

Brandon G Goodell
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Research Interests

Commutative algebra, homological algebra, algebraic number theory, Fourier analysis, dynamical systems

Education in Mathematics

Ph.D., Mathematics 2013 - 2014 (expected)
North Dakota State University Advisor: Jim Coykendall

M.S., Mathematics 2008 - 2013
North Dakota State University Advisor: Davis Cope
Thesis: Bifurcation portrait of a hybrid spiking neuron model

B.S., Applied Mathematics with minor in Physics 2001 - 2007
Colorado State University

Teaching Experience

Teaching Fellow 2011 to present
Department of Mathematics, North Dakota State University

Teaching Assistant 2009 to 2011
Department of Mathematics, North Dakota State University

Tutor Fall 2009
Academic Collegiate Enhancement Tutoring, North Dakota State University

Research Experience

Research Assistant August 2008 to August 2009
North Dakota State University, , Department of Psychology
Analyzed and critiqued a model found in the literature purported to describe a mechanism through which the brain can bind disparate sources of visual information via synchronous neural activity. Demonstrated the model and the associated quantitative assessment were both poorly supported by the literature. Suggested an alternative model and an alternative measure of synchrony.

Undergraduate Research Assistant (NSF REU) June 2006 to January 2008
Colorado State University, Department of Biology
Investigated an ecological model describing the dynamics of plague resistance and maintenance in North American mammal hosts, and expanded that model to describe the evolution of plague resistance. Gave scientific presentations of technical material to non-technical audiences, presented posters, and interpreted mathematical results into a physical, real-world, sensible context. Attended and presented in lab meetings with Colleen Webb and Mike Antolin at Colorado State University, and Rebecca Eisen and Ken Gage at the Centers for Disease Control and Prevention.

Undergraduate Research Assistant January 2006 to June 2006
Colorado State University, Department of Biology
Worked with Dylan George to develop a statistical model describing the seasonal dynamics of bat rabies. Performed data entry and statistical analyses of large data sets. Gave scientific presentations to non-technical audiences, and presented a poster. Attended and presented in lab meetings.

Honors and Awards

Travel Grant Spring 2013
American Mathematical Society

Graduate School Teaching Award Spring 2010
North Dakota State University Graduate School

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| <i>Honorable Mention</i> Mathematical Contest in Modeling; Consortium for Mathematics and its Applications | Spring 2007 |
| <i>Outstanding Undergraduate Student Oral Presentation</i> Twelfth Annual Department of Biology Student Research Symposium Colorado State University | Fall 2006 |
| <i>Summer Ecology Research Program Fellowship</i> Colorado State University | Summer 2006 |

Publications, Abstracts, Works in Progress

- Coykendall, JB and **Goodell, BG**. The Group of Divisibility as a Functor. For submission to the Journal of Commutative Algebra, 2013. In prep.
- Coykendall, JB and **Goodell, BG**. A Homological Approach to Factorization. For submission to Crelle's Journal, 2013. Submitted. Preprint on arXiv.
- Buhnerkempe MG, Eisen RJ, **Goodell B**, Gage KL, Antolin MF, et al. (2011) Transmission Shifts Underlie Variability in Population Responses to Yersinia pestis Infection. PLoS ONE 6(7)
- Webb, C.T., **Goodell B.G.**, Antolin M.F. (2010) Evolution of resistance in natural hosts of plague (abstract). *Vector-borne and zoonotic diseases*, volume 10, issue 1 (special issue).

Talks, Posters, Workshops

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| <i>Invited Talk</i> Homological Results from the Group of Divisibility Iowa State University, AMS Special Session on Commutative Ring Theory Goodell, B.G. | 2013 |
| <i>Invited Talk</i> Homological Approaches with Partially Ordered Abelian Groups North Dakota State University, Algebra Seminar Goodell, B.G. | 2013 |
| <i>Poster presentation</i> On Some Homological Approaches within Partially Ordered Abelian Groups. North Dakota State University, Further Connections Between Algebra and Geometry Coykendall, J.B. and Goodell, B.G. | 2013 |
| <i>Workshop</i> Workshop on Connections Between Algebra and Geometry University of Regina | 2012 |
| <i>Invited Talk</i> Bifurcations in Neural Models North Dakota State University, Department of Mathematics Junior Colloquia Goodell, B.G. | 2012 |
| <i>Poster presentation</i> Critique of a Wilson-Cowan model Linking Neural Synchronization with Visual Grouping. York University, Centre for Vision Research Conference Goodell, B.G. and Rainville, S.J. | 2009 |
| <i>Paper and poster presentation</i> Modeling the Evolution of Plague Resistance in Prairie Dogs Colorado State University, 12 th Annual Dept. of Biology Student Research Symposium C.T. Webb, B.G. Goodell , M.F. Antolin | 2007 |
| <i>Paper presentation</i> Disease Modeling in Black-tailed Prairie Dogs Summer Ecology Research Program Symposium; Colorado State University C.T. Webb, B.G. Goodell , M.F. Antolin | 2006 |

Modeling the Seasonal Dynamics of Bat Rabies
Student Research Colloquium; Colorado State University
D. George, **B.G. Goodell**, K.K. Sweetzer

References

Jim Coykendall
James A. Meier Professor
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María de los Ángeles Alfonso-Cubero,
Assistant Professor
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A complete bifurcation portrait of a simple model neuron

Stuff stuff stuff