

SILICON VALLEY CHEMIST

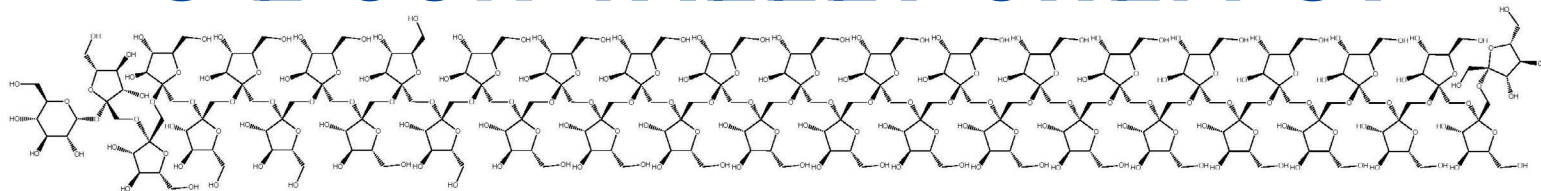


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SVACS and Golden Gate Polymer Forum 2020 Joint Webinar

Replacing Plastics: Can Bacteria Help Us Break the Habit?

Dr. Molly Morse, CEO of Mango Materials

Date and Time: Wednesday, June 24,
6:30 PM Webinar

Free to attend but RSVP required by June 21st. On registering, please indicate your primary affiliations: GGPF, ACS, or both. If you do not receive a confirmation message after registering, please [contact us](#).

Abstract:

Mango Materials manufactures biodegradable materials from waste methane. The Company's end product is a naturally occurring biopolymer that can biodegrade in many different environments. Collaborations with industrial partners have led to the formulation of biopolymers for numerous applications including textile fibers as a polyester replacement and injection molded



MANGO MATERIALS

Biography:

Dr. Morse is the CEO and co-founder of Mango Materials, a San Francisco Bay Area-based, next generation, biomanufacturing, start-up company. Mango Materials converts abundant methane gas into low-cost, high-value,

packaging for the cosmetics industry. Overall, the company is focused on applications where new end-of-life properties are desirable. Mango Materials is scaling up its process and operates at a wastewater treatment plant in the San Francisco Bay area. Additional background information can be found at [Mango Materials](#) and [NPR/KQED article](#).

continued on next page

Chair's Message

Matt Greaney

This is the third Chair's Message I've written during the shelter-in-place, and hopefully it's the last. As the Bay Area slowly reopens, it is critical for everyone to continue to do their part to practice safe, responsible behavior so we don't jeopardize the health and safety of others. The Silicon Valley ACS local section has postponed or cancelled all in-person events through July. Unfortunately, this includes our annual awards picnic that is typically held in July outdoors at the Stanford Chemistry Department gazebo. We hope to put together a make-up event later this year, but we cannot be more specific at this time. Potential events for the second half of the year will continue to be a topic of discussion at our monthly (virtual) Executive Committee meetings, and I will use this Chair's Message platform to update the local membership on any policy changes.

While our in-person events are on hold for the near future, we have moved ahead with a virtual meeting for our annual joint June meeting with the Golden Gate Polymer Forum. This year's joint meeting will be held on Wednesday, June 24, at 6:30pm and will feature a presentation from



continued on next page

UPCOMING EVENTS

- On-going** [ACS Webinars](#) (Free)
Broadcasts every day of the week at 11am Pacific Time
Sessions on Thursdays are open to everyone.
[Join ACS webinar mailing list](#)
Over 250+ archived webinars are available to ACS members.
- Jun 8-9** [Golden Gate Polymer Forum Short Course: Introduction to Polymer Science and Engineering](#)
Prof. Gary Wnek, Case Western Reserve University
Virtual; [registration is required](#).
- Jun 15-19** [24th Annual ACS Green Chemistry and Engineering Conference](#)
Virtual Conference. Free, registration is required.
- Jun 24** [Replacing Plastics: Can Bacteria Help Us Break the Habit?](#)
Dr. Molly Morse, CEO of Mango Materials
Webinar. Free, [registration](#) is required by **June 21st**.
A joint event of the Golden Gate Polymer Forum and ACS Silicon Valley Section
- Jul 11** [SVACS Annual Picnic, Awards, & Wine/Beer-Tasting](#)
Cancelled
Stanford Chemistry Department
- Aug 16-20** [ACS Fall 2020 National Meeting & Expo](#)
San Francisco or virtual, TBA

Replacing Plastics, continued from front page

biodegradable materials. They believe waste facilities are the goldmines of the future and are dedicated to building closed loop, cradle-to-cradle technologies in order to recycle carbon naturally and sustainably.

Dr. Morse received her Ph.D. in Civil & Environmental Engineering—with an emphasis on anaerobic biodegradation of biocomposites for the building industry—from Stanford University, and her B.S. in Civil and Environmental Engineering from Cornell University. She has contributed to multiple patents, publications, and presentations. Along with other Mango Materials team members, she is currently working to up-scale the biomanufacturing technology of using methane gas to produce biodegradable materials.

About Golden Gate Polymer Forum (GGPF)

GOLDEN GATE POLYMER FORUM



The GGPF is a non-profit educational and scientific organization dedicated to the study of polymeric materials and devices. They sponsor monthly dinner lectures and occasional short courses and symposia with events based in the San Francisco Bay Area. Their participants are individuals working in both industry and academia from a variety of disciplines. All interested in the study of polymers are welcome to attend.

Chair's Message, continued from front page

Dr. Molly Morse, CEO of Mango Materials. Dr. Morse will describe Mango Materials' use of naturally occurring microorganisms to produce biodegradable polymers from the methane gas of a Bay Area wastewater treatment plant. The virtual event is free, yet requires registration. More information can be found at <http://ggpf.org/events/?ee=273>.

Another looming big event is the Fall 2020 ACS National Meeting that is still scheduled for August 16-20 in San Francisco. While ACS has decided that this event will take place, the exact logistics for doing so are still being worked out. San Francisco tends to draw some of the largest attendance numbers for ACS National Meetings, so there will undoubtedly be some changes from what we've used to. A few scenarios including an in-person meeting, a combination of in-person and virtual, or a fully virtual meeting are being discussed. Additional information can be found on the ACS National website at <https://www.acs.org/content/acs/en/meetings/national-meeting.html>.

It's been a tough couple of months for sure. If everyone continues to act responsibly and considerately, we will get through this stronger than before. Hang in there, and be safe.

Call for Nominations for Our SVACS Executive Committee

It's that time again - time to select candidates for the SVACS Executive Committee ballot for 2021. We are in the process of forming the committee, chaired by Madalyn Radlauer and Todd Eberspacher, to draw up nominations of candidates for many of the positions of the Executive Committee:

Chair Elect ♦ Secretary ♦ Councilor ♦ Alternate Councilor

The Executive Committee meets once a month – in person or virtually - and is responsible for the oversight and conduct of the activities of our section. All members of the Executive Committee are expected to attend the monthly meetings as well as other section activities. The Councilors are also expected to represent the interest of our section at National ACS meetings. Alternate Councilors substitute for a Councilors who are not able to attend the meetings. The specific duties of these positions are outlined on our website at http://svacs.org/?page_id=4.

If you are interested in becoming involved and/or would like to run for one of these offices, please contact Madalyn (madalyn.radlauer@sjsu.edu), Todd (eberspacher@stanford.edu) or other current ExComm members. We look forward to hearing from you.

2020 Nominations for Ottenberg Award

The Ottenberg Award is presented annually to a member of our local section for outstanding service to the section. Previous recipients are not eligible to receive it again.

Nominations should include the nominee's biography, description of the service(s) for which the member is nominated, and a discussion or evaluation of the service to be recognized by the award. Nominations are not retained for subsequent years but re-nominations are accepted for consideration.

Deadline Extended! Please send your nomination before June 30, 2020.

Email: PFRusch@aol.com

Fax: (650) 961-8120

Peter Rusch

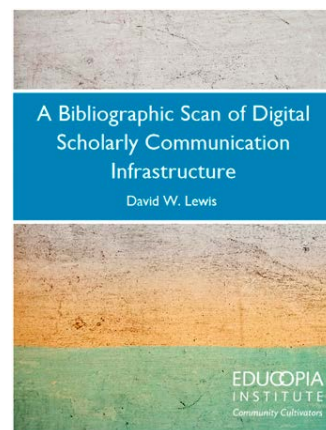
Chair, Ottenberg Award Selection Committee
About the Ottenberg Award:

The Abraham Ottenberg Service Award was established in 1973 by the Silicon Valley Section to recognize members who have rendered outstanding service to the Section. It is named after Abraham Ottenberg, a former member who devoted much of himself to service to the Section. The award currently consists of an engraved plaque and a check for \$250. The award recipient is selected from candidates nominated by members of the Section. Nominees must be members or affiliates of the Silicon Valley Section.

[List of Past recipients](#)

Mapping the Scholarly Communication Infrastructure

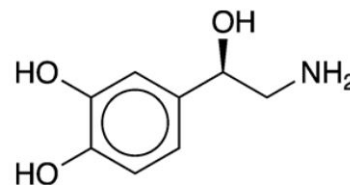
Produced as part of the "Mapping the Scholarly Communication Infrastructure" project, a *new report provides an extensive overview of today's digital scholarly communications ecosystem*, including information about 206 tools, services, and systems that are instrumental to the publishing and distribution of the scholarly record.



CHEMISTRY

Quiz

Blame me when your hair turns gray.



What molecule am I?

Answer

Green Chemistry & Engineering Virtual Conference

Free, Register Now!



JOIN US AT THE
24th Annual Green Chemistry & Engineering Conference
Systems-Inspired Design

JUNE 15-19, 2020
VIRTUAL CONFERENCE



Register now and make the most of your attendance at the 24th Annual Green Chemistry & Engineering (GC&E) Virtual Conference, June 15-19. Brought to you by the American Chemical Society's Green Chemistry Institute, your complimentary registration gives you an all-access pass to the virtual event and GC&E Fridays. For those interested in advancing sustainable science and solutions to global sustainability challenges, this is one event you don't want to miss! Connect and network with over 3,000 participants. **Register to attend.**

Welcome to the Silicon Valley Section of ACS

Each month, the section receives a spreadsheet from national ACS with the names of members new to our section. The members are either new to ACS, have transferred in from other areas, or are the newest members -- students. To welcome you to the section and get to know you, the Executive Committee offers new members a free dinner! To encourage you to attend a monthly section seminar meeting, we would like you to be our guest. When you register, make certain to mention that you are a new member and you and a friend will be our guests. The seminar meetings are held at a number of local venues. If you are unable to attend in the evening, perhaps you would join us for an outreach event, like judging a science fair, proctoring the Chemistry Olympiad or participating in a National Chemistry Week event in October. Then, there is our annual beer & wine tasting and awards picnic in July. The local section is a volunteer organization. Please attend an event, volunteer to help and get to know your local fellow chemists. Welcome!

NEW ACS MEMBERS

Dr. Alexandre Balkanski
Scott Evan Berger
Dr. Gustave Bergnes
Dr. Thomas Brewer
Gregory Chin
Jerika Arielle Chiong
Dr. Marita Espinoza
Emily Gale
Dr. Christian Gampe
Melissa Marie Geinitz
Katarina Marie-Gomez Gibson
Maija Iris Heller
Abhinav Jain

Janis Jermaks
Dr. Robert John Jones
Dylan Karr
Michael Tae-Jong Kim
Alex Komoroske
Ashley Leibham
Dr. Nanna Holmgaard List
Varsha Nair
Jingjing Qiu
Dr. Florentine Uwamahoro
Rutaganira
Joel Schneider
Adam Michael-Anthony Simpson

Alp Mehmet Sunol
Shannon Marie Swantek
Danny Tam
Hao Tang
Felix Vega
Chandrasekar Venkataramani
Wenyue Wang
Dr. Robert Whalen
Ning Xu
Mei Yu
Dr. Jiazhong Zhang
Dr. Meng Yao Zhang

ByLaws Need Superheroes



The very mention of bylaws in a board meeting is usually met with dread! It typically means either that there is a conflict and it has risen to the point where the bylaws must be consulted, or it means that someone is pointing out an area of noncompliance that has gone unnoticed for years. If written well, the bylaws undergird the whole governance structure and culture of a nonprofit organization. Even the Avengers needed the By-Laws and nonprofits need superheroes to tackle them. We at Silicon Valley American Chemical Society (SVACS) wanted to take this opportunity to thank someone who is best known for being our resident parliamentarian – always following the letter of the 'by' law, all pun intended! We are talking about none other than our very own George Lechner.

George has been a part of the SVACS for many years and has been an active member of this executive committee for over 20 years. He has served the Silicon Valley section in a myriad of roles such as Chair, Alternate Councilor and Councilor.

George received his BA in Chemistry and Biological Sciences at San Jose State University in 1963. In his work life, he analyzed rocket motor fuels and space ordnance chemicals, helping employees conduct their work safely and in environmentally sound ways while in the semiconductor manufacturing and also in the copier and printer industries. He is well versed in safety and environmental training programs, hazardous waste operations and regulations, injury and illness prevention processes and industrial hygiene. He earned a certificate in Industrial Hygiene (Certified Industrial Hygienist) and has used his expertise to shape ACS's Committee of Chemical Safety to encourage a more safety-minded approach to teaching chemistry to students at all levels and providing guidance for teachers, professors, students, academic institution administrators and officials.

But most importantly for our section, George has served as an impartial arbiter of the SVACS By-laws, Roberts Rules of Order, and has played a central role in building the Operations Manual. The ByLaws and the Operations Manual have served as resources and strategic documents to the newer members. We would like to take this opportunity to thank George for his many years of service!

José Ramirez Winner of the 2020 Perkin Medal Scholarship

The Silicon Valley ACS has the distinction of producing two Perkin winners in 2020.

Earlier this year, Dr. Jane Frommer was awarded the **Perkin Medal**, one of the most prestigious awards for an American industrial chemist, reported in the **SVACS April 2020 newsletter**. The honor of the Perkin Medal includes choosing the recipient of the annual Perkin Medal Scholarship, which is awarded to a graduate student for outstanding performance and potential in the advanced study of applied chemistry. Dr. Frommer focused her search on Hartnell College in Salinas where she has organized industrial research internships and mentored science and engineering students.

Foremost among her selection criteria was the chemistry student's potential for influencing future generations of students in this community to study science and engineering. She chose as the

recipient of the 2020 Perkin Medal Scholarship Hartnell College graduate, José Ramirez.

José Ramirez - the first in his family to go to college - was fortunate to have a positive first exposure to chemistry through his chemistry

Jose Ramirez

teacher at Everett Alvarez High School in Salinas, Patricia Alexander. That good fortune continued at Hartnell Community College with supportive chemistry faculty, Professors Slava Bekker and Lawrence Yee. While a student at Hartnell, José tutored classmates in chemistry and math. He also held several research internships: synthesis of phthalate mimics in the UCSC laboratory of Professor Braslau; Python programming for electronics in

next-gen femto satellites at the Naval Postgraduate School in Monterey; Python programming for processing Argo's dissolved oxygen data at the Monterey Bay Aquarium Research Institute (MBARI).

In 2017, José transferred to UC Berkeley and graduated with a chemistry degree in 2019. While a Cal undergrad, he expanded his lab experience both on campus and in industry: synthesis and studies of uranium(IV) and thorium(IV) complexes as precursors for oxide and nitride photoanodes in photoelectrochemical water splitting in the UCB lab of Professor John Arnold; synthesis and analysis of natural and non-natural amino acid monomers in the development of macrocyclic peptides as therapeutics at Genentech in South SF.



UC Berkeley Arnold Group Trip - Yosemite 2018.

Mr. Ramirez will begin graduate studies in chemistry at the University of Illinois at Urbana-Champaign in the autumn. His long-term plans include returning to California's central valley to teach chemistry and demonstrate to future generations the opportunities and fulfillment of careers in science.

Worth Knowing About

Ever feel there's so much to learn in our world of chemistry and so little time to navigate the literature's landscape? What are your favorite literature-reporting services and search tools? **Send them to us** and we'll print them here.

Did you know you can search a drawing of a molecule in Google? **Google Patents** now integrates search with Google Scholar and Google Books, and recognizes machine-readable forms of molecules. Publications and patents can be searched by structure, substructure, and similarity structure. Give it a try. Draw a molecular with your favorite molecular editor (there are **free versions on-line**). Export it in a machine-readable format (save and copy as SMILES or InChIKey), and paste it into a Google Patents search window.



Hits will be returned as text and as molecular structures. In the search window, select the mortarboard icon to search Google Scholar, the light bulb icon to search Google Patents, or both. To find similar molecules, add a tilde ~ in front of the SMILES or InChIKey. Try it and **let us know** what you think. It's a work in progress.

Much of chemistry, and pharmaceutical chemistry in particular, is becoming an informatics industry. Access to chemical information and tools to process it are essential to staying apace.



Rotavapping in the Braslau Lab UC Santa Cruz 2017.



Launch party of ChemUNITY College of Chemistry UC Berkeley 2018.

The Perkin Medal Scholarship Program Society of Chemical Industry America Group

The **Perkin Medal Scholarship program** was established to recognize and reward outstanding performance and potential in the advanced study of applied chemistry or related sciences, and to broaden awareness of the Perkin Medal and the contributions to society that this prestigious award represents.

The scholarship includes a stipend awarded to a graduate student or doctoral candidate from a discipline and institution chosen by the Perkin Medalist.

Eligibility criteria include excellent academic standing, outstanding or unusual contribution or work within the chosen discipline, current or recent contributions to the chemical industry and potential for outstanding contribution to applied chemistry and the chemical industry.

The scholarship is to be presented at the annual Perkin Medal Award Dinner in Philadelphia.

2020 Chemistry Olympiad Update for the Silicon Valley Local Section

The past several years when I have written this article about the Chemistry Olympiad I have commented that our outstanding high school chemistry students gave up a beautiful Saturday to spend time indoors and in the lab participating in chemistry exams. Well, this year was slightly different because of the corona-virus. We still had outstanding students, but they gave up two Sunday afternoons to spend them in front of computer screens in their living rooms rather than meeting with other students on a college campus! And there was no laboratory needed!

Normally in March, over 30 schools and over 300 students from our section would participate in a local standardized exam at their high school in the first level of the International Chemistry Olympiad competition. However, this year, the high schools were closed before most of the teachers could administer the exam, so an alternate method of selecting our top students was needed. Over the years, students from several schools routinely scored in the top of our section; so we decided to invite those teachers to nominate 1 or 2 students to compete in the national exam. Some students were very persistent in contacting me about the exam and because they had been studying so hard for it, we included them in our top 14. Some teachers decided to go ahead and administer the local exam 'virtually' to their students, so they would not have to decide whom to nominate. Some schools declined to nominate anyone because of the uncertainty of the situation.

On Sunday, April 26th, we had 14 students hunkering down in front of their computers taking a difficult chemistry Olympiad exam. The actual exam was able to proceed because of the kindness and expertise of Dr. Eileen Nottoli, the CA local section Olympiad coordinator, and some of their teachers. They were able to coach the students in setting up their computers and cell phones properly for proctoring the exams. National was sending out last-minute instructions for parent consent forms, hard copy answer sheets, and online answer sheets. Finally, with everyone's efforts and expertise, Part 1 of the nation exam was completed. Part 2, the really difficult 'problem set' part, occurred in a similar situation on Sunday, May 3rd, for

the top 150 students in the country. The students' laboratory ability was not tested. We had four students qualify to participate in Part 2. The top 20 students from across the country were chosen to participate in the study camp. The study camp also will not be in person at the Air Force Academy, but will be held virtually. At this time, the International Chemistry Olympiad will also be held remotely.

Go to <https://www.acs.org/content/acs/en/education/students/highschool/olympiad.html> to test your chemical knowledge on the exams in which these students participated! And to see the names of the **20 finalists** who will attend the study camp. Our section did not have a national finalist this year, but for the second time, the California section has 2 students who qualified to attend the study camp. In previous years, we have had students attend the study camp and compete in the international competition. This year's student rankings by High Honors and Honors have not been released yet.

Also, a very special thanks goes to the high school teachers who make it possible for their students to participate in these unusual times. The 2020 Silicon Valley section outstanding high school chemistry students and their teachers are:

Basis Independent School: **Jack Zhang & Aditya Udgaonkar** (Dr. Ilona Davies)

Fremont High School: **Isaac Ives** (Dr. Anita Wu)

Gunn High School: **Binh-Minh Nguyen & Sean Yen** (Heather Mellows)

Harker School: **Rishab Parthasarathy & David Dai** (Robbie Korin)

Leigh High School: **Karan Gurazada** (Inna Diordieva)

Menlo School: **Marissa Li** (Dr. Eugenia McCauley)

Monta Vista High School: **Calton Kong & Eugene Yoon** (Kavita Gupta)

Peach Blossom School: **Cara Burgess** (Stephanie Hood)

Sacred Heart Prep: **Theresa Lim** (Dr. Sharon Sikora)

Saratoga High School: **Kohan Kumar** (Janny Cahatol)

Sally Peters
Chemistry Olympiad Coordinator

Chemistry Outreach in the Time of Covid-19

By Natalie McClure

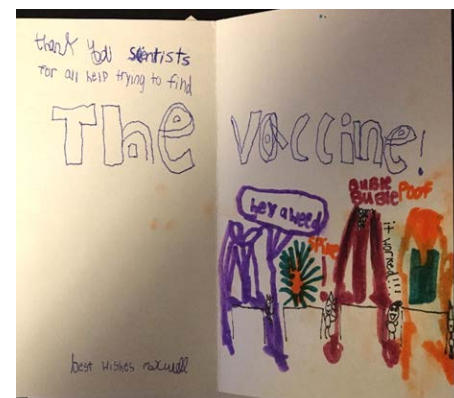
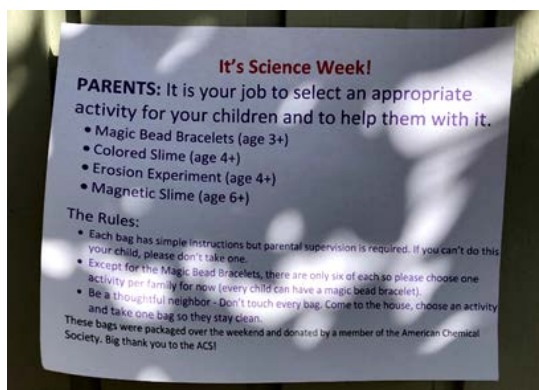
Everything in our lives is changed these days, and our ACS outreach projects fall into the same category. Unfortunately, the projects we usually do in the summer to provide chemistry experiences for students, including Project SEED, Tech Trek, Palo Alto STEAM and the Bay Area Science Festival at Oracle Park, have all been cancelled for this year. While this is disappointing but understandable, it doesn't mean that we have completely abandoned our outreach.

We just have to be creative. One activity that I and a friend, who is an educator, have explored is to set out a hands-off activities table on the sidewalk in front of our homes for local families. We prepare activities that can be done safely by children, with parental supervision. The activities are packaged in plastic bags, which can be wiped down with disinfectant each day. To keep it fun, we have set out different activities each week.

Some of the activities have been chalk for sidewalk drawing, slime preparations, making diffraction grating kaleidoscopes, paper airplanes, UV sensitive bead bracelets and thank you notes for first responders. This activity station has been a huge hit with more families coming by each

week. If anyone else is interested, please contact me (nmclure@drugregulatoryaffairs.com). I'll share my supplies and ideas. I would love to hear your creative ideas on other projects we can try.

Thank you to the vaccine developers, from one of the young students:



THE CHEMISTRY OF BIODEGRADABLE PLASTICS

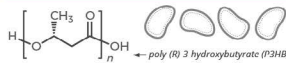
COMMON BIOPOLYMERS & SOURCES

POLYLACTIC ACID (PLA)



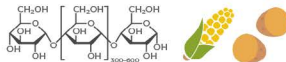
Obtained from fermented plant starch from corn, cassava, sugar cane or sugar beet.

POLYHYDROXYALKANOATES (PHAs)



Extracted from bacteria, which produce it via the fermentation of sugar or lipids.

THERMOPLASTIC STARCHES (TPS)



Starches from plant materials are heated with water, then mixed with plasticisers or other polymers.

EVERYDAY USES OF BIOPOLYMERS



Biodegradable coffee cups are paper cups with a PLA lining to make the paper waterproof.



PLA has the second largest production volume of any biopolymer (behind TPS). It is also used in plastic films, bottles, and food containers.



PLA and TPS both find use in the manufacture of plastic cutlery that's biodegradable.



TPS is also used in food waste bags and some magazine wrappers. PHAs have fewer uses, but have medical uses such as in surgical sutures.

ADVANTAGES AND DISADVANTAGES

GLOBAL PLASTIC PRODUCTION



Use of bioplastics is increasing, but they still account for less than 1% of the global plastics market (as of 2018).

CONDITIONS FOR BIODEGRADING



Compostable plastics need specific conditions to break down - and take much longer to do so completely if they go to landfill instead of being recycled. However, they still break down faster than conventional plastics.



Biodegradable plastics are more expensive than plastics derived from fossil fuels on weight basis, and require land to grow raw materials. However, the greenhouse gas emissions associated with their production are lower.

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Click to enlarge

2020 Section Officers

Chair	Matt Greaney	510-410-0195	greaney19@gmail.com
Chair-Elect	Jigisha Shah	315-289-5115	jssheth@syr.edu
Past-Chair	Grace Baysinger	650-725-1039	graceb@stanford.edu
Secretary	Laura Yeager	626-826-3145	laura.yeager123@gmail.com
Treasurer	Ihab Darwish	650-624-1389	darwishis@yahoo.com

Councilors

2018-2020	Ean Warren	650-714-5133	ewarren@scvacs.org
2018-2020	Natalie McClure	650-906-7831	nmclure@drugregulatoryaffairs.com
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2019-2021	Jane Frommer	408-927-2225	jane@collabra.net
2019-2021	Sally Peters	650-447-3027	sallybrownpeters@gmail.com
2020-2022	Matt Greaney	510-410-0195	greaney19@gmail.com
2020-2022	Madalyn Radlauer	408-924-5482	madalyn.radlauer@sjsu.edu

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2020-2022	Todd Eberspacher	650-723-2505	eberspacher@stanford.edu
2020-2022	Avni Gandhi	626-831-8230	avni.caltech@gmail.com
2020-2022	Heddie Nichols	310-435-2133	hnhichols105@gmail.com
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2020-2020	Peter Rusch	650-961-8120	pfrusch@aol.com

Newsletter

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Assoc. Ed	Vacant		

ChemPloyment Abstracts

Director	Liang Cao		liang.cao@aol.com
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ACS Local Section
Silicon Valley

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