

Why Randy Peacocks Would Give a Hoot



Even when Indian blue peacocks have their potential mates well in range, they make a point to hoot and announce their intentions.

During a research trip to northwest India's Keoladeo National Park in 2011, Jessica Yorzinski sat inside a hunting blind. Searing summer temperatures caused her camcorders to malfunction. Animals — probably jackals — growled and scratched at her shelter, while a speaker blared an odd hooting noise. She watched for peahens to approach.

They did, far more frequently on days when Yorzinski, then a postdoc biologist at Duke University, played a particular peacock mating call, called a hoot-dash, than when she played nothing. Male animals often use mating calls to attract females, but the hoot-

dash is peculiar. Indian blue peacocks emit a single ecstatic hoot just before dashing less than a yard toward females to mount them. "Few species emit courtship calls directly before copulating," says Yorzinski, now at Purdue University. Not only do the calls expend energy, they might also attract predators like jackals, tigers and leopards. During Yorzinski's research trials, some predators approached, but none struck.

So why would peacocks be so reckless? Yorzinski's observations showed that the hoot-dash attracted other females, increasing the male's chances of mating again. Despite the

peacock's over-the-top tail and infamous strutting display, the birds need help finding each other in India's dense forests and scrubland. Yorzinski believes peahens may also be able to decode a male's hoot for useful information, like his size or dominance status. And frequent hooters may take advantage of a phenomenon called mate-choice copying, in which females prefer popular males.

But peahens should beware, Yorzinski says: "Peacocks occasionally produce the hoot when they're not mating, giving the false impression that they're with a female." Future studies could explain why peacocks don't fake it more often. Two possibilities: Females might reject them if they catch them bluffing, or other males might attack them if they appear to be greater rivals.

— JENNIFER ABBASI

How to Make Light Matter

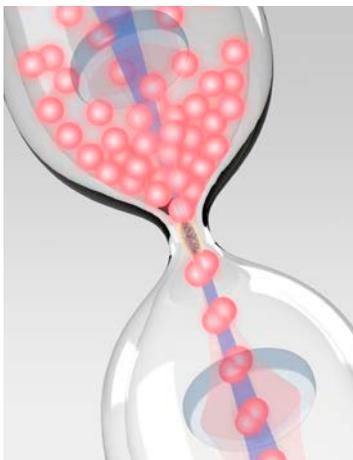
In a lab in Cambridge, Mass., a vacuum chamber the size of a shoebox has made history. Here, Harvard physicist Ofer Firstenberg has created a new form of matter: a pair of photons, stuck together. The "light molecule" is, potentially, the building block of technology that uses some form of tangible light — from light sculptures to lightsabers to (perhaps more practically) computers that can perform vastly more complex calculations than today's machines.

Unlike atoms and the matter they're made of, two photons on a collision course will simply pass through one another, with no interaction. To get photons to stick together, a first step for all the above technologies, Firstenberg and his team used a setup they've spent years perfecting. They rigged a specialized metal box with a laser on one side to let in one photon at a time. The first photon slips into a cloud of rubidium atoms, which were chosen because they can easily be cooled to the

extreme point at which they are nearly motionless. A second photon then enters the cloud. The two photons end up sticking together and move forward just like a two-atom molecule.

The interaction between the two allows one photon to alter the quantum information carried by the other by changing its properties (such as momentum and polarization). This kind of control over light will help researchers working on quantum computers, the next-generation machines that use photons instead of electrons in their computations. These can take advantage of the wacky laws of quantum mechanics, resulting in devices that could leave today's computers in the dust.

But that's a long way off. For now, Firstenberg and his colleagues are slowly building their understanding of the strange, new matter and how it operates by taking the next logical step: They're trying to make a light molecule composed of three photons. — SHANNON PALUS



Physicists have created a device (illustrated here) that can bind photons together to form "light molecules."