



Fernanda G. Duque, Ph.D.

Assistant Professor of Neuroethology
School of Biological Sciences
Illinois State University
Normal, IL

email: fgduque@ilstu.edu

website: www.fduque.com

CURRENT POSITION:

Assistant Professor of Neuroethology (August 2023 – Present). School of Biological Sciences. Illinois State University.

- Ecology and neural mechanisms of multimodal communication and social behaviors in birds.

PREVIOUS POSITION:

Postdoctoral Research Fellow (July 2021 – July 2023). Coadvised by Kathleen Lynch, Ph.D. (Hofstra Univ.) and Steve Shea, Ph.D. (Cold Spring Harbor Laboratory).

- Conserved neural mechanisms regulating maternal care in birds and mammals.

EDUCATION:

Ph.D. Neuroscience. Georgia State University (August 2021).

Advisors: Walter Wilczynski, Ph.D. and Laura Carruth, Ph.D.

Dissertation: 'Evolution of high-frequency vocalizations in hummingbirds.'

M.Sc. Neuroscience. Georgia State University (2020).

B.A. Psychology. *Cum Laude*. Universidad San Francisco de Quito. Ecuador (2012).

HONORS AND AWARDS:

University of California Chancellor's Postdoctoral Fellowship (2021-2023)

(I declined in favor of another position).

The Capranica Neuroethology Prize. International Society for Neuroethology (2021).

Neuroscience Impact Award. Neuroscience Institute. Georgia State University (2021).

Honeycutt Fellow. Neuroscience Institute. Georgia State University (2019 – 2021).

Brains & Behavior Fellow. Neuroscience Institute. Georgia State University (2019 – 2021).

PUBLICATIONS:

*Current or past undergraduate students; a = coauthors contributed equally.

Fernández-Gómez, R.A., Ku-Peralta, W., Botero-Restrepo, D., Niño-Rodríguez, N., Laverde-R, O., Pantoja-Sánchez, H.E., Álvarez-Rebolledo, M., Marín-Gómez, O.H., **Duque, F.G.**, and N. Ocampo-Peñuela (2023). La voz de nuestras aves: contribuciones de la bioacústica a la ornitología colombiana. *Ornitología Colombiana*. 23:3-30. DOI: 10.59517/oc.e555

Rodriguez-Saltos, C.A., **Duque, F.G.**, and J.A. Clarke (2022). Precise and non-scalar timing of intervals in a bird vocalization. *Animal behaviour*. 191:165-177. DOI: 10.1016/j.anbehav.2022.06.004

- Featured in *All things considered* (Texas) by the National Public Radio (NPR).

Duque, F.G., and L.L. Carruth (2022). Vocal communication in hummingbirds [Review]. *Brain, Behavior, and Evolution*. 97:241-252. DOI: 10.1159/000522148

Duque, F.G., Rodriguez-Saltos, C.A., Monteros, M.F.*, and W. Wilczynski (2021). Transmission of high-frequency vocalizations from hummingbirds living in diverse habitats. *Biological Journal of the Linnean Society*. 132(1):148-160. DOI: 10.1093/biolinnean/blaa180.

Duque, F.G., Rodriguez-Saltos, C.A., Uma, S.^{a*}, Nasir, I.^{a*}, Monteros, M. F. *, Wilczynski, W., and L. Carruth (2020). High-frequency hearing in a hummingbird. *Science Advances*. 6(29): eabb9393.

- Featured by the Associated Press (AP), Diario El Pais – Spain, Agence France-Presse (AFP) – Quito. Replicated by several news outlets around the world.

Duque, F. G., Rodriguez-Saltos, C.A., and W. Wilczynski (2018). High-frequency vocalizations in Andean hummingbirds. *Current Biology* 28, 17: R927-R928.

- Featured on Popular Science and Nature Ecology & Evolution Community.
- Featured in 2022 book 'An immense world' (p. 241-242), by Ed Yong, Pulitzer Prize winning author.

RESEARCH GRANTS AND AWARDS:

Konishi Neuroethology Research Award. **International Society for Neuroethology (ISN)**. \$2,500.00 (Summer 2019 – 2020).

Student Research Grant. **Animal Behavior Society (ABS)**. \$1,898.00 (Summer 2019 – 2020).

Research Coordination Network on the Genetics and Genomics of Social Behavior. **National Science Foundation**. Travel Award. \$4,700.00 (NSF IOS 1256839) (Summer 2019).

Margaret Morse Nice Award. **American Ornithological Society (AOS)**. Graduate Student Research Award. \$1,697.76 (Summer – Fall 2018).

Research Coordination Network on the Genetics and Genomics of Social Behavior. **National Science Foundation**. Travel Award. \$3,400.00 (NSF IOS 1256839) (Summer 2018).

Research Coordination Network on the Genetics and Genomics of Social Behavior. **National Science Foundation**. Travel Award. \$2,309.00 (NSF IOS 1256839) (Summer 2017).

TEACHING EXPERIENCE:

Brain, behavior, and evolution. Instructor on record. Joined upper-level undergraduate and graduate course. Biology Department. Hofstra University (Spring 2022).

Writing Across the Curriculum (WAC) Program. Writing consultant. Undergraduate Neuroscience Laboratory. Prof. Manfred Schmidt. Georgia State University (2 semesters - Fall 2017, Spring 2020).

Scientific methods in neuroscience. Graduate Teaching Assistant. Undergraduate Neuroscience Program. Prof. Michael Black, Ph.D. Georgia State University (Spring 2020).

Undergraduate neuroscience laboratory. Graduate Teaching Assistant. Undergraduate Neuroscience Program. Prof. Manfred Schmidt, Ph.D. Georgia State University (2 semesters - Spring–Fall 2017).

Cognitive neuroscience (Psychophysiology). Undergraduate Teaching Assistant. Prof. Eduardo Arizaga, MD. Universidad San Francisco de Quito (Fall 2008).

STUDENT RESEARCH MENTORING:

Undergraduate research. Neuroscience program. Hofstra University.

- Christian Farrelly (Junior, Spring 2022 – Present).
- Audrey Soo (Junior, Fall 2021 – Present).
- Asma Azam (Junior, Summer 2021 – Spring 2022).
- Aman Kaur (Junior, Summer 2021 – Spring 2022).
- Nina Glawe (Junior, Summer 2021 – Spring 2022).
- Rachel Pao (Senior, Summer 2021 – Spring 2022).
- Rosin Crosby (Senior, Summer 2021 – Fall 2021).

Undergraduate research. Neuroscience program. Georgia State University.

- Blessy Varghese (Fall 2020 – Spring 2021).
- Shivaanii Uma (April 2019 – Spring 2021).
 - Honor's College Research Assistant (2019 – 2020)
 - Brains & Behavior Summer Scholar (2020)
- Isbah Nasir (April 2019 – May 2021).
 - Brains & Behavior Summer Scholar (2020)

Marco Monteros. Senior, Biological and Environmental Sciences program. Universidad Tecnica del Norte, Ecuador (Summer – Fall 2018).

- Current collaborator; now affiliated with the Ecuadorian National Institute for Biodiversity and Fundacion Ecominga.

INVITED TALKS:

Duque, F.G. (2023, February). From sender to receiver: communication coming full circle. School Biological Sciences. Illinois State University. Normal, IL.

Duque, F.G. (2022, December). From sender to receiver: communication full circle. Biology Department. Allegheny College. Meadville, PA.

Duque, F.G. (2022, December). From sender to receiver: communication full circle. Biology Department. Ohio Wesleyan University. Delaware, OH.

Duque, F.G. (2022, October). From sender to receiver: communication full circle. Biology Department. Bowdoin College. Brunswick, ME.

Duque, F.G. (2022, February). Evolution of high-frequency vocalizations in hummingbirds. Biology department. Hofstra University. Hempstead, NY.

Duque, F.G. (2021, October). Evolution of high-frequency vocalizations in hummingbirds. Biology department. Vassar College. Poughkeepsie, NY.

Duque, F.G. (2021, August). A private channel of communication: High-frequency vocalizations and hearing in hummingbirds [Invited talk – Symposium: How birds sense the world]. American Ornithological Society. Online.

Duque, F.G. (2021, May). Vocalizaciones de alta frecuencia en colibríes [Invited talk]. Red Ecuatoriana de Ornitología. Online.

PRESENTATIONS AND POSTERS AT CONFERENCES:

*Undergraduate students; a = coauthors contributed equally.

Duque, F.G., Rodriguez-Saltos, C.A., and K.S. Lynch (2023, January). Comparative studies using mesotocin in parental and non-parental blackbirds [Presentation]. Society for Integrative and Comparative Biology. Austin, TX.

Duque, F.G., Azam, A. ^{a*}, Glawe, N. ^{a*}, Kaur, A. ^{a*}, Pao, R. ^{a*}, and K.S. Lynch. Effects of mesotocin in the brain and behavior of a female brood parasite

- Presentation. Animal Behavior Society. Online. (2022, July).
- Poster. Society for Behavioral Neuroendocrinology. Atlanta, GA. (2022, June).

Duque, F.G., Azam A.*, Crosby, R.*, Kaur, A.*, Pao, R.*, and K.S. Lynch (2022, January). Understanding the effects of reproductive and parental hormones in an avian brood parasite [Presentation]. Society for Integrative and Comparative Biology. Online.

Duque, F.G., Monteros, M.F., Rodriguez-Saltos, C.A., Varghese, B.*, Wilczynski, W., and L.L. Carruth (2021, August). Dialects in the high-frequency courtship song of an Andean hummingbird [Presentation]. Animal Behavior Society. Online.

Duque, F.G., and L.L. Carruth (2021, January). Do smaller hummingbirds sing higher-pitched songs? [Presentation]. Society for Integrative and Comparative Biology. Online.

Duque, F.G., Rodriguez-Saltos, C.A., Uma, S. ^{a*}, Nasir, I. ^{a*}, Monteros, M.F., Wilczynski, W., and L.L. Carruth (2020, July). High-frequency hearing in an Andean hummingbird [Presentation]. Animal Behavior Society. Online.

Mein, S., Mournighan, D.*, **Duque, F.G.**, and L.L. Carruth (2020, July). Effects of acute stress in preference behavior in pair-bonded adult female Zebra Finches. Animal Behavior Society. Online.

Uma, S.^{a*}, Nasir, I.^{a*}, **Duque, F.G.**, and L.L. Carruth (2020, April). High-frequency vocalizations and hearing in hummingbirds [Undergraduate presentation]. Georgia State University Undergraduate Research Conference. Online.

Duque, F.G., Monteros, M.F., Rodriguez-Saltos, C.A., Uma, S.^{a*}, Nasir, I.^{a*}, Carruth, L.L., Bonaccorso, E., and W. Wilczynski (2020, January). Dialects in the high-frequency song of a hummingbird. [Presentation]. Society for Integrative and Comparative Biology. Austin, TX.

Duque, F.G. Rodriguez-Saltos, C.A., Carruth, L.L., Bonaccorso, E., and W. Wilczynski (2019, August). Dialects in the high-frequency song of the Ecuadorian Hillstar. [Presentation]. International Biogeography Society. Quito, Ecuador.

Duque, F.G., Rodriguez-Saltos, C.A., Uma, S.^{a*}, Nasir, I.^{a*}, Monteros, M.F., and W. Wilczynski (2019, May). Vocal communication in hummingbirds: Transmission of high-frequency signals. [Poster]. Brains & Behavior Retreat. Neuroscience Institute. Georgia State University. Atlanta, GA.

Duque, F.G., Rodriguez-Saltos, C.A., Carruth, L., and W. Wilczynski (2019, April). High-frequency vocalizations and habitat acoustics in Andean hummingbirds. [Poster]. Center for Brain, Behavior, and Evolution. University of Texas at Austin. Austin, TX.

Duque, F.G. (2019, January). Signal transmission of high-frequency vocalizations of Andean hummingbirds. [Presentation]. Society for Integrative and Comparative Biology. Tampa, FL.

Rodriguez-Saltos, C.A. and **Duque, F.G.** (2019, January). Precise decrease in the tempo of a song of a Tropical Wren. [Poster]. Society for Integrative and Comparative Biology. Tampa, FL.

Duque, F.G. (2018, January). Diversification of vocal communication in Andean hummingbirds. [Presentation]. Neuroscience Institute Breakfast & Lecture (NIBL), Georgia State University. Atlanta, GA.

Duque, F.G., Rodriguez-Saltos, C.A., Carruth, L., and W. Wilczynski (2018, January). High-frequency vocalizations and habitat acoustics in Andean hummingbirds. [Poster]. Society for Integrative and Comparative Biology. San Francisco, CA.

Duque-Mendoza, F.G., and C.A. Rodriguez-Saltos (2017, April). Exceptionally high fundamental frequencies in a bird. [Poster]. Brains & Behavior Retreat, Neuroscience Institute, Georgia State University. Atlanta, GA.

Duque-Mendoza, F.G., and C.A. Rodriguez-Saltos (2017, January). Exceptionally high fundamental frequencies in a bird vocalization. [Poster]. Society for Integrative and Comparative Biology, New Orleans, LA.

Coleman, M.J., Roeser, A., **Duque, F.**, and E.S. Fortune (2015, October). Neural representation of a shared behavior in two individuals. [Poster]. Society for Neuroscience, Chicago, IL.

FIELD EXPEDITIONS:

I have organized and lead multiple field expeditions since 2015 along the Ecuadorian Andes to study the evolution of high-frequency vocalizations in Andean hummingbirds.

- 2022 Summer field season. North Dakota, USA. Two comparative studies including three bird species to investigate the neural basis of maternal care in parental species and the loss of these behaviors in avian brood parasites.
- 2019 Summer expedition. Experiments with hummingbirds in captivity to assess sexually dimorphic responses to high-frequency song during the breeding season. Specimen collections.
*Undergraduate student as field assistant
- Fall expedition. Final collection of data on dialects. Testing behavioral protocols for assessing multimodal signaling in hummingbirds.
- 2018 Summer expedition. Chimborazo, Cotacachi, and Intag Valley (cloud forest). Experiments on signal transmission in the grasslands and cloud forest. Experiments with hummingbirds in captivity to analyze neural responses to high-frequency song. Specimen collections.
*Undergraduate student as field assistant
- Fall expedition. Recordings of vocalizations to study dialects in the high-frequency song of *O. chimborazo*. Field behavioral experiments.
*Undergraduate student as field assistant
- 2017 Summer expedition. Testing protocols for working with hummingbirds in captivity. Specimen collection to test laboratory protocols in hummingbird brains.
- 2016 Spring expedition. Recording vocalizations from the two *O. chimborazo* subspecies.
- 2015 Summer and Winter expeditions. Pichincha, Antisana, and Chimborazo. Ecuador. Collection of high-frequency vocalizations from the Ecuadorian Hillstar (*Oreotrochilus chimborazo*) and test of field behavioral experiments.

SERVICE IN DIVERSITY, EQUITY, AND INCLUSION (DEI):

Mentor. Graduate School Mentorship Initiative (GSMI). Cientifico Latino. Fall 2020 – 2022.

- Mentoring students from underrepresented minorities in STEM and low-income families throughout the application process to graduate school.

Graduate student founding member. Newly formed Diversity, Equity, and Inclusion (DEI) Committee. Neuroscience Institute. Georgia State University. July 2020 – May 2021.

- Develop initiatives to create inclusive spaces for diverse scientists to broadcast their research at an early stage in their career.

Panelist. Informing undergraduate students about diverse backgrounds leading to a scientific career and demystifying the application process to graduate school.

- BIPOC Graduate School Advice Panel. Center for the Advancement of Students and Alumni (CASA). Georgia State University. March 2021.
- CNS Career Panel for Undergraduates. Collegiate Neuroscience Society. Georgia State University. September 2020.
- Brains & Behavior Student panel for Undergraduate scholars. Neuroscience Institute. Georgia State University. Atlanta, GA: June 2020.

ACADEMIC SERVICE:

Peer reviewer. 2023 Hormones and behavior
Bioacoustics
The Wilson Journal of Ornithology
2022 Ecology and Evolution Journal

Fellowship reviewer. National Fellowship Program. Graduate Women In Science (GWIS). Spring 2021.

Session Chair. Session 19 Animal Communication. Society of Integrative and Comparative Biology Annual Meeting. Online: January – February 2021.

Panel moderator. Communication 5 session, Live Q&A. Animal Behavior Society Annual Meeting. Online: July 2020.

Student representative. Graduate Program Committee. Neuroscience Institute. Georgia State University. September 2019 – May 2020.

Session Chair. Functional biogeography session. International Biogeography Society meeting 'Humboldt 250'. Quito: August 2019.

Volunteer. Neuroscience Institute Recruitment. Georgia State University. Recruitment cycle 2018, 2021.

SCIENCE COMMUNICATION:

Graduate Fellow. Science ATL Communication Program. Science ATL. Sponsored by Emory University. Online: Fall 2020.

ComSciCon Fellow. Communicating Science workshop for graduate students. Atlanta Chapter. University of Georgia. Athens, GA: March 2020.

Guest Contributor. Chasing hummingbirds in the footsteps of Humboldt [Story behind the paper]. Nature Ecology & Evolution Community. June 2019.

COMMUNITY ENGAGEMENT & OUTREACH:

Guest speaker. Extraordinary song and hearing in the Ecuadorian hillstar. Motmot Birds and Nature. Online: August 2020.

Guest scientist. Science Tales & Trails. Science for Georgia, Inc. Online: July 2020.

Workshop lecturer. Brain states – sleep, arousal, attention, and rest. Atlanta Brain Bee. Emory University. Atlanta, GA: January 2020.

Presenter. Hummingbirds and auditory perception. Miller Grove Middle School. Brain Awareness Month. Decatur, GA: March 2019.

Presenter. Extraordinary high-frequency vocalizations in hummingbirds: Andean hummingbirds as a model to study the evolution of vocal communication. INABIO & Aves Quito. Quito, Ecuador: November 2018.

Presenter. The evolution of the brain – what we can learn from hummingbirds. Miller Grove Middle School. Brain Awareness Month. Decatur, GA: March 2018.

Presenter. The evolution of the brain – how animal behavior helps us understand ourselves. River Trail Middle School. Duluth, GA: February 2017.

Judge. Fulton County Science and Engineering Fair. Category Environmental Sciences and Animal Sciences – Juniors. Atlanta, GA: February 2017.

Strategic planning. Sociedad de Divulgacion Cientifica Quinto Pilar. Non-profit science communication grassroots organization. Ecuador (2013–2015).

FEATURED ON THE MEDIA:

Featured scientist. Fernanda Duque Mendoza, talento que vuela alto. Revista Mundo Diners. November, 2020.

Interview. El colibrí que maravilló a la ciencia con su canto de contratenor [Featured paper]. Agence France-Presse (AFP) – Quito. September, 2020.

Interview. Lecciones sonoras de los animales para seducir. [Featured paper]. Diario El Pais. August 2020.

Interview. Ecuadorian hummingbirds sing ultrasonic song of seduction. [Featured paper]. Associated Press. July 2020.

Interview. Un colibrí despierta el interés turístico en la Reserva de Produccion de Fauna Chimborazo [Scientific expert]. Diario El Comercio. Quito, Ecuador: June 2019.

Interview. Some hummingbirds hit notes so high that only dogs could hear them [Featured paper]. Popular Science. October 2018.

ADDITIONAL EDUCATION AND TRAINING:

Mastering Online Teaching: Graduate Teaching Assistant facilitator. Center for Excellence in Teaching and Learning (CETL). Georgia State University. Online (July 2020).

Pedagogical Theories and Practices. Neuroscience Institute. Georgia State University (Spring 2018).

Neuroethology course. Lecturers: Eric Fortune, Ph.D. (NJIT), Melissa Coleman, Ph.D. (Claremont College), Kimberly Hoke, Ph.D. (Colorado State U). Funded by the National Science Foundation (NSF). Universidad Catolica del Ecuador and Yanayacu Biological Station, Ecuador. June 2014.

Neuropsychology and Dementias. Universidad de Barcelona (Online) (2009 – 2010).

Business Administration (Core curriculum and several electives). Universidad San Francisco de Quito (2005 – 2010).

OTHER ADMINISTRATIVE EXPERIENCE:

Advisor to the Secretariat of Research and Academic Affairs. Yachay Tech University (Ecuador) (2014 – 2016). Reporting directly to members of the Board of Trustees.

Medical Liaison. Neuroscience Division. Laboratorios Bago del Ecuador. 2013 – 2014.

Medical Liaison. Respiratory Division. Laboratorios Bago del Ecuador. 2011 – 2013.

Medical Liaison. Cardiometabolic Division. Merck Sharpe & Dohme. 2011.

Medical Liaison. Family Medicine Division. Laboratorios Interpharm del Ecuador. 2010.

MEMBERSHIPS:

Graduate Women in Science. Postdoctoral member (2022 - Present).

Society for Behavioral Neuroendocrinology. Postdoctoral member (2022 - Present).

International Society for Neuroethology. Postdoctoral member (2019 – Present).

Society for Integrative and Comparative Biology. Postdoctoral member (2016 – Present).

Animal Behavior Society. Postdoctoral member (2018 – Present).

American Association for the Advancement of Science. Member (2018 – Present).

American Ornithological Society. Member (2018 – Present).

J.B. Johnston Club for Evolutionary Neuroscience. Member (2020 – 2022).

Society for the Study of Evolution. Student member (2019 – 2021).

Society for Neuroscience. Full member (2015).

USFQ Alumni Association. Quito–Ecuador (2012 – Present).

REFERENCES:

(provided upon request)