

# Chesapeake Chemist

Maryland Section  
American Chemical  
Society

Local Section Newsletter  
May 10, 2020

**SPECIAL ISSUE**  
**APRIL/MAY**

*Simple  
Nature of  
Chemical  
Bonds...*

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**“I CHOSE  
CHEMISTRY  
THE REST IS  
HISTORY”**

**CARLOS GUARDIA, PHD  
NIH RESEARCHER**



**ACS** Local Section  
Maryland

Volume 77 issue No.3

## Maryland Local Section Newsletter

Editor in chief: Beatrice Salazar

### Policy

Pumtiwitt McCarthy, Chair-2020  
Sarah Zimmerman, Web Master  
Jennifer Schmitt, Social Media Liaison

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## From the Editor: United in Spirit

The year 2020 pandemic continues challenging our lives. During this time of uncertainty, we have changed the way we approach our daily routine and the way we treat and communicate with others. My new routine includes long daily walks and volunteer activities.

The Chesapeake Chemist – one of my volunteer activities - will bring information on events as well as ACS members input on their careers. I want to encourage everyone to take advantage of this resource to share your research, the significance of your most recent published article, the love for your job, your experience at an ACS meeting. Simply: your thoughts in general. You can also send encouraging messages to young future chemists and senior scientists. Let us connect and flourish while remembering all that make us the happy people we are.

On this note, we are dedicating this special issue to young aspiring students seeking careers in chemistry or other related science areas. See:

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We could not have done this special April/May Issue Vol. 77 No. 3 without the collaboration of our authors and support of Dr. S. Narayan (Stevenson University) and Dr. P. Smith (UMBC) that suggested the authors' work . Thank you very much!

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*Beatrice Salazar*

## CHAIR'S MESSAGE



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Dear members,

The COVID-19 pandemic has had an unexpected and very real disruption to all our lives on many fronts. We hope that you and your families are staying safe and well. As a result of Maryland's stay at home orders, we have had to cancel/postpone many recent events. Our Student Awards Luncheon, which honors the top chemistry students from each institution in the Maryland section area and would have featured guest speaker Mike Adelstein, President and CEO of Potomac Photonics had to be cancelled. Also, during this event, the ACS Travel Awardees from the Spring ACS meeting would have showcased their posters. Two Earth Day events were also cancelled. Our very successful tour of the Montebello Water Filtration Plant-I and an event featuring Professor Lee Blaney from the Department of Chemical, Biochemical and Environmental Engineering, UMBC as a speaker scheduled to take place at Heavy Seas Taproom. We hope to be able to reschedule these events later. Our 50/60/70/80 Senior Luncheon has also been postponed until later in the Fall, dependent on public health conditions at that time.

A few things became virtual. Our April 15, Executive Committee Meeting was held successfully via Zoom. The US National Chemistry Olympiad went virtual this year and Executive Committee member Beatrice Salazar has an article about this on page 12. Please keep an eye out for future virtual events hosted by the section.

In closing, I would like to wish all of you safety and good health during these challenging times. ACS National has a [webpage](#) that outlines some initiatives and free resources during COVID-19.

Stay safe,

*Pumtiwitt McCarthy, Ph.D.*

# I Chose Chemistry – The Rest Is History

By Carlos Guardia, PhD  
Researcher at the National Institutes  
of Health (NIH),  
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**"THE EARLY  
ACKNOWLEDGMENT  
THAT I MIGHT BECOME A  
SCIENCE ENTHUSIAST  
WAS KEY FOR MY  
FUTURE CAREER  
DEVELOPMENT..."**

I may not be a sports person, but I do love the Olympic Games! I think it is because watching so much talent gathered in one place, doing their best is exciting: the elite athletes of our generation claiming their spot in history after years of training and sacrifice. For two weeks, the whole world seems to stop worrying too much and simply enjoys a good competition between countries in a safe and different arena than economics or politics. Perhaps it is because of the growing rumors that someone might set a new record or perform a unique routine, so unique that nobody has ever seen something like it before and we cannot wait to see it. But to be honest, I also think that it could be due to that sudden burst of empathy or pride that we get when a fellow compatriot wins or loses, especially because we come from the same place and culture, and understand the same chance of success and struggle, the same fight and hunger for victory, the same joy and frustration, seeking validation, the ultimate dream that we hope comes true. I may not be a sports person, but I can relate to those feelings. I was once an Olympic athlete... of Chemistry! A unique lifetime experience that early defined my career. Maybe that is why I love the Olympic Games after all.

**I** was born and raised a few miles outside Buenos Aires, Argentina. I come from a humble middle-class family where nobody talked about science. My parents did not have the chance to study after high school, though I'm pretty sure they would not have pursued a career in science, even if they had the opportunity. My sister liked economics and ended up studying International Business in college. Still, they all had to deal with a very curious kid, whose only pass-time "sport" was reading through the encyclopedia. I did like swimming during the summer, but there was something else that I enjoyed even more: spending time in the backyard, doing 'experiments' with whatever I could find from the kitchen or the laundry room.

The early acknowledgment that I might become a science enthusiast was key for my future career development, and some important life decisions to come. One of those was the decision about which high-school I should attend. In the early 2000's, the Argentinian economy collapsed and dragged my family into a difficult time. Moving from the best private school in town to a new public school was a tough choice for my parents to make, but it

turned out to be a blessing in disguise. It was there that I was first involuntarily faced with the "opportunity" of studying 'something different'. Back then, most of the schools had a particular curriculum orientation, and the most popular ones were related to economic or social studies. But you could still find some specialized schools, here often called technical schools, which resisted the erosion from the many different education system changes that my country tried, that still offered more industry-related orientations, and thankfully more STEM-heavy programs.

**BETWEEN  
ELECTRONICS,  
ARCHITECTURE AND  
CHEMISTRY, THE  
THREE PROGRAMS IN  
MY HIGH-SCHOOL, I  
CHOSE CHEMISTRY,  
AND THE REST IS  
HISTORY.**

My first year Inorganic Chemistry teacher Ms. Oieni saw the spark in me, so it was natural for her to invite me to the 'Olympics Club,' that she had been organizing by herself, to see if I was interested in some training and having fun solving extracurricular chemistry problems.

Every Saturday, when the school was closed, Ms. Oieni came to school with her whole family and offered her time and knowledge to prepare us for the National Chemistry Olympiad (OAQ, from the Spanish for Olimpiada Argentina de Química). Two tiny tables in the middle of the main hallway, a few chairs borrowed from Ms. Oieni's nearby office, 'mate and facturas' (our most popular yerba mate hot drink and sweet pastries), and a couple of giant chemistry books, all that we needed. I still remember the silent school inside and the sound of fall outside, while our brains got cooked by the stoichiometry, thermodynamics and atomic models training problems provided by the organizers of the OAQ.

In Argentina, the OAQ competition offers three different levels according to the three high-school grades that can participate, and three different stages of examinations: school, regional and national tests. Each one of these tests explores different topics, except the final test that could include a potpourri of everything evaluated before, plus additional special topics for the final round. What I did not know at the beginning of my participation in the OAQ was the existence of an extra top-level that everyone

wanted to achieve. The best national exams from the two high levels got a golden ticket for a special opportunity: training and selection for the national team that each year represented Argentina at the International Chemistry Olympiad (IChO).



**35th INTERNATIONAL  
CHEMISTRY OLYMPIAD**

**ATHENS, GREECE 5 - 14 JULY 2003**

*"Olive"*

Suddenly, not only was the school too big of a dream for me, but I would be competing against students from other parts of the country, and even more, from all over the world.

Test after test, I passed all the filters up to the national competition, where I did surprisingly well for my first trial, winning a gold medal at the basic level of the OAQ. It was the first time that my high school brought a medal in any Olympic games, so you can imagine the excitement and

happiness around. I was even highlighted in the local newspaper! But the pathway to success is not that linear since my next year competing was not nearly as fruitful. I was able to qualify for the national exam, but my score was not high enough for a medal. I knew that I had not studied enough, but I was also nervous to live up to the expectation from my previous year's performance. I was heartbroken and bitter tears were spilled, but I also felt happy knowing I was not there alone. I was with more professors and more students than before, who had joined the training club after the previous year's proven success. I felt that I helped put in motion something bigger than me, and, it was also a wake-up call. I now had only one last shot at the next year's competition. And it was just that. I did not only obtain the best regional exam, but I also won my second gold medal, which put me in the group of students to receive more training and a chance to compete internationally.

**T**he University of Buenos Aires is one of the best Universities in Latin America and is the Argentinian entity in charge of organizing the OAQ and coordinating the training of the candidates for the National Team.

In just a couple of very intense weeks, different professors and teaching assistants help you go through the [IChO' syllabus](#), but they also test you at each step while interacting with you. I learned so much content from the advanced classes that I felt as if I had already started studying for a degree in Chemistry. Thinking back, that time was very important for me, since most of the instructors would later become my professors, and the other students competing for a spot on the team would become classmates for the next 5 years, while pursuing my first degree in Chemistry. I am still in contact with several of those students and professors, nearly 20 years later. Training sessions, one after the other almost non-stop, and laboratory practical tests combined with impossible organic chemistry retrosynthesis problems, prepared me well enough to assure me a spot in the 2003 National Team, that later went on to compete in the 35<sup>th</sup> IChO, in Athens, Greece, just one year before the 2004 Summer Olympic Games in the same place where everything began. It was almost surreal.



Greek gold Medal for IChO



Olympia

Training sessions, one after the other almost non-stop and laboratory practical tests combined with impossible organic chemistry retrosynthesis problems, prepared me well enough to assure me a spot in the 2003 National Team, that later went on to compete in the 35<sup>th</sup> IChO, in Athens, Greece, just one year before the 2004 Summer Olympic Games in the same place where everything began. It was almost surreal. I was just 18 years old. I had never flown before, and suddenly I was crossing the Atlantic to measure up against the best students from all over the globe. It sounds terrifying, but in the end, it was an amazing experience. We had to share our sleeping rooms with the team from Venezuela, and last year I reconnected with one of those students, thanks to a colleague from work. We got to explore the culture, the food and the most famous places in the host city. But nothing is more memorable than the moment of the examination. With so many people in one room or laboratory, it felt like the real Olympic Games without the TV cameras. And there is the moment when your heart starts beating, the flag and familiar faces from the mentors that travel with you that make you feel proud being there, whatever the result. I achieved an Honorable Mention that felt like the best

souvenir that I could bring home, and that my parents keep in Argentina as if it was the brightest of the medals.

Years have passed and now, a cell biologist working at the National Institutes of Health (NIH), who pursued a PhD in Chemistry at the University of Buenos Aires, I look back, in a year where the 2020 Olympic Games were postponed for the recent world COVID-19 outbreak, and it is impossible not to feel the nostalgia of those great years. The memories of my time at my beloved University, where I trained and later helped train Olympic students of my own, where I helped organize some of the OAQs and stayed in touch with many of them, now science colleagues are strong. I felt that I needed to rewire this part of my past with my present and future. Now that I have a chance to live my life in America, I cannot wait for the moment to start sharing my science and my love for chemistry, and help all the local students of the DMV area to be a part of the US National Chemistry Olympics (USNCO) and experience the Olympics like a real athlete of science! If you feel like joining the USNCO program, you can always reach your science teachers and the organizers and I'm sure they will find a way to connect with you.

Visit the USNCO official webpage at

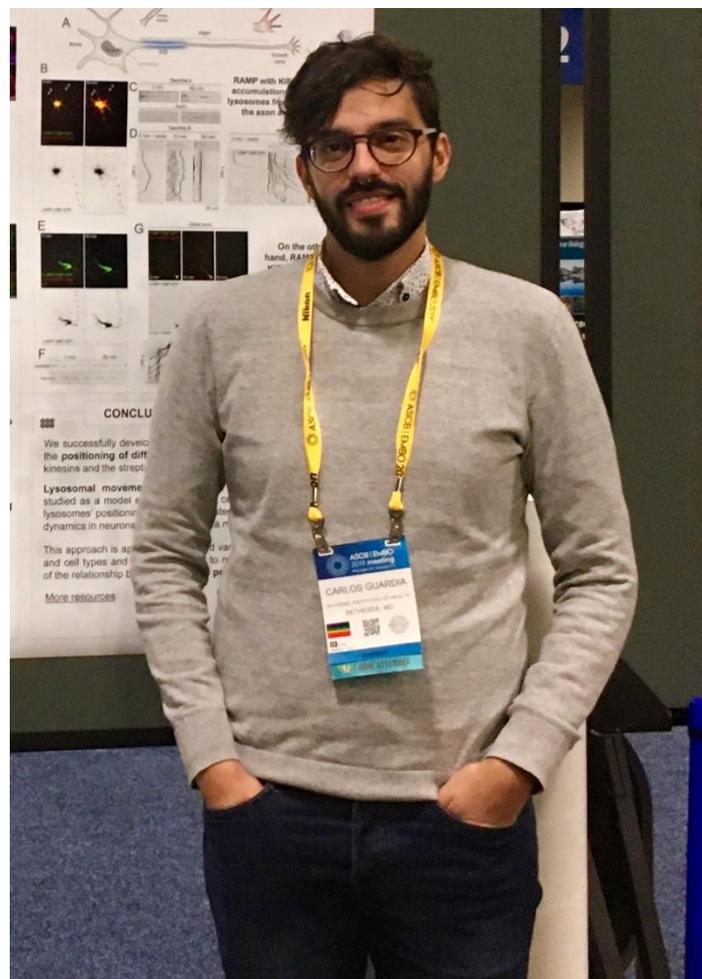


U.S. National Chemistry Olympiad

<https://www.acs.org/content/acs/en/education/students/highschool/olympiad.html> 8

## Carlos Guardia, PhD

I obtained my BS, MS and PhD in Chemistry from University of Buenos Aires, Argentina. Currently, I am a researcher at the National Institutes of Health (NIH), in Bethesda, Maryland in Dr. Juan Bonifacino's group since 2014. During my first years at NIH, I studied the key aspects of organelle (lysosomes and mitochondria) transport driven by motor molecules (kinesins and dynein), not only in non-polarized cells but also in neurons. Now, I am actively working on a novel approach for controlling the positioning of different organelles within the cell, using engineered kinesins that can reversibly detach from its cargo. With these tools, I am trying to understand the molecular mechanisms of intracellular traffic and provide insights into the neurodevelopmental disorders where these proteins have failed to work properly.



## Students from Argentina participating in the 35<sup>th</sup> IChO



*Argentina (Pablo Aberbuj, Matias David Galetti, Carlos Manuel Alberto Guardia, Eduardo Jose Rosaz)*

*"I look back, in a year where the 2020 Olympic Games were postponed for the recent world COVID-19 outbreak, and it is impossible not to feel the nostalgia of those great years."*

# Onwards with Hydrogen



For the Chesapeake Chemist I chose to write some verse  
 Now, I asked, then answered, me – "where do I begin?"  
 Why not choose the most abundant "stuff" in the Universe  
 Forget "dark matter" and "dark energy", here be hydrogen  
 I hope there be no reader's gripes for the simplicity  
 These chosen species serve as archetypes, at least for me,  
 Here be my poem for all readers, all types of chemistry  
 In industry, government, freelance, the academy  
 Let us start with one proton, alone, and one that is solvated  
 The reader need not be told that they differ, but are related  
 Here arise the concepts: proton affinity, pH, acidity and basicity  
 That solvation is strong, answers contradictory, who's wrong  
 But equating  $H^+$  and  $H_3O^+$  begins early, before the bachelor's degree  
 Long before the doctorate, there is the PhD.  
 Add one electron to  $H^+$ ; mentally, or why not add two?  
 Form free radical atomic H, form hydride  $H^-$ , hardly new  
 Here be unpaired electrons, electrophile and nucleophile  
 Concepts, essential, like ionization potential  
 Here be electron affinity, electronegativity, oh, how they can beguile  
 Turn now to  $H_2$  and bonds with 2-electrons apiece naturally appear  
 Form from species with electrons 0, 1 and 2, charges and lone pairs  
 The octet rule is taught to be inviolate, but there are exceptions given to it  
 Soon after are  $S_N1$  and  $S_N2$  reactions, mechanisms, and electron duet  
 Species like radical ion  $H_2^+$  and excited  $H_2^*$  are taught as part of  
 spectroscopy  
 The former written as  $H^+ + H \longleftrightarrow H + H^+$  (looks like resonance to me)  
 And/or use orbital language to write as  $\sigma_{1s}^1$  with only half a bond  
 Now what about  $H_2^-$  another ion radical wherein antibonding is found  
 But not this species unto itself, the "extra" electron is unbound  
 Consider now  $H_3^+$  a cation of high stability and triangular geometry  
 It has 3 protons and but 2 electrons, here be Hückel and aromaticity  
 $H_3^-$  and species with more hydrogens, these go beyond the curriculum  
 Should these be discussed as well – by now, the reader may be numb  
 And so I stop. Hmmm

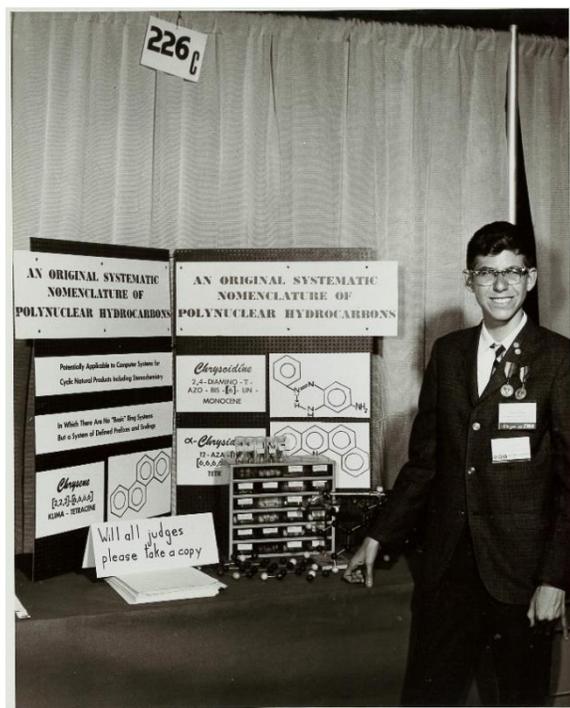
Joel F. Liebman

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## POET AND PROFESSOR

### Dr. Joel Liebman

Recipient of numerous Honors and Awards since high school



Presidential Research Professor at UMBC, 2006-2009, <https://facultystaffawards.umbc.edu/awards2006/> American Chemical Society – Slovenian Chemical Society International Activities Travel Award Associate, 2004, **Regents' Award for Excellence in Research, Scholarship and Creative Activity**- University System of Maryland, 2002, **Maryland Chemist of the Year**- Maryland Section, American Chemical Society, 1998 among others.

Professor Joel Liebman - Professor of chemistry and biochemistry –  
 Email: [jl Liebman@umbc.edu](mailto:jl Liebman@umbc.edu)  
 Ph.D. Princeton University 1970; M.S. Princeton University 1968; B.S. Brooklyn College 1967



## Professional Interests

My research is:

- **Interdisciplinary** - It overlaps computational/theory, organic chemistry and physical/inorganic chemistry.
- **It is international** - I have coauthored papers with other researchers from over 20 countries. [Coauthor](#) or coeditor of more than 25 books and special volumes. His CV and more than 80 of his selected research papers are listed at the following UMBC link <https://chemistry.umbc.edu/faculty/joel-liebman/>
- **It is eclectic** - It spans the periodic table as well as the gas and condensed phases. These studies involve the Interplay of molecular structure and energetics; chemical bonding theory; quantum chemistry and calorimetry; rules and regularities of chemical phenomena. We have investigated the energetics of neutrals and related ions; species stabilized by aromaticity and/or those destabilized by antiaromaticity and strained rings; compounds containing novel functionalities and their energetics. Not merely organic compounds, but also those of the nonmetals and metalloids, we have especially explored species containing fluorine, the noble gases and boron — we have generally been interested in exotic structures and corresponding energetics.

Links to enjoy: [Organic](#) - [Physical/Inorganic](#) - [Computational/Theory](#)

## USNCO:

# WHEN THERE IS A WILL THERE IS A WAY

By Beatrice Salazar

- **USNCO goes virtual due to COVID-19 restrictions**
- **Maryland Student, parents and teachers embrace learning and testing online**

This year, 2020, the U.S. National Chemistry Olympiad (USNCO) faced a challenge to administer the local and the national exams, due to the COVID-19 restrictions in schools. Students could not get together so the Maryland local section of the American Chemical Society Initiated the examinations online. We requested teachers to use the same system they use for online classes and provide students the opportunity to take the local exam. It worked! All teachers that registered students for the competition collaborated. The process began with few participants at the beginning and many more joined later when ACS offered the local exam online on April 23, 2020.

The results of the local exam were immediate, this allowed us to select very quickly 13 qualified students from Maryland for the US national exam. The same week on April 26th, 13 nominees (see their photos on page 17) took the National Exam with no problems at all. Students with qualifying scores moved to next level of the competition. We are proud to announce that **Maryland had one student in this group: Tomas Young Germanas, 11th grade, from Centennial High School, teacher - Robert Astri. Tomas was one of 150 top students in the United States. He took the USNCO exam Part-II representing the state of Maryland on May 3, 2020.**

We used ZOOM for the virtual exams. This is a free application that allows for virtual meetings up to 40 min. Thanks to the license provided by ACS we were able to extend the time for the length of the three exams 110 min (local exam), 110 min (national exam part-I) and 175 min (national exam part-II). Zoom allows video and audio for all students, so proctoring was as if we were in the classroom. It was exciting! all students had positive feedback about this experience.



13 Maryland students qualified for U.S. National Chemistry Olympiad



ACS prepares Local Sections' proctors for Part II of the U.S. National Chemistry Olympiad

## HISTORY CORNER...

# USNCO Makes History in 2020

ZOOM.COM



ICHO-ICHO

URL: <http://www.beatricesalazarusncocoordinator.webs.com>

### April 2020: USNCO goes virtual

Due to COVID-19 Restrictions, ACS decided to change the USNCO regular three parts national examination process of the 2020 Chemistry Olympiad. The new format included an online local examination, online national examination part-I and online national examination part-II. The laboratory practical was removed.

### 2018: USNCO's new location

New partnership with Community College of Baltimore County, CCBC



2011: **Joe Wan**, 11Gr - Wilde Lake HS -Teacher: Gail Shulman. Attended chemistry training camp along other 19 top chemistry USNCO participants nationwide (20/1300 from 2<sup>nd</sup> round) at USAF Academy in Colorado. 43<sup>rd</sup> IChO



2010: **USNCO's new Coordinator**, Beatrice Salazar, location: Notre Dame of MD U.

1997: **Joseph Comberiate**, 11Gr - Mount Saint Joseph HS -Baltimore, MD – Teacher: Bernard Kenyon. Attended chemistry training camp with other 18 top students nationwide

1997: **Alexander Ioannidis**, 10Gr – Bel Air HS -Bell-Air, MD – Teacher: Mary Fox. Attended chemistry training camp with other 18 top students nationwide (20/10k initial participants)

1997: **USNCO invitation to Paul Sarbanes Maryland Senator** to recognize two Maryland High school students and their teachers attending chemistry Training camp at the U.S. Air force Academy, Colorado Springs, CO

**1968:** ICHO started in the former Czechoslovakia. **1st IChO** June 18 - 21, 1968 in Prague  
Three teams of six pupils (four days!). Today, we have more than 70 teams, teams of 4 pupils

**1938: ACS is chartered by Congress**

**1876: ACS begins**

By Michael Zapf, PhD and Beatrice Salazar, E-in-C CCNL

## Biography



B.Sc. & M.Sc. (India),  
Ph.D. Cambridge Univ.,  
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# RAJI HEYROVSKA, Ph.D.

## **Research positions:**

IISc, Bangalore, India, Post-doctoral research (private research scientist) in Prague, Czech Republic, Visiting Research Scientist: Johns Hopkins Univ., Baltimore, Visiting Research Scholar: Chemical Heritage Foundation, Philadelphia; (present, Emeritus): Academy of Sciences of the Czech Republic.

## **Publications:**

About 200 scientific contributions and **15** on “women in science”, in: <http://www.jh-inst.cas.cz/~rheyrovs>

## **Selected recent “break-through” results:**

1. Solution chemistry: Complete restoration of “Arrhenius' theory of partial dissociation of strong electrolytes”.
2. Ground state energy of H: “Bohr radius,  $a_B = a_e + a_p =$  sum of the Golden sections pertaining to e & p”.
3. Bond lengths: “Additivity of atomic and ionic radii”;  $d(AA) = d(A^-) + d(A^+)$ ;  $d(A^-)/d(A^+) = \phi =$  Golden ratio
4. Structures of molecules: Atomic structures of many molecules established based on “additivity of radii”
5. Absolute electrode potential: “Absolute potential of the standard hydrogen electrode (SHE)” established.

## **Highest honors:**

1. Invited Plenary Lecturer: “Symposium Svante Arrhenius”, Uppsala, Sweden, 2003, commemorating the 100th Anniversary of the award of the Nobel Prize for chemistry to Arrhenius
2. Women's team leader: In four IUPAP conferences on Women in Physics, from 2002 - 2011

## **Lectures, seminars, etc. in conferences and institutions:**

In USA, Canada, UK, Europe, Japan and Asia.

## **Membership in scientific bodies:**

Electrochemical Society, USA; World Innovation Foundation, UK; International Advisory Board of Eurasia Chemistry Conferences; American Chemical Society, USA.

# Simple Nature of Chemical Bonds – Additivity of Radii of Adjacent Atoms and or Ions

By Raji Heyrovska, Ph.D.

Chemistry is an attractive science for students when they can use a simple hand calculator for explaining the observations rather than churn a frustrating bunch of parameters through a computer. In this article the author summarizes her novel findings over the years how the known bond lengths in small as well as large molecules are simply exact sums of the radii of the adjacent atoms and or ions. A collection of her main articles over the years from 2004 to 2017 can be found in [1a,b].

A new breakthrough was started in 2004 by expressing Bohr's equation for the ionization potential ( $I_E$ ) of the hydrogen atom as the difference between those of the electron ( $e^-$ ) and proton ( $p^+$ ). It was found that the ground state Bohr's radius ( $a_B$ ) is divided into two parts at the Golden point into the larger Golden section ( $a_e = a_B/\phi$ ) pertaining to the electron and the smaller Golden section ( $a_p = a_B\phi^2$ ), to the proton, where  $\phi$  is the Golden ratio found in many spontaneous creations in the Universe.

## Atomic detail of Formation of ClO and degradation of ozone.

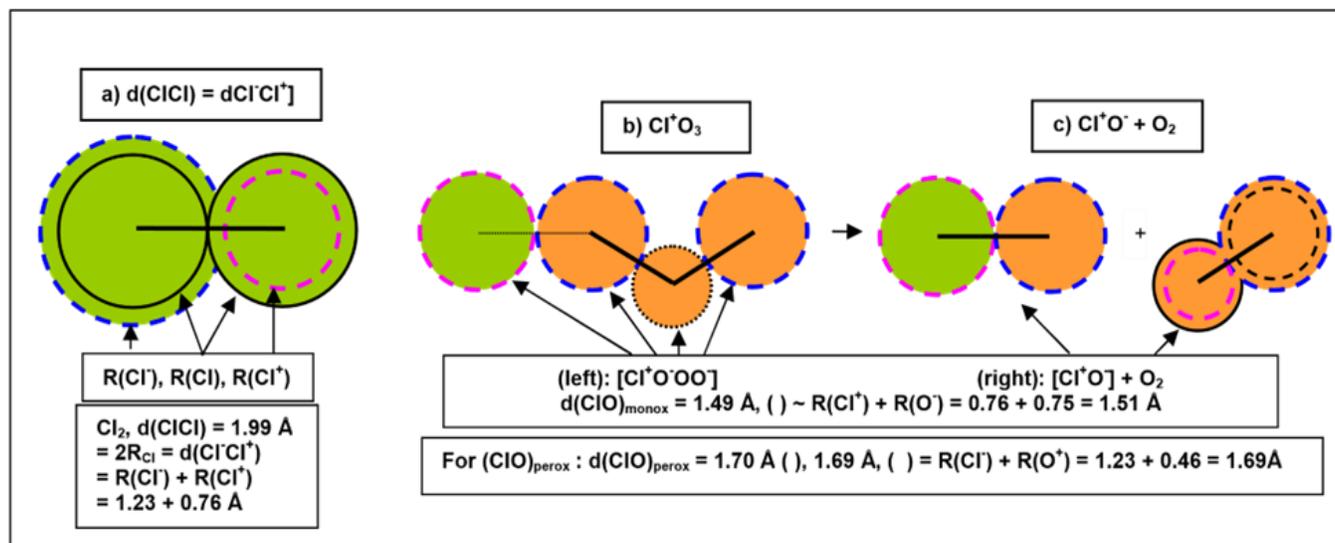


Fig.1. Formation of ClO and degradation of "ozone, [6]." a) the relative sizes of the Cl ion pair and covalent atomic radii; b) shows how the Cl+ attaches to O- of O3 and c) shows how Cl+O3 splits into Cl+O- and O2. All the radii and bond lengths are given in the figure.

It was found that in the case of the hydrogen molecule, the bond length,  $d(\text{HH}) = 2^{1/2}r_{\text{AB}} = R(\text{H}^+) + R(\text{H}^-)$ , where  $R(\text{H}^+) = d(\text{HH})/\phi^2$  and  $R(\text{H}^-) = d(\text{HH})/\phi$ , the Golden ratio based radii of the cation,  $\text{H}^+$  and anion,  $\text{H}^-$ , which are the ionic resonance forms of H as per Pauling [2].

Pauling mentions [2] that the interatomic distance in the molecule is the same as that between the ionic resonance forms, but he did not account for the exact radii of the ionic forms.

It was soon shown by the author that the bond length between any two atoms (A),  $d(\text{AA}) = R(\text{A}^+) + R(\text{A}^-)$ , the sum of the Golden ratio based radii of the cation,  $\text{A}^+$  and anion,  $\text{A}^-$ . The bond lengths in hydrogen halides, alkali hydrides and alkali halides were all found to be exact sums of the radii of the atomic and ionic radii as the case maybe, whether completely covalent or ionic or partially ionic. All the papers for various molecules, small and large, inorganic, organic and biological, are collected in [1a,b]. A talk on this subject with structures of molecules drawn to scale in color can be found in [3]. Further additions are in [4] and [5].

## References:

- [1] Heyrovská R (2017) Simple and Exact Additivity of Atomic and Ionic Radii in Various Types of Bonds in Small as Well as Large Molecules, a) <https://vixra.org/abs/1603.0199>  
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U.S. National  
Chemistry Olympiad  
Maryland

Maryland Local Section  
USNCO  
[www.acsmaryland.org](http://www.acsmaryland.org)

USNCO NOMINEES  
U.S. NATIONAL CHEMISTRY OLYMPIAD

CONGRATULATIONS!

\* Tomas Y. Germanas received Honors score in the US National Chemistry Olympiad part I. He was among the 150 top students in the United States who qualified for the US National Chemistry Olympiad part-II



**Colin T. Jones**  
Governor Thomas Johnson High School



**Sarah-Fatime Yoda**  
Saint John's Catholic Preparatory School



**Annie Liu\*\***  
Centennial High School



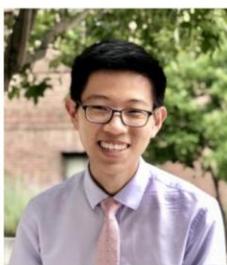
**Alana Frankel**  
Bethesda Chevy Chase High School



**Tomas Y. Germanas\***  
Centennial High School



**Alexander Oh**  
River Hill High School



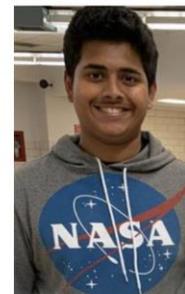
**Shuming Alan Mao**  
Towson High School



**Stuart Zhu**  
McDonogh High School



**Stone Jialei Li**  
Atholton High School



**Imaad A. Syed**  
North County High School



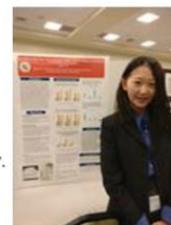
**Benjamin Schreyer**  
Bethesda Chevy Chase High S



**Alan Elbert**  
Mount Hebron High School

No photo available  
**Vedaant Shah**  
River Hill High School

\*\* Annie Lui has an interesting research presentation on Effect of Age... in Drosophila Metanogaster. We are looking forward to learn more about it!



**FOR IMMEDIATE  
RELEASE  
May 6, 2020**



For more information, contact  
Beatrice Salazar  
Immediate Past Chair ACS Maryland  
U.S. National Chemistry Olympiad  
Coordinator  
<mailto:beatricesalazar1@gmail.com>

## U.S. NATIONAL CHEMISTRY OLYMPIAD

### LOCAL STUDENTS WIN CHANCE TO QUALIFY FOR INTERNATIONAL CHEMISTRY OLYMPIAD, IChO

The Maryland Section of the American Chemical Society has announced the names of 13 outstanding high school chemistry students that moved forward to the second part of the chemistry competition. These students took a national exam that may qualify them to become members of the U.S. National Chemistry Olympiad Team that will compete in the 52<sup>nd</sup> International Chemistry Olympiad, IChO.

Due to recent COVID-19 restrictions all exams were administered online. This is the first year that virtual exams were offered. USNCO made history with this challenging and exciting process.

---

| Students              | High Schools                      | Teachers         |
|-----------------------|-----------------------------------|------------------|
| Tomas Young Germanas* | Centennial High School            | Robert Astri     |
| Annie Liu             | Centennial High School            | Robert Astri     |
| Colin Thanh Jones     | Governor Thomas Johnson HS        | Scott Rippeon    |
| Benjamin Schreyer     | Bethesda Chevy Chase HS           | Nurgul Balimptas |
| Alana Frankel         | Bethesda Chevy Chase HS           | Nurgul Balimptas |
| Stuart Zhu            | McDonogh School                   | Uriah Lee Shang  |
| Stone Jialei Li       | Atholton High School              | Beatrice Salazar |
| Shuming Alan Mao      | Towson High School                | Ronald Schneider |
| Alan Elbert           | Mount Hebron                      | Mary Ann Sankey  |
| Sarah-Fatime Yoda     | Saint John's Catholic Preparatory | Erin Smith       |
| Vedaant Shah          | River Hill HS                     | Kelly Wester     |
| Alexander Oh          | River Hill HS                     | Kelly Wester     |
| Imaad A. Syed         | North County High School          | Harold Covey     |

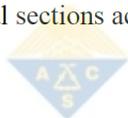
\*Top 150 USNCO Honors list

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The IChO involves a series of theoretical exams, laboratory exercises, and other activities aimed at identifying the best chemistry students from participating nations from around the world. The U.S. has participated in this event since 1984. Approximately 300 students represent more than 75 countries each year at IChO. [Members of the U.S. Team](#) won gold and Silver medals in Paris, France, [last year](#). This was another great performance in the history of the U.S. Team!

Our 13 local nominees are among over 1,200 nationwide that took a national qualifying exam April 26, 2020. Twenty finalists will be identified and will undergo two weeks of intensive training in June at the US Force Academy in Colorado Springs, Colorado. The top four students will be chosen to represent U.S. in the 52<sup>nd</sup> IChO competition.

The American Chemical Society was founded and chartered by Congress in 1876. It is a nonprofit scientific and educational organization dedicated to the advancement of chemistry in the public interest, serving about 160,000 members. The Maryland Section is one of 185 local sections across the nation serving more than 2,000 members.





- A physicist, a biologist and a chemist were going to the ocean for the first time. The physicist saw the ocean and was fascinated by the waves. He said he wanted to do some research on the fluid dynamics of the waves and walked into the ocean. Obviously, he was drowned and never returned. The biologist said he wanted to do research on the flora and fauna inside the ocean and walked inside the ocean. He, too, never returned. The chemist waited for a long time and afterwards, wrote the observation, "The physicist and the biologist are soluble in ocean water".
- Two hydrogen atoms bumped into each other recently. One said: "Why do you look so sad?" The other responded: "I lost an electron." Concerned, one asked "Are you sure?" The other replied "I'm positive."

Jokes from  
IChO Catalyzer Journal

## Acknowledgements

Special thanks to Local Section members Dr. Sara Narayan and Dr. Paul Smith for their suggestion to include articles by Raji Heyrovska, PhD and Professor Joel Liebman.



**We are one Chesapeake Chemist family.**  
**At this time of uncertainty, we are united in spirit.**  
**We are grateful by your acts of hope and**  
**your support with notes, poems, articles and encouragement.**

# REPORTS

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**2<sup>nd</sup> Executive Committee Meeting:** An official meeting took place online on April 15, 2020 using Pro ZOOM a free application provided by ACS. This new system for meetings is reliable and easy to use. It can accommodate up to 250 people at a meeting with "no" time limit. If any member needs to use it, please contact [Pumtiwitt McCarthy](#), 2020 Chair, ACS-Maryland.

## EVENTS CANCELLATIONS:

### APRIL:

- Special Earth Day Seminar: "The Environment is on Drugs!" [Professor Lee Blaney](#) Department of Chemical, Biochemical and Environmental Engineering, UMBC
- Chemist
- Celebrate Earth Day: Tour of the Montebello Water Filtration Plant
- [Student Awards Ceremony](#)

### MAY:

- Chemistry in the Library: all year events
- Braude Award: The George L. Braude Award, presented at the October meeting, Nominations will be accepted May 1, 2020 to May 31, 2020  
<https://acsmaryland.org/braude-award/>Contact: Louise Hellwig at [louise.hellwig@morgan.edu](mailto:louise.hellwig@morgan.edu)

### JUNE:

- [Senior Awards Ceremony](#)

## 2020 ADMINISTRATION OFFICERS

### 2020 SECTION OFFICERS

Chair 2020..... Pumtiwitt McCarthy, Morgan State University, [pumtiwitt.mccarthy@morgan.edu](mailto:pumtiwitt.mccarthy@morgan.edu)  
 Vice-Chair 2020..... Eric C. Cotton, Community College, of Baltimore County, [ccotton2@ccbcmd.edu](mailto:ccotton2@ccbcmd.edu)  
 Chair-Elect (Chair 2022).... Sarah Zimmerman, Web Master, Chair of Member Assistance Committee [scatzim@gmail.com](mailto:scatzim@gmail.com)  
 Secretary 2020..... Louise Hellwig, Morgan State University, [louise.hellwig@morgan.edu](mailto:louise.hellwig@morgan.edu)  
 Treasurer 2020..... Angela Sherman, Notre Dame of Maryland University, [asherman@ndm.edu](mailto:asherman@ndm.edu)  
 Past Chair (2019)..... Dana Ferraris, McDaniel College, [dferraris@mcdaniel.edu](mailto:dferraris@mcdaniel.edu)

### 2020 SECTION COMMITTEE ON NOMINATIONS and ELECTIONS

Chair of the Committee on Nominations..... James Saunders, [jsaunders@towson.edu](mailto:jsaunders@towson.edu)  
 Additional 4 members: ..... Dana Ferraris, Chair-2019, [dferraris@mcdaniel.edu](mailto:dferraris@mcdaniel.edu)  
 ..... Pumtiwitt McCarthy, Vice Chair-2019, [pumtiwitt.mccarthy@morgan.edu](mailto:pumtiwitt.mccarthy@morgan.edu)  
 ..... Beatrice Salazar, Chair-2018, [beatricesalazar1@gmail.com](mailto:beatricesalazar1@gmail.com)  
 ..... Sara Narayan, Stevenson University, [SNARAYAN@stevenson.edu](mailto:SNARAYAN@stevenson.edu)

### COUNCILORS/COMMITTEES

- 2020-2022 Kelly Elkins Member of the ACS Ethics Committee, [Kmelkins@towson.edu](mailto:Kmelkins@towson.edu)
- 2018-2020 Dana Ferraris Chair of the Section Program Committee (McDaniel College), [dferraris@mcdaniel.edu](mailto:dferraris@mcdaniel.edu)
- 2018-2020 Jan Kolakowski Member of the ACS Committee on Technician Affairs, CTA [jek6042@gmail.com](mailto:jek6042@gmail.com)
- 2018-2020 Stephanie Watson ACS Committee on Committees member (ConC) NIST), [stephanie.watson@nist.gov](mailto:stephanie.watson@nist.gov)

### ALTERNATE COUNCILORS/COMMITTEES

- 2020-2022 Paul Smith Member of ACS Local Section Activities(LSAC) Committee, [pjsmith@umbc.edu](mailto:pjsmith@umbc.edu)
- 2020-2022 Pumtiwitt McCarthy Chair of Publicity Committee, [pumtiwitt.mccarthy@morgan.edu](mailto:pumtiwitt.mccarthy@morgan.edu)
- 2018-2020 Michele Foss Committee TBA, [foss.michele@gmail.com](mailto:foss.michele@gmail.com)
- 2018-2020 Sarah Zimmerman Web Master, Chair of Member Assistance Committee,\* [scatzim@gmail.com](mailto:scatzim@gmail.com)

### MEMBERS-AT-LARGE

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- James Saunders, [jsaunders@towson.edu](mailto:jsaunders@towson.edu)
- George Farrant, [gfarrant@yahoo.com](mailto:gfarrant@yahoo.com)
- Rose A. Pesce-Rodriguez, [rose.a.pesce-rodriquez.civ@mail.mil](mailto:rose.a.pesce-rodriquez.civ@mail.mil)
- Sara Narayan, Stevenson University, [SNARAYAN@stevenson.edu](mailto:SNARAYAN@stevenson.edu)

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**Social Media Liaison**..... Jennifer Schmitt, [Jen@rapafusyn.com](mailto:Jen@rapafusyn.com)

**CONTACT US:** [acsmarylandsection10@gmail.com](mailto:acsmarylandsection10@gmail.com)

## OTHER MEMBERS OF THE MARYLAND LOCAL SECTION EXECUTIVE COMMITTEE

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Suzanne Procell, Edgewood Chemical Biological Center, [suzanne.a.procell.civ@mail.mil](mailto:suzanne.a.procell.civ@mail.mil)

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Michael Zapf, [MZapf@towson.edu](mailto:MZapf@towson.edu)

# HOW COULD WE IMPROVE PARTICIPATION?

### Analysis

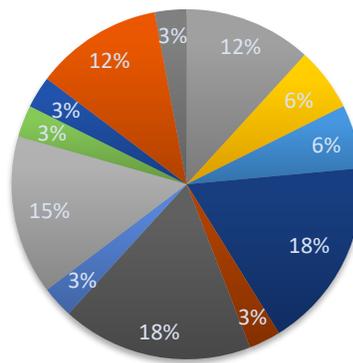
## 2020

**18 High Schools**  
Registered for  
The USNCO local  
Competition  
**72 students**  
registered and  
59 students took  
the exam

The Impact of  
COVID-19!

**13 students**  
nominate for  
US National  
Chemistry  
Olympiad

### U.S. National Chemistry Olympiad Participants and Schools



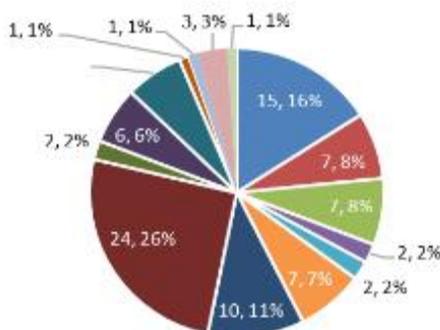
- |                            |                           |                                   |
|----------------------------|---------------------------|-----------------------------------|
| ■ Marriotts HS             | ■ Overlea HS              | ■ Mount Hebron HS                 |
| ■ North County HS          | ■ Cenntenial HS           | ■ Baltimore Polytechnic Institute |
| ■ Riverhill HS             | ■ Towson HS               | ■ Eastern Tech. HS                |
| ■ Gilman HS                | ■ Richard Montgomery HS   | ■ Marriott's Ridge HS             |
| ■ Loyola Blakefield School | ■ Bethesda Chevy Chase HS | ■ McDonogh HS                     |
| ■ Francis Scott Key HS     | ■ Long Reach HS           | ■ Atholton HS                     |

### Analysis

## 2019

**15 High Schools**  
Registered for  
The USNCO local  
Competition  
**105 students**  
took the exam  
**13 students**  
nominate for  
USNCO

### ACS Local Section Maryland U.S. National Chemistry Olympiad Local Competition 2019 STUDENT PARTICIPATION PER SCHOOL



- |                      |                                   |                     |
|----------------------|-----------------------------------|---------------------|
| ■ Richard Montgomery | ■ Gilman                          | ■ Mount Hebron      |
| ■ Towson             | ■ Marriott's                      | ■ River Hill        |
| ■ Eastern Technical  | ■ Baltimore Polytechnic Institute | ■ McDonogh School   |
| ■ Loyola Blakefield  | ■ Bethesda Chevy Chase            | ■ Francis Scott Key |
| ■ Atholton           | ■ Long Reach                      | ■ Cenntenial        |

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- **Contacting the National ACS membership division: 800-333-9511 (US only) or [service@acs.org](mailto:service@acs.org)**

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