

Big or small, there's no place like home

ARE some home grounds better than others for ensuring sporting victories? It seems not – at least in soccer leagues.

Many pundits argue that vocal fans or daunting stadiums lend some teams a greater home advantage than other sides with quieter fans or smaller grounds. Physicists Andreas Heuer and Oliver Rubner at the University of Münster in Germany analysed over 12,000 soccer matches in the German Bundesliga between 1965 and 2007. Goal difference was used to gauge team performance, rather than games won, because it arguably gives a more reliable picture, says Rubner.

Heuer and Rubner confirmed teams have a home advantage over away sides: on average, home sides scored 0.7 more goals per game than visitors. However, they found that no team was inherently better at home than any other (www.arxiv.org/0803.0614).

Though some teams may appear particularly strong at their own ground, this assumption is often based on wins from a limited number of games, says Rubner. Any extra home advantage disappeared when the researchers extrapolated to an infinite number of games. This apparent bias can be seen when a coin lands on heads more than tails after a set number of flips. "Would you attribute that to the psychological effects of the person tossing the coin?" asks Rubner.



Why small people fall foul of the green-eyed monster

JEALOUS lovers will wish they could adjust the height of their heels, for the power of the green-eyed monster depends on how tall you are.

So say researchers from the Universities of Groningen and Valencia who asked 549 men and women in the Netherlands and Spain to rate how jealous they felt and to identify the qualities in a romantic competitor that were most likely bug them.

Men, who generally felt most nervous about attractive, rich and strong rivals, were increasingly

relaxed, the taller they were themselves. Women, on the other hand, were most jealous of others' beauty and charm, but least so if their own height was average.

This makes evolutionary sense, say the researchers, because previous findings suggest that whilst taller men do best with the ladies, it is women of medium height who enjoy the best health, fertility and popularity with men.

But unlike tall men, medium-height women can be more vulnerable to jealousy under some circumstances. Faced with

socially or physically powerful rivals they actually felt more jealous than shorter or taller women. According to the study, this may be because tall and strong, or socially well-connected women could well pose a threat to average-height feminine favourites since they might win conflicts, including physical fights. "Taller women are more dominant and have greater fighting abilities than shorter women," write the researchers in *Evolution and Human Behavior* (vol 29, p 133).

East, west, ants know best

CHRISTOPHER COLUMBUS could have done with one of these. Leafcutter ants navigate using an internal compass, and are the first invertebrates found to do so.

Leafcutters are known to use stars and landmarks to help keep track of their position, but Robert Srygley and Andre Riveros, then at the Smithsonian Tropical Research Institute in Balboa, Panama, suspected magnetism may play a part too. They picked up ants from foraging trails, turned them randomly and dropped them in a nearby spot devoid of landmarks and celestial cues. "We expected they would orient back toward the trail, because that's the nearest thing they would recognise," says Srygley. Instead, most headed towards their nest.

When the researchers used a powerful electromagnetic pulse to disrupt any magnetic sense, the ants set off in random directions. And when they reversed the magnetic field, about half the ants followed the new field lines and marched directly away from their nest (*Animal Behaviour*, DOI: 10.1016/j.anbehav.2007.09.030).

The ability could be important when heavy rains wash away the ants' trails, says Srygley.



If you're there ET, send us a neutrino

IF ALIENS have built a massive collider to smash particles together, a new detector could soon pick up the signs.

Most searches for ET focus on radio signals. But Zurab Silagadze at the Budker Institute of Nuclear Physics in Novosibirsk, Russia, points out that we could pick up signs of neutrinos created by our alien neighbours' science experiments. Here on Earth physicists are pondering building accelerators that could reach higher energies by smashing together muon particles. "If we have thought about developing muon colliders, aliens – if they exist – could have too," says Silagadze.

Such muon colliders would create an intense beam of neutrinos that could travel through intergalactic space and be picked up by the IceCube neutrino observatory being built in Antarctica (see above). The beam would shut down intermittently, distinguishing it from natural astrophysical sources, such as supermassive black holes, says Silagadze (www.arxiv.org/abs/0803.0409).

Silagadze isn't the first to consider alien neutrino beams. Almost 30 years ago, physicists suggested that aliens might choose to carry out secret intergalactic conversations with neutrinos because technologically immature civilisations like ours would not be able to eavesdrop on them.