Sloan Career Cornerstone Center
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Career Cornerstone News

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Career Cornerstone News is a Publication of the Sloan Career Cornerstone Center, the Premier Online Resource for Exploring Career Paths in Science, Technology, Engineering, Mathematics, Computing, and Healthcare.

Inside this issue:

Talking Fish?

An artist's representation shows the midshipman fish singing to attract a mate.
Credit: Original Illustration by Nicolle Rager Fuller, National Science Foundation

Talking fish are no strangers to Americans. From the comedic portrayal of "Mr. Limpet" by Don Knotts, to the Disney favorite, "Nemo," fish can talk, laugh and tell jokes. But can real fish verbally communicate? Researchers say, "Yes."

Further, the findings put human speech -- and social communications of all vertebrates -- in evolutionary context. By mapping the developing brain cells in newly hatched midshipman fish larvae and comparing them to those of other species, Andrew Bass and his colleagues, Edwin Gilland of Howard University and Robert Baker of New York University, found that the neural network behind sound production in vertebrates can be traced back through evolutionary time to an era long before the first animals ventured onto dry land.

The neural circuitry that enables human beings to verbally communicate--not to mention birds to sing, and frogs to "ribbit"--was likely laid down hundreds of millions of years ago with the hums and grunts of fish.

According to Bass, the research "sends a message to scientists and non-scientists about the importance of this group of animals to understanding behavior; to understanding the nervous system; and to understanding just how important social communication is--among them, as it is among ourselves." Find out about careers in biology at www.careercornerstone.org.

Engineering New Uses For Gold

The glitter of gold may hold more than just beauty, or so says a team of MIT researchers that is working on ways to use tiny gold rods to fight cancer, deliver drugs and more. But before gold nanorods can live up to their potential, scientists must figure out how to overcome one major difficulty: The surfaces of the tiny particles are coated with an uncooperative molecule (a byproduct of the synthesis process) that prevents researchers from creating nanorods with the features they want. "The surface chemistry is really key to everything," said Kimberly Hamad-Schifferli, assistant professor of biological and mechanical engineering at MIT. "For all of these nifty applications to work, someone's got to sit down and do the dirty work of understanding the surface."

As their name implies, gold nanorods are tiny cylinders of gold, about 10 billionths of a meter wide and 40 billionths of a meter long. They differ from traditional, spherical gold nanoparticles in one very important respect -- they can absorb infrared light. That means they can theoretically be activated by infrared laser without damaging surrounding cells, which do not absorb infrared light. That information could help scientists design nanorods that fight cancer agents by burning away tumor cells when activated with infrared light.

Materials Science Innovations at the Olympics

At the Beijing Olympics, innovations in materials science played a critical role in delivering maximum performance. The quest for lighter, stronger and safer sports equipment has provided added benefits to world-class and recreational athletes. DuPont is one of the companies finding solutions for these challenges. For example, tennis and badminton racquets constructed with the DuPont material Kevlar® can help resist cracking and shattering. Racquet strings made with Kevlar® don't stretch as much as conventional strings to deliver control and power, and break less frequently. New materials can also be found in many cycling accessories. And, Olympic and recreational swimmers are cutting their swim times by wearing a swimsuit made of fabric tested at NASA. The swimsuit fabrics were tested at NASA Langley's wind tunnel. The Speedo fabric, LZR PULSE™, is lightweight, water repellent, and fast-drying. The resulting swimsuit, the LZR RACER, is ultrasonically welded suit, which gives the effect of no seams at all. Ultra low drag LZR panels are laminated onto the base fabric to help compress the entire swimmer's body into a more streamlined shape and enabling them to cut through the water with more power and agility. Find out more about materials science at www.careercornerstone.org.

Olympic swimmer Michael Phelps helped develop the swimsuit that used materials tested at NASA Langley. ***Credit: Speedo***

Degree Profile: Physician Assistant

Physician assistants (PAs) practice medicine under the supervision of physicians and surgeons. They should not be confused with medical assistants, who perform routine clinical and clerical tasks. PAs are formally trained to provide diagnostic, therapeutic, and preventive health care services, as delegated by a physician.

Working as members of the health care team, they take medical histories, examine and treat patients, order and interpret laboratory tests and x rays, and make diagnoses. They also treat minor injuries, by suturing, splinting, and casting.

Physician assistants work under the supervision of a physician. However, PAs may be the principal care providers in rural or inner city clinics, where a physician is present for only 1 or 2 days each week. In such cases, the PA confers with the supervising physician and other medical professionals as needed and as required by law.

PAs also may make house calls or go to hospitals and nursing care facilities to check on patients, after which they report back to the physician.

About 136 education programs for physician assistants are accredited or provisionally accredited by the American Academy of Physician Assistants. More than 90 of these programs offered the option of a master's degree, and the rest offered either a bachelor's degree or an associate's degree.

Median annual earnings of physician assistants is about $74,980. Find out more about a career as a physician assistant at www.careercornerstone.org/physasst/physasst.htm.

7.1% Increase in Average Starting Salaries

Despite a less-than-robust economy, the overall average starting salary offer to new college graduates, regardless of major, increased by 7.1 percent over last year, according to a new report from the National Association of Colleges and Employers (NACE).

The Summer 2008 issue of NACE's Salary Survey showed that, in general, average starting salary offers to 2007-2008 bachelor's degree graduates are on the rise.

"The continued economic downturn and results from the Spring 2008 issue of Salary Survey suggested salary increases to new college graduates might be leveling off," says Marilyn Mackes, NACE executive director. "However, the current report shows that salaries continue to rise in many disciplines—including some that appeared flat in the spring."

In terms of specific majors, accounting graduates received a 2.9 percent increase to their average offer, raising it to $48,085 — a significant change from the Spring report when no increase was reported for these grads. Salary offers to computer science graduates rocketed up 13.1 percent over last year to an average of $60,416. Conversely, information sciences and systems graduates saw a modest 3.1 percent increase, bringing their average offer to $52,418. The average offer to chemical engineering graduates rose 6.4 percent to $63,165. Many offers to these grads came from petroleum and coal products manufacturers, which offered an average salary of $71,976.

Civil engineering graduates also posted a 6.4 percent increase, bringing their average offer to $51,632. Mechanical engineering grads received a healthy 5.3 percent increase, boosting their average offer to $57,009. The offer to electrical engineering graduates rose a modest 2.9 percent, bringing their offer to $56,910.

Find out more about salary levels for those with associate, bachelor's, and master's degrees at www.careercornerstone.org.

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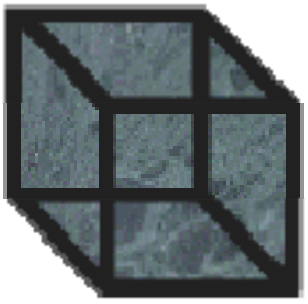
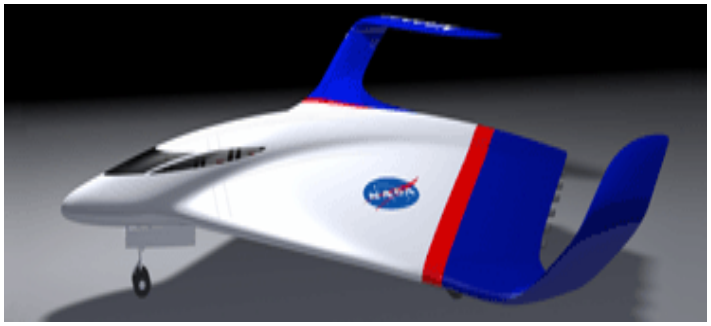


Why not link to the Sloan Career Cornerstone Center from your website? Link to individual pages such as precollege resources, to degree profiles, or to our podcasts or newsletter. We're happy to provide you with a custom graphic or any materials you need!

Find out more at www.careercornerstone.org/addalink.htm

College Students Design Future Aircraft



Sixty-one students from 14 colleges and universities around the globe have imagined what the next generation of airliners and cargo planes may look like. Fourteen teams and two individual students submitted their designs in the annual competition sponsored by NASA's Fundamental Aeronautics Program, part of the agency's Aeronautics Research Mission Directorate. The highest scoring graduate team was from Georgia Tech in Atlanta, GA. Undergraduate team honors went to Virginia Tech in Blacksburg, VA. The contest asked students to create a future subsonic transport aircraft that could carry up to 50,000 pounds, operate on runways between 1,500 and 3,000 feet long, and cruise at speeds between 595 and 625 mph - about the average speed of airliners today. The competition also stressed that concept planes should use alternative fuels and be quieter and more environmentally friendly than today's commercial fleet.

The judges graded the designs on criteria including creativity and imagination, feasibility and cost analysis, and comprehensive discussion of design concept. As part of the competition, six U.S. students received a 10-week paid summer internship at one of four NASA research centers around the country. Non-U.S. student winners received an engraved trophy and certificate.

Sponsors are already planning next year's competition. Find out more at http://aero.larc.nasa.gov.

Math is #1 at MATHCOUNTS and AMC!

MATHCOUNTS® is a national math enrichment, coaching and competition program that promotes middle school mathematics achievement in every U.S. state and territory, and involves volunteers, educators, industry sponsors, and students in America. Over the last 25 years, more than 7 million students have used MATHCOUNTS materials. For its 25th anniversary year, MATHCOUNTS introduced a new Club Program to create non-competitive math clubs by providing free materials and guidance to any middle school in the U.S. Materials and information are available free-of-charge at www.mathcounts.org.

For middle and high school students, the American Mathematics Competitions sponsors the AMC 8, 10, and 12. The AMC 8 is for students in the sixth, seventh or eighth grade; accelerated fourth and fifth grade students also take part. The AMC 10 and 12 are 25 question, 75 minute multiple choice examinations in secondary school mathematics. The AMC tests are available worldwide and are a big part of shared experience of young math-interested people around the world. More details are at www.unl.edu/amc. The Sloan Career Cornerstone Center provides links to hundreds of precollege STEM programs and projects at www.careercornerstone.org/pcprogproj.htm.