

Anusha Shankar

323A Murie, 2090 N Koyukuk Dr, Fairbanks, AK 99775 | ashankar1@alaska.edu
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Professional Appointments

- Rose Postdoctoral Fellow, Lab of Ornithology (Supervisor: Dr. Irby Lovette)** 2020–2022
Transcriptomics of a sleep-torpor spectrum in hummingbirds.
Cornell University, Ithaca, USA.
- Postdoctoral Fellow, Institute of Arctic Biology (Supervisor: Dr. Cory Williams)** 2019–current
Seasonal Affective Disorder in diurnal Nile grass rats: behavior & neuroendocrinology.
University of Alaska Fairbanks, Alaska, USA.

Education

- PhD, Ecology and Evolution (Advisor: Dr. Catherine Graham)** 2012–18
"Field physiology to build hummingbird daily energy budgets: Hummingbirds are energetically flexible". Stony Brook University, New York, USA.
- M.Sc. Ecology and Environmental Sciences (Advisor: Dr. Priya Davidar)** 2009–11
"Malabar Pied Hornbill (*Anthracoceros coronatus*) nest site parameters in the highly fragmented Northern Western Ghats, India". Pondicherry University, Puducherry, India.
- B.Sc. Advanced Zoology and Biotechnology** 2006–09
Stella Maris College, Chennai, India.

Publications and Manuscripts

Published N = 4; Submitted N = 1; In Revision N = 1; In prep N = 3

- Shankar A***, Schroeder RJ*, Wethington SM, Graham CH, Powers DR. 2020. Hummingbird torpor in context: duration, more than temperature, is the key to nighttime energy savings. (*Equal authors). *Journal of Avian Biology*. Early View. DOI: 10.1111/jav.02305
- Shankar A**, Powers DR, Dávalos LM, Graham CH. 2020. The allometry of daily energy expenditure in hummingbirds: an energy budget approach. *Journal of Animal Ecology*. Early View. DOI: 10.1111/1365-2656.13185
- Shankar A**, Graham CH, Canepa JR, Wethington SM, Powers DR. 2019. Hummingbirds budget energy flexibly in response to changing resources. *Functional Ecology*. 3(10):1904-16. DOI: 10.1111/1365-2435.13404.
- Graham CH, Supp SR, Powers DR, Beck PA, Lim MCW, **Shankar A**, Cormier, T, Goetz S, and Wethington S. 2016. Winter conditions influence biological responses of migrating hummingbirds. *Ecosphere*. 7(10):e01470. DOI:10.1002/ecs2.1470.
- Shankar A**, Cisneros INH*, Thompson S*, Graham CH, Powers DR. Bird torpor, shallow and deep: A torpor spectrum in hummingbirds uncovered using thermal imaging. *Submitted: Ecology*. (*Student mentees)
- Aguilar JMA, **Shankar A**, Nieto, AV, Tinoco BA. Year-round occurrences of birds in the Southwestern high Andes of Ecuador. *In Revision: Cotinga*.
- Eberts E*, Auger P, Curley M, Welch K, Tattersall G, **Shankar A**. Thermal imaging: Do nesting female hummingbirds use torpor? *In prep*. (*Student mentee)
- Shankar A**, McCahon S*, Callegari K*, Williams CT. SAD rats: Effects of short photoperiod on sleep disruption, the gut microbiome, and carbohydrate consumption in diurnal grass rats. *In prep* (*Student mentees).
- Shankar A**, Williams CT. Diurnal rodent models for depression: A review. *In prep*: Invited Review for *Disease Models and Mechanisms*.

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Recent Research Experience

Postdoctoral work Sleep disruption, carbohydrate consumption, gut microbiome changes in response to short photoperiod in Nile grass rats (A study of Seasonal Affective Disorder). <u>Funded</u> by NIH's Alaska INBRE. <u>Skills</u> : piezosleep data collection and analyses, actogram analyses, grass rat lab maintenance, iPrecio pump (continuous drug infusion) implantation, programming, and maintenance euthanasia and dissections (brain extraction, blood, liver, cecum, fat), liver histology and image analyses, gut microbiome collection, DNA extraction.	2019-20
Dissertation work Integrating hummingbird field physiology with ecology (energy expenditure and intake). <u>Funded</u> by NASA. <u>Skills</u> : Bird handling, mist-netting, field respirometry, doubly labeled water, stable isotope micro-distillation, resource measurements, coding in R, MCMCglmm, mentoring, Fieldwork and team management (12 months in Ecuador)- led a team of 11 field assistants	2012-18
Visiting Scientist, WSL, Switzerland Swiss Federal Institute for Forest, Snow and Landscape Research. 3 months; Analyses and paper writing with Dr. Catherine Graham and Dr. Don Powers.	2017,18
Visiting Researcher, George Fox University, Oregon 6 weeks; Analyses and paper writing with Dr. Don Powers.	2018
Research Assistant, NASA hummingbird diversity grant, Stony Brook, New York Compiled data and performed preliminary data analyses (in R), generated maps for publication, improved methods of data collection and storage.	2013, 2018
Field Technician, Shola evolution project, NCBS Bangalore. Mist-netted, collected blood samples, made morphological measurements, extracted DNA and carried out PCR for high elevation bird species.	2012

Grants and Honours (over \$37,000 raised)

INBRE Faculty Travel Award from Alaska INBRE Jan 2020 for travel, membership and registration for attending SICB 2020.	\$2000
Diversity & Inclusion Travel Award from the American Ornithological Society June 2019 for travel, membership and registration at the AOS 2019 meeting.	\$760
Resource access project award (RAP) , Graduate Student Organization, Stony Brook University, Apr 2018. For conference travel.	\$500
Cost of Education scholarship , Dept of Ecology and Evolution, Stony Brook, Mar 2018. For research in ecology.	\$600
David F. Ludwig travel scholarship , AEHS , Aug 2017. For fieldwork on shallow torpor in hummingbirds in Arizona.	\$1000
Distinguished Travel Award , Graduate Student Organization , Stony Brook University, Aug 2017. To attend International Union of Physiological Sciences Meeting.	\$1500
SICB broadening participation travel award , Jan 2017. To attend Society for Integrative and Comparative Biology (SICB) Annual Meeting.	\$489
Experiment crowd-funded grant , Experiment.com , Dec 2016. (Together with Erich Eberts*, Dr. Peter Auger, Maria Curley, and Dr. Glenn Tattersall) To study nesting female hummingbirds' torpor use with thermal cameras. *Mentored student	\$5026
Lewis and Clark field scholarship grant , American Philosophical Society, May 2016. For field work on hummingbird physiological ecology.	\$5000
Mildred and Herbert Weisinger dissertation fellowship , Stony Brook University , Mar 2016. For dissertation research on hummingbird physiology and ecology.	\$10,000

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Lawrence B. Slobodkin award for research in ecology, Feb 2016.	\$750
Departmental unrestricted research grant , Stony Brook University, Mar 2015.	\$750
Tinker field research grant , Tinker Foundation, May 2014. For research in the field in Latin America.	\$2300
National Geographic Society Young Explorer's Grant , Mar 2014. For field research on hummingbird physiology and ecology.	\$4997
Departmental research excellence award , Stony Brook University, Mar 2014.	\$1000
Resource access project award (RAP) , Graduate Student Organization, Stony Brook University, Jan 2013. For conference travel.	\$350
Lawrence B. Slobodkin award for Research in Ecology, March 2013.	\$900

Awards

3-Minute Thesis , Stony Brook University. 3rd place	Apr 2018
Best Teaching Assistant Award , Department of Ecology and Evolution. Stony Brook University	Mar 2018
Departmental Service Award for service to the Department of Ecology and Evolution. Stony Brook University	Mar 2018
National Geographic Leadership and Development Program for Young Leaders . 1 of 15 international grantees selected for this year-long program.	2017-18
Charlotte Magnum student support award for housing costs at the Society for Integrative and Comparative Biology (SICB) Meeting.	2017, 2018
Cedar Brook award for best talk at the Ecology and Evolution departmental retreat, Stony Brook University.	Feb 2016
National Science Foundation mentoring program for Young Scientists (Travel and registration award for GRC 2014: "Unifying Ecology across Scales").	Jul 2014

Science Communication & News

Children's Book with Pratham Storyweaver Illustrated by Harjyot Khalsa. <i>What do Sunbirds Eat All Day?</i>	2020
Current Conservation Kids A day in the life of: Anusha Shankar, Vol 13, Issue 1. Humming with Energy	March 2019
Current Conservation Field notes, Vol 13, Issue 1. A city-girl field ecologist	March 2019
Video feature , Kim Michaels' hummingbird documentary Nature's single mom: A hummingbird nest story	Mar 2, 2019
News article , Mohammed Rayaana for NewsToday, Chennai Wildlife explorer, Anusha Shankar, shares nuggets about her birds research	Mar 2, 2019
Explorer-Educator partnership through National Geographic: A year long partnership with Steve Kirsche at a school near Jacksonville, Florida, to talk science to sixth graders.	Nov 2018-2019
Featured radio guest , National Geographic Kids' Weird But True radio show	Apr 27, 2018

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- National Audubon Society** *Why Anusha Shankar doesn't mind being the 'Hummingbird Pee Person'*. By Jayme Moye. Also feat. on [Stony Brook News](#) Apr 2, 2018
- Featured podcast guest** with [IndSciComm](#), *A Soupçon of SciComm with Anusha Shankar on hummingbirds and energy budgets.* Mar 28, 2018
- Featured video** in the [New York Times](#) and [New York Times Science Take](#) of a hummingbird in and out of torpor. Mar 20, 2018
- Explorer-Educator partnership** through National Geographic: A year long partnership with [Kate Craven](#) at a school in Ashford, Connecticut, to develop projects revolving around my science: grades 1-7. Oct 2017-2018
- Blog post** for [National Geographic](#) and [Science Outside](#). Feb 2018
- Voiceover** for National Geographic Learning *Panorama* Video for Grade 1 "How do animals use their body parts?" 2017
- Co-founder** and contributor: [Science Outside](#), For field scientists to share their crazy, silly, fun stories with the world. 2017-current
- Co-founder** and contributor: [BrainChem & Ecology](#) in collaboration with a Chemical Neurobiologist, to illustrate scientific concepts in simple graphics and videos for the public. 2017-current
- "Today I Learned" series** for National Geographic *Hummingbirds Are the World's Hungriest Birds.* [YouTube](#). Oct 22, 2016
- News** *Youth for Tigers.* The Hindu NxG. Jan 5, 2011
- News** Pooja Sharma, [Dainik Bhaskar](#) (in Hindi). Dec 6, 2014
- News** Anusha Parthasarathy, *On the Wild Side*, The Hindu Education Plus. October 6, 2014

Talks and posters

Invited talks (N = 31)

- Explorer classroom** through National Geographic: Live Zoom call for a series featuring [women in science and exploration](#). 2020
- Tri-Valley School**, 8 talks for grades 1-12. *Science at the equator and the North Pole; and Using data to learn: lessons from life at extremes.* Covered by the [Daily News Miner](#). 2020
- HHMI Janelia Research Center**, seminar. *Hummingbirds: A model for understanding sleep?* 2019
- National Geographic Education Summit**, *Lessons from animals at the extremes.* 2019
- Life Sciences Seminar**, University of Alaska Fairbanks *Field physiology and energetics: linking ecology and evolution in free-living hummingbirds.* 2019
- National Geographic After Hours Museum talk**, Brightest Young Things event *Data from animals, data from myself!* 2019
- American Ornithological Society**, Anchorage, AK. 2019
Mini-talk, *Early-professionals Symposium: Bringing field physiology to the tropics.*
- South Valley School's Explorer Day** 'Vamos explorar!' 2019
Virtual Speaker, with teacher [Jennifer Chavez-Miller](#).
- National Geographic Learning** Webinar speaker, 2019
Virtual Learning Series: National Geographic Explorers in the Classroom.
- Explorer classroom** through National Geographic: [Live Youtube hangout](#) with seven school classrooms reaching over a 1000 students live. 2019

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TEDx Chennai , India. Talk, <i>What can hummingbirds teach us about time management?</i>	2019
Stella Maris College , Chennai, India. Talk, <i>An Indian ecologist in the forests of Ecuador (and how hummingbirds manage to exist).</i>	2019
IISER Tirupati , India. <i>Field physiology and energetics: linking ecology and evolution in free-living hummingbirds.</i>	2019
St. Joseph's College , Bengaluru, India. <i>An Indian Ecologist in the cloud forests of Ecuador (and some of her findings on how hummingbird manage to exist).</i>	2018
Ecology Students' Society: Indian Institute of Science , Bengaluru, India. <i>Field physiology and energetics: linking hummingbird ecology and evolution.</i>	2018
Max Planck Institute for Ornithology, Radolfzell, Germany. <i>Day and night: energy balance in hummingbirds.</i>	2018
Friends of the Long Pond Greenbelt, New York. <i>Surprising secrets of sleeping hummingbirds.</i>	2018
National Geographic Explorer's Festival , Washington D.C. <i>Hummingbirds and Tequila.</i>	2018
Telluride Mountainfilm Festival Telluride, CO. <i>Hummingbirds, energy, pee and infrared.</i>	2018
Explorer classroom through National Geographic: Live Youtube hangout with seven school classrooms reaching over a 1000 students live.	2018
National Geographic Family Day 2018 Why Birds Matter Washington D.C. <i>The secret nightlife of hummingbirds.</i>	2018
Nat Geo Nights Bird Nerd: For the Birds Washington D.C. <i>The secret nightlife of hummingbirds.</i>	2018
SBU Natural History Club Talk - I Know What You Did Last Summer Stony Brook, NY. <i>The secret nightlife of hummingbirds.</i>	2017
Virtual speaker: Comparative animal physiology class, Pontificia Universidad Javeriana, Cali, Colombia. <i>Hummingbird energy management, and a career in Ecology.</i>	2017
Chief Guest, Valedictory speech: Stella Maris College, Zoology Culturals 'Synapse', Chennai, India. <i>Turning failures into successes in a Zoology career.</i>	2017
Seminar speaker: Swiss Federal Institute for Forest, Snow and Land WSL, Zurich, Switzerland. <i>On a shoe string: energy balance in hummingbirds</i>	2017
School of Biology, Universidad del Azuay, Cuenca, Ecuador. <i>Colibríes hipotérmicos y su presupuesto energético</i> (Spanish for: <i>Hypothermic hummingbirds and their energy budgets</i>)	2016
Ecology Students' Society, Indian Institute of Science , Bengaluru, India. <i>Hypothermic hummingbirds: an energy management story.</i>	2016
National Centre for Biological Sciences , Bengaluru, India. <i>Hypothermic hummingbirds: an energy management story.</i>	2016
Guest lecture: Chordate Zoology lecture, Stony Brook University. <i>The Biology of Birds.</i>	2015
Gordon Research Seminar: Unifying ecology across scales , University of New England, Maine. <i>Field physiology: A key component in forecasting species distributions.</i>	2014
To high-school & undergraduate students: at Bala Vidya Mandir Senior Secondary School; Department of Zoology, Stella Maris College; and at Science Sense, Chennai.	2010-12

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Conference Talks and Posters (N = 13)

- Society for Integrative and Comparative Biology**, Austin, TX. 2020
Talk, *SAD rats: Effects of short photoperiod on sleep disruption, the gut microbiome, and carbohydrate consumption in diurnal grass rats.*
- American Ornithological Society**, Anchorage, AK. 2019
Talk and session chair, *From shallow to deep: A torpor spectrum in hummingbirds uncovered using thermal imaging.*
- Society for Light Treatment and Biological Rhythms**, Chicago, IL. 2019
Talk, *SAD rats: Effects of short photoperiod on sleep and carbohydrate consumption in diurnal grass rats.*
- American Physiological Society: Comparative Physiology**, New Orleans, LA. 2018
Talk, *Hummingbird daily energy expenditure allometry: Is bigger better?*
- Society for Integrative and Comparative Biology**, San Francisco, CA. 2018
Talk and session co-chair, *From shallow to deep: A torpor spectrum in hummingbirds.*
- International Union for Physiological Sciences**. Rio de Janeiro, Brazil. Poster, 2017
Activity has largest effect on daily energy expenditure in a sub-tropical hummingbird.
- Evolution**, Portland, Oregon. Dávalos, L.M., **Shankar A**, and Lauterbur ME. 2017
Talk, *The unnatural concept of extinction in species-area relationships and teaching conservation biology.*
- Society for Integrative and Comparative Biology**, New Orleans, LA. 2017
Talk, *Energy budgeting in a temperate hummingbird.*
- National Geographic, Washington D.C.** Talk, *Hummingbird energy management!* 2016
- North American Ornithological Conference**, Washington D.C. 2016
Talk, *Hypothermic hummingbirds - an energy management story.*
- Reunión Ecuatoriana de Ornithología, Zamora, Ecuador**. Poster, Córdova G*, Urgilés G*, Tinoco BA, **Shankar A**. *Ahorro energético nocturno en cuatro especies de colibríes en los Andes del austro Ecuatoriano.* (Spanish for: *Nocturnal energy savings in four hummingbird species of the southern Ecaudorian Andes*). 2016
- Reunión Ecuatoriana de Ornithología, Zamora, Ecuador**. Poster, Morales AC *, **Shankar A**, Graham CH, Powers DR. *Costos de termorregulación de Heliangelus viola en los Andes sur del Ecuador* (Spanish for: *Thermoregulatory costs of Heliangelus viola in the Andes in the south of Ecuador*). 2016
- Gordon Research Conference: Unifying ecology across scales**. University of New England, Maine. Poster, *Field physiology: A key component in forecasting species distributions* 2014
- International Biogeography Society. International Biogeography Society** 2013
6th Biennial Meeting, *Frontiers of biogeography* 4:1, p. 174. **Shankar A**. et al.
Poster, *The Malabar Pied Hornbill (Anthracoceros coronatus) nests near human habitations in highly fragmented landscapes in the Northern Western Ghats, India.*
- Students Conference for Conservation Science (SCCS), Bangalore**. 2011
Talk, *Malabar Pied Hornbills nest in fragmented habitats in the Western ghats.*

* Mentored students, Poster presenters

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Teaching (N semesters = 9; N students ≈ 570)

Teaching Assistant, Conservation Biology (BIO 336), SBU (Active learning).	Fall 2016/17/18
Head Teaching Assistant, Chordate Zoology (BIO 344), SBU.	Spring 2015/16
Teaching Assistant, Ecology Lab (BIO 352), SBU.	Fall 2014
Teaching Assistant, Chordate Zoology Lab (BIO 344), SBU.	Spring 2013/14/16
Teaching Assistant, Fundamentals of Scientific Inquiry in the Biological Sciences I (BIO 204), SBU.	Fall 2012

Additional Experience

Workshop , Functional Ecology Genomics, Lacawac Sanctuary, Philadelphia.	2017
Volunteer , International Biogeography Society 6th Biennial Meeting, Miami, FL.	2013
Workshop on rescue and relocation of snakes conducted by Gowri Shankar of the Agumbe Rainforest Research Station and Snake Shyam, Mysore, India.	2012
Workshop on basic remote sensing and GIS with a focus on conservation planning, conducted by FERAL, supported by an ATREE-CEPF small grant.	2012
Workshop on wetland bird survey and mark-recapture, by Bombay Natural History Society at Point Calimere, India.	2011
India's Youth Tiger Ambassador , one of two selected by WWF-India to represent the country at the Youth Tiger Summit held in Vladivostok, Russia.	2010

Students mentored (N = 17)

Meret Beutler , Lab assistant, Univ of Alaska, Fairbanks.	Oct 2019 - current
Shelby McCahon , Lab assistant & BLAST scholar, Univ of Alaska, Fairbanks.	Feb 2019 - current
Kyle Callegari , Lab assistant & BLAST scholar, Univ of Alaska, Fairbanks.	Feb 2019 - current
Erich Eberts , Field assistant, now: PhD student, Univ Toronto at Scarborough.	Dec 2015 - current
Rebecca Schroeder , Field assistant, now in the US National Park Service.	Jun 2014 - 2017
Sarah Thompson , Undergraduate student, George Fox University.	Jun - Aug 2018
Alexis Stark , Undergraduate student, Northern Arizona University.	May - Jun 2018
Isabelle Cisneros , Undergraduate student, George Fox University.	Jun - Aug 2017
Ana Morales , Head field assistant, now: M.Sc. at McGill University, Canada.	Oct 2015 - Oct 2016
Gabriela Cordova , Universidad del Azuay, Internship & Bachelor's thesis.	Aug 2015 - Oct 2016
Gabriela Urgiles , Universidad del Azuay, Internship & Bachelor's thesis.	Nov 2015 - Oct 2016
Rosalee Elting , Field assistant, George Fox University.	Sept - Oct 2016
Julisa Ricart , Field assistant, University of Wisconsin-Madison.	Jul 2015 - Jan 2016
Amanda Quezada , Universidad del Azuay, Pasantias (internship) project.	Aug - Sept 2015
Joshua van Bourg , Field assistant, University of California Berkeley.	Sept - Dec 2015
Pedro Jose Machado Tapia , Field assistant, Universidad del Azuay.	Jun - Sept 2015
Joseph Canepa , Undergraduate student, George Fox University.	Jun - Aug 2014

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Other Skills

LaTeX, GPS, ArcGIS, qGIS, GitHub /nushiamme, small mammal lab maintenance, Radio-telemetry of snakes, photography; handling people, birds, arachnids and reptiles; science communication, mentoring, active learning methods. CPR (and AED) certified (May 2017).

Languages: British and American English, Tamil, Hindi, conversational Spanish, some Malayalam; Also, the skill and interest to learn new skills and languages quickly.

Professional Service

Member - Society for Integrative and Comparative Biology, American Physiological Society, American Ornithological Society.

Reviewer- Ecology and Evolution, International Journal of Biometeorology, Journal of Avian Biology, Journal of Animal Ecology; [Publons profile](#)

Selection Committee, Distinguished Travel Award committee, 2017
Graduate Student Organization, Stony Brook University

Founder, Departmental mentoring program for & by graduate students, 2016-18
Stony Brook University

Founder, cross-departmental Silent Writing group, Stony Brook University 2017

Attendee, Women in Science and Engineering (WISE) Leadership and Career course 2018

Vice President, Graduate Women in Science and Engineering (GWISE), 2017-18
Stony Brook University

Mentor, The New York Academy of Sciences' (NYAS) Next Scholar Program 2017

Judge, 5th Annual Nassau County Science Competition 2017

Event manager and Newsletter writer, GWISE, Stony Brook University 2016-17

Student representative to the Faculty, Ecology & Evolution, Stony Brook University 2016-17

Science Educator with Grads for Education and Outreach (GEO) 2016

Treasurer of the Ecology Club, Stony Brook University 2013-14

Departmental representative to the RA union Stony Brook University 2013-14

Senator, Graduate Student Organization, Stony Brook University 2013-15

Executive Officer, Freewheel Collective (helping students learn how to repair their own bicycles), Stony Brook University 2014-18