

Michael V. Rosario

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## EDUCATION

Ph.D., Biology, Duke University (2013 – 2015)

M.Sc., Organismic and Evolutionary Biology, University of Massachusetts Amherst (2010 - 2013)

B.A., Integrative Biology, University of California Berkeley (2005 - 2009)

## ACADEMIC POSITIONS

National Science Foundation Postdoctoral Fellow, Brown University (2016 – 2018)

Computational Science Intern, Sandia National Laboratories (2013)

## FUNDING

National Science Foundation Postdoctoral Research Fellowship in Biology (2016-2018)  
Broadening Participation  
\$138,000 in support of study

Information Initiative at Duke Undergraduate Expedition (2014)

Organismic and Evolutionary Biology Research Grant (2012)

Department of Energy Computational Science Graduate Fellow (2011 – 2015)  
\$152,000 in support of study

Northeast Alliance for Graduate Education and Professoriate Fellowship (2010-2011)  
\$63,000 in support of study

## PUBLICATIONS

Werth A.J., Harriss R.W., **Rosario M.V.**, George J.C., Sformo T.L. 2016. Hydration affects the physical and mechanical properties of baleen tissue. *Royal Society Open Science*. 3:160591.

**Rosario, M.V.**, Sutton, G.P., Patek, S.N., Sawicki, G.S. Muscle-spring dynamics in time-limited, elastic movements. *Proceedings of the Royal Society, B*, 283: 20161561.

**Rosario, M.V.**, Patek, S.N. 2015. Multi-level analysis of elastic morphology: the mantis shrimp's spring. *Journal of Morphology*, 276:1123-1135.

Scott, S.N., Templeton, J.A., Hough, P.D., Ruthruff, J.R., **Rosario, M.V.**, Peterson, J.P. 2015. Statistical validation for heat transfer problems: A Case Study. *Computational Methods and Experimental Measures*. 3:101-120.

Smith, A.J., **Rosario, M.V.**, Eiting, T., Dumont, E.R. 2013. Joined at the hip: linked characters and the problem of missing data in studies of disparity. *Evolution*. 1558-5646.

Patek, S.N., Green, P.A., **Rosario, M.V.** 2013. Treatise on Zoology - Anatomy, Taxonomy, Biology. The Crustacea, Volume 4: Internal Morphology. Brill Press. Editor: Fred Schram.  
Patek, S.N., Rosario, M.V., Taylor, J.R.A. 2013. Comparative spring mechanics in mantis shrimp. *Journal of Experimental Biology*, 216:1317-1329.

McHenry, M. J., Claverie, T., **Rosario, M. V.**, Patek, S. N. 2012. Gearing for speed slows the predatory strike of a mantis shrimp. *The Journal of Experimental Biology*, 215:1231-45.

Patek, S.N., Dudek, D.M., **Rosario, M.V.** 2011. From bouncy legs to poisoned arrows: elastic movements in invertebrates. *Journal of Experimental Biology*, 214: 1973-1980.

## ACADEMIC ORGANIZATIONS

**SOURCE: Studying, Originating, and Understanding R Coding Examples.** Co-founder. Responsible for presenting information about R coding and programming to other graduate students to help with analysis of data and simulation models. Participates regularly in consultations with other students and faculty (2010 – present)

**Diversity Committee Student Representative.** Presented poster and conducted lab tours for UMass Graduate Recruitment day (2010 - 2013)

**Behavior and Morphology Coordinator.** Co-organized biweekly meetings between four different labs to discuss topics in animal behavior and functional morphology (2010)

## PRESENTATIONS AND PUBLISHED ABSTRACTS

Rosario, M.V., Sutton, G.P., Patek, S.N., Sawicki, G.S. 2017. The springs of time-limited bullfrogs jumps and slow-preparation grasshopper leaps are tuned to their muscle dynamics. *Annual Meeting of the Society for Integrative and Comparative Biology*. (New Orleans, Louisiana).

Rosario, M.V., Sawicki, G., Sutton, G.P., Patek, S.N. 2015. So much work, so little time: maximizing elastic energy within the duration of muscle contraction. Annual Meeting of the Department of Energy Computational Science Graduate Fellowship. (Arlington, Virginia)

Rosario, M.V., Smith, A.J., Eiting, T., Dumont, E.R. 2014. The case of the missing body parts: computational approaches to the fossil record. Annual Meeting of the Department of Energy Computational Science Graduate Fellowship.(Arlington, Virginia)

Rosario, M.V., Patek, S.N. 2013. Studying the effect of shape in fast biological springs. Annual Meeting of the Department of Energy Computational Science Graduate Fellowship. (Arlington, Virginia)

Rosario, M.V., Dumont, E.R., Patek, S.N. 2013. Shrimp springs: how shape affects strength in energy storage. *Annual Meeting of the Society for Integrative and Comparative Biology*. (San Francisco, California)

Rosario, M.V., Dumont, E.R., Patek, S.N. 2012. Support, stability, and shrimp springs. Eastern Regional Meeting for Division of Vertebrate Morphology of the Society for Integrative and Comparative Biology. (Amherst, Massachusetts)

Rosario, M.V., Patek, S.N., Dumont, E.R. 2012. Investigating how morphological change alters the competing demands of a biological spring. Annual Meeting of the Department of Energy Computational Science Graduate Fellowship. (Arlington, Virginia)

Rosario, M.V., Patek, S.N. 2011. Comparing the effects of shape on elastic support structures. Eastern Regional Meeting for Division of Vertebrate Morphology of the Society for Integrative and Comparative Biology. (Kingston, Rhode Island)

Rosario, M.V., Patek, S.N., Dumont, E.R. 2011. Comparing elastic energy structures in mantis shrimp using finite element analysis. *Integrative and Comparative Biology*, 51: E117. (Salt Lake City, Utah)

Rosario, M.V., Patek, S.N., Dumont, E.R. 2010. Measuring elastic properties with finite element analysis. Eastern Regional Meeting for Division of Vertebrate Morphology of the Society for Integrative and Comparative Biology. (Cambridge, Massachusetts)

Rosario, M.V., Taylor, J.R.A., Patek, S.N. 2010. Probing the evolutionary biomechanics of elastic energy storage in mantis shrimp. *Integrative and Comparative Biology*, 50: E289. (Seattle, Washington)

## **DISTICTIONS AND ACHIEVEMENTS**

Northeast Alliance for Graduate Education and the Professoriate, University of Massachusetts Amherst (2010)

Best Student Oral Presentation Award, The Crustacean Society (2011)

Best Student Poster Award, Division of Comparative Biomechanics, Society for Integrative and Comparative Biology (2010)

Best Student Poster Award, The Crustacean Society (2010)

## **OUTREACH**

**Science Cafe Speaker.** Showcased examples of elastic mechanisms in biology and answered questions from the public. Created and used a device to collect materials data with members of the audience. (2017)

**Volunteer on Science Day.** Led multiple small groups of 3<sup>rd</sup> and 4<sup>th</sup> graders through color and vision experiments in place of regular science class. (2014)

**Online R Tutorials.** Created online tutorial series for scientists to learn basic programming skills in the R programming language. Taught skills such as importing data, handling data, and plotting. <http://youtube.com/oebsource> (2012 – present)

**RET mentor.** Mentored and advised high school teacher in Research Experiences for Teachers program. Aided in materials testing and hypotheses testing. (2012)

**Science Cafe Board Member.** Participated in planning and running events to educate the public about broad themes in biology. Edited and produced videos to encourage attendance. Composed various science-inspired love songs (2011 - 2013)

## TEACHING EXPERIENCE

**SOURCE Instructor,** Graduate Program in Organismic and Evolutionary Biology, Univ. Mass., Amherst. Department of Biology, Duke University. Department of Ecology and Evolution, Brown University. *SOURCE.* Created lessons and exercises to teach undergraduates, graduate students, postdocs and faculty to process, analyze, and simulate biological datasets. (2010 - present)

**Teaching Assistant,** Department of Biology, Duke Univ. *Vertebrate Anatomy.* Prepared and guided students through various dissections of vertebrate animals. Designed practical exams to test students' knowledge of comparative anatomy and functional morphology. (2015)

**Teaching Assistant,** Department of Biology, Univ. Mass., Amherst. *How Organisms Move.* Designed and lead computer labs using the R programming language to process biomechanical datasets, and demonstrate basic computational skills needed to perform biomechanical analyses (2012)

**Biology Undergraduate Research Apprenticeship,** Department of Biology, Univ. Mass., Amherst. *Creating a 3-Dimensional Model of a Biological Spring.* Supervised an undergraduate student with manipulating and analyzing finite element models created from micro-CT scans (2010)

**Undergraduate Student Instructor,** Department of Integrative Biology, UC Berkeley. *Human Anatomy Lab.* Provided hands on instruction using models, wet specimens, and cadavers. Held weekly office hours (2008)

## SERVICE

Reviewer for: Journal of Experimental Biology, Journal of Morphology, Journal of the Royal Society Interface

Reviewer for internal Dissertation Development Grant. (2016 - present)