

THE OCTAGON



LOOKING FORWARD TO A BETTER NEXT YEAR!



Blue Mountain at the Lehigh Gap

Photo Credit: John Freeman

Your LVACS colleagues have been busy offering online webinars and web conferences to keep the community talking about chemistry and the environment (“Earth Day 50 at home”). On Thursday, May 21st, John Freeman and Lindsey Welch hosted a Zoom webinar/discussion about local area ecological issues and some of the research that is addressing it (see pages 3-5).

ACS Reactions Video continues to expand their content on the fight against COVID-19:

“Can Soap REALLY Kill the Coronavirus?” <https://www.acs.org/content/acs/en/pressroom/reactions/videos/2020/can-soap-really-kill-the-coronavirus.html>

“Coronavirus vaccine: Where are we and what's next?”

<https://www.acs.org/content/acs/en/pressroom/reactions/videos/2020/coronavirus-vaccine-where-are-we-and-whats-next.html>

“How Effective are Cloth Masks Against Coronavirus?”

<https://www.acs.org/content/acs/en/pressroom/reactions/videos/2020/how-effective-are-cloth-masks-against-coronavirus.html>

“Could a polio vaccine stop the coronavirus pandemic?”

<https://www.acs.org/content/acs/en/pressroom/reactions/videos/2020/could-a-polio-vaccine-stop-the-coronavirus-pandemic.html>

“Coronavirus Drugs: Where Are We and What's Next?”

<https://www.acs.org/content/acs/en/pressroom/reactions/videos/2020/coronavirus-drugs-where-are-we-and-whats-next.html>

“Did You Already Have COVID-19? This Test (Maybe) Can Tell You.”

<https://www.acs.org/content/acs/en/pressroom/reactions/videos/2020/did-you-already-have-covid-19-this-test-maybe-can-tell-you.html>

Also, many recently-published papers related to the pandemic are available for free download from ACS:

https://pubs.acs.org/page/vi/chemistry_coronavirus_research

Summer/Fall 2020 LVACS Events

DUE TO THE COVID-19 EMERGENCY, ALL SCHEDULED IN-PERSON LVACS AND RELATED EVENTS HAVE BEEN CANCELLED THROUGH THE END OF JULY. FOLLOW THE LVACS E-NEWSLETTERS AND SOCIAL MEDIA PAGES FOR ANNOUNCEMENTS OF VIRTUAL EVENTS AND PLANS FOR LATE SUMMER AND FALL. THE FALL EVENTS BELOW ARE SCHEDULED SUBJECT TO LOCAL RESTRICTIONS.

July **EVENT CANCELLED**

Special Event: Iron Pigs Game vs Durham Bulls

Friday, July 31st 7:05 pm

LVACS will be seated in the Pig Pen (in-seat food/beverage)

Tickets: \$20 (includes \$10 food/beverage credit)

CONTACT: Lindsey Welch [lawelch@cedarcrest.edu]

DUE TO CONTINUING RESTRICTIONS, WE HAVE DECIDED TO CANCEL THIS ACTIVITY FOR 2020: LET'S PLAN FOR A HEALTHY AND EXCITING 2021 SEASON!

September

Section Meeting

LVACS Awards Night

Da Vinci Science Center, Allentown

Thursday, September 17th 5:30 pm

CONTACT: Nigel Sanders [nigel53.sanders@gmail.com]

October

Section Meeting

Speaker: Lorena Tribe, PSU/Berks

Albright College, Reading

October 15th 5:30 pm (dinner/business/talk at 7:30 pm)

CONTACT: Chris Hamann [chamann@albright.edu]

LVACS communications changes coming this summer...

In July, MagnetMail, our bulk email supplier, will cease supporting ACS so we will be migrating to a new email platform which includes hosting of a re-launched website, lvacs.net. Expect a change in the source and format of our e-newsletters soon. The Octagon will continue to be published about 8 times per year with the next issue of Volume 103 coming out in late August/early September 2020.

As you enjoy the summer, please consider enhancing diversity in our field by contributing to ACS programs which support bright young people hoping to join us as chemists/scientists: ACS Project SEED <https://www.acs.org/content/acs/en/education/students/highschool/seed.html> and the ACS Scholars Program <https://www.acs.org/content/acs/en/funding-and-awards/scholarships/acsscholars.html>.

We always appreciate comments and suggestions regarding LVACS media and ideas for future activities. Drop us a line!

Nigel Sanders, secretary and newsletter editor, nigel53.sanders@gmail.com

In This Issue...

3-5. May 21st CCEW Webinar Report

6. May 13th PA BioPharma
Networking Group Webinar Report

7. August 17-20 will be the ACS 2020
Fall **Virtual** Meeting; Saturday, June
27th **Virtual** Career Day

8. Lehigh Valley ACS section
demographic summary

9. Iron Pigs Game July 31st **HAS BEEN
CANCELLED.**

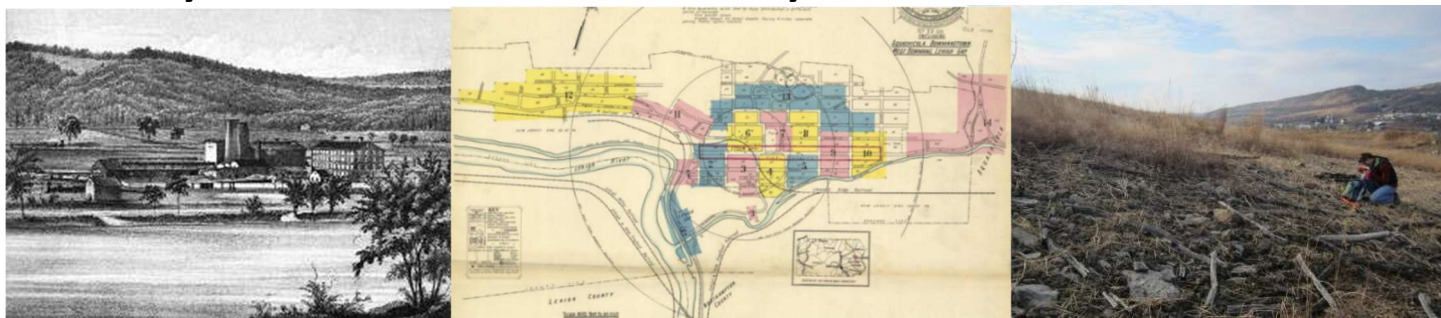
10. 2020 Executive Committee

MAY WEBINAR FOCUSES ON CCEW THEMES LOCALLY

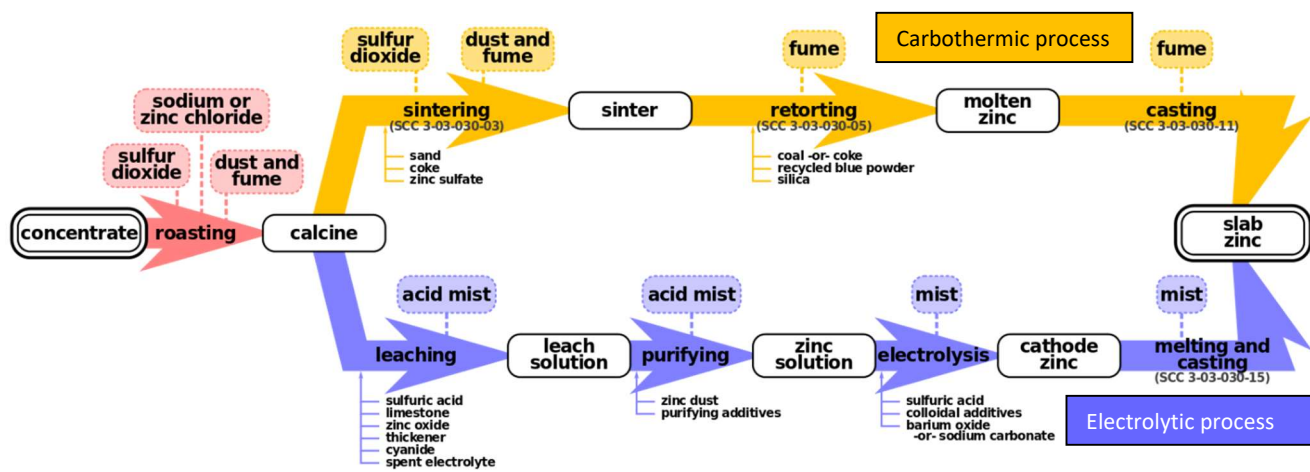
Lehigh Valley section continued to celebrate Earth Week remotely this year with a webinar summarizing the history of a local environmental issue: metals contamination from zinc ore smelting in the Palmerton area.



“Applying CCEW thinking to our local area: The Environmental chemistry of Palmerton PA's New Jersey Zinc smelter site”



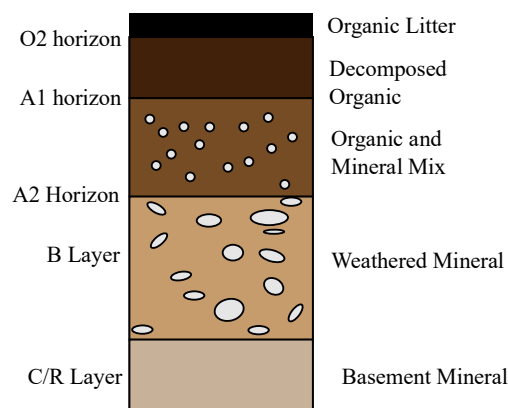
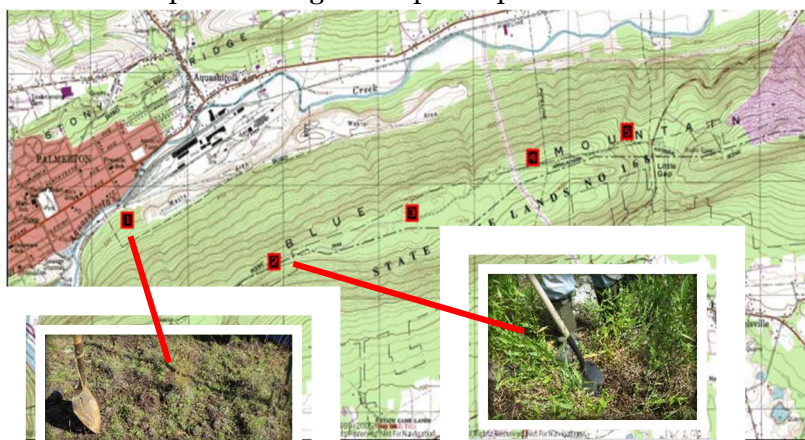
On May 21st John Freeman and Lindsey Welch led a webinar discussion of a CCEW/ED50 topic of local interest: the history of zinc extraction and processing and its environmental impacts. A group of 8 attendees took a journey back to the mid-nineteenth century to review the origins of the industry, the chemistry of ore processing and the waste products generated. Zinc ore was initially found in Friedensville PA in 1845 on a local farm (quite near the current site of Penn State Lehigh Valley). The mining company was founded as National Mining Company in 1850 (later renamed Pennsylvania and Lehigh Zinc Company) and merged with Wetherall and Gilbert zinc works in 1855. It produced white zinc for paints and zinc metal from the ores found locally. The first processing plant was sited in South Bethlehem in 1853. Friedensville Mines closed in 1876 whereupon the plant purchased ore from the mines of NJ Zinc Company (founded 1848 in Franklin, NJ) and later from mines in Missouri and other states. The Palmerton, PA Site was founded in 1896 by the Lehigh Zinc and Iron Company with the construction of the West plant. The East plant was built in 1911 to handle a wider range of zinc sulfide ores. The town of Palmerton was incorporated 1912 and was named after the then chair of NJ Zinc. The introduction of cheaper, more plentiful sulfide ores required the use of a roasting step which emitted large amounts of sulfur dioxide. Metal fumes and particulates were also given off at each step with the final retorting step resulting in large amounts of waste cinder (see diagram below: top flow is the carbothermic process used in Palmerton).



Source: US EPA

“Applying CCEW thinking to our local area: The Environmental chemistry of Palmerton PA's New Jersey Zinc smelter site (cont'd)”

The EPA's assessment of the site when manufacturing was halted in 1983 indicated extensive contamination of surrounding town area from zinc, cadmium, copper and lead. There was quite significant deforestation from metal and sulfate deposition on Blue Mountain and contamination of local surface and ground water from deposited metals and cinder bank leachate. Over the many years of operation with ore roasting, high levels of acidic SOx gases had lowered the soil pH to 4 or less in many areas. Estimates of the total metals emitted from site over 82 years of operation were: cadmium 3,740 tons or 47 tons/year; lead 7,560 tons or 95 tons/year; zinc 286,000 tons or 3,575 tons/year. The table below [Arch Environ Contam Toxicol (2011) 61:376-388] shows the metals found in a 2006 study. The levels are significantly less than in a 1975 survey when the smelter was still operating but still above EPA limits. Aquashicola Creek had become so badly contaminated that dredging was necessary after which metal levels were still elevated in surface waters. A sampling program considered five (5) locations at various depths. The cadmium resistance data in the table are one example showing the depth dependence at two sites.



Cadmium resistance

Soil Horizon	% Cadmium Resistance ¹	
	Site 1	Site 2
O ₂	24.5	4.39
A ₁	63.5	44.9
A ₂	91.2	69.3

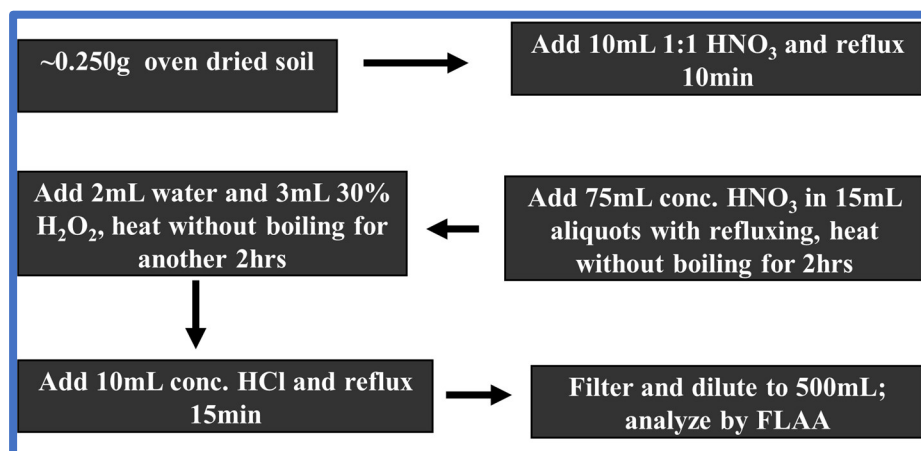
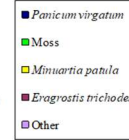
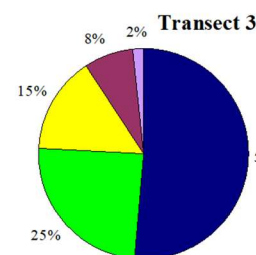
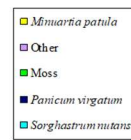
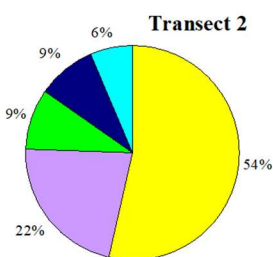
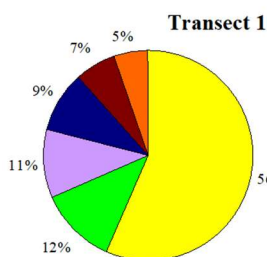
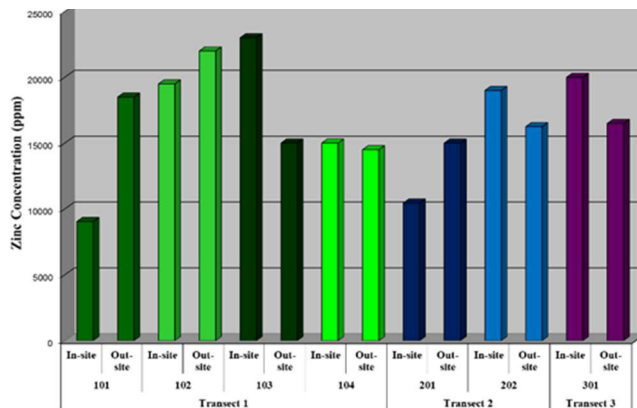
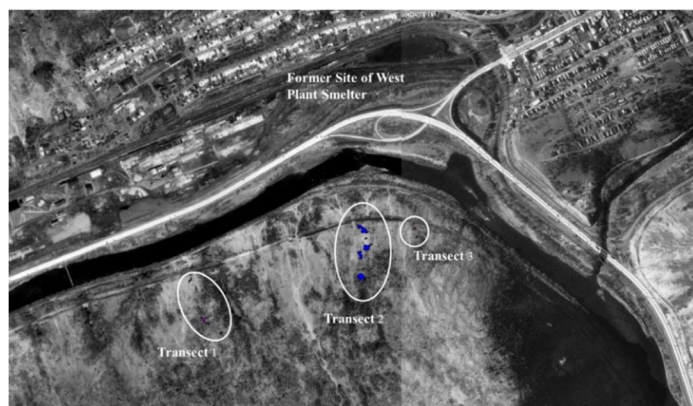
Site number	Metals 2006 ^a					
	Zn	Mn	Cd	Pb	Cu	pH
10 ^b (2) ^c Mineral soil	2352	967	109.62	336	48	4.4
10 ^b (2) ^c Litter ^d O ₂	3125	1927	60.48	2193	166	4.0

Mitigation work has indicated that the primary metal source is the cinder waste banks. These have been capped and vegetated (native warm weather grasses) to reduce acid/metal-containing leachate. Also, the capped cinder bank has been treated with activated sewer sludge fly ash mixture to improve soil conditions and plant growth. Shallow water wells (but not deep water wells) were found to be contaminated and their use had to be eliminated. In 2008 and 2012, areas along the blue mountain ridge were treated with lime fertilizer and native grass seed in order to improve soil conditions. A comparison of satellite maps of the affected region from 2007 and 2020 (below) shows the greatly improved results from these mitigation steps.



“Applying CCEW thinking to our local area: The Environmental chemistry of Palmerton PA's New Jersey Zinc smelter site (cont'd)”

Lindsey Welch presented a 2014 study co-authored by Stephanie Augustine and Amy Faivre of Cedar Crest College on vegetation types found downwind of the former west plant and soil zinc concentration. About 22 species were seeded on the mountainside in 2006. The pie charts below show the species found in 2014 in three selected transects (see map) and the bar chart shows the zinc levels found in the accompanying soil samples by the analysis scheme given below. Findings were that (a) there was more diversity of plants outside of barren areas; (b) concentrations of zinc show progress in remediation efforts and (c) there was no correlation between zinc contamination and plant diversity. Work continues in this region under the auspices of Lehigh Gap Nature Center (<https://lgnc.org>).

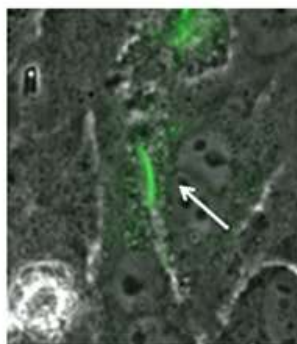


Slides from this webinar and a recording are available at the links below.

Slides: <https://drive.google.com/file/d/1t6ym440e06-bugoxSgdwvuNHvE8NwoPU/view?usp=sharing>

Recording: <https://drive.google.com/file/d/1LeBUgboUyPAXzRejvNXr1GFIG07PWYBs/view?usp=sharing>

PA BioPharma Networking Group sponsored a Zoom meeting Wednesday, May 13th 2020 with a webinar by Moravian College's Dr. Anastasia Thevenin



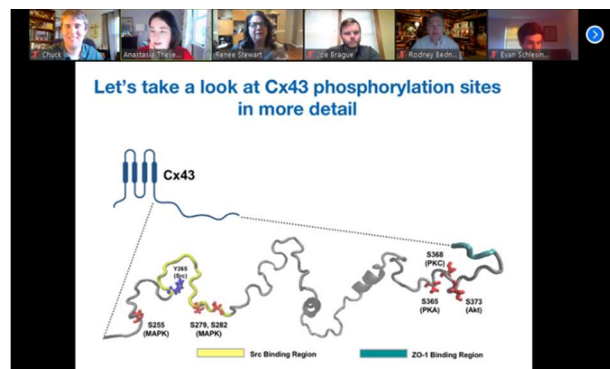
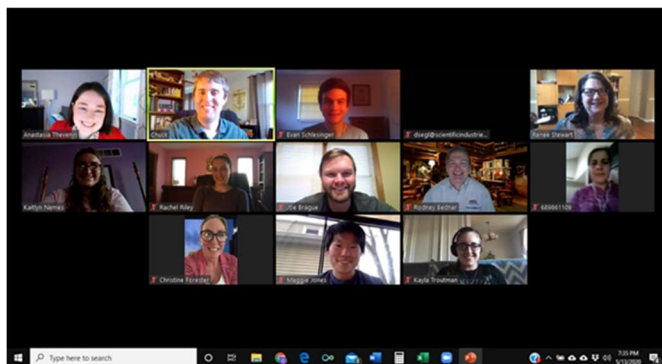
Dr. Thevenin is an assistant professor of Biological Sciences at Moravian College where she incorporates her research into cellular communication into a highly successful teaching curriculum. Dr. Thevenin earned her Ph.D. at the University of Delaware and completed subsequent Post-Doctoral Fellowships at Yale and Lehigh University. In an online PABPNGLV webinar Dr. Thevenin described how she uses hands-on learning to educate the next generation of researchers and to stay on the cutting edge of her field!!! thevenina@moravian.edu

Education

B.S. in Biomedical Science, Lynchburg College
Ph.D. in Chemistry and Biochemistry, University of Delaware

Research Interests

I am interested in understanding how phosphorylation of Gap Junction (GJ) protein, Connexin 43 (Cx43), affects its function. GJs are pores found in plasma membranes of two neighboring cells and are made up of 12 Cx43 molecules. These pores are the only means cells have for direct cell-cell communication, allowing small molecules and ions to move from cell to cell. Cell-cell communication is key for many cellular functions, such as development, proliferation, and differentiation. Current projects are focused on using phosphor-mimetic mutants of Cx43 to study their ability to interact with other protein partners and to affect GJ function.



ACS Fall National Meeting will be **Virtual**



Based on the established COVID-19 reopening plans of the State of California and the City of San Francisco, as well as direct inputs from San Francisco city and public health officials, the American Chemical Society has decided to move the ACS Fall 2020 Meeting & Expo to a virtual platform. There will be no physical events held in San Francisco associated with the meeting.

The decision, approved by the ACS Board of Directors, is in keeping with the Society's core value of safety by ensuring the safety of its members, staff, and the citizens of San Francisco. **The ACS Fall 2020 VIRTUAL Meeting & Expo will be held August 17-20, 2020, completely online.** Details for attendees, presenters, and organizers will be announced over the coming days and weeks and will be available on the ACS National Meetings website.

More information:

https://www.acs.org/content/acs/en/meetings/national-meeting.html?sc=200609_mtg_news_acsmters_SF20_virtualmtg_od

Career Navigator LIVE!

Onsite or virtual - Career days are exciting events filled with workshops and networking opportunities for mid-career chemistry professionals. The FREE career day is designed to help job seekers reach their goals and network with other local chemists.



VIRTUAL

ACS Career Day Younger Chemists Committee (YCC)

Early Career Development Workshops

Q&A

ACS Career Consultants

Networking

SATURDAY, JUNE 27 / 10 AM ET

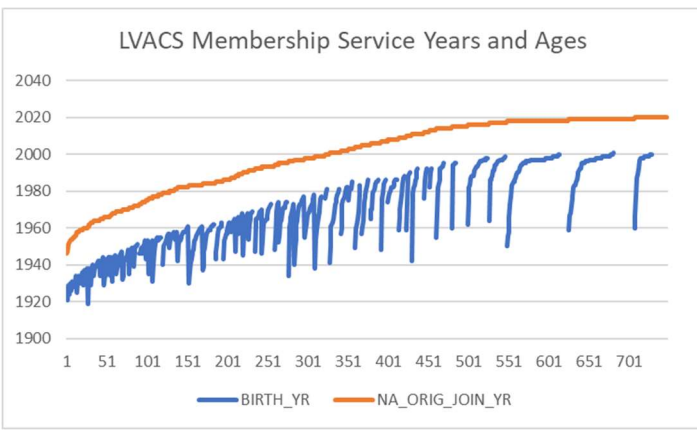
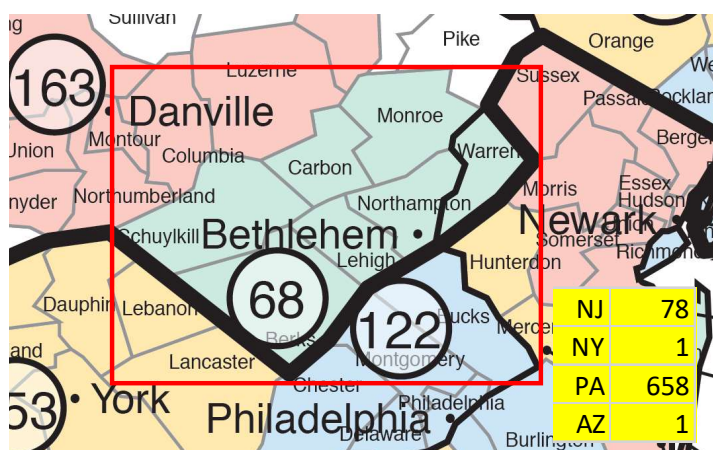
Visit www.acs.org/virtualcareerdays

More information:

<https://www.acs.org/content/acs/en/careers/career-events.html>

LEHIGH VALLEY ACS SECTION DEMOGRAPHIC SUMMARY

Every month, ACS provides the local sections with an updated roster of their members. Part of this report is a demographic summary based on information provided by the members. The Octagon thought it might be useful to share a summary of this data issued on April 30, 2020 as it gives a perspective on who we are as a section today. The Lehigh Valley section #68 consists of 6 counties in PA and Warren County, NJ (see map, below). Members are assigned based on having their primary address in those 7 counties. Member data is provided to ACS voluntarily so some demographic categories represent only a fraction of the total section population. We have focused on those categories where the response rate was at least 70%. The distribution of ages and years of ACS membership are shown in the graph. A simple realization from this chart is while half of the members joined since 2005, the average age of a member is about 50 years. Almost 20% of our members are emeritus or retired members and nearly 30% are students. The ratio M/F is about 2/1. About half of responding members work in academia (Lehigh University has the largest number of members of any employer with 52) and half in all other occupations.



The complete demographic summary for April 30, 2020 may be accessed via this link:
https://drive.google.com/file/d/1vxSovPVbh08_Sj1hUGqnLWLOz_69rLb9/view?usp=sharing

Member Type			
Group	Count	%	
Emeritus Member	103	13.96	
Local Section Member	1	0.14	
Regular Member	390	52.85	
Regular Student Member	60	8.13	
Retired Member	33	4.47	
Society Affiliate	7	0.95	
Student Member - UnderGrad	144	19.51	
Total	738	100.00	

Gender			
Group	Count	%	
Female	208	28.18	
Male	452	61.25	
Non-binary/third gender	1	0.14	
Prefer not to say	1	0.14	
n/a	76	10.30	
Total	738	100.00	

Industry			
Group	Count	%	
Academic Institution	239	32.38	
Engineering/Construction Firm	7	0.95	
Government	10	1.36	
Hospital/Clinic	3	0.41	
Independent Consulting	39	5.28	
Independent Laboratory	13	1.76	
Manufacturer - Industrial chemicals	44	5.96	
Manufacturer - Other	71	9.62	
Manufacturer - Petrochemical	7	0.95	
Manufacturer - Pharmaceutical Co	42	5.69	
Manufacturer-Biotech/life sciences co	9	1.22	
Manufacturer-Environmental/water	4	0.54	
Manufacturer-Food/beverage/flavors	18	2.44	
Public Utility/Transportation	1	0.14	
Retail/Wholesale Trade	6	0.81	
Other	48	6.50	
No Response	149	20.19	
N/A	28	3.79	
Total	738	100.00	



CANCELLED

Friday, July 31st @ 7:05 pm

Lehigh Valley Iron Pigs vs Durham Bulls

Celebrate Summer with LVACS in the Coca-Cola Park Pig Pen!

[In-Seat Food & Beverage Service]



Reserve your seats now!

Tickets \$20

(includes \$10 food/beverage credit)



**DUE TO CONTINUING RESTRICTIONS, WE HAVE
DECIDED TO CANCEL THIS ACTIVITY FOR 2020:
LET'S PLAN FOR A HEALTHY AND EXCITING 2021
SEASON!**

CONTACT: Lindsey Welch [lawelch@cedarcrest.edu]

LEHIGH VALLEY SECTION OF THE AMERICAN CHEMICAL SOCIETY
2020 EXECUTIVE COMMITTEE

OFFICERS

Chair:
George Ruger
gruger04@yahoo.com



Chair Elect:
Roger Egolf
rae4@psu.edu



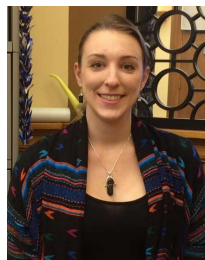
Immediate Past Chair:
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Secretary/Newsletter Editor:
Nigel Sanders
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Treasurer:
Tesia Chciuk
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