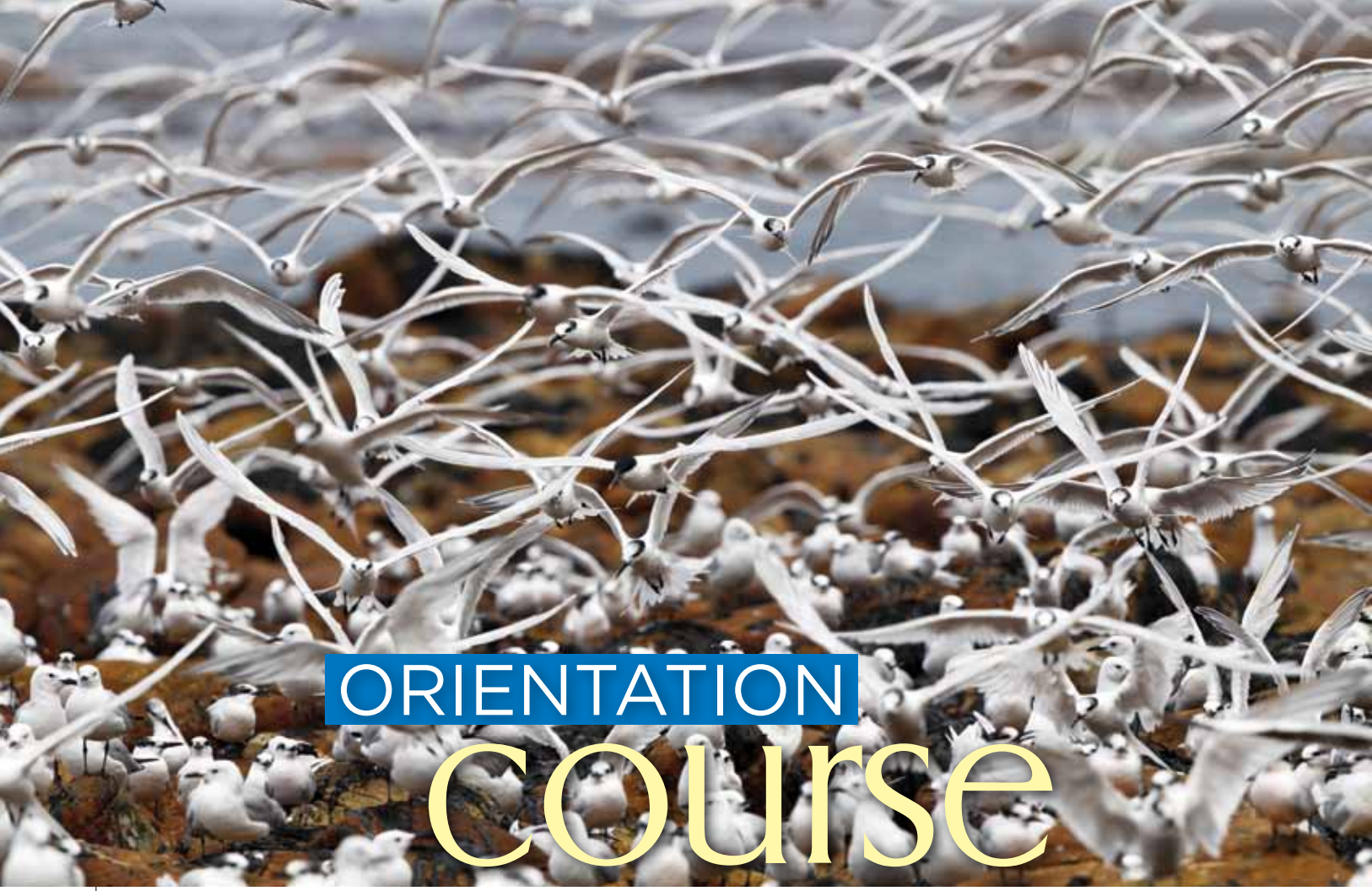

ORIENTATION course

PETER RYAN

Check the compass, chaps

Scientists often attract ridicule by asking seemingly esoteric questions – yet sometimes these questions yield surprising answers. Such research is celebrated by the Ig Nobel Prizes, which were started in 1991 by the *Annals of Improbable Research* magazine. One of the hot contenders for the biology award in 2014 must be the recent study by Vlastimil Hart and his colleagues on the cues used by flocks of waterfowl to decide on the direction in which to land (*Frontiers in Zoology* 10: 38).

Anyone with a passing interest in birds will have noticed that ducks (and indeed almost all large birds) land into the wind. It makes aerodynamic sense in exactly the same way that it does for aircraft: by landing into the wind, birds and planes can remain aloft at lower ground speeds, reducing the risk of stalling or incurring injuries as they touch down. But what happens when there is little or no wind?

Novel research suggests that in calm conditions waterbirds, such as these Sandwich Terns, use the earth's magnetic field to align their approach direction when landing to avoid mid-air collisions.

By recording the direction in which flocks of waterfowl approached wetlands and landed, Hart and his colleagues showed that this is not influenced by the direction whence the birds come. Flocks typically circle a wetland a few times, presumably to check that it is safe to land. However, all birds in a flock land in more or less the same direction, presumably to minimise the risk of mid-air collisions. Take-offs and landings are the most challenging and dangerous flight stage for birds and planes alike. At busy airports, planes rely on air traffic controllers to guide them down one at a time. Birds don't have this luxury, and the risk of predation gives them a strong incentive to remain in a tight flock.

Surprisingly, in calm conditions, duck and lapwing flocks almost invariably landed along a north-south axis. The sun also appeared to influence landing direction to some extent, because the north-south pattern was more striking on overcast days. And as predicted, the effect was stronger among large flocks, where the risk of collisions was greater. The authors argue that the only plausible reason for the pattern they observed is that large birds use the earth's magnetic field to orientate their landing direction. Indeed, they found a closer alignment to magnetic north than true north, and could detect subtle differences in landing angles between the western and eastern hemispheres.

The study was based on observations in eight countries of more than 3 000 flocks landing under calm conditions. Most data were obtained for Mallards, which are known to be able to perceive magnetic fields, but significant preferences for the north-south landing axis were found in 13 of 14 species, so it appears to be a widespread phenomenon. However, most of the observations were made in the northern hemisphere; only a few species were checked at one southern hemisphere location, in Botswana. Next time you're out birding, why not check to see if the pattern holds more widely in the south?

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