

Lab Notes

BODY OF WORK

Renee Engeln knows what's going on inside the heads of today's Northwestern students. The popular psychology senior lecturer — she's been chosen twice by student vote to deliver the "Last Lecture" during Senior Week — lives among students as faculty-in-residence at Allison Residential Community with her large, lovable German shepherd, Quant. On the research side, Engeln's Body and Media Lab explores body image and beauty sickness, issues that hit home with college-age students.

What's the focus of the Body and Media Lab?

We're trying to convince women to reallocate some of their cognitive resources — to just think about their appearance less. We're also working on ways to get women to think about their bodies as things that are capable and powerful and strong, instead of as things that are passive and for others to look at.

Why is this issue so important to you?

There are big battles to be fought for this world, and these bright young college students can fight those battles, but we're losing women when so many of their psychological resources are drawn out by worrying about how they look. It's not fair that women live in a world where we expect them to be just as accomplished as men in every way, but then we also expect them to spend significantly more time and energy and money on how they look.

What's it like to live among the students in Allison?

It's 95 percent fun. I host a lot of events in my apartment. Living there is also a reminder of how hard Northwestern students work. I think it's easy as a professor to forget that. But I see them studying in the lobby at 2 in the morning. So I have a real sense of what's important to them.



BRENNAN ANDERSON (WCAS'13, GJ14)

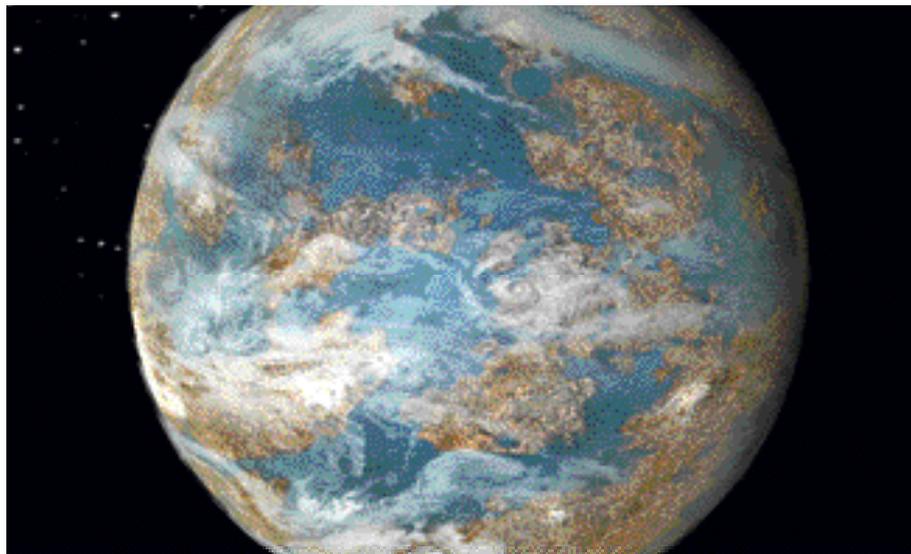


PHOTO ILLUSTRATION BY NASA AMES/DANA BERRY

A WORLD LIKE OUR OWN

MASSIVE ALIEN PLANETS LIKELY TO HAVE BOTH OCEANS AND CONTINENTS.

"Super-Earths" — massive terrestrial planets outside our solar system — are common in the Milky Way. Despite the name, scientists assume these planets have a surface covered in water and are in many ways drastically different from Earth.

However, a new model, created by Northwestern astrophysicist Nicolas Cowan and University of Chicago geophysicist Dorian Abbot, shows that most tectonically active super-Earths store most of their water in the mantle — the rocky part that makes up most of the volume and mass of the planet — and have both oceans and exposed continents, enabling a stable, Earth-like climate.

"Super-Earths are expected to have deep oceans that will overflow their basins and inundate the entire surface, but we show this logic to be flawed," says Cowan, a post-doctoral fellow. "Terrestrial planets have significant amounts of water in their interior. Super-Earths are likely to have shallow oceans to go along with their shallow ocean basins."

In their model, Cowan and Abbot treated the massive exoplanets just like Earth, which holds water in the mantle. In Earth's deep water cycle, tectonic movements shift the water between the oceans and the mantle. On a super-Earth, high gravity increases seafloor pressure, forcing the surface water into the planet's mantle. "We can put 80 times more water on a super-Earth and still have its surface look like Earth," says Cowan.

EVERYTHING AND THE KITCHEN SINK

Green tea isn't just for drinking.

Northwestern researchers discovered that polyphenols, naturally occurring molecules found in green tea, red wine and cacao beans, make for a superb antibacterial coating.

The bacteria-killing coating was discovered in a series of kitchen sink experiments, in which biomedical engineering professor Phillip Messersmith

and his team detected a colorless residue left behind on containers exposed to the polyphenols in green tea and red wine.

Polyphenols are naturally sticky, which makes them an excellent choice for coatings that can adhere to virtually anything — even Teflon. When they discovered the behavior held true for low-cost compounds



that resemble polyphenols, researchers developed a method for producing multifunctional coatings that can be used on a wide variety of consumer, industrial and medical products, ranging from catheters and orthopedic implants to membranes for water purification.