Jessica Maral Conway

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CONTACT INFORMATION

Department of Mathematics
The Pennsylvania State University
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CITIZENSHIP

Canada; Permanent Resident of the U.S.

EDUCATION

Ph.D., Applied Mathematics, 2008; Northwestern University, Evanston, IL, USA
Dissertation advisor: Prof. Hermann Riecke
Dissertation title: "Complex Patterns in Oscillatory Systems"
M.S. Applied Mathematics, 2003; Northwestern University, Evanston, IL, USA
B.S. Honours Applied Mathematics, 2002; McGill University, Montreal, Qc, Canada

PROFESSIONAL HISTORY

2014 - Present	**Assistant Professor**, Pennsylvania State University
2012 - 2014	**Postdoctoral Fellow**, Los Alamos National Laboratory
2008 - 2012	**Postdoctoral Fellow**, Department of Mathematics, University of British Columbia
2008 - 2010	**Postdoctoral Fellow**, Division of Mathematical Modeling (DMM), UBC Centre for Disease Control, University of British Columbia
2003-2008	**Graduate Research Assistant**, Engineering Sciences and Applied Mathematics Department, Northwestern University
Summer 2002	**Undergraduate Research Assistant**, Department of Mathematics, McGill University

HONORS AND FUNDING

Aug 2017-present	National Science Foundation Grant DMS-1714654, "HIV Post-Treatment: Rebound or Control? Stochastic Modeling Insights" ($270 000 USD)
May 2013	*Mathematics Travel Grants for Women Researchers*, Association of Women in Mathematics (SIAM Conference on Applications of Dynamical Systems; $1350 USD)
Jun 2010-Nov 2011	*Fellowship Award in the Area of Biomedical / Clinical HIV/AIDS Research* ($67 500 CAD) Canadian Institutes of Health Research (CIHR), Canada
2010	*Postdoctoral Teaching Award,* for excellence in mathematics teaching UBC Department of Mathematics
2008-2009	(declined) *Visiting Fellowships in Canadian Government Laboratories (VF)* National Sciences and Engineering Research Council, Canada
Mar-Jun 2008	*Smith Fellowship* (approx. $6800 USD) Northwestern University
Sep 2002-Jun 2003	*Walter P. Murphy Fellowship* (approx $50 000 USD), Northwestern University

PUBLICATIONS

In review:

J.M. Conway, A.S. Perelson, and J.Z. Li, "Stochastic model of HIV viral rebound relying on patient characteristics."

C. Deleage, C.M. Fennessey, T.T. Immonen, A. Reynaldi, C. Reid, T.E. Schlub, L. Newman, L. Lipkey, C. Camus, S. O'Brien, J. Smedley, J.M. Conway, G.Q. Del Prete, M.P. Davenport, J.D. Lifson, J.D. Estes, and B.F. Keele, "Defining early SIV replication and dissemination dynamics following vaginal transmission."

L.E. Quevillon, J.M. Conway, and D.P. Hughes, "Infectious diseases do not collapse ant colonies."

Peer-reviewed publications:

J.M. Conway and R.M. Ribeiro, "Modeling the immune response to HIV infection," to appear in *Current Opinion in Systems Biology*.

R. Ke, J.M. Conway, D.M. Margolis, and A.S. Perelson, "Determinants of the efficacy of HIV latency reversing agents and implications for drug and treatment design," *JCI Insight* **3**(2018): e123052.

J.M. Conway and A.S. Perelson, "Early HIV infection predictions: role of viral replication errors," *SIAM Journal on Applied Mathematics* **78**(2018): 1863-1890.

B.M. Quintela, J.M. Conway, J.M. Hyman, J. Guedj, R.W. dos Santos, M. Lobosco, and A.S. Perelson, "A New Age-Structured Multiscale Model of the Hepatitis C Virus Life-cycle During Infection and Therapy with Direct-Acting Antiviral Agents," *Frontiers in Microbiology* **9**(2018): 601.

B. Konrad, D. Taylor, J.M. Conway, G. Ogilvie, and D. Coombs, "On the duration of the period between exposure to HIV and detectable infection," *Epidemics* **20**(2017):73-83.

B.M. Quintela, J.M. Conway, J.M. Hyman, R.F. Reis, R.W. dos Santos, M. Lobosco, and A.S. Perelson, "An Age-based Multiscale Mathematical Model of the Hepatitis C Virus Life-cycle During Infection and Therapy: Including Translation and Replication," *IFMBE Proceedings* **60**(2017): 508-511.

J.M. Conway, J.J. Dennehy, and A. Singh, "Optimal Adsorption of λ phage infecting E. coli bacteria in changing environments," *IEEE 55th Conference on Decision and Control (CDC)* http://ieeexplore.ieee.org/document/7799174/.

J.M. Conway and A.S. Perelson, "Residual viremia in treated HIV+ individuals," *PLoS Comput Biol* **12**(2016):e1004677.

T.T. Immonen, J.M. Conway, E. Romero-Severson, A.S. Perelson, and T. Leitner, "Recombination facilitates survival of latent HIV1 lineages in the replicating population," *PLoS Comput Biol* **11**(2015):e1004625.

J.M. Conway and A.S. Perelson,"Post-treatment control of HIV infection," *PNAS* **112**(2015):54675472.

L. Canini, S. DebRoy, Z. Mariño, J.M. Conway, G. Crespo, M. Navasa, M. D'Amato, P. Ferenci, S.J. Cotler, and A.S. Perelson,"Severity of liver disease affects hepatitis C virus kinetics in patients treated with intravenous silibinin monotherapy," *Antivir Ther* **20**(2015):149-155.

J.M. Conway and A.S. Perelson,"A hepatitis C virus infection model with time-varying drug effectiveness: solution and analysis," *PLoS Comput Biol* **10**(2014):e1003769.

L. Canini, J.M. Conway, A.S. Perelson, and F. Carrat, "Impact of Different Oseltamivir Regimens on Treating Influenza A Virus Infection and Resistance Emergence: Insights from a Modelling Study," *PLoS Comput Biol* **10**(2014):e1003568.

J.M. Conway, B.P. Konrad, and D. Coombs, "Stochastic analysis of pre- and post-exposure prophylaxis against HIV infection," *SIAM J Appl Math* **73**(2013):904-928.

J.M. Conway et al, "Vaccination against 2009 pandemic H1N1 in a population dynamical model of Vancouver, Canada: timing is everything," *BMC Public Health*, **11**(2011):932.

J.M. Conway and D. Coombs, "A stochastic model of latently infected cell reactivation and viral blip generation in treated HIV patients," *PLoS Comput Biol* **7**(2011):e1002033.

J.M. Conway and H. Riecke, "Superlattice patterns in the complex Ginzburg-Landau equation with multi-resonant forcing," *SIAM J of Appl Dyn Sys* **8**(2009):977.

J.M. Conway and H. Riecke, "Quasipatterns in a model for chemical oscillations forced at multiple resonance frequencies," *Phys Rev Lett* **99**(2007):218301.

J.M. Conway and H. Riecke, "Multiresonant forcing of the complex Ginzburg-Landau equation: pattern selection," *Phys Rev E* **76**(2007):057202.

SCIENTIFIC PRESENTATIONS (2013-present)

'Within-host viral infections'

Nov 2016	(invited)	AMS Special Session on Stochastic Processes in Mathematical Biology; AMS Fall Eastern Sectional Meeting, University of Delaware, Newark DE University, Raleigh, NC
Sept 2018	(invited)	Center for Infectious Disease Dynamics (CIDD) Seminar, Pennsylvania State University, University Park PA
Jun 2018	(invited)	2018 Canadian Applied and Industrial Mathematics Society Annual Meeting, Toronto ON Canada

SCIENTIFIC PRESENTATIONS (2013-present), CONT'D

'Within-Host viral infections' (cont'd)

Jun 2018	(invited)	Canadian Mathematical Society Summer Meeting, Fredericton NB Canada
Mar 2018	(invited)	Linking Computational & Experimental Biology in HIV Research, Frederick National Laboratory, Frederick MD
Feb 2018	(invited)	Emphasis Workshop on Host Pathogen Dynamics, Mathematical Biology Institute, Columbus OH
Jul 2017	(invited)	Minisymposium on the Immunobiology and Infection Subgroup; Society for Mathematical Biology Annual Meeting, Salt Lake City UT
May 2017	(invited)	Minisymposium on Advances in Infectious Disease Modeling; SIAM Conference on Applications of Dynamical Systems, Snowbird UT
May 2017	(poster)	International conference: Viral Dynamics: past, present, future; Santa Fe NM
Mar 2017	(invited)	Fisk Distinguished Speaker Series; University of Wyoming, Laramie WY
Dec 2016	(invited)	AIDS and Cancer Virus Program Seminar, National Cancer Institute, Frederick MD
Nov 2016	(invited)	AMS Special Session on Mathematical Modeling of Infectious Disease and Immunity; AMS Fall Southeastern Sectional Meeting, North Carolina State University, Raleigh, NC
Sep 2016	(contributed)	Systems Approaches in Immunology, Santa Fe NM
Jul 2016	(contributed)	SIAM Conference on the Life Sciences, SIAM, Boston MA
Jun 2016	(invited)	Minisymposium on Stochastic Models in Mathematical Biology; International Workshop on Applied Probability, Toronto ON Canada
May 2016	(invited)	Living with our Viromes, Pennsylvania State University, University Park PA
Apr 2016	(poster)	23rd International HIV Dynamics & Evolution, Woods Hole MA
Jan 2016	(invited)	Fred Hutch Math Modeling Affinity Group Seminar, Fred Hutchinson Cancer Research Center, Seattle WA
Jan 2016	(invited)	AMS Special Session on Recent Advances in Dynamical Systems and Mathematical Biology; 2016 Joint Mathematics Meetings, Seattle WA
Oct 2015	(invited)	Applied Math Seminar, University of Missouri-Kansas City, Kansas City MO
Oct 2015	(invited)	5th International Conferences on Mathematical Modelling and Analysis of Populations in Biological Systems, London ON, Canada
Aug 2015	(invited)	CNLS Seminar, Los Alamos National Laboratory, Los Alamos NM
Jul 2015	(contributed)	2nd Workshop on Virus Dynamics, Fields Instititute, Toronto ON Canada
Jul 2015	(invited)	Minisymposium on Modeling HIV Latency, Persistence and Treatment; Society for Mathematical Biology Annual Meeting, Atlanta GA
May 2015	(invited)	Minisymposium on Advances in Viral Infection Modeling; SIAM Conference on Applications of Dynamical Systems, Snowbird UT
May 2015	(invited)	22nd International HIV Dynamics & Evolution, Hungarian Academy of Sciences, Budapest, Hungary
Mar 2015	(invited)	Special Session on Within-Host Disease Modeling; AMS Spring Eastern Sectional Meeting, Georgetown University, Washington, D.C.
Oct 2014	(invited)	Applied Mathematics Seminar, University of Delaware, Newark DE
Oct 2014	(poster)	Strategies for an HIV Cure, NIH Main Campus, Bethesda MD
Oct 2014	(invited)	Seventh International Symposium on Biomathematics and Ecology: Education and Research (BEER), Claremont CA
Sept 2014	(invited)	Center for Infectious Disease Dynamics (CIDD) Seminar, Pennsylvania State University, University Park PA
Aug 2014	(invited)	Minisymposium on Advances in Mathematical Modeling of Complex Aspects and Control of Some Prevalent Infectious Diseases; SIAM Conference on the Life Sciences, Charlotte NC
Jul 2014	(invited)	Minisymposium on Recent Advances in Mathematical Epidemiology, Ecology and Population Dynamics; 2014 SIAM Annual Meeting, Chicago IL

SCIENTIFIC PRESENTATIONS (2013-present), CONT'D

'Within-Host viral infections' (cont'd)

Feb 2014	(invited)	Mathematical Biology Seminar, Department of Mathematics, Duke University, Durham NC
Feb 2014	(invited)	Special Colloquium, Department of Mathematics, Pennsylvania State University, University Park PA
Nov 2013	(invited)	Mathematical Biology Seminar, Department of Mathematics, Florida State University, Gainesville FL
May 2013	(invited)	Minisymposium on Branching Processes in Biology; SIAM Conference on Applications of Dynamical Systems, Snowbird UT
Feb 2013	(invited)	Mathematical Biology and Physiology Seminar, Department of Mathematics, Pennsylvania State University, University Park PA
Jan 2013	(invited)	Disease Dynamics 2013: Immunization, a true multi-scale problem Vancouver, BC Canada

'Bacteria dynamics'

Dec 2016	(contributed)	IEEE Conference on Decision and Control, Las Vegas NV

ACTIVITIES

Service (2013-present)

Jul 2017-present	Society for Mathematical Biology Immunobiology and Infection Subgroup *Co-founder and co-organizer,* with Judy Day (University of Tennessee), Angela Reynolds (Virginia Commonwealth University), and Amber Smith (University of Tennessee Health Science Center).
Jul 2017	Society for Mathematical Biology Annual Meeting, Salt Lake City UT, USA *Organizer,* contributed mini-symposium presenting the SMB Immunobiology and Infection Subgroup, with Subgroup co-founders.
May 2017	SIAM Conference on Applications of Dynamical Systems, Snowbird, UT USA *Organizer,* contributed mini-symposium on Multiscale Modeling of Infectious Disease Dynamics: State-of-art and Challenges, with Ruian Ke (North Carolina State University).
Aug 2015	International conference on "Viral Dynamics: Past, Present, and Future" Santa Fe NM, USA *Conference organizer (co-lead)* with Stanca M. Ciupe (Virginia Polytechnic Institute and State University), Nick Hengartner (Los Alamos National Laboratory), and Ruy M. Ribeiro (Universidade de Lisboa Faculdade de Medicina).
May-Jul 2015, 16, 18	Penn State's Summer Research in Applied Mathematics Program, University Park PA, USA Eight-week long mathematics research summer program for undergraduate students. *Co-organizer* with Timothy Reluga (lead), Alberto Bressan, and Wen Shen (2015-2016); *Mentor* (2018).
Jun 2015-18	Penn State's Science U camp: Infection!, State College PA, USA Week-long science camp aimed at high-school students on causes and consequences of an infectious disease outbreak; *Instructor* with Lauren Quevillon (director) and David Hughes (Penn State)
Aug 2015	BIRS Workshop on Viral Dynamics and Cancer: Modeling Oncogenic and Oncolytic Viruses (15w5095), Oaxaca, Mexico *Conference organizer (co-lead)* with Rafael Meza (University of Michigan), Mads Kaern (University of Ottawa), and Jack Tuszinsky (University of Alberta)
Jul 2015	Society for Mathematical Biology Annual Meeting, Atlanta GA, USA *Organizer,* contributed mini-symposium on Modeling HIV Latency, Persistence and Treatment, with Ruian Ke (North Carolina State University)
May 2015	SIAM Conference on Applications of Dynamical Systems, Snowbird, UT USA *Organizer,* contributed mini-symposium on Advances in Viral Infection Modeling, with Naveen Vaidya (University of Missouri-Kansas City)

ACTIVITIES, CONT'D

Service (cont'd)

May 2013 SIAM Conference on Applications of Dynamical Systems, Snowbird, UT USA
Organizer, contributed mini-symposium on Branching Processes in Biology, with Paul Tupper (Simon Fraser University)

Jan 2013 Disease Dynamics 2013: Immunization, a true multi-scale problem, Vancouver, BC Canada
Conference organizer (lead) with Daniel Coombs (University of British Columbia) and Rafael Meza (University of Michigan)

Additional training

Jun 2010 *American Association of Immunologists 2010 Introductory Course in Immunology*
University of Pennsylvania, Philadelphia PA USA
Intensive two-part course, taught by world-renowned immunologists, that provides a comprehensive overview of the basics of immunology.

TEACHING EXPERIENCE

Instructor

- *Mathematical Modeling*, The Pennsylvania State University
- *Honors Ordinary and Partial Differential Equations*, The Pennsylvania State University
- *Honors Calculus with Analytic Geometry II*, The Pennsylvania State University
- *Calculus and Biology I*, The Pennsylvania State University
- *Ordinary Differential Equations*, University of British Columbia
- *Partial Differential Equations*, University of British Columbia
- *Linear Differential Equations*, University of British Columbia
- *Multiple Integration and Vector Calculus*, Northwestern University

Supervisor

May 2017 - present *Student:* Emily Sellinger, undergraduate, Pennsylvania State University
Project: "Population dynamics of *Peromyscus leucopus* ."

Sep 2016 - present *Student:* Olga Dorabiala, undergraduate, Pennsylvania State University
Project: "Predictive effectiveness of on-demand pre-exposure prophylaxis to prevent HIV."

Jan 2015 - Apr 2017 *Student:* Rachel Hoellman, undergraduate, Pennsylvania State University
Project: "Optimizing vaccine distribution mid-influenza epidemic."

LANGUAGES

English (fluent), French (fluent)
Computer Languages and Software: Fortran, Matlab, R, Python, Maple, Mathematica, LaTeX, html

SOCIETY MEMBERSHIP

Society for Industrial and Applied Mathematics (SIAM)
Society for Mathematical Biology (SMB)