/24/2017
A method for parameter sensitivity analysis and parameter estimation using polynomial surrogates
Math Graduate Student seminar, The Ohio State University 04/19/2016
A reaction-diffusion model of cell polarization in budding yeast

Extra-curricular Service

- NSF grant review panel (Mathematical Biology Program of DMS) 2018
- Association for Women in Mathematics Student Chapter at The Ohio State University
  - President Autumn 2015 – Spring 2018
  - Founder Autumn 2015
- Invitations to Industry seminar, OSU Department of Mathematics
  - Graduate student organizer Spring 2018
- OSU Math Graduate Student Association
  - Member Autumn 2015 – Spring 2018
  - Travel fund committee member Autumn 2017 – Spring 2018
- Organizer for OSU Math Grad DataFest 05/2018
- Judge for OSU Mathematical Modeling Contest 11/2017
- Graduate Studies Committee, OSU Department of Mathematics
  - Student representative Autumn 2015 – Spring 2016
- Association for Women in Mathematics Student Chapter at Virginia Tech
  - Member Autumn 2012 – Spring 2013
- Member of the following professional organizations:
  - Association for Women in Mathematics (AWM)
  - American Mathematical Society (AMS)
  - Society for Mathematical Biology (SMB)
  - Society for Industrial and Applied Mathematics (SIAM)