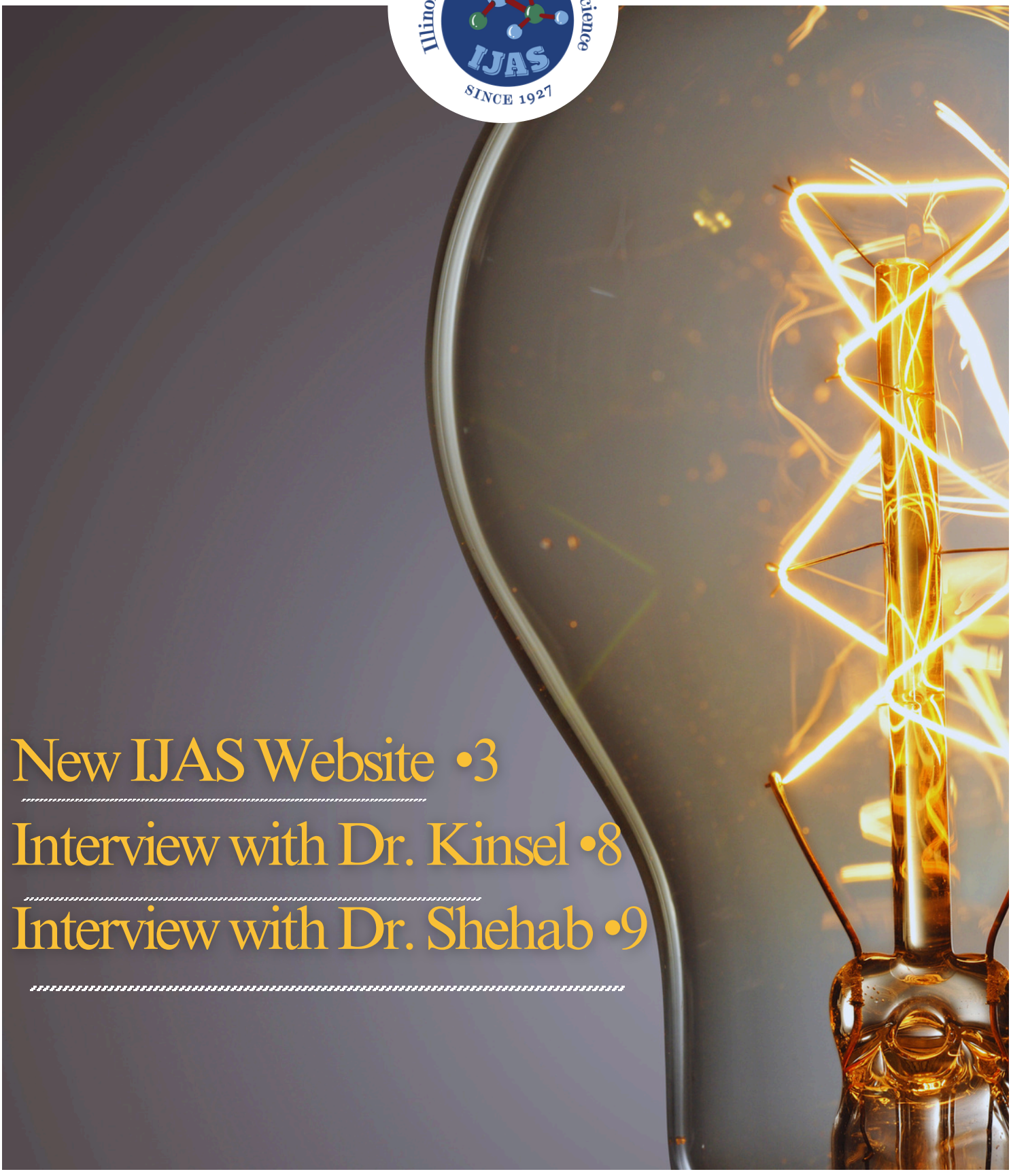
IJAS NEWSLETTER

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.

2026 IJAS State Science Exposition April 24-25

Southern Illinois University CARBONDALE

In This Issue:

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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!

Upcoming Events

December

December IJAS Board Meeting

December 20, 2025 - 9 am

January

January IJAS Student Board Meeting

January 11, 2026 - 7 pm

January IJAS Adult Board Meeting

January 25, 2026 - 7 pm

February

February IJAS Student Board Meeting

February 8, 2026 - 7 pm

February IJAS Adult Board Meeting

February 22, 2026 - 7 pm

Office Hours Zoom Link

January 11
6 pm

February 8
6 pm

CONTACT LIST

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IJAS RUNNER VOLUNTEERS

WE NEED YOU!

HOW CAN YOU HELP?

Runners provide the backbone of the State Science Exposition. Without them, the rounds would take much longer, leading to more delays, and wasted time. Runners keep everything moving by working hard, and moving quickly.

WHAT YOU WILL DO

Runners connect judges and scorers by providing the information from judges to the score room. Runners will move between the rooms and physically transport the scores in order that people receive the awards they have won.

Tips for Research Paper & Poster:

ANNETTE KANG

Written Report:

- First, make an outline or a draft of your research paper, then edit.
- Use as many recent sources as possible, preferably five years ago being the oldest.
- Be specific with what you are researching, but make it clear and concise.
- Ensure that all data such as tables, graphs, and charts are accurate and truthful. It is okay for your hypothesis to be incorrect.
- Fully support your data collection and analysis in your conclusion; do not add new or irrelevant evidence or information.

Poster:

- Make sure you put your Abstract, Safety Sheets and Endorsements on your posterboard!
- Keep your poster relevant to your project, informative, and neat.
- Make your title large enough to be visible from afar.
- Be sure that the text on your poster is clear and visible. For example, use a light background for dark text, or vice versa.
- Add some color to your poster (i.e. use colored paper behind the papers with your science information, or use different colors on graphs and charts) to make it look more presentable, creative, and original.

- For Paper Session, students present their project using a powerpoint presentation and their report.
- For the Poster Session, students present their project using a poster board and their report.

QUESTIONS?

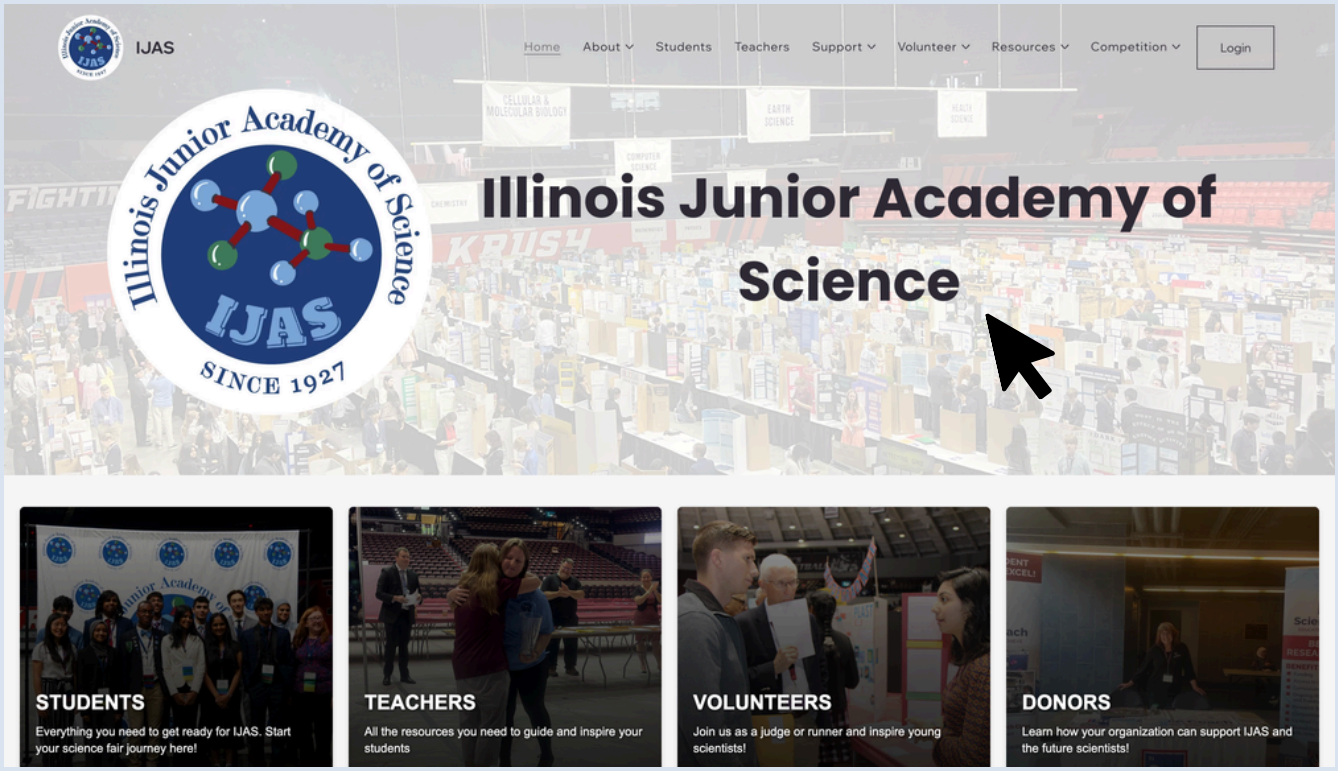
Stop by during Office Hours!

January 11 at 6 pm

February 8 at 6 pm

BREAKING NEWS!

The IJAS Website Has a NEW LOOK!



We are thrilled to announce that IJAS has a new website! The new and improved format and features make navigating your way on the website easier than ever before. Check it out!

ijas.org

Contests

ANY student who attends an IJAS member school may participate.

Win prizes!

Please see the IJAS website for rules and information

An Interview with an SIU Professor: Dr. Gary Kinsel

Annette Kang

Dr. Gary Kinsel is a professor of chemistry and mass spectrometry at Southern Illinois University, and he has been doing research in mass spectrometry for over forty years. Dr. Kinsel performs both basic and applied research, including fundamental studies of ion formation and consumer product analysis such as caffeine and cannabinoid content in various products. His area of research for many years has been on MALDI, or Matrix-Assisted Laser/Desorption Ionization. MALDI is a soft ionization technique used in mass spectrometry to analyze large biomolecules like proteins and peptides (Creative Proteomics, n.d.).

Many years ago, the main problem of conducting mass spectrometry was that it could not be done on large molecules because of the less developed technology and equipment, as well as the lack of a method for "soft" ionization. This problem challenged and inspired Dr. Kinsel to start his research on mass spectrometry. Knowing the limitations to this type of experiment, Dr. Kinsel and many other people conducted decades of research, which has helped them largely solve the problem. For Dr. Kinsel, it was the importance of being able to tackle the challenge of how to do mass spectrometry on large molecules and, as different tools came about, how those tools worked. Being able to study larger molecules through mass spectrometry has opened a way to investigate proteins, polymers, and all kinds of different compounds that have important biomedical properties that would not have been able to be conceived forty years ago.

A typical day in Dr. Kinsel's research group consists of preparing samples at various concentrations using molecules selected for the study, applying those compounds to different surfaces, and then conducting MALDI mass spectrometry on those compounds to then collect mass spectra. Dr. Kinsel and his research group spend much of their time analyzing data and following trends in the data.

Looking to his future research direction, Dr. Kinsel said that his team is beginning to apply their research to real-world problems. He notes that many people are now doing mass spectrometry on proteins, drug compounds, fatty acids, and even tissue samples. Conducting mass spectrometry on such molecules is helping to find solutions to those real-world problems, like surface analysis by mass spectrometry on cell systems and tissue samples, and using fluorescence microscopy to locate different molecules in the cells. Conducting mass spectrometry on large molecules with MALDI can determine the mass spectra of different processes within cells.

Beyond the research that Dr. Kinsel and his team conduct, he also provides mentoring for his students conducting research. He prioritizes learning from mistakes because a perfect project is unrealistic. By providing ideas and suggestions for students, they learn how to improve their understanding and application of the scientific method. He studies data with students, asks them questions, and guides them to effectively evaluate their experiment and goals. Just as Dr. Kinsel's students need to learn these processes and find experimental obstacles to overcome, IJAS students follow a similar procedure when conducting research. The level of experience may be different for IJAS students, but learning how science operates and putting the scientific method into practice is very similar. Dr. Kinsel highlights that it is a learning process, and that it is very common in

Kinsel, G. (winter of 2023). [Photograph]. Carbondale, IL: Longbranch Cafe

research to do an experiment many times before you can get a useful result. Mentoring students helps them become successful, but Dr. Kinsel believes that students are truly successful when they find mistakes in their own experiment without having him explain it to them. Students achieve success when they have a mentor who can help them ask questions, analyze data, and determine what to do next. **"When we are discussing science and the results as two fellow scientists, then I know that is the point when those graduate students are ready to go out and do whatever the next thing they want to do is."**

Dr. Kinsel's advice for academic assistance or trouble in a science experiment is to have group meetings, where members of his research group come together and each person gets an opportunity to talk a little bit about their experiment and the question they are trying to answer, and show some of the data they have gotten. Then, they have a group discussion where they ask each other questions, give insights, have collective conversations about the problems, and compare data with one another. **"The advancement of a research project, very often, is a collective process of conversation, refinement, and figuring out how to do it better. And that is usually achieved by talking it over with colleagues who are interested in what you are doing and who try to help you succeed."**

SIU's Chemistry department has high research activity which is funded by federal grants. All of the faculty have some kind of research group, as research is considered a very important component to learning at SIU. The university wants every student, even undergraduates, to conduct research through experimentation or work on a project. Since SIU is a smaller university, even undergraduate chemistry majors can assist in the faculty's research projects. Such opportunities for undergraduates often do not exist in larger universities. Dr. Kinsel notes that...

"Anybody can make a contribution to a research project. It doesn't require years and years of graduate study."

Creative Proteomics. (n.d.). MALDI-TOF Mass Spectrometry. Creative Proteomics. https://www.creative-proteomics.com/technology/maldi-tof-mass-spectrometry.htm

Shehab, S. (November 4, 2025). [Photograph], Courtesy of UIUC

An Interview with Dr. Shehab

Anda Wattanakit

Since scientific research is at the core of IJAS, I am excited to have an opportunity to interview Dr. Saadeddine Shehab, Associate Director of Assessment & Research at the Siebel Center for Design (SCD), University of Illinois Urbana Champaign, to ask for his insights about conducting research. Dr. Shehab is no stranger to our IJAS community; he was our keynote speaker at the IJAS State Exposition banquet at the University of Illinois this past May.

At the beginning of the interview, Dr. Shehab briefly gave a summary of his presentation on Human-Centered Design (HCD) at the State Exposition: "When I presented, I defined Human-Centered Design as a problem solving approach that relies on design thinking tools and methods which help the designers connect with the people or stakeholders who are involved in the problem." He added that the goal of HCD was to develop innovative solutions. This approach can be used with both individual and group projects.

HCD may be a difficult concept to grasp at first, but Dr. Shehab described how it is less complex than it sounds when we understand the "taxonomy" of HCD, which can be divided into "spaces," consisting of Understand, Synthesize, Ideate, Prototype and Implement spaces. These spaces guide and foster divergent and convergent thinking and decision making. He stressed that these steps are not necessarily linear nor sequential. For example, the Prototype space is where one uses convergent thinking to select two or three ideas to create a prototype.

To illustrate the taxonomy of HCD , Dr. Shehab gives a real world example. **"If we want to put together professional development to teach teachers to learn how to use AI in their classrooms, the first thing we do is to read and review literature to understand what AI is. How do teachers usually use AI? Then, we go talk to teachers to understand their views about what they think. Do they want to use it? What is the gap? What are the challenges? "** Dr. Shehab explains that this is the Understand space. Research and synthesis are an important aspect in this space because the project should not be built on assumptions. **"You don't want to generate something that the teachers may not want. The whole idea of Human-Centered Design is that you involve the stakeholders or the users in what you are doing."**

At the Siebel Center for Design at UIUC, Dr. Shehab meets with different team members daily to make progress on different projects. His main focus is research that looks into how individuals or learners benefit from and engage in Human-Centered Design in different disciplines. For example, in supporting Engineering students and engineers to incorporate HCD into their project development, his team will have regular meetings with them. **"We try to collect data such as using surveys, interviews, or visual-audio recordings in order for us to understand how people are actually engaged in Human-Centered Design. Are they able to use it to address problems they have at hand?"** Dr. Shehab also added that there are many workshops available for university students and high school students at the Siebel Center for Design. Schools can also request a workshop by contacting the center.

Dr. Shehab also discussed the Next Generation Science Standards and how to incorporate the Human-Centered Design approach into the Standards and science classroom. **"The best way to bring Human-Centered Design into primary education is to merge it with existing problem-based and project-based learning lessons. Human-Centered design enriches these lessons by adding the level of authenticity and the level of empathy."** Dr. Shehab emphasized the importance of "authenticity" and "empathy" in project-based learning: "Instead of being a project in a vacuum, teachers can help students make the project connected to the community by designing something that the community needs. The second part is empathy. Teachers can open an opportunity for students to go out and talk to the people in the community to understand their needs before they actually start the project." He also encouraged science educators to use the professional development resources offered at the Siebel Center for Design such as the program called

SHIFT

(https://designcenter.illinois.edu/outreach/ProfessionalDevelopment/SHIFTprogram) and the

Human Centered Schools Network

(https://designcenter.illinois.edu/outreach/ProfessionalDevelopment/HCSN).

Dr. Shehab advises IJAS student researchers to learn more about the HCD approach and think how they can incorporate it into their research project. He also suggests they find examples where Human-Centered Design was successfully used in projects to arrive at innovative and creative solutions.

Lastly, Dr. Shehab also shared with me what he found most rewarding working at the Siebel Center for Design.

"I love the collaborative culture of the Siebel Center for Design. All of the people I work with at the center are very collaborative. I love working, thinking with them. It is the collaborative culture of the people I work with that I find most rewarding."