



# Rafael Maia

Junior Fellow  
Simons Society of Fellows

Department of Ecology, Evolution  
and Environmental Biology  
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**Appointments** Columbia University, New York NY • July 2015 – Present  
Simons Foundation Junior Fellow (3-year postdoctoral fellowship),  
Department of Ecology, Evolution & Environmental Biology  
Supervisor: Dr. Dustin Rubenstein

University of Idaho, Moscow ID • Aug 2014 – June 2015  
Postdoctoral Fellow, Department of Biological Sciences  
Supervisor: Dr. Luke Harmon

**Education** The University of Akron, Akron OH • 2009 – 2014  
PhD, Integrated Bioscience PhD program  
Advisor: Dr. Matthew D. Shawkey

Universidade de Brasília, Brasília, Brazil • 2006 – 2008  
MSc, Ecology  
Advisor: Dr. Regina H. Macedo

Universidade de Brasília, Brasília, Brazil • 2001 – 2004  
BSc, Biological Sciences

Universidade de Brasília, Brasília, Brazil • 2003 – 2007  
BSc, Science Teaching in Biological Sciences

**Grants & Awards** **Fellowships & Research Grants**  
2014 Junior Fellow Award, Simons Foundation Society of Fellows (\$366,000)  
2012 Doctoral Dissertation Improvement Grant (DDIG), NSF (\$14,844)  
2012 Frank M. Chapman Research Grant, American Museum of Natural History (\$2,000)  
2011 Tiered Mentoring Research Program, The University of Akron/Choose Ohio First (\$2,500)  
2010 Grant-in-Aid of Research, Sigma XI (\$400)  
2006 Developing Nations Research Grant, Animal Behavior Society (\$1,000)

**Travel Awards**  
2012 International Society for Behavioral Ecology (ISBE), Lund, Sweden  
2011 Phylogenetic Comparative Methods & Macroevolution in R, Santa Barbara CA  
2011 NESCent Evolutionary Quantitative Genetics Workshop, Durham NC  
2010 International Ornithological Congress (IOC), São José dos Campos, Brazil  
2008 Iridescence: More than Meets the Eye, ASU SOLS, Tempe AZ

2007 Advanced Topics in Behavioral Ecology Workshop, IEB-Chile, Santiago, Chile  
2006 4<sup>th</sup> North American Ornithological Conference (NAOC), Veracruz, Mexico  
2005 Annual Meeting of the Animal Behavior Society (ABS), Salt Lake City UT

## **Publications**   **Journal Articles**

(†equal contribution, \*undergraduate co-author)

23. Uyeda, J.C., Pennell, M.W., Miller, E.T., **Maia R.** & McClain, C.R. Submitted. The evolution of energetic scaling across the vertebrate tree of life. *Revision submitted to The American Naturalist*.
22. D’Alba L.†, **Maia R.**†, Hauber M.E. & Shawkey M.D. 2016. The evolution of eggshell cuticle in relation to nesting ecology. *Proceedings of the Royal Society of London B: Biological Sciences* 283:20160687.
21. **Maia R.**, Rubenstein D.R. & Shawkey M.D. 2016. Selection, constraint, and the evolution of coloration in African starlings. *Evolution* 70:1064-1079.
20. Rubalcaba J.G., Polo V., **Maia R.**, Rubenstein D.R. & Veiga J.P. 2016. Sexual and natural selection in the evolution of extended phenotypes: the use of green nesting material in starlings. *Journal of Evolutionary Biology* 29:1585-1592.
19. Iskandar J.P.\*, Eliason C.M., Astrop T., Igic B., **Maia R.** & Shawkey M.D. 2016. Morphological basis of glossy red plumage colors. *Biological Journal of the Linnean Society* in Press (doi: 10.1111/bij.12810)
18. Eliason C.M., **Maia R.** & Shawkey M.D. 2015. Modular color evolution facilitated by a complex nanostructure in birds. *Evolution* 69:357-367.
17. Simons M.J.P.†, **Maia R.**†, Leenknecht B.\* & Verhulst S. 2014. Carotenoid-dependent signals and the evolution of plasma carotenoid levels in birds. *American Naturalist* 184:741-751.
16. Manica L.T., **Maia R.**, Dias A., Podos J. & Macedo R.H. 2014. Vocal output predicts territory quality in a Neotropical songbird. *Behavioural Processes* 109(A):21-26.
15. Pessoa D.M.A., **Maia R.**, Ajuz R.C.A., Moraes P.Z.P.M.R., Spyrides M.H.C. & Pessoa V.F. 2014. The adaptive value of primate color vision for predator detection. *American Journal of Primatology* 76:721-729.
14. **Maia R.**, Rubenstein D.R. & Shawkey M.D. 2013. Key ornamental innovations facilitate diversification in an avian radiation. *Proceedings of the National Academy of Sciences* 110:10687-10692
13. **Maia R.**, Eliason C.M., Bitton P.-P., Doucet S.M. & Shawkey M.D. 2013. pavo: an R package for the analysis, visualization and organization of spectral data. *Methods in Ecology & Evolution* 4:906-913.
12. Sicsú P.\*, Manica L.T., **Maia R.** & Macedo R.H. 2013. Here comes the sun: multimodal displays are associated with sunlight incidence. *Behavioral Ecology & Sociobiology* 67:1633-1642.

11. **Maia R.**, Brasileiro L., Lacava R.V. & Macedo R.H. 2012. Social environment affects acquisition and color of structural nuptial plumage in a sexually dimorphic tropical passerine. *PLOS ONE* 7:e47501.
10. Snyder H.K.\*, **Maia R.**, D'Alba L., Shultz A.J., Rowe K.M.C., Rowe K.C. & Shawkey M.D. 2012. Iridescent colour production in hairs of blind golden moles (Chrysochloridae). *Biology Letters* 8:393-396.
09. **Maia R.**, Macedo R.H. & Shawkey M.D. 2012. Nanostructural self-assembly of iridescent feather barbules through depletion attraction of melanosomes during keratinization. *Journal of the Royal Society Interface* 9:734-743.
08. Shawkey M.D., **Maia R.** & D'Alba L. 2011. Proximate bases of silver color in Anhinga (*Anhinga anhinga*) feathers. *Journal of Morphology* 272:1399-1407.
07. **Maia R.** & Macedo R.H. 2011. Achieving luster: prenuptial molt pattern predicts iridescent structural coloration in blue-black grassquits. *Journal of Ornithology* 152:243-252.
06. **Maia R.**, D'Alba L. & Shawkey M.D. 2010. What makes a feather shine? A nanostructural basis for glossy black colors in feathers. *Proceedings of the Royal Society of London B: Biological Sciences* 278:1973- 1980.
05. Lacava R.V., Brasileiro L., **Maia R.**, Oliveira R.F. & Macedo R.H. 2010. Social environment affects testosterone level in captive male blue-black grassquits. *Hormones & Behavior* 59:51-55.
04. Santos E.S.A.\*, **Maia R.** & Macedo R.H. 2009. Condition dependent resource-value affects male-male competition in the blue-black grassquit. *Behavioral Ecology* 20:553-559.
03. **Maia R.**, Caetano J.V.O.\*, Bão S.N. & Macedo R.H. 2009. Iridescent structural colour production in male blue-black grassquit feather barbules: the role of keratin and melanin. *Journal of the Royal Society Interface* 6:S203-S211.
02. Aguilar T.M., **Maia R.**, Santos E.S.A.\* & Macedo R.H. 2008. Parasite levels in blue-black grassquits correlate with male displays but not female mate preference. *Behavioral Ecology* 19:292-301.
01. Dacier A., **Maia R.**, Agostinho D.P. & Barros M. 2006. Rapid habituation of scan behavior in captive marmosets following brief predator encounters. *Behavioural Processes* 71:66-69.

### Invited Chapters

02. **Maia R.** & Santos E.S.A. 2008. Tropical Bird Communities. *in*: Tropical Bird Communities (edited by R.H. Macedo & M. Morris), *in*: Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, EOLSS Publishers, Oxford, UK.
01. Dias A., **Maia R.** & Dias R.I. 2008. Breeding Strategies of Tropical Birds. *in*: Tropical Bird Communities (edited by R.H. Macedo & M. Morris), *in*: Encyclopedia of Life Support Systems (EOLSS), Developed under the Auspices of the UNESCO, EOLSS Publishers, Oxford, UK.

**Software** **pavo** organization, analysis & visualization of color data. [\[github\]](#) [\[CRAN\]](#)  
**reBird** R interface to the eBird API. [\[github\]](#) [\[CRAN\]](#)  
**R scripts for thin-film optical modeling** (Supplementary Material for [Maia et al. 2009](#))

## **Presentations** **Invited Talks**

Integrating development, constraints and selection in the study of avian color diversification

University of Texas at Austin • Nov 2016

American Museum of Natural History Richard Gilder Graduate School

Comparative Biology Seminars • Nov 2016

University of Pittsburgh • Nov 2016

New York University Evening Evolution Group • Dec 2015

Stephen F. Austin State University Biology Department Seminar • Dec 2015

The development, mechanisms and diversification of iridescent feather colors

University of Idaho Biology Department Seminar Series • Oct 2014

The optics of diversity: using physics to illuminate the evolution of bird feather colors

Oberlin College Biology Department Seminar Series • Nov 2013

From nano(structure) to macro(evolution): what the development and mechanisms of iridescence can tell us about plumage color diversification

Physiological and Functional Advances in Avian Coloration Symposium, American Ornithologists' Union Meeting • Aug 2013

Development and evolution of iridescent plumage colors

Cornell Lab of Ornithology • Mar 2012

Key innovations and the evolution of iridescent ornamental colors

The Role of Behavior in Non-Ecological and Non-Adaptive Speciation Symposium, ISBE Meeting • Aug 2012

The evolution of iridescent colors in African starlings

The University of Akron Brown Bag Seminar Series • Apr 2012

Fragments of the rainbow: the development and evolution of iridescence in feathers

The University of Pittsburgh Ecology & Evolution Seminar Series • Sep 2011

## **Contributed Presentations**

(3 most recent of 31 shown, †oral presentation, \*poster)

Selection, constraint and the evolution of coloration in African starlings.†

Evolution, Austin TX • 2016

Form and function in the evolution of iridescent hummingbird colors.\*

Evolution, Salt Lake City UT • 2013

Key innovations and the evolution of iridescent ornamental colors.†

Joint Congress on Evolutionary Biology, Ottawa, Canada • 2013

## Teaching Teaching Assistant

The University of Akron

2013 Principles of Biology

2011 Ornithology

2009–2012 Natural Science: Biology

Universidade de Brasília

2006 Applied Statistics for Ecology (graduate course)

2005–2006 Animal Behavior (advanced undergraduate & graduate course)

2004–2005 Vertebrate Biology

## Guest Lecturer

Universidade Católica de Brasília

2008 Field Methods in Biology (two-week field course)

## Instructor

The University of Akron

2013 Programming and Applied Statistics using R (12h workshop)

Museu Nacional, Universidade Federal do Rio de Janeiro

2010 Applied Spectrophotometry for Animal Coloration Studies (10h workshop)

Universidade Católica de Brasília

2008 Statistics for ecology: experimental design and data analysis (10h workshop)

Universidade de Brasília

2006 Behavioral Ecology and Sociobiology (10h workshop)

## Service & Outreach Reviewer

### Scientific Journals

The Auk, American Naturalist (3), Behavioral Ecology (4), Behavioral Ecology and Sociobiology (4), Biological Journal of the Linnean Society, Biology Letters, Biota Neotropica, BMC Evolutionary Biology (2), Current Opinion in Behavioral Sciences, Evolution (4), Evolutionary Biology, Integrative Zoology (2), Journal of Animal Ecology, Journal of Avian Biology, Journal of Ornithology (2), Methods in Ecology and Evolution (2), PLOS ONE, Ornitología Colombiana, Proceedings of the Royal Society of London B: Biological Sciences (6), Scientific Reports, Systematic Biology.

### National Science Foundation (NSF)

panelist for the Division of Environmental Biology for the 2016 fiscal year.

### Ad hoc reviewer

Reviewer for the book “Modern Phylogenetic Comparative Methods and their Application in Evolutionary Biology: Concepts and Practice” (L. Z. Garamszegi, ed.)

Associate Faculty Member for F1000Prime

Peer member for Peerage of Science

## High School Student Research Mentoring

Samuel Levy, The Heschel School, New York NY

Sarah Dhinojwala, Our Lady of the Elms High School, Akron OH

## Departmental & Society Service

American Society of Naturalists • 2012–2014

Graduate Council to the Executive Committee (member 2012–2013, chair 2013–2014)

The University of Akron • 2011–2012

Interviewer for the Honors College scholarship selection process

Judge and peer reviewer for the University of Akron Biology Undergraduate

Research Symposium (BURS) undergraduate authored publication award and best poster presentation award

Animal Behavior Society • 2009

Volunteer organizer and support team for the 46<sup>th</sup> annual meeting

Society for Conservation Biology • 2005

Volunteer organizer and support team for the 19<sup>th</sup> annual meeting

Brazilian Zoology Society • 2009

Volunteer organizer and support team for the 25<sup>th</sup> annual meeting

## Media Coverage

Care2, Ciência Hoje (BRA), The Conversation, Discovery News, Eos Wetenschap (BEL/NLD), Examiner.com, Globo G1 (BRA), National Geographic's "Not Exactly Rocket Science", Nature, New Scientist, Museum Victoria (AUS), MSNBC, Ohio Authority, PNAS First Look, Popular Science, Sci-News, Science Daily, Sify News (IND), Süddeutsche Zeitung (GER), The University of Akron News, WKSU Exploradio, WQED, Yahoo! News

NPR's "[The Golden Mole Award For Accidental Brilliance](#)" was inspired by one of our publications (Snyder *et al.* 2012).

## Outreach Activities

The colorful sex life of birds • Nov 2016

Talk given to the Secret Science Club at The Bell House in Brooklyn, NY. [The Secret Science Club](#) is a monthly lecture series aimed at the general public, with a regular attendance of 300-400 people.

Evolutionary Biology Online Journal Club • 2012–2013

Creator and member of online discussion group, with meetings recorded and made available on the [website](#).

Instituto Sangari & American Museum of Natural History • 2008

Supervisor of educational activities for the Darwin itinerant exhibit in Brasília, Brazil. Activities included preparing, monitoring and conducting guided tours; training tour guides; creating and lecturing "Meetings with Educators" talks,

focusing on Darwin's life as a tool in the teaching of evolution and the major misconceptions of evolutionary theory (audience: middle and high school teachers)