



THE IOTAN

Iota Sigma Pi National Honor Society for Women in Chemistry *Fall 2019 No. 116*

Nobel Laureate to Speak at 2020 ΙΣΠ Convention

2020 Invited National Honorary Member Awarded to Prof. Frances Arnold of California Institute of Technology



Professor Frances H. Arnold has accepted the *Invited National Honorary Member Award*. This award recognizes exceptional achievement in chemistry or an allied field that merits international recognition. This special award is the highest honor that Iota Sigma Pi awards to an outstanding female chemist and has previously been awarded to Marie Curie (1921), Gerti T. Cori (1949), and Dorothy Crowfoot Hodgkin (1966), all Nobel Laureates.

Frances H. Arnold is the Linus Pauling Professor of Chemical Engineering, Biochemistry, and Bioengineering at the California Institute of Technology. She also serves as the Director of the

Donna and Benjamin M. Rosen Bioengineering Center and the Biotechnology Leadership Predoctoral Training. Prof. Arnold pioneered the field of directed evolution of enzymes, research that earned her the 2018 Nobel Prize in Chemistry, making her the fifth woman to win the award. The evolved enzymes have catalyzed important reactions in the fields of medicine (diabetes drug Januvia®), neurobiology (MRI agents), chemical synthesis (plant sugars to jet fuel), and alternative energy (anaerobic biofuel synthesis). The widespread uses of these selectively evolved enzymes reveal not only the elegance of her directed evolution concept, but also demonstrate scalability and transition of science out of the laboratory, something that is of importance to Prof. Arnold. In addition to her groundbreaking work, Prof. Arnold also provides a research environment to unleash the creativity of young scientists, something that she views as a crucial and rewarding part of her career, and as such has mentored 250 young scientists to date.

Prof. Arnold has been invited to the 2020 Iota Sigma Pi Triennial Convention for a presentation to the delegates and to receive her award.

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ISΠ Professional Awards

2020 National Honorary Member: Prof. Vicki H. Grassian, University of California-San Diego

Prof. Vicki H. Grassian will receive the **2020 National Honorary Member**



Award. This award honors exceptional and significant achievement in chemistry or an allied field of such nature to merit international recognition. This award is the highest

honor that Iota Sigma Pi bestows on outstanding women chemists.

After a distinguished career at the University of Iowa, in 2013 Professor Grassian became Co-Director of the Center for Aerosol Impacts on Climate and the Environment (CAICE,) a multi-institutional NSF-Chemical Center of Innovation headquartered at the University of California San Diego (UC San Diego). In January 2016, she joined the faculty at UC San Diego as Distinguished Professor and currently holds the Distinguished Chair of Physical Chemistry. In August 2016, she was appointed Associate Dean of Physical Sciences and in January 2018 Executive Associate Dean of Physical Sciences.

Dr. Grassian's research spans physical, analytical, surface, materials and environmental chemistry. Her nominators said, "Her research focuses on the chemistry of environmental interfaces including indoor surfaces,

heterogeneous and multiphase aerosol chemistry, climate impacts of atmospheric aerosols, and environmental, energy and health aspects of nanoscience and nanotechnology. In particular, she has been a pioneer in laboratory studies of the reactivity and physicochemical properties of mineral dust and sea spray aerosols." "Her research has transformed several areas including atmospheric chemistry and climate impacts of particulate matter and the environmental and health impacts of nanoparticles. These studies provide the fundamental basis needed to understand the global impacts of mineral dust."

Professor Grassian is an innovative and dedicated teacher. In her distinguished career, she has mentored nearly two hundred students in her laboratory including thirty-two students who have received their PhDs under her guidance. In 2018, she received the ACS-CEI Award for Incorporation of Sustainability into Chemistry Education for her innovative work in education. She has mentored numerous women including junior faculty, postdocs and graduate and undergraduate students paving the way for woman chemists to follow in her successful career path.

As a member of several technical divisions of American Chemical Society (ACS) including Physical Chemistry, Colloid and Surface Chemistry, Environmental Chemistry and Geochemistry she has served in the governance of ACS, as well as providing leadership and vision. She also co-chaired the AWIS-ACS AWARDS Task Force. In this role, she worked to increase the number of women nominated and selected to receive national awards.

PRESIDENT'S MESSAGE**What's Happening
at the National Level?**

So many exciting things have been happening this past Summer! National Council has been working hard on the new Iota Sigma Pi website/database



and hope to launch it in the public domain soon! Many thanks to the members who served as beta testers and helped us understand the limitations and kinks in the new site. This new website will ultimately allow you to apply electronically for membership/upload supporting documents, pay dues, facilitate communication between National Council and members, buy merchandise, and network with members in a members-only section (log-in required). In the future, we also plan to have a place to share details on outreach activities, making it easier for all chapters to bring chemistry to their community. Behind the scenes, the website creates a safe and secure database, streamlining the workflow of many of the National Council Officer positions, which will ultimately enable these officers to use their time, talents, and connections to benefit Iota Sigma Pi in new ways.

The 33rd Convention of Iota Sigma Pi will be held in Irvine, CA in less than one year. I am so excited to be able to reconnect with Iotans I have met at Iota Sigma Pi Coffee Hours at ACS meetings and at past Conventions, and hope to meet many new Iotans too! This

Convention is hosted by the Ca chapter, making it extra special for me, as I was a founding member/President of the Ca chapter. We will also have the honor of hosting three Iota Sigma Pi National Triennial Award recipients:

Prof. Frances H. Arnold: Invited National Honorary Member Award of Iota Sigma Pi and Nobel Laureate

Dr. Vicki Grassian: National Honorary Member Award of Iota Sigma Pi and IUPAC Distinguished Woman in Chemistry Award

Dr. Debbie C. Crans: Violet Diller Award for Professional Excellence of Iota Sigma Pi and inaugural recipient of the Vanadis Award

In addition, the winners of the two annual professional awards will participate in a panel discussion.

I have thoroughly enjoyed serving as your President the last two years and am looking forward to working with each of you in this last year to make sure that membership in Iota Sigma Pi benefits you both professionally and personally. Please do not hesitate to contact me with any question or suggestion you may have regarding Iota Sigma Pi (meganbourg@gmail.com).

Megan Sassín
National President



Iota Sigma Pi
National Honor Society
for Women in Chemistry

MORE PROFESSIONAL AWARDS**2020 Violet Diller Award for Professional Excellence:
Prof. Debbie C. Crans
of Colorado State University**

The **Violet Diller Award for Professional Excellence** honors outstanding contributions to chemistry and allied fields by a woman. Nominees are judged on the significance of their accomplishments in academic, governmental, industrial chemistry, education, administration, or a combination of these areas.

Dr. Crans is currently Professor of Chemistry and Cell and Molecular Biology



at Colorado State University. She was named Professor Laureate of the College of Natural Sciences in 2015-2017. She and her research group are involved in

problems related to the mode of action of drugs for diseases such as tuberculosis, Alzheimer's, diabetes, and cancer. They have interests in a range of different drugs including organic drugs, and transition metal based drugs.

Her research group recently observed that vanadium compounds have enhancing effects on oncolytic viruses and can be used to treat cancer. This work represents an important application and shows Crans' ability to bring fundamental inorganic chemistry into other disciplines thus expanding the field of inorganic chemistry.

Dr. Crans' career is unique in combining three scientific disciplines. She is a leader in the area of vanadium chemistry (organic vanadium compounds) and biochemistry, in addition to inorganic chemistry. Her research contributions have been recognized by many awards. In 2018 she

was honored with the first Vanadis Award, presented to a researcher who has displayed innovative research and impacted Vanadium Science.

In addition to her own field of research, Debbie has been a great promoter of chemistry for the broader scientific community and has organized symposia for the Women Chemists Committee and Regional ACS meetings. In 2016, she organized the "Young Talent in Colorado and Beyond" symposium, involving more than 100 young untenured scientists from the neighboring states. She is a tireless advocate for young scientists and women, constantly championing deserving individuals for awards.

SHOP AND SUPPORT Iota Sigma Pi!

Iota Sigma Pi is now a participant in the Amazon Smile program. You can shop and support women in chemistry at the same time. To join Amazon Smile, go to: <https://smile.amazon.com/> and login using your regular Amazon password. Choose your charity as "Iota Sigma Pi National Council".

For current subscribers to Amazon Smile, use the direct link: <https://smile.amazon.com/ch/94-6093887> to change charity to Iota Sigma Pi. Then keep shopping, and Amazon will donate 0.5% of eligible purchases to us at NO cost to you. **Try it out today!**

PROFESSIONAL AWARDS

2019 Centennial Award: Prof. Maria Craig, Mary Baldwin University

The award is given for excellence in teaching chemistry, biochemistry, or a chemistry-related field.

Dr. Craig has been teaching at Mary Baldwin since 2008 and is currently department Chair. She has taught most of



the chemistry courses, but primarily organic chemistry and biochemistry, including both lectures and laboratories. Her nominator said, "Dr.

Craig is determined to help her students succeed. She never hesitates to explain concepts that students have trouble understanding, whether the subject at hand is about organic chemistry, biochemistry, or physical chemistry." The nomination included many similar comments from former students.

Dr. Craig also conducts undergraduate research and has mentored over 20 students. She is interested in studying a short protein molecule called LL37 which has been implicated in the onset of certain autoimmune diseases. This research has yielded both presentations and publications for the students and their professor.

Dr. Craig is a leader of the Argentum Chapter (Shenandoah Valley) of Iota Sigma Pi, serving as President in 2011-2014. She has a great influence on her students at a personal level, as illustrated by this quote:

"A phenomenal member of Iota Sigma Pi, Dr. Craig has strengthened me as a woman in chemistry by serving as one of my greatest role models. She discusses gender inequality in STEM and reassures her

students -- many of whom are female -- that they are competent, smart-working researchers. Moreover, Dr. Craig encourages activism in STEM and the importance of on-campus STEM awareness by actively participating in the student-led American Chemical Society club. By doing this, Dr. Craig is not only a teacher, but a friend that many students look up to and want to follow."

ISΠ Triennial Convention – Coming July 16–19, 2020

Things you need to know!

- Each active chapter sends a delegate to represent them and vote on business matters. Chapters that have more than 75 active members may send two delegates.
- The majority of the delegates' travel (up to \$450), lodging (double-occupancy), meals and registration expenses are paid by Iota Sigma Pi.
- Chapters may send alternate delegates but need to pay their expenses.
- Family members and other guests may also attend. They pay for the events that they attend.

See page 11 for more information.

PROFESSIONAL AWARDS

2019 Agnes Fay Morgan Research Award: Prof. Leslie Hicks, University of North Carolina–Chapel Hill

The *Agnes Fay Morgan Research Award* is given for research achievement to a woman chemist or biochemist not over forty years of age.

Dr. Hicks is currently an associate professor in the Department of Chemistry at the University of North Carolina–Chapel Hill (UNC–CH). Under Dr. Hicks' leadership, her research group has developed a new



method that allows one to screen and identify bioactive peptides that have antimicrobial or anti-cancer activity. The results of her research will

have a wide-ranging impact on fighting antibiotic resistance and developing new chemotherapeutic agents to target cancerous cells.

The other focus of Hicks' research is a long-standing problem in biofuels development: the decoupling of algal growth from biodiesel production. Hicks' skills and knowledge of mass spectrometry and proteomics have helped her group make significant contributions to solving this puzzle.

To date, she has co-authored 62 publications, which have collectively been cited almost 3,400 times — a testament to the importance of the science that she has produced so far. Dr. Hicks has been recognized nationally for her achievements

in chemistry — this is clearly evidenced by her numerous publications, awards and honors, and grants received.

Dr. Hicks nominators cited her personal qualities, as well as her research achievements, as reasons for her nomination. “In addition to publishing significant research for the advancement of anti-microbial agents, Dr. Hicks is committed to increasing opportunities for underrepresented students in science, including both women and minorities. She frequently invites undergraduate students to take on meaningful roles in ongoing research... She pairs significant research achievements in analytical chemistry with an unwavering dedication to student mentorship. Dr. Hicks uses her success to the benefit of graduate and undergraduate students alike, ensuring that underrepresented students are empowered to advance in science either by direct mentorship or through collaborations with other universities.”

NOMINATE FRIENDS AND STUDENTS FOR IΣΠ AWARDS!

Who will you nominate for 2020 awards?

The two annual professional awards and all the student awards will be given in 2020. The two **triennial** professional awards for 2020 have already been chosen.

**All nomination packets are due
February 15, 2020!**

IMMEDIATE PAST-PRESIDENT'S MESSAGE

Iota Sigma Pi - National Honor Society for Women in Chemistry is a non-profit organization that conducts business locally and nationally due in large part to members like you. Founded in 1902, it continues to serve as a platform to promote and raise awareness of issues for females in various stages of their journey in a STEM field. Girls are exposed to this organization through our various outreach programs such as Girl Scouts, National Chemistry week, our Speakers' Bureau, and judges supporting science fairs throughout the country.

If your journey began with us during your early days, such as participating in one of our numerous outreach events, having been recognized as an outstanding high school chemistry student and/or receiving a scholarship or grant for education or travel from our society, then you understand that this diverse group of women has carved out time in our busy lives for this cause. Why? I can't answer that for everyone, but I certainly think many of our members echo my own sentiments.

Why do I serve?

This is my 6th term serving on Iota Sigma Pi National Council (NC), equal to 17+ years and counting... I have served as the Coordinator of Initiates and Supplies and as Vice President and President of this organization. I am not unique, many of our NC members serve for double digit years. We lead reviews for our many awards and recognitions; we review our charter to make sure that it is still relevant at each triennial national convention, and we provide a wealth of resources from our experiences and careers in government, industry and academia. We do all of this because of our commitment to volunteerism for a cause that promotes interest in chemistry among women; fosters mutual advancement in academic, business and social life; and stimulates personal accomplishments in chemical fields. Each local chapter provides leadership opportunities to members to serve as officers. We would not be successful if we do not have strong local

leadership. At the national level, National Council coordinates and directs the operation of the society as a whole based on the local chapters' feedback. It is a symbiotic organization.

You can serve too!

Whether you join locally or nationally, your contribution matters. As the Immediate Past-President, I am currently seeking nominees for the 2020-2023 National Council. If you or someone you know have strong leadership skills and able to conduct business virtually, then please consider running for National Council. This is an excellent national leadership growth opportunity.

Additional information for each position can be found here:

<https://www.iotasigmapi.info/membership/for.ms.html> under "Rules and Regulations" link.

National Council consists of 13 members, 12 are elected positions:

1. National President
2. National Vice President
3. National Treasurer
4. National Secretary
5. National Editor
6. Director of Professional Awards
7. Director of Student Awards
8. Director of Members-at-Large
9. Coordinator of Initiates and Supplies
10. National Webmaster
11. National Records Chair
12. National Historian
13. National Immediate Past-President (not an elected position)

For further information or to nominate someone or yourself, please contact me at <Quynhgiao.N.Nguyen@NASA.gov>

Quynhgiao.N.Nguyen
Immediate Past President

ΙΣΠ Student Awards

2019 Anna Louise Hoffman Award for Outstanding Achievement in Graduate Research: Lauren Elizabeth VanGelder, University of Rochester

Starting at the State University of Buffalo (SUNY) (2011-2015) and continuing on at University of Rochester (2015-present), Lauren is completing her work in, “a new area of development for nonaqueous redox flow batteries---one that provides new insights into the capabilities of multimetallic charge carriers.” She has published seven



first-author manuscripts within the span of two years, on this important topic related to the “effective integration of renewable energy from intermittent sources such as solar and wind.” As a recipient of a **National Science Foundation Graduate Research Fellowship**, one nominator describes Lauren as “a total Rockstar” in the laboratory. The other states that “Lauren is fully equipped with expertise in organic, inorganic, and organometallic synthesis as well as electrochemistry, an impressively broad skillset.”

In the area of Teaching *and* Service, Lauren was a recipient of the **Walters Teaching Award**, which recognizes “outstanding undergraduate teaching by graduate student teaching assistants.” She is known to work extremely hard to prepare for teaching workshops and to make herself accessible to undergraduate students. Also, she has been actively involved in various “outreach” activities, such as, the Horizons Program and the Early Connections

Opportunity, which promotes increase in representation of underrepresented minorities in the STEM fields.

Lauren’s nominators described her as “a remarkably level-headed and grounded individual”, who represents a “complete package”. Last fall, she was named **the Outstanding Graduate Student**, at the University of Rochester.

2019 GLADYS ANDERSON EMERSON SCHOLARSHIP: Chloe A. Beardsley, Colorado State University

According to her personal statement, Chloe A. Beardsley aspires to pursue and share her passion for chemistry through teaching. Since she was 16, she has volunteered to lead, support, encourage and teach young women to be “strong, smart, and bold” through various summer programs. Chloe is a chemistry major in her third year at



Colorado State University, who is simultaneously pursuing teacher licensure in secondary education. As with many other chemistry majors, “she caught the science and chemistry bug from a dynamic teacher and wants to pass on the appreciation of how chemistry exists in all we do”.

Chloe’s involvement with research experience is impressive. At Colorado State University, she started and continues to pursue research focused on development of inexpensive, “microfluidic paper-based devices for detection of pesticide and heavy metals”. In addition to her work with the research group at the university, Chloe works to expand the technology to detect
(continued on page 10)

STUDENT AWARDS

2019 The Undergraduate Award for Excellence in Chemistry: Melisa Pasli, North Carolina State University.

In her personal statement, Melisa Pasli explained her unusual circumstance of moving back to her birth country, Turkey, from the United States when she was twelve years old. Although she is a Turkish-



American, she had to work hard to overcome difficulties with language skills, cultural differences, and unfamiliar circumstances during her secondary school years in Turkey. She described how she met the challenges

and gained the strength to grow and succeed academically. She is currently a senior, ranked as the Number One Student in her class, across all majors, at North Carolina State University (NCSU).

Melisa has devoted her time to several research projects both at NCSU and at Colorado School of Mines where she worked as an intern. Her research spans the areas of industrial chemical research as well as biomedical research.

The first research project she worked on at NCSU was "Ultrasonic Polymerization of Polyurethane" and the second, which is going into publication this year, is titled "Morphology of Electrospun Polyvinyl Alcohol/Polyvinyl Acetate Blends". In addition to these research projects, her internship at the Colorado School of Mines made her aware of the relationship between chemistry and medicine. The project titled "Polylactide Coated Hydroxyapatite Nanoparticles for Reinforced Biodegradable Polymer Scaffolds" has led to her interest in biomedical applications of chemistry.

Her nominators wrote about Melisa's determination, and maturity. Along with her academic excellence, Melisa is a teaching

assistant/tutor at NCSU, volunteers at the Duke Cancer Center, mentors young children at a Salvation Army homeless shelter and also works with Alzheimer patients at an assisted living center. Melisa is definitely a multi-talented, goal-oriented, yet very personable and inquisitive young woman.

She plans to continue to conduct biomedical research and has chosen the research project "Characterization of Collagen for Yarn Spinning" as her Senior Capstone

TREASURER'S MESSAGE

Did You Pay Your Dues This year?

It is now easier than ever to pay your Iota Sigma Pi dues using updated methods and multi-year options!

Annual dues can be paid anytime between January 1st and June 30th.

National Council has created an online dues form:

<https://goo.gl/forms/YJDJKF6cB86kEoHN2>
and dues can now be paid three different ways:

1. **PayPal** via the Iota Sigma Pi website: <http://iotasigmapi.info/membership/paydues.html>
2. **Venmo** to @ISPNationalCouncil
3. **Mail** a check payable to Iota Sigma Pi to:

Wynne Kandur

P.O. Box 75

Brentwood, MD 20722

Please contact our National Council Treasurer, Wynne Kandur (ispnctreasurer@gmail.com), if you have any questions!

STUDENT AWARDS

The 2019 Undergraduate Award for Excellence in Chemistry by a First Generation Student: Ashley Hoffmaster, Fairmont State University

In her personal statement, Ashley wrote about the challenge of being a first generation student. She also wrote about being “galvanized” when her problem-solving skills were pushed to their limits. She talked about joining “her first research group”, a collaborative team of professors, postdocs, undergraduate and graduate students at Fairmont State University (FSU) and West Virginia University (WVU), during her first year at FSU.



In addition to her three-page Personal Statement, three other nominators wrote multi-page, comprehensive letters of accolades including a list of manuscripts and presentations in which Ashley was prominently featured.

During her senior year at FSU, Ashley had the opportunity to work as a full-time intern for 10 months at the U.S. Naval Research Laboratory (NRL) in Washington D.C. Her then supervisor stated that “Ashley commuted 4 hours per day while working 40 hours a week at NRL and taking an online course through FSU”. Yet, she arrived every single day “eager to work and learn” and revealing a high level of commitment and professionalism.

Ashley took part as a lead experimentalist in two main projects during those 10 months. Her first project involved “solution processable conducting polymers for macroscale high-rate energy-storage

devices.” The second project dealt with the synthesis and characterization of carbon nanofoams, also for high-performance energy-storage devices. The titles of the manuscripts and the presentations represented a remarkable degree of collaboration and maturity.

In addition, two professors from FSU touted her integrity, excellence in communication and organization skills. They also mention her ability to work with and help other students.

Ashley is poised to pursue a PhD in Chemistry and Chemical Education.

Scholarship *(continued from page 18)*

metals in aqueous, soil and air samples, through a startup company founded by her professor.

Chloe is a recipient of multiple scholarships. She aims to further the role of women in science and is planning to form a chapter of Iota Sigma Pi in the Fort Collins area. She is also interested in networking across the Rocky Mountains.

IΣΠ Coffee Hour in San Diego



The Iota Sigma Pi Coffee Break August 27, 2019, during the ACS Fall Meeting in San Diego was well attended. Several members dropped by but we were unable to include all in our group picture. We had a very enjoyable time socializing and networking. Several members were able to obtain leads for future positions.

Attendees: Kathryn Louie (Np), Carol Duane (F), Elaine Yamaguchi (H), Mamie Moy (Np), Nabeelah Kauser (V), Andrea Rohrbacher (Ca), Jessica Maat (Ca), Patty Wiley (Pu), Mary Anderson (U). *Photo by John Osterhout*

MESSAGE FROM HOSTESS CHAPTER**Calcium Chapter to Host Triennial Convention**

Hello Iotans! We have exciting news for you. Here's our chemistry themed logo for the 2020 National Convention which represents mentoring, mutual advancement and collaboration among female scientists.



We will be hosting the **Triennial Convention** at The Embassy Suites by Hilton in **Irvine, California, July 16 – July 19, 2020**. The poster session is scheduled for the evening of 16th July, 2020. Preeta Pratakshya and Megan Newcomb are the chairwomen for the chapter (Calcium) planning the National Convention. We have also put together a schedule for the Convention with a comprehensive list of activities for professional development, networking and local outing options. The website for the convention is under construction and will be up soon. Keep checking the National website for updates: <https://www.iotasigmapi.info/>. We have our sponsorship letter ready and have started approaching local and national companies for fundraising. Do you know of a company that would be interested in supporting the convention? If so, feel free to contact us at ISPconvention2020@gmail.com. Stay tuned for further updates.

Calcium Chapter Convention Committee

ΣΠΙ MINI-GRANT PROGRAM

Did you know that each Chapter (including MAL) has the opportunity to receive one mini-grant per triennium to support a proposed activity? To find out more, go to our website's forms page (www.iotasigmapi.info/forms.htm) and click on "Minigrant Applications" for more details.

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