

# the Catalyst



Official publication of the Philadelphia Section, ACS  
<http://phillyacs.org>

April 2022  
Volume 107, No. 4



**Excellence in Undergraduate Teaching Award Winner**

**Dr. Mark F. Reynolds, Saint Joseph's University**

## HIGHLIGHTS

Comments From the Chair	49
News Atoms	50
2022 Chemagination Competition	53
2022 CCEW Poem Contest	54

## ADVANCE NOTICE

### MAY MEETING

**TBD**

See the May issue of *the Catalyst* for details,  
call the Section Office at (267) 485-1792 or email [PhilaACS@gmail.com](mailto:PhilaACS@gmail.com).

# *the Catalyst*

ACS Philadelphia Section

Founded April 15, 1899

## STAFF

### EDITOR-IN-CHIEF

Robin S. Davis

### EDITORS

*News Atoms:* Alan Warren

*Proof Editors:* Anthony Addison

Georgia Arbuckle-Keil

Kendra Luther

Corrie Kuniyoshi

Marge Matthews

Alan Warren

### ADVERTISING MANAGER

Victor Tortorelli

### COMMUNICATIONS COMMITTEE

**Chair:** Lee Hoffman

Anthony W. Addison

Georgia Arbuckle-Keil

Matthew Bodek

Robin S. Davis

Alan Heldon

Corrie Kuniyoshi

Kendra Luther

Marge Matthews

Liliana Suárez

Victor Tortorelli

Alan Warren

## CONTENTS

Comments From the Chair .....	49
News Atoms .....	50
Opportunities to Volunteer for YCC .....	50
April Meeting Information.....	51
April Meeting Agenda .....	52
2022 Chemagination Competition.....	53
2022 CCEW Illustrated Poem Contest.....	54
April Board of Directors Meeting .....	55
February 2022 Board of Directors Meeting Minutes....	56
ACS Career Consultants .....	57
Chemical Consultants Network.....	58
Directory of Services .....	59

Published monthly except July, August and December by the Philadelphia Section of the American Chemical Society. All views expressed are those of the editors and contributors and do not necessarily represent the official position of the Philadelphia Section of the American Chemical Society. Editorial matters should be sent to the attention of the Editor-in-Chief c/o the Philadelphia Section ACS, Department of Chemistry, University of Pennsylvania, 231 South 34<sup>th</sup> Street, Philadelphia, PA 19104-6323 or PhilaACS@gmail.com.

Advertising: Victor Tortorelli, vtortorelli@ursinus.edu

## Comments From the Chair



### Ivona Sasimovich

I would like to begin this month's column by saying that my heart goes out to everyone whose family and loved ones have been affected by Russia's invasion of Ukraine. I sincerely hope that your loved ones can stay safe during these difficult times.

In March the Awards Committee was busy reviewing the applications for the Excellence in Pre-College Teaching and the Excellence in Undergraduate Teaching Awards. The finalists were selected and approved by The Board of Directors at our monthly meeting. The recipients of the awards will be honored at the Awards Ceremony on April 5<sup>th</sup> on the campus of Rutgers-Camden. Dr. Graham Dobereiner and Dr. David Salas-de la Cruz were putting some finishing touches on the planning of this event. I hope to finally see many of you in person this month!

Among other things, last month was full of deadlines. The Local Section submitted its nominations to MARM for the Emmet Reid Award in Chemistry Teaching at a small college and for the ACS Divisions of Chemical Education for Excellence in High School Teaching. The Spring National meeting was in San Diego this year. I hope some of you had a chance to attend and enjoy the weather and the science. The deadlines for the Fall National meeting have passed just a few days ago. Chicago awaits!

With spring arriving, we also enter the season of graduations. Many talented graduating chemists will be honored with Scholastic Achievement Awards at our April 5<sup>th</sup> meeting. I will share their stories in our next issue.

Under the leadership of Dr. Christine McInnis, we now have links on our website where students can apply for co-ops and internships at local companies. I encourage the students to visit our website and look through the options. Also, if your company is looking for co-ops or interns, we would love to post these opportunities on our website.

I have the pleasure to welcome Robert Wertz on board this month. Robert has joined the Local Section as a part-time administrative assistant. He has many years of experience and is well known for his organizational skills. Robert previously worked as an editorial assistant on *Organic Letters*, and he is glad to be back to working with ACS. We are lucky to have him!

One last thing before I let you go. I encourage you to check the Section calendar on our website PhillyACS.org. We have been diligent in keeping it up to date with various virtual and in-person activities. To highlight some of the March items, we had a virtual event brought to you by Chinese American Chemical Society and featuring Dr. Gang Chen on March 24<sup>th</sup>. Another event was a virtual seminar brought to you by the Princeton Local Section about the importance of flavor delivery systems in food applications. As for April, Chem Wars are hosted by the University of the Sciences for undergraduate students on April 2<sup>nd</sup>. If you have an event you would like to share with the membership, let us know by sending an email to PhilaACS@gmail.com.

Have a great April and I will talk to you next month!

## NEWS ATOMS—*Alan Warren*

**David Allen Cole**, president and CEO of the Science History Institute, has an article in the 1-2022 issue of the *Bulletin for the History of Chemistry*, published by the ACS division of the History of Chemistry. He laments the decline in chemical apparatus and analytical instruments used in displays of chemical history in various science museums here and abroad. They outdated themselves by focusing on the technical and scientific purposes of the instruments rather than relating them to what casual audiences and children can understand.

The 20<sup>th</sup> century “black boxes” mean less to viewers than the current trend in interactive displays in many museums. Newer technologies are being implemented such as Q&A cards, 3-dimensional replicas, smart phone and tablet tutorials, virtual reality projections, and holograms.

**Chinedum Osuji**, professor and chair of the department of chemical and biomolecular engineering at Penn, is recipient of one of the 2021 Intel Outstanding Research Awards for his project “Patterning at Nano-Length Scales by Directed Assembly.” The awards are part of Intel Labs corporate research council program.

---

## OPPORTUNITIES TO VOLUNTEER

*Younger Chemist Committee Program and Event Planning Volunteers:* The Younger Chemist Committee (YCC) is a committee of the Philadelphia Local Section focusing on the needs of undergraduate, graduate, post doc, and early career chemists under 35 years old. The committee is looking for volunteers to help with program planning for the annual poster session to be held this Fall. Many hands make light work, so several volunteers are needed in this capacity! This is an excellent opportunity for students and early career chemists to assume leadership roles and network with likeminded scientists within the ACS community. The estimated time commitment would be less than 1 hour per week.

All interested individuals can reach out to Isabella Goodenough at:

[igoodenough.acs@gmail.com](mailto:igoodenough.acs@gmail.com)



**2 0 2 2**  
**ACS**  
**PHILADELPHIA**  
**SECTION AWARDS**  
**FOR**

Excellence in Pre-College Teaching  
Excellence in Undergraduate Teaching  
&  
2022 Student Scholastic Achievement Awards

*Details*

---

April 5, 2022

7 pm

---

Campus Center, 326 Penn St.  
Camden, NJ 08102

---

Cost of Admission: \$25

---

TO REGISTER SCAN CODE

OR

GO TO [RB.GY/OT5P6O](https://rb.gy/OT5P6O)







**ACS** Local Section  
Philadelphia

2022 ACS Philadelphia Section

Award For Excellence in Pre-College Teaching in Chemical Sciences,  
Award For Excellence in Undergraduate Teaching in the Chemical Sciences,

&

Student Scholastic Achievement Awards

Awards Ceremony – Tuesday, April 5, 2022

at

Campus Center  
Rutgers University-Camden  
326 Penn St.  
Camden, NJ 08102

Please join us in an award ceremony to celebrate the recipients of 2022 ACS Philadelphia Section Awards for Excellence in Pre-College and Undergraduate teaching in the chemical sciences. In addition, we will be honoring the best and the brightest graduating students for their Scholastic Achievements in chemical sciences.

**Attention!** ALL event attendees must provide proof of vaccination or negative PCR test from a test taken no more than 72 hours before the event when entering an event. The vaccination card/digital record or negative PCR test will be checked at the door.

All attendees need to register by going to [rb.gy/ot5p6o](https://rb.gy/ot5p6o). The price of admission is \$25 per person. All registered individuals will receive parking directions a week prior to the event.

**Program:**

6:30-7:00 pm Registration

7:00-7:15 pm Welcome by Rutgers University- Camden Faculty

7:15-7:30 pm Opening remarks by Ivona Sasimovich, Chair of the ACS Philadelphia Local Section

7:30-8:00 pm Dr. Graham Dobereiner, Chair Elect of ACS Philadelphia Local Section presents:

LeeAnne Fox -- the recipient of Excellence in Pre-College Teaching Award

Dr. Mark Reynolds – the recipient of Excellence in Undergraduate Teaching Award

8:00 -8:20 pm Ivona Sasimovich and Dr. Graham Dobereiner present the Student Scholastic Achievement Awards

8:20-8:30 pm Closing remarks by Dr. Graham Dobereiner

8:30-9:00 pm Networking



ACS Local Section  
Philadelphia



## 2022 CHEMAGINATION COMPETITION FOR HIGH SCHOOL STUDENTS

### DESCRIPTION AND RULES

High school students are asked to imagine that they are living 25 years in the future and have been invited to write an article for ChemMatters, a magazine for high school students that focuses on the role of chemistry in everyday life. The subject of the article is: *"Describe a recent breakthrough or innovation in chemistry (and/or its applications) that has improved the quality of people's lives today."* To view a sample ChemMatters magazine visit [acs.org](http://www.acs.org), and look under Education:

<http://www.acs.org/content/acs/en/education/resources/highschool/chemmatters.html>.

In addition to the article, students are asked to design a cover for the magazine. The article must be written as if the student is living in the year 2047, looking back at innovations that have occurred since 2022. The innovation must fall into one of the following categories:

- \* Alternative Energy
- \* Environment

- \* Medicine/Health
- \* New Materials

A few examples of areas where development is expected are: nanotechnology, energy efficiency, pollution prevention, green chemistry, sustainability, intelligent devices for sensing, proteomics, climate models, biopharmaceutical therapies, medical devices and/or implants and new energy sources.

### RULES

#### ARTICLES must:

- be written by a team of two or three students; each student may be on only one team.
- be about 1,000 words (figure captions are not included in the limit).
- present the chemistry/scientific concepts/ideas/principles behind the innovation.
- describe the innovation and indicate how it has improved people's lives.
- present a "history" of the changes that had to occur over the "past" 25 years to develop this innovation.
- include drawings, diagrams, illustrations and descriptions of the chemistry and any technology involved in all key aspects of the innovation.
- cite a minimum of three technical references.
- include a cover design for the magazine. The cover design can be an original computer graphic or a free-hand drawing.

**PRIZES:** Members of the first-place team in each of the four categories with each receive \$50 from the Philadelphia Local Section of the ACS. Additionally, members from the first-place team in each of the four categories will be invited to present their article at the Middle Atlantic Regional Meeting of the American Chemical Society CHEMAGINATION contest to be held **in-person** at The College of New Jersey, Ewing, NJ on June 4, 2022.

**DEADLINE:** Teams must submit a completed entry form and article to [phillyacs.education@gmail.com](mailto:phillyacs.education@gmail.com) no later than **MONDAY, APRIL 18, 2022**. Entry forms may be downloaded at: <https://bit.ly/35mR0RI>. Winning teams will be notified on or around May 1 to ensure time to prepare for the regional competition.

The Philadelphia Section of the American Chemical Society



## 2022 CCEW Illustrated Poem Contest The Buzz About Bugs: Insect Chemistry

The Philadelphia Local Section of the American Chemical Society (ACS) is hosting an illustrated poem contest for students in Kindergarten through 12th grade. Entries must be sponsored by a local school or community group for verification purposes.

**Contest Deadline: Sunday, April 24, 2022 at 11:59 PM Eastern**

**Local Prizes:** \$50 for the winning poem in each category: (grades K–2, 3–5, 6–8, & 9–12)

**Local Contact:** Tom Umile ([phillyacs.education@gmail.com](mailto:phillyacs.education@gmail.com))

**Submission:** Entries will be collected via e-mail. Download the entry form at <https://bit.ly/3vtH9DT>. E-mail your completed entry form and your illustrated poem as separate files to [phillyacs.education@gmail.com](mailto:phillyacs.education@gmail.com).

Winners of the Philadelphia Local Section's Illustrated Poem Contest will advance to the National Illustrated Poem Contest for a chance to be featured on the ACS website and to win prizes!

Write and illustrate a poem using the CCEW theme, "The Buzz About Bugs: Insect Chemistry." 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 the CCEW 2022 theme include:**

Entomology	Eating Insects	Insect Molecules
Insect Bites	Pollination	Pollinators

**Entries will be judged based upon:**

Artistic Merit - use of color, quality of drawing, design & layout  
Poem Message - fun, motivational, inspiring about yearly theme  
Originality Creativity - unique, clever and/or creative design  
Neatness - free of spelling and grammatical errors



**Contest rules:**

- All poems must be no more than 40 words, and in one of the following styles to be considered: Haiku, Limerick, Ode, ABC poem, Free verse, End rhyme, and Blank verse.
- Entries are judged based upon relevance to and incorporation of the yearly theme (The Buzz about Bugs: Insect Chemistry), word choice and imagery, colorful artwork, adherence to poem style, originality and creativity, and overall presentation.
- All entries must be original works without aid from others. Physical drawings may be scanned or captured via camera and submitted to the online form. Illustrations may be created using crayons, watercolors, other types of paint, colored pencils, or markers.
- The illustration may also be electronically created by using a digital painting and drawing app on a computer, tablet, or mobile device. If the illustration is created using a digital painting or drawing app, the name of the program must be included on the entry form.
- The text of the poem should be easy to read and may be typed before the hand-drawn or digital 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.
- No clipart or unoriginal images can be used.
- Only one entry per student will be accepted.
- Students must be sponsored by a school or another sponsoring group (e.g. Homeschool Association, Boys and Girls Club, Scout Troop, 4-H, etc.).
- 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.





ACS Local Section  
Philadelphia

**739<sup>th</sup> ACS Philadelphia Section Board of Directors Meeting**

**Call for Agenda**

The 739<sup>th</sup> Meeting of the Board of Directors of the ACS Philadelphia Section will be held from **7:00 PM to 8:00 PM** on **Thursday, April 14, 2022** by teleconference.

- Those interested in being added to the agenda are kindly asked to send a request to the Chair ([ivona.sasimovich@gmail.com](mailto:ivona.sasimovich@gmail.com)) by **Wednesday, April 13, 2022** for inclusion in the agenda.
- All Officers will be included on the agenda to verbally report by default.
- **Please Note:** If a written report or notice of a verbal report is not submitted to the Chair by the specified deadline, then all such reports will be relegated for discussion as "Other Business." Please note that the Chair cannot guarantee sufficient time for discussion in these cases.
- **All Board of Directors meetings will be open to the public.** Public access information for this teleconference will be released through the Section's website and by the Section's email blast.

**Tentative Agenda**

- I. Roll Call
- II. Approval of Meeting Minutes
- III. Officers' Reports
- IV. Committee Reports
- V. Other Business

**For those participating by teleconference:** All Officers and Directors should have received a Google Calendar invitation with a Zoom Link. For those who have not received this information as well as for your convenience, please use the following information to access the teleconference:

**By Internet:** register by following this link <https://bit.ly/3ty92rF>  
Meeting ID: 859 6763 3038

**By Phone:**  
Phone Number: +1 646 558 8656 or +1 301 715 8592  
Access Code: 859 6763 3038

Ivona Sasimovich  
Chair  
[Ivona.sasimovich@gmail.com](mailto:Ivona.sasimovich@gmail.com)

Sister Rose B. Mulligan  
Secretary  
[rmulligan@immaculata.edu](mailto:rmulligan@immaculata.edu)

Section Office  
[PhilaACS@gmail.com](mailto:PhilaACS@gmail.com)

Cc: Officers & Directors  
Councilors & Alternate Councilors  
Committee & Group Chairs

**American Chemical Society – Philadelphia Section**  
231 South 34<sup>th</sup> Street, Office – 5<sup>th</sup> Floor, Philadelphia, PA 19104-6323  
T [phillyacs.org](http://phillyacs.org)

**737<sup>th</sup> ACS Philadelphia Section Board of Directors Meeting**

Thursday, February 10, 2022

Teleconference Meeting

**Present:** Catherine Bentzley, Amy Brown, Michael Castaldi, David J. Cichowicz, Melissa Cichowicz, Deborah H. Cook, Graham Dobereiner, Anne DeMasi, Wei Gao, Isabella Goodenough, Sharon Haynie, Kathryn Lysko, Christine McInnis, Sr. Rose Mulligan, James K. Murray, David Salas-de la Cruz, Ivona Sasimovich, Kathleen Shaginaw, Victor Tortorelli, Ann Valentine, and Wei Wang

**Excused:** Judith Currano

**Not Present:** Rick Ewing

The 737<sup>th</sup> Board Meeting of the Philadelphia Section, ACS, was called to order at 7:06 pm.

**I. Roll Call**

Roll was taken and a quorum was present to begin the meeting.

**II. Approval of Meeting Minutes**

The January 14, 2022, 736<sup>th</sup> BOD meeting minutes were approved as amended.

**III. Officers' Reports:**

**a. Chair – Ivona Sasimovich**

**CCN-YCC joint event.** The Chemical Consultants Network, CNN, and the Younger Chemists Committee, YCC, gathered online on Wednesday, Feb. 9. The 22 attendees enjoyed about 90 minutes of discussing, sharing goals and connecting with CNN representatives.

The topic of safety in labs while following pandemic precautions surfaced. The topic of lab safety will be scheduled for a future fall event.

**Trivia Night.** Ivona will host this event planned for February 23, 7pm. All BOD members invited to attend. Kahoot will be used for the trivia game. The event is planned to be a relaxed, informal, fun-filled evening.

**March meeting.** No information has been forth-coming about whether the Edgar Fahs Smith Lecture will be held this year. A Phila. ACS Section meeting will not be scheduled for March in case the lecture is scheduled. Ivona will contact Judith Currano at U. of Penn for information.

**Administrative Assistant.** Ann Boffice is unable to continue as administrative assistant for ACS due to added responsibilities with her work. Graham and Christie have been picking up some of the work and helping Ivona. Extra work is needed for the April, in-person meeting. The board recognized the need to pursue a sustainable solution.

**April Meeting – Student Scholastic Achievement and Teaching Awards.** Graham has been soliciting nominations. The event will be held at Rutgers, Camden, on April 5, 2022. Dinner will be served and include individually wrapped sandwiches and some alternatives. Recipients will be guests for dinner. Non-award recipients will be charged \$25. The event in 2021 had about 40 people. David Salas-de la Cruz and Ivona will work out the details for onsite needs such as tables, etc. David will take care of seeing that all is set up on campus.

The Student Scholastic Achievement Award was clarified to mean that two students from a department could be awarded with the realization that one department may have several majors.

**b. Chair-Elect – Graham Dobereiner**

Graham invited Board Members to submit nominations for the ACS Teaching Awards. The deadline is March 1.

**c. Immediate Past Chair—Christie McInnis**

Christie submitted the ACS Annual Report. When the report is approved it will be sent to ACS national.

While working on ChemLuminaries, it was noted that the ACS had a glitch on their site which was prohibiting the submissions.

**d. Secretary – Sister Rose Mulligan**

No report.

e. **Treasurer** – Wei Wang

Wei previously sent the report for all to review. Christie requested an extension from ACS for the submission of the financial and treasurer's reports for one piece of information still needed from Edward Jones. The reports are due Feb. 15 with the treasurer's report possibly due March 15 to ACS. A motion to approve the treasurer's report was affirmed with one abstention.

For the Teaching Awards, those nominated will be given the 1099 forms to fill out prior to or in conjunction with the event. All were reminded of the past practice where the recipient would receive their check after the 1099 form was returned.

f. **Chair of Council Affairs** – Anne DeMasi

An agenda has been posted for the upcoming Hybrid Councilors Meeting at the ACS National Meeting, March 23, 11am ET. All Phila. ACS councilors, except Anne, will be present. Tony Addison will serve as an alternate for Anne.

## **IV. Committee Reports**

a. **Career Services** – Jim Murray

Feb. 4<sup>th</sup> was Temple Career Day. The attendance was lower than expected. Jim thanked ACS board members who volunteered for this.

b. **Budget and Finance**—Victor Tortorelli

No report.

## **V. Other Business**

Deborah spoke with long-time member Libby Harper who sends her regards to the Section.

She also asked all to remember Mort Hoffman whose wife passed away recently.

It was requested that the ACS Section Meeting and Board Meeting be held in different weeks when possible.

The meeting was adjourned at 8:10 PM.

Sister Rose B. Mulligan, IHM

## **ACS CAREER CONSULTANTS**

*Would you like to speak to a local ACS Career Consultant? The Philadelphia Section career consultants can provide one-on-one career advice, resume reviews, or mock interviews. Please send an email request to [acsphillycareerservices@gmail.com](mailto:acsphillycareerservices@gmail.com) to set up an appointment.*

## Chemical Consultants Network ZOOM MEETING

APRIL 13, 2022

### **THE EVOLUTION OF BATTERY TECHNOLOGY FOR THE EMERGING GLOBAL ELECTRIC VEHICLE MARKET**

**Ron Turi – Element 3 Battery Venture, LLC**

**DATE & TIME:** Wednesday, April 13, 2022 at 6:30 PM

[Click here to register](#)

**Location:** Online via Zoom! (registration required, see below)

**Abstract:** As the EV Future barrels into the passenger vehicle market, it is transforming the global battery industry toward large scale, commercial manufacturing operations that are supported by emerging regionalized supply chains. Global sales of 6.6 million Electric Vehicles in 2021 consumed over 280 GWh of Lithium-Ion Battery Cells valued at almost 30 B USD. This is double the EV Battery market of 2020.

The phenomenal rate of growth of EV production since 2018 motivates evolving battery designs and chemistries as auto OEMs compete for EV market share in the nascent market. Si-rich anodes and Ni-rich cathodes are replacing "conventional" lithium electrode chemistries based on graphite anodes and cobalt-rich mixed transition metal oxides - driving down the cost of energy storage materials and improving energy density. Electrolyte solutions are evolving toward mixtures with additives that extend battery life by suppressing or limiting the detrimental effects of side reactions. Solid state electrolytes of various forms enable liquid-free technologies with lithium metal anodes to eliminate low temperature failure modes, even as liquid electrolytes that are compatible with lithium metal and high voltage cathodes emerge.

We will discuss the baseline lithium-ion liquid technology in use today and benchmark the advances in EV grade battery technologies along with some of the practical supply chain and manufacturing challenges that the automotive industry today seems all too happy to embrace!

**Biography:** Ron Turi is a battery engineer who owns and operates Element 3 Battery Venture, LLC, a small, but well-equipped development lab centered on lithium battery design that provides contract services for battery end users, cell makers and materials suppliers to the battery industry. Ron is a chemical engineer with 30 years of experience in the lithium-ion battery industry, starting with electrode coating and moving to cell and to battery level development / design. Ron is engaged in projects for startup companies and larger companies involved in multiple emerging battery technologies with a focus on EV applications.

(<https://www.linkedin.com/in/lithiumbatteries/>).

[Click here to register to attend the event.](#) This session is **FREE**.



# DIRECTORY OF SERVICES

ILLINOIS INSTITUTE  
OF TECHNOLOGY

## Master of Chemistry in Materials Chemistry

### PART-TIME & FULL-TIME ONLINE PROGRAM

#### Rigor and relevance

Study the science and technology of functional materials and chemical systems for sustainable development.

Boost your knowledge of business principles while learning how to manage projects and lead teams with problem-solving strategies.

Contact Professor M. Ishaque Khan,  
Program Director, at [khan@iit.edu](mailto:khan@iit.edu)

Visit:

<https://go.iit.edu/mchm>

## SURPRISE

our editor by calling and saying you appreciate the quality and content of our newsletter. Our editor works hard to maintain a publication of interest to our membership. Oh, and by the way you could also give credit to our advertisers who financially support us.

### Custom Synthesis of Chemicals

Gram to Commercial Production  
On-time Delivery, Quality & Competitive Price

**TYGER Scientific Inc.**

324 Stokes Ave. Ewing, NJ 08638

Phone: 888-329-8990

Email: [sales@tygersci.com](mailto:sales@tygersci.com)

Replacement MIST & ODOR elements for  
EDWARDS VACUUM RV and EM vacuum pump  
EMF & MF series Oil Mist Filters at the lowest prices  
Contact: TRING ENTERPRISES LLC  
FREE SHIPPING on website and phoned in orders

[tringenterprises@hotmail.com](mailto:tringenterprises@hotmail.com)

Office: 610-792-3505 Our 13<sup>th</sup> year in business  
We stock other VP Mist & Oil elements – please ask

## PROMOTE YOUR PRODUCTS AND SERVICES • ADVERTISE IN THE CATALYST

The Catalyst readership is greater Philadelphia's largest source for chemical and biochemical buyers. The Catalyst reaches more than 5,400 readers each month. It has been estimated that these buyers annually purchase more than \$150,000,000 of:

- EQUIPMENT
- SUPPLIES
- CONSULTING SERVICES

Placing an advertisement in The Catalyst is the lowest cost method of reaching this select audience.

For further information and other options for promoting your company's products and services visit:

[vtortorelli@ursinus.edu](mailto:vtortorelli@ursinus.edu)

**micron inc.**  
Analytical Service Laboratory

<https://micronanalytical.com>

SEM EDS FTIR DSC TGA ESCA +

 **Robertson Microlit**  
LABORATORIES  
*Where speed and accuracy are elemental*

Elemental CHN, S, X analysis  
Metals by ICP-OES, ICP-MS, USP<233>  
FTIR, UV/VIS spectroscopy, Optical Rotation  
GC-MS/FID, Residual Solvents, Headspace

Ion Chromatography  
KF Aquametry, Titrimetry  
DSC, TGA, melting point  
HPLC

1705 US Highway 46 • Suite 1D • Ledgewood, NJ 07852 • 973.966.6668 • F 973.966.0136  
[www.robertson-microlit.com](http://www.robertson-microlit.com) • [results@robertson-microlit.com](mailto:results@robertson-microlit.com)

**Rapid Results • Quality • Accuracy • Competitive Pricing**

## ADVERTISING INDEX

ACS	59
Illinois Institute of Technology	59
Micron Analytical Services	59
Robertson Microlit Labs	59
Tring Enterprises LLC	59
Tyger Scientific Inc.	59

Advertising: [vtortorelli@ursinus.edu](mailto:vtortorelli@ursinus.edu)