Rensselaer

why not change the world?℠

Welcome!

Renaissance at Rensselaer
The Campaign for Rensselaer Polytechnic Institute

President Jackson
Advancement
RPI Alumni
Campus Events
RPI Athletics

Why not change the world?

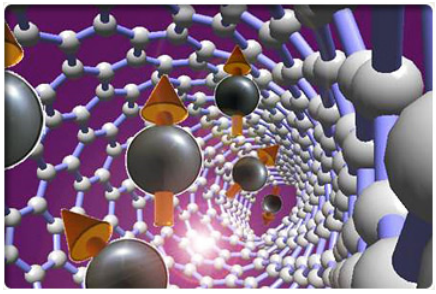
Global Energy Security is the 'Space Race' of the New Millennium

Rensselaer has responded to this urgent challenge with innovative research programs and initiatives in renewable energy sources and increased energy conservation.

RPI Connections

Parents & Family
Summer @Rensselaer
Education for Working Professionals
Corporate Relations
Foundation Relations
Government & Community Relations
Human Resources
Technology Commercialization
Incubator Program
Faculty Governance Review

Audio Podcasts



New Hybrid Nanostructures Detect Nanoscale Magnetism

Research could pave way for new data storage devices, drug delivery systems

Magnetic behavior is one such phenomenon that can change significantly depending on the size of the material. However, the sheer challenge of observing the magnetic properties of nanoscale material has impeded further study of the topic. Researchers at Rensselaer Polytechnic Institute have developed and demonstrated a new method for detecting the magnetic behaviors of nanomaterials. Read more

At Rensselaer Polytechnic Institute

Madison Avenue Magic: Study Reveals Effects of Unconscious Exposure to Advertisements

New research, led by Mark Changizi of Rensselaer, shows why direct exposure to repeated ads initially increases a consumer's preference for promoted products, and why the most effective advertisements are the ones consumers don't even realize they have seen.

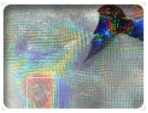
Obama's First 100 Days

Energy security is the greatest challenge and the greatest opportunity of our time. But lack of action has put the U.S. at risk. In a *Scientific American* feature article this month, Rensselaer president Shirley Ann Jackson writes that the new U.S. president must take bold steps, right away, to tackle the nation's energy challenge.

College Radio Maintains Its Mojo

More than 50 years ago, WRPI made history when it joined a small but growing group of radio stations presenting regular FM broadcasting. A recent *New York Times* article notes that in a digital world, "instead of clashing with the Internet, the 700 or so college stations have persevered alongside it..."

"Gray's Paradox" Solved: Researchers Discover Secret of Speedy Dolphins



For decades the puzzle prompted much attention, speculation, and conjecture in the scientific community. But now, armed with cutting-edge flow measurement technology, researchers at Rensselaer have tackled the problem and conclusively solved Gray's Paradox. Video

Students Explore Geometry's Role in Architecture

The Italian Cultural Institute of New York recently hosted a weeklong exhibition of the work of 20 students from Rensselaer's School of Architecture. Called "Reinterpreting the Baroque," the show featured research conducted by the students while they studied abroad in Rome, Italy, during the fall 2007 semester.

School of Architecture Launches Center for Architecture Science and Ecology

Headquartered at SOM's offices on Wall Street, CASE is an innovative collaboration that engages scientists, engineers, and architects from the professional and academic worlds toward a common goal of redefining how we build sustainable cities and environments.

Rensselaer Polytechnic Institute educates the leaders of tomorrow for technologically based careers. We celebrate discovery, and the responsible application of technology, to create knowledge and global prosperity.

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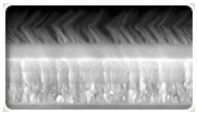
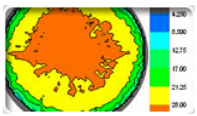
Research Spotlight



Solar Power Game-Changer: "Near Perfect" Absorption of Sunlight, From All Angles

By developing a new antireflective coating that boosts the amount of sunlight captured by solar panels and allows those panels to absorb the entire solar spectrum from nearly any angle, researchers at Rensselaer have moved academia and industry closer to realizing high-efficiency, cost-effective solar power.

Results of the year-long project are explained in the paper "Realization of a Near Perfect Antireflection Coating for Silicon Solar Energy," published this week by the journal *Optics Letters*.



Just Scratching the Surface: New Technique Maps Nanomaterials as They Grow

Researchers at Rensselaer have developed a measurement technique that will help scientists and companies map nanomaterials as they grow. The discovery could help create superior nanotechnologies and lead to the development of more efficient solar panels and increased magnetic data storage.

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Madison Avenue Magic: Study Reveals Positive Effects of Unconscious Exposure to Advertisements

Findings could help marketers optimize advertising for the human mind

Fads have been a staple of American pop culture for decades, from spandex in the 1980s to skinny jeans today. But while going from fad to flop may seem like the result of fickle consumers, a new study suggests that this is exactly what should be expected for a highly efficient, rationally evolved animal.

The new research, led by cognitive scientist Mark Changizi of Rensselaer Polytechnic Institute, shows why direct exposure to repeated ads initially increases a consumer's preference for promoted products, and why the most effective advertisements are the ones consumers don't even realize they have seen.

It has long been known that repeated visual exposure to an object can affect an observer's preference for it, initially rapidly increasing preference, and then eventually lowering preference again. This can give way to short-lived fads. But while this may seem illogical, Changizi argues that it makes perfect cognitive sense.

"A rational animal ought to prefer something in proportion to the probable payoff of acting to obtain it," said Changizi, assistant professor of cognitive science at Rensselaer and lead author of the study, which appears in the online version of the journal *Perception*. "The frequency at which one is visually exposed to an object can provide evidence about this expected payoff, and our brains have evolved mechanisms that exploit this information, rationally modulating our preferences."

A small number of visual exposures to an object typically raises the probability of acquiring the object, which enhances preference, according to Changizi.

On the other hand, Changizi says overexposure to an object provides the brain with evidence that the object is overabundant, and is likely not valuable, thereby lowering the individual's preference for it.

"An individual's preference for an object based on a large number of visual exposures will almost always take the shape of an inverted 'U', with an initial rapid rise in preference based on the enhanced probability that an object can be obtained, followed by a plateau and a gradual decrease in preference as the evidence begins to suggest that the object is overly common and thus not valuable," Changizi said.

One of the most surprising aspects of visual exposure effects, according to Changizi, is that they are enhanced when visual exposure occurs without conscious recognition.

"This non-conscious mechanism exists because visual exposure information alone, without conscious judgment, has implications for the expected payoff of one's actions," Changizi said. "In many natural situations, observers potentially have both exposure schedule information and consciously accessible information about the object, in which case the predicted degree of preference modulations from visual exposure will be dampened, as the visual information is competing with the information from conscious recognition of the object and any subsequent judgment."

These non-conscious mechanisms for rationally modulating preference are the kind animals without much of a cognitive life can engage in, and Changizi speculates that they are much more ancient.

Advertising that takes the form of apparel branded with company's names, and products strategically placed in movies and television shows, often go unnoticed by consumers, capitalizing on our brain's mechanisms to modulate preference based on non-conscious

exposure.

Changizi's research suggests that such advertising tactics work because they tap into our non-conscious mechanisms for optimal preferences, hijacking them for selling a company's products. The research could hold potential for marketers interested in optimizing their advertising for the human mind, Changizi says.

Changizi conducted his research with Shinsuke Shimojo, professor of biology at the California Institute of Technology. The project was funded by a grant from the National Institutes of Health.

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