



Academy of Applied Science



**Forty-Fifth Annual**

**Southeastern Michigan**

**Junior Science and  
Humanities  
Symposium**

**Program**  
**2009**

**WAYNE STATE  
UNIVERSITY**

**McGregor Memorial Conference Center  
Detroit, Michigan**

**March 5 and 6, 2009**

**Forty-Fifth Annual**

**SOUTHEASTERN MICHIGAN**

**JUNIOR SCIENCE AND HUMANITIES**  
**SYMPOSIUM**

Thursday and Friday, March 5th and 6th, 2009

*SPONSORED BY*

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

*in cooperation with*

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

U.S. Naval Research Office

U. S. Air Force Research Office

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 enlarge 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.*

## ADMINISTRATION OF JSHS

### **Dr. Maria M. Ferreira**

Associate Professor and Coordinator of Science Education, College of Education, Wayne State University  
Director and Coordinator of JSHS

## JSHS ADVISORY BOARD

### **Mr. Jeff Conn**

Senior Lecturer  
College of Science—Physics  
Wayne State University

### **Mr. Brian Derowski**

Teacher  
Sanilac County Science and Math  
Center (SCSMC)

### **Dr. Herbert Dobbs**

Retired Technical Director of U.S. Army  
Tank-Automotive Command

### **Dr. Thomas Edwards**

Associate Professor  
Mathematics Education  
Wayne State University

### **Dr. Russell L. Finley**

Associate Professor  
Center for Molecular Medicine & Genetics  
Wayne State University

### **Dr. Daniel Frohardt**

Associate Department Chair  
Mathematics/Science  
Wayne State University

### **Dr. Michele Grimm**

Associate Dean for Academic Affairs  
Engineering  
Wayne State University

### **Ms. Margaret Hoard**

Secretary JSHS  
Wayne State University

### **Dr. Rubye Holloway**

Science Administrator  
Detroit Public Schools

### **Dr. Steven Ilmer**

Associate Dean for Research, College of  
Education  
Wayne State University

### **Dr. Padu Karur**

Associate Professor  
Experimental Condensed Matter Physics  
Wayne State University

### **Dr. Daniel Kashian**

Assistant Professor, Biological Sciences  
Wayne State University

### **Dr. Craig Roney**

Assistant Dean, Teacher Education Division  
College of Education  
Wayne State University

### **Dr. Eva Powers**

Associate Professor, Department of Dance  
Wayne State University

### **Dr. Claude A. Pruneau**

Associate Professor  
Physics  
Wayne State University

### **Mr. Kevin Rashid**

Honors Curriculum Coordinator  
Wayne State University

### **Dr. David Rueda**

Assistant Professor- Chemistry  
Wayne State University

### **Dr. Paula Wood**

Dean, College of Education  
Wayne State University



# WELCOME

Dear Students, Teachers, Parents and Colleagues,

It is my great privilege to welcome you to the 45<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 can not 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. Margaret Hoard for her help in the planning and running of the symposium and to Mrs. Victoria Miller and the students from Martin Luther King, Jr. High School Band for gracing us with their music during the interlude. Many thanks to Dr. Holloway for facilitating the process and for her students' help with the registration.

I would like to take this opportunity to give you a short overview of the history of the JSHS, for those 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 of the symposium. However, the Academy of Applied Sciences administers all facets of the program.

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 \$16,000.00, \$6,000.00 and \$2,000.00 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:16080/tes/JSHS/>

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

Maria M. Ferreira, Director JSHS

## Guest Speaker

**Dr. Scott W. Jorgensen**, General Motors Research & Development

*Alternate Fuels, Advanced Automobiles, and Transportation  
in the World You Will Build*



Dr. Jorgensen manages the Electrochemistry and Battery Systems Group at General Motors R&D, with the mission to develop new batteries for electrified vehicles. He is part of the management team in the 400 million dollar USCAR / FreedomCAR program to improve vehicles. He is also the chair of the Coordinating Research Council's Advanced Vehicle, Fuel, and Lubricant committee. From summer jobs in college to his present leadership role he has sought alternative energy sources for transportation, including synthetic oil and cleaner gasoline, biofuels, and hydrogen.

Dr. Jorgensen received his Ph.D. in Chemical Engineering from Stanford University and his BS in Chemical Engineering from the University of Illinois. He received a fellowship from the National Science Foundation while at Stanford University.

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## **Interlude With Jazz**

### **Martin Luther King, Jr. Senior High School Band**



The Martin Luther King Jr. Senior High School Band has been under the direction of Mrs. Victoria Miller since 2002. The Marching Band began with 28 students and has grown to over 84 musicians and 40 auxiliary. The school also has a Symphonic Band with 60 members and a Jazz Band with 16 members. The Marching Band has performed in a variety of events including the last Olympic Games in Beijing, China and has received many awards, including 1<sup>st</sup> place (2006 and 2008) in the Southfield competition and 2<sup>nd</sup> place in the 2005 national competition that took place in Alabama.

The Symphonic Band received 1<sup>st</sup> Division at the district level from 2003 to 2008 and 1<sup>st</sup> Division at the state level 2006-2008 and 2<sup>nd</sup> Division 2003-2005.

**The following band students are playing here today under the direction of Mrs. Miller:**

- **Lisa Anderson – Alto Saxophone**
- **Kenny Murphy – Baritone Saxophone**
- **Dae’Lon Simmond – Alto Saxophone**
- **Stephen Todd – Tenor Saxophone**

# Campus Tour

## College of Fine, Performing and Communication Arts

<http://www.cfpc.wayne.edu/>



The College of Fine, Performing and Communication Arts at Wayne State University is housed in Old Main, one of the oldest and most beautiful buildings on the WSU campus. The college includes the departments of Art, Dance, Music, Theater, and Communication Arts. Old main celebrated its centennial in 1997.

Those participating in the campus tour will have the opportunity to visit a number of the programs in old main including dance, theater, and film.

## WSU Planetarium



The WSU planetarium is used for astronomy lectures, demonstrations and laboratory exercises and offers free session to members of the community. Features include a 27-foot compound-curve hemispheric projection dome; capabilities for special effects projections and direct projection for images downloaded from NASA, and projection of live images from space bound sources like the Hubble Space Telescope or shuttle missions. The hour-long shows are designed to give the audience an appreciation of the current night sky and other wonders of our universe. Those participating in the campus tour will have the opportunity to attend a session at the planetarium.



## PROGRAM

THURSDAY AND FRIDAY, MARCH 5 AND 6, 2009

THURSDAY, MARCH 5, 2009

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

**REGISTRATION**

Lobby

McGregor Memorial Conference Center

Wayne State University

*M. L. King, Jr. High Students, Detroit*

**Dr. Rubye Holloway**, Sponsor

Detroit Public Schools

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

**OPENING SESSION**

Room B/C, McGregor

*PRESIDING:*

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

Associate Professor of Science Education

College of Education

Wayne State University

*WELCOME/OVERVIEW OF WAYNE STATE UNIVERSITY:*

**Dr. Craig Roney**, Assistant Dean Teacher Education Division

College of Education, Wayne State University

*ORIENTATION:*

**Dr. Maria Ferreira**

JSHS Director and Coordinator

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

**PRESENTATION OF STUDENT PAPERS**

McGregor Conference Center

## PRESENTATIONS

### SECTION I ROOM E, MCGREGOR

**MODERATOR:**       **Dr. Dan Kashian**, Biology Department - Wayne State University

**STUDENT PRESENTERS:**

**Kimberly Chew**

*Effectiveness of Chinese Brand Joint Reliever, Wo Chun Tong Superfine Musk Oil vs. American Brand Joint Reliever Bengay*

**Samantha Cloutier**

*Is a Dog's Mouth Cleaner than a Human's Mouth? A Comparison of Bacterial Content and Growth in Dog and Human Saliva*

**Eric Cosky**

*Effects of Regulating Circadian Rhythms on *Phodopus Campbelli**

**Michael Fitzgerald**

*The effects of PKC Inhibition on Protein Levels of Maf-A, a Key Transcription Factor Involved in Glucose Toxicity in INS-1 B-cells*

**Srivarsha Koripella**

*Characterizations of Mutations in Nuclear-Mitochondrial Pathways*

**Nakisha Rutledge**

*Strengthening Chitosan-Based Scaffolds with Thiolated Chitosan Fibers: Mechanical Properties and Cell Interaction*

**JUDGES:**

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

**Ms. Katrina Prantzos**, Electrical Engineer – TARDEC

**Dr. Susan XIAOXIN XU**, Toxicology, Wayne State University

## **SECTION II ROOM F, McGREGOR**

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

### *STUDENT PRESENTERS:*

**Salman Ahsan**

*Aqueous-Phase Hydrogenation of Cellulose and Glucose to Hydrocarbons*

**Emily Anthon**

*Grain Boundary Analysis of Magnesium Alloys*

**Ashley Childers**

*Comparative Analysis of Biochemical Delivery Systems*

**Pranav Moudgil**

*Ultra-violet Light Photo-Reduction and Spectroscopy of Conjugated Systems: Radical Production in Tyrosine and Bovine Insulin*

**Kush Sharma**

*The Structural Characterization of a Possible 3-Coordinate Intermediate during Copper Transfer between Copper Chaperone (hah1) AND Wilson Domain Four (WD4)*

**Jamie (JiaJia) Zhang**

*Potency of Chinese Herbs*

### *JUDGES:*

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

**Zhuojun Guo**, Chemistry Department - Wayne State University

**Mr. Cleophas Harris**, TARDEC

### **SECTION III ROOM G, MCGREGOR**

**MODERATOR:**       **Dr. Ann Sodja**, Biology Department – Wayne State University

**STUDENT PRESENTERS:**

**Disha Bora**

*Adaptive Resistance of Candida Albican to Fluconazole*

**Hannah Cheriyan**

*Genes or Other Means? The Effect of Environment vs. Genes on the Incidence of Anaphylactic Food Allergies*

**Ann Marie Schumar**

*The Mortality Rate of Adult Patients on Extracorporeal Membrane Oxygenation System for Acute Circulatory Collapse*

**Sonali Sharma**

*Novel, Cost-effective Strategies for Maintaining Cooled Intravenous Saline in Paramedic Units to Induce Hypothermia in Out-of-Hospital Cardiac Arrest Patients*

**Maggie Stein**

*Localization Value of Specific Auras in Epilepsy Supported by Resective Surgical Outcomes*

**Sherwin Wu**

*An Evaluation of Anti-Cancer Activity of MI-319 in Two B-Cell Lymphoma Lines*

**JUDGES:**

**Dr. Maik Hutteman**, Medical School – Wayne State University

**Dr. George Roberts**, Medical School – Wayne State University

**Mr. Shahriar Shidfar**, TARDEC

## SECTION IV ROOM H, MCGREGOR

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

### *STUDENT PRESENTERS:*

**Joshua Cambridge**

*The Viability of Wind Power as a Domestic Alternative to Grid Power Usage*

**Jenna Freudenburg**

*Parameterizing Knots with Chebyshev Polynomials*

**HongAn Nguyen**

*Upgrading SMART for Use at CHARA*

**Rahul Pandey**

*A Microwave Meta Material Lens with Negative Index of Refraction*

**Connie Shi**

*A Gold Nanoparticle-based Biosensor for Salmonella Enteritidis Detection on Screen-Printed Carbon Electrodes*

**Scott VanderLugt**

*The Efficiency of Various Algorithms for Locating Microsatellites in DNA*

### *JUDGES:*

**Dr. Sean Gavin**, Physics Department - Wayne State University

**Mr. Robert Udvardi**, TARDEC

**Dr. Ava Zeineddin**, Science Education – Wayne State University

## **SECTION V ROOM I, MCGREGOR**

**MODERATOR:**       **Dr. Rubye Holloway**, Detroit Public Schools

### *STUDENT PRESENTERS:*

**Killian Burns**

*An Abelisauroid Jaw Fragment from the Late Cretaceous (Maastrichtian) of India*

**Stephany Frailey**

*Grass vs. Pellets: The Study of the Effects of Commercial Pellets vs. Grass in the Growth and Weight of Californian Rabbits*

**Kevin Green**

*The Effectiveness of Functional Objects as a Mathematical Teaching Tool for Preschoolers*

**Thomas Gregovich**

*The Effect of Caffeine on Mental Acuity*

**Jahanavi Ramakrishna**

*A Study of Drive Distraction: Human Machine Interface Simulation to Understand Reaction Times*

**April Surinck**

*Vitamin B3: The Effect on Vasodilation*

### *JUDGES:*

**Ms. Harsha Desai**, TARDEC

**Dion Gnanakkan**, Science Education – Wayne State University

**Sharla Wood**, Chemistry Department - Wayne State University

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

**INTERLUDE**  
**Room B/C McGregor**

*Student Poster Presentations*

*Music by students from the Martin Luther King, Jr. Senior High School Band*

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

**BANQUET SESSION**  
Room LM – Lower Level, McGregor Conference Center

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

**SPEAKER: Dr. Scott W. Jorgensen**, General Motors Research & Development

**TOPIC: *Alternate Fuels, Advanced Automobiles, and Transportation  
in the World You Will Build***

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

**Dr. Maria Ferreira**  
Director, JSHS

**FRIDAY, MARCH 6, 2009**

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

**CONTINENTAL BREAKFAST**

Lobby: McGregor Memorial Conference Center  
Wayne State University

**8:45-11:30 a.m.**

**CAMPUS TOUR: Old Main: College of Fine and  
Performing Arts & Planetarium**

*(wait in breakfast area for tour guide)*

**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. Elvin Aleman**, Chemistry Department - Wayne State University

**Dr. William Branford**, Biology Department – Wayne State University

**Dr. Padu Karur**, Physics Department – Wayne State University

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

**LUNCHEON BANQUET**

Room LM – Lower Level, McGregor Conference Center

*PRESIDING:*

**Dr. Maria Ferreira**

College of Education

*WELCOME:*

**Dr. Michele Grimm**

Associate Dean, College of Engineering

*SPEAKER:*

**Kevin Rashid**, Honors Program – Wayne State University

*TOPIC:*

***Undergraduate Research Opportunities at Wayne State University***

*STUDENT PRESENTERS:*

- **Clarissa Dass:** *Novel Inhibitors of Staphylococcus aureus Efflux Pumps*
- **Wendy Benson:** *Art-making with Bone Marrow Transplant Patients at Children's Hospital of Michigan*



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

**CLOSING SESSION**

*PRESIDING:*

**Dr. Maria Ferreira**  
Director, JSHS

*AWARDS:*

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

*PRESENTATION FROM STUDENT FINALIST*

*EVALUATION OF PROGRAM:*

**Participants please complete evaluation forms**

# **REGISTRATION COMMITTEE**

**Martin Luther King, Jr. High School**

**Renisha Bishop  
Jaquella Kee  
Steven King  
Cierra Traylor**



## STUDENT RESEARCH PAPERS

Name	School	City
Salman Ahsan	Detroit Country Day	Beverly Hills
Emily Anthon	Grand Rapids Catholic Central	Grand Rapids
Disha Bora	Detroit Country Day	Beverly Hills
Killian Burns	Grand Rapids Catholic Central	Grand Rapids
Joshua Cambridge	Sandusky High School/Sanilac County Science and Math Center (SCSMC)	Peck
Hannah Cheriyan	Detroit Country Day	Beverly Hills
Kimberly Chew	Roseville High School	Roseville
Ashley Childers	Roseville High School	Roseville
Samantha Cloutier	Roseville High School	Roseville
Eric Cosky	Roseville High School	Roseville
Michael Fitzgerald	Grand Rapids Catholic Central	Grand Rapids
Stephanie Fraley	Sandusky High School/Sanilac County Science and Math Center (SCSMC)	Peck
Jenna Freudenburg	Kalamazoo Area Math and Science Center	Kalamazoo
Kevin Green	Grand Rapids Catholic Central	Grand Rapids
Thomas Gregovich	Roseville High School	Roseville
Srivarsha Koripella	Troy High School	Troy
Pranav Moudgil	Detroit Country Day	Beverly Hills
Hong An Nguyen	Grand Rapids Catholic Central	Grand Rapids
Rahul Pandey	Stoney Creek High School	Rochester Hills
Jahanavi Ramakrishna	Detroit Country Day	Beverly Hills
Nakisha Rutledge	Renaissance High School	Detroit
Ann Marie Schumar	Grand Rapids Catholic Central	Grand Rapids
Sonali Sharma	Kalamazoo Area Math and Science Center	Kalamazoo
Kush Sharma	Kalamazoo Area Math and Science Center	Kalamazoo
Connie Shi	Okemos High School	Okemos
Maggie Stein	Grand Rapids Catholic Central	Grand Rapids
April Surinck	Roseville High School	Roseville
Scott VanderLugt	Kalamazoo Area Math and Science Center	Kalamazoo
Sherwin Wu	Detroit Country Day	Beverly Hills
Jamie (JiaJia) Zhang	Battle Creek Area Math and Science Center	Battle Creek

## STUDENT PARTICIPANTS

Name	School	City
Salman Ahsan	Detroit Country Day	Beverly Hills
Lisa Anderson	Martin Luther King, Jr. Senior High School	Detroit
Emily Anthon	Grand Rapids Catholic Central	Grand Rapids
Renisha Bishop	Martin Luther King, Jr. Senior High School	Detroit
Joshua Boegner	Marlette/Sanilac County Science and Math Center (SCSMC)	Peck
Disha Bora	Detroit Country Day	Beverly Hills
Killian Burns	Grand Rapids Catholic Central	Grand Rapids
Joshua Cambridge	Sandusky High School/ Sanilac County Science and Math Center (SCSMC)	Peck
Hannah Cheriyan	Detroit Country Day	Beverly Hills
Kimberly Chew	Roseville High School	Roseville
Ashley Childers	Roseville High School	Roseville
Samantha Cloutier	Roseville High School	Roseville
Eric Cosky	Roseville High School	Roseville
Leana Danesh	Roseville High School	Roseville
Steven Dorshkind	Roseville High School	Roseville
Lorene Dreisbach	Grand Rapids Catholic Central	Grand Rapids
Michael Fitzgerald	Grand Rapids Catholic Central	Grand Rapids
Stephanie Fraley	Sandusky High School/Sanilac County Science and Math Center (SCSMC)	Peck
Jenna Freudenburg	Kalamazoo Area Math and Science Center	Kalamazoo
Kyle Grace	Croswell-Lexington/ Sanilac County Science and Math Center (SCSMC)	Peck
Kevin Green	Grand Rapids Catholic Central	Grand Rapids
Thomas Gregovich	Roseville High School	Roseville
Brianna Hunt	Roseville High School	Roseville
Jaquella Kee	Martin Luther King, Jr. Senior High School	Detroit
Steven King	Martin Luther King, Jr. Senior High School	Detroit
Srivarsha Koripella	Troy High School	Troy
David Middleton	Roseville High School	Roseville
Pranav Moudgil	Detroit Country Day	Beverly Hills
Kenny Murphy	Martin Luther King, Jr. Senior High School	Detroit
Hong An Nguyen	Grand Rapids Catholic Central	Grand Rapids
John Ostrowski	Roseville High School	Roseville
Rahul Pandey	Stoney Creek High School	Rochester Hills
Jahanavi Ramakrishna	Detroit Country Day	Beverly Hills
Nakisha Rutledge	Renaissance High School	Detroit
Samantha Schmalenberg	Roseville High School	Roseville
Ann Marie Schumar	Grand Rapids Catholic Central	Grand Rapids
Sonali Sharma	Kalamazoo Area Math and Science Center	Kalamazoo
Kush Sharma	Kalamazoo Area Math and Science Center	Kalamazoo
Connie Shi	Okemos High School	Okemos
Dae'Lon Simmond	Martin Luther King, Jr. Senior High School	Detroit
Alexis Snyder	Roseville High School	Roseville
Maggie Stein	Grand Rapids Catholic Central	Grand Rapids
April Surinck	Roseville High School	Roseville

Stephen Todd	Martin Luther King, Jr. Senior High School	Detroit
Cierra Traylor	Martin Luther King, Jr. Senior High School	Detroit
Scott VanderLugt	Kalamazoo Area Math and Science Center	Kalamazoo
Siju Varughese	Roseville High School	Roseville
Brian Williams	University Prep High School	Detroit
Sherwin Wu	Detroit Country Day	Beverly Hills
Jamie (JiaJia) Zhang	Battle Creek Area Math and Science Center	Battle Creek

**TEACHER/SUPERVISOR/ADMINISTRATIVE  
PARTICIPANTS**

<b>Name</b>	<b>School</b>	<b>City</b>
Rebecca Brewer	Troy High School	Troy
Sandra Dejoie	Martin Luther King, Jr. Senior High School	Detroit
Brian Derowski	Croswell-Lexington/SCSMC	Peck
Walt Erhardt	Battle Creek Area Math and Science Center	Battle Creek
John Goudie	Kalamazoo Area Math and Science Center	Kalamazoo
Patricia Hanlan	Detroit Country Day	Beverly Hills
Ruby Holloway	Martin Luther King, Jr. Senior High School	Detroit
Angela Leese	Sandusky High School/SCSMC	Peck
Gene Menton	Detroit Country Day	Beverly Hills
Victoria Miller	Martin Luther King, Jr. Senior High School	Detroit
Andrew Moore	Grand Rapids Catholic Central	Grand Rapids
Colleen Palmer	Okemos High School	Okemos
Ermelda Polk	Renaissance High School	Detroit
John Reinowski	Roseville High School	Roseville
David Thomson	Stoney Creek High School	Rochester Hills
Scott Wheeler	Roseville High School	Roseville

# Judges

**Dr. Elvin Aleman**  
Chemistry Department  
Wayne State University

**Dr. William Branford**  
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

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

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

**Dr. Sean Gavin**  
Physics Department  
Wayne State University

**Mr. Dion Gnanakkan**  
Science Education  
Wayne State University

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

**Zhuojun Guo**  
Chemistry Department  
Wayne State University

**Mr. Cleophas Harris**  
TARDEC- U.S. Army Tank  
Automotive Research Development &  
Engineering Center

**Dr. Rubye Holloway**  
Science Administrator  
Detroit Public Schools

**Dr. Alice Hudder**  
Institute of Toxicology  
Wayne State University.

**Dr. Maik Hutteman**  
Medical School  
Wayne State University

**Dr. Padu Karur**  
Physics Department  
Wayne State University

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

**Ms. Katrina Prantzos**  
Electrical Engineer – TARDEC- U.S. Army  
Tank Automotive Research  
Development & Engineering Center

**Dr. George Roberts**  
Medical School  
Wayne State University

**Mr. Shahriar Shidfar**  
TARDEC-U.S. Army Tank Automotive  
Research Development & Engineering Center

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

**Mr. Robert Udvare**  
TARDEC- U.S. Army Tank Automotive  
Research Development & Engineering Center

**Sharla Wood**  
Chemistry Department  
Wayne State University

**Dr. Susan XIAOXIN XU**  
Toxicology  
Wayne State University

**Dr. Ava Zeineddin**  
Science Education  
Wayne State University

## SPECIAL ARRANGEMENTS AND ACKNOWLEDGMENTS

**Doris E. Cousens, Director**

National Junior Science & Humanities Symposium  
Academy of Applied Science

**Dr. & Mrs. Herbert Dobbs**

Association U.S. Army, Detroit Chapter

**Dr. Thomas Edwards**

Associate Professor of Mathematics Education  
Wayne State University

**Dr. Michele Grimm**

Associate Dean for Academic Affairs, Engineering  
Wayne State University

**Dr. Rubye Holloway**

Science Administrator, Martin. L. King, Jr. Senior High School  
Detroit Public Schools

**Ms. Margaret Hoard**

TED Secretary, College of Education  
Wayne State University

**Mrs. Sandra Jenkins**

TED Division Secretary, College of Education  
Wayne State University

**Jeff Conn**

Physics Department  
Wayne State University

**Derrielle Goodwin**

McGregor Conference Center

**Ms. Joyce Martin**

Administrative Assistant, College of Education  
Wayne State University

**Mr. Kevin Rashid**

Honors Program  
Wayne State University

**Dr. Scott W. Jorgensen**

General Motors Research & Development

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**Wayne State University**

*World-Class Education in the Real Word*