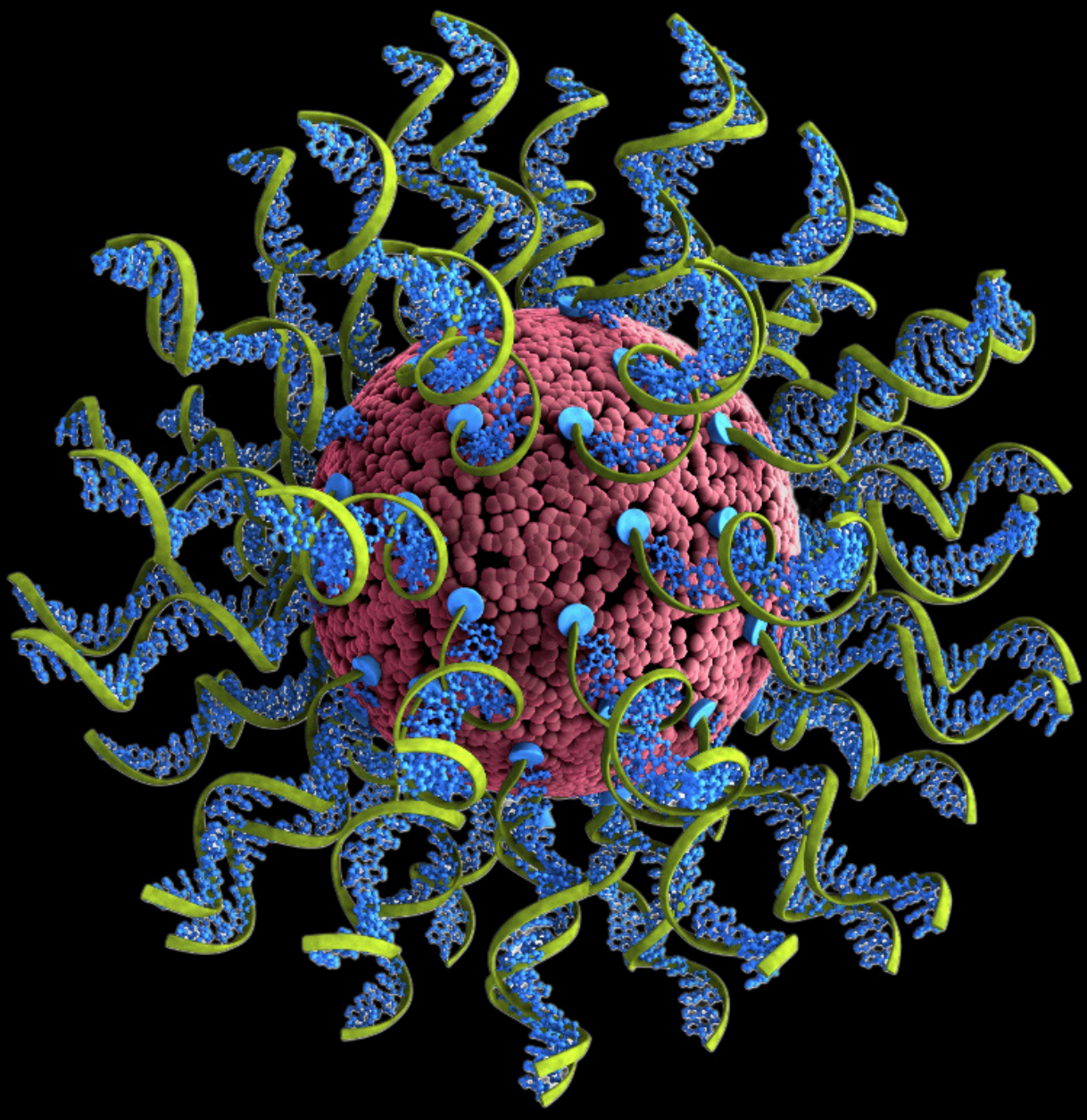
IJAS NEWSLETTER

January
2026



IJAS MISSION

The Illinois Junior Academy of Science exists for the benefit of students in the State of Illinois. The process students follow for IJAS gives them some insight into the problems and methods of thinking that are particular to the scientist. This process encourages these students to find information concerning new investigations and discoveries in science. It allows students a chance to use and gain an understanding of scientific equipment. Science fair gives reason for students with a special interest in science to go beyond the classroom curriculum and develop their own investigation(s). IJAS encourages students in their progress toward a career in science, technology, and engineering.

In This Issue:

2026 IJAS State Science Exposition April 24-25

Southern Illinois University CARBONDALE

Cover: The Spherical Nucleic Acid (SNA) graphic is used with permission from the Mirkin Group at International Institute of Nanotechnology, Northwestern University.

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Letter from the President

IJAS Sponsors,

We hope each of you had a great holiday season! With regional fairs approaching, we have several important updates to share.

New IJAS Website Launched

We've launched a new website! We hope you find our new website user-friendly and accessible. We're incredibly fortunate to have many talented students on our student board who dedicated considerable time to this project. With this change, you can now manage your school's membership and access valuable information. We also have a page dedicated to information for students, and we encourage you to share the resources we've made available.

Membership

We appreciate everyone's flexibility as we transitioned to a new membership system. This change allows IJAS to redirect over $1,000 of administrative costs into awards for our young scientists. To account for the downtime and migration to our new system, we have extended the membership deadline to Friday, January 15. After this deadline, an additional fee will apply. Unsure if your membership has been paid? Head to members.ijas.org and search for your school. If you believe you have paid but it is not reflected in our membership portal, please email us at info@ijas.org.

Regional Fair Registration

As part of IJAS's push to modernize, we're introducing a new fair management system. Our system, zFairs, will manage the registration process for all 12 regions across the state. This portal launches on Friday, January 15, and sponsors on record will receive additional, detailed information via email prior to launch. Students will submit all their required information, including abstracts, safety sheets, etc. through this portal. The deadline to submit your project, regardless of region, is February 15, 2026. To assist with this rollout, IJAS will have a dedicated support email address for sponsors and students to seek assistance. Additionally, sponsors & students will have the opportunity to reserve a virtual meeting time to seek one-on-one assistance. There's so much more information to share on this endeavor, so stay tuned!

ISEF

As a reminder, all high school students competing in IJAS are eligible to submit their project for ISEF consideration. The deadline to submit is February 1, 2026. More information on ISEF can be found on our website at ijas.org/isef.

If you have any questions, please contact our team at info@ijas.org!

Future Forward Labs
Science Research Mentoring

Illinois Junior Academy of Science
IJAS
SINCE 1927

RESEARCH 201 WEBINAR

Learn how to take your research game to the next level with Future Forward Labs, a proud IJAS partner!

02/15

7:00 PM CST

Learn about everything from interpreting experimental results, to presenting a research poster

Future Forward Labs @futureforwardlabshq

www.IJAS.org

An Interview with Dr. Taokun Luo

Anda Wattanakit

Luo, T. (December 19, 2025). [Photograph], Courtesy of IIN

In recent years, nanoscience-the study of matter at the nanoscale-has driven remarkable advances in medicine. One example of such progress is the development of mRNA-based vaccines, which were first widely deployed during the COVID-19 pandemic. Research on mRNA vaccines predates the pandemic, but their rapid and successful use against COVID-19 highlighted the potential of nanotechnology in healthcare. The state of Illinois also boasts many medical innovations using nanotechnology, including Spherical Nucleic Acids (SNAs). SNAs were invented by Chad A. Mirkin, who is the George B. Rathmann Professor of Chemistry in the Weinberg College of Arts and Sciences at Northwestern University and the director of the International Institute for Nanotechnology (IIN). Dr. Taokun Luo, a postdoctoral fellow and programmable materials subgroup leader at IIN, kindly gave our IJAS student participants a glimpse of SNAs therapeutic promise and provided an update on the ongoing progress of SNA research.

A doctoral graduate from the University of Chicago and winner of the Elizabeth R. Norton Prize for Excellence in Research in Chemistry in 2023, Dr. Luo says that he is grateful that his research has been recognized by a broader community and that the prize has given him confidence to keep pushing innovative ideas, especially those that would benefit cancer patients.

Dr. Luo's interest in nano-oncology was triggered by his personal loss: "During the third year of my undergraduate studies, I lost my grandfather, who was diagnosed with brain cancer. He also received radiotherapy and chemotherapy. For late stages of cancer, those treatments were not very effective. During his last moments, he tried to tell me that I had to be a useful person. So I think I am not going to pursue science in a way that is only in theory or principle. I want to apply science to have a real social impact or application. So I want to study something that can be applied especially for cancer patients."

His goal of helping cancer patients is being realized through his graduate research at the University of Chicago and his current work on SNAs at the IIN. Dr. Luo is developing nucleic acid-based nanostructures for targeted cancer therapy: "SNA is a three-dimensional architecture of nucleic acids, typically DNA or RNA, densely arranged on a nanoparticle core. It is a very unique nanostructure containing short DNA strands, with enhanced cellular uptake and stability. We use SNAs for gene silencing and immunomodulation. In the latest manuscript titled "Chemotherapeutic Spherical Nucleic Acids" published on ACS Nano, we developed a new type of SNA that changes the DNA from genetic materials to potent antimetabolite chemotherapeutics."

In addition, the translation of chemotherapeutic SNAs from the IIN's research lab to real-world usage seems promising, particularly through collaboration with Flashpoint Therapeutics, a clinical-stage biotechnology company affiliated with Northwestern University. Dr. Luo notes, "We are focusing on a real clinical use. It will take about one or two years for advanced preclinical studies, including a more detailed toxicology in the large animal models and pharmacokinetics in which we observe how the SNA circulates in the body. This would take about one or two years before we can move to a human clinical trial."

"I think I am not going to pursue science in a way that is only in theory or principle. I want to apply science to have a real social impact or application."

" A combination of curiosity and discipline will make you a great scientist."

Working at the IIN under the direction of Professor Mirkin has been an amazing experience for Dr. Luo. As a subgroup leader, he meets with group members every week to help them with their research. "We also brainstorm new ideas and build a supportive team culture. Very fast paced, collaborative, energizing environment to work at." He encourages IJAS student participants to follow the IIN's publications and news. For example, the IIN is currently developing nanostructures that combine lipid nanoparticles (LNPs) with SNAs—known as LNP-SNAs—to enhance the efficiency and specificity of drug delivery.

Although Dr. Luo spends most of his time at the lab, he stresses the importance of a researcher's connection with the general public. "It is the way science grows. It can show young people how research can connect with real life. I personally enjoy sharing my work with students and people in the group. It not only sparks curiosity and makes science more accessible but also inspires me when young people ask questions. It keeps me motivated." While he was pursuing his doctoral degree at the University of Chicago, he enjoyed attending Chicago's South Side Science Festival because he thought this kind of activity would help inspire the next generation of scientists to pursue STEM careers.

When asked about his advice for starting a research project, Dr. Luo suggests looking into previous publications. "You can think of something new or something that contradicts the existing knowledge." He gives an example of how DNA is commonly known as genetic material, but in his chemotherapeutic SNA research, he rethinks this concept of DNA by making it part of a polymeric drug. Lastly, he advises IJAS student participants who want to pursue a career in science to keep working toward their goal: "Stay curious. Ask questions. Be brave. Think critically of all the things around you. Keep learning and build a foundation. You need to have a good background knowledge, especially in this age of AI. A combination of curiosity and discipline will make you a great scientist."

IJAS Participant Spotlight: Diya Nanjappa

Annette Kang

For the January issue of the IJAS Newsletter, we had the opportunity to interview one of our IJAS student participants, Diya Nanjappa. Diya is a Senior at Quincy Senior High School in Region 10. This 2025-2026 academic year will be her fifth year as an IJAS participant! Diya's favorite field of science is environmental science. She mentioned that she had done projects in many different fields such as biochemistry and health sciences, but she says environmental science remains her favorite because of the various plants and organisms one can study.

Diya is currently investigating the impact and effect of mycorrhizae, a type of symbiotic fungus, on oak roots and oak decline. Her goal is to see if there is any correlation between the presence of the fungus on the oak roots, and whether the fungus is able to combat oak decline. Diya says this experiment is a continuation of her project from the previous year, which was inspired by a Senior (who graduated a year before her) from her school. Diya learned a lot about oak decline from this student and found it interesting, which led her to explore the topic further through her own research and experimentation.

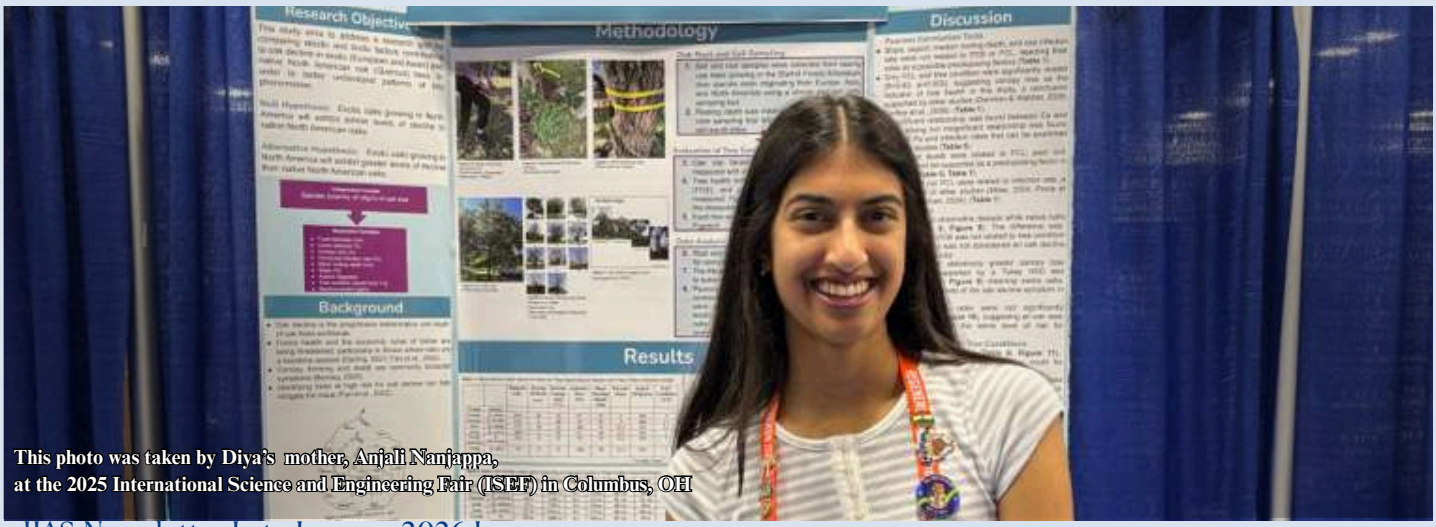
The main problem that Diya is trying to solve is figuring out how to combat oak decline in the least invasive way. As oak decline is a very complicated issue with many factors that play into it, the most ideal cure would be a naturally occurring substance, such as the mycorrhizal fungus. The procedure for Diya's project is to conduct the experiment in an outside arboretum. She will wash the oak roots (which were collected by her mentor), cut tips from the oak root samples, and view them under a microscope to count mycorrhizae spores. Diya will then run an ANOVA test (Analysis of Variance) to see if there are correlations between the number of spores and oak decline symptoms.

The symptoms that Diya will be measuring and comparing are canopy loss and percent dieback. She will study how much of the canopy has withered away or how transparent it is, because in last year's project, she found that canopy loss was the strongest indicator of decline in oak trees. The independent variable is the presence of mycorrhizae or the number of spores. Her dependent variable is the level of decline symptoms, such as how much percent dieback or how much canopy loss there is. Diya says that she does not have an exact control group for this experiment, since it is more of an observational study. Although the number of trials she will run is subject to change, Diya says she plans to cut close to 100 tips from each root and randomly select around 20 to 50 tips to study, performing 20 to 50 trials.

For Diya, the most challenging part of conducting this experiment is working with limited time and having to go to an outside lab to work on the experiment, as she does not have access to oak roots at her school.

The real world application of Diya's experiment is that if she were to find a negative correlation between the number of mycorrhizae spores and percent dieback (the higher number of spores = less decline), her findings could be applied to help support oak trees. This would be achieved by integrating the mycorrhizae fungus into the oaks' environments, giving the trees the strength to ward off some of the decline factors, such as bad fungi and oomycetes that are attacking them. We wish Diya luck on her project!

Some insight and advice from Diya as a five-year participant of IJAS: "I think the IJAS State Expositions are a wonderful opportunity that has helped me grow more passionate about science and build confidence in my presenting skills! Over the past five years participating in IJAS, I have learned an incredible amount and made so many memories. New students should be excited about the chance to share their research at the state level and meet new friends from regions across the state. The students and judges truly create an environment where everyone can learn and grow."



This photo was taken by Diya's mother, Anjali Nanjappa, at the 2025 International Science and Engineering Fair (ISEF) in Columbus, OH

Important Announcement!

All IJAS participants must submit their abstract and required safety/endorsement forms through zFairs by February 15, 2026, 11:59 PM CT., regardless of regional fair dates. For more information about zFairs, please go to ijasregional.zfairs.com

zFairs

NON IJAS AFFILIATED COMPETITIONS

ISAS

Annual meeting will be on April 18, 2026. Abstract submissions to IJAS or ISAS are due March 1, 2026.

ISEF

ISEF applications are in February. You MUST participate in IJAS to attend.

Thermo Fisher JIC

Must be named the top 10% of participants at fairs affiliated with the Society for the Thermo Fisher JIC. The application period is from February to June.

U.S. National Chemistry Olympiad

To qualify, students must participate in local exams from Feb 27-March 16, 2026.
The national exam is April 10-19, 2026.

NSB (National Science Bowl)

Students must have coaches to set up team and apply. Application deadlines depend on regions. Regional winners are able to apply for the national team.

USA Biology Olympiad

2026 enrollment closed. 2027 enrollment opens sometime in August. Students must register through school.

US Physics Olympiad

The application deadline for the U.S. Physics team is in January.

Caleb Gao

IJAS Grants and Scholarships
2026 President's Grant

Anda and Kanishka

PRESIDENTS GRANT
ILLINOIS JUNIOR ACADEMY OF SCIENCE

- The Board of Directors of the IJAS and their generous donors support students' efforts by providing grants of up to $250 per year per project.
- This grant is open to all students of IJAS member schools or individuals members who intend to participate in the IJAS State Exposition in Illinois. Any student with sponsor support can apply for reimbursement for purchased materials.
- The primary focus of this award is to increase the opportunity to buy the supplies required to conduct their experiment.
- APPLICATION DEADLINE: April 15th, 2026 at 11:59 PM CST

Special Announcement:
Two Scholarships Offered!

2026 IJAS State Exposition Special Award:
$20,000 Scholarship to Bradley University

IJAS Alumni Registration

Calling all IJAS alumni! Donors or members who competed in an IJAS Regional or State Exposition event can register for this membership. To register as an IJAS alum:

- Please go to the IJAS website and click 'About'
- A header titled 'Membership' should appear. Click on the header.
- Scroll down to the bottom of the page and click on IJAS Alumni.
- Membership costs 15 dollars per year.

Coming soon...
IJAS Ambassador Program

Requirements:

- EPIC award winner at the IJAS State Exposition 2026

Benefits:

- Help IJAS grow!
- Build Strong communication skills
- Acquire leadership experience in a professional organization
- Build Connections with motivated students across Illinois
- Highlight these skills on scholarship applications and resumes!

2026 Regional Fairs

https://www.ijas.org/regional-expositions

Region 1
March 14
Western Illinois University

Region 2
March 7 *(paper)*
March 14 *(poster)*

Region 3
March 13th *(paper)*
March 14th *(poster)*

Region 4 - March 28th

Region 5 - March 21st

Region 6
March 4th *(paper)*
March 7th *(poster)*

Region 7
March 30
Ramsey Junior High

Region 8
TBD
Southern Illinois University

Region 9
March 7 *(paper)*
March 14 *(poster)*

Region 10
March 14
Lincoln Land Community College

Region 11
March 7

Region 12
March 21
Southwestern Illinois College

National STEM Festival - Top 10 Finalists in Illinois

National STEM Festival

Adhrit Chavali

Aitran Le

Issa Geisendorfer

Krithik Senthilkumar

Luke Yin

Mythreyi Govindarajan

Nishant Narayanan

Poojak Patel

Pratayanch Sav

Sammit Chidambaram

Congratulations to the Illinois Scholars who have been selected as a

Top 300 Regeneron STS Scholar!

Scarlet Gitelson

Latin School of Chicago, Illinois
Project Title: Detecting Stellar and Disk Winds Through Absorption Spectroscopy of Black Hole High Mass X-Ray Binary Cygnus X-1

Diego Benjamin Landeros

Lane Technical High School, Illinois
Project Title: Targeted Nitroisoxazole-Based GPX4 Inhibitor Drug Conjugate for Ferroptosis Induction in Chemoresistant Tumors

Karthik Prasad

Illinois Math and Science Academy, Illinois
Project Title: On Yetter-Drinfeld Modules Over the Pansera Algebra

Keith Xin

Whitney Young Magnet High School, Illinois
Project Title: High-Capacity Al3+/Fe3+-Crosslinked Nanocellulose Hydrogels for Arsenite Removal: A Zero-Waste Approach to Water Remediation

Anda Wattanakit

2026 IJAS Essay Contest

THEME:

Driven by Discovery - Research is Key

Deadline: March 1, 2026, 11:59 pm CST

MIDDLE SCHOOL:

Investigate a university scientist or research team whose curiosity reshaped their field. How did their questions redefine what was possible?

HIGH SCHOOL:

Build a case using real-world examples of how university research has benefitted society. How does cross-field collaboration and research within universities accelerate progress?

To submit, go to: ijas.org/additional-contests

Upcoming Events

March

ISAS Abstract Submission Deadline
March 15h

STEM Education Conference at WIU
March 13th

IJAS ISEF Top 9 Projects Announced
March 15th - 11:59 PM CST

IJAS Decal Contest Submission Deadline
March 15th

April

IJAS Student Board Application Opens
April 1st

ISAS Annual Meeting
April 18th at the Pere Marquette

Special Physics Luncheon at SIU: Invitation Only
April 25th - 1pm

May

IJAS Student Board Application Submission Deadline
May 2nd

IJAS Office Hours

January 11
6 - 7 pm

February 1
6 - 7 pm

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