



Equity and Excellence

Impact Report 2018

the next 30 years: **from our president**



José M. Torres, PhD

For over 30 years, the Illinois Mathematics and Science Academy (IMSA) has pioneered the future of science, technology, engineering and mathematics (STEM) education through its two legislative charges: 1) to provide a uniquely challenging education for students talented in the areas of mathematics and science; and 2) to stimulate further excellence for all Illinois schools in mathematics and science. IMSA champions these goals through:

- Residential education: Helping talented 10th-12th graders representing over 93% of Illinois counties to date reach their fullest potential.
- Student and educator outreach: Leading the charge to continually innovate K-12 STEM education, creating a strong and diverse STEM talent base through teacher training, turnkey STEM curricula and student enrichment.
- Entrepreneurship and innovation: Strengthening Illinois' STEM pipeline through entrepreneurship training and makerspace education in a collaborative environment.

Sustaining excellence in STEM teaching and making inroads into equity has never been more challenging and complicated given our national landscape. Yet, I know that you share my commitment to this vision. As STEM education moves into an increasingly complex world, IMSA is positioned to provide the leadership necessary to train and guide future generations. Our alumni will indeed go on to “earn degrees in laws and letters” in the words of our founder, Dr. Leon Lederman. “There are likely to be those few who create new intellectual worlds, cure a dreaded human ailment, or in some other way significantly influence life on our planet.”

For the next 30 years, we will continue to treat our charges as if each one is capable of this extraordinary achievement.

Respectfully,
José M. Torres, Ph.D., President

IMSA Welcomes the World to the 2018 International Student Science Fair

IMSA is proud to host the 14th Annual International Student Science Fair (ISSF) June 27-July 1, 2018. A signature event of the Illinois Bicentennial celebration and the first time the fair will be held in the United States, ISSF 2018 provides a festive opportunity for young scientists to collaborate on an international stage. ISSF 2018 highlights three global challenges that transcend national boundaries: energy, hunger and water. Approximately 40 international STEM schools will attend ISSF 2018.



annual profile: **IMSA 2018**

Residential Academy

652

residential academy
students annually

55%

of IMSA faculty have a Ph.D.
100% have a masters degree

32.6

average ACT composite
score (state average 21.4)
725 average Math SAT
score (state average 554)

77%

of IMSA class of 2017
conducted research at
28 world-leading institutions

43,333

hours of community
service completed
by IMSA students

1,875

hours of free internship
time completed by IMSA
students at Illinois
innovation hubs
such as 1871

Student & Educator Outreach

8,716

Illinois student
participants reached
through STEM enrichment

5,450

participants, grades 4-8,
reached by IMSA's
Fusion program

3,266

participants reached in
IMSA summer camps
and workshops

2,676

Illinois teacher participants
reached through STEM
professional development

48,869

hours of STEM
professional development
delivered to Illinois teachers

86,785

lesson plans accessed
digitally in Illinois and
worldwide through IMSA's
Digital Commons Network

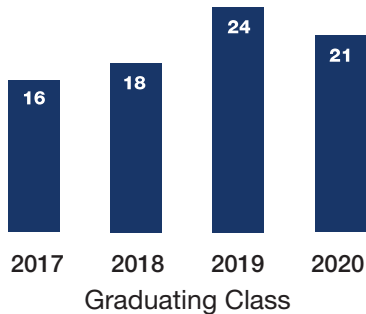
4,879

institutions from
188 countries
utilized IMSA's
teaching materials

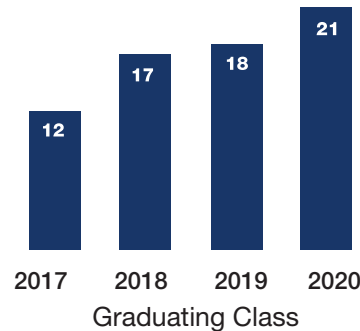
diversifying the STEM pipeline: **the academy**

Growth of Underrepresented Students - Graduating Class of 2017 - 2020

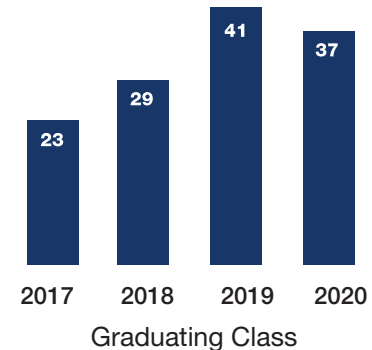
Hispanic Students



Black Students



Low Income Students



95

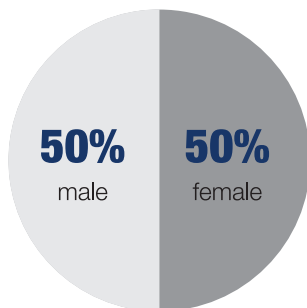
of 102 Illinois counties represented since 1989

44%

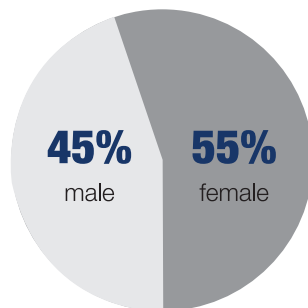
of 9th grade PROMISE participants admitted and enrolled at IMSA

Gender Equity

Students



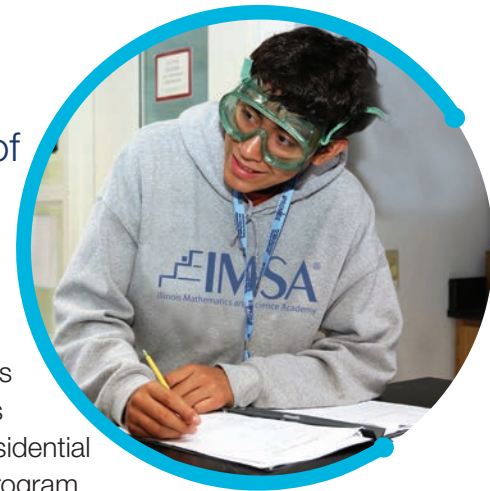
Faculty/Staff



Outreach Initiatives Support Recruitment of Underrepresented Students to Academy

IMSA has a number of student outreach initiatives designed to recruit underrepresented populations to its residential Academy. High ability 8th and 9th grade students are identified based on standardized test scores. These students are personally invited to attend regional information sessions held throughout the state, called upon to apply to IMSA's residential Academy and selected to participate in IMSA's PROMISE Program.

The PROMISE program addresses the challenges of underrepresented students and encourages future admission to the Academy. IMSA faculty, staff and student mentors work with participants on developing math, science and English skills, SAT preparedness and assistance with the IMSA application process while encouraging family involvement. IMSA also provides transportation to and from Chicago for PROMISE program participants.



diversifying the STEM pipeline: outreach

IMSA Statewide Student and Educator Initiatives Motivate Interest in STEM

IMSA's statewide outreach programs equip Illinois students with the skills necessary to pursue STEM through summer camps, workshops, funshops, field trips, community groups and science nights. These programs employ the practices scientists use to study the world including questioning, forming hypotheses, conducting investigations and collecting and analyzing data to effectively teach STEM content while developing scientific habits of mind at the same time.

IMSA also offers statewide cutting edge professional development for Illinois teachers including IMSA's award-winning Fusion program curriculum. The curricula for all IMSA student and educator outreach programs are created by IMSA curriculum writers. Lessons and activities are aligned with Next Generation Science Standards.



3,266

Illinois student participants
in IMSA summer camps
and workshops

1,972

participants in funshops
and summer camps

1,294

participants in field trips,
community groups and
science nights

2,676

Illinois teacher participants
reached through IMSA's
STEM professional
development

2,046

educators participated in
professional development

630

educators trained in
Fusion curricula



Illinois Bicentennial Committee Announces Fusion Legacy Project, Expands Access to STEM

The Illinois Bicentennial Committee announced the Fusion Legacy Project which will award 25 Illinois schools with IMSA Fusion programming.

IMSA's award-winning Fusion program provides Illinois teachers with engaging STEM curriculum and teaching methods they can readily apply to motivate and encourage student interest in STEM. 80% of these programs benefit schools whose primary enrollment is low-income students. IMSA Fusion has been recognized by Boeing, Bayer, Chicago Innovation and Change the Equation.



leaders start at IMSA: **the academy**

REGENERON

Melissa Mu '18 was named a top 300 finalist in the Regeneron Science Talent Search, the most prestigious national research-based science competition for high school seniors.

SIEMENS | Foundation

Neil Wary '18 placed third in the Siemens Competition, the nation's premier competition in math, science and technology for high school students.

23.4%

of IMSA's senior class were named National Merit Finalists

Young IMSA Students Impress Audience at Prestigious MILCOM Conference

Seven IMSA students impressed audience members at the prestigious MILCOM Conference with their research and design of a mobile tracking system for satellite communication so much that they were offered internships at the Naval Research Laboratory in Washington, DC.

MILCOM, a military communications conference hosted by the Armed Forces Communications and Electronics Association (AFCEA) and the Institute for Electrical and Electronics Engineers (IEEE), is the premier international conference on military communications. Attendees include representatives from academia, the armed forces and military contractors.

Students **Harrison Carcione '18, Charles Kuch '18, Advai Podduturi '18, Peijing (Mike) Xu '18, Joseph Hutter '17, Gina Jiang '17** and **Soomin (Shannon) Park '17**, under the guidance of IMSA faculty advisor Dr. Peter Dong, partnered with David Beering of Intelligent Designs, LLC, on a Student Inquiry and Research (SIR) project that aimed to expand on the company's efforts to develop systems that enable on-demand communication via satellite in a highly inclined orbit.

In 18 short months, Dr. Dong and the student team completed their work and submitted a paper to MILCOM, "Designing a Low-Cost Mobile Tracking System for Communication with a Medium Earth Orbit Satellite," which was selected to be presented at the October 2017 conference. The students are believed to be the youngest to present at MILCOM.

The SIR program is the embodiment of IMSA's inquiry-based education and provides a framework that allows students to learn how scientific knowledge is constructed through a 1-2 year engagement in concentrated research in a specialized field under the leadership and direction of world-class university and scientific researchers. It also exposes students to a systematic and comprehensive research process that includes a literature review, knowledge map, research proposal, research, public presentation and submission of findings for publication.



leaders start at IMSA: alumni

66%

of IMSA Alumni reside
in Illinois

62%

of Alumni work in a STEM field*

24

Alumni are presidents and
CEOs of Illinois companies*

**\$101,000 -
\$150,000**

is the median income of
IMSA Alumni which is 2 - 3 times
that of state and national averages*

*based on 2017 survey of 1,651 alumni

IN2, Steve Chen Innovation Center, Wins Chicago Innovation Award

IN2 was named a winner of the 2017 Chicago Innovation Awards which recognizes the most innovative new products or services brought to market or to public service each year.

Alumnus and YouTube co-founder Steve Chen '95, opened IN2, the Steve and Jamie Chen Center for Innovation and Inquiry, at IMSA March 30, 2017. IN2, modeled after successful entrepreneurial spaces like 1871, MIT's media lab and the University of Illinois' EnterpriseWorks, focuses on the next generation of STEM innovators stimulating entrepreneurship, design prototypes and tech start-ups. Private funds were raised for the facility with a lead gift from Chen.

"When I reflect on the pivotal points in my own journey of innovation and entrepreneurship, IMSA was among the most important," says Chen. "My years at IMSA sparked curiosity, exploration and revealed to me all that was possible."

*Sam Yagen '95, ShopRunner CEO presents
IMSA Principal Dr. Robert Hernandez with the
2017 Chicago Innovation Award for its IN2
Innovation Center*



Top 10 Institutions with Most IMSA Alumni All-Time

- 1 University of Illinois at Urbana**
- 2 University of Illinois at Chicago**
- 3 Northwestern University**
- 4 University of Chicago**
- 5 Massachusetts Institute of Technology
- 6 Washington University
- 7 Stanford University
- 8 Harvard University
- 9 Case Western Reserve University
- 10 Illinois Institute of Technology**

IMSA alumni have defined and redefined technology through their contributions in launching global, leading companies and products



Coming from a lower income Hispanic community, IMSA exposed me to a better quality of life. What truly made IMSA memorable was not just the academics, but the opportunity to connect and learn from others who have followed a different path in the journey we call life.

Jorge Acosta '13
Cook County

IMSA gave me the courage to chase my dreams and the confidence to boldly lead. It awakened in me an academic curiosity that never rests. That curiosity is responsible for much of my professional success.

Jennifer Tietz '97
DuPage County

Coming from a rural district with fewer resources across the board, IMSA allowed me to take advantage of opportunities not only in math and science, but in the arts, athletics, and applied research, that would otherwise have been impossible. Even more than that, I spent three years with a diverse group of faculty, staff, and peers who challenged me, supported me, and, to a great degree, made me into the person who I am today.

Aaron Foss '99
Adams County