



Academy of Applied Science



**Forty-Eighth Annual**

**Southeastern Michigan**

**Junior Science and  
Humanities  
Symposium**

**Program**  
**2012**

**WAYNE STATE  
UNIVERSITY**

**McGregor Memorial Conference Center  
Detroit, Michigan**

**March 1st and 2<sup>nd</sup>, 2012**

**Forty-Eighth Annual**

**SOUTHEASTERN MICHIGAN**

**JUNIOR SCIENCE AND HUMANITIES**

**SYMPOSIUM**

Thursday and Friday, March 1<sup>st</sup> and 2<sup>nd</sup>, 2012

*SPONSORED BY*

**WAYNE STATE UNIVERSITY**  
**College of Education**

*In cooperation with*

U.S. Army Research Office - Research Triangle, NC

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U.S. Army Tank - Automotive Command  
Research, Development, and Engineering Center  
Warren, MI

Academy of Applied Science - Concord, New Hampshire

National Association of Secondary School Principals

## **OBJECTIVES OF THE JUNIOR SCIENCE AND HUMANITIES SYMPOSIUM PROGRAM**

- 1. To promote research and experimentation in the sciences, mathematics and engineering at the high school level.*
- 2. To recognize the significance of research in human affairs and the importance of humane and ethical principles in the applications of research results.*
- 3. To search out talented youth and talented teachers; recognize their accomplishments at symposia and encourage their continued interest and participation in the sciences, mathematics, and engineering.*
- 4. To expand the horizons of research-oriented students by exposing them to opportunities in the academic, industrial, and governmental communities.*
- 5. To increase the number of future adults capable of conducting research and development.*

In order to accomplish these objectives, we enlist the active participation of our local communities in improving the education of our children.

### **Publishing Opportunity**

Students who submitted a paper for presentation at this year's JSHS are encouraged to submit their paper for publication in JOURNEYS – *Journal of Youths in Science*. Students planning to submit their paper for publication should first consult with their research mentor(s) and anyone else who collaborated in their research.

**Before submitting a paper** for publication in JOURNEYS students should check the journal's website at <http://www.journys.org/> and closely follow the instructions under "Submission."

## ADMINISTRATION OF JSHS

**Dr. Maria Madalena Ferreira**, Director and Coordinator of JSHS  
Associate Professor and Coordinator of the Science Education Program  
College of Education, Wayne State University

## JSHS ADVISORY BOARD

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Assoc Provost Academic Success  
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Associate Dean, College of Engineering  
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Wayne State University

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Wayne State University

**Ms. Sandra Yarema**

Secretary JSJS  
Wayne State University



# *Welcome*

*from the JSHS Director  
Dr. Maria Madalena Ferreira*

Dear Students, Teachers, Parents and Colleagues,

It is my great privilege to welcome you to the 48<sup>th</sup> annual Junior Science and Humanities Symposium (JSHS) of Southeast Michigan. Once again we have a group of very talented young men and women from schools throughout southeast Michigan who will share their research with us. I would like to thank the teachers and mentors for the guidance they provided students throughout the research process and their parents for the support that such activities entail.

An event such as this one cannot be accomplished by one person alone and I would like to express my gratitude to those who every year help make this event possible: the members of the Advisory Board, judges, speakers and the administration of the College of Education at Wayne State University. A special thanks to Ms. Sandra Yarema for her help in the planning and running of the symposium and to Mr. Herbert Cage and the students from the Edward “Duke” Ellington Conservatory of Music & Art for gracing us with their music during the interlude.

I would like to take this opportunity to give you a short overview of the history of the JSHS, for those of you who might not be familiar with this wonderful program. The JSHS was established in 1958 by the U. S. Army Research Office. In 1995 the Office of Naval Research and in 1997 the U. S. Air Force joined the army in funding the symposium. However, the Academy of Applied Sciences administers the funds and organizes the National Symposium every year.

The primary aim of the JSHS is to promote research among high school students. Every year, more than 10,000 students and their teachers participate in forty-eight regional symposia held on university campuses across the country and in Alaska, Puerto Rico and the Department of Defense schools in Europe and the Pacific. Students presenting at the regional symposia have the opportunity to receive significant awards in the form of scholarships, payable to the university of their choice. The first, second and third student finalists at each of the regional symposium receive \$2000, \$1500, and \$1000 respectively, and all five finalists are invited to attend the National JSHS. The two finalists at each regional symposium present their research once again at the National JSHS where they have the opportunity to receive additional awards. The three finalists in each of the categories at the National JSHS receive \$12,000.00, \$8,000.00 and \$4,000.00 respectively in scholarships and the first place finalist in each category is invited to participate in an expense-paid trip to the London International Youth Science Forum, which brings every year over 400 participants from 60 nations. For additional information about the JSHS please visit: <http://coe.wayne.edu/ted/science/jshs/>

Thank you for participating in this year’s symposium. I hope your experience is a memorable one.

A handwritten signature in black ink, consisting of the initials 'M. M.F.' with a stylized flourish.

Maria Madalena Ferreira, Director JSHS

## Keynote Speaker

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**Dr. Sandro R. P. da Rocha**  
**Associate Professor, Chemical Engineering**  
**College of Engineering**  
**Wayne State University**

Dr. Sandro da Rocha received his Ph.D. in Chemical Engineering in 2000, from the University of Texas at Austin, followed by a 2-year postdoctoral position in Chemistry and Biochemistry also at UT Austin. In 2008 he joined the Department of Chemical Engineering and Materials Science at Wayne State University and became Associate Professor in 2008.

The focus of Dr. da Rocha's research group is in the broad area of Nanomedicine. Their long range goal is to develop innovative drug and gene nanocarriers and their formulations for the regional and systemic delivery of therapeutics to and throughout the lungs. Their objective is to design carriers that modulate the transport of the therapeutic molecules across the lung epithelial barrier by engineering carriers with controlled morphology, size, and surface chemistry. Nanocarriers are of great relevance as they provide opportunities for controllable target and release of their cargo to specific tissues, cell populations, and intracellular organelles, while at the same time protecting their sensitive cargo. This type of research is highly multidisciplinary, involving students with different backgrounds from Molecular Biology to Polymer Science. His group also collaborates extensively with researchers in the School of Medicine and Pharmaceutical Science.

Dr. da Rocha has over 40 publications in scientific journals, several book chapters, and 4 patents. He and his group enjoy sharing their research results at national and international scientific meetings. He has graduated several Ph.D. and master's students who are now in various positions in research and academia. He has also mentored a number of undergraduate students, many of whom continued their studies and are now Ph.D. candidates at various universities.

In his presentation Dr. da Rocha will discuss how engineers can contribute to the broad area of nanomedicine and explain recent advances in the formulation of drug and gene carriers for the non-invasive delivery of drugs to and throughout the lungs using portable inhalers. These formulations have relevance in the treatment of a variety of diseases, including cancer, cystic fibrosis, and asthma, among others.

# Welcome from the Deans

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**Carolyn M. Shields, Ph.D.**  
**Dean and Professor, College of Education**  
**Wayne State University**

Dean Shields joined WSU in 2011 as the Dean of the College of Education. In this role she reports directly to the Provost and Senior Vice President for Academic Affairs, and oversees all the administrative decisions in the college. She works closely with faculty in research and program development to advance the field of education, while facilitating collaborations at the institutional, state, national, and international levels. Before joining WSU, Dean Shields spent 4 years as Department Chair and Professor at the University of Illinois, Urbana-Champaign, and before that another 4 years in similar roles at the University of British Columbia.

Dean Shields' teaching and research focus on leadership for academic excellence and social justice, including the creation of environments in which democratic organizations can effectively prepare students for participation, engagement and citizenship in a pluralistic civil society and global community. She has worked collaboratively with colleagues in many countries and supervised numerous international graduate students. Her research activities have resulted in over 100 publications, including 7 books, refereed articles, book chapters and reports.

Dean Shields will provide the welcome remarks at the dinner banquet on Thursday.



**R. Darin Ellis, Ph. D.**  
**Associate Dean of Academic Affairs and**  
**Student Services**  
**College of Engineering, Wayne State University**

Dr. Ellis provides leadership and direction to the College of Engineering's academic programs and student services. In 2011 he led a reorganization of the College's advising, academic services and student services, and oversaw the integration of most Computer Science academic programs into the College of Engineering.

Dr. Ellis has nearly 20 years of experience in the field of human factors and ergonomics, specializing in human-computer interaction. He is currently on the faculty of the Industrial Engineering Department where he holds the rank of Associate Professor and teaches courses including statistics, human factors in product development, work design and ergonomics. His current research focuses on human-robot interaction including application of augmented reality to robotic interfaces, user-centered design and evaluation of robot controls and displays, operator mental workload assessment and operator-in-the-loop system performance measurement. Dr. Ellis' research has been shared in over 60 publications and many conference presentations.

During the Friday's luncheon Dr. Ellis will discuss some of the interesting research projects taking place in the various programs in the College of Engineering.

## Where is She Now?

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### **Jia Jia Zhang – JSHS 1<sup>st</sup> Place Finalist – 2008 and 2009**

Jia Jia is a junior at Harvard University studying biomedical engineering. She attended Lakeview High School and the Battle Creek Area Math and Science Center. At Harvard, she is the Editor-in-Chief of the Harvard Undergraduate Leadership Magazine. She has worked at the Wyss Institute for Biologically Inspired Engineering and the Vanderbilt Institute for Nanoscale Science and Engineering. She is fascinated by nature's ability to engineer systems that are efficient, tunable, and sustainable. Currently, she is investigating biological chemical production by microorganisms in the Girguis group in Harvard's Department of Organismic and Evolutionary Biology. Her passion lies in leveraging science and technology to meet society's challenges.

Jia Jia will discuss how her participation in the JSHS impacted her experiences in college and future research interests at the luncheon on Friday.



## Undergraduate Research at Wayne State University

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A native of West Bloomfield, Michigan, Bhavika Chepuri will be graduating in May 2012 with a Dual Degree in Psychology Honors and Economics, in addition to a Minor in Biological Sciences. Bhavika began her research as a sophomore in the Department of Neurosurgery at the Wayne State University's School of Medicine under the guidance of Dr. Saroj P. Mathupala. Her work in neuro-oncology has continued throughout her undergraduate career and has developed into an individual project. As a Junior Bhavika was awarded an Undergraduate Research Grant through the Irvin D. Reid Honors College Office of Undergraduate Research. In November 2011, she presented her project, titled "*Metabolic Targeting of Malignant Brain Tumors via Synergistic Inhibition of Proton and Lactate Efflux*" at the 2011 Wayne State University Undergraduate Research Conference. Her research has also been accepted for presentation at the 2012 National Conference of Undergraduate Research in Ogden, Utah this March.

Bhavika is the President of the National Society of Collegiate Scholars Wayne State Chapter, and serves as a board member of Circle K International. She recently interned at the San Ignacio Public Hospital located in the Cayo District of Belize, and participated in a Rural Health Externship in Iron Mountain, Michigan in August 2011. She plans to pursue a career in medicine and will begin her studies at Wayne State University's School of Medicine in the Fall 2012.

Bhavika will talk about undergraduate research opportunities at Wayne State University, during the Friday's luncheon.

## Interlude with Music

### The Edward “Duke” Ellington Jazz Band

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**The Duke Ellington Jazz Band** is an after-school rehearsal group comprised of middle school students from the Edward “Duke” Ellington Conservatory of Music and Art. The students are mentored by the jazz staff of the University of Michigan and perform compositions by Freddie Hubbard and Herbie Hancock to name a few. The group recently performed at the University of Michigan Jazz festival, one of only two middle school jazz bands performing at the festival. Mr. Herbert Cage directs the band.

# Campus Tour

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College of Engineering - <http://engineering.wayne.edu/>



The Wayne State College of Engineering has more than 2,600 undergraduate and graduate students, in a large number of programs including chemical engineering, civil engineering, electrical engineering, industrial engineering, mechanical engineering, electrical/electronic engineering technology and mechanical engineering technology. College faculty researchers generate \$16 million annually in research recognized world-wide, particularly in certain standout areas such as nanotechnology and biomedical engineering, and through partnerships with industry in the areas of automotive engineering, nanotechnology, environmental infrastructures and transportation engineering, materials, manufacturing/communication engineering, and Biomedical engineering.

The Center for Automotive Research represents the College's longstanding role in the development of advanced automotive technology. From engine optimization, including gas and diesel engines, to cabin noise reduction, research and coursework is focused on enhancing all aspects of automotive engineering and production. A pioneer and long-time leader in research related to automotive safety Wayne State engineers have played an important part in the development and evolution of safety equipment, including the seatbelt, collapsible steering wheel, padded dashboard, and airbag. Based on 65 years of experience in this area, the Biomedical Engineering graduate programs prepare students to enter the new frontier that merges the medical and engineering sciences. The College's top-ranked Smart Sensors and Integrated Microsystems lab is pioneering new ground in nanotechnology, developing unique biosensors, including retina and cortical implants that may soon give sight to the blind. The lab, anchored by a new world-class clean room facility, brings together faculty from throughout the College, Science, and Medicine to address the latest challenges to face society.

Established in 2004, the College's newest program, Alternative Energy Technology, immediately became its most crucial, as the nation strives for energy independence and sustainability, and the state of Michigan transitions from its manufacturing base to high tech and alternative energy. Wayne State is one of the first universities in the nation to offer a degree in alternative energy.

## **PROGRAM**

**THURSDAY AND FRIDAY, MARCH 1<sup>st</sup> AND 2<sup>nd</sup>, 2012**

**THURSDAY, MARCH 1<sup>st</sup>, 2012**

*2:30 p.m.- 3:30 p.m.*

### **REGISTRATION**

Lobby  
McGregor Memorial Conference Center  
Wayne State University

*3:30 p.m. - 4:00 p.m.*

### **OPENING SESSION**

Room BC, First Level, McGregor Conference Center

*PRESIDING:*

**Dr. Maria Madalena Ferreira**, Director - JSHS  
Associate Professor of Science Education  
College of Education  
Wayne State University

*WELCOME/OVERVIEW OF WAYNE STATE UNIVERSITY:*

**Dr. Kathleen Crawford-McKinney**, Asst. Dean of Curriculum & Evaluation  
College of Education, Wayne State University

*ORIENTATION:*

**Dr. Maria Madalena Ferreira**  
JSHS Director and Coordinator

*4:00 p.m.- 6:00 p.m.*

### **PRESENTATION OF STUDENT PAPERS**

McGregor Conference Center

## STUDENT PRESENTATIONS

### SECTION I ROOM E, McGREGOR

**MODERATOR:**       **Dr. Lori Pile**, Biology Department, Wayne State University

**STUDENT PRESENTERS:**

**Ashi Arora**

*The Transcription Factor Gene ZCF28 in Regulating Resistance in C. albicans*

**Sujay M. Dewan**

*Relationship Between Major Histocompatibility Complex Class II Alleles and Immunogenicity in Dogs Treated With Potential Canine Therapeutic*

**Seungah Choo**

*Genetic Basis of Craniometric Features in Worldwide Populations*

**Yash Pandya**

*Analyzing the Manifestation of Hyperthermia in the Mice Model of Serotonin Syndrome With Regards to the Change in 5-HT<sub>1A</sub> Receptor-associated G<sub>0</sub> Protein Levels Possibly Contributing to the Thermal Effect Observed*

**Tyler Sykes**

*Cloning Human Tau and Tau Mutants into Expression Vectors for Use in the Slime Mold*

**Claire J. Wiggins**

*Effects of the Deletion of the DSCI Cation Channel on Egg Laying, Resistance to Oxidative Stress, and Tolerance to Starvation in Drosophila melanogaster*

**JUDGES:**

**Dr. Claudio Verani**, Chemistry Department, Wayne State University

**Dr. Paul Albosta**, School of Medicine, Wayne State University

**Shahriar Shidfar**, TARDEC

## SECTION II ROOM F, McGREGOR

**MODERATOR:** Dr. Christy Chow, Chemistry Department – Wayne State University

### *STUDENT PRESENTERS:*

**Amir Alavi**

*Chromophores as Ligands for a Novel Fluorescent Protein*

**Alexander Kucy**

*The Effects of pH and Salt Concentrations on 2-aminopurine Fluorescence*

**Griffin MacDonald**

*Angeli's Salt Activates Glucose Uptake in L929 Fibroblast Cells*

**Sarah Manski**

*Robust Amide Couplings: Determination of the Relative Tolerance of Various Acid Activation and Coupling Strategies to Water*

**Ankita Nallani**

*Tβ4 Treatment Induces Oligodendrocyte Differentiation*

**Gautam Rajagopal**

*The Effects of pH on the Fluorescence and Absorbance of 4-Amino-2, 6-Diphenylphenol*

### *JUDGES:*

**Dr. Vladimir Chernyak**, Chemistry Department - Wayne State University

**Dr. Amanda Solem**, Chemistry Department - Wayne State University

**Lillian El-Gothamy**, TARDEC

### **SECTION III ROOM G, McGREGOR**

**MODERATOR:**       **Dr. Russell Finley**, School of Medicine – Wayne State University

**STUDENT PRESENTERS:**

**Jonathan Cernanec**

*Pulmonary Reactivity in Response to Hyperbaric Oxygen Treatment and Optimum Ring Studies Conditions*

**Nicole Gaudino**

*Possible Role for Phage in Inflammatory Bowel Disease*

**Peter Hao**

*Induction of Skeletal Muscle Cycoxygen 2 by Heat-shock Protein 60 Following Extremity Operative Procedures*

**Shafali Sood**

*Tissue Oxygen Levels Measured Using Spectroscopy Following Mental and Physical Activity*

**Steven Springer**

*Mechanism of Pectus Deformities in Marfan Syndromic and Non-Syndromic Patients*

**Shirley Wu**

*The Oncogenic Effects of the Over-expression of Both the PIK#CA Mutant H1047R and HER2 Genes and Their Response to Inhibitors in Breast Cancer Cells*

**JUDGES:**

**Dr. Markku Kurkinen**, School of Medicine – Wayne State University

**Dr. Xiangyi Lu**, School of Medicine - Wayne State University

**Dr. Maria Pontes Ferreira**, Nutrition & Food Science - Wayne State University

## **SECTION IV ROOM H, MCGREGOR**

**MODERATOR:** Dr. Karen Beningo, Biology Department – Wayne State University

### *STUDENT PRESENTERS:*

**JoAnn Ballor**

*Locomotion in the Eocene Primate Smilodectes gracilis: Climbing or Leaping?*

**Philip Cody He**

*A Novel Role of an Actin Capping Protein in Plant Immune Signaling*

**Grace Kiel**

*Canine Keratinocyte Cytokines Secretion Mediated by LPS or Dust Mite Antigen Stimulation*

**Keenan Noyes**

*Lipid Levels of Egg Masses of Salvelinus namaycush Correlate with the Somatic Size of Young Fish*

**Rachel Rounds**

*The Effect of Coprophagous Beetles (Coleoptera: Scarabaeidae, Geotrupidae, and Hydrophilidae) on Methane Emission Rates From Cattle Dung and a Six-month Species Composition Survey of Coprophagous Beetles in Lake City, Michigan*

**David VanderZee**

*The Effects of Long Term Predation on Courtship Behavior of Drosophila melanogaster and a Morphological Analysis of Natural Selection of Drosophila melanogaster by Salticus scenicus*

### *JUDGES:*

**Dr. Dan Kashian**, Biology Department– Wayne State University

**Dr. Ann Sodja**, Biology Department - Wayne State University

**Ms. Katrina Prantzos**, TARDEC



## **SECTION V ROOM I, McGREGOR**

*MODERATOR:* **Dr. David Grueber**, Science Education – Wayne State University

*STUDENT PRESENTERS:*

**Lawrence Kim**

*MEG Study of the Neuronal Networks of Stuttering*

**Kelsey Komyathy**

*Anterior Tibialis CMAP Amplitude Correlations With Impairment in CMT1A*

**Rachel Schultz**

*Scaffolding Property of MLK3 Variants in HEK293 Cells and Gastrointestinal Cancer*

**Natasha Sood**

*Identifying Genetic Interactions for the Prickle Gene in Epilepsy*

**Jordan Sykes**

*Determination of the Role of *Nato3* and *NICD* in DA Neuron Marker Expression in the Ventral Mesencephalon*

**Edgar Wang**

*MicroRNA 17-92 Cluster Mediates Sonic Hedgehog Induced Neurogenesis on Neural Stem Cells After Stroke*

*JUDGES:*

**Dr. Maik Huttemann**, School of Medicine - Wayne State University

**Dr. David Rueda**, Chemistry Department – Wayne State University

**Dr. Karen Myhr**, Biology Department – Wayne State University

## **SECTION VI ROOM J, McGREGOR**

*MODERATOR:* **Dr. David Cinabro**, Physics Department – Wayne State University

*STUDENT PRESENTERS:*

**Jessica Wojtczak**

*The Effects of Attention Allocation on Emotional Memory as a Function of Wake or Nap Conditions*

**Amy Sun**

*Humidity and Impact on EGR Scheduling*

**Kevin J. Beach**

*The Correlation Between GOES Flare Classification and the Impact of Solar Flaring on Geomagnetic Field Stream*

**Jinho Kim**

*Comparing Image Classification Methods: K-Nearest-Neighbor and Support-Vector-Machines*

**Peter Nguyen**

*Conway's Game of Life: Program Simulator and a Possible Future Application*

**Grady Sertic**

*Logarithms in Calculus: An Interesting New Approach*

*JUDGES:*

**Carol Miller**, College of Engineering – Wayne State University

**Manjiree Jalukar**, TARDEC

**Ralph Pinnock**, TARDEC

*6:00 p.m.- 6:30 p.m.*

**INTERLUDE - McGregor Lobby**

Student Poster Presentations

**Music by students from the Edward “Duke” Ellington Conservatory  
of Music and Art under the direction of Mr. Herbert Cage**

*6:30 p.m.- 8:30 p.m.*

**BANQUET SESSION**

Room LM – Lower Level, McGregor Conference Center

***PRESIDING:* Dr. Maria Madalena Ferreira**  
Director, JSHS

***WELCOME:* Dr. Carolyn Shields, Dean and Professor**  
College of Education, Wayne State University

***KEYNOTE SPEAKER:* Dr. Sandro Rocha, Associate Professor**  
Chemical Engineering, Wayne State University

***TOPIC:***        *Nanomedicine in the Treatment of Lung Diseases*

***ANNOUNCEMENT OF FRIDAY’S STUDENT PAPERS:***

**Dr. Maria Madalena Ferreira**  
Director, JSHS

**FRIDAY, MARCH 11, 2011**

**8:30 a.m. - 9:00 a.m.**

**CONTINENTAL BREAKFAST**

Lobby - McGregor Memorial Conference Center  
Wayne State University

**9:00-11:45 a.m.**

**CAMPUS TOUR: College of Engineering**

*(wait in breakfast area for tour guides)*

**9:30 a.m. - 11:45 a.m.**

**Final Judging**

McGregor Conference Center, Room I

*Moderator:*

**Dr. Thomas Edwards**, Mathematics Education – Wayne State University

*Judges:*

**Dr. Peter Andreana**, Chemistry Department - Wayne State University

**Dr. Kezhong Zhang**, School of Medicine – Wayne State University

**Dr. Amar Basu**, College of Engineering – Wayne State University

**12:00 p.m.-1:30 p.m.**

**LUNCHEON BANQUET**

Room BC – First Level, McGregor Conference Center

*PRESIDING:*

**Dr. Maria Madalena Ferreira**

College of Education

*WELCOME:*

**Dr. Darin Ellis**

Associate Dean, College of Engineering

*SPEAKERS:*

**Bhavika Chepuri**, Honors Program – Wayne State University

*TOPIC:*

*Undergraduate Research Opportunities at Wayne State University* –  
Bhavika, a student in the Honors Program at WSU, will talk about  
research opportunities for undergraduate students and the types of research  
experiences she has had while at WSU.

***Jia Jia Zhang***

*TOPIC:*

*Where Is She Now?* - Jia Jia Zhang, a twice JSJS finalist will talk about her  
research experiences during high school and how her participation in the  
JSJS impacted her college experiences and future research interests.

*1:30 p.m. - 2:15 p.m.*

**CLOSING SESSION**

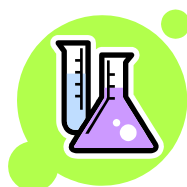
*PRESIDING:*           **Dr. Maria Madalena Ferreira**  
Director, JSHS

*AWARDS:*             **Presentation of Student Speaker Awards**  
Dr. Maria Madalena Ferreira, Director

*PRESENTATION FROM STUDENT FINALIST*

*EVALUATION OF PROGRAM:*

**Participants please complete evaluation forms**



## STUDENT RESEARCH PAPERS

Name	School	City
Amir Alavi	Okemos High School	Okemos
Ashi Arora	Novi High School	Novi
JoAnn Patricia Ballor	Okemos High School	Okemos
Kevin J. Beach	Chippewa Hills High School	Remus
Jonathan Francis Cernanec	Grand Rapids Catholic Central	Grand Rapids
Seungah Choo	Okemos High School	Okemos
Sujay Mohan Dewan	Kalamazoo Math/Science Center	Kalamazoo
Nicole Irene Gaudino	Grand Rapids Catholic Central	Grand Rapids
Peter Hao	Troy High School	Troy
Philip Cody He	Okemos High School	Okemos
Grace Ellen Keil	Kalamazoo Math/Science Center	Kalamazoo
Jinho Kim	Okemos High School	Okemos
Lawrence Kim	Troy High School	Troy
Kelsey Lauren Komyathy	Okemos High School	Okemos
Alexander G. Kucy	Detroit Country Day School	Beverly Hills
Griffin John MacDonald	Grand Rapids Catholic Central	Grand Rapids
Sarah E Manski	Kalamazoo Math/Science Center	Kalamazoo
Ankita Nallani	Detroit Country Day School	Beverly Hills
TrungHau Peter Nguyen	Grand Rapids Catholic Central	Grand Rapids
Keenan Lee Noyes	Okemos High School	Okemos
Yash Kalpesh Pandya	Okemos High School	Okemos
Gautam Rajagopal	Kalamazoo Math/Science Center	Kalamazoo
Rachel J. Rounds	MOISD-Math Science Technology Center (Evert High School)	Big Rapids
Rachel Megan Schultz	Okemos High School	Okemos
Grady Sertic	Kalamazoo Math/Science Center	Kalamazoo
Natasha Sood	Detroit Country Day School	Beverly Hills
Shefali Sood	Detroit Country Day School	Beverly Hills
Steven Paul Springer	Grand Rapids Catholic Central	Grand Rapids
Amy Tong Sun	Detroit Country Day School	Beverly Hills
Angela Sun	Canton High School	Canton
Jordan Phillip Sykes	Grand Rapids Catholic Central	Grand Rapids
Tyler Michael Sykes	Grand Rapids Catholic Central	Grand Rapids
David Lee VanderZee	Grand Rapids Catholic Central	Grand Rapids
Edgar Wilson Wang	Troy High School	Troy
Claire Jordan Wiggins	Okemos High School	Okemos
Jessica Jane Wojticzak	Grand Rapids Catholic Central	Grand Rapids
Shirley Zhang Wu	Detroit Country Day School	Beverly Hills

## STUDENT PARTICIPANTS

Name	School	City
Amir Alavi	Okemos High School	Okemos
Ashi Arora	Novi High School	Novi
JoAnn Patricia Ballor	Okemos High School	Okemos
Angela Saradar Barcega	Roseville High School	Roseville
Kevin J. Beach	Chippewa Hills High School	Remus
Jonathan Francis Cernanec	Grand Rapids Catholic Central	Grand Rapids
Seungah Chou	Okemos High School	Okemos
Jacob Michael Cochenar	Roseville High School	Roseville
Sujay Mohan Dewan	Kalamazoo Math/Science Center	Kalamazoo
Lauren N. Dombrowski	Roseville High School	Roseville
Nicole Irene Gaudino	Grand Rapids Catholic Central	Grand Rapids
Brianna Marie Hall	Roseville High School	Roseville
Peter Hao	Troy High School	Troy
Edwin Coy Harbauer	Roseville High School	Roseville
Philip Cody He	Okemos High School	Okemos
Meghan Anne Hebert	Roseville High School	Roseville
Carly Johannah Hedemark	Roseville High School	Roseville
Grace Ellen Keil	Kalamazoo Math/Science Center	Kalamazoo
Jinho Kim	Okemos High School	Okemos
Lawrence Kim	Troy High School	Troy
Kelsey Lauren Komyathy	Okemos High School	Okemos
Alexander G. Kucy	Detroit Country Day School	Beverly Hills
Adena Louise Leibbrand	Kalamazoo Math/Science Center	Kalamazoo
Elizabeth Lenning	Kalamazoo Math/Science Center	Kalamazoo
Stephanie Karalee Love	Roseville High School	Roseville
Griffin John MacDonald	Grand Rapids Catholic Central	Grand Rapids
Sarah E Manski	Kalamazoo Math/Science Center	Kalamazoo
Gabrielle Lynn Mielke	Roseville High School	Roseville
Shaina Meena Mohan	Roseville High School	Roseville
Rebecca Ann Moore	Roseville High School	Roseville
Ankita Nallani	Detroit Country Day School	Beverly Hills
TrungHau Peter Nguyen	Grand Rapids Catholic Central	Grand Rapids
Keenan Lee Noyes	Okemos High School	Okemos
Yash Kalpesh Pandya	Okemos High School	Okemos
Michael David Patrick	Macomb Academy of Arts & Sciences	Armada
Kristy Breanna Peraino	Roseville High School	Roseville
Gautam Rajagopal	Kalamazoo Math/Science Center	Kalamazoo
Rachel J. Rounds	MOISD-Math Science Technology Center (Ewart High School)	Big Rapids
Rachel Megan Schultz	Okemos High School	Okemos
Grady Sertic	Kalamazoo Math/Science Center	Kalamazoo
Brianna Marie Smith	Roseville High School	Roseville
Natasha Sood	Detroit Country Day School	Beverly Hills
Shefali Sood	Detroit Country Day School	Beverly Hills
Steven Paul Springer	Grand Rapids Catholic Central	Grand Rapids
Ryan Matthew Staler	Roseville High School	Roseville

Amy Tong Sun  
Angela Sun  
Jordan Phillip Sykes  
Tyler Michael Sykes  
Zachary Paul Thompson  
David Lee VanderZee  
Edgar Wilson Wang  
Danielle Nicole Watson  
Kirk A. Wawrzyniak  
Claire Jordan Wiggins  
Jessica Jane Wojticzak  
Shirley Zhang Wu  
Trevor Mark Zalewski  
Emily Ann Zielonka

Detroit Country Day School  
Canton High School  
Grand Rapids Catholic Central  
Grand Rapids Catholic Central  
Roseville High School  
Grand Rapids Catholic Central  
Troy High School  
Roseville High School  
Roseville High School  
Okemos High School  
Grand Rapids Catholic Central  
Detroit Country Day School  
Roseville High School  
Roseville High School

Beverly Hills  
Canton  
Grand Rapids  
Grand Rapids  
Roseville  
Grand Rapids  
Troy  
Roseville  
Roseville  
Okemos  
Grand Rapids  
Beverly Hills  
Roseville  
Roseville



**TEACHER/SUPERVISOR/ADMINISTRATIVE  
PARTICIPANTS**

<b>Name</b>	<b>School</b>	<b>City</b>
Rebecca Brewer	Troy High School	Troy
Mr. Cris DeWolf	Chippewa Hills High School	Remus
Leigh Ann Eriks	Grand Rapids Catholic Central	Grand Rapids
Michelle Evans	Novi High School	Novi
Laura J. Forbes	Mecosta/Osceola ISD -Math Science Technology Center	Armada
John W. Goudie	Kalamazoo Math/Science Center	Kalamazoo
Gene Menton	Detroit Country Day School	Beverly Hills
Andy Moore	Okemos High School	Okemos
Emily Parker Pohlonski	Novi High School	Novi
Michael P. Rourke	Macomb Academy of Arts & Science	Macomb
Michael M. Spitz	Canton High School	Canton
Scott Wheeler	Roseville High School	Roseville

## Judges

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**Dr. Paul Albosta**  
School of Medicine  
Wayne State University

**Dr. Peter Andreana**  
Chemistry Department  
Wayne State University

**Dr. Amar Basu**  
College of Engineering  
Wayne State University

**Dr. Karen Beningo**  
Biology Department  
Wayne State University

**Dr. Vladimir Chernyak**  
Chemistry Department  
Wayne State University

**Dr. Christy Chow**  
Chemistry Department  
Wayne State University

**Dr. David Cinabro**  
Physics Department  
Wayne State University

**Harsha Desai**  
TARDEC- U.S. Army Tank Automotive  
Research Development & Engineering Center

**Dr. Thomas Edwards**  
Mathematics Education  
Wayne State University

**Lillian El-Gothamy**  
Electrical Engineer – TARDEC- U.S. Army  
Tank Automotive Research  
Development & Engineering Center

**Dr. Maria Pontes Ferreira**  
Nutrition & Food Science  
Wayne State University

**Dr. Russell Finley**  
School of Medicine  
Wayne State University

**Dr. David Grueber**  
Science Education  
Wayne State University

**Dr. Maik Huttemann**  
School of Medicine  
Wayne State University

**Manjiree Jalukar**  
TARDEC- U.S. Army Tank Automotive  
Research Development & Engineering Center

**Dr. Dan Kashian**  
Biology Department  
Wayne State University

**Dr. Markku Kurkinen**  
School of Medicine  
Wayne State University

**Dr. Carol Miller**  
College of Engineering  
Wayne State University

**Dr. Karen Myhr**  
Biology Department  
Wayne State University

**Dr. Lori Pile**  
Biology Department  
Wayne State University

**Ralph Pinnock**  
TARDEC- U.S. Army Tank Automotive  
Research Development & Engineering Center

**Ms. Katrina Prantzalos**  
TARDEC- U.S. Army Tank Automotive  
Research Development & Engineering Center

**Dr. David Rueda**  
Chemistry Department  
Wayne State University

**Dr. Anna Sodja**  
Biology Department  
Wayne State University

**Dr. Amanda Solem**  
Chemistry Department  
Wayne State University

**Dr. Claudio Verani**  
Chemistry Department  
Wayne State University

**Dr. Xiangyi Lu**  
School of Medicine  
Wayne State University

**Dr. Kezhong Zhang**  
School of Medicine  
Wayne State University

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**Ms. Doris E. Cousens, Director**  
National Junior Science & Humanities Symposium  
Academy of Applied Science

**Dr. & Mrs. Herbert Dobbs**  
Association U.S. Army, Detroit Chapter

**Dr. Carolyn Shields, Dean**  
College of Education  
Wayne State University

**Dr. Darin Ellis, Associate Dean  
of Academic Affairs and Student Services**  
College of Engineering  
Wayne State University

**Dr. Thomas Edwards**  
Professor of Mathematics Education  
Wayne State University

**Ms. Debbie Moore**  
McGregor Conference Center

**Mr. Kevin Rashid**  
Honors Program  
Wayne State University

**Ms. Sandra Yarema**  
JSHS Secretary & Ph.D. candidate  
College of Education  
Wayne State University

\*\*\*\*\*

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