DANIEL C. REUMAN

Laboratory of Populations, Rockefeller University
1230 York Ave., Box 20
New York, NY 10021
212 327 8887
Date of Birth: 05 Sept. 1974

220 E. 70th St. #5E
New York, NY 10021
reumand@rockefeller.edu
917 805 7519
Citizenship: U.S.A.

Education

Ph.D., Mathematics, University of Chicago, Chicago, IL: July 1998 – August 2002
Supervisor: Professor Robert E. Kottwitz.

M.S., Mathematics, University of Chicago, Chicago, IL: September 1997 – June 1998

B.A., Harvard University, Cambridge, MA: September 1992 – June 1996
Magna Cum Laude.

Research Experience

Research Associate, Laboratory of Populations, Rockefeller University, New York, NY: August 2006 – present

Post-doctoral Associate, Laboratory of Populations, Rockefeller University, New York, NY: September 2002 – July 2006
Research on food webs, nonlinear population dynamics with applications to insects, spectral analysis of populations, and other topics in mathematical population biology.

Ph.D. Dissertation, University of Chicago, Chicago, IL: July 1998 – August 2002

Undergraduate Researcher, Research Experience for Undergraduates, Mt. Holyoke College, South Hadley, MA: June 1995 – August 1995

Cryptographic Researcher, **Director's Summer Program, National Security Agency,** Ft. Meade, MD: June 1994 – August 1994
Worked on a team to solve cryptographic problems of importance to national security. Held top-secret security clearance.

Publications

D.C. Reuman, C. Mulder, C. Banašek-Richter, M.-F. Cattin Blandenier, A.M. Breure, H.A. Den Hollander, J.M. Kneitel, D. Raffaelli, G. Woodward, J.E. Cohen. Allometry of body size and abundance in 166 food webs: tests of the standard linear model. In review. *Journal of Animal Ecology*.

U. Brose, T. Jonsson, E.L. Berlow, P. Warren, C. Banašek-Richter, L.-F. Bersier, J.L. Blanchard, T. Brey, S.R. Carpenter, M.-F. Cattin Blandenier, L. Cushing, H.A. Dawah, T. Dell, F. Edwards, S. Harper-Smith, U. Jacob, M.E. Ledger, N.D. Martinez, J. Memmott, K. Mintenbeck, J.K. Pinnegar, B. C. Rall, T. Rayner, **D.C. Reuman**, L. Ruess, W. Ulrich, R.J. Williams, G. Woodward, J.E. Cohen. Consumer-resource body-size relationships in natural food webs. In press. *Ecology*.

U. Görtz, T.J. Haines, R.E. Kottwitz, **D.C. Reuman**. Dimensions of some affine Deligne-Lusztig varieties. In press. *Annales Scientifiques de l'Ecole Normale Supérieure*. arXiv/math.AG/0504443

D.C. Reuman, J. E. Cohen. Estimating relative energy fluxes using the food web, species abundance, and body size. 2005. In: *Food Webs: From Connectivity to Energetics*, ed. Hal Caswell. *Advances in Ecological Research* 36, 137-182. Elsevier, San Diego.

D.C. Reuman, J.E. Cohen. Trophic links' length and slope in the Tuesday Lake food web with species' body mass and numerical abundance. 2004. *Journal of Animal Ecology* 73, 852-866.

D.C. Reuman. Formulas for the dimensions of some affine Deligne-Lusztig varieties. 2004. *Michigan Mathematical Journal* 52:2, 435-451.

D.C. Reuman. Determining whether certain affine Deligne-Lusztig sets are empty. 2003. arXiv:math.RT/0211434

Manuscripts in Preparation

D.C. Reuman, J.E. Cohen. Multi-dimensional spectral mimicry: a method of synthesizing matching vector valued time series with different Fourier spectra.

D.C. Reuman, R.A. Desharnais, R.F. Costantino, O. Ahmad, J.E. Cohen. Power spectra reveal the influence of stochasticity on nonlinear population dynamics.

D.C. Reuman, R.A. Desharnais, R.F. Costantino, J.E. Cohen. Spectral analysis of populations reveals interactions among stochasticity, nonlinear dynamics, and small-population effects.

D.C. Reuman, J.E. Cohen, C. Mulder. Disturbance and fertilization shape diversity, allometry, and biomass flux in soil food webs.

Current and Past Funding

National Science Foundation: 2005 – present

Collaboratively won a five-year grant worth $1,400,000 from the NSF Division of Mathematical Sciences and the Directorate for Biological Sciences with Joel E. Cohen, Robert A. Desharnais, and Robert F. Costantino.

Department of Mathematics, University of Chicago: September 1997 – August 2002

Graduate tuition fellowship and stipend.

American Rewards for College Scientists: 2000, 2001

Two annual merit based $5000 rewards for excellence in graduate studies.

National Science Foundation: 1996

Honorable mention for graduate fellowship.

Teaching Experience

Volunteer Tutor, DOME project, New York, NY: December 2004 – June 2006

Served as a one-on-one, long term mentor and mathematics tutor for two middle school students.

Lecturer in Mathematics, **University of Chicago,** Chicago, IL: October 1999 – June 2002

Fully responsible for teaching seven undergraduate mathematics courses:

Elementary Calculus I, II (Math 131-132): Basic introduction to calculus. Supervised two teaching assistants.

Calculus II,III (Math 152-153): Introduction to calculus. Taught 152 twice.

Multivariable Calculus and Linear Algebra (Math 195-196): For economics students.

Math Reasoning Instructor, Johns Hopkins University Center for Talented Youth, Clinton, NY: June 2000 – July 2000

Created and taught an intensive three week course in logic and mathematical reasoning for students of ages 13-15 years. Instructional time was 7 hours daily.

Teaching Fellow in Mathematics, University of Chicago, Chicago, IL: October 1998 – June 1999

Assessed students using homework, taught weekly review, lectured on special topics, and assisted students individually in an Honors Analysis course.

High School Teaching Intern, Casablanca American School, Casablanca, Morocco: August 1996 – June 1997

Fully responsible for teaching high school mathematics and computer science courses:
International Baccalaureate Math Methods (calculus and other topics).
Several computer programming courses for 7-8th grade students.
Created and taught interactive units on philosophy of math and electric motor construction.
Created and taught a two week intensive course on Newtonian mechanics in preparation for British A-level exams.
Assisted with instruction of 10-12th grade students in computer programming courses.

Teaching Fellow in Mathematics, Harvard University, Cambridge, MA: January 1996 – June 1996, September 1993 – January 1993

Assessed students using homework, taught weekly review, lectured on special topics, and assisted students individually in:
Multivariable calculus (Math 21a).
Elementary number theory (Math 124).

Development and Policy Experience

Educational Development Consulting Intern, **Khulisa Management Services,** Johannesburg, South Africa: June 2001 - December 2001

Coordinated a project to choose university centers of specialization in education policy development for the Southern African Development Community, a region of 14 countries.
Developed database systems to streamline government disbursement of grants.
Interacted extensively with clients from the government and non-profit sectors.
Wrote proposals and budgets for long-term projects in response to government tenders.
Conducted fieldwork in schools as part of a five-year monitoring and evaluation project.

Awards and Honors

CUE Award for excellent teaching, Harvard University, Boston, MA: June 1996

John Harvard Scholarship for Academic Excellence, Harvard University, Boston, MA: June 1996

Prize for an excellent lecture, Undergraduate Math Table, Harvard University, Boston, MA: 1995

Lecture: *Dividing a Square into Triangles.*

Conferences and Lectures

Invited lecture, 91st annual meeting of the Ecological Society of America, Memphis, TN: 6-11 August 2006

Power spectra reveal the interactions among nonlinear population dynamics, stochasticity, and lattice effects.

Invited participant, Gordon Research Conference on the Metabolic Basis of Ecology, Lewiston, ME: 9-14 July 2006

Poster: *Disturbance and fertilization shape diversity, abundance-body-mass relations, and biomass flux in 146 soil food webs.*

Invited lecture, Department of Ecology and Evolutionary Biology, Princeton University, Princeton, NJ: 8 May 2006

Power spectra reveal the interactions among nonlinear population dynamics, stochasticity, and lattice effects.

Invited participant and lecturer, workshop on the analysis of entire networks of ecological interactions, Institute for Scientific Interchange Foundation, Turin, Italy: 11-13 January 2006

Food webs augmented with additional data: Structure and dynamics.

Invited lecture, Department of Biology at Bard College, Annandale-on-Hudson, NY: 17 October 2005

Food webs of the past, present and future: from static community description to predictive tool.

Lecture, International Association for Ecology Ninth International Congress of Ecology, Montreal, Canada: 9 August 2005

Estimating relative fluxes of energy in trophic links using the food web, species abundance, and body size.

Invited lecture, Center for Environmental Research and Conservation, Columbia University, New York, NY: 22 February 2005

Estimating relative fluxes of energy along trophic links using the food web, species abundance, and body size.

Lecture, Rockefeller Research Exchange, Rockefeller University, New York, NY: 17 February 2005

Frequency domain analysis of difference equation models of chaotic beetle population dynamics.

Invited participant and lecturer, International Advancement of Community Ecology Theory workshop in Cork, Ireland: 2-4 September 2004

Co-leader of the working group on trivariate patterns in food webs, and the estimation of energy fluxes.

Lecture: *Estimating relative flux along trophic links using trivariate data*.

Invited participant, Gordon Research Conference on the Metabolic Basis of Ecology, Lewiston, ME: 4-9 July 2004

Poster: *Length, slope and flux for trophic links in the Tuesday Lake food web with body mass and numerical abundance.*

Lecture, Biomathematics Lunchtime Seminar, Courant Institute of Mathematical Sciences, New York, NY: 2 March 2004

Frequency domain analysis of difference equation models of chaotic beetle population dynamics.

Invited participant and lecturer, Northeast Ecology and Evolution Conference, Rutgers University, New Brunswick, NJ: 11-13 April 2003

Lecture: *Testing stochastic models of population dynamics against data using the Fourier Transform.*

Poster: *Links in gourmet food webs: length and slope of links in food webs plotted on body mass versus numerical abundance coordinates.*

Invited participant, NSF/NIH Symposium on Accelerating Mathematical-Biological Linkages, Bethesda, MD: 12-13 February 2003

Invited participant, Santa Fe Institute workshop on Modeling and Simulating Biocomplexity for Mathematicians and Physicists, Santa Fe, NM: 4-9 August 2002

Attended American Mathematical Society Central Sectional Meeting, Ann Arbor, MI: 1-3 March 2002

Professional Memberships

American Association for the Advancement of Science.

Ecological Society of America.

International Association for Ecology.

New York Academy of Sciences.
Full member of Sigma Xi.
Society for Mathematical Biology.
American Mathematical Society.

Peer Review Services

Nature, Mathematical Medicine and Biology, Ecology, Journal of Animal Ecology, Trends in Ecology and Evolution, Marine Ecology Progress Series.

References

Joel E. Cohen: 212 327 8884
Abby Rockefeller Mauzé Professor of Populations, The Rockefeller University
Professor of International and Public Affairs, Columbia University
Professor of Earth and Environmental Science, Columbia University

Robert E. Kottwitz: 773 702 7100
Professor of Mathematics, University of Chicago

Robert F. Costantino: 520 621 7295
Professor Emeritus of Biological Sciences, University of Rhode Island
Adjunct Professor of Ecology and Evolutionary Biology, University of Arizona

Robert A. Desharnais: 323 343 2056
Professor of Biology, California State University, Los Angeles