

ENS – IISER / BIOSANTEXC Partnership Internship Proposal Form

FIELD

Ecology

Internship subject (title): **Northern fulmar exposure to microplastics during the non-breeding season in the Northeast Atlantic**

Name of the laboratory at ENS: Science for the environment Department, Laboratory ECOBIO (UMR 6553)

Name of the internship supervisor: Françoise Amélineau
Email: francoise.amelineau@gmail.com

Requested level: Master 2 (6 months)

Prerequisites for the internship: a good command of R, experience with spatial analyses is a plus

Internship proposal (description and expected training outcomes / 15 lines max):

Plastic pollution is now ubiquitous, and microplastics (pieces <5 mm) are found on every ocean, even in remote polar areas¹. Some species are more at risk than others of plastic ingestion. It is the case of seabirds feeding on the sea surface, such as the Northern fulmars (*Fulmarus glacialis*), and vulnerable to floating plastic debris². Fulmars are defined as an indicator species for plastic pollution by the OSPAR Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)^{2,3}. The aim of this project is to better evaluate the exposure of fulmars to microplastics during the non-breeding season, when they migrate, and to explore the differences in exposure for different colonies. To do so, the student will work on more than 10 years of tracking data (geolocation) of fulmars from several colonies of the North-East Atlantic, obtained by the SEATRACK project⁴, and compare it with the distribution of floating microplastic debris in the North Atlantic^{5,6}. As microplastics accumulate in adult stomachs during the non-breeding season, and are offloaded when feeding their chicks by regurgitation, the winter exposure to microplastics of a population is expected to be reflected in chick contamination, and further impact chick growth and

breeding success⁷⁻⁹. The results will improve our understanding of plastic contamination in fulmars and regional variations in contamination.

This project will be in collaboration with researchers from the Norwegian Polar Institute (NPI) and the Norwegian Institute for Nature Research (NINA).

1. Bergmann, M. *et al.* Plastic pollution in the Arctic. *Nat. Rev. Earth Environ.* **3**, 323–337 (2022).
2. van Franeker, J. A. *et al.* Monitoring plastic ingestion by the northern fulmar *Fulmarus glacialis* in the North Sea. *Environ. Pollut.* **159**, 2609–2615 (2011).
3. van Franeker, J. A. & Law, K. L. Seabirds, gyres and global trends in plastic pollution. *Environ. Pollut.* **203**, 89–96 (2015).
4. Strøm, H., Descamps, S., Ekker, M., Fauchald, P. & Moe, B. Tracking the movements of North Atlantic seabirds: steps towards a better understanding of population dynamics and marine ecosystem conservation. *Mar. Ecol. Prog. Ser.* **676**, 97–116 (2021).
5. Sebillé, E. van *et al.* A global inventory of small floating plastic debris. *Environ. Res. Lett.* **10**, 124006 (2015).
6. Eriksen, M. *et al.* Plastic pollution in the world's oceans: more than 5 trillion plastic pieces weighing over 250,000 tons afloat at sea. *PloS One* **9**, e111913 (2014).
7. Tulatz, F. *et al.* Implications of regurgitative feeding on plastic loads in Northern Fulmars (*Fulmarus glacialis*): a study from Svalbard. *Environ. Sci. Technol.* **57**, 3562–3570 (2023).
8. Ryan, P. G. Intraspecific variation in plastic ingestion by seabirds and the flux of plastic through seabird populations. *The condor* **90**, 446–452 (1988).
9. Ryan, P. G. Effects of ingested plastic on seabird feeding: Evidence from chickens. *Mar. Pollut. Bull.* **19**, 125–128 (1988).

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