

## Akos Vertes, GWU, named 2012 Hillebrand Prize Recipient

Akos Vertes, Professor of Chemistry and Professor of Biochemistry and Molecular Biology at George Washington University has been named the recipient of the 2012 Hillebrand Prize. The Chemical Society of Washington is recognizing Vertes for “the significance and impact of his research in multiple areas of physical and analytical chemistry, including mass spectrometry, matrix assisted and electrospray ionization methods, proteomics, and real-time imaging of biological material at the cellular level.”

The Hillebrand Prize, awarded annually for original contributions to the science of chemistry by a member or members of CSW, is the most prestigious honor given each year by CSW and is recognized nationally as a mark of significant accomplishment in chemistry. The prize, which originated in 1924, is named for William F. Hillebrand (1853-1925), an internationally recognized pioneer in analytical chemistry, a former President of the American Chemical Society, and one of Washington’s most distinguished chemists. The Hillebrand Prize carries an honorarium of \$2000.



After receiving his Ph.D. in 1979 at the Eötvös Loránd University in Budapest, Hungary, Vertes undertook postdoctoral work at the University of Notre Dame in Indiana, moving to The George Washington University in 1991, where he rose through the ranks to his current position as Full Professor in 2000. He is a co-founder and co-director of the W. M. Keck Institute for Proteomics Technology and Applications, a center of strategic excellence at the university. He has also served as a Guest Researcher at the Naval Research Laboratory in Washington, D.C., as an Adjunct Scientist at the National Institutes of Health in Bethesda, MD, and has been a visiting

faculty member at the Swiss Federal Institute of Technology Zurich in Zurich, Switzerland, and at the Lawrence Berkeley National Laboratory in Berkeley, CA.

Vertes has more than 140 peer-reviewed publications, 10 of which have been featured on the covers of high-impact journals, and two books. He has 5 issued U.S. patents and 13 pending patent applications, and much of this intellectual property has been licensed by the biotech industry.

The Hillebrand Selection Committee made particular note of the significance and impact of Vertes’ research in multiple areas of physical and analytical chemistry, including mass spectrometry, matrix assisted and electrospray ionization methods, proteomics, and real-time imaging of biological material at the cellular level. Methodology developed by Vertes during the last two decades “is revolutionizing the role that mass spectrometry can play in the life sciences,” and applying the technique at the cellular level with the ability to determine spatial resolution “is nothing short of remarkable.” Dr. Vertes will present his talk, “From

## Volunteers Needed for Chemists Celebrate Earth Day

Earth Day is April 22, and the Chemical Society of Washington (CSW) will once again participate in Chemists Celebrate Earth Day (CCED) activities. This year marks the 10<sup>th</sup> annual celebration of the ACS-sponsored Chemists Celebrate Earth Day, and the theme, “Our Earth: Handle with Care!” focuses on the general topics of water, air, plants/soil, and recycling. Chemistry is all around us and is vital to our planet’s sustainability. Whether it’s used in recyclable and biodegradable materials or through the reduction of waste, chemistry is involved in ensuring that we can be eco-friendly and kind to our environment. This year’s theme explores these concepts and gives us the opportunity to highlight many achievements in the materials field where the transformative power of chemistry is displayed. K-12 stu-

dents are encouraged to compete in the illustrated poem contest (see page 6). The CCED publication, “Celebrating Chemistry,” for K-8 grade is available via the ACS website ([www.acs.org/earthday](http://www.acs.org/earthday)).

CSW, in conjunction with the chemistry department from Montgomery College, Rockville Campus will participate in Rockville Science Day on Sunday, April 28, 2013. Rockville Science Day is open to the general public and CSW encourages you to attend. Rockville Science Day is intended to provide a friendly environment for students and their parents to participate in some hands-on demonstrations and to learn more about how science and engineering are important to our society. Additional information about Rockville Science Day can be found on their website,

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*...Continued on Page 6*

# The Capital Chemist™



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## Editor, Business Manager

Jessica L. Rasmussen  
Voice: 202-659-2650  
Email: [csw@acs.org](mailto:csw@acs.org)

## Publisher

Chemical Society of Washington

## Business Staff

Zory R. Glaser, Chair  
CSW Publications Committee  
202-659-2650

## Advertising Manager

MBO Services  
PO Box 1150, Marshfield, MA 02050-1150  
781-837-0424 voice  
[www.mboservices.net](http://www.mboservices.net)

## CSW Correspondence

Kristy A. Martin, Administrator  
CSW, 1155 16th Street, NW, O-218  
Washington, DC 20036  
202-659-2650 voice  
email: [csw@acs.org](mailto:csw@acs.org)

<http://csw.sites.acs.org>

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## THE CHEMICAL SOCIETY OF WASHINGTON PRESENTS: *1117th Dinner Meeting*

Thursday, March 14, 2013

Alfio's Restaurant

4515 Willard Avenue

Chevy Chase, MD 20815

## Agenda

6:00 pm Check-in and Social Hour

7:00 pm Dinner

8:00 pm Hillebrand Award Ceremony and Presentation

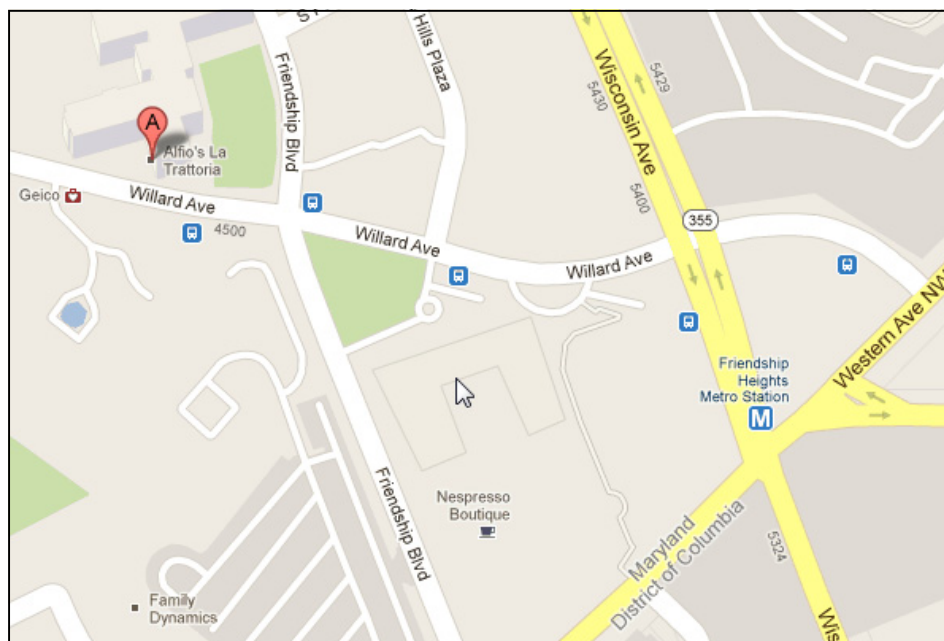
\$26.00 Members & guests, \$13 Students

**Menu:** Choice of entrée: veal parmigiana, veal piccata, eggplant parmigiana, broiled filet of flounder, or chicken francese. All will be served with pasta with marinara, chef salad, fresh vegetables, bread and butter, and dessert.

**Reservations:** Make reservations by **Monday, March 11 at 12:00 noon**, to the CSW office: [csw@acs.org](mailto:csw@acs.org) or 202-659-2650. Please designate the names in your party, and entrée choice. The public is invited to attend. You may attend the talk only, but reservations are appreciated. **Those who make a reservation, but are unable to attend, should send a check for the cost of their meal to the CSW office.**

**Parking:** Alfio's offers free valet parking.

**Metro:** 4 blocks from Friendship Heights (red line) station.



## CSW Participating in "Coins for Cleaner Water" Campaign

Every day, several billion people around the world live without safe drinking water. More than 4,000 children die every day from diseases as a result of drinking unsafe water. ACS is seeking to raise funds to purchase water purification packets that can be used in areas of the world where safe drinking water is not readily available. The goal of the program is simple, and if successful, the impact will be huge: a true demonstration and validation of the ACS Vision, "Improving people's lives through the transforming power of chemistry."

Procter & Gamble, in collaboration with the U.S. Centers for Disease Control and Prevention, has developed a low-cost technology in a sachet to purify heavily contaminated water so it meets World Health Organization standards for safe drinking water. P&G's water purifier packets are being distributed through its Children's Safe Drinking Water (CSDW), a special foundation the company established in 2004. Since CSDW's creation, P&G has distributed over 300 million water purifier packets throughout 65 countries. Through these efforts, over 5 billion liters of clean water have been made available to people around the globe. The program has saved more than 16,000 lives and prevented over 200 million days of diarrhea. For more information on the CSDW, please visit <http://www.csdw.org/>.

Each packet costs only 3.5 cents to produce (and 7 cents to distribute) and safely treats 2.5 gallons of water. ACS is proud to continue its partnership with P&G's Children's Safe Drinking Water program. All funds raised by ACS will go towards the production costs. Last year, *Pennies for PUR*® raised \$18,000, enough to provide more than 1.2 million gallons of clean water to developing countries. This year, our goal is to raise enough funds before May 1, 2013 to be able to provide over 1.8 million gallons of safe water!

**CSW is will be helping to raise money by collecting donations during the March dinner meeting.** Please help us in our effort to provide clean drinking water to children all over the world.

## Hillebrand, *Continued From Page 1*

Fundamentals to New Tools and Back to Fundamentals" at the March CSW Dinner Meeting. Meeting details can be found on page 2.

### Speaker Abstract, "From Fundamentals to New Tools and Back to Fundamentals"

In the past three decades, new insights into two physical phenomena, laser-solid interactions and electrosprays, reshaped the landscape of bioanalytical chemistry. Specific interactions of lasers with condensed matter are used throughout chemistry to synthesize, modify and probe materials of interest. Important examples include matrix-assisted laser desorption ionization (MALDI) for biomolecular analysis, photonic ion production from nanostructures, and phase explosion for laser ablation sampling of biological specimens. Electrification of liquid menisci finds similarly diverse applications in macromolecular ion production, nanoencapsulation and electrospinning. Our efforts to understand the volatilization, ionization and fragmentation of biomolecules in these processes resulted in the description of limited energy transfer between matrix and analyte, and the introduction of a fluid dynamic model for MALDI. Analyte internal energy measurements in MALDI, electrospray ionization (ESI) and photonic ionization revealed fragmentation patterns in these highly complex processes. Columnar nanostructures, for example, silicon nanopost arrays (NAPA), were shown to exhibit photonic ion production, including the polarization dependence of ion yields. The formation and disintegration regimes of electrified liquid droplets were followed from bulk solution to nanoscopic

droplets to explain ion production in ESI.

Armed with extensive knowledge about laser ablation sampling and various forms of ion production, we set out to design a new bioanalytical modality. This technique capitalized on mid-IR laser sampling of microvolumes followed by ESI of the ablation plume for mass spectrometric analysis. The resulting method, termed laser ablation electrospray ionization (LAESI), enabled the direct local analysis of biological tissues and cells, and their mass spectrometric imaging at atmospheric pressure in two and three dimensions. In situ LAESI measurements on numerous biomedical systems included plant tissues and cells, virally infected lymphocytes, energy harvesting microorganisms, rodent brain tissue sections and the central nervous system of molluscs. Optimized nanofabrication of NAPA resulted in an ultrasensitive ionization platform that enabled the metabolic analysis of a single yeast cell.

These novel tools enabled us to ask some fundamental questions that promised fresh insight in cell biology. Through the combination of cell dissection and LAESI mass spectrometry, we demonstrated the existence of significant metabolite gradients between the cytoplasm and the nucleus within a cell. Our ability to analyze individual cells on NAPA allowed the exploration of cellular heterogeneity and its changes under oxidative stress. In these endeavors we benefitted from an interdisciplinary approach that started with exploring the basic physics of ion production, capitalized on the gained knowledge to create new analytical devices and used them to approach unresolved questions in biology.



## Retired Chemists Group Touring Kennedy Center March 11

The Retired Chemists Group (RCG) will meet at the Kennedy Center on Monday, March 11, 2013 at 11:00 AM for a special tour of the Center. Our group will assemble at the Visitors Center, located in the Hall of States corridor, where we will be met by a tour guide. The tour will include visits to the major theaters, private rooms, artworks and gifts, etc. The tour will be followed by lunch (on your own, cafeteria style) in the Kennedy Center Café in an area reserved for RCG.

After lunch, attendees are free to tour a unique festival called "Nordic Cool 2013" that highlights the diverse arts and cultures of the Nordic region of our planet. For this RCG inaugural event of 2013, reservations are required and can

be made by contacting RCG President Dr. Joseph Antonucci at 301-493-8392, 301-975-6794, or [joseph.antonucci@nist.gov](mailto:joseph.antonucci@nist.gov) no later than Friday March 8, 2013.

Travel to the Kennedy Center is best by Metro, exiting at the Foggy Bottom Station, and then taking the free shuttle bus at that station to the Kennedy Center (every 15 minutes). Parking is available in the Kennedy Center garage but can be expensive (\$9 for 3 hours to \$22 all day). For more information please visit [www.kennedy-center.org/visitor/directions.html](http://www.kennedy-center.org/visitor/directions.html).

**The Retired Chemists Group**  
offers a social program of lunches  
and outings available to all.  
[csw.sites.acs.org/rcg.htm](http://csw.sites.acs.org/rcg.htm)

## Calendar of Events

**RCG Kennedy Center Outing**  
March 11, 2013

**March Dinner Meeting**  
March 14, 2013  
Alfio's Restaurant, Bethesda

**CCED Illustrated Poem  
Deadline**  
March 29, 2013

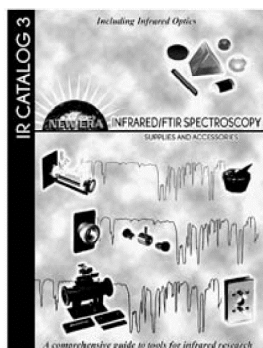
**Rockville Science Day**  
April 28, 2013  
Montgomery College, Rockville



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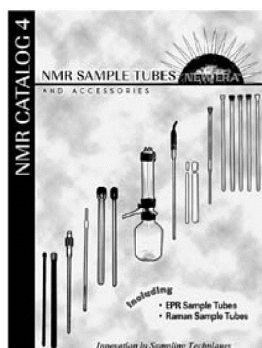
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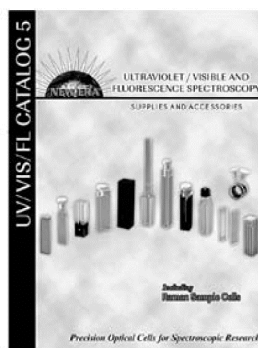
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## Undergraduates Honored at February Dinner Meeting

The College Chemistry Achievement Awards are presented annually by the Chemical Society of Washington to the outstanding seniors majoring in chemistry and biochemistry from each of the area colleges and universities. The following students received awards (in photo below, left to right, pictured with Doug Raber, CSW President):

- Kristen Johnson, The Catholic University of America
- Timothy P. Dougherty, Georgetown University

- Lindsay Wise, Georgetown University
- Mary McGann, The Catholic University of America
- Nam Soo Kim, University of Maryland
- Keyun Wang, American University
- Klare Lazor, American University
- Dain T. Thorpe, University of the District of Columbia
- Tarek Mansour, The George Washington University
- Sara Tadayon, George Mason University (not pictured)



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**March 7:** Funding Agency Priorities for 2013, with speakers Bob Lees and Eric Rohlfing

**March 14:** Chemistry + Physics = Great Beer and a Frothy Foam, with speakers Charles Bamforth and Steve Carlo

**March 21:** Chemical Entrepreneurship Series Perspective: The Stuff that Dreams are Made Of—Part 2, with speakers Neil Senturia and Barbara Bry

**March 26:** Chemists Celebrate Earth Day, with speakers Andrew Jorgensen and George Heard



### CSW Committee Chairs 2013

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**MARM Delegate:** Robert Wiacek

**Retired Chemists:** Joe Antonucci

## CCED, *Cont. from Page 1*

[www.rockvillescience.org/rcsday.html](http://www.rockvillescience.org/rcsday.html).

Volunteers from CSW will be providing hands-on activities for children, in addition to handing out copies of the Celebrating Chemistry publication for CCED, and various CCED-themed products. If you would like to volunteer for this event, please contact Kim Morehouse, the CSW CCED Coordinator, via email at [Kim.Morehouse@fda.hhs.gov](mailto:Kim.Morehouse@fda.hhs.gov). Additional activities, as they are planned, will be posted on the CSW website.

## Encourage a Future Scientist: Judge a Science Fair!

The Chemical Society of Washington (CSW) encourages its members to serve as judges for high school science fairs held in the DC area. Events are held late February through March. Serving as a judge is a great way to benefit the community and encourage young scientists.

### Upcoming Dates:

Northern Virginia: March 2

Prince George's: March 9

Montgomery County: March 16

DC: March 23



Please visit [csw.sites.acs.org/activities.htm](http://csw.sites.acs.org/activities.htm) for more information.

## Illustrated Poem Submissions Due March 29

Write and illustrate a poem using the CCED theme, **"Our Earth: Handle with Care!"**

Your poem must be **no more** than 40 words, and in the following styles to be considered:

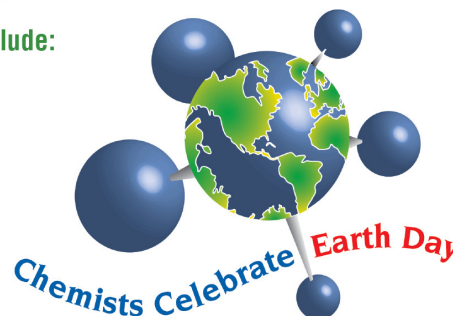
HAIKU • LIMERICK • ODE • ABC POEM • FREE VERSE • END RHYME • BLANK VERSE

### Possible topics related to Chemists Celebrate Earth Day include:

- Green chemistry and sustainability
- Recycling aluminum, glass, paper, and plastic
- Clean air, carbon footprint, and fuel emissions
- Plant, photosynthesis, and composting
- Water conservation and purification
- Any other relevant topics

### Entries will be judged based upon:

- Relevance to and incorporation of the theme
- Word choice and imagery
- Colorful artwork
- Adherence to poem style
- Originality and creativity
- Overall presentation



### Contest Rules:

- Poems must conform to a particular style. No poem may be longer than 40 words.
- The topic of the poem and the illustration must be related to the CCED 2013 theme, "Our Earth: Handle with Care!"
- All entries must be original works without aid from others.
- Each poem must be submitted and illustrated on an unlined sheet of paper (of any type) not larger than 11" x 14". The illustration must be created by hand using crayons, watercolors, other types of paint,

colored pencils or markers. The text of the poem should be easy to read and may be printed with a computer, before the hand-drawn illustration is added, or the poem may be written on lined paper which is cut out and pasted onto the unlined paper with the illustration.

- Only one entry per student will be accepted.
- All entries must include an entry form.
- All illustrated poems and/or digital representations of the poems become the property of the American Chemical Society.
- Acceptance of prizes constitutes consent to use winners' names, likenesses and entries for editorial, advertising and publicity purposes.

Teachers at schools in the Chemical Society of Washington area are encouraged to hold a contest at their school and then submit the winning entries from the school to:

CCED Coordinator  
Chemical Society of Washington  
1155 16<sup>th</sup> Street, NW, Stop O-218  
Washington, DC 20036

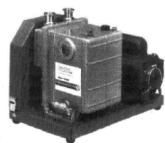
Electronic submissions should be sent to:  
[Kim.Morehouse@FDA.HHS.GOV](mailto:Kim.Morehouse@FDA.HHS.GOV)

**All entries must be received by Friday, March 29, 2013.**



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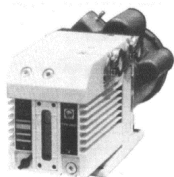
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