



# Anaïs DUHAMEL

Paleo-ornithologist

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Car driving licence

French (native), English (fluent),  
German (B1), Spanish (B1)



## Academic Background

### **Laboratoire de Géologie de Lyon – Terre, Planètes et Environnement (LGL-TPE, Villeurbanne, France)**

2022-2026 – PhD in Isotopy, geometric morphometrics, and statistics (see Research Experience section).

### **Ecole Normale Supérieure de Lyon (ENS Lyon, France)**

2021-2022 – Final year of ENS Lyon degree: *Long-term Research Project*.

2019-2021 – Master's degree in Earth, Planetary and Environmental Sciences, major in Paleontology and Sedimentology.

2018-2019 – Bachelor's degree in Geology, major in Paleontology and Sedimentology.

### **Lycée Faidherbe (Lille, France)**

2015-2018 – BCPST (Biology, Physics, Chemistry, Life and Earth Sciences) Preparatory class.

## Research Experience

### **September 2022 - September 2026 – PhD in Isotopy, Geometric Morphometrics and Phylogenetic Comparative Methods**

Title: *Bones on the Move: How Skeletal Remains Can Shed Light on the Origin and Evolution of Avian Seasonal Migration*.

Project designed independently with advice from my supervisors Antoine Louchart (LGL-TPE, Lyon, France), Anne-Claire Fabre (Museum für Naturkunde, Bern, Switzerland), and Julien Clavel (LEHNA, Lyon, France).

### **December 2021 - March 2022 – Phylogenetic Comparative methods**

Co-development and performance assessment of a new discriminant analysis approach, phylogeny-informed and applicable in large dimensions (penalized). Supervised by Julien Clavel and Gilles Escarguel in LEHNA, Lyon (France).

### **September-November 2021 – Eggshell paleoproteomics**

Paleoproteomic analysis of Lanzarote's giant bird eggshells: taxonomic identification and paleogeographic implications. Supervised by Sophie Cersoy, Séverine Zirah and Antoine Louchart in MNHN, Paris (France).

### **January-June 2021 – Oxygen isotopes chemistry**

Development of an experimental framework for predicting bird migratory behaviour from bone oxygen isotopes, with first applications to extant and fossil bones. Supervised by Romain Amiot, Arnauld Vinçon-Laugier and Antoine Louchart in LGL-TPE (Villeurbanne, France).

### **April-June 2020 – Isotopic modelling**

First insights into the predictability of bird migratory behaviour from bone oxygen isotopes using a simulation framework. Supervised by Romain Amiot, Arnauld Vinçon-Laugier and Antoine Louchart in LGL-TPE (Villeurbanne, France).

### **June-July 2019 – Microtomography - morphometrics**

Study of the ecological adaptations of an extinct owl from Rodrigues Island using 3D geometric morphometrics approaches on its fossil skull (endocast and inner ear). Supervised by Antoine Louchart in LGL-TPE (Villeurbanne, France).

### **January 2019 – Comparative anatomy**

Preparation and analysis of a partial bird fossil from southeastern France, using comparative anatomy and camera lucida drawing. Supervised by Antoine Louchart in LGL-TPE (Villeurbanne, France).

## Main Technical Skills

- Coding in R (+++), Bash (+), Python (+)
- Integrating simulation and experimental data
- Bases in computing clusters to parallelize jobs
- Histological identification of bone tissues
- Stable isotopes geochemistry (oxygen)
- Analysis of telemetric and raster data (e.g., climate or isotopes maps)
- Imaging techniques: X-ray, surface scanning, microscopy (including SEM)
- 2D and 3D geometric morphometrics approaches
- Image analysis and processing using Photoshop and ImageJ
- Proficient in Illustrator and PowerPoint for visual support design

## Publications and Preprints

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**Duhamel, A.**, Canoville, A., Vinçon-Laugier, A., Joseph, J., Fourel, F., Lecuyer, C., Amiot, R., & Louchart, A. (2025). *Inferring Bird Migration from Bone Isotopes and Histology: A Fossil-Friendly Methodological Framework* (p.2025.02.08.637244). *Methods in Ecology and Evolution*, 00-23. <https://doi.org/10.1111/2041-210x.70211>

Monclús-Gonzalo, O., Alba, D. M., **Duhamel, A.**, Fabre, A.-C., & Marigó, J. (2023). Early euprimates already had a diverse locomotor repertoire: Evidence from ankle bone morphology. *Journal of Human Evolution*, 181, 103395. <https://doi.org/10.1016/j.jhevol.2023.103395>

**Duhamel, A.**, & Louchart, A. (2021). Regard sur l'aviafauve fossile de l'Oligocène du Parc du Luberon et ses implications paléobiologiques, incluant de nouvelles données fossiles. *Courrier Scientifique Du Parc Naturel Régional Du Luberon et de La Réserve de Biosphère Luberon-Lure*, 16-2019–2020, 98–117.

Louchart, A., & **Duhamel, A.** (2021). A new fossil from the early Oligocene of Provence (France) increases the diversity of early Gruoidea and adds constraint on the origin of cranes (Gruidae) and limpkin (Aramidae). *Journal of Ornithology*, 162(4), 977–986. <https://doi.org/10.1007/s10336-021-01891-z>

**Duhamel, A.**, Balme, C., Legal, S., Riamon, S., & Louchart, A. (2020). An early Oligocene stem Galbulae (jacamars and puffbirds) from southern France, and the position of the Paleogene family Sylphornithidae. *The Auk*, 137(3), ukaa023. <https://doi.org/10.1093/auk/ukaa023>

**Duhamel, A.**, Hume, J. P., Guensler, P., Salaviale, C., & Louchart, A. (2020). Cranial evolution in the extinct Rodrigues Island owl *Otus murivorus* (Strigidae), associated with unexpected ecological adaptations. *Scientific Reports*, 10(1), 14019. <https://doi.org/10.1038/s41598-020-69868-1>

## Conferences

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Below, congresses I participated in as: (1) co-organizer “\*\*\*”; (2) scientific committee member “\*\*”; (3) volunteer “\*”

**International Mass Spectrometry Congress 2026 (Lyon, France)** \*\* – Oral presentation  
*Inferring Bird Migration from Bone Isotopes and Histology: A Fossil-Friendly Methodological Framework*

**European Society of Isotopic Research 2025 (Villeurbanne, France)** \*\*\* – Oral presentation  
*Towards a tracking of bird migratory behaviour through geological time: an isotopic and histological approach*

**Decrypt-Thèse 2025 (Villeurbanne, France)** – Oral presentation  
*A look at Bird Migration through geological time*

**Société Française d'Ecologie et d'Evolution 2024 (Lyon, France)** \* – Oral presentation  
*A new method of discriminant analysis, phylogeny-aware and applicable in large dimensions*

**Symposium de Morphométrie de d'Evolution des Formes 2024 (Dijon, France)** – Oral presentation  
*A new method of discriminant analysis, phylogeny-aware and applicable in large dimensions*

**Society of Avian Paleontology and Evolution 2023 (Málaga, Spain)** – Oral presentations  
*Towards a tracking of bird migratory behaviour through geological time: an isotopic and histological approach* (Prelim. results);  
And: *Extinct Island Birds: Saint Helena "AtlantAves Project"*.

**Congrès des Doctorants de L'Observatoire des Sciences de l'Univers de Lyon 2023 (Lyon, France)** \*\*\* – Oral presentation  
*Letting fossil birds talk about deep time seasonal migration*

**Mathematical and Computational Evolutionary Biology 2022 (Cargèse, Corsica)** – Poster  
*A new method of discriminant analysis, phylogeny-aware and applicable in large dimensions* (Prelim. results)

**Ecology and Behaviour 2022 (Strasbourg, France)** – Poster  
*Towards a tracking of bird migratory behaviour through geological time: an isotopic and histological approach* (Prelim. results)

**Congrès des Doctorants de L'Observatoire des Sciences de l'Univers de Lyon 2022 (Lyon, France)** – Poster  
*A new method of discriminant analysis, phylogeny-aware and applicable in large dimensions* (Prelim. results)

**Virtual Congress for Women in Archaeology and Paleontology 2021** – Oral presentation  
*Towards a tracking of bird migratory behaviour through geological time: an isotopic and histological approach* (Prelim. results)

**Réunion des Sciences de la Terre 2021 (Lyon, France)** \* – Poster  
*Towards a tracking of bird migratory behaviour through geological time: an isotopic and histological approach* (Prelim. results)

## Grants and Awards

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Below are grants I wrote (\*\*) or co-wrote (\*) to fund various aspects of my PhD and side projects.

### **2024-2027 – “*AtlantAves*” project funded by the French National Research Agency (ANR) [~500k€ – Pl.: A. Louchart] \***

Project: *Biodiversity trajectories on two Atlantic islands: Revealing anthropic and climatic impacts on species and communities, with implications for conservation*. Collaborator; contributed to writing the project proposal. Since 2025, supported fieldwork on Saint Helena Island, related research contracts (including my 4<sup>th</sup>-year PhD funding), and analyses of collected materials.

### **2022-2025 – Specific Doctoral Contract for Normaliens (CDSN) \*\***

Three-year competitive doctoral contract funded by the *ENS Lyon*, providing full salary for my PhD from 2022 to 2025.

### **2025 – Decrypt-Thèse Prize of the Jury [200€]**

Awarded for the talk: *A look at Bird Migration through geological time*

### **2024 – Godfrey Hewitt Mobility Award from the European Society of Evolutionary Biology (ESEB) [2k€] \*\***

Funded part of 2024 fieldwork on Saint Helena Island. Project: *Saint Helena Island: a citizen science project to decipher the impact of human activity and climate on the avifauna using subfossil birds*.

### **2024 – Mobility Grant from E2M2 Doctoral School [300€] \*\***

Funded part of 2024 fieldwork on Saint Helena Island.

### **2024 – E2M2 Doctoral School Student Association Grant [200€] \*\***

Funded a 2-year licence for the Stratovan Checkpoint ® landmarking software, used by my interns and myself.

### **2022 – SYNTHESYS+ Transnational Access Grant (Copenhagen) \*\***

Funded a two-week stay – including CT-scan access – at the 3D Imaging Centre of the Technical University of Denmark and the Natural History Museum (Copenhagen). Project: *Osteological characterization of bird seasonal migrations and their evolution through the Cenozoic climate changes: an ecomorphological approach with 3D morphometry*.

### **2022 – SYNTHESYS+ Transnational Access Grant (London) \*\***

Funded a two-week stay – including CT-scan access – at the Natural History Museum (NHMUK, London). Project: *Osteological characterization of bird seasonal migrations and their evolution through the Cenozoic climate changes: an ecomorphological approach with 3D morphometry*.

## Student Supervision

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**May-July 2025** – Seven weeks internship of Martin Gourdon (3<sup>rd</sup> year Bachelor student) on the genetic determinants of bird seasonal migration. Co-supervision with Julien Joseph (Evolutionary Biologist).

**May-July 2024** – Seven weeks internship of Rémi Guillot (3<sup>rd</sup> year Bachelor student) on the systematic and ecology of a fossil Charadrii from Saint-Gérand-Le-Puy, using 3D geometric morphometric approaches.

**January-June 2024** – Five months internship of Enzo Degot (2<sup>nd</sup> year Mast student) on the morphology of inner-ears in relation with migration, flight styles and habitat across birds.

**January 2023** – Three weeks internship of Jérémie Pétex (3<sup>rd</sup> year Bachelor student) on the morphology of endocasts in relation with migration and flight styles in Charadriiformes.

## Teaching

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Below are courses I designed (\*\*) or revised (\*), including examination materials.

### **Université Lyon 1:**

1st year Bachelor (L1) – Geosciences tutorials (72 hours) \*

2nd year Bachelor (L2) – Bird Zoology: lectures and practicals (42 hours) \*\*

2nd year Master (M2) – Imaging Ancient Life: lectures and practicals. Scientific drawing, Photography, 3D Imagery (42 hours) \*\*

1st year Bachelor (L1) – Sedimentology Fieldwork, Poleymieux-au-Mont-d’Or, France (2 days)

1st year Bachelor (L1) – Fieldwork: Geology in Lyon (2 days)

### **Université Lyon 1 x Ecole Normale Supérieure de Lyon:**

3rd year Bachelor (L3) – Cartography Fieldwork, Barles, France (8 days)

## Fieldworks

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Below are the field campaigns I coordinated (\*\*\*) or joined as a volunteer (\*).

### **August-September 2022, 2024, 2025 – Saint Helena Island \*\***

Two-week (2022) or one-month (2024 and 2025) fieldwork campaigns on Saint Helena Island to reconstruct the recently extinct pre- and post-human avifauna (from 50,000 to 500 years BP). Includes new exploration, prospecting and collection of bird fossils and other contextual evidence (bones of birds, fish and small vertebrates, insect remains, sediments, snails, charcoal, etc.).

### **July 2021, 2022, 2023, 2024, 2025 – Phosphatières du Quercy \***

Annual 10-day fieldwork in the National Natural Reserve of Geological Interest of the Lot, Causse du Quercy UNESCO World Geopark (France). Includes sampling and sieving of sediments (Paleogene deposits, from 50 to 20 My BP), sorting of fossils (mainly remains of small vertebrates), and public science outreach for visitors (see “Outreach section”).

### **April 2024-2025 – Montaigu Le Blin (Saint-Gérand-Le-Puy Locality) \*\*\***

One-day field campaigns in Montaigu-Le-Blin fossil deposits (more broadly referred to as part of Saint-Gérand-Le-Puy Early Miocene fossil deposits, France). Consists mostly in bird bone remains, more exceptionally tortoise, crocodile, etc.

## Outreach

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### **2025 – Pint of Science**

Public talk at the Carbone Café Librairie (Villeurbanne, France) : *Quand la migration prend de la distance chez les dinosaures ailés* (When Migration Takes Off Among Winged Dinosaurs).

### **2025 – International Women in Science Day**

Public talk during the *International Day of Women and Girls in Science* (Université Lyon 1, Villeurbanne, France) : *Un regard sur la migration au cours des temps géologiques* (A look at Migration through Deep Time).

### **2025-(...) – Saint Helena Island Natural History Museum Project**

Design of an extension to the *Museum of Saint Helena* for natural history exhibits, including fossil birds, in collaboration with Adam Sizeland (Curator) and Julian Hume (Artist and Paleontologist).

### **2024, 2025 – Radio and local newspaper interviews – Saint Helena Island**

Radio interview on *Saint FM Community Radio* (2024), along with various communications in local newspapers (*The Sentinel* and *The Independent*) in 2024 and 2025.

### **2022, 2024 – Public talks on Saint Helena Island**

Public talk at the *Museum of Saint Helena: On the fossil birds of Saint Helena Island* (2024); public talks at the *Saint Helena Secondary School* and the *Saint Helena Research Institute: Extinct Island Birds: Saint Helena “AtlantAves Project”* (2022).

### **2022 – Radio interview – Phosphatières du Cloup d'Aural (France)**

Radio interview on *Antenne d’Oc* (local station) about the work of paleontologists during the annual field season in the *Causse du Quercy Regional Natural Park*.

### **2021, 2022, 2023, 2024 – Safari Paléontologique, Phosphatières du Cloup d'Aural (France)**

Volunteer during the *Safari Paléontologique* (Paleontological Safari), an annual weekend event organised by the *Regional Natural Park of the Causses du Quercy* and the *Phosphatières du Cloup d'Aural*. Activities include public fieldwork and practical tasks such as sampling, sieving, sorting and identifying fossils.

## Other Collective Engagements

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**2022-2024 – Student Representative** at the E2M2 (Evolution, Ecosystem, Microbiology, Modelling) Doctoral School.

**2022-2025 – Paleostuff Seminars:** Organizer of the monthly *Paleostuff* seminars at LGL-TPE (Villeurbanne, France).

## Technical Skills Summary

Geometric morphometrics  
X-ray microtomography  
Surface scanning  
Comparative anatomy  
Phylogenetic comparative methods

Isotopic chemistry / modelling  
Bird bone histology  
R and Python coding  
Paleoproteomics  
And also: (Wildlife) Photography,  
(Scientific) Drawing, etc.

