



QuantumBirds

Radical-pair-based
magnetic sensing in
migratory birds

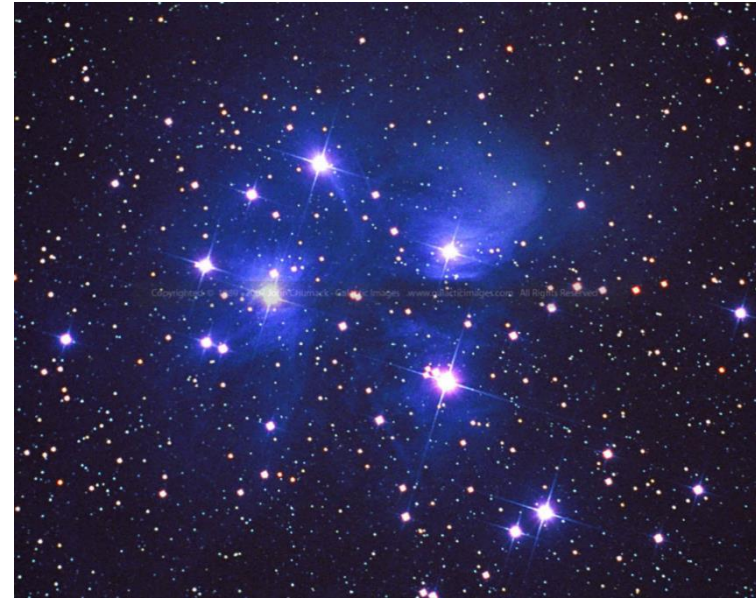
ERC SyG
2019-2026

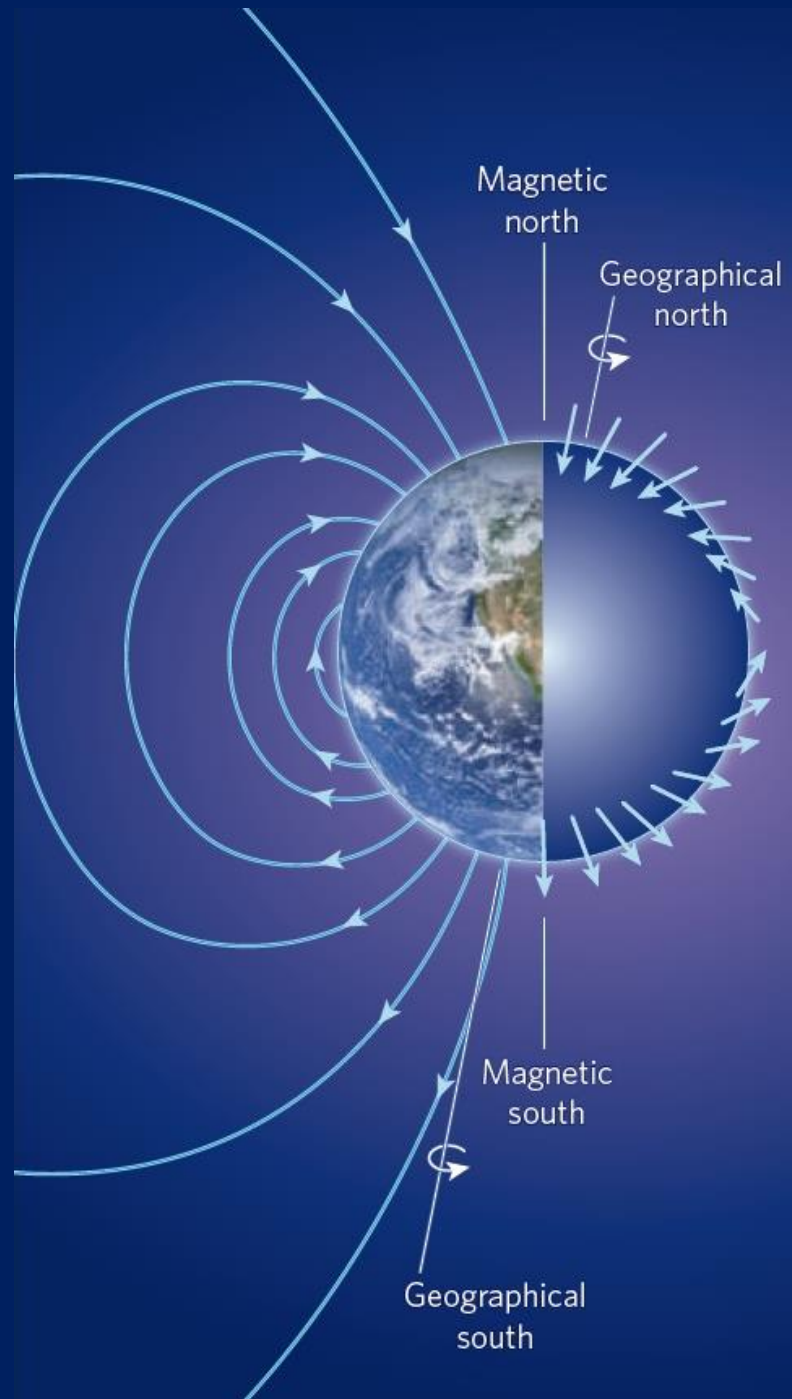
Northern wheatear

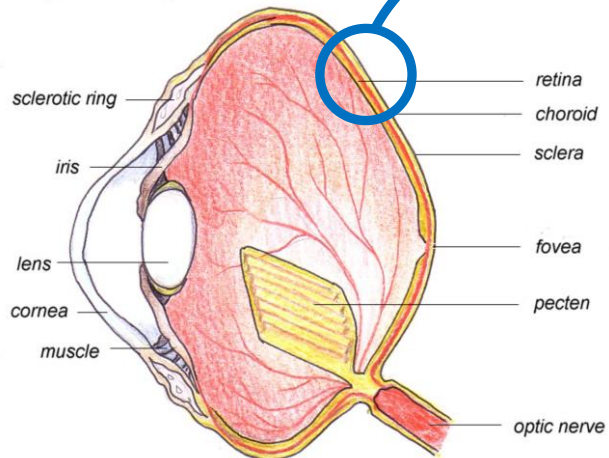


Northern wheatear migration



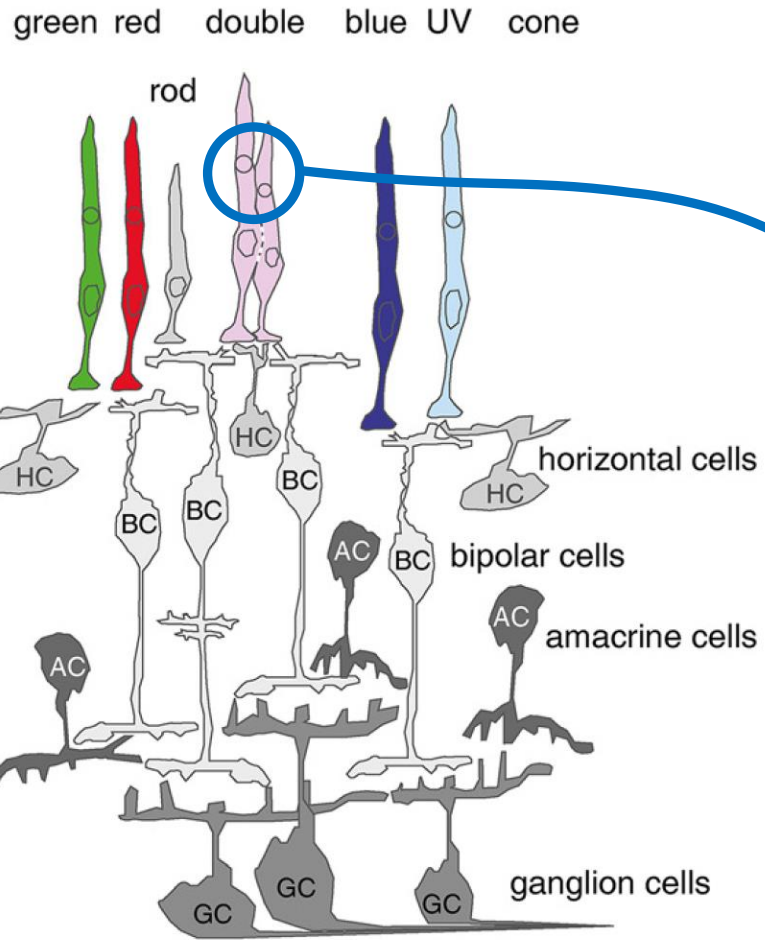




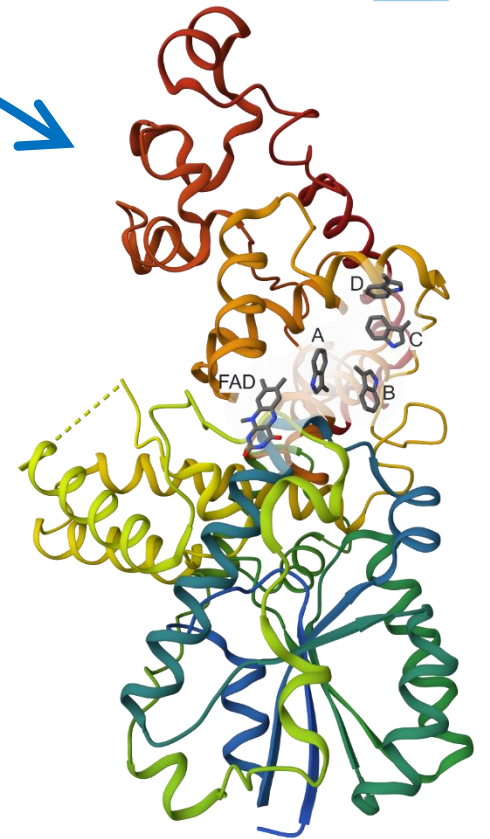


bird

eye



retina



cryptochrome



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Radical-pair-based magnetic sensing in
migratory birds

Peter Hore (Oxford)
Henrik Mouritsen (Oldenburg)

April 2019 – March 2026

Three key questions to revolutionize our understanding of avian magnetoreception

1. Are avian cryptochromes capable of functioning as magnetic compass receptors?
2. Do retinal neurons encode light-dependent, cryptochrome-derived magnetic information?
3. Are cryptochromes the primary magnetoreceptor molecules for magnetic compass orientation?





Timeline

SyG relaunch	Jul 2017
Discussions	Aug 2017
Started writing	Sep 2017
Submission	Nov 2017
Interview	Sep 2018
Decision	Sep 2018
Evaluation report	Oct 2018
Start	Apr 2019

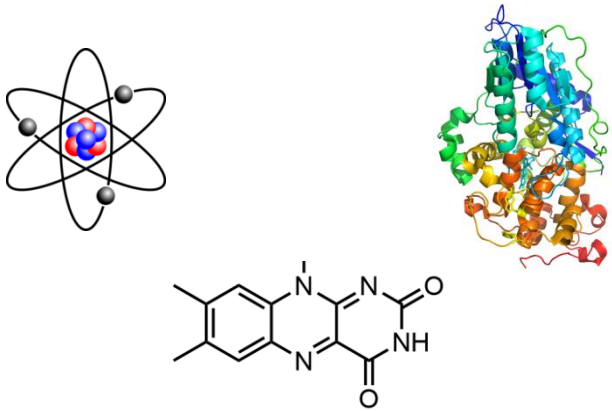
- Exciting & ambitious science
- Mixture of high-risk-high-gain and safer elements
- Impacts beyond magnetoreception
- Assessment of risk/gain balance
- Existing and planned collaborations
- Aims only achievable by working closely together
- Exchange of students and postdocs
- Bi-annual progress meetings
- Frequent discussions between biologists and chemists

Mariposa.com



Hore

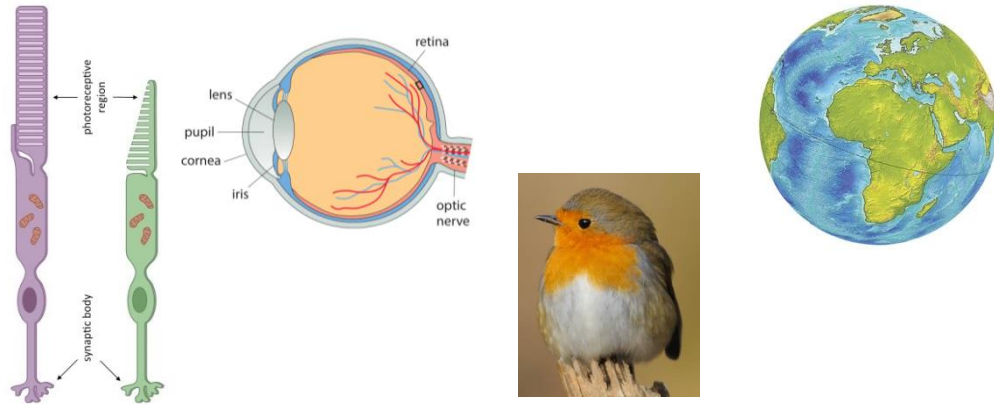
Physical Chemistry
Quantum mechanics
Spectroscopy
Magnetic field effects



10^{-11} m 10^{-10} m 10^{-8} m

Mouritsen

Animal navigation behaviour
Neurobiology
Biochemistry
Magnetoreception



10^{-6} m 10^{-3} m 10^{-1} m 10^6 m



17 orders of magnitude



Interview

15 min presentation

35 min questions

12-15 member panel

Script + 12 slides

Multiple rehearsals and Q/A

Mock interview

Thank you for listening

