

WRIGHT STATE UNIVERSITY

SONT  
17

SCIENCE OLYMPIAD NATIONAL TOURNAMENT

MAY 19-20, 2017



WRIGHT STATE  
UNIVERSITY

50  
YEARS

[wright.edu/scienceolympiad](http://wright.edu/scienceolympiad)



Exploring the World of Science

# 2017 SCIENCE OLYMPIAD NATIONAL TOURNAMENT



## WELCOME TO WRIGHT STATE UNIVERSITY



We couldn't be more thrilled to host 2,000 of the nation's best and brightest middle and high school students for the Science Olympiad National Tournament 2017. We have seen many of your great young minds at work during the invitational competitions held at Wright State University. Your ingenuity, innovation, and sheer brilliance are beyond compare! It makes me feel very positive about the future of this country when I see such genius in the next generation.

Of course, an event of this magnitude would not be possible without the generosity of our sponsors and the dedication of our volunteers. Thank you for helping to support the scientists, engineers, and entrepreneurs of tomorrow. Planning the Science Olympiad National Tournament 2017 has truly been a university-wide effort. I'd like to express my appreciation to all of the Wright State University faculty and staff who worked so tirelessly to make this weekend possible.

To our students and their families, I hope you will consider Wright State as you begin exploring your options for a college education. While you're here, please take a tour of the campus and learn more about all our university has to offer. We hope to welcome many of you back again as future Wright State Raiders!

We are pleased to offer scholarships to the winners of the Science Olympiad National Tournament 2017. Members of the first-place team in Division B and Division C may be eligible to receive a \$2,500 scholarship that is renewable for up to four years. Scholarships of \$1,000 may be awarded to the first-place winners of each individual event, renewable for up to four years.

Finally, I would like to wish all of our students and coaches the best of luck in the competition. I know you have put in countless hours of hard work preparing for this event. May your efforts be rewarded!

With best regards,  
Thomas Sudkamp, Ph.D.  
Provost  
Wright State University

## WELCOME FROM THE SCIENCE OLYMPIAD NATIONAL EXECUTIVE BOARD



On behalf of the Science Olympiad Executive Board and Advisory Committee, I'd like to welcome you to the 33rd Annual Science Olympiad National Tournament, hosted by Wright State University.

This weekend will feature intense competition among 120 of the best Science Olympiad teams in the nation, striving for honors in events like Electric Vehicle, Disease Detectives, and Game On. Each of the 46 events featured requires in-depth understanding of rigorous science content, teamwork, and real-world problem solving by young men and women committed to achieving at the highest level.

Back in 1903, in a small bicycle shop in Dayton, two brothers invented the world's first successful airplane, called the Wright Flyer. This university's namesakes, Orville and Wilbur Wright, built and tested, tried and failed, and ultimately etched their names in history as the pioneers of flight. In 2017, Science Olympiad teams will vie for honors with their own Wright Stuff planes, watching their hand-crafted devices soar for the longest time aloft. During this weekend, what sparks of innovation will lead to the next pair of game-changing inventors, researchers, or engineers? Only time will tell your story.

For all those who support your dreams of being the best, like coaches, mentors, and parents, we say thanks. This Science Olympiad National Tournament is an opportunity to not only display talent, but also to make friends, have fun, and exemplify your passion for science and sportsmanship. We hope the memories you make here at Wright State will last a lifetime.

We are extremely proud of your accomplishments, and wish you the best of luck in this tournament and beyond.

Gerard J. Putz, Ph.D.  
President and Co-Founder  
Science Olympiad

## SCIENCE OLYMPIAD CODE OF ETHICS

The goal of competition is to give one's best effort while displaying honesty, integrity, and good sportsmanship. Everyone is expected to display courtesy and respect (see Science Olympiad Pledges below). Teams are expected to make an honest effort to follow the rules and the spirit of the problem (not interpret the rules so they have an unfair advantage). Failure by a participant, coach, or guest to abide by these codes, accepted safety procedures, or rules below, may result in an assessment of penalty points or, in rare cases, disqualification by the tournament director from the event, the tournament, or future tournaments.

### Student's Pledge

I pledge to put forth my best effort in the Science Olympiad tournament and to uphold the principles of honest competition. In my events, I will compete with integrity, respect, and sportsmanship towards my fellow competitors. I will display courtesy towards Event Supervisors and Tournament Personnel. My actions will exemplify the proud spirit of my school, team, and state.

### Coach's Pledge

On behalf of the coaches and assistants at this tournament, I pledge to encourage honesty and respect for tournament personnel, our fellow coaches, and other team members. We want our efforts to bring honor to our community and school.

### Parent's Pledge

On behalf of the parents and spectators I pledge to be an example for our children by:

- respecting the rules of Science Olympiad,
- encouraging excellence in preparation and investigation,
- supporting independence in design and production of all competition devices,
- and respecting the decisions of event supervisors and judges.

Our examples will promote the spirit of cooperation within and among all our participating teams.

### Event Supervisor's Pledge

On behalf of my fellow supervisors and tournament personnel, I pledge to run my event with fairness and respect for the participants and their coaches. Our actions will reflect the principles of the Science Olympiad program and display the pride we feel as representatives of our colleges, universities, companies, states, or organizations.



## WELCOME FROM MICHAEL R. TURNER



Welcome to Wright State University for the Science Olympiad National Tournament. This event brings together America's future innovators in the spirit of friendly competition. I hope you take great pride in the success that you and your team have achieved to reach this point.

Our very own Wright State University is once again the host institution for this year's Science Olympiad. The institution was named in honor of the Wright brothers—two men who epitomize the spirit of scientific advancement and new inventions. The Wright brothers invented the first successful airplane, and Dayton continues their legacy as Ohio's official hub for aerospace technology. Dayton is home to Wright-Patterson Air Force Base, which houses the Air Force Materiel Command, the Air Force Institute of Technology, the Aeronautical Systems Center, and the Air Force Research Laboratory. Each has played an important role in advancing science in the United States. Given the region's long history of innovation and continued leadership in science and technology, it is fitting to hold the Science Olympiad National Tournament at Wright State University here in southwest Ohio.

During your stay in Dayton, I encourage you to visit our local scientific attractions, including the National Museum of the United States Air Force, the Dayton Aviation Heritage National Historical Park, the Boonshoft Museum of Discovery, and Carillon Park, where you can see the Wright Flyer III, the world's first practical airplane. America will continue to rely on science, technology, and innovation to maintain its position as the world's top economic superpower. Congratulations on your qualification to the National Tournament, and I wish you the best of luck during this event and on all your future endeavors.

Michael R. Turner (OH-10)  
United States Congress

## WELCOME FROM ROB PORTMAN



I welcome you to Ohio and congratulations on qualifying for the 2017 Science Olympiad National Tournament. This event brings together our country's best and brightest scientists, and you should be proud to represent your team in this event.

Wright State University is once again the host of this year's National Tournament, which is appropriate because the school is named after two men who truly lived the spirit of innovation and discovery—Wilbur and Orville Wright. During your visit to Dayton, I hope you take the opportunity to explore the city's history of groundbreaking research and development in the fields of industrial and aeronautical engineering. As the birthplace of aviation, Dayton has many sites dedicated to the history of airplanes. The National Aviation Heritage Area features many fascinating exhibits and collections related to the invention and development of the airplane, including the National Museum of the United States Air Force.

To this day, Dayton remains a center for innovation and is designated as Ohio's official hub for aerospace technology. Wright-Patterson Air Force Base, home to the Air Force Research Laboratory and the Air Force Materiel Command, is the site of cutting-edge experimentation in numerous areas of study.

Like the Wright brothers, every great inventor starts with a curious mind and a desire to gain knowledge. By qualifying for the National Tournament, you have demonstrated an ability to be a future scientific leader. I wish you success in this competition and in all your future endeavors.

Rob Portman  
United States Senator from Ohio

## WELCOME FROM SHERROD BROWN



I would like to welcome the students, parents, and teachers to the 2017 Science Olympiad National Tournament at Wright State University.

This year's participants are here today because of their hard work, creativity, and dedication. Yet, today's participants did not get here on their own. Science is a collaborative effort and it is the support of teachers, parents, friends, and family members that has helped foster your creativity.

The advancement of science is critical to the future of our state, our nation, and the world. We face many challenges, and it is your creativity and sense of discovery that will help us address them. The Dayton area in particular has a proud history of innovation. Two brothers in a bicycle shop in Dayton shared a dream of achieving human flight. We all know the results of those dreams—in fact, Wright State University's name is a testament to the lasting legacy of Wilbur and Orville Wright. The 2017 Science Olympiad Tournament is about your dreams and your discoveries. It is for that reason that I welcome you to Ohio, and wish you the best in all your endeavors.

As future leaders, scientists, educators, and innovators, you should be proud to play an instrumental role in keeping the United States globally competitive in the 21st century.

Congratulations again on being afforded the opportunity to compete in this year's Science Olympiad National Tournament and I look forward to hearing about your future contributions to science and innovations.

I extend my support to the success of this event. I wish you all the best in the years to come.

Sherrod Brown  
United States Senator from Ohio












## ABOUT WRIGHT STATE UNIVERSITY

Wright State University is a public research university in Dayton, Ohio, with nearly 18,000 students from 59 countries and all 50 states. Wright State is named after Orville and Wilbur Wright, Dayton's aviation pioneers who changed the world forever. Their exceptional ingenuity, courage, and perseverance inspire our commitment to research, community engagement, and teaching.

Wright State offers more than 230 degree programs from eight colleges and three schools, including the Boonshoft School of Medicine, plus a regional campus in Celina, Ohio. We see the potential in every student and intentionally create pathways for students to succeed through exceptional programs at an exceptional value.

### Here's more you should know about Wright State:

-  Wright State originally opened in 1964 as a branch campus of The Ohio State University and Miami University. Three years later, in 1967, Wright State became an independent institution with 5,704 students.
-  We take pride in the fact that 21 percent of Wright State undergraduates are first-generation college students. Our new Student Success Center offers innovative mentoring and academic support services to help students transition to college.
-  Wright State is next door to one of the largest Air Force bases in the world, Wright-Patterson Air Force Base, home of the Air Force Research Laboratory, Materiel Command, and National Air and Space Intelligence Center. The university's close ties with the base offer unique research and career opportunities to students and graduates.

-  Tom Hanks has long appreciated Wright State's students. The Tom Hanks Center for Motion Pictures opened in April 2016, with the Hollywood icon on hand to celebrate with us. He also co-chairs Wright State's *Rise. Shine.* fundraising campaign, along with Amanda Wright Lane, the great-grandniece of the Wright brothers.
-  One of the world's most complete collections of Wright brothers materials is at the Dunbar Library's Special Collections and Archives. The collection includes the Wrights' technical and personal library, family papers, and film documenting the invention of the airplane.
-  Wright State is a national innovator in services for students with disabilities. In 1970, decades before the Americans with Disabilities Act, Wright State was one of the first universities to create an Office of Disability Services. *College Success for Students with Physical Disabilities* rates Wright State as a Top 5 disability-friendly school.
-  Nearly two miles of tunnels (10,436 feet) create an accessible path beneath 20 of the 22 buildings in the academic section of Wright State's Dayton campus.
-  Our state-of-the art Veteran and Military Center offers a dedicated space for military-affiliated students and veterans. Student mentors and trained staff offer academic tutoring, GI Bill services, and other student services. Victory Media, owner of *G.I. Jobs* magazine, has named Wright State "military friendly" for nine consecutive years.
-  Wright State participates in 15 NCAA Division I intercollegiate athletic programs, and many students compete in intramural sports programs. The Wright State University Nutter Center, a 12,000-seat entertainment and sports complex, and other recreational and workout facilities are available to students on a daily basis.





# WRIGHT STATE BY THE NUMBERS

**17,775** students  
**133** undergraduate programs  
**139** graduate and  
professional programs  
**123,620** degrees awarded  
**63** countries represented  
**19.6** percent minority students

For more Wright State facts, see [wright.edu/factsheet](http://wright.edu/factsheet).





## INNOVATION AND DISCOVERY AT WRIGHT STATE UNIVERSITY



Research is vital to Wright State's mission and vision. The Carnegie-classified research university has cultivated an environment of collaboration and innovation, resourced with state-of-the-art facilities, that allows our faculty and student researchers to pursue excellence and discovery across a wide range of disciplines. Creative scholarship at Wright State is nationally recognized in numerous areas, from neuroscience and molecular biology to history, and computer science to the performing arts.

Housing the Dayton region's only medical school, Wright State supports biomedical and translational research and clinical trials that directly improve the quality of life and health in our community and beyond. The Wright State Research Institute works with interdisciplinary faculty to deliver high-impact solutions for government, industry, and health care, addressing critical challenges facing the nation and world. With almost \$50 million of research and development expenditures, the university's research enterprise contributes significantly to regional economic development through commercialization initiatives, work force development, and collaborative partnerships with other institutions, government, and industry.

Through a range of unique partnerships across the state, and particularly with Wright-Patterson Air Force Base, Wright State has emerged as a leader in multidisciplinary collaborative research among Ohio's universities. Wright State research covers a broad spectrum of activity, from fundamental investigations into the physical, biological, and neurological sciences, all the way to translational research that directly improves the quality of life in the Dayton region and beyond.

The \$37 million Neuroscience Engineering Collaboration Building opened in April 2015, bringing researchers from six disciplines under one roof to work with area health professionals to understand brain, spinal cord, and nerve disorders and develop treatments and devices. The building is designed to foster research projects that break new ground by putting neuroscientists, engineers, and clinicians in a collaborative environment.





Undergraduate and graduate students have numerous opportunities to conduct research projects as part of their studies. Wright State's faculty members are available to mentor students through a successful research project. Working on a team or independently, during one term or multiple years, conducting hands-on or theoretical research, students have opportunities to make their mark on the world.

Science and technology are not the only areas where Wright State is known for innovation. Through the Collaborative Education, Leadership, and Innovation in the Arts, an Ohio Center of Excellence; the university's Departments of Art and Art History; Music; and Theatre, Dance, and Motion Pictures develop initiatives to enrich the artistic climate in the Dayton region.

*U.S. News & World Report* ranked Wright State's Master of Education degree No. 43 in the nation among online graduate education programs. The College of Engineering and Computer Science has been recognized by the same publication as one of the top engineering schools. *The Princeton Review* has named the Raj Soin College

of Business among the best business schools in the nation. The Boonshoft School of Medicine was ranked No. 82 nationally among medical schools and 25 of its faculty members were named to the Best Doctors in America list by Best Doctors, Inc.

Wright State has a long history of volunteerism and civic engagement. Its students, faculty, and staff are passionate about making a difference and improving the world around them. In 2015, the Carnegie Foundation for the Advancement of Teaching selected Wright State to receive its Community Engagement Classification. Just 361 colleges and universities receive the classification nationwide. Wright State also has been named to the President's Higher Education Community Service Honor Roll for five consecutive years. Community engagement is everywhere on campus and throughout the region, ranging from small, personal volunteer opportunities to large, campus-wide initiatives. Academic service-learning courses, internships, and co-ops allow students to learn while making a difference in the real world.





## MASTER SCHEDULE OF EVENTS

### Thursday, May 18, 2017

All Day	<b>Wright State University Scavenger Hunt</b>	Student Union RaiderConnect Welcome Desk
8 a.m.–5 p.m.	<b>Volunteer Check-In</b>	Student Union Discovery Room (163)
8 a.m.–7 p.m.	<b>Team Registration</b> (coaches only)	Student Union Endeavour Room (156)
8 a.m.–7 p.m.	<b>Team Merchandise Pickup</b> (coaches only)	Student Union Bookstore (merchandise) and Pathfinder Lounge (apparel)
8 a.m.–7 p.m.	<b>Event Supervisor Check-In</b>	Student Union Atlantis Room (E157)
8 a.m.–11 p.m.	<b>Dorm Check-In</b> (after-hours check-in available by arrangement)	Location sent by email confirmation
8:30 a.m.–5 p.m.	<b>Tournament Information</b>	186 Student Union
9 a.m.–5 p.m.	<b>Special Activities</b> (see page 9 for details)	Wright State Campus
10 a.m.–9 p.m.	<b>Science Olympiad Merchandise</b>	Student Union Bookstore (merchandise) and Pathfinder Lounge (apparel)
6 p.m.–9 p.m.	<b>Fun Night at the Union</b>	Student Union Atrium

### Friday, May 19, 2017

All Day	<b>Wright State University Scavenger Hunt</b>	Student Union RaiderConnect Welcome Desk
8 a.m.–3:30 p.m.	<b>Science Olympiad Merchandise</b>	Student Union Bookstore (merchandise) and Pathfinder Lounge (apparel)
8 a.m.–4 p.m.	<b>Team Registration</b> (coaches only)	Student Union Endeavour Room (156)
8 a.m.–4 p.m.	<b>Event Supervisor Check-In</b>	Student Union Atlantis Room (E157)
8 a.m.–4 p.m.	<b>Volunteer Check-In</b>	Student Union Discovery Room (163)
8 a.m.–4 p.m.	<b>Tournament Information</b>	186 Student Union
8:30 a.m.–1:30 p.m.	<b>Trial Events</b>	Student Union and Russ Engineering
9 a.m.–2:30 p.m.	<b>Special Activities</b>	Wright State Campus
3:30 p.m.	<b>Team Barbeque</b> (first seating, pre-purchased tickets only)	Nutter Center McLin Gym (enter at Gate 3)
4:15–5:45 p.m.	<b>VIP Reception</b> (invitation only)	Nutter Center Berry Room
4:30 p.m.	<b>Team Barbeque</b> (second seating, pre-purchased tickets only)	Nutter Center McLin Gym (enter at Gate 3)
5:15–5:30 p.m.	<b>Parade of States Lineup</b>	Nutter Center Backstage
6–8 p.m.	<b>Opening Ceremony</b>	Nutter Center Arena
8–9 p.m.	<b>Swap Meet</b>	Nutter Center McLin Gym
8–9 p.m.	<b>Coaches and Event Supervisors Meeting</b>	Nutter Center Arena

### Saturday, May 20, 2017

6–8 a.m.	<b>Team Registration</b> (coaches only)	Student Union Endeavour Room (156)
6 a.m.–4 p.m.	<b>Tournament Information</b>	186 Student Union
7 a.m.–4 p.m.	<b>Tournament Competition</b>	See pages 12–13 for schedule
8 a.m.–3 p.m.	<b>Science Olympiad Merchandise</b>	Student Union Bookstore (merchandise) and Pathfinder Lounge (apparel)
8 a.m.–4 p.m.	<b>Volunteer Check-In</b>	Student Union Discovery Room (163)
11 a.m.–1 p.m.	<b>Box Lunch and Pizza Pickup</b> (pre-purchased)	Various locations
5:30–7 p.m.	<b>Team Banquet</b> (pre-purchased tickets)	Nutter Center McLin Gym or Student Union Market
5:45–7:15 p.m.	<b>VIP Light Dinner</b> (invitation only)	Nutter Center Berry Room
7:30–9:30 p.m.	<b>Awards Ceremony</b>	Nutter Center Arena

## ADDITIONAL ACTIVITIES

Thursday, May 18, 2017

All Day	<b>Wright State University Scavenger Hunt</b>	Student Union RaiderConnect Welcome Desk
10–11 a.m.	<b>Exercise Physiology:</b> You're the subject of lab experiments!	055 Biological Sciences II
10–11 a.m.	<b>Nursing Human Patient Simulator</b>	025 University Hall
10 a.m.–Noon	<b>Motion Lab at Home:</b> A portable motion lab for physical therapy	484 Joshi Research Center
10–10:45 a.m.	<b>Financial Aid 101</b>	Student Union Emerald Room (010)
11 a.m.–Noon	<b>Frozen Alive:</b> Tree frogs that freeze solid without croaking	109 Oelman Hall
1–2 p.m.	<b>Neuro Lab:</b> Hands-on neuroscience experiments	114 Oelman Hall
2–2:45 p.m.	<b>Financial Aid 101</b>	Student Union Emerald Room (010)
2–2:30 p.m.	<b>Campus Tour Student Union</b>	Student Union RaiderConnect Welcome Desk
2–3 p.m.	<b>Nursing Human Patient Simulator</b>	025 University Hall
3:30–4:30 p.m.	<b>Anatomy lab:</b> Diseased vs. healthy organs	105 White Hall
4–4:45 p.m.	<b>Financial Aid 101</b>	Student Union Emerald Room (010)
6–9 p.m.	<b>Fun Night at the Student Union</b> Billiards, Table Tennis, Wheelchair Basketball, Swimming, Climbing Wall, Cornhole, Music, and Zumba	Student Union Atrium

Friday, May 19, 2017

All Day	<b>Wright State University Scavenger Hunt</b>	Student Union RaiderConnect Welcome Desk
9–10:30 a.m.	<b>Human Anatomy and Physiology Institute Cadaver Lab Tour</b>	105 White Hall
10–10:30 p.m.	<b>Campus Tour Student Union</b>	Student Union RaiderConnect Welcome Desk
10–10:45 a.m.	<b>Financial Aid 101</b>	Student Union Emerald Room (010)
10–11 a.m.	<b>Q&amp;A with Douglas Leaman, Ph.D., Dean, College of Science and Mathematics</b>	112 Oelman Hall
10 a.m.–2 p.m.	<b>ACE Hardware Science and Ward's Science booths</b>	Student Union Atrium
11 a.m.–Noon	<b>Exercise Physiology:</b> You're the subject of lab experiments!	055 Biological Sciences II
11 a.m.–12:30 p.m.	<b>Human Anatomy and Physiology Institute Cadaver Lab Tour</b>	105 White Hall
1–3 p.m.	<b>Robotic Pursuit-Evasion Testbed:</b> Test your skills against robotic adversaries while playing a game of robot tag	233 Russ Engineering
2–2:45 p.m.	<b>Financial Aid 101</b>	Student Union Emerald Room (010)
4–4:45 p.m.	<b>Financial Aid 101</b>	Student Union Emerald Room (010)

See [wright.edu/scienceolympiad](http://wright.edu/scienceolympiad) for a complete list of activities.

## FIND US ON SOCIAL MEDIA:



@SOAlumniNetwork  
@SO2017WSU

Document your team journey with the hashtag #SO2017WSU



SOAlumniNetwork

# 2017 SCIENCE OLYMPIAD NATIONAL TOURNAMENT



## OPENING CEREMONY Wright State University Nutter Center

Friday, May 19, 2017

5:15 p.m.	<b>Parade of States Participant Lineup</b>	Nutter Center Backstage
6 p.m.	<b>Opening Ceremony</b>  <b>Introduction</b> Master of Ceremonies Jim Sayer, Ph.D. Professor Emeritus, Wright State University  <b>Parade of States</b> Douglas W. Leaman, Ph.D. Dean, College of Science and Mathematics Wright State University  <b>National Anthem</b>  <b>Welcome Remarks</b> Douglas A. Fecher, Vice Chair, Wright State University Board of Trustees Gerard Putz, Ph.D., President and Co-Founder, Science Olympiad  <b>Keynote Address</b> Elliott R. Brown, Ph.D. Professor, Physics and Electrical Engineering Endowed Chair, Experimental Sensor Physics Wright State University  <b>Science Olympiad Pledges</b>	Nutter Center Arena
8 p.m.	<b>Swap Meet</b>	McLin Gymnasium
8 p.m.	<b>Coaches and Event Supervisors Meeting</b>	Nutter Center Arena

THE OPENING AND CLOSING CEREMONIES WILL BE STREAMED LIVE AT [WRIGHT.EDU/STREAMING](http://WRIGHT.EDU/STREAMING)

## AWARDS CEREMONY Wright State University Nutter Center

Saturday, May 20, 2017

7:30–9:30 p.m.	<b>Awards Ceremony</b>  <b>Competition Highlights</b>  <b>National Anthem</b>  <b>Welcome</b> Gerard Putz, Ph.D., President and Co-Founder, Science Olympiad  <b>Individual Event Awards Presentations</b> <b>Division B:</b> Nathan Klingbeil, Ph.D., Dean, Wright State University College of Engineering and Computer Science <b>Division C:</b> Jim Woodland, Chairman, Science Olympiad National Executive Board Wright State University and Science Olympiad Sponsors and Officials  <b>Special Awards Presentations</b> Global Ambassador Team: Gerard Putz, Ph.D., President, Science Olympiad Spirit Award: Sharon Putz, Executive Administrator, Science Olympiad DuPont Enterprise Team Award: P. J. Simon, DuPont Corporation  <b>Team Awards Presentations</b> Gerard Putz, Ph.D., President and Co-Founder, Science Olympiad  <b>Host University Exchange</b> Douglas W. Leaman, Ph.D., and Nathan Klingbeil, Ph.D., Deans, Wright State University Steve Lovaas, Tournament Director, Colorado State University	Nutter Center Arena
----------------	--	---------------------

## OPENING CEREMONY SPEAKERS

### Keynote Speaker



#### **Elliott R. Brown, Ph.D.**

Professor, Physics and Electrical Engineering  
Endowed Chair, Experimental Sensor Physics  
Wright State University

Elliott R. Brown joined Wright State University's physics department in spring 2010. He is conducting research and teaching courses in terahertz (THz) science and technology, solid-state physics, and antenna theory and technology. His THz research encompasses ultrafast 1550-nm GaAs photoconductive sources, microwave-to-THz interaction with soft tissue and biomaterials, THz resonant signatures from biomolecules and bioparticles, THz active-system biomedical imaging, and GaN tunneling and light-emitting devices.

In 2015, he co-authored a paper that won the 2016 THz Science and Tech. Best Paper Award from the IEEE (Institute of Electrical and Electronics Engineers) Microwave Theory and Techniques Society. The paper applied some of the technology developed by the Wright State research team to better diagnose and treat eye disease and improve the success of eye surgeries.

In 2013 Brown was part of a team that won a three-year National Science Foundation grant to develop technology for a one-of-a-kind sensor that uses GHz-to-THz radiation to detect viruses contained in microfluidic chips by measurement of their resonant signatures.

In 2012, Brown and his team began investigating unique THz DNA signatures through a Multidisciplinary University Research Initiative (MURI) funded by the U.S. Army Research Office. Their multi-year grant identified several unique and surprisingly strong signatures from DNA molecules between 0.7 and 1.0 THz, and then in nucleobase molecules between ~1.0 and 2.5 THz.

In 2011, a research group that included Brown won a five-year contract from the Department of Defense to explore an electronic compound semiconductor that could lead to improvements in military radar. The group focused on gallium nitride, a "wide-band-gap" semiconductor that could potentially raise the power output levels of electronic devices and sources up to THz frequencies.

In 2010, he was selected for the Ohio Research Scholars Endowed Chair in THz Sensors Physics and moved his research group from California to Ohio.

Brown earned his bachelor's degree in physics from UCLA and graduate degrees in applied physics from the California Institute of Technology. At UCLA, he was awarded the Kinsey Prize for outstanding graduating physics student. At Caltech, he conducted basic research on magnetically quantized narrow-bandgap semiconductors for use in ultra-sensitive THz superheterodyne receivers and earned a Ph.D. in applied physics.

For his postdoctoral research, Brown worked as an assistant group leader at the MIT Lincoln Laboratory, a federally funded research and development center whose mission is to apply advanced technology to national security issues. While there, he explored THz and IR technologies, high-speed electronics, and novel electromagnetic concepts such as photonic crystal antennas.

Brown also did a stint as program manager for the Defense Advanced Research Projects Agency (DARPA), an arm of the Department of Defense responsible for developing new technology for the military. He oversaw work on microwave integrated circuits for radar and electronic warfare. For this service, he received an Outstanding Achievement Award from the U.S. Office of the Secretary of Defense in 1998. Following DARPA, he was a tenured full professor at UCLA and the University of California, Santa Barbara.

Brown is a Fellow of the IEEE and of the American Physical Society.

## WRIGHT STATE UNIVERSITY SCHOLARSHIPS

Wright State University is pleased to offer scholarships to student winners of the Science Olympiad National Tournament 2017. All official members of the first-place team in Division B and Division C will receive a \$2,500 scholarship, renewable for four years. This scholarship is stackable on top of other academic merit scholarships earned upon admission to Wright State University. In both divisions, the university will also award \$1,000 scholarships to the first-place winners of each individual event. This scholarship is also stackable on top of other academic merit scholarships earned upon admission to Wright State.

Winners must meet regular admission criteria and be accepted to Wright State to receive the scholarship for enrollment. Once enrolled at Wright State, students must maintain a cumulative GPA of 3.0, earn 30 credit hours annually, and complete a designated number of volunteer hours at the Dayton Regional STEM School to be eligible for scholarship renewal.

A student may only receive one National Science Olympiad Scholarship from Wright State, even if he or she wins multiple events. Students who win an individual event and are on a winning team will receive the higher scholarship amount. Students may be eligible for University Honors Program and other applicable scholarships. Students who intend to participate in NCAA Division I athletics at Wright State may not be eligible to receive the National Science Olympiad Scholarship due to NCAA regulations that govern scholarship awards.

### Master of Ceremonies



#### **Jim Sayer, Ph.D.**

Professor Emeritus, Wright State University

Jim Sayer is a Professor Emeritus of Communication at Wright State University, having taught there from 1974 to 2010.

He served as chair of the Department of Communication for 18 years and as dean of the Lake Campus for three years prior to his retirement.

A former intercollegiate debater and debate coach, Sayer now works as a communication professor in the University Honors Program. Rhetoric, mass media, and First Amendment issues are among his areas of expertise.

Sayer served seven terms as the elected president of the university faculty between 1979 and 2007. He is a past president of the Wright State Retirees Association.



## DIVISION B EVENT SCHEDULE Saturday, May 20, 2017

	EVENT	7:00 a.m. to 8:00 a.m.	8:15 a.m. to 9:15 a.m.	9:30 a.m. to 10:30 a.m.	10:45 a.m. to 11:45 a.m.	noon to 1:00 p.m.	1:15 p.m. to 2:15 p.m.	2:30 p.m. to 3:30 p.m.	LOCATION
	Anatomy		01–10	11–20	21–30	31–40	41–50	51–60	145 Medical Sciences
	Bottle Rockets	Scheduled Online							Russ Engineering Parking Lot
	Crime Busters		01–10	11–20	21–30	31–40	41–50	51–60	107 Fawcett Hall
	Disease Detectives	All Teams							101 White Hall
	Dynamic Planet		01–10	11–20	21–30	31–40	41–50	51–60	129 Medical Sciences
	Ecology		51–60	01–10	11–20	21–30	31–40	41–50	127 Medical Sciences
	Experimental Design	All Teams							130 White Hall
	Fast Facts		51–60	01–10	11–20	21–30	31–40	41–50	140 Health Sciences
	Food Science		21–30	31–40	41–50	51–60	01–10	11–20	105 Fawcett Hall
	Hovercraft	Impound	Scheduled Online						009 Student Success Ctr
	Invasive Species		41–50	51–60	01–10	11–20	21–30	31–40	141 Medical Sciences
	Meteorology		31–40	41–50	51–60	01–10	11–20	21–30	125 Medical Sciences
	Microbe Mission		31–40	41–50	51–60	01–10	11–20	21–30	127 Fawcett Hall
	Mission Possible	Impound	Scheduled Online						Student Union Atrium
	Optics		31–40	41–50	51–60	01–10	11–20	21–30	143 Medical Sciences
	Reach for the Stars		11–20	21–30	31–40	41–50	51–60	01–10	165 Brehm Laboratory
	Road Scholar		41–50	51–60	01–10	11–20	21–30	31–40	135 Oelman Hall
	Rocks & Minerals		21–30	31–40	41–50	51–60	01–10	11–20	011 Biological Sciences I
	Scrambler	Impound	Scheduled Online						Student Union Apollo Room
	Towers	Scheduled Online							101 Fawcett Hall
	Wind Power	Impound	11–20	21–30	31–40	41–50	51–60	01–10	160 Rike Hall
	Wright Stuff	Scheduled Online							Student Union Gym
	Write It Do It		21–30	31–40	41–50	51–60	01–10	11–20	103, 105, 107 Student Union
	Open to the Public								



## DIVISION C EVENT SCHEDULE Saturday, May 20, 2017

EVENT	7:00 a.m. to 8:00 a.m.	8:15 a.m. to 9:15 a.m.	9:30 a.m. to 10:30 a.m.	10:45 a.m. to 11:45 a.m.	noon to 1:00 p.m.	1:15 p.m. to 2:15 p.m.	2:30 p.m. to 3:30 p.m.	LOCATION
Anatomy		01–10	11–20	21–30	31–40	41–50	51–60	103 Biological Sciences I
Astronomy		41–50	51–60	01–10	11–20	21–30	31–40	340 Oelman Hall
Chemistry Lab		01–10	11–20	21–30	31–40	41–50	51–60	119 Fawcett Hall
Disease Detectives	All Teams							120 Medical Sciences
Dynamic Planet		01–10	11–20	21–30	31–40	41–50	51–60	105 Biological Sciences I
Ecology		51–60	01–10	11–20	21–30	31–40	41–50	134 Health Sciences
 Electric Vehicle	Impound	Scheduled Online						Student Union Apollo Room
Experimental Design	All Teams							014 Student Success Ctr
Forensics		21–30	31–40	41–50	51–60	01–10	11–20	064 Brehm Laboratory
Game On		41–50	51–60	01–10	11–20	21–30	31–40	007 Student Success Ctr
 Helicopters	Scheduled Online							Student Union Racquetball Courts
 Hovercraft	Impound	Scheduled Online						009 Student Success Ctr
Hydrogeology		31–40	41–50	51–60	01–10	11–20	21–30	005 Student Success Ctr
Invasive Species		41–50	51–60	01–10	11–20	21–30	31–40	169 Brehm Laboratory
Materials Science		31–40	41–50	51–60	01–10	11–20	21–30	137 Fawcett Hall
Microbe Mission		31–40	41–50	51–60	01–10	11–20	21–30	130 Fawcett Hall
Optics		51–60	01–10	11–20	21–30	31–40	41–50	146 Russ Engineering
Remote Sensing		21–30	31–40	41–50	51–60	01–10	11–20	144 Russ Engineering
 Robot Arm	Scheduled Online							109 Oelman Hall
Rocks & Minerals		11–20	21–30	31–40	41–50	51–60	01–10	019 Biological Sciences I
 Towers	Scheduled Online							101 Fawcett Hall
Wind Power	Impound	11–20	21–30	31–40	41–50	51–60	01–10	145 Russ Engineering
Write It Do It		21–30	31–40	41–50	51–60	01–10	11–20	171, 178, 180 Brehm Laboratory
 Open to the Public								

# 2017 SCIENCE OLYMPIAD NATIONAL TOURNAMENT



STATE	TEAM NUMBER AND SCHOOL	COACH
<b>Alabama</b>	B35 Auburn Junior High School C31 Auburn High School	Jacque Middleton Rekha Lall
<b>Alaska</b>	B50 Colony Middle School C57 Mat-Su Career and Technical High School	Erin Pilgreen Faith Lussow
<b>Arizona</b>	B42 Paragon Science Academy C45 University High School	Ayse Kolo Thomas Tobin
<b>Arkansas</b>	B54 LISA Academy Charter School West C53 Little Rock Central High School	Sherry Washington Melissa Donham
<b>California</b>	B1 Oak Valley Middle School B2 Winston Churchill Middle School C3 Troy High School C4 Mira Loma High School	Cass Kaminetz Jeff Jungk Kurt Wahl, Justin Kim Scott Martinez
<b>Colorado</b>	B27 Preston Middle School C36 Fossil Ridge High School	Elizabeth Loyd Daniel Dannahower, Melissa Vigil
<b>Connecticut</b>	B49 Lyme/Old Lyme Middle School C41 Hopkins School	Shannon Glorioso Sarah Leite
<b>Delaware</b>	B37 HB duPont Middle School C35 Charter School of Wilmington	Dana Wisnoski Glenn Heffner
<b>Florida</b>	B21 Archimedean Middle Conservatory B22 Orlando Science Middle School C17 Boca Raton Community High School C18 Archimedean Upper Conservatory	Patricio Mendez Zafer Demir Jon Benskin Kalaiselvi Panneerselvam
<b>Georgia</b>	B15 Dodgen Middle School B16 Fulton Science Academy C15 Brookwood High School C16 Chattahoochee High School	Debbie Amodeo Pam Walsh Joseph Cox Anne Podber
<b>Hawaii</b>	B41 Highlands Intermediate School C44 Iolani School	Wynne Lee Narayan Raja
<b>Idaho</b>	B45 Treasure Valley Homeschool C51 Treasure Valley Homeschool	Michelle Anderson April Daum
<b>Illinois</b>	B9 Daniel Wright Junior High School B10 Marie Murphy Middle School C9 New Trier High School C10 Adlai E. Stevenson High School	Mary Ellen Buckley Shannon Wright Alex Howe Amerigo Carnazzola
<b>Indiana</b>	B23 Thomas Jefferson Middle School C24 Munster High School	Carol Haller Keith Koszut
<b>Iowa</b>	B53 Ames Middle School C54 Mount Vernon High School	Peg Barbour Alaina Appley
<b>Kansas</b>	B28 California Trail Middle School C33 Olathe North High School	Mallory Beem Chris Elniff
<b>Kentucky</b>	B39 Russell Independent Middle School C32 DuPont Manual High School	Derrick Elliott Belinda Hafell
<b>Louisiana</b>	B51 St. John Berchmans Catholic School C49 St. Martin's Episcopal School	Amy Knight Warren Lind



STATE	TEAM NUMBER AND SCHOOL	COACH
<b>Maine</b>	B59 Medomak Middle School C52 Waterville Senior High School	Madelon Kelly Jon Ramgren
<b>Maryland</b>	B26 North Bethesda Middle School C37 Centennial High School	Daniel Werbeck Jarrett Emery
<b>Massachusetts</b>	B36 A.W. Coolidge Middle School C38 Acton-Boxborough Regional High School	Karawan Meade Brian Dempsey
<b>Michigan</b>	B5 Meads Mill Middle School B6 Baker Middle School C7 Northville High School C8 International Academy–Central	Murali Dhulipalla Parvath Police Jin Yu Brad Davies
<b>Minnesota</b>	B44 Chippewa Middle School C29 Mounds View High School	Kevin Swanson Michael Huberty
<b>Mississippi</b>	B48 Germantown Middle School C47 Cathedral High School	Stacy Tingle Denise Thibodeaux
<b>Missouri</b>	B19 Ladue Middle School B20 Wydown Middle School C21 Ladue Horton Watkins High School C22 Pembroke Hill High School	Martin Long Sandra Sermos Mark Biernbaum Kimberly Cho
<b>Montana</b>	B38 Clancy School C40 Helena High School	Deanna Carlson Claire Pichette
<b>Nebraska</b>	B32 Mission Middle School C34 Lincoln Southwest High School	J. Matthew Thompson, Norma Thompson, Iris Woolery Greg Cooper
<b>Nevada</b>	B52 Hyde Park Middle School Academy of Science and Mathematics C50 Ed W. Clark High School	Robin Hill, Judy Kraus James Miller
<b>New Hampshire</b>	B58 Walpole Elementary School C43 Merrimack High School	Kim Lewis Mary-Alice Corliss
<b>New Jersey</b>	B34 Community Middle School C30 West Windsor Plainsboro High School South	Kevin Mackenzie Sunila Sharma
<b>New Mexico</b>	B33 Albuquerque Area Home Schoolers C39 Albuquerque Academy	Linda Walkup Kiran Manne
<b>New York</b>	B7 Eagle Hill Middle School B8 Paul J Gelinas Junior High School C1 Fayetteville-Manlius High School C2 Columbia High School	Kristin Cook Gary Vorwald Joshua Buchman Diana Prout
<b>North Carolina</b>	B3 Piedmont IB Middle School B4 Fred J. Carnage Magnet Middle School C5 North Carolina School of Science and Math C6 William G. Enloe High School	Corina Mota Pat Weber Kim Monahan Travis Martin
<b>North Dakota</b>	B29 Wachter Middle School C26 Bismarck High School	Ben Schiermeister Scott Weigum
<b>Ohio</b>	B11 Tower Heights Middle School B12 Solon Middle School C13 Mentor High School C14 Solon High School	Susan Ralston, Karen Hardie David Brewer Tom Ramsey Nicole Geiger

# 2017 SCIENCE OLYMPIAD NATIONAL TOURNAMENT



STATE	TEAM NUMBER AND SCHOOL	COACH
Oklahoma	B46 Casady School C56 Casady School	Aric Sappington Lisa Bek-gran
Oregon	B55 Stoller Middle School C55 Westview High School	Diptha Shrinivas Komo Chiu, Mei Hong
Pennsylvania	B13 Springhouse Middle School B14 Shady Side Academy C11 Harriton High School C12 Bayard Rustin High School	Sam Ghosh Bonnie Maxwell Brian Gauvin James Byrd
Rhode Island	B47 Gallagher Middle School C48 Barrington High School	Jeff Altomari Sonalya Jayasuriya
South Carolina	B43 Clinton Middle School C46 Clinton High School	Terri O'Shields Michael Mack
South Dakota	B57 Yankton Middle School C58 Yankton High School	Brooks Schild Robert Medeck Sr.
Tennessee	B25 Bearden Middle School C25 White Station High School	Bill Kenny Crystal Davis
Texas	B17 Beckendorff Junior High School B18 Kealing Middle School C19 Liberal Arts and Science Academy (LASA) C20 William P. Clements High School	Morgan Allen Vaishalee Patil David Walker Vicky Brathwaite
Utah	B40 Fairfield Junior High School C42 Maple Mountain High School	Dennis Erickson Kyle Miller
Virginia	B30 Longfellow Middle School C27 Fairfax High School	Susan Boomer Catherine Williams
Washington	B24 Northshore Junior High School C28 Camas High School	Edie Lie Matthew Chase
West Virginia	B60 Huntington Middle School C60 Huntington High School	Leann Haines William Strait
Wisconsin	B31 Hamilton Middle School C23 Medford Area Senior High	Lori Vogel Brad Paff
Wyoming	B56 Riverton Middle School C59 Kelly Walsh High School	Aziz Waheed Paul Kasza
Japan	C61 Gifu Prefectural Gifu Senior High School	Ayaka Kawano



We welcome Gifu High School as the 2017 Science Olympiad Global Ambassador Team from Japan! Our eight-year relationship with the Japan Science and Technology Agency has allowed a team to travel to the Science Olympiad National Tournament each year since 2012.



## EVENT DESCRIPTIONS Division B: Middle School / Division C: High School



### **ANATOMY AND PHYSIOLOGY (B/C)**

This event encompasses the anatomy and physiology of selected body systems, this year limited to nervous and endocrine systems and sense organs.



### **ASTRONOMY (C)**

Teams will demonstrate an understanding of stellar evolution and Type Ia supernova.



### **BOTTLE ROCKETS (B)**

Prior to the tournament, teams construct up to two rockets designed to stay aloft for the greatest amount of time while carrying a raw Grade A large chicken egg that survives impact.



### **CHEMISTRY LAB (C)**

Teams will demonstrate chemistry laboratory skills and answer questions related to thermodynamics and gas laws.



### **CRIME BUSTERS (B)**

Teams will identify the perpetrators of a crime or crimes by using paper chromatography and analysis of unknown solids, liquids, and plastics found at the scene of a crime.



### **DISEASE DETECTIVES (B/C)**

Students will use investigative skills in the scientific study of disease, injury, health, and disability in populations or groups of people with a focus on food-borne illness.



### **DYNAMIC PLANET (B/C)**

Students will demonstrate an understanding of the large-scale processes affecting the structure of Earth's crust (tectonics).



### **ECOLOGY (B/C)**

Students will answer questions involving content knowledge and process skills in the area of ecology and adaptations in featured North American biomes.



### **ELECTRIC VEHICLE (C)**

Teams must design, build, and test a vehicle that uses electrical energy as its sole means of propulsion to travel as quickly as possible and stop close to a target point.



### **EXPERIMENTAL DESIGN (B/C)**

Given a set of unknown objects, teams will design, conduct, analyze, and write up an experiment.



### **FAST FACTS (B)**

Teams will fill in a grid of terms that begin with a given letter to match given science categories.



### **FOOD SCIENCE (B)**

Students will answer questions about the chemistry of food and food grains and build a simple calorimeter to determine the energy content of a solid foodstuff.



### **FORENSICS (C)**

Students will identify polymers, solids, fibers, and other materials in a crime scenario.



### **GAME ON (C)**

This event will determine a team's ability to design and build an original computer game incorporating the theme provided to them by the supervisor using the program Scratch.



### **HELICOPTERS (C)**

Prior to the tournament, teams design, construct, and test free flight rubber-powered helicopters to achieve maximum time aloft.



### **HOVERCRAFT(B/C)**

Competitors may construct a self-propelled air-levitated vehicle with up to two battery-powered motors that turn one propeller each to levitate and move the vehicle down a track. Competitors must also be tested on their knowledge of classic mechanics and related topics.



### **HYDROGEOLOGY (C)**

Students will manipulate a groundwater computer model, answer questions about groundwater concepts, and evaluate solutions, based on hydrogeological evidence, to reduce anthropogenic effects on groundwater.



### **INVASIVE SPECIES (B/C)**

This event will test student knowledge of invasive species in local and national ecosystems



### **MATERIALS SCIENCE (C)**

Teams will answer a series of questions or complete tasks involving the science processes of chemistry focused in the areas of materials science.



### **METEOROLOGY (B)**

This event is about this meteorological topic: severe storms.



### **MICROBE MISSION (B/C)**

Teams will answer questions, solve problems, and analyze data pertaining to microbes.














### **MISSION POSSIBLE (B)**

Prior to the competition, participants will design, build, test, and document a Rube Goldberg-like device that completes a required final task through an optional series of simple machines.



## EVENT DESCRIPTIONS Division B: Middle School / Division C: High School

- |   |   |
|---|---|
| <p> <b>OPTICS (B/C)</b><br/>Teams must participate in an activity involving positioning mirrors to direct a laser beam towards a target. Teams must also be tested on their knowledge of geometric and physical optics.</p> <p> <b>REACH FOR THE STARS (B)</b><br/>Students will demonstrate an understanding of the properties and evolution of stars, especially star-forming regions and supernova remnants, and their observation of different portions of the electromagnetic spectrum.</p> <p> <b>REMOTE SENSING (C)</b><br/>Participants will use remote sensing imagery, data, and computational process skills to complete tasks related to climate change processes in the Earth system.</p> <p> <b>ROAD SCHOLAR (B)</b><br/>Teams will answer interpretive questions that may use one or more state highway maps, USGS topographic maps, internet-generated maps, a road atlas, or satellite/aerial images.</p> <p> <b>ROBOT ARM (C)</b><br/>Prior to the competition, teams must design, build, document, and test one robotic device to move scoreable items.</p> <p> <b>ROCKS AND MINERALS (B/C)</b><br/>Teams will demonstrate their knowledge of rocks and minerals.</p> | <p> <b>SCRAMBLER (B)</b><br/>Competitors must design, build, and test a mechanical device that uses the energy from a falling mass to transport an egg along a track as quickly as possible and stop as closely as possible to the center of a terminal barrier without breaking the egg.</p> <p> <b>TOWERS (B/C)</b><br/>Prior to the competition, teams will design and build a tower meeting requirements specified in the rules to achieve the highest structural efficiency.</p> <p> <b>WIND POWER (B/C)</b><br/>Teams will build a blade assembly that consists of any kind of propeller/pinwheel/rotor attached to a CD that will be used to capture wind power. Students will also be tested on their knowledge relating to alternative energy.</p> <p> <b>WRIGHT STUFF (B)</b><br/>Prior to the competition teams design, construct, and test free flight rubber-powered monoplanes to achieve maximum time aloft.</p> <p> <b>WRITE IT DO IT (B/C)</b><br/>This event is a technical exercise where students write a description of a contraption and other students will attempt to recreate it using only the written description.</p> |
|---|---|





## TOURNAMENT EVENTS BY BUILDING

### **Biological Sciences I**

Anatomy and Physiology (Div. C)

Dynamic Planet (Div. C)

Rocks and Minerals

### **Brehm Laboratory**

Forensics

Invasive Species (Div. C)

Reach for the Stars

Write It Do It (Div. C)

### **Fawcett Hall**

Chemistry Lab

Crime Busters

Food Science

Materials Science

Microbe Mission

Towers

### **Health Sciences**

Ecology (Div. C)

Fast Facts

### **Medical Sciences**

Anatomy and Physiology (Div. B)

Disease Detectives (Div. C)

Dynamic Planet (Div. B)

Ecology (Div. B)

Invasive Species (Div. B)

Meteorology

Optics (Div. B)

### **Oelman Hall**

Astronomy

Road Scholar

Robot Arm

### **Rike Hall**

Wind Power (Div. B)

### **Russ Engineering Center**

Bottle Rockets

Optics (Div. C)

Remote Sensing

Wind Power (Div. C)

### **Student Success Center**

Experimental Design (Div. C)

Game On

Hydrogeology

### **Student Union**

Electric Vehicle

Helicopters

Hovercraft

Mission Possible

Scrambler

Write It Do It (Div. B)

Wright Stuff

### **White Hall**

Disease Detectives (Div. B)

Experimental Design (Div. B)



#### About this List

This is a list of events by location. For tournament event times, see your division's event schedule on pages 12–13.



## STATE DIRECTORS

**Jane Nall**  
Alabama  
**Tim Lundt**  
Alaska  
**Reina Gomez**  
Arizona  
**Eric Kaufmann**  
Arkansas  
**Barbara Little**  
California  
**Peter Hung**  
California  
**Steve Lovaas**  
Colorado  
**Brendan Herlihy**  
Connecticut  
**Gerald Poirier**  
Delaware  
**Mike McKee**  
Florida  
**Kelly Price**  
Georgia  
**Kina Kinsley**  
Hawaii (B)  
**Tyson Kikugawa**  
Hawaii (C)  
**Gary Carlson**  
Idaho  
**Joe Simmons**  
Illinois  
**Jeremy Gerber**  
Indiana  
**Susan Noreuil**  
Iowa  
**Jill Fisher**  
Kansas  
**Lowell Shank**  
Kentucky  
**Bruce Sherman**  
Louisiana  
**Carol Titterton**  
Maine  
**Sara Shunkwiler**  
Maryland  
**Brian Niece**  
Massachusetts (B)  
**Bob Goldstein**  
Massachusetts (C)  
**Regina Zibuck**  
Michigan  
**Brandi Gordon**  
Minnesota (B)  
**Matthew Neibergall**  
Minnesota (C)

**Sheila Hendry**  
Mississippi  
**Patty Palmietto**  
Missouri  
**Michelle Akin**  
Montana  
**Susan Hester**  
Nebraska  
**Richard Vineyard**  
Nevada  
**Nicole Eyet**  
New Hampshire  
**Jennifer Wirt**  
New Jersey  
**Troylyn Zimmerly**  
New Mexico  
**Harold Miller**  
New York (B)  
**Jamie Cucinotta**  
New York (C)  
**Kim Gervase**  
North Carolina  
**Guy Hokanson**  
North Dakota  
**Angela Davis**  
Ohio  
**Bob Melton**  
Oklahoma  
**Jean Cavanaugh**  
Oregon  
**Roger Demos**  
Pennsylvania  
**James Magyar**  
Rhode Island  
**Bret Clark**  
South Carolina  
**Clark Bennett**  
South Dakota  
**David Stanislawski**  
Tennessee  
**Nancy Magnussen**  
Texas  
**Amy Arkwright**  
Utah  
**Karen Emmons**  
Virginia  
**Sue Murphy**  
Washington  
**Jennifer Mosher**  
West Virginia  
**Sara Seidling**  
Wisconsin (B)  
**Forrest Schultz**  
Wisconsin (C)  
**Paul Marquard**  
Wyoming

## EVENT SUPERVISORS

**Division B**  
Anatomy and Physiology: **Patty Palmietto**, MO  
Bottle Rocket: **Jason Painter**, NC  
Bottle Rocket: **Jake Winemiller**, NE  
Crime Busters: **Brent Horn**, UT  
Disease Detectives: **Ralph Cordell**, GA  
Dynamic Planet: **Russ Crittenden**, IL  
Ecology: **Kimberly Gervase**, NC  
Experimental Design: **Kirsten Jaster**, OH  
Fast Facts: **Maha Hrbac**, NY  
Fast Facts: **Sheila Hendry**, MS  
Food Science: **Jamie Cucinotta**, NY  
Hovercraft: **Audrey Carson**, OH  
Hovercraft: **Andy Hamm**, WI  
Invasive Species: **Franklin Allaire**, TX  
Meteorology: **Stacie Bender**, UT  
Meteorology: **Susannah Burrows**, WA  
Meteorology: **Bob Hansen**, DC  
Meteorology: **Jeannine Montgomery**, VA  
Microbe Mission: **Karen Lancour**, MI  
Mission Possible: **Manley Midgett**, NC  
Optics: **Roger Demos**, PA  
Optics: **Paul Voydanoff**, MI  
Reach for the Stars: **Dustin Schroeder**, CA  
Road Scholar: **John Leutz**, OH  
Road Scholar: **Brendan Herlihy**, CT  
Rocks and Minerals: **Paul Randazzo**, MI  
Scrambler: **Dennis Papesh**, OH  
Scrambler: **Bro. Nigel Pratt**, NY  
Towers: **Chuck Stachovic**, AZ  
Wind Power: **Ian Emmons**, VA  
Wind Power: **Karen Emmons**, VA  
Wright Stuff: **Tom Sanders**, IN  
Wright Stuff: **John Hance**, OH  
Write It Do It: **Reina Gomez**, AZ  
Write It Do It: **Shelly Heger**, IL

**Division C**  
Anatomy and Physiology: **Matt Kramer**, OH  
Anatomy and Physiology: **Katherine Toy**, NY  
Astronomy: **Donna Young**, AZ  
Chem Lab: **Jon Aros**, IN  
Chem Lab: **Allen Leung**, CA  
Disease Detectives: **Ralph Cordell**, GA  
Dynamic Planet: **David Harwood**, NE  
Dynamic Planet: **Enrica Quartini**, TX  
Ecology: **Robyn Fischer**, NM  
Electric Vehicle: **Peter Hung**, CA  
Electric Vehicle: **Kevin Kha**, CA  
Experimental Design: **Bonnie Buddendeck**, OH  
Forensics: **Lin Wozniewski**, IN  
Game On: **Dan Nichols**, IN  
Helicopters: **Matthew Chalker**, HI  
Hovercraft: **Dave Moyer**, PA  
Hydrogeology: **Jim Simpson**, OH  
Hydrogeology: **Paul Fleischman**, OH  
Hydrogeology: **Darius Hixon**, OH  
Invasive Species: **Alex Fairchild**, WI  
Material Science: **Alex Dang**, NY  
Material Science: **Forrest Schultz**, WI  
Microbe Mission: **Greg Palmer**, TX  
Optics: **Russ Burleson**, MD  
Remote Sensing: **Mike Bellus**, OH  
Remote Sensing: **Anand Gnanadesikan**, MD  
Robot Arm: **Jeff Anderson**, MI  
Rocks and Minerals: **Allan Nolan**, MS  
Rocks and Minerals: **Gary Vorwald**, NY  
Towers: **Greg Marconnet**, WI  
Wind Power: **Jim Grant**, IL  
Wind Power: **Matt Barnett**, IA  
Write It Do It: **Heather McKean**, WA  
Write It Do It: **Sue Murphy**, WA  
Write It Do It: **Mimi Smith**, PA

### Trial and Pilot Events

Roller Coaster: **Patrick Chalker**, OH  
Roller Coaster: **Rob Diamond**, OH  
Rotor Egg Drop: **David Goorskey**, OH  
Indoor Bottle Rocket: **Jake Winemiller**, NE  
Electric Wright Stuff: **Matthew Chalker**, HI



## EMERGENCY AND LOCAL RESOURCES

### POLICE

**Emergency**  
Call 911

**Wright State Police (non-emergency)**  
Police Headquarters: 118 Campus Services Building  
(937) 775-2111

### HOSPITALS/URGENT CARE

**Doctors' Urgent Care Office**  
2131 Gateway Dr.  
Fairborn, OH 45324  
(937) 873-9500  
(Daily, 8:30 a.m.–10 p.m.)

**Kettering Urgent Care Beaver Creek**  
3371 Kemp Rd.  
Beaver Creek, OH 45431  
(937) 458-4200  
(Monday–Friday, 9 a.m.–8:45 p.m.;  
Saturday–Sunday, 9 a.m.–4:45 p.m.)

**Soin Medical Center**  
3535 Pentagon Blvd.  
Beaver Creek, OH 45431  
(937) 702-4000

**WrightCare**  
Wright State Physicians Health Center  
725 University Blvd.  
Dayton, OH 45435  
(937) 560-2273  
(MTWF, noon–6 p.m., closed Thursday)

### PHARMACIES

**CVS Pharmacy**  
200 E. Dayton–Yellow Springs Rd.  
Fairborn, OH 45324  
(937) 878-3991

1331 North Fairfield Rd.  
Beaver Creek, OH 45432  
(937) 426-4478

**Kroger**  
1161 E. Dayton–Yellow Springs Rd.  
Fairborn, OH 45324  
(937) 482-0305

**Meijer Pharmacy**  
3822 Colonel Glenn Hwy.  
Fairborn, OH 45324  
(937) 426-3600

**Walgreens**  
2269 N. Fairfield Rd.  
Beaver Creek, OH 45431  
(937) 320-9112

**Walmart Pharmacy**  
3360 Pentagon Blvd.  
Beaver Creek, OH 45431  
(937) 426-7007

### HARDWARE STORES

**Barney's True Value**  
3375 Dayton–Xenia Rd.  
Beaver Creek, OH 45432  
(937) 426-5070  
(M–F 8 a.m.–8 p.m.; Sat 9–6; Sun 10–5)

**Handyman Ace Hardware**  
122 E. Dayton–Yellow Springs Rd.  
Fairborn, OH 45324  
(937) 879-7866  
(M–F 8 a.m.–8 p.m.; Sat 8–7; Sun 10–5)

**The Home Depot**  
3775 Presidential Dr.  
Fairborn, OH 45324  
(937) 431-7346  
(M–S 6 a.m.–9 p.m.; Sun 8–7)

**Lowe's**  
2850 Centre Dr.  
Beaver Creek, OH 45324  
(937) 427-1110  
(M–S 6 a.m.–10 p.m.; Sun 8–8)

### CRAFT STORES

**Busy Beaver Arts & Crafts**  
3445 Dayton–Xenia Rd.  
Beaver Creek, OH 45432  
(937) 429-3920  
(M–S 10–5; closed Sun)

**Hobby Lobby**  
2440 N. Fairfield Rd.  
Beaver Creek, OH 45431  
(937) 429-9952  
(M–S 9 a.m.–8 p.m.; closed Sun)

**Jo-Ann Fabric and Craft Store**  
Beaver Creek Towne Centre  
2850 Centre Dr.  
Fairborn, OH 45324  
(937) 426-6765  
(M–S 9 a.m.–9 p.m.; Sun 10–6)

**Michaels**  
Beaver Creek Shopping Center  
2500 N. Fairfield Rd.  
Beaver Creek, OH 45431  
(937) 431-8940  
(M–S 9 a.m.–9 p.m.; Sun 10–7)

### GROCERY STORES

**Aldi**  
2451 Lakeview Dr.  
Beaver Creek, OH 45431  
(855) 955-2534

**Kroger**  
1161 E. Dayton–Yellow Springs Rd.  
Fairborn, OH 45324  
(937) 754-1491

**Meijer**  
3822 Colonel Glenn Hwy.  
Fairborn, OH 45324  
(937) 426-3600

**Walmart**  
3360 Pentagon Blvd.  
Beaver Creek, OH 45431  
(937) 426-7007

### SHIPPING AND PRINTING

**FedEx Office Print & Ship Center**  
University Shoppes Shopping Center  
2646 Colonel Glenn Hwy.  
Fairborn, OH 45324  
(937) 429-2585  
(Monday–Friday, 7 a.m.–11 p.m.;  
Saturday, 8 a.m.–9 p.m.;  
Sunday, 9 a.m.–9 p.m.)

**Wright Copy**  
181 Student Union  
(937) 775-5784  
(Monday–Thursday, 8 a.m.–6 p.m.;  
Friday 8 a.m.–5 p.m.)

### BANKING

**Wright-Patt Credit Union**  
180 Student Union  
Wright State University Campus  
(937) 775-5797  
ATMs are located in the Student Union,  
on the first floor of Allyn Hall, and in the  
Nutter Center.

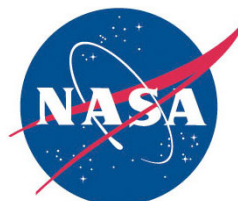
# 2017 SCIENCE OLYMPIAD NATIONAL TOURNAMENT



## NATIONAL SPONSORS

### Platinum Sponsors

---



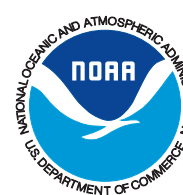
### Gold Sponsors

---



### Silver Sponsors

---



### Bronze Sponsors

---

Academy of Model Aeronautics  
Investing in Communities  
MAKE Magazine  
Society for Neuroscience  
Yale Young Global Scholars  
The Groundwater Foundation



## NATIONAL SPONSORS

### Strategic Partners

---



**DMDII**  
DIGITAL MANUFACTURING AND  
DESIGN INNOVATION INSTITUTE



### Local Presenting Sponsor

---



**FOUNDATION**

### Local Supporting Sponsors

---

**BARNES & NOBLE**  
AT WRIGHT STATE UNIVERSITY  
in the Student Union Building



### Local Hosting Sponsor

---



### Science Olympiad National Executive Board

---

**Gerard Putz**, President and Co-Founder  
**James Woodland**, Former Nebraska State Director  
**Mike McKee**, Florida State Director  
**Sharon Putz**, Executive Administrator  
**Jennifer Kopach**, Executive Director  
**Steve Betza**, Lockheed Martin  
**Peggy Vavala**, DuPont Corp. (ret.)  
**Jon Pedersen**, Dean, School of Education, University of South Carolina  
**Angela Davis**, STEM Outreach Director, Ohio State University  
**Jack Cairns**, Science Olympiad Co-Founder, Emeritus

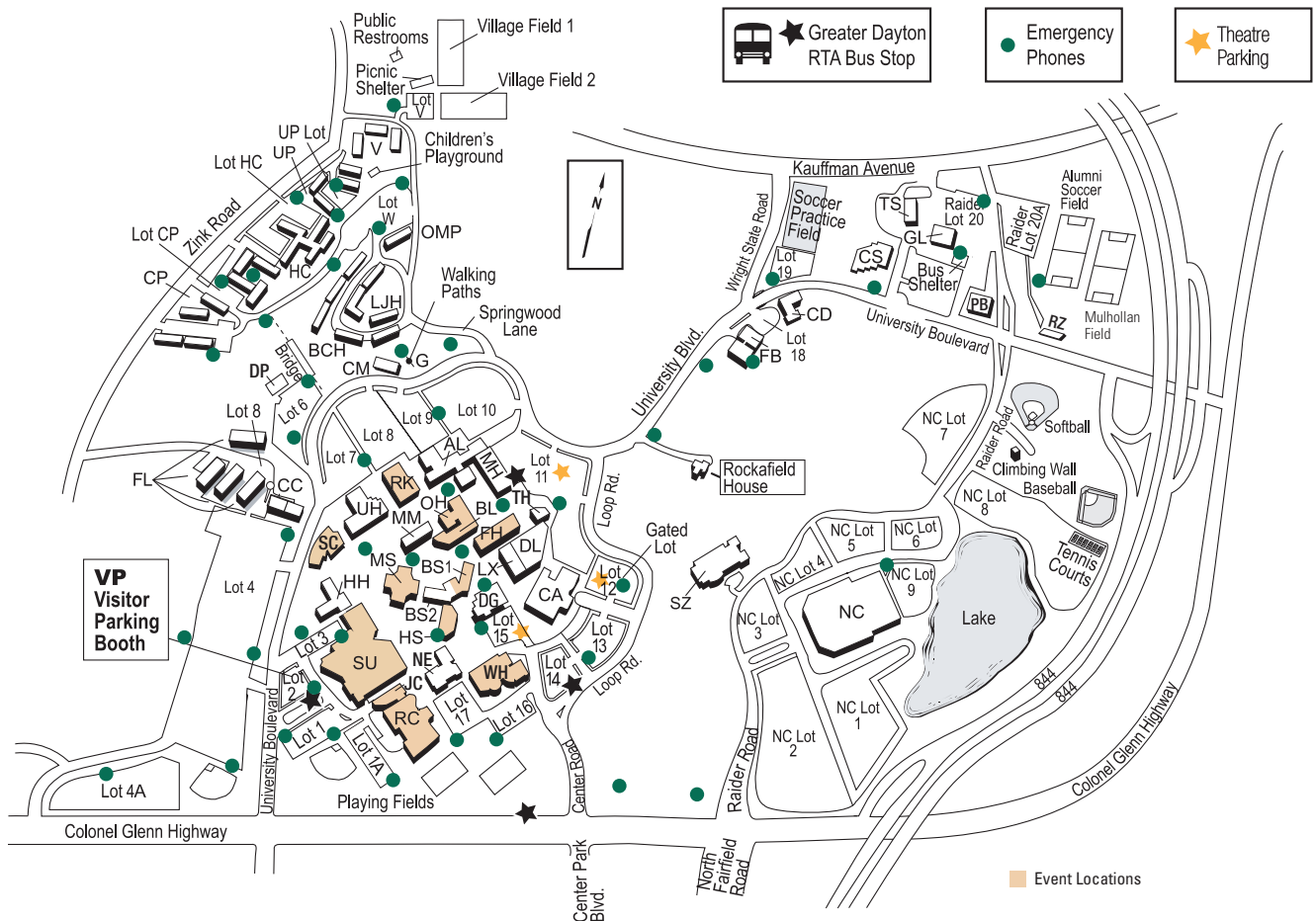
### Science Olympiad National Tournament 2017 Committee

---

**CeAnn Chalker**, Co-Director and Science Olympiad National Office Liaison  
**Fran Keeley**, Co-Director and Wright State University Liaison  
**Mark Anderson**, Marketing  
**Jason Bickford**, Facilities/Operations  
**Julie Bertso**s, Registration  
**Andrew Call**, Marketing  
**Alan Chalker**, Opening/Awards Ceremonies  
**Angela Davis**, State Director  
**Lee Guild**, Nutter Center, Opening/Awards Ceremonies  
**Marianne Kramer**, Science Olympiad Representative  
**Jacqueline Neal**, Tournament Equipment  
**Cory Owen**, Marketing  
**Eric Rowley**, Volunteers  
**Soha Shah**, Science Olympiad Coordinator

# WRIGHT STATE UNIVERSITY DAYTON CAMPUS MAP

- |   |   |   |
|---|---|---|
| <b>AL</b> Allyn Hall                    | <b>G</b> Garden for the Senses                            | <b>PB</b> Wright State Physicians Health Center     |
| <b>BS1</b> Biological Sciences I        | <b>GL</b> Geology Field Equipment Base                    | <b>RK</b> Rike Hall                                 |
| <b>BS2</b> Biological Sciences II       | <b>HH</b> Hamilton Hall                                   | <b>RZ</b> Rinzler Student Sports Complex            |
| <b>BCH</b> Boston/Cedar/Hawthorn        | <b>HC</b> Honors Community                                | <b>RC</b> Russ Engineering Center                   |
| <b>BL</b> Brehm Laboratory              | <b>HS</b> Health Sciences                                 | <b>SC</b> Student Success Center                    |
| <b>CC</b> Community Center              | <b>JC</b> Joshi Research Center                           | <b>SU</b> Student Union                             |
| <b>CM</b> Campus Ministry Center        | <b>LJH</b> Laurel/Jacob/Hickory                           | <b>SZ</b> Setzer Pavilion/Mills Morgan Center       |
| <b>CS</b> Campus Services Building      | <b>LX</b> Computer Services Library Annex                 | <b>TH</b> Tom Hanks Center for Motion Pictures      |
| <b>CD</b> Child Development Center      | <b>MM</b> Mathematical and Microbiological Sciences       | <b>TS</b> Transportation Services Center            |
| <b>CP</b> College Park Apartments       | <b>MS</b> Medical Sciences                                | <b>UH</b> University Hall                           |
| <b>CA</b> Creative Arts Center          | <b>MH</b> Millett Hall                                    | <b>UP</b> University Park Apartments                |
| <b>DG</b> Diggs Laboratory              | <b>NE</b> Nutter Center, Wright State                     | <b>V</b> The Village Apartments                     |
| <b>DP</b> Dog Park, Wingerd Service     | <b>NC</b> Neuroscience Engineering Collaboration Building | <b>VP</b> Visitor Parking Booth                     |
| <b>DL</b> Dunbar Library, Paul Laurence | <b>OMP</b> Oak/Maple/Pine                                 | <b>WH</b> White Hall (Boonshoft School of Medicine) |
| <b>FH</b> Fawcett Hall                  | <b>OH</b> Oelmann Hall                                    |   |
| <b>FB</b> Fine Arts Building            |   |   |
| <b>FL</b> Forest Lane Apartments        |   |   |



**WRIGHT STATE UNIVERSITY**

**50 YEARS**