

---

CONTACT INFORMATION	Mathematical Biosciences Institute The Ohio State University 377 Jennings Hall 1735 Neil Avenue, Columbus, OH 43210	<i>Phone:</i> (614) 688-3198 <i>Email:</i> jacobsen.50@osu.edu <i>Web:</i> karlyjacobsen.github.io
EDUCATION	<b>Ph.D. Mathematics</b> , University of Florida 2013 Advisor: Sergei S. Pilyugin  <b>M.S. Mathematics</b> , University of Florida 2010  <b>B.S. Materials Science &amp; Engineering</b> , University of Florida 2007 Cum Laude, 4.0 GPA, Biomaterials specialization	
ACADEMIC APPOINTMENTS	<b>Postdoctoral Fellow</b> 2013 – present The Ohio State University, Mathematical Biosciences Institute • Funded by NSF RAPID DMS-1513489, <i>Stochastic Ebola Modeling on Dynamic Contact Networks</i> (2015)  <b>Graduate Teaching Assistant</b> 2008 – 2013 University of Florida, Department of Mathematics  <b>Graduate Research Assistant</b> 2010 – 2012 University of Florida, Department of Mathematics • Funded by University of Florida Emerging Pathogens Institute (Fall 2010)	
RESEARCH INTERESTS	Mathematical biology, particularly modeling infectious diseases on networks; applied dynamical systems; differential equations.	

---

PUBLICATIONS Peer-reviewed	M. Burch, <b>K. Jacobsen</b> , J. Tien and G. Rempala. Network-based analysis of a small Ebola outbreak. <i>Submitted</i> .  <b>K. Jacobsen</b> , L. Russell, B. Kaur and A. Friedman. 2015. Effects of CCN1 and macrophage content on glioma virotherapy: A mathematical model. <i>Bull. Math. Biol.</i> (77): 984-1012.  <b>K. Jacobsen</b> and S. S. Pilyugin. 2015. Analysis of a mathematical model for tumor therapy with a fusogenic oncolytic virus. <i>Math. Biosci.</i> doi:10.1016/j.mbs.2015.02.009.  <b>K. Jacobsen</b> , J. Stupiansky, and S. S. Pilyugin. 2013. Mathematical modeling of citrus groves infected by huanglongbing. <i>Math. Biosci. Eng.</i> <b>10</b> (3): 705-728.
Thesis	<b>K. Jacobsen</b> . 2013. A mathematical model for tumor therapy with a fusogenic oncolytic virus. Ph.D. Thesis, University of Florida.
Educational	<b>K. Jacobsen</b> , <i>MAC1105 College Algebra Notetaking Guide: Custom Edition for the University of Florida</i> , Pearson Education, 2012.
MANUSCRIPTS IN PREPARATION	<b>K. Jacobsen</b> , M. Burch, J. Tien and G. Rempala. <i>The large graph limit of a stochastic epidemic model on a dynamic multilayer network</i> .  <b>K. Jacobsen</b> and J. Tien. <i>A generalized inverse for graphs with decay</i> .

---

GRANTS  
SUBMITTED

G. Rempala, J. Tien, M. Yotebieng and **K. Jacobsen**. *Disease models on dynamic stochastic networks: application to Ebola*. Submitted November 2015 to NSF Ecology and Evolution of Infectious Diseases.

---

INVITED TALKS

*A modeling framework for an epidemic with multiple modes of transmission on a dynamic network*. University of Pittsburgh, Applied Mathematics Seminar, Pittsburgh, PA. March 2016.

*Residence time and epidemics on networks*. University of Florida, Biomathematics Seminar, Gainesville, FL. March 2015.

*Modeling disease spread on networks with a new notion of distance*. Ohio Wesleyan University Science Lecture Series, Delaware, OH. January 2015

*Modeling the effects of macrophage content and CCN1 on glioma virotherapy*. Mathematical Biosciences Institute, Cancer and the Immune System Workshop, Columbus, OH. November 2014.

*Mathematical modeling of cancer-fighting viruses*. Field of Dreams Conference, Mesa, Arizona. November 2014.

OTHER TALKS &  
PRESENTATIONS

*Tractable models for epidemics on multilayer networks*. Mathematical Biosciences Institute, Columbus, OH. February 2016.

*When a pair approximation gives the exact large graph limit*. Epidemics: Fifth International Conference on Infectious Disease Dynamics, Clearwater Beach, FL. December 2015.

*A hybrid model for epidemics on a contact network using a pair approximation result*. International Conference on Mathematical Modelling and Analysis of Populations in Biological Systems, London, Ontario, Canada. October 2015.

*Impact of network hydrology on cholera spread*. Annual Meeting of The Society for Mathematical Biology, Atlanta, GA. July 2015.

*Integrating hydrological and waterborne disease network models*. Society for Industrial and Applied Mathematics: Dynamical Systems, Snowbird, UT. May 2015.

*Residence time: characterizing weighted graphs with decay (poster)*. Society for Industrial and Applied Mathematics: Workshop on Network Science, Snowbird, UT. May 2015.

*Using residence time as distance on graphs with decay*. Mathematical Biosciences Institute, Columbus, OH. March 2015.

*Using residence time as distance on graphs with decay (poster)*. Mathematical Biosciences Institute, Institute Partners Meeting, Columbus, OH. February 2015.

*The role of CCN1 in glioma virotherapy with oncolytic herpes simplex virus*. European Conference on Mathematical and Theoretical Biology, Gothenburg, Sweden. June 2014.

*A battle between cancer and a virus: modeling oncolytic virotherapy*. Mathematical Biosciences Institute, Columbus, OH. March 2014.

*Seasonality of cholera in Bangladesh: integrating hydrological and disease network models*. Mathematical Biosciences Institute, Columbus, OH. March 2014.

*A mathematical model for tumor therapy with a fusogenic oncolytic virus (poster)*. Mathematical Biosciences Institute, Institute Partners Meeting, Columbus, OH. February 2014.

*Chronic myeloid leukemia: who can cease TKI treatment? (team presentation).* Moffitt Cancer Center, Integrated Mathematical Oncology Personalized Medicine Workshop, Tampa, FL. November 2013.

*A mathematical model for tumor therapy with a fusogenic oncolytic virus (poster).* Mathematical Biosciences Institute, Workshop for Young Researchers in Mathematical Biology, Columbus, OH. August 2013.

*Existence and uniqueness of solutions for a tumor therapy model.* University of Florida, Biomathematics Seminar, Gainesville, FL. January 2013.

*Tumor treatment by oncolytic virotherapy with syncytia formation.* University of Florida, Biomathematics Seminar, Gainesville, FL. September 2012.

*A host-vector model for citrus greening with roquing: persistence, transients and other behavior.* Annual Meeting of The Society for Mathematical Biology, Knoxville, TN. July 2012.

*A host-vector model for citrus greening: Part II (poster).* Mathematical Methods in Systems Biology and Population Dynamics, African Institute for Mathematical Sciences, Cape Town, South Africa. January 2012.

*Mathematical modeling of citrus greening (poster).* Mathematical Biosciences Institute, Spatio-Temporal Dynamics in Disease Ecology and Epidemiology, Columbus, OH. October 2011.

*Mathematical modeling of citrus greening II,* University of Florida, Conference on Computational and Systems Biology, Gainesville, FL. March 2011.

*Citrus greening: motivation and modeling (with Jillian Stupiansky).* University of Florida, Biomathematics Seminar, Gainesville, FL. October 2010.

---

TEACHING  
EXPERIENCE

**University of Florida, Department of Mathematics**

**Adjunct Instructor**, *Elementary differential equations* Summer 2013

**Course Improvement Assistant** Fall 2012

- Streamlined calculus homework sets and developed electronic assignments

**Course Coordinator for AIM Mathematics** Summer 2012

- Managed four sections of *Basic college algebra* with teaching assistant instructors for the AIM program which supports incoming students from underserved populations

**Lecturer**, *Calculus I* (approx. 250 students) Spring 2012

**Instructor**, *Basic college algebra* Summer 2011, 2010, 2009

- Authored a textbook supplement published by Pearson Education & Fall 2011, 2009

**Discussion section leader**

*Calculus III* Spring 2013

*Calculus II* Fall 2012

*Calculus I* Spring 2010, 2009

*Precalculus* Fall 2008

---

AWARDS

University of Florida Mathematics Graduate Student Teaching Award Spring 2012

Best poster award, Mathematical Methods in Systems Biology and Population Dynamics, African Institute for Mathematical Sciences, Cape Town, South Africa Spring 2012

University of Florida CLAS Travel Grant	Spring 2012
University of Florida Center for Applied Mathematics Travel Grant	Fall 2011
Eleanor Ewing Ehrlich Award (for outstanding female graduate student)	2011
University of Florida Grinter Fellow	2008
Alpha Sigma Mu National Scholar (single nationwide recipient)	2006
University of Florida Lombardi Scholar	2003 – 2007

---

WORKSHOPS	Modeling the Spread and Control of Ebola in West Africa. Atlanta, GA. January 2015.
	Cancer and the Immune System. Mathematical Biosciences Institute, Columbus, OH. November 2014.
	Parameter Estimation for Dynamic Biological Models. National Institute for Mathematical and Biological Synthesis, Knoxville, TN. May 2014.
	Within Host Dynamics to Epidemiology of Infectious Disease. Mathematical Biosciences Institute, Columbus, OH. April 2014.
	Integrated Mathematical Oncology Personalized Medicine. Moffitt Cancer Center, Tampa, FL. November 2013.
	Sustainable Management of Living Natural Resources. Mathematical Biosciences Institute, Columbus, OH. November 2013.
	Sustainability and Complex Systems. Mathematical Biosciences Institute, Columbus, OH. September 2013.

---

SERVICE & MENTORING	<b>Organizer</b> , MBI Postdoc Professional Development Seminar	2014 – 2015
	<b>MBI representative</b> , Field of Dreams Conference, Mesa, Arizona	November 2014
	<ul style="list-style-type: none"> <li>Recruited undergraduate and graduate students from underrepresented groups to MBI educational programs and introduced these students to mathematical biology research</li> </ul>	
	<b>Poster judge</b> , Denman Undergraduate Research Forum, The Ohio State University	2014
	<b>Reviewer</b> , <i>Mathematical Biosciences</i>	2014
	<b>Mentor</b> , The Ohio State University, <i>Calculus for Biological Sciences</i>	2013, 2014
	<ul style="list-style-type: none"> <li>Mentored undergraduate group project on the mathematics of disease spread</li> </ul>	
	<b>Treasurer</b> , University of Florida Graduate Mathematics Association	2012
	<ul style="list-style-type: none"> <li>Secured funding for the colloquium and social activities</li> <li>Developed a two-part, campus-wide <math>\text{\LaTeX}</math> workshop with team of officers</li> </ul>	
	<b>Mentor</b> , University of Florida Graduate Mathematics Association	2012
	<ul style="list-style-type: none"> <li>Created and organized mentoring program with team of officers</li> </ul>	
	<b>President</b> , University of Florida Chapter of Alpha Sigma Mu	2006 – 2007

INDUSTRY EXPERIENCE	<b>Intern</b> , Process and Product Development	June – August 2006
	Vistakon, a Division of Johnson & Johnson Vision Care, Inc., Jacksonville, FL	

MEMBERSHIPS	Society for Mathematical Biology
-------------	----------------------------------

Society for Industrial and Applied Mathematics  
Alpha Sigma Mu, the Professional Honor Society for Materials Science and Engineering