



United States National Chemistry Olympiad

36th Summary Report



2019



***Congratulations and thank you for the successful
2019 USNCO program!***

U.S. NATIONAL CHEMISTRY OLYMPIAD

36th SUMMARY REPORT

2019

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2019 CHEMISTRY OLYMPIAD COMPETITION



L-R: E. Jin, A. Ni, Y. Ravan and A. Liu at 51st IChO in Paris.

Photo by M. Barranger-Mathys

The 51st International Chemistry Olympiad (IChO) was held in Paris, France July 21-30, 2019 and gathered 309 students from 80 countries that participated in the competition. The USA Team earned three gold and one silver medals.

The American Chemical Society (ACS), the Chemours Company and other donors supported the participation of the U.S. Alpha Mu team. **Yajvan Ravan** from Churchill High School, MI (Detroit Local Section), **Anton Ni** of University High School, CA (Orange County Local Section), and **Edward Jin** from Arnold O. Beckman High School, CA (Orange Count Local Section) earned gold medals and **Albert Liu** of North Hollywood High School, CA (Southern California Local Section) won a silver medal. The students placed 19th, 28th, 30th and 59th respectively in the general ranking of the competition.

Approximately 16,000 students from more than 1,300 high schools representing 152 ACS local sections participated in the U.S. National Chemistry Olympiad (USNCO) local competition. 1017 of these students representing 143 ACS Local Sections took the USNCO national exam to compete for a spot on the international team. The test consisted of three parts: sixty multiple-choice questions, eight complex problems, and two laboratory practical exercises.

Twenty students who excelled on the national examination participated in a 12 day chemistry study camp at the University of Maryland College Park in Maryland. Students received training in various major areas of chemistry by faculty of the University of Maryland College Park, Department of Chemistry and Biochemistry, and Georgetown University, Department of Chemistry; and from mentors **Patrick Chan** (chemistry teacher, Benjamin Cardozo High School,

NY), **Tomislav Pintauer** (chemistry professor, Duquesne University, PA), and **Melissa Barranger-Mathys** (chemistry professor, Ursuline College, OH). Peer mentor **Derek Wang** (chemistry masters' student, Oxford University, UK) assisted the mentors in training the students. In addition to lectures, labs and training, students participated in career programming and had a tour of UMD laboratories and campus. Ms. Barbara Haviland Minor from the Chemours Company was keynote speaker at the banquet for the students and invited guests. At the conclusion of the camp, the members of the U.S. team and two alternates were selected based on a combination of results of tests and laboratory exercises. The 2019 alternates were **Allen Ding**, Stevenson High School, IL (Chicago Local Section) and **Yannik Singh**, Carmel High School, IN (Indiana Local Section).



Team Alpha Mu with Ms. B. Haviland Minor from Chemours Company at the USNCO Banquet
Photo P. Cutts Photography/ACS

The U.S. delegation arrived in Paris on July 20th to give students some time to adjust to a different time zone and rest. The next morning the team officially registered for the competition and the students met their French guide, Yohan Fis, and were separated from the mentors. Students stayed at the Centre International de Séjour Kellermann youth hostel in Paris, and the mentors stayed in Cité Internationale Universitaire de Paris.

The 51st IChO started with an opening ceremony held on July 22nd at Maison de la Chimie in Paris. The ceremony was formally opened by the French Minister of Education Jean-Michel Blanque. 2016 Nobel laureate Jean-Pierre Sauvage delivered his welcoming remarks and I-Jy Chang, Chair of the IChO Steering Committee officially declared IChO 2019 to be open. In the afternoon students visited the Louvre museum and Tuileries gardens.

Students participated in the five-hour laboratory practical and theoretical examination at the Pierre Gilles de Gennes High School in Paris. When not taking exams, students spent time together with members of the other teams and visited various attractions and historic sites including a guided tour of Versailles Palace and its gardens, Palais de la Découverte and la Cité des Sciences et de l'Industrie. The teams reunited with their mentors during a party on July 26th.

The IChO concluded on July 29, with the presentation of medals at the closing ceremony at the Maison de la Chimie, followed by a banquet to celebrate the accomplishments of all the students.

The success of the 2019 USNCO is reflected by the participation of over 16,000 students, the extraordinary accomplishments of the U.S. team at the 51st IChO, and the building of friendships between students across the globe who share the same interest and passion for chemistry.

The American Chemical Society views the USNCO program as an investment in the future of young chemists in this country. The goals of the program are to:

- *stimulate young people to achieve excellence in chemistry;*
- *recognize outstanding chemistry students and, by doing so, encourage additional learning at a formative time in their intellectual development;*
- *recognize the excellent achievement of the teachers of these students and the importance of the school environment in which they learn;*
- *promote contact between ACS local sections and area schools and foster the interest and influence of professional chemists in the teaching of chemistry;*
- *challenge the chemical knowledge and skills of young students in an international arena; and,*
- *foster cross-cultural experiences and acquaint students with similarities and differences between themselves and their counterparts in other nations.*

Since 1984, the USNCO program has been sponsored by the Donald F. and Mildred Topp Othmer Chemistry Olympiad Endowment.

The following corporations supported the program through financial support and in-kind donations:

- | | |
|---|--|
| • The Chemours Company
Student housing, t-shirts and backpacks
and other expenses for study camp
participants | • John Wiley & Sons
Biochemistry, Organic textbooks |
| • Carolina Biological Supply and Company
Laboratory supplies | • Macmillan Learning
Analytical chemistry textbooks |
| • Fisher Science Education
Laboratory coats and supplies | • Pearson Education Company
Physical chemistry textbooks |
| | • Texas Instruments Inc.
Scientific calculators |

The ACS USNCO staff appreciates the dedication, enthusiasm, and contribution of time given by:

- The 2019 members of the USNCO Subcommittee of the Society Committee on Education, which provided policy direction for this program,
- The members of the USNCO examinations task forces, the grading team, and the mentor selection task force,
- The staff and faculty of the Department of Chemistry and Biochemistry of UMD College Park and Georgetown University, and
- The mentors and peer mentor who taught and guided the 2019 Alpha Mu Team.

Thank you!



Students working in laboratory *Photo by P. Cutts Photography/ACS*

PARTICIPATING ACS LOCAL SECTIONS

Local Section (YP**)

1. Akron (25)
2. Alabama (28)
3. Ames (26)
4. Baton Rouge (35)
5. Binghamton (33)
6. Brazosport (8)
7. California (36)
8. California Los Padres (21)
9. Carolina-Piedmont (22)
10. Central Arizona (32)
11. Central Arkansas (36)
12. Central Massachusetts (13)
13. Central New Mexico (34)
14. Central New York (34)
15. Central Pennsylvania (33)
16. Central Texas (34)
17. Central Wisconsin (28)
18. Chattanooga (33)
19. Chemical Soc. of Wash. (36)
20. Chicago (36)
21. Cincinnati (35)
22. Cleveland (33)
23. Colorado (36)
24. Columbus (34)
25. Connecticut Valley (36)
26. Dallas-Fort Worth (29)
27. Dayton (33)
28. Delaware (35)
29. Detroit (35)
30. East Central Illinois (5)
31. East Tennessee (30)
32. *East Texas (26)
33. Eastern New York (34)
34. Eastern North Carolina (28)
35. Erie (34)
36. Florida (29)
37. Georgia (30)
38. Greater Houston (35)
39. Green Mountain (21)
40. Hampton Roads (35)
41. Hawaii (35)
42. Hong Kong Int. Chapter (9)
43. Huron Valley (26)
44. Idaho (34)
45. Illinois-Heartland (30)
46. Illinois-Iowa (31)
47. Indiana (36)
48. Inland Northwest (12)
49. Iowa (30)
50. Jacksonville (34)
51. Joliet (34)
52. Kanawha Valley (24)
53. Kansas City (35)
54. Kansas State University (14)
55. LaCrosse Winona (19)
56. Lehigh Valley (32)
57. Lexington (12)
58. Louisville (22)
59. Maine (32)
60. Mark Twain (31)
61. Maryland (31)

Coordinator

Carol Shreiner
Shirley Ginwright
Terry Kruse
Lawrence Wilkinson
Alexsandra Silva
Yifan Dong
Eileen Nottoli
Stephen Contakes
Tim Champion
Richard Bauer
Marian Douglas
Jeremy Andreatta
Jacqueline Veauthier
Neal Abrams
Tod McPherson
Diane Kneeland
Dana Haagenon
Rebecca Stimson
Regina Cody
R. Kohnken/D. Crumrine
Susan Marine
Anne O'Connor
Lisa Johnson
Mary Wahba
Edward Fitzgerald
Kathleen Holley
Weijie Lu
Glenn Hartman
Mark DeCamp
Kyle Shelton
Al Hazari
Greg Hogan
Eric Davenport
Stephen Gabriel
Christine Saber
Stephanie Dillon
Heather Abbott-Lyon
Jerry Yang
Marie Agan
Suely Black
Pamela Fujinaka
David Lee Phillips
Larry Kolopajlo
Rene Rodriguez
Shanna McDaniels
Bradley Sturgeon
J. Huang/ R. Pribush
Thomas Flanagan
Leonard MacGillivray
Michael Lufaso
Thomas Rickhoff
Michael Fultz
Innocent Pumure
Tendai Gadzikwa
Basudeb Bhattacharyya
Kathleen Herrera
Meghan Knapp
J. Tatera/ K. Muller
James Killarney
Scott Luaders
Beatrice Salazar

Local Section (YP**)

62. Memphis (34)
63. Michigan State University (34)
64. Mid-Hudson (35)
65. Midland (34)
66. Milwaukee (33)
67. Minnesota (36)
68. Mississippi (25)
69. MO-KAN-OK (19)
70. Mobile (35)
71. Mojave Desert (10)
72. Montana (35)
73. Nashville (32)
74. Nebraska (6)
75. New Haven (33)
76. New York (36)
77. North Alabama (33)
78. North Carolina (33)
79. North Jersey (36)
80. *Northeast Wisconsin (35)
81. Northeastern (36)
82. Northeastern Indiana (31)
83. Northeastern Ohio (17)
84. Northern New York (13)
85. Northern Oklahoma (34)
86. Northern West Virginia (33)
87. Oklahoma (36)
88. Ole Miss (18)
89. Omaha (12)
90. Orange County (35)
91. Orlando (27)
92. Ozark (33)
93. *Panhandle Plains (14)
94. Penn-Ohio Border (34)
95. Pensacola (35)
96. Philadelphia (35)
97. Pittsburgh (36)
98. Portland (34)
99. Princeton (24)
100. Puerto Rico (28)
101. Puget Sound (28)
102. Purdue (12)
103. Rhode Island (24)
104. Rio Grande Valley (16)
105. Rochester (33)
106. Rock River (36)
107. Sabine-Neches (19)
108. Sacramento (29)
109. Salt Lake (36)
110. San Antonio (34)
111. San Diego (35)
112. San Gorgonio (35)
113. Savannah River (34)
114. Shanghai Int. Chapter (6)
115. Sierra Nevada (17)
116. Silicon Valley (33)
117. Snake River (11)
118. South Carolina (32)
119. South Florida (27)
120. South Korea Int. Chapter (3)
121. *South Plains (19)
122. South Texas (26)

Coordinator

Dennis Merat
Virginia Cangelosi
Lynn Maelia
Michael Tulchinsky
Scott Barry
Roberta Naujok
Reid Bishop
Dilip Paul
Jessica Owens
Tahira Mohammed
Carol Pleninger
Amanda Carroll
Martha Morton
Olivier Nicaise
Stephen Goldberg
Bernhard Vogler
Michael Bruno
Steven Chen
Andrew Schweitzer
Steve Lantos
Vicki Moravec
Richard West
Jim Burdick
Keith Lawson
Harry Finklea
Reza Latifi
Jason Ritchie
Edmund Tisko
Brent Shenton
Mary Roslonowski
Madhuri Manapadi
Greg McGovern
Michael Serra
Tanay Kesharwani
Craig McClure
Ericka Huston
Nick Hamel
Danielle Jacobs
Myrna Otano-Vega
Clarita Bhat
Beatriz Cisneros
Elaine Magyar
Erik Yukl
Alexey Ignatchenko
Matthew Bork
Lloyd Crosby
Makoto Masuno
Michelle Paustenbaugh
E. Robert Fanick
Joan Shellinger
Dennis Pederson
Monty Fetterolf
Jiang Peng
Sean Casey
Sally Peters
Marian DeWane
Amy Rogers
Venkatesh Shanbhag
Chang Gi Cho
Robert Long
Ludivina Avila

PARTICIPATING ACS LOCAL SECTIONS

<u>Local Section (YP**)</u>	<u>Coordinator</u>	<u>Local Section (YP**)</u>	<u>Coordinator</u>
123. Southeastern Pennsylvania (35)	Todd Trout	138. Tulsa (32)	Patrick Idwasi
124. Southern Arizona (17)	Iman Daryaei	139. University of Missouri (24)	Donald Wycoff
125. Southern California (36)	Gerald Delker	140. *Virginia Blue Ridge (17)	Kimberly Lane
126. Southern Illinois (26)	Gary Kinsel	141. Virginia (35)	Ann Sullivan
127. Southern Indiana (4)	James Clark	142. Wabash Valley (32)	Edward Mottel
128. Southern Nevada (34)	Mark Garner	143. Wakarusa Valley (9)	Lisa Sharpe Elles
129. *Southwest Georgia (33)	Alexandrina Focsan	144. Washington-Idaho Border (8)	Kristopher Waynant
130. St. Joseph Valley (34)	Diane Bowersox	145. Western Carolinas (31)	George Heard
131. St. Louis (36)	Harold Harris	146. Western Connecticut (35)	Linda Farber
132. Susquehanna Valley (33)	Patrick Martino	147. Western Maryland (29)	James Stickler
133. *Taiwan Int. Chapter (3)	I-Jy Chang	148. Western New York (34)	Mariusz Kozik
134. Tampa Bay (14)	Eric Ballard	149. Wichita (26)	Norman Schmidt
135. Texas A & M (11)	Stephanie McCartney	150. Wichita Falls-Duncan (30)	Jianguo Shao
136. Toledo (24)	Somnath Dutta	151. Wisconsin (15)	Matt Bowman
137. Trenton (35)	Danielle Jacobs	152. Wooster(25)	Steven Boyer

* Participated in the local section competition but not the National Exam

** YP-Number of years participating in the USNCO

Congratulations to the ACS Georgia Local Section for winning the 2019 ChemLuminary Award for its outstanding 2018 program.



Ajay Mallia and Cheryl Trusty receiving a ChemLuminary award for the Georgia Local Section *Photo by P. Cutts Photography/ACS*

USNCO STUDY CAMP PARTICIPANTS

<u>STUDENT/GRAD. YEAR</u>	<u>SCHOOL/TEACHER</u>	<u>LS/COORDINATOR</u>
Ridings Bald 2020	The Westminster Schools, GA Juliet Allan	Georgia Heather Abbott-Lyon
Jenny Cai 2020	Park Tudor School, IN Jessica Hollenbeck	Indiana Jianping Huang/Robert Pribush
Anugrah Chemparathy 2020	Dougherty Valley High School, CA Ethan Schnell	California Eileen Nottoli
Allen Ding 2020	Stevenson High School, IL Kevin Crowe	Chicago Russell Kohnken/David Crumrine
Andrew Feng 2020	Canyon Crest Academy, CA Kaveh Shakeri	San Diego Joan Schellinger
Michael Han 2020	Dougherty Valley High School, CA Ethan Schnell	California Eileen Nottoli
Edward Jin 2019	Arnold O. Beckman High School, CA Michael Tran	Orange County Brent Shenton
Alex Li 2021	Lexington High School, MA Laura Ferrari	Northeastern Steve Lantos
Albert Liu 2019	North Hollywood High School, CA Altair Maine	Southern California Gerald Delker
Anton Ni 2019	University High School, CA Nicholas Brighton	Orange County Brent Shenton
Yajvan Ravan 2021	Churchill High School, MI Robert Upton	Detroit Mark DeCamp
Ananthan Sadagopan 2021	Westborough High School, MA Michelle Wynn	Central Massachusetts Jeremy Andreatta
Yannik Singh 2020	Carmel High School, IN Jennifer Drudge	Indiana Jianping Huang/Robert Pribush
Nicholas Tsao 2020	St. Mark's School of Texas, TX Kenneth Owens	Dallas Fort Worth Kathleen Holley
David Wu 2019	Westview High School, CA Scott Halander	San Diego Joan Schellinger
William Xu 2020	Thomas Jefferson HS for Science and Technology, VA Hadan Kauffman	Chemical Society of Washington Regina Cody
Aaron Xue 2020	Oklahoma School for Science and Mathematics, OK Fazlur Rahman	Oklahoma Reza Latifi
Iris Yan 2020	Carmel High School, IN Virginia Kundrat	Indiana Jianping Huang/Robert Pribush
Albert Zhu 2019	Solon High School, OH Anthony Sanson	Cleveland Anne O'Connor
Alec Zhu 2021	Lexington High School, MA Janice Compton	Northeastern Steve Lantos

51ST INTERNATIONAL CHEMISTRY OLYMPIAD RESULTS

In the 51st International Chemistry Olympiad 309 students from 80 countries participated and were awarded 196 medals and 23 Honorable Mentions (HM)
37 students received gold, 64 students received silver, and 95 students received bronze medals

COUNTRY (number of years of participation)	MEDALS	COUNTRY (number of years of participation)	MEDALS
1. Argentina (25)	1 gold, 1 bronze	41. Malaysia (13)	1 bronze, 2 HM
2. Armenia (4)	1 bronze, 2 HM	42. Mexico (28)	1 bronze, 1 HM
3. Australia (32)	2 silver, 2 bronze	43. Moldova (13)	2 bronze, 1 HM
4. Austria (44)	1 silver, 3 bronze	44. Mongolia (14)	2 bronze
5. Azerbaijan (20)	1 silver, 1 bronze	45. Montenegro (5)	
6. Belarus (24)	2 silver, 2 bronze	46. Netherlands (40)	1 bronze, 2 HM
7. Belgium (39)		47. New Zealand (28)	3 bronze, 1 HM
8. Brazil (20)	2 silver, 2 bronze	48. Nigeria (7)	
9. Bulgaria (50)	1 gold, 1 silver, 2 bronze	49. North Macedonia (7)	2 bronze
10. Canada (33)	1 silver, 2 bronze	50. Norway (38)	1 HM
11. China (32)	3 gold, 1 silver	51. Pakistan (14)	1 bronze, 2 HM
12. Chinese Taipei (20)	2 gold, 2 silver	52. Peru (15)	4 HM
13. Costa Rica (10)	1 bronze	53. Philippines (3)	1 silver, 1 bronze, 1 HM
14. Croatia (20)	4 bronze	54. Poland (51)	3 silver, 1 bronze
15. Cuba (28)		55. Portugal (16)	
16. Cyprus (31)	1 bronze	56. Qatar (1)	
17. Czech Republic (51)	1 gold, 3 silver	57. Romania (49)	1 gold, 3 silver
18. Denmark (38)	1 gold, 3 bronze	58. Russia (26)	4 gold
19. El Salvador (7)	3 bronze	59. Saudi Arabia (9)	1 silver, 2 bronze, 1 HM
20. Estonia (26)	2 silver, 2 bronze	60. Serbia (8)	1 silver, 2 bronze, 1 HM
21. Finland (42)	1 bronze	61. Singapore (30)	2 gold, 2 silver
22. France (38)	1 silver, 3 bronze	62. Slovakia (25)	2 gold, 2 silver
23. Georgia (6)	2 bronze	63. Slovenia (28)	4 bronze
24. Germany (29)	2 silver, 2 bronze	64. South Africa (4)	
25. Greece (24)	1 bronze	65. Spain (25)	1 silver, 2 bronze
26. Hungary (51)	2 silver, 2 bronze	66. Sweden (45)	3 bronze
27. Iceland (18)		67. Switzerland (33)	
28. India (21)	2 gold, 1 silver, 1 bronze	68. Syria (10)	2 bronze
29. Indonesia (23)	2 silver, 2 bronze	69. Tajikistan (15)	
30. Iran (27)	1 gold, 2 silver, 1 bronze	70. Thailand (30)	1 gold, 3 silver
31. Ireland (22)	1 bronze	71. Turkey (27)	2 silver, 1 bronze
32. Israel (14)	1 silver, 3 bronze	72. Turkmenistan (17)	3 bronze, 1 HM
33. Italy (38)	1 gold, 2 silver, 1 HM	73. Ukraine (26)	1 gold, 2 silver, 1 bronze
34. Japan (17)	2 gold, 2 silver	74. United Arab Emirates (1)	
35. Kazakhstan (22)	1 silver, 3 bronze	75. United Kingdom (37)	1 gold, 2 silver, 1 bronze
36. Korea (28)	4 gold	76. USA (36)	3 gold, 1 silver
37. Kyrgyzstan (20)	1 bronze	77. Uruguay (21)	
38. Latvia (29)	1 gold, 1 silver, 2 bronze	78. Uzbekistan (7)	2 silver, 2 bronze
39. Lithuania (18)	1 silver, 2 bronze, 1 HM	79. Venezuela (19)	1 HM
40. Luxembourg (1)		80. Vietnam (24)	2 gold, 2 silver

Observing countries:

Bangladesh, Oman, Sri Lanka, Trinidad and Tobago

USNCO STATISTICAL INFORMATION

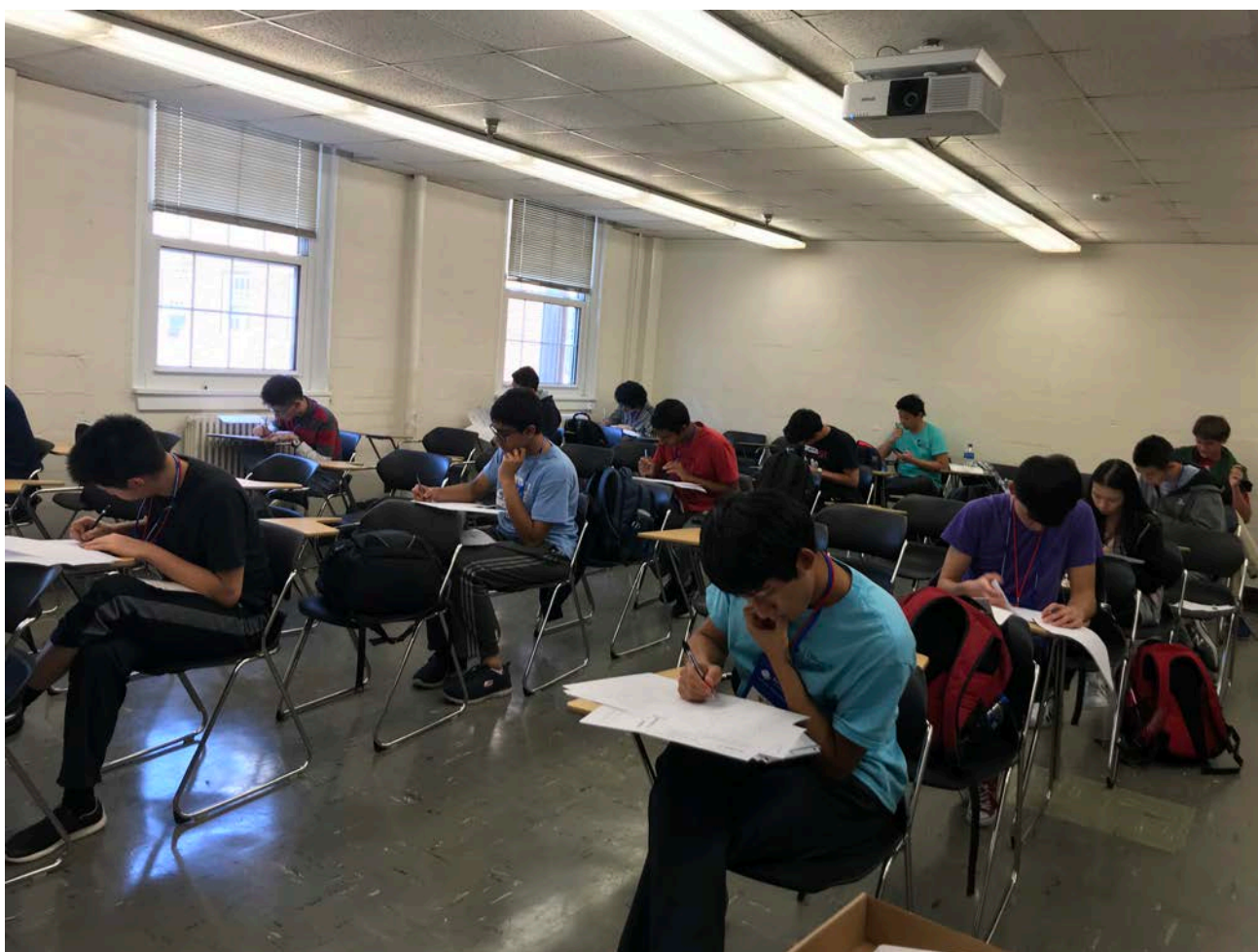
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Local Exam Local Sections	45	90	115	133	138	137	142	142	136	140	138
Natl. Exam Local Sections	45	90	115	133	138	137	142	142	136	138	138
Natl. Exam Nominees	209	500	600	650	706	689	719	684	638	940	900
Countries participating in IChO	21	22	22	26	26	26	28	31	33	38	41
Students participating in IChO	76	83	86	103	104	104	111	118	131	149	156

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Local Exam Local Sections	131	136	142	147	145	143	142	146	135	131	134
Natl. Exam Local Sections	121	130	127	134	130	126	121	133	130	125	128
Natl. Exam Nominees	875	840	838	880	851	809	796	850	829	800	909
Countries participating in IChO	42	45	47	55	51	54	54	57	59	61	59
Students participating in IChO	163	170	184	185	199	216	210	225	232	234	225

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Local Exam Local Sections	133	139	127	129	133	135	141	141	143	144	142
Natl. Exam Local Sections	125	128	117	125	128	126	134	135	137	134	128
Natl. Exam Nominees	890	917	868	916	930	941	1034	1062	1011	1010	983
Countries participating in IChO	66	66	66	65	68	70	72	73	75	75	67
Students participating in IChO	254	256	257	250	267	273	283	291	291	290	264

USNCO STATISTICAL INFORMATION

	2017	2018	2019								
Local Exam Local Sections	144	150	152								
Natl. Exam Local Sections	138	139	143								
Natl. Exam Nominees	982	1025	1017								
Countries participating in IChO	76	76	80								
Students participating in IChO	297	300	309								



Students taking an exam *Photo by Derek Wang*

USNCO NATIONAL EXAM STATISTICAL INFORMATION
(TOTAL STUDENTS – 1017)

Gender				
Male		697	76%	
Female		226	24%	
	Responses	923	100%	91%
Ethnic Background				
African American		7	1%	
Asian		481	53%	
Hispanic		27	3%	
White		343	38%	
Native American		3	0%	
Pacific Islander		7	1%	
Prefer not to disclose		31	3%	
Other		11	1%	
Responses		910	100%	89%
Grade in School				
8th Grade		256	28%	
9th Grade		600	65%	
10th Grade		56	6%	
11th Grade		7	1%	
12th Grade		1	0%	
Responses		920	100%	90%
Years of H.S. Chemistry				
1		229	25%	
2		610	67%	
3		60	7%	
4		15	2%	
5 or more		0	0%	
	Responses	914	100%	89%
Average time per week spent doing experiments in HS Chemistry Lab				
Less than ½ hour		279	42%	
Between ½ and 1 hour		226	34%	
Between 1 and 2 hours		126	19%	
More than 2 hours		30	5%	
Responses		661	100%	65%
Intended College Major				
Biological Sciences/Pre-Medicine		158	19%	
Chemistry or other Chemical Science		158	19%	
Engineering/Mathematics/Physics		280	34%	
Other Science discipline		41	5%	
Other or undecided		186	23%	
	Responses	823	100%	81%

As a result of participating in USNCO students (% responded):	Strongly agree	Agree	Disagree	Strongly disagree
Plan to study more chemistry	39%	49%	10%	2%
Plan to major in chemistry	12%	33%	47%	8%
Have more positive view about chemistry	36%	51%	11%	2%

IChO PARTICIPATING TEAMS RESULTS 1984–2018

1984 – Frankfurt, West Germany – 16th IChO

Name	School	Local Section	Medals	Ranking
Seth Brown	Taylor Allderdice H.S., Pittsburgh, PA	Pittsburgh	Silver	13 (of 76)
Keith Rickert	The Latin School of Chicago, IL	Chicago	Bronze	37
Aaron DiAntonio	Clayton H.S., MO	St. Louis	Bronze	50
Peter Capofreddi	Newton High H.S., MA	Northeastern	D. R.*	

1985 – Bratislava, Czechoslovakia – 17th IChO

Name	School	Local Section	Medals	Ranking
Keith Rickert	The Latin School of Chicago, IL	Chicago	Silver	12 (of 83)
David Maymudes	University H.S., Los Angeles, CA	Southern California	Silver	25
Glen Whitney	Medfield H.S., MA	Northeastern	Bronze	44
Eric Kelson	Bountiful H.S., UT	Salt Lake City	Bronze	54

1986 – Leiden, Holland – 18th IChO

Name	School	Local Section	Medals	Ranking
Keith Rickert	The Latin School of Chicago, IL	Chicago	Gold	3 (of 86)
David Maymudes	University H.S., Los Angeles, CA	Southern California	Silver	20
Howard Lee	Lowell H.S., San Francisco, CA	California	Bronze	49
Hedy Edmonds	Greenwich H.S., CT	Western Connecticut	D. R.*	

1987 – Veszprem, Hungary – 19th IChO

Name	School	Local Section	Medals	Ranking
Anthony West	Kempsville H.S., Virginia Beach, VA	Hampton Roads	Silver	23 (of 103)
Cecil Huang	Pequannock Townsh. H.S., Pompton Pl., NJ	North Jersey	Silver	34
Jeffrey Snyder	Amherst Central H.S., NY	Western New York	Bronze	48
Kevin Crellin	Highland H.S., Salt Lake City, UT	Salt Lake City	D. R.*	

1988 – Helsinki, Finland – 20th IChO

Name	School	Local Section	Medals	Ranking
David Cliffel	Plainfield H.S., IL	Joliet	Silver (tie)	15 (of 104)
Laurance Lee	Lowell H.S., San Francisco, CA	California	Silver (tie)	15
Brian Kantsiper	Spring Valley H.S., Columbia, SC	South Carolina	Silver	26
Kurt Huang	New Terier H.S., Winnetka, IL	Chicago	Bronze	43

1989 – Halle, German Democratic Republic – 21st IChO

Name	School	Local Section	Medals	Ranking
Raphael Lehrer	Highland Park H.S., NJ	North Jersey	Bronze	40 (of 104)
Jon Kleinberg	Iroquois Central School, Elma, NY	Western New York	Bronze	42
Michael Furlanetto	Cherry Hill East H.S., PA	Philadelphia	Bronze	64
Roger Moore	Thompson Valley H.S., Loveland, CO	Colorado	D. R.*	69

* D.R. Diploma of Recognition

ICHO PARTICIPATING TEAMS RESULTS 1984–2018

1990 – Paris, France – 22nd IChO

Name	School	Local Section	Medals	Ranking
Wayne Whitney	Medfield H.S., MA	Northeastern	Gold	6 (of 111)
Marc Dionne	La Jolla H.S., CA	San Diego	Silver	30
Roger Moore	Thompson Valley H.S., Loveland, CO	Colorado	Silver	31
Steve Gubser	Cherry Creek H.S., Greenwood Village, CO	Colorado	Silver	32

1991 – Lodz, Poland – 23rd IChO

Name	School	Local Section	Medals	Ranking
Forrest Michael	Naperville Central H.S., IL	Chicago	Gold	12 (of 118)
Dean Chung	Mountain Lakes H.S., NJ	North Jersey	Silver	26
Ashley Reiter	NC School of Sci.& Math, Durham, NC	North Carolina	Bronze	39
Susan Kuhn	Girls Preparatory School, Chattanooga, TN	Chattanooga	Bronze	41

1992 – Washington, DC/Pittsburgh, PA, USA – 24th IChO

Name	School	Local Section	Medals	Ranking
Swaine Chen	O'Fallon Township H.S., IL	St. Louis	Gold	15 (of 131)
Logan McCarty	Amherst Central H.S., NY	Western New York	Silver	21
Jeffrey Chuang	Bellaire H.S., TX	Southeastern Texas	Silver	35
Christopher Herzog	Highland Park H.S., NJ	North Jersey	Bronze	44

1993 – Perugia, Italy – 25th IChO

Name	School	Local Section	Medals	Ranking
Chris Herzog	Highland Park H.S., NJ	North Jersey	Gold	5 (of 149)
Daniel Katz	Torrey Pines H.S., San Diego, CA	San Diego	Gold	14
David Hutz	Fox Chapel H.S., Pittsburgh, PA	Pittsburgh	Silver	27
Robert West	Oak Park H.S., Kansas City, MO	Kansas City	Silver	49

1994 – Oslo, Norway – 26th IChO

Name	School	Local Section	Medals	Ranking
Jessen Yu	T. Jefferson H.S. for S&T, Alexandria, VA	Washington, DC	Gold	12 (of 156)
Justin McCarty	Amherst Central H.S., NY	Western New York	Gold	19
Nicholas Loehr	Midlothian H.S., VA	Virginia	Silver	47
James Grimmelman	Horace Mann H.S., Riverdale, NY	New York	Bronze	59

1995 – Beijing, China – 27th IChO

Name	School	Local Section	Medals	Ranking
Jason Wong	T. Jefferson H.S. for S&T, Alexandria, VA	Washington, DC	Silver	43 (of 163)
Prashant Mishra	Detroit Country Day S., Beverly Hills, MI	Detroit	Silver	56
Elliot Waingold	Central York H.S., PA	Southeastern PA	Bronze	79
Michael Sawka, Jr.	Gunn H.S., Palo Alto, CA	Santa Clara Valley	Bronze	106

ICHO PARTICIPATING TEAMS RESULTS 1984–2018

1996 – Moscow, Russia – 28th IChO

Name	School	Local Section	Medals	Ranking
Henry Fu	Brecksville-Broadview Hts. H.S., OH	Cleveland	Gold	8 (of 170)
Alex MeVay	Groton School, MA	Northeastern	Silver	39
Michael Sawka, Jr.	Gunn H.S., Palo Alto, CA	Santa Clara Valley	Silver	45
Jason Chen	Claremont H.S., CA	San Gorgonio	Bronze	63

1997 – Montreal, Canada – 29th IChO

Name	School	Local Section	Medals	Ranking
Jason Chen	Claremont H.S., CA	San Gorgonio	Gold	2 (of 184)
Jordan Krall	Harvard-Westlake S., N. Hollywood, CA	Southern California	Silver	38
Andrew Heckerling	Niles West H.S., Skokie, IL	Chicago	Silver	51
Ian Baker	The McCallie School, Chattanooga, TN	Chattanooga	Bronze	112

1998 – Melbourne, Australia – 30th IChO

Name	School	Local Section	Medals	Ranking
Thomas Snyder	Amherst Central H.S., NY	Western New York	Gold	2 (of 185)
Ian Baker	The McCallie School, Chattanooga, TN	Chattanooga	Gold	6
Alexander Ioannidis	Bel Air H.S., MD	Maryland	Silver	30
Wei Ho	New Berlin West H.S., WI	Milwaukee	Bronze	86

1999 – Bangkok, Thailand – 31st IChO

Name	School	Local Section	Medals	Ranking
Timothy Jones	NC School of Sci.& Math, Durham, NC	North Carolina	Top Gold	1 (of 196)
Alexander Ho	Niles West H.S., Skokie, IL	Chicago	Gold	9
Wei Ho	New Berlin West H.S., WI	Milwaukee	Gold	20
Lisa Carlivati	T.Jefferson H.S. for S&T, Alexandria, VA	Washington, DC	Silver	36

2000 – Copenhagen, Denmark – 32nd IChO

Name	School	Local Section	Medals	Ranking
David Kurtz	Skyline H.S., Idaho Falls, ID	Idaho	Top Gold	1 (of 216)
Charles Duan	Beverly Hills H.S., CA	Southern California	Gold	13
Luke McSpadden	OK School for Science & Math, Tulsa, OK	Oklahoma	Bronze	69
Albert Wang	Bellaire H.S., TX	Greater Houston	Bronze	74

2001 – Mumbai, India – 33rd IChO

Name	School	Local Section	Medals	Ranking
Sean Kedrowski	Baylor H.S., Chattanooga, TN	Chattanooga	Gold	7 (of 210)
Binghai Ling	Brighton H.S., Rochester, NY	Rochester	Gold	15
Albert Wang	Bellaire H.S., TX	Greater Houston	Silver	25
Collin Martin	OK School for Science & Math, Tulsa, OK	Oklahoma	Silver	27

IChO PARTICIPATING TEAMS RESULTS 1984–2018

2002 – Groningen, The Netherlands – 34th IChO

Name	School	Local Section	Medals	Ranking
Helen Shi	OK School for Science & Math, Tulsa, OK	Oklahoma	Gold	21 (of 225)
Daniel Cissell	Walnut Hill H.S., Cincinnati, OH	Cincinnati	Gold	25
Colin Whittaker	Wayland H.S., MA	Northeastern	Silver	36
Timothy Davenport	OK School for Science & Math, Tulsa, OK	Oklahoma	Bronze	90

2003 – Athens, Greece – 35th IChO

Name	School	Local Section	Medals	Ranking
Wei-Han Bobby Liu	Cookeville H.S., TN	Nashville	Silver	80 (of 233)
Eric Brown	The McCallie School, Chattanooga, TN	Chattanooga	Bronze	98
Frances Hocutt	Redondo Union H.S., Redondo Beach, CA	Southern California	Bronze	104
Benjamin Kaduk	Naperville North H.S., IL	Chicago	Bronze	100

2004 – Kiel, Germany – 36th IChO

Name	School	Local Section	Medals	Ranking
Eric Brown	The McCallie School, Chattanooga, TN	Chattanooga	Silver	56 (of 234)
John L. Kiappes Jr.	Memorial H.S., Houston, TX	Greater Houston	Silver	78
Emily Tsui	Montgomery Blair H.S., Silver Spring, MD	Washington, DC	Silver	66
Fan Zhang	Bergen County Academies, NJ	North Jersey	Silver	75

2005 – Taipei, Taiwan – 37th IChO

Name	School	Local Section	Medals	Ranking
Jacob Sanders	Acad. for the Adv. of S&T, Hackensack, NJ	North Jersey	Silver	48 (of 225)
Nicholas Sofroniew	Harvard-Westlake S., N. Hollywood, CA	Southern California	Silver	64
Allen Cheng	Arcadia H.S., CA	Southern California	Silver	72
Scott Rabin	Miami Palmetto H.S., FL	South Florida	Bronze	109

2006 – Gyeongsan, Republic of Korea – 38th IChO

Name	School	Local Section	Medals	Ranking
Michael Blaisse	Bishop McDevitt H.S., PA	Southeastern PA	Silver	55 (of 254)
Gregory Brockman	Red River H.S., ND	Red River Valley	Silver	65
Andrew Freddo	Manalapan H.S., NJ	Monmouth County	Silver	77
Alexander Zozula	East Brunswick H.S., NJ	North Jersey	Bronze	94

2007 – Moscow, Russia – 39th IChO

Name	School	Local Section	Medals	Ranking
Brian Lee	Aca. for the Adv. of S&T, Hackensack, NJ	North Jersey	Silver	40 (of 256)
Justin Koh	Stockdale H.S., CA	Southern California	Silver	43
Kenneth Brewer	Timpview H.S., UT	Central Utah	Silver	65
Sofia Izmailov	W. Windsor-Plainsboro H.S. South, NJ	Trenton	Bronze	152

ICHO PARTICIPATING TEAMS RESULTS 1984–2018

2008 – Budapest, Hungary – 40th IChO

Name	School	Local Section	Medals	Ranking
Jonathan Lee	Harvard-Westlake H.S., N. Hollywood, CA	Southern California	Silver	70 (of 257)
Yuxin Xie	East Brunswick H.S., NJ	North Jersey	Bronze	89
Jenny Lu	Pomperaug H.S., Southbury, CT	New Haven	Bronze	132
Andrew Liu	Parkway Central H.S., Chesterfield, MO	St. Louis	Bronze	137

2009 – Cambridge, England – 41st IChO

Name	School	Local Section	Medals	Ranking
Yixiao Wang	Westfield H.S., NJ	North Jersey	Gold	25 (of 250)
Nathan Benjamin	W. H. Harrison H.S., West Lafayette, IN	Purdue	Silver	34
Brian Seifried	Chamblee H.S., GA	Georgia	Silver	37
Colin Lu	Vestal H.S., NY	Binghamton	Silver	59

2010 – Tokyo, Japan – 42nd IChO

Name	School	Local Section	Medals	Ranking
Colin Lu	Vestal H.S., NY	Binghamton	Gold	21 (of 267)
Alex Siegenfeld	Hopkins School, CT	New Haven	Gold	22
Richard Li	River Hill H.S., MD	Maryland	Silver	52
Utsarga Sikder	S. Brunswick H.S., NJ	North Jersey	Bronze	94

2011 – Ankara, Turkey – 43rd IChO

Name	School	Local Section	Medals	Ranking
Konstantin Borisov	North Allegheny H.S., PA	Pittsburgh	Gold	9 (of 273)
Joe Tung	Gretchen Whitney H.S., CA	Southern California	Gold	24
Elmer Tan	John P. Stevens H.S., NJ	North Jersey	Silver	48
Tayyab Shah	Vestal H.S., NY	Binghamton	Silver	80

2012 – Washington, D.C. – 44th IChO

Name	School	Local Section	Medals	Ranking
Chris Hillenbrand	Regis H.S., NY	New York	Gold	16 (of 283)
Sidhart Chand	Detroit Country Day School, MI	Detroit	Silver	64
James Deng	Choate Rosemary Hall, CT	New Haven	Silver	70
Jason Ge	Westview H.S., CA	San Diego	Silver	80

2013 – Moscow, Russia – 45th IChO

Name	School	Local Section	Medals	Ranking
David Liang	Carmel H.S., IN	Indiana	Gold	21 (of 291)
Runpeng Liu	Ladue Horton Watkins H.S., MO	St. Louis	Gold	26
Stephen Ting	Monta Vista H.S., CA	Santa Clara Valley	Silver	36
Saaket Agrawal	Mira Loma H.S., CA	Sacramento	Silver	47

IChO PARTICIPATING TEAMS RESULTS 1984–2018

2014 – Hanoi, Vietnam – 46th IChO

Name	School	Local Section	Medals	Ranking
Robert Kao	Edwin O. Smith High School, CT	Connecticut Valley	Gold	28 (of 291)
Derek Wang	North Allegheny Senior High School, PA	Pittsburgh	Silver	41
Stephen Li	Troy High School, MI	Detroit	Silver	44
Andrew Chen	W. Windsor-Plainsboro H.S. South, NJ	Trenton	Silver	50

2015 – Baku, Azerbaijan – 47th IChO

Name	School	Local Section	Medals	Ranking
David Wang	Monta Vista High School, Cupertino, CA	Santa Clara Valley	Gold	7 (of 290)
Janice Ong	T. Jefferson H.S. for S&T, Alexandria, VA	Washington, DC	Silver	76
Bryce Cai	Barrington High School, IL	Chicago	Silver	82
Sooraj Nath	OK School of Sci. and Math., OK	Oklahoma	Silver	83

2016 – Tbilisi, Georgia – 48th IChO

Name	School	Local Section	Medals	Ranking
Alex Liu	The Village School, Houston, TX	Greater Houston	Gold	8 (of 264)
Kevin Tang	Solon High School, OH	Cleveland	Silver	44
Joyce Tian	T. Jefferson H.S. for S&T, Alexandria, VA	Washington, DC	Silver	66
Zilu Pan	Canyon Crest Academy, San Diego, CA	San Diego	Bronze	102

2017 – Nakhon Pathom, Thailand – 49th IChO

Name	School	Local Section	Medals	Ranking
Harrison Wang	Hinsdale Central High School, IL	Chicago	Gold	5 (of 297)
Joshua Park	Lexington High School, MA	Northeastern	Gold	16
Steven Liu	Monta Vista High School, CA	Santa Clara Valley	Gold	28
Brendan Yap	Carmel High School, IN	Indiana	Gold	32

2018 – Bratislava, Slovakia, Prague, Czech Republic – 50th IChO

Name	School	Local Section	Medals	Ranking
Jeffrey Shi	Marcellus High School, NY	New York	Gold	4 (of 300)
Michelle Lu	Pomperaug High School, CT	New Haven	Gold	10
Andrew Wu	Park Tudor School, IN	Indiana	Gold	12
Yutong Dai	Princeton International School, NY	Princeton	Gold	13

2019 – Paris, France – 51st IChO

Name	School	Local Section	Medals	Ranking
Yajvan Ravan	Churchill High School, MI	Detroit	Gold	19 (of 309)
Anton Ni	University High School, CA	Orange County	Gold	28
Edward Jin	Arnold O. Beckman High School, CA	Orange County	Gold	30
Albert Liu	North Hollywood High School, CA	Southern California	Silver	59

51st International Chemistry Olympiad, Paris, France

Alpha Mu Team Members essays



Team USA with French guide Johan Fis sightseeing in Paris. *Photo by E. Jin*

Edward Jin

Upon our arrival in Paris, every member of the team was feeling the same thing – tiredness. And yet, this feeling vanished almost immediately after leaving the airport and seeing the majestic views of Paris. This feeling would not come again until we got on our plane back – how could it, with so many cultural landmarks to see and so many interesting people from around the world to talk to? From singing “Les Champs-Élysées” on our bus rides, to smelling various natural and synthetic perfumes during the opening ceremony, to our visits to the Louvre and our admiration of the grandeur of Versailles, to our excursions into Paris in the night and on the Seine, to the moment where we received our medals on stage, IChO was unforgettable.

The examination tasks themselves each told a unique story, with many of the tasks relating to France itself. The practical examination featured analyses of the iron and sulfur content in French white wine, which control both the taste and safety of the wine. The theoretical examination featured interesting explorations of both classical and modern French chemistry, including Gay-Lussac’s observations about silver chloride in the 1800s and Jean-Pierre Sauvage’s work on molecular motors, which won the Nobel Prize in 2016. While some of the

tasks were routine, others, such as the qualitative and quantitative analysis of iodine, were highly original and required extensive thought.

Both the theoretical and practical tasks were similar in difficulty to the preparatory problems, which we had all mastered. And yet, for one reason or another, we all didn't do as well as we hoped – all of us believed that we were on the boundary between gold and silver after the exams. As a result, we were all very nervous for our results during the closing ceremony. Seeing the score distributions at the beginning made us even more nervous and made the waiting even worse. In the end, however, we did better than anticipated, winning three golds and a high silver.

But much more important than our results were the people that we met and bonded with. Despite our separation by distance, language, and politics, we were united in a desire to meet each other and “make science together,” [the IChO 2019 motto] not against each other. There simply was no competitive atmosphere or intensive studying (except the study parties the day before the theoretical exam!) - our nights were instead spent learning about each others' cultures, playing the unique “Nabla Operator Game” with the Japanese, tasting the *very interesting* Danish “Pirate Coin” candies, and much more, ultimately resulting in friendships to cherish. And of course, we were all united by our love for chemistry - where else would you find someone to discuss Organic Synthesis with at 4 am?

These experiences would not have been possible without the support of *many, many* people, both in France and at home. Specifically, I would like to thank all the organizers and sponsors of the IChO, all the other competitors that made our nights memorable and exciting, our guide Yohan for bringing us all around Paris, the ACS for sponsoring the USNCO program and our travel, the faculty of UMD and our mentors – Patrick, Melissa, Derek, Lily, Joe, and Tomislav for organizing the study camp and travelling with us around France, the faculty of UCI for arranging additional lab practice, my school teachers Mr. Beilin and Mr. Tran for providing their experience and guidance, and of course, my parents and family for supporting me throughout this journey.

Albert Liu

I didn't realize I was in France until I couldn't read the signs. On the way to the LAX airport the day before, I felt anxiety surging up and down erratically, and yet everything felt surreal. Even the overnight flight to Paris felt like a blur. As I stepped off the plane, the pilot said “Au revoir,” foreshadowing what was to happen.

The next few hours felt like a blur, but very different from my flight to France; rather than a dream, everything was a sensory overload. The signs saying “sortie” and “tous passeports,” the miniature Eiffel Towers sold everywhere, the flags, the music... everything was somewhere between slightly and completely different. In that first hour of being in Paris, any thought of chemistry vanished as I stepped into the world “across the pond.”



Team USA at the Opening Ceremony Photo by J. Houck

Fast forwarding to our arrival at the IChO venue, I was daunted by the task of meeting new people. In a crowd of 300 people from around the world, as well as feeling the pressure of representing the United States, I wasn't sure how to relate and bond with everyone there.

As it turns out, I was stressed over nothing. Over the next few days, I met people who were not only incredibly talented, but also incredibly personable, representing nations with fascinating cultures. Yet these descriptions do not do any of the friends I made justice, from the Danish team overprotective of their mascot named Hafnium to the Spaniard Quim, who loved designing total syntheses as a pastime. From the Syrian team, who tried to teach me how to pronounce Arabic phrases, to the United Kingdom team and their brilliant clothing and dance moves. Language fails at describing the feeling of community, friendliness, and comradery amongst that anyone outside would describe as competitors.

Contributing to the experience was, indubitably, the beauty that is Paris. Our guide, Yohan Fis, brought us to some of the most breathtaking spectacles the city had to offer: the Louvre and its myriad exhibits, the Notre Dame, a boat cruise on the Seine, the resplendent Versailles Palace, and countless other attractions. A picture is worth a thousand words, yet countless pictures later, none of them could capture the awe of the experience.

But IChO is a competition, and surely enough, the practical and theoretical examinations came. Despite the heat wave, we pushed through the exams, titrating wines, performing green

oxidations, and analyzing molecular motors, the subject of the 2016 Nobel Prize in chemistry. Stressful as the competition was, the exams were well written and quite fascinating, and the proctors were supportive throughout, providing us with water, snacks, and smiles of encouragement. At the end of the tasks, as we walked back to the auditorium, cringing or happy, but universally anxious, we were met by the cheers of our guides, the IChO staff, and our peers.

As IChO came to a close, my teammates and I stayed supportive. As the closing ceremony progressed, I watched as many of the friends I had made go up to receive their award. In the end, I received a silver medal, and my teammates, Anton, Edward, and Yajvan, received gold medals. Yet, there was no comparison, no feeling of inferiority or superiority. Just the thrill of having the opportunity of our lives, and meeting some of the most wonderful people - people who stayed up all night together because no amount of time was enough to say farewell.

In closing, I'd like to say thank you to everyone who helped me along the way. Our wonderful mentors this year, Patrick Chan, Melissa Barranger, Tomislav Pintauer, and Derek Wang, who sacrificed their time and an incalculable amount of sleep in order to prepare us. Moreover, I would like to thank my chemistry teacher Altair Maine for being super supportive both inside and outside the classroom. I would like to thank the University of Maryland for hosting the USNCO study camp this year, and all the IChO staff in Paris for making this event possible.

Anton Ni

IChO has been an unforgettable experience, from landing in Paris to waving goodbye to friends made over the ten brief days. Immediately after setting our bags down at the hotel and meeting our guide Yohan, we started chatting with other teams while playing foosball.

The day after our arrival was the opening ceremony. At the opening ceremony, we received a talk from French Nobel Prize Laureate Professor Jean-Pierre Sauvage about molecular machines. This talk also prefaced two of the theoretical problems this year: a question about nanomachine kinetics and another about catenanes. Overall, the problems this year were very creative and thought provoking, and they contained elements of French culture. For example, on the practical portion, two problems involved determining the iron and sulfur dioxide content in a given French wine.

Outside of the exams, we were able to tour Paris, stopping by various historical landmarks with our excellent guide Yohan. I was amazed by the sheer size and beauty of the Louvre, Versailles, and Sacre-Coeur Basilica. My most breathtaking view of Paris occurred when we climbed up to the second floor of the Eiffel Tower and gazed upon the twinkling city lights. Even though it was almost midnight, the city was still filled with energy—something I really appreciated, as it was drastically different from the suburbs I come from.

Another highlight of the trip was the amazing food we had during our excursions in the city. From getting up early to buy bread at a boulangerie to walking for an hour in the streets of Paris to try French-style roast duck, nearly all the food I had was delicious, including the escargot! I still dream about eating the perfectly-made croissants and baguettes in the morning, not to

mention all of the mouth-watering desserts I had after lunches and dinners, especially the tiramisus and creme-brulees.

By far the most valuable part at IChO was the free time where we were able to chat and play cards with other teams. Many teams spent time trading gifts with each other, and I'm proud to say our stuffed moles were a hit with the students and guides. From playing cards with Japan and Norway, playing foosball with Portugal, and chatting with Denmark, China, and Spain, I was able to learn so much about the culture and lives of students in other countries. For example, I was able to try a Danish candy which consisted of black licorice laced with ammonium chloride—very different from American candy! On the last night, nearly everybody stayed up to chat with each other instead of sleeping, and as we left for the airport, a huge group of people stood outside waving goodbye to us. At that moment, I felt moved by the power of the Olympiad to bring together so many people who share a common interest in chemistry. In spite of the excruciating heat and humidity where we spent hours fanning ourselves before sleeping, we formed connections with people from so many different countries in a short span of time.

It has been an honor to represent the United States at IChO, and I would not have made it without the support of all my friends, family, teachers, and mentors. I will retain the memories made in Paris for the rest of my life.

Yajvan Ravan

What do you get when you combine 300 kids with a passion for chemistry and an amazing country full of breathtaking sights and wonderful food? An amazing 10-day experience that has been truly unforgettable. From dance parties to record setting temperatures, IChO was full of amazing memories.

From the moment I stepped off the plane into Paris, I knew that I was in for a truly grand experience. As I have got to see more of Paris through the excursions, I learned what a truly magical place it was. The palace of Versailles especially wowed me through its luxurious golden decor and immense size. Along with this, the glittering sight of the Eiffel tower at night stunned me. We have got to climb the sparkling spectacle and on the second floor, at midnight, I was exposed to a view of Paris that left me speechless. These excursions however, would not have been the same without my spectacular guide and friend, Yohan. Yohan gave us an incredibly enjoyable experience and a view of Paris that no one else could have given us. He satiated my endless curiosity about Paris, and gave us a thorough insight into the rich cultural wealth of France.

While the excursions really gave me a special view of Paris, no Olympiad could have been complete without mind-boggling problems. The practical exam day really tested our grit and perseverance, with temperatures over 100 degrees F that had never before been seen in Paris. The heatwave coupled with lab coats and hot plates really tested our physical and mental stamina. While the practical was difficult, it was the theoretical portion that really caught everyone by surprise. The tough inorganic question as well as the unconventional proof based kinetics really required creativity at the same time as logical thinking. Following the exam there were many involved discussions about the extraordinarily unique and novel problems, which were designed to be remembered and to spark curiosity in all of us.



Y. Ravan dancing at the reunion party in Paris Photo by 51st IChO

However, IChO is far more than just sightseeing and problem solving. Rather, it was the innumerable connections and friendships I made, with people who came from every corner of the world, connected by a passion for chemistry that really defined the IChO experience. The fondest times at IChO were the times I spent playing late night card games to the picnic on the lawn of Versailles. The hotel was constantly echoing with laughter and conversation. We shared many fun times from karaoke night to playing Just Dance.

After countless hours spent having dinners with the Danish, and playing UNO with the Indians, and foosball with the Spanish, and having late night talks with the Syrians, as well as befriending so many other people from all over the world, it thoroughly amazed me how the fabric of chemistry really united us all. Despite coming from every corner of the world, speaking hundreds of different languages, and living in vastly different cultures, we were all more alike than different. Through the common experience of IChO, we all forged memories that will last us a lifetime.

Press Release

American Chemical Society
External Affairs & Communications



FOR IMMEDIATE RELEASE

Top 20 high school students compete for spot on U.S. Chemistry Olympiad team

WASHINGTON, May 14, 2019 — The teachers competing for prizes in the “Jeopardy!™” Teachers Tournament are not the only ones studying and preparing for tests. Twenty of the nation’s top high school chemistry students have outscored more than 16,000 others to qualify for an intensive study camp at the University of Maryland, June 2-13.

The top four students from the 20 attending the camp will represent the U.S. at the [51st International Chemistry Olympiad](#) (IChO) in Paris on July 21-30. Two additional students will be designated as alternates on the U.S. team.

During the camp, the students will receive college-level training, with an emphasis on organic chemistry, through a series of lectures, problem-solving exercises, lab work and testing.

The American Chemical Society (ACS) has sponsored the American team annually since the U.S. joined the Olympiad in 1984. Principal funding is through the ACS Donald F. and Mildred Topp Othmer Olympiad Endowment, with additional support from Chemours; the University of Maryland at College Park, department of chemistry and biochemistry; Carolina Biological Supply Company; Macmillan Learning; Texas Instruments; Pearson and others.

The 20 finalists, including 18 boys and two girls representing 10 states, are:

<u>City/State</u>	<u>Name</u>	<u>High School</u>
Alexandria, Va.	William Xu	T.J. High School for Science and Technology
Atlanta, Ga.	Ridings Bald	The Westminster Schools
Carmel, Ind.	Iris Yan*	Carmel High School
Carmel, Ind.	Yannik Singh	Carmel High School
Cleveland, Ohio	Albert Zhu*	Solon High School
Dallas, Texas	Nicholas Tsao	St. Mark’s School of Texas
Indianapolis, Ind.	Jenny Cai*	Park Tudor High School
Irvine, Calif.	Anton Ni*	University High School
Irvine, Calif.	Edward Jin*	Arnold O. Beckman High School
Lexington, Mass.	Alex Li*	Lexington High School
Lexington, Mass.	Alec Zhu	Lexington High School
Lincolnshire, Ill.	Allen Ding*	Stevenson High School
Livonia, Mich.	Yajvan Ravan*	Churchill High School
North Hollywood, Calif.	Albert Liu*	North Hollywood High School
Oklahoma City, Okla.	Aaron Xue	Oklahoma School of Science & Math
San Diego, Calif.	Andrew Feng	Canyon Crest Academy
San Diego, Calif.	David Wu**	Westview High School
San Ramon, Calif.	Anugrah Chemparathy	Dougherty Valley High School

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San Ramon, Calif.
Westborough, Mass.

Michael Han
Ananthan Sadagopan

Dougherty Valley High School
Westborough High School

* Students who participated in 2018 IChO Study Camp

** Students who participated in 2017 and 2018 IChO Study Camps

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Press Release

American Chemical Society
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FOR IMMEDIATE RELEASE

U.S. team chosen for the 51st International Chemistry Olympiad

WASHINGTON, June 20, 2019 — The American Chemical Society (ACS) is proud to announce the team that will represent the U.S. at the [51st International Chemistry Olympiad](#) in Paris from July 21 to 30.

The members of the 2019 U.S. team are:

Edward Jin, Arnold O. Beckman High School, Irvine, California

Albert Liu, North Hollywood High School, Porter Ranch, California

Anton Ni, University High School, Irvine, California

Yajvan Ravan, Churchill High School, Westland, Michigan

Alternates:

Allen Ding, Stevenson High School, Licolnshire, Illinois

Yannik Singh, Carmel High School, Carmel, Indiana

These mentors will accompany the team to Paris:

Patrick Chan, Ph.D., Benjamin Cardozo High School, New York City

Melissa Barranger Mathys, Ph.D., Ursuline College, Pepper Pike, Ohio

Joseph Houck, Ph.D., Penn State University, State College, Pennsylvania



Left to right: Anton Ni, Albert Liu, Edward Jin, Allen Ding, Yajvan Ravan, Yannik Singh

Credit: Peter Cutts Photography
[Click here for a high-resolution image.](#)

The competition for the U.S. team was fierce, beginning with a multiple-choice exam taken by nearly 16,000 high school students across the country. The top 1,000 then advanced to take the National Chemistry Olympiad test. From there, the top 20 went on to a study camp at the University of Maryland, College Park, where four were selected for the team along with two alternates.

ACS has sponsored the American team annually since the U.S. joined the Olympiad in 1984. Principal funding is through the ACS Donald F. and Mildred Topp Othmer Olympiad Endowment, with additional support from The Chemours Company; the University of Maryland at College Park, department of chemistry and biochemistry; Carolina Biological Supply Company; Macmillan Learning; Texas Instruments; Pearson; and Fisher Science Education.

The International Chemistry Olympiad originated with Czechoslovakia, Poland and Hungary in 1968. Soon, other Eastern European countries joined the event; Western Europe began participating in 1974. The first U.S. team competed in 1984, winning one silver and two bronze medals.

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American Chemical Society

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USNCO Media Metrics



Facebook Social Media Stats -ACS has 800K followers

Post Date	Clicks	Impressions	Shares
6/15/19	581	20,421	4
6/18/19	246	12,820	3
8/7/2019	1,396	28,647	34

Notes: The post on 6/15/19 was sent on Saturday and still showed that ACS members are engaged on the weekend. The post on 8/7 had the highest clicks and impressions on ACS social media for that day.

Twitter Social Media Stats -ACS has 57K followers

Post Date	Likes	Retweets
6/15/19	22	3
6/18/19	18	4
8/7/2019	22	4

Notes: For the 6/18 post, it had the most likes and retweets on ACS that day.

LinkedIn Social Media Stats - ACS has 46K followers

Post Date	Clicks	Impressions	Shares
6/15/19	184	9,089	1
6/18/19	85	2,863	2
8/7/2019	523	15,812	8

Notes: For the 6/18 post, it had the most clicks on ACS that day. For 8/7 – highest clicks and impressions on ACS that day.

Instagram Social Media Stats - ACS has 24K followers

Post Date	Likes
8/7/2019	659

Notes: With Instagram sometimes you have to think about picture fatigue so you do not put the same type of pictures up.

Other Media: Chemistry Olympiad also included articles in the ACS Matters Newsletter on 6/25 = 111 Clicks, 7/16 = 79 Clicks, and 8/6 = 73.

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Prof Andrei Vedernikov
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SOCIETY COMMITTEE ON EDUCATION
U.S. NATIONAL CHEMISTRY OLYMPIAD SUBCOMMITTEE**

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Kimberly Gardner U.S. Air Force Academy, CO	Lawrence Wilkinson (2018-2020) ExxonMobil Refining & Supply Co., LA
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