

## Evolution and trade-offs between courtship signals in bowerbirds

We are looking for a motivated student with an interest in avian courtship behaviour. This desktop study includes the construction of datasets, data analysis, and scientific writing, with the potential for publication.

### Background

Avian courtship displays often involve multimodal signaling, meaning that multiple signals are performed simultaneously (Mitoyen et al. 2019). The 'trade-off' hypothesis predicts that different signals trade-off with each other due to resource limitations, whereas the 'joint evolution' hypothesis predicts that sexual traits develop simultaneously to improve communication effectiveness (Ariznavarreta et al. 2025; Ligon et al. 2018).

An exceptional example of a bird family that uses signals over different sensory modalities are the bowerbirds (Aves: Ptilonorhynchidae). Many ornithologists see bowerbirds as by far the most behaviorally complex of all birds, mainly because males construct elaborate structures from sticks and moss, called bowers (Fig. 1). These bowers are often decorated with variable and colorful objects such as fruits, berries, fungi, and even human-made objects like drinking straws and gun cartridges. In addition to the bower construction, males perform complex courtship dance displays and vocalizations and have a wide variety in plumage ornamentations (Kusmierski et al. 1997). The diversity of mating systems (Ericson et al. 2020), combined with the bower building behaviour, makes the bowerbirds an interesting and unique model to investigate evolutionary trade-offs in courtship displays.



**Fig. 1** Great bowerbird (*Chlamydera nuchalis*) constructing an avenue type bower.

### Methods

In this thesis, we will investigate the trade-offs between different sexual traits within the bowerbird family. To do so, the student can construct datasets for the 23 bowerbird species to consequently perform interesting statistical analysis to broaden our knowledge on the trade-offs between sexual traits within bowerbirds. Projects on other avian families that perform more classical lekking behaviour (e.g. manakins, cotingas, grouses) are also possible. In addition, the link between vocalization and mating systems will also make an interesting thesis topic. Ultimately, students are more than welcome to come up with own research ideas.

### Supervisors

This project will be supervised by Prof. Terje Lislevand and PhD candidate Arjen van der Kamp. If this opportunity interests you, please contact Arjen van der Kamp (arjen.kamp@uib.no).

### References

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- Ligon RA, Diaz CD, Morano JL, Troscianko J, Stevens M, Moskeland A, et al. (2018). Evolution of correlated complexity in the radically different courtship signals of birds-of-paradise. *PLoS biology*, 16(11), e2006962.
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