

Klara K. Nordén

Curriculum Vitae

Education

- 2018–Present **PhD Ecology and Evolutionary Biology**, *Princeton University*, Princeton, USA.
Thesis title: The evolution and function of iridescence in bird plumage
Advisor: Mary C. Stoddard
- 2013–2017 **MSci Palaeontology and Evolution**, *University of Bristol*, Bristol, UK.
Thesis title: Were herbivorous dinosaurs declining in the Cretaceous?
Advisor: Michael J. Benton

Research summary

I am an evolutionary biologist fascinated by the diversity of animal coloration. In particular, I am interested in iridescent coloration in birds, a type of structural coloration that change appearance with viewing angle. How do birds produce iridescent colors, and why did these spectacular colors evolve? To answer these questions, I use an interdisciplinary approach combining optical modelling, chemical analysis, imaging, microscopy, and evolutionary phylogenetic methods.

Publications

1. Kristina Fialko, Jarome R Ali, Laura Céspedes Arias, Jacob Drucker, Klara K Nordén, Trevor Price, Rosalyn Price-Waldman, and Stephen Pruett-Jones. The sensory ecology of birds. *The Auk*, 138(2):320, 2021.
2. Klara K Nordén, Chad M Eliason, and Mary Caswell Stoddard. Evolution of brilliant iridescent feather nanostructures. *bioRxiv*, 2021.
3. Klara K Nordén, Jaeike W Faber, Frane Babarović, Thomas L Stubbs, Tara Selly, James D Schiffbauer, Petra Peharec Štefanić, Gerald Mayr, Fiann M Smithwick, and Jakob Vinther. Melanosome diversity and convergence in the evolution of iridescent avian feathers—implications for paleocolor reconstruction. *Evolution*, 73(1):15–27, 2019.
4. Klara K Nordén, Thomas L Stubbs, Albert Prieto-Márquez, and Michael J Benton. Multifaceted disparity approach reveals dinosaur herbivory flourished before the end-cretaceous mass extinction. *Paleobiology*, 44(4):620–637, 2018.
5. Klara K Nordén and Trevor D Price. Historical contingency and developmental constraints in avian coloration. *Trends in ecology & evolution*, 33(8):574–576, 2018.
6. Luke A Parry, Fiann Smithwick, Klara K Nordén, Evan T Saitta, Jesus Lozano-Fernandez, Alastair R Tanner, Jean-Bernard Caron, Gregory D Edgecombe, Derek EG

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Briggs, and Jakob Vinther. Soft-bodied fossils are not simply rotten carcasses—toward a holistic understanding of exceptional fossil preservation: exceptional fossil preservation is complex and involves the interplay of numerous biological and geological processes. *BioEssays*, 40(1):1700167, 2018.

7. D Cary Woodruff, Thomas D Carr, Glenn W Storrs, Katja Waskow, John B Scannella, Klara K Nordén, and John P Wilson. The smallest diplodocid skull reveals cranial ontogeny and growth-related dietary changes in the largest dinosaurs. *Scientific reports*, 8(1):1–12, 2018.
8. Klara K Nordén, Christopher J Duffin, and Michael J Benton. A marine vertebrate fauna from the late triassic of somerset, and a review of british placodonts. *Proceedings of the Geologists' Association*, 126(4-5):564–581, 2015.

Presentations

- June 2021 **5th Annual Digital Data in Biodiversity Research Conference**, *Oral presentation: Detecting iridescent feather nanostructures with polarization imaging*, Florida Museum of Natural History, FL, USA.
- May 2021 **Natural Sciences Collections Association Conference**, *Oral presentation: A non-destructive method to detect iridescent feather nanostructures*, UK.
- January 2020 **Society for Integrative and Comparative Biology Annual Meeting**, *Oral presentation: Do diverse feather nanostructures increase the colourfulness of iridescent plumage?*, Austin, TX, USA.
- August 2017 **Progressive Palaeontology Conference**, *Oral presentation: Were herbivorous dinosaurs in decline before the K-Pg extinction?*, Leicester, UK.

Experience

Curatorial

- 2021-Present **Digitization of Princeton Bird Collection**, *Project leader*.
Project to update and extend current database of bird skin collections. This will make the currently underused collection available to researchers, students and the public in Princeton and beyond - with benefits for furthering both science and science education.
Tasks:
- Produce a report containing an inventory of the state of collections and database, aims and goals of the updated database and a budget proposal
 - Create a workflow for imaging bird specimens with digital photography
 - Publish dataset to biodiversity data aggregator (GBIF, iDigBio) to make it publically available

Teaching

- Fall 2018 **Assistant in Instruction**, *Life on earth: Chaos and Clockwork of Biological Design*, Dept. of Ecology and Evolutionary Biology, Princeton.
Introductory course to ecology and evolutionary biology.
Responsibilities:
- Lead and organize teaching labs
 - Grading and feedback on reports and exams

Fall 2019 **Assistant in Instruction, *Sensory Ecology***, Dept. of Ecology and Evolutionary Biology, Princeton.

Responsibilities:

- Lead precept discussions
- Hold guest lecture on my own research
- Write exam questions
- Grading and feedback on essays and exams

Fall 2020 **Assistant in Instruction, *Conservation Biology***, Dept. of Ecology and Evolutionary Biology, Princeton.

Responsibilities:

- Lead precept discussions
- Grading and feedback on essays and exams

Mentoring

Summer 2021 **Kojo Baidoo, *Bogle Fellowship***, Princeton University.

8-week project to design a website housing the digitized "Charles Rogers bird journals" – a collection of bird observations from 1899-1972 by the late Princeton University curator Charles Rogers. Supervised project to create a resource with both important educational aspects (engaging the public in this rare dataset) and scientific ones (allowing searchability and easy access for researchers).

Fieldwork

Summer 2016 **Intern, *Senckenberg Research Station***, Grube Messel, Germany.

Field assistant at the excavations of the Messel Oil Shales, an Eocene lagerstätte. Fossils include numerous insect species, bats, birds, reptiles, amphibians and plant remains.

Summer **Intern, *Museum of the Rockies***, Montana, USA.

2013, 2014, 2015 Field assistant at palaeontological excavation, Livingston, Montana. Fossil collecting from the Morrison Formation, mostly sauropod fossils.

Summer 2012 **Field Assistant, *University of Lund***, Lund, Sweden.

Great Reed Warbler project (lead by Bengt Hansson, University of Lund), Kvismare Bird Observatory, Sweden. Work included inventories, field observation of behaviour and breeding of the Great Reed Warbler, data collecting and ringing of birds.

Science outreach and diversity initiatives

July 2021 **Princeton University Materials Academy program, *Presentation: Rainbow colors in nature***, Princeton University, Princeton, USA.

Engaging high school students from groups historically underrepresented in STEM in science topics, with focus on material science

Fall 2020 **Princeton University Ecology and Evolutionary Biology Scholars Program, *Mentor and presenter***, Princeton University, Princeton, USA.

Program for prospective graduate students from backgrounds historically underrepresented in STEM

2019-2020 **Princeton University Women in Science Program, *Leader***, Princeton University, Princeton, USA.

Organized events and lead discussions related to issues facing women in academia

- March 2019 **7th Annual Symposium, organised by Metropolitan Society of Natural Historians**, *Invited talk: Diversity of iridescent structural colors in modern and fossil birds*, American Museum of Natural History, New York City.
The symposium is an opportunity for scientist to share their research with the public.
- Spring 2017 **Bristol Dinosaur Project**, *Volunteer*, University of Bristol, Bristol, UK.
Program to foster science education in primary schools, with focus on Earth Science/palaeontology. Activities include workshops and interactive presentations to learn about fossils and palaeontology, but also broader topics such as evolutionary biology and climate change.
- March 2017 **Dinosaur Takeover**, *Volunteer*, Bristol City Museum and Art Gallery, Bristol, UK.
Yearly outreach and science education program for primary school children, including workshops and activities focused on paleontology.

Science communication and media

- Summer 2021-Present **Specimen Stories**, *Podcast show*, Creator and producer.
This is a show uncovering the exciting science that takes place in museum collections. Each episode explores a new type of collection, by interviewing the scientists that work there. The podcast aims to engage a broad audience in science topics, and increase public awareness of the value of museum collections. To be released Fall 2021.
- December 2018 **Scientists discover how birds and dinosaurs evolved to dazzle with colourful displays**, *Press release*, University of Bristol.
Picked up by Daily Mail, BBC Radio, Phys.org, EurekAlert!
- August 2015 **Ancient British shores teemed with life – shows study by Bristol undergraduate**, *Press release*, University of Bristol.
Picked up by Bristol Post, BBC Radio

Grants and Awards

- 2020 **Society for the Study of Evolution, R. C. Lewontin Early Award**, *More than meets the eye - testing non- signaling functions of iridescent plumage*, \$2300.
- 2017 **Alumni Foundation Conference Travel Grant**, *Were herbivorous dinosaurs in decline before the K-Pg extinction?*, £320.
- 2015 **Palaeontological Association, Undergraduate Research Bursary**, *Effects of diagenetic processes on melanosome morphology in iridescent feathers*, £1600.
- 2015 **Head of School's Commendation for Excellent Performance in Examinations**, *University of Bristol*.

Academic and professional service

- Organization **SPNHC Early Professionals Committee**, *Committee member*, 2020-Present.
Organizing events for early professionals within natural history museums, creating blog posts and social media content for SPNHC (Society for the Preservation of Natural History Collections) members
- Seminar **Alternative Careers in Science**, *Founder and organizer*, 2020-2021.
Weekly seminar hosting PhD graduates with careers outside academia. The seminar seeks to broaden and diversify the options made visible to graduate students, by hearing personal stories and first-hand accounts of alternative career routes.

- Research seminar **Integrated Behavioural Research Group**, *Organizer*, Princeton University, 2019-2020.
Weekly research seminar with internal and invited guests speakers in the fields of behavioural ecology and evolution.
- Conference **CRPPY conference**, *Organizer*, Princeton University, 2019.
Yearly student led conference for ecology and evolutionary biology departments in Columbia-Rutgers-Princeton-Penn-Yale.
- Peer-review **Evolution, Royal Society Interface, Journal of Heredity**, *Invited reviewer*.

References

- Prof. Michael J. Benton
- Dr. Jakob Vinther
- Prof. Mary C. Stoddard