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Upcoming Events -

Mark your Calendar!

NYWEA 82nd Annual Winter Meeting

January 31 - February 3, 2010
 at the Marriott Marquis in
 New York City

STUDENT DAY

February 2, 2010

Student Day will feature presentations and poster displays from students at colleges and universities.

Leading the Way in Water Quality Management

E3 Fair-July 2009

The E3 (Engineering, Exploration, and Experimentation) Fair began in 1991 and was organized by professionals from the Rochester engineering community, as an extension of National Engineer's Week. Conceived originally by the American Society of Mechanical Engineers, the objective is to provide opportunities for middle school students in Rochester and the surrounding community to learn about engineering professions, to meet and interact with practicing engineers, and to begin learning how to "engineer" solutions to problems. High school students and their parents are also encouraged to attend the Fair, to take advantage of the Career Opportunities offered by the event. For more information, go to www.e3fair.org.

Innovative Ways to Teach Students

Liquid Assets, The Story of Water Infrastructure produced by the Water Environment Federation, can be useful in teaching grades 6-12 about wastewater, sustainable water use, public health, watersheds, the water system and community participation. Visit <http://liquidassets.psu.edu/outreach/education.html> for more information.

NSTA book -Climate Change from Pole to Pole: Biology Investigation offers case studies and background information on how to teach the science of climate change. NSTA produced a book which is an experiment-based environmental science curriculum. To view a sample chapter, visit the NSTA Science Store.

Activities Linking Science with Math, K-4, offers preservice and inservice elementary school teachers a ready-to-use, hands-on guide that integrates the study of science with mathematics, as well as with the visual arts, social sciences, and language arts. The 20 lessons, aligned with the latest national standards, encourage the natural curiosity of elementary students and promote the development of their problem-solving skills. The interdisciplinary activities are teacher-friendly and require only inexpensive and easy-to-find materials. The lessons, which cover topics in general, physical, chemical, Earth and life science include an overview, skills to learn, step-by-step procedures, discussion questions, and assessment techniques. "What makes a boat float," "Your very own museum-making collections," and "investigating the properties of magnets" are some of the activities. To examine a sample chapter and to purchase, visit the NSTA Science Store.

National Defense Education Program

The Department of Defense and U.S. military services are intent on boosting K-12 students interests and achievement in science, technology, engineering and mathematics(STEM). Programs include: Pre-engineering partnerships(PEP) among defense laboratories, school systems and non-government organizations intended to enhance STEM curricula.

To learn more and find out if one of these programs is available in your area, go to the NDEP website and click on Teachers.



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Spotlight on Schools



California

The San Jose Mercury News(7/10) reported that 27 middle school girls from Santa Cruz and north Monterey counties were introduced to engineering at UC Santa Cruz through the Girls in Engineering program. The activities stress the creative aspect of problem solving.

Georgia

The Atlanta Journal-Constitution(5/13) reports that fourth and fifth graders from the Marietta Center for Advanced Academics(MCAA) are "working with students from Southern Polytechnic State University to develop an oceanography computer simulation. The game is "funded by a \$5,000 state Science, Technology, Engineering and Math (STEM) grant." The game itself helps the students "understand the effects of over fishing.

Massachusetts

South Coast Today(5/17) reported that the Verizon Foundation is teaching students about high-growth careers in science, technology, engineering and mathematics, also known as "STEM."

Tennessee

The Knoxville News Sentinel(5/18) reports on the Project Lead The Way curriculum being offered in Oak Ridge Tennessee Schools. It aims to provide hands-on, real-world learning to middle and high school students in a way that will interest them in future careers in math and science.

Texas

The Texas Star Community Newspaper(6/17) reported that middle school students in the Frisco Independent School District embarked on a journey to explore the fields of science, technology, engineering and math through the second annual Mindbender Academy summer camp. For one week, campers participate in hands-on projects such as robotics, small film production, microbiology, 3D animation, mechanical engineering and nanotechnology.

Virginia

Virginia's News Leader(7/14) reported that "about 10 University of Virginia students along with alumni, two faculty and consultants" are working to complete a floating classroom dubbed the "Learning Barge." The purpose of the floating classroom is to educate grade-school children about the various natural and man-made processes under way on the polluted Elizabeth River in eastern Virginia.



Message From the Chair

The NYWEA Public Education Committee publishes this newsletter twice a year to engage young people in careers

related to water quality such as engineers, biologists, chemists, treatment plant operators, managers, laboratory technicians, government officials and many others. In this edition of our newsletter we highlight electricians and other electrical specialists that most wastewater and water treatment plants employ. As with most of the careers in the water quality profession there is a wide range of duties to be performed as well as a wide range of education that is required. But the biggest requirement of a career in water quality is the desire to make a difference and be a part of the solution to the challenges related to water supply and treatment that our society faces on a daily basis.

Along with the careers being highlighted, we feature links to educational websites and NYWEA Scholarship opportunities.

Please contact Beth Petrillo, Vice-Chair at bpetrillo@dep.nyc.gov if you would like previous newsletters emailed to you or if you have any suggestions on how we can improve the newsletter.

Featured Careers this issue:

- Electrical Engineer
- Electrical Engineering Technician
- Electrician

Featured Career Opportunities

Electrical Engineer

Electrical engineers design systems of various sizes that use electricity. Water and wastewater treatment and supply systems rely on electricity. So the reliability of the water supply and wastewater treatment depends on the reliability of the electrical equipment. Electrical engineers help:

- design, test, install electrical systems and electronic components, ranging from huge turbines to microcomputers;
- design and develop remote sensing devices for detecting leaks and locating underground pipes and sources of water;
- estimate the time and cost of engineering projects.

Electrical Engineering Technician



Electrical engineering technicians work on electrical and electronic systems and components. In the water quality profession, these systems range from computer circuitry to wiring huge hydroelectric generators. An electrical engineering technician:

- operates, maintains, and services electrical systems;
- builds, tests, and modifies electrical equipment, circuits, and electronic devices;
- helps electrical engineers make sound engineering decisions.

Requirements:

- High school diploma
- Associates (two-year) degree with training in computer engineering
- Electrical and electronics engineering
- Some knowledge of communication technology is a plus. Sometimes the technician must be a licensed electrician. Strong in science and math, especially physics; analytical with good fine motor skills.



Electrician

Electricians install, repair, operate, and maintain electrical equipment. Often, they work with electrical engineers who design the systems. In the water industry, electricians may install, operate, and maintain:

- the large-scale electrical system of a hydroelectric plant;
- the electrical wiring within a building;
- high-voltage systems for the machine and repair shops, pumping stations, and generators;
- high-quality electrical supplies for computers and laboratory equipment.

Requirements:

- High school diploma and apprenticeship; two-year degree is a plus.
- State Electrician's License

Other skills and traits that might help in this career are being a good problem solver; logical thinker and someone who enjoys working with their hands.

Note: In smaller utilities, operators are hired rather than electricians. The operators must have a knowledge of electrical systems before being hired.

How do you get ready?

Most electricians start by becoming apprentices. As apprentices, they learn on the job. They also take classes and get paid while they learn. As part of their classroom work the apprentices learn blueprint reading, electronics, math, safety, and rules about electricity. This course work and apprenticeship usually lasts 3 to 5 years. After they finish an apprenticeship, many electricians take more classes. They might learn more about telephone lines, computer lines, and other kinds of special wiring. Most electricians also need a license from the State or County where they work.

How much does this job pay?

In 2006, the middle half of electricians earned between \$16.07 and \$27.71 an hour. The lowest-paid 10 percent earned less than \$12.76. The highest-paid 10 percent earned more than \$34.95. People who worked in car factories made the most.

What about the future?

Jobs are expected to grow about as fast as the average for all occupations through the year 2016.

Where can you find more information?

More Bureau of Labor Statistics (BLS) information about electricians can be found in the Occupational Outlook Handbook. The Handbook also shows where to find out even more about this job.

Scholarships

NYWEA Offers \$19,000 in Scholarships!

The New York Water Environment Association will be offering a total of six (6) \$1,500 scholarships and one (1) \$10,000 scholarship in 2010.

2010 \$10,000 Environmental Career Scholarship

The eligibility criteria for the \$10,000 scholarship (paid out over four years) is as follows:

The recipient must be:

- A qualifying high school senior
- A New York State resident
- Enrolled full-time in a B.S. or B.E. degree program with an environmental emphasis.

Application deadline: **January 21, 2010.**

2010 \$1,500 Scholarship Application Package

To be eligible for one of the \$1,500 scholarships:

- Two(2) are granted to children of members
- Two (2) are granted to students enrolled at a college or university where there is a NYWEA student chapter, and
- Two (2) are granted to high school students who will be enrolled in an environmentally related program in a four year college or university.

Application deadline: **January 21, 2010.**

2010 N.G. Kaul Memorial Scholarship

The N.G. Kaul Memorial Scholarship Fund will be offering a total of \$2500 in scholarships to students pursuing graduate or doctoral degrees in environmental/civil engineering or environmental science concentrating on water quality who show a commitment to government service. Application deadline: February 28, 2010.

Jim Anderson Memorial Scholarship

The Jim Anderson Memorial Scholarship offers one \$1,250 scholarship annually. Applicants must be enrolled in a BS or BE full-time engineering program with a focus on environmental issues, particularly water/wastewater. Application deadline: May 1, 2010

Lucy Grassano Memorial Scholarship

The scholarship will be utilized to further the careers of secretaries, administrative assistants, and operators in the water quality field. Details of the scholarship will follow.

Attention Parents of High School Seniors

NYWEA has a Child of Member Scholarship! A son or daughter following in your environmental footsteps can submit a scholarship application in the Child of Member category. For more information visit www.nywea.org.

Competitions for Students

2010 U.S. Stockholm Junior Water Prize- What is the SJWP?

The International Stockholm Junior Water Prize (SJWP) is the most prestigious youth award for a high school water science research project. Its purpose is to increase youth attention toward the water environment, and to sensitize them – as future leaders - to local and global water challenges. HRH Crown Princess Victoria is the patron of the prize. In a royal ceremony, during World Water Week, the international winner receives \$5,000 USD and a blue crystal sculpture.

The SJWP was founded by the Stockholm Water Foundation and is administered by the Stockholm International Water Institute (SIWI). ITT Industries is the global sponsor.

In the United States, the Water Environment Federation (WEF), and its member associations, sponsor and organize the state and national competition with support from ITT Industries and The Coca-Cola Company.



The 2009 New York State representative was Benjamin Valentino from Mexico, NY. His paper was entitled "Magnetic Gradient Anomalies on Onondaga Lake, New York: Are They Geologic or Anthropogenic? Benjamin was able to compete in the National SJWP competition held in Anchorage, Alaska this past June and his project was well-received.

North Carolina Student To Represent U.S. In International Stockholm Junior Water Prize Competition

Eileen Jang of Cary, N.C. was named the U.S. winner of the 2009 Stockholm Junior Water Prize (SJWP) – the most prestigious international competition for water-related research.

The student's work, "Natural Organics Control Aggregation of Mercury Sulfide Nanoparticles in Freshwater Systems", introduced a novel aqueous synthesis process for studying how HgS nanoparticles, the precursors to methylmercury, persist in freshwater systems. Jang's research deepened the understanding of mercury, a substance that bioaccumulates in fish and is toxic to humans, in its aqueous phase and furthered the emerging field of nanogeoscience. Her project was selected from more than 40 state SJWP winners at the national competition held in Anchorage from June 25-27th.

The student from the North Carolina School of Science and Mathematics in Durham, N.C. received \$3,000 (USD) and an all-expense paid trip to Stockholm, Sweden, where she will compete against national winners from more than 30 countries for the international honor during World Water Week, August 16-22, 2009. HRH Crown Princess Victoria of Sweden will present the international award – \$5,000 and crystal sculpture – during a royal ceremony held in conjunction with the Stockholm Water Symposium. In addition, Jang's school will receive a \$1,000 grant toward enhancing water science education and she will present her research to more than 20,000 water quality professionals at WEFTEC.09 - the Water Environment Federation's 82nd annual technical exhibition and conference - this October in Orlando, Fla.

Three U.S. finalists, Scott Boisvert from Chandler, Ariz., Li Boynton from Houston, Texas, and Collin McAilley of Melbourne Beach, Fla., also received a \$1,000 award.

The Water Environment Federation sponsors the U.S. SJWP with support from ITT Corporation and Delta Air Lines. The Alaska Water Wastewater Management Association served as the 2009 host of the national competition and Jang received sponsorship from the North Carolina Water Environment Association.

For more information about SJWP, please visit www.SJWP.org.

The deadline for entry is **April 15, 2010**, or as indicated on State Deadlines and Special Awards.

Kelydra Welcher, a former state winner and U.S. finalist of the 2007 Stockholm Junior Water Prize(SJWP) competition was one of three young scientists selected for the upcoming documentary called "Whiz Kids."

NYWEA POSTER CONTEST

The theme is "The Importance of Wastewater Treatment." All middle and high school students in New York State public and private schools are eligible.

The deadline for submission of posters is **January 8, 2010**. For more information got to www.NYWEA.org