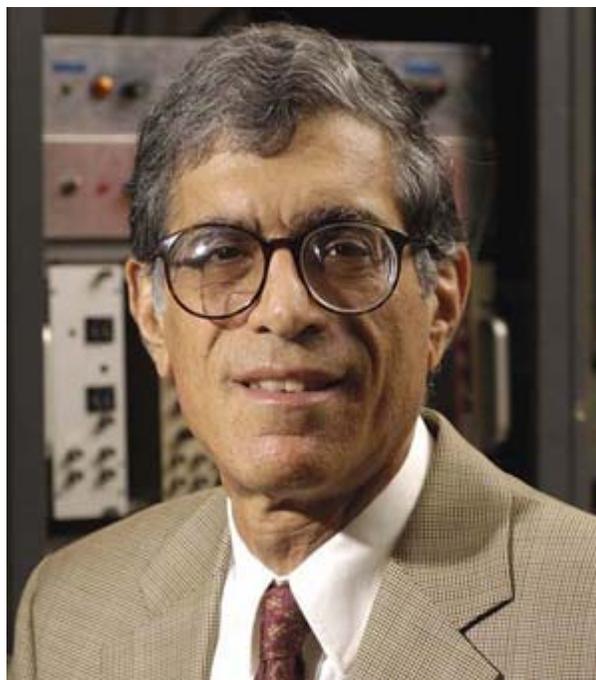


Chesapeake Chemist

*Maryland Section
American Chemical
Society*



Maryland Chemist of the Year Awardee
and December Speaker:

~ **Dr. Paul J. Dagdigian** ~

Department of Chemistry, Johns Hopkins University
[\(http://chemistry.jhu.edu/\)](http://chemistry.jhu.edu/)

**“Laser Spectroscopy for Basic and Applied Studies:
Investigations of Transient Intermediates and Detection of Explosives”**

Wednesday, December 12, 2007 – 6pm – Berkshire Marriott Hotel, Towson, MD

Message from the Chair

By: Stephanie S Watson

This month marks the end of my term as Chair of the Section. It has been a rewarding experience, a very busy year and one of change. We have experienced losses within our executive committee, but have picked up some new members. Our Section has made efforts to change the dinner meeting format to help boost attendance. We have learned many things and will continue to try new formats. Our Section has also reached out to other local Sections and has held successful joint programs. We hope to continue this in the future. Finally, we are moving closer to an electronic format for voting. We will continue to move forward with this effort. I am happy to be continuing my involvement with the Section as a councilor. I want to thank all the executive committee members for their help and guidance throughout my term.

The year ends with the MD Chemist Award. The Maryland Chemist Award was established in 1962 to recognize and to honor a member of the Maryland Section for outstanding achievement in the fields of chemistry. The achievement, as originally stated, may be in pure or applied chemistry, chemical engineering, or chemical education. Some recipients have distinguished themselves in management. The work on which the award is based should have been performed in Maryland. This year Dr. Paul Dagdigian from Johns Hopkins University is the awardee. His work with laser spectroscopy has made advances in explosives detection. I hope that you will find time to attend this meeting.

December Meeting

Wednesday, December 12, Burkshire Marriott Hotel, Towson, MD

6:00-6:30 pm Registration / Networking & appetizers/beverages

6:30-7:30 pm Dinner

7:30-7:45pm Award Presentation to Dr. Paul J. Dagdigian

7:45-8:45 pm Presentation

Dr. Paul J. Dagdigian

Department of Chemistry, Johns Hopkins University, Baltimore, MD 21218

"Laser Spectroscopy for Basic and Applied Studies:

Investigations of Transient Intermediates and Detection of Explosives"

Question and Answer (10 minutes)

Price: Cost for the dinner is \$25 for members; \$20 for spouses, retired chemists, guests, and students - \$10

Contact: Shirish Shah at 410-323-0803 (H) or by email at dr.shah@juno.com

Where: **Burkshire Marriott Conference Center:** 10 West Burke Avenue, Towson, MD - directions at:
(<http://www.mdchem.org/meetings/burkshire.html>)

Directions to Burkshire Marriott Conference Center: 10 West Burke Avenue, Towson, MD

- From the Baltimore beltway, I-695, follow to exit 27, Dulaney Valley Road
- The Burkshire is on the left side as you enter Burke Ave. (18-story building). Meeting attendees should proceed to the left lane. Turn left into the Burkshire's parking entrance. Turn the corner and make an immediate right into the P2 parking garage.
- (You may have to press the intercom button for admittance to the elevators)
- Proceed to the front desk to get a parking pass required for your car
- Look for signs posted in the lobby and by the elevators to locate the dining room

~ Abstract continued on Page 4 ~

ACS Maryland Section - Officers and Committee Chairs

Section Officers:

Chair - Stephanie J. Watson - (301) 975-6448; stephanie.watson@nist.gov

Vice-chair - Lev Ryzhkov - (410) 704-3831; lyzhkov@towson.edu

Chair-elect - Walter Roy - (410) 771-7886; walter_roy@mccormick.com

Secretary - Sara Narayan - (443) 334-2326; f-naraya@mail.vjc.edu

Treasurer - Angela Sherman - (410) 532-5713; CND of MD, 4701 North Charles Street, Baltimore, MD 21210
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Alternate Councilors:

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Joseph Topping

Members at Large:

Karen Hatwell, Maurice Iwunze, Liina Ladon,

Angela Wells Winstead, Takashi Tsukamoto

Committee Chairs:

Student Awards (April) - George Farrant - (410) 455-4120; gfarrant@yahoo.com

MD ACS Student Grants (April) - Susan Mercer - sgill002@umaryland.edu or Paul Smith, pjsmith@umbc.com

Remsen Award (May/June) - Lev Ryzhkov

Braude Award (October) - Charles Rowell

Maryland Chemist Award (December) - Angela Sherman - (410) 532-5713; ASherman@ndm.edu

Maryland Service Award - Shree Iyengar - (410) 777-2266; ssiyengar@aacc.edu

Programs:

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Career Planning - Linh Cheong - (410) 762-1159

Earth Day - Paul Smith

Environmental Issues - Shirish Shah - (410) 704-2720

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Chemistry Olympiad/Chem-a-Thon -

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Continuing Education/High School Education -

Shirish Shah/Ellen Pisciotta

Kids & Chemistry/Chemistry-in-the-Library -

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National Chemistry Week (NCW) -

Shirish Shah & Sandy Young

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and

Sandy Young (mdchem@mdchem.org)

Abstract: "Laser Spectroscopy for Basic and Applied Studies: Investigations of Transient Intermediates and Detection of Explosives"

A variety of laser-based detection techniques, such as laser-induced fluorescence, are available for the sensitive detection and detailed characterization of small molecules in the gas-phase. The recently developed technique of cavity ring-down spectroscopy (CRDS) is seeing utility for spectroscopic studies and sensitive molecular detection. This talk will highlight work from my laboratory on the use of these laser-based techniques for fundamental investigations of spectroscopy and collision dynamics and applied studies for security and defense. Examples of fundamental studies will include collisional energy transfer in a diatomic free radical and the spectroscopic study of the electronic spectrum of a polyatomic intermediate. The detection of trace explosives is an important problem for security and defense. Our investigation of the use of CRDS for the detection of TNT and related compounds will be described. The technique of laser-induced breakdown spectroscopy (LIBS) shows great promise for the remote detection of explosives and other compounds. Our work to understand the fundamental processes which lead to the detected LIBS spectral signatures will be outlined.

About the speaker

Dr. Paul J. Dagdigian
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(<http://chemistry.jhu.edu/Dagdigian/biography.html>)

Bio:

PhD - University of Chicago
Post Doctoral Fellow - Columbia University

Laser spectroscopy is a powerful tool for the study of molecules and their interactions in the gas phase. We are employing various laser spectroscopic techniques for the study of the dynamics of gas-phase collisional processes and for the sensitive detection of trace concentrations of molecules such as explosives.

Molecular free radicals are important chemical intermediates in various environments, including combustion media and the atmosphere. We are interested in the dynamics of molecular collisional processes, including rotational and vibrational energy transfer, photodissociation, and chemical reactions, involving diatomic and small polyatomic free radicals. The techniques of laser-induced fluorescence (LIF) and resonance enhanced multiphoton ionization (REMPI) allow us to study these processes with resolution of the internal quantum states of the radical.

Recently, we have been turning to the study of the spectroscopy and kinetics of polyatomic free radicals, which are important in the early stages of the decomposition of energetic materials. We have implemented the technique of cavity ring-down spectroscopy (CRDS) in this work, since LIF and REMPI are not applicable to these polyatomic species, since they generally dissociate upon electron excitation. CRDS is seeing wide application and is a sensitive absorption-based laser detection method which offers effective absorption path lengths of a kilometer or more in a table-top apparatus. We are employing CRDS in both the UV and IR for CRDS studies on both electronic and vibrational transitions.

There is a continuing need for the development of rapid detection of explosives and explosive-related compounds in trace quantities. As part of a DoD multi-university research initiative (MURI), our group has explored the use of UV CRDS for the detection of TNT and related compounds in the vapor phase. This technique displays very good sensitivity of detection, but poor selectivity. In recent work, we are partners in another MURI, in which femtosecond laser-matter interactions are being explored. Our principal role in this project is to develop an understanding of the chemical and physical processes which lead to the observed optical emission from laser-induced plasmas. This has practical applications in the analytical technique of laser-induced breakdown

spectroscopy (LIBS), in which the optical emission is being used for materials identification, most notably in the detection of explosives.

In service to the chemical physics community, Professor Dagdigian has been Chair of the Division of Chemical Physics, of the American Physical Society (APS), and is a Fellow of the APS.

Maryland Chemist Award Citation:

The Maryland Chemist Award for 2007 is presented to Professor Paul J. Dagdigian in acknowledgement and appreciation of his outstanding research accomplishments in experimental chemical physics and in recognition of his significant contributions to the understanding of fundamental interactions between molecules in the gas phase through the use of laser spectroscopy and to the development of new laser analytical techniques for trace explosives detection.

Maryland Chemist Award

The Maryland Chemist Award was established in 1962 to recognize and to honor, each year, a member of the Maryland Section for outstanding achievement in the fields of chemistry. The achievement, as originally stated, may be in pure or applied chemistry, chemical engineering, or chemical education. Some recipients have distinguished themselves in management. The section's Bylaw VIII (applicable section quoted below) establishes the rules of selection of recipients of the Maryland Chemist Award. Recommendations of the Awards Committee must be approved by the section officers.

"Recipients of the Maryland Chemist Award must have been members of the section for a minimum of five years and have made outstanding contributions to chemistry as defined in the Constitution of the Society (chemistry is defined in broad terms). The work on which the award is based should have been performed in Maryland."

A list of previous awardees can be found on the Maryland ACS website at: (<http://mdchem.org/mdchem.html>).

Nominations for the 2008 Maryland Chemist Award

The Maryland Chemist Award Committee is accepting nominations for the 2008 Maryland Chemist Award. Supportive documentation should include copies of the resume of the nominee and his/her list of publications. A short statement describing the outstanding contributions of the nominee to scientific research, education, industry, technology, etc., will be helpful and appreciated. Please send nominations to Dr. Angela Sherman. Nominations are PREFERRED to be sent in to the committee via e-mail: ASherman@ndm.edu. If you can not send your nomination via e-mail, please contact Dr. Sherman via e-mail or phone (410) 532-5713 to arrange for alternate delivery method. The deadline for submission of nominations is April 15, 2008.



Fall 2007 - Important Dates



December 12, 2007 December Dinner Meeting: MD Chemist of the Year (Award Recipient: Dr. Paul J. Dagdigian) - Burkshire Marriott, Towson, MD - directions at:
(<http://mdchem.org/meetings/burkshire.html>)



Spring 2008 - Important Dates



January 15, 2008 Student Affiliate National Meeting Travel Grant application deadline
February 2008 February Dinner Meeting - Date to be determined
April 5, 2008 (**Saturday**) MD ACS joins the Herring Run Watershed for Project Clean Stream
April 6-10, 2008 235th National ACS Meeting & Exposition, New Orleans, LA
(<http://chemistry.org/meetings>)
April 13, 2008 (**Sunday**) Student Awards/April MD ACS Meeting, Burkshire Marriott, Towson, MD - directions at:
(<http://mdchem.org/meetings/burkshire.html>)
April 22, 2008 Earth Day (<http://chemistry.org/earthday>)
May 18-21, 2008 40th Mid-Atlantic Regional Meeting (MARM), Queensborough Community College of the City University of New York (<http://www.marmacs.org/2008/>) - Theme: Chemistry & Health



Summer 2008 - Important Dates



June 16, 2008 Student Affiliate National Meeting Travel Grant application deadline
July 13, 2008 MD ACS Annual Picnic, McKeldin Area, Patapsco State Park (Directions):
<http://mdchem.org/meetings/patapsco-mckeldin.html>



Fall 2008 - Important Dates



August 17-21, 2008 236th National ACS Meeting & Exposition, Philadelphia, PA
(<http://chemistry.org/meetings>)
November 15, 2008 America Recycles Day (<http://nrc-recycle.org/americanrecycles.aspx>)

Student Affiliate News – by Susan Mercer

Morgan State University – by Dr. Louise Hellwig (advisor)

Morgan State University's SAACS held three meetings this month. Our local section member, Ms. Susan Mercer, described the Ph.D. in Pharmaceutical Sciences program at the University of Maryland. Ms. Gail Hewitt-Clarke, Assistant Dean of Admissions at Howard University College of Dentistry, discussed the possibilities for chemistry majors in the dental field and the requirements for attending Howard. Dr. Jill Morgan brought a team from the University of Maryland to talk about their PharmD program.

Reminder: Applications are Being Accepted for the 2008 Undergraduate Student Travel Awards

Students can apply to receive up to \$500 for travel and expenses to attend a National ACS Meeting or up to \$300 to attend a Regional ACS Meeting. Open to undergraduate student affiliates of the ACS who are enrolled full time in a college or university in the Maryland Section.

The application should include:

- The meeting you plan to attend along with location, dates
- An estimated budget (cost for travel, registration, lodging, and meals)
- A 250 word essay describing your motivation for attending the meeting (if you plan to present, include a brief description of the work to be presented)
- A letter of support from a faculty member in your department

Review of applications will begin January 15th but will continue through the year until all funds are utilized. Applications should be mailed to: Dr. Paul Smith, UMBC, Department of Chemistry and Biochemistry, 1000 Hilltop Circle, Baltimore, MD, 21250 or sent via e-mail: pjsmith@umbc.com.

Reminder: 2008 Undergraduate Student Awards Nominations

The deadline is February 1, 2008 for Colleges and University chemistry departments within the MD ACS boundaries (<http://www.mdchem.org/section.html>) who are nominating students for the April 2008 Student Award. Student Awardee names and digital photo must be sent to (gfarrant@yahoo.com).

The Student Awards Meeting will be held at the Berkshire Marriott Conference Center in Towson on Sunday, April 13, 2008 from 1-4 PM.

Science Fair Judges Needed

It's not too early in the school year for you to get involved with judging a science fair!!

Where: Chesapeake Science Point Charter School, Address: 1321 Mercedes Dr. Suites q-s, Hanover, MD 21076

When: Saturday, December 8th - 8:00am-5:00pm

(Judges may leave after judging is completed at 1pm, or remain for lunch and the awards ceremony through the remainder of the afternoon.)

If you are interested in volunteering to be a science fair judge, please contact Mr. Tuna via email sciencefair@mycsp.org



December Historical Events In Chemistry

By: Leopold May

- December 3, 1900 Richard Kuhn, who was a researcher on the structures and syntheses of vitamins and carotenoids, was born on this day. He was awarded the Nobel Prize in 1938 for his work on carotenoids and vitamins. He refused the Prize in 1938 due to Nazi rules but received the diploma and the medal in 1949.
- December 5, 1901 Seventy-five years ago, Werner Heisenberg received the Nobel Prize in Physics for the creation of quantum mechanics, the application of which has, inter alia, led to the discovery of the allotropic forms of hydrogen. He developed the Heisenberg Principle in 1927 and born on this date.
- December 6, 1778 Joseph L. Gay-Lussac, who was born on this date, discovered law of expansion of gases with heat in 1802 and in 1809, the law of combining volumes of gases. He isolated boron and was a researcher on fermentation, prussic acid, and composition of water.
- December 8, 1845 Thomas E. Thorpe, a researcher on atomic weights, was born on this date. He also studied the viscosity of liquids and did chemical analyses.
- December 11, 1925 Paul Greengard shared the Nobel Prize in Physiology and Medicine in 2000 with Arne Carlsson and Kric Kandel for discoveries concerning signal transduction in the nervous system. He was born on this date.
- December 13, 1939 Perkin-Elmer Corp., was incorporated on this date.
- December 15, 1852 Antoine H. Becquerel, who discovered radiation (Becquerel Rays) from uranium salts in 1896, was born on this date. In 1903, he shared the Nobel Prize in Chemistry with the Curies in recognition of the extraordinary services he has rendered by his discovery of spontaneous radioactivity.
- December 17, 1778 Two hundred years ago on this date, Humphry Davy was born. In 1807, he discovered potassium, sodium in 1807, barium in 1808, and strontium in 1808.
- December 23, 1912 Anna J. Harrison was the first woman president of the ACS in 1978. She also served as president of the American Association for the Advancement of Science, 1983-4 and was born on this date.
- December 24, 1745 Benjamin Rush published first American chemistry textbook; signer of the *Declaration of Independence*.
- December 25, 1642 Sir Isaac Newton, an alchemist as well as a mathematician and physicist, was born on this day. He discovered the laws of gravity and nature of light.
- December 28, 1932 Seventy-five years ago, Kary B. Mullis was born. He invented the polymerase chain reaction (PCR) method for duplicating DNA. In 1993, he shared the Nobel Prize in Chemistry with Michael Smith for his invention of the polymerase chain reaction (PCR) method.

For more historical facts on chemistry, visit Dr. May's website at <http://faculty.cua.edu/may/>.

An informal association, Society for the Propagation of the Music of the Chemist-Composers, has been formed to publicize the music of chemist-composers. For information, see <http://faculty.cua.edu/may/SPMCC.htm>.



Outreach

One fun thing during this year's National Chemistry Week (NCW) was that we held the NCW poster contest. We haven't organized this in the past because we've focused our time on going into the classrooms and doing hands-on events. This turned out to be a lot of fun. Two adults contacted me about their students participating and 8 students from Hebbville Elementary in Baltimore County and 2 students from a homeschool group in Howard County ended up submitting posters to the local contest.

The creativity shown in these posters and the care that the students took in making them was fantastic! The tough part for the judges was only picking one poster per category.

All participants received some ACS balloons, pencils, and Celebrating Chemistry booklets. The winners also were given a National Chemistry Week t-shirt. Congratulations!!

The winners were:

Category	MD ACS Student Winner	Poster Title
3 rd – 4 th	Ayanna Maxwell, Hebbville Elementary	The Many Faces of Chemistry
5 th – 8 th	Johnson Moore, Homesteaders Homeschool Group	Metal is Used in Big Ways!

Chemists Celebrate Earth Day 2008 – Theme: Streaming Chemistry

National ACS plans to publish an Earth Day handout again this year. When it is available we will have it available for download on our website.

Stop in and join us if you have time!! If you have any questions or want to assist with an event, please feel free to contact us at chemists4fun@yahoo.com.

Community Event “Adopt-A-Stream”

The 2008 Community Event for Chemists Celebrate Earth Day is “Adopt-A-Stream”. In an “Adopt-A-Stream” program, groups register with the “environmental protection” office of their state or local government to clean-up and keep clean a section of a stream or aquifer. In addition to clean-up efforts, volunteers may be asked to monitor water quality and/or pollution sources. Responsibilities vary slightly from one municipality to the next. Provide water quality information at your event and document it with a photograph that you will submit to ACS! The Maryland ACS will once again be participating in the Herring Run Watershed – Project Clean Stream Clean-Up Event on Saturday, April 5th, 2008. Please mark your calendars!

ACS Maryland Section Survey

At the end of every year, we publish a section survey for the Maryland ACS. This survey helps us to gauge member satisfaction with various section efforts and plan for next year's activities. Please take a few minutes to look over and evaluate the activities that you took part in this year, marking each with a number from 1 (Best) to 5 (Worst) or N/A if you did not take part in the activity. Then please either snail mail your survey responses to Shirish Shah, Chemistry Department, Towson University, Towson, MD, 21252 or send them via e-mail to Shirish at: dr.shah@juno.com by December 31, 2007, labeling the subject of the e-mail as 'MD ACS Section Survey'. Thanks for your input!! (We hope to have this on-line for section members next year!!)

Activities & Communication:

Regular and Award Dinner Meetings:

- Monthly Dinner meetings (Feb, Sept, Nov)
- Student Awards (April)
- Remsen Award (May)
- Braude Award (October)
- MD Chemist Award (December)

- Reception & Presentation (alternative dinner meeting (Nov))

Outreach Events:

- Chemistry-in-the-Library
- Kids and Chemistry
- National Chemistry Week

General Events:

- Earth Day Celebration

Section Communication:

- Chesapeake Chemist
- MD ACS website (<http://mdchem.org>)

High School & College/University Events:

- Chemistry Olympics
- Chemagination

- SAACS (Chemistry Clubs at Colleges and Universities)
- SAACS Bowling event
- SAACS Social at Dave N' Busters
- Grants available to undergraduates for ACS travel, outreach, etc

Other or Comments: _____

REMINDER: Receiving the Chesapeake Chemist

Hopefully, if you are reading the Chesapeake Chemist this month, you are receiving it via e-mail from us. We went to electronic only mailings to our MD ACS membership in October 2006. Please remember that we are dependant on the National ACS records for your correct, current e-mail.

Changing your e-mail address? Moving out of the MD ACS area? E-mail changes can be updated either by:

- E-mailing us at mdchem@mdchem.org - give us your member #, full name, and e-mail changes and we can ensure that your records are updated with National ACS.
- Contacting the National ACS membership division: 800-333-9511 (US only) or service@acs.org

To ensure that you receive the Chesapeake Chemist, please add the MD ACS e-mail (mdchem@mdchem.org) to your accepted e-mail address list IF you have a spam filter.

If you are a member who currently doesn't receive the Maryland ACS Chesapeake Chemist but download it from our website, it is possible that National ACS does not have your e-mail address on file. If you want to receive the Chesapeake Chemist via e-mail, please e-mail us at mdchem@mdchem.org - give us your member #, full name, and e-mail address and we can ensure that your records are updated with National ACS.

The current edition and previous editions of the Chesapeake Chemist can ALWAYS be obtained via our website: <http://mdchem.org> - please see the Newsletter Archive link on the right-hand side of the website.

Maryland ACS

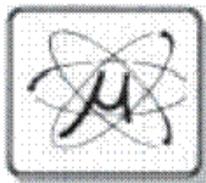
Interested in how your dues get used and want to work on interesting member programs/projects? If you want to get involved with the Maryland Section Executive Committee and/or with section activities, we want to hear from YOU! The Maryland ACS Executive Committee meets 4 times during the year to discuss and plan activities. Please feel free to contact the chair, vice-chair, or chair-elect via e-mail to get more information on various areas/activities that you are interested in or that we would like to start or expand in the future. The amount of time to commit would be up to you but might be around 2 hours per month, depending on the activity. We are always looking for individuals with budget/financial, editing, and planning skills.

Volunteer Here!

Like working with students? Have a talent for encouraging students in science? Have ideas for outreach events? Sign up for our volunteer news. Contact Sandy Young at mdchem@mdchem.org.

Interested in holding your own Chemistry-in-the-Library Program?

We are looking at putting some supply kits together and having a short training event with luncheon for folks who plan to hold their own Maryland ACS sponsored science events at local libraries in the spring. Please contact Sandy Young at mdchem@mdchem.org for more information.



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