

# INDIANA JUNIOR ACADEMY OF SCIENCE

Report for 2016

Approximately 160 students, teachers, and parents representing eight schools attended the annual fall meeting of the Indiana Junior Academy of Science held at Indiana University Bloomington on November 14, 2016.

Both the Outstanding Junior Scientist and Research Presentation competitions were judged by IU Bloomington research faculty, senior scientists, post docs and graduate students. I wish to acknowledge them here, they were:

## **Abstract Judges:**

Dr. Dan Watts, IU Department of Biotechnology  
Ms. Riddhi Sood, IU Department of Biology  
Dr. Paul Staten, IU Department of Geological Sciences

## **OJS Judges:**

Dr. Cecile Berne, IU Department of Biology  
Dr. Fred Luehring, IU Department of Physics  
Dr. James Reilly, IU Department of Chemistry  
Ms. Sally Miller, IU Department of Psychological & Brain Sciences

## **Research Presentation Judges:**

Dr. Breah LaSarre, IU Department of Biology  
Ms. Jolene Ramsey, IU Microbiology Program  
Dr. Matthew Shepherd, IU Department of Physics  
Dr. Rasheda Sultana, IU Biotechnology Program

Ms. Hannah Busey, IU STARS Scholar gave a keynote address titled “**Conservation, Innovation, and Bias: embryonic segment boundaries posterior, but not anterior, head horns in adult beetles**” that was very well received by the students and teachers. In addition to talking about her research, she talked about her journey from doing research in high school to being an undergraduate researcher in the IU STARS program and about her future plans. Hannah is a 2016 Goldwater Scholar, her research at Indiana University during her senior year of high school in Armin Moczek’s lab in the Biology Department. She then went on to be a STARS scholar in the Moczek lab and began a project researching the integration of novel traits within preexisting ancestral trait complexes and structures. This study was published her sophomore year in the Journal of Experimental Zoology. She also contributed to an article published that same year in the Proceedings of the Royal Society. Additionally, she presented at the Society for Integrative and Comparative Biology in Portland, the Midwest Ecology and Evolution Conference and was a platform speaker at last year’s STARS spring symposium. Last summer, Hannah worked as an undergraduate researcher in Joseph Tomkins’ Lab at The University of Western Australia in Perth. Outside the lab, Hannah is involved with the Indiana University Journal of Undergraduate Research on the Student Editorial Board, Biology Club and Physics Club. After graduation, Hannah plans to go to graduate school and hopefully combine her interests in evolutionary biology and neuroscience. She plans to continue research in either the public or private sector.

Five competitions and research tours filled out the remainder of the day followed by the awards ceremony. A brief description and a list of winners for each competition are outlined below.

### **1. The Problem Solving Exam**

This exam provides students with a fun and meaningful exercise in scientific knowledge and problem-solving skills. The exam was written by several people at IU Bloomington. We asked graduate students and faculty from different disciplines to write 10-12 questions. Melissa Blunck, S-STEM Program coordinator proctored and graded the tests. Top five students were recognized with certificates and top two students received plaques.

**This year's winners were:**

- 1<sup>st</sup> Place – Darren Chang, Carmel High School**
- 2<sup>nd</sup> Place – Abhinav Ramkumar, Carmel High School
- 3<sup>rd</sup> Place – Gus Devaul, Northwestern High School
- 4<sup>th</sup> Place – Sara Alhaffar, Eman School
- 5<sup>th</sup> Place – Jackson Konty, Floyd Central High School

### **2. The Issues Presentation Competition**

This competition encourages students to learn about the political, social, and scientific issues surrounding the selected topic. This year, the topic was ***“Should pharmaceutical companies be required to make all medications accessible (in terms of pricing and availability) to all people?”*** Each competitor gave a five minute presentation on the topic without the use of visual aids. The students were judged by a panel of peers in the morning session then the top three were judged again by faculty and undergraduate students in the afternoon. Plaques were awarded to the top two students, all finalists received a certificate.

**This year's finalists are:**

- Darren Chang, Carmel High School
- Victoria Combes, Northwestern High School
- Asmaa Mahoui, Eman Schools

- 1<sup>st</sup> Place – Asmaa Mahoui, Eman School**
- 2<sup>nd</sup> Place – Darren Chang, Carmel High School

### **3. Science Olympiad Competition**

This year we held one Science Olympiad competition called “Write It, Do It.” Up to two students from each school were allowed to participate. Students tested their communication skills. Certificates were given to the 2<sup>nd</sup> place teams (we had a tie) and plaques were awarded to the top scoring school.

This year's winners are:

- 1<sup>st</sup> Place – Katie Long & Selena Qian, Carmel High School**
- 2<sup>nd</sup> Place – Julianna Meyer & Grace Dennis, Marian High School
- 2<sup>nd</sup> Place – Olivia Malone & Brent Strahla, Beech Grove High School

3<sup>rd</sup> Place – Sophia Kimbell & Jacob Trulock, New Albany High School

4<sup>th</sup> Place – Ethan Henry & Jeret McCoy, Floyd Central High School

5<sup>th</sup> Place – Brayden Chou & Gus Devaul, Northwestern High School

#### **4. The Research Paper Competition**

This competition allows students who have carried out an original scientific investigation the opportunity to present their work to a panel of judges. Students who wish to compete in this event submit an abstract of their work to the IJAS Director in early October.

Twenty-two abstracts were submitted for review and the top twelve finalists were selected by a panel of impartial abstract judges from IU Bloomington. The top twelve finalists all received a \$25 cash award from the Indiana Academy of Science. At the IJAS meeting, the finalists gave a 10-minute research presentation to a panel of judges who evaluated them on originality, research procedures, and presentation skill. The second and third place winners received a plaque. The first place winner received a plaque and a \$1,000 scholarship from the Indiana Academy of Science to attend any Indiana College or University.

This year's winners are:

**1<sup>st</sup> Place – 380.5 points: Asmaa Mahoui, Eman School**

2<sup>nd</sup> Place – 361.5 points: Julia Hunckler, Marian High School

3<sup>rd</sup> Place – 349.0 points: Amanda Wilson, Northwestern High School

4<sup>th</sup> Place – 348.0 points: Darren Chang, Carmel High School

5<sup>th</sup> Place – 347.0 points: Raihan Saiffuddin, Eman School

6<sup>th</sup> Place – 346.0 points: Sarah Alhaffar, Eman School

7<sup>th</sup> Place – 341.0 points: Christopher Smith, Northwestern High School

8<sup>th</sup> Place – 315.0 points: Dennis Mammolenti, Marian High School

9<sup>th</sup> Place – 314.5 points: Sarah Stopcznski, Marian High School

10<sup>th</sup> Place – 309.5 points: Ethan Smiley, Beech Grove High School

11<sup>th</sup> Place – 307.5 points: Abhinav Ramkumar, Carmel High School

12<sup>th</sup> Place – 281.5 points: Kayla Bevington, Northwestern High School

#### **5. The Outstanding School Award**

The Outstanding School Award is given to the school with the most participation points. To calculate this score, credit is given for every abstract submitted, more credit for those abstracts accepted for the Research and for Outstanding Junior Scientist competitions, and finally for rank scores for the top presentations. Each school received credit for entering students in the Issues Competition, for having a judge at the Issues presentations, and for entering students in the Problem Solving Exam and Science Olympiad Competition. More credit was given to the top five winners.

The top three schools and the teachers representing them today are:

**1<sup>st</sup> Place – 51 points: Carmel High School, Mrs. Jennifer Marlow**

2<sup>nd</sup> Place – 47 points: Eman Schools, Mrs. Mia Sankari

3<sup>rd</sup> Place – 42 points: Northwestern High School, Mrs. Linda Wilson

## **6. The Outstanding Junior Scientist Competition**

This event recognizes those students who are exemplary in overall scholarship as well as scientific ability and achievement. Each school may nominate two students for this competition. The top ten nominees are then selected to compete at the IJAS meeting where they are interviewed by a panel of judges. The Outstanding Junior Scientist is selected based upon his/her academic record, involvement in original research and extracurricular scientific activities, abstract scores and the interview. The top ten finalists received a \$25 cash award from the Indiana Academy of Science. The second and third place winners received plaques and the Most Outstanding Junior Scientist received a plaque and a \$1,000 scholarship from the Indiana Academy of Science to attend any Indiana College or University.

This year's winners are:

**1<sup>st</sup> Place – 147.68 points: Brayden Chou, Northwestern High School**

2<sup>nd</sup> Place – 144.41 points: Asmaa Mahoui, Eman School

3<sup>rd</sup> Place – 142.10 points: Darren Chang, Carmel High School

4<sup>th</sup> Place – 140.61 points: Abhinav Ramkumar, Carmel High School

5<sup>th</sup> Place – 139.86 points: Sara Alhaffar, Eman School

6<sup>th</sup> Place – 138.52 points: Julia Hunckler, Marian High School

7<sup>th</sup> Place – 127.21 points: Victoria Combs, Northwestern High School

8<sup>th</sup> Place – 119.06 points: Anthony Kramer, Marian High School

9<sup>th</sup> Place – 107.16 points: Ethan Smiley, Beech Grove High School

10<sup>th</sup> Place – 94.28 points: Theodore Hardesty, Beech Grove High School

## **7. Tours of research labs and facilities on campus**

Students had two opportunities, one in the morning and one in the afternoon, to go on a research based tours. Tours included:

- The Sesame Research Lab  
<http://www.geology.indiana.edu/wasylenki/sesamelab/index.html>
- Kirkwood Observatory & Solar Telescope Tour  
<http://www.astro.indiana.edu/kirkwoodinfo.shtml>
- Jordan Hall Greenhouses  
<http://www.bio.indiana.edu/faculty/facilities/greenhouse.shtml>
- Woodland Campus Tour <https://spea.indiana.edu/doc/about/woodland.pdf>
- Chemistry Tours included the following stops:
  - Molecular Structure Center <https://www.iumsc.indiana.edu/>
  - Nuclear Magnetic Resonance Facility <https://www.iumsc.indiana.edu/>
  - Chemistry Glass Shop – <http://glass.chem.indiana.edu/>