



Academy of Applied Science



Forty-Ninth Annual

Southeastern Michigan

Junior Science and
Humanities
Symposium

Program
2013

WAYNE STATE
UNIVERSITY

McGregor Memorial Conference Center
Detroit, Michigan

March 28th and 29th , 2013

Forty-Ninth Annual
SOUTHEASTERN MICHIGAN
JUNIOR SCIENCE AND HUMANITIES
SYMPOSIUM

Thursday and Friday, March 28th and 29th , 2013

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 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

Dr. Monica Brockmeyer
Assoc Provost Academic Success
VP Academic Affairs
Wayne State University

Dr. John Goudie
Kalamazoo Area Mathematics and
Science Center

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Associate Dean and Professor, Chemistry
College of Liberal Arts and Sciences
Wayne State University

Ms. Patricia Hanlan
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Wayne State University

Dr. Padu Karur
Associate Professor, Physics
Wayne State University

Mr. Jeff Conn
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Wayne State University

Dr. Daniel Kashian
Assistant Professor, Biological Sciences
Wayne State University

Mr. Brian Derowski
Sanilac County Schools

Mr. Gene Menton
Detroit Country Day

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

Ms. Alycia Meriweather
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Detroit Public Schools

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Wayne State University

Dr. Eva Powers
Associate Professor, Department of Dance
Wayne State University

Dr. Darin Ellis
Associate Dean, College of Engineering
Wayne State University

Ms. Natalie Rich
Instructional Specialist, Office of Science
Detroit Public Schools

Dr. Russell L. Finley
Professor
Center for Molecular Medicine & Genetics
Wayne State University

Ms. Sandra Yarema
Secretary JSHS
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 49th 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 in 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. Chris Burton and the students in the string ensemble of the Southeast Michigan Arts Forum: Weekend School of Music at WSU's Department of Music 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 free of charge. The two finalists from each regional symposium also present their research 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.' in a stylized, cursive script.

Maria Madalena Ferreira, Director JSHS

Welcome from the Dean



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.

Keynote Speaker

Dr. Larry Lemke, Associate Professor, Geology - Wayne State University



Dr. Larry Lemke is an Associate Professor of Geology and Director of the Environmental Science Program at Wayne State University. Dr. Lemke earned a Bachelor of Science (BS) degree in Geology from Michigan State University, a Master of Science (MS) degree in Geosciences from the University of Arizona, as well as a M.B.A. degree from the University of Denver, and a Ph.D. in Environmental Engineering from the University of Michigan. His educational and professional career path carried him around the world prior to returning him to Detroit, the city where he was born. Dr. Lemke spent 12 years working for Exxon and its subsidiaries exploring for oil and gas in the Rocky Mountains, the Gulf of Mexico, the North Sea, and The Peoples' Republic of China. At Wayne State, his research interests focus on modeling contaminant fate and transport in groundwater, air, and soil, and characterizing the spatial variability of physical properties and chemical constituents in natural and urban environments. He is a member of the Geospatial Determinants of Health Outcomes Consortium (GeoDHOC) – a team of researchers investigating links between urban air quality and adverse health outcomes.

At the dinner banquet on Thursday Dr. Lemke will make a presentation titled, *Linking Air Pollution to Health Outcomes in Detroit and Windsor: The Importance of Collaboration and Teamwork in Science*, in which he will describe the GeoDHOC project (an international, interdisciplinary research project that links environmental science with epidemiology and health) to illustrate the importance of collaboration and teamwork in science.

Where is He Now?



Sherwin Wu – 2nd Place at Regional JSHS and 1st Place at the National 2010 JSHS

Sherwin is a junior at the Massachusetts Institute of Technology (MIT) where he is studying computer science with a minor in biology. Sherwin was a senior at Detroit Country Day when he participated in the 2010 Junior Science and Humanities Symposium, earning 2nd place for his work at Karmanos Cancer Institute related to the isolation of novel genes to target breast cancer metastasis. Sherwin presented his research paper at the National JSHS where it won first place in medicine, resulting in a large scholarship and a two-week, all-expense paid trip, to the London Youth Science Forum.

While at MIT Sherwin has worked at the Koch Institute for Integrative Cancer Research and hopes in the future to do research on how to bridge Computer Science and Medicine.

Interlude with Music

String Ensemble: Weekend School of Music Southeast Michigan Arts Forum and the Music Department Wayne State University



The Weekend School of Music at WSU's Department of Music began in September 1978 to provide assistance to Detroit Public Schools as they reinstated instrumental music programs that had been eliminated due to millage failure. Since then, students from the Metropolitan Detroit area enroll in small master classes in all of the band & orchestra instruments, including guitar and piano. Since September 1990, over 17,500 students have participated in the program, an average of 247 per semester (Fall, Winter/Spring, and Summer). The program is sponsored by the Wayne State University's Department of Music and the Southeast Michigan Arts Forum.

The classes at the Weekend School of Music are taught by graduate and undergraduate students and faculty from WSU's Department of Music as well as past students from the Weekend School of Music.

Students in the string ensemble will play music in the atrium during the poster session and interlude on Thursday evening under the direction of Mr. Christopher Burton.

Campus Tour

Geology Department - Materials Collections



The Geology Department at Wayne State University is located in Old Main – the oldest building on the WSU campus. The Geology Department’s collections comprise four groups of materials:

1. Minerals
2. Invertebrate Fossils
3. Surface collections of igneous, sedimentary, and metamorphic rocks used for teaching and research
4. Subsurface collections of well cuttings and cores (about 98% from the Michigan Basin) used for teaching, research and reference.

The specimens in the collections have been part of the University’s assets since the 1920’s. However, the bulk of the collection has been assembled since 1947. The Department’s collections include a number of historically significant specimens such as most of the specimens from Thomas A. Edison’s mineral collection and most of the mineral collection of Dr. A.N. Goddard, founder of the Michigan Mineralogical Society. The collections also include fossil specimens from the Pierre Shale in South Dakota, collected by General George Custer and an extensive and valuable fossil collection known as the *Tomalchoff Collection* whose specimens were collected in 1905 in Siberia and smuggled out of Russia. These historic specimens are often displayed in local and national exhibitions.

The facilities and system for storing the geology collections were uniquely designed to facilitate storage, accessibility and handling of the types of specimens and materials necessary to the study of the Earth.

Undergraduate Research at Wayne State University

<http://undergradresearch.wayne.edu/index.php>



The Office of Undergraduate Research (OUR) at Wayne State University provides funds to undergraduate students from disciplines across the university – hard sciences, social sciences, performing arts and humanities – to participate in undergraduate research. Undergraduate research puts theory into practice as students work on projects and are mentored by full-time faculty who are leaders in their field. The funds help cover students’ research activities as well as travel expenses to present their research at local, regional and national conferences.

PROGRAM

THURSDAY AND FRIDAY, MARCH 28th AND 29th, 2013

THURSDAY, MARCH 28th, 2013

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

STUDENT PRESENTERS:

Juhi Katta

*The Effects of Atrazine on the Ability to Discriminate Food Odor by *Orconectes rusticus* (common river crayfish)*

Neha Nayak

The Antimicrobial Properties of Plants

Lilia Popova

Elucidating Environmental and Genetic Mechanisms of Magnetically Altered Plant Growth

Sujay M. Dewan

Lack of Bilateral Yoking in the Rhythmic Heartbeat of the Medicinal Leech Via Peripheral Interactions

Abhiram Krishnan

Construction of a Canine Phage Display Library to Identify Antibodies against Therapeutic Targets

JUDGES:

Dr. Chuanzhu Fan, Biology Department, Wayne State University

Dr. Haidong Gu, Biology Department, Wayne State University

SECTION II ROOM F, McGREGOR

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

STUDENT PRESENTERS:

Anirudh Ghantasala

Novel Graphene Oxide/zinc Oxide Composite Nanoparticles as Oxygen Sensors

Raoul Wadhwa

Using Nanoscale Catalysts to Convert Natural Resources into Commodity Chemicals

Madhavi Venugopal

Cloning, Expression, and Evaluation of L-Glutamate Dehydrogenase Enzymes for Conversion of MSG to Alpha KetoGlutamate

Dhiraj Surapareni

The Viability of the Drug ACCA in Various Temperatures and pH's for Treatment of Glioblastoma

Ashley Lowery

Determination of Optimum Crystallization Solvents for a Variety of Non-Steroidal Anti-Inflammatory Drugs

JUDGES:

Dr. Vladimir Chernyak, Chemistry Department - Wayne State University

Dr. Ashley Campanali, Chemistry Department - Wayne State University

SECTION III ROOM G, McGREGOR

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

STUDENT PRESENTERS:

Lizzie Bensik

Socialization of Parkinson's Patients in Therapy

Phillip An

MiR17-92 Cluster in Axons Promotes Axonal Outgrowth

Ashi Arora

Vancomycin and Tetracycline Simultaneously Tethered to Titanium Pins Prevents the Attachment and Proliferation of Gram-Positive and Gram-Negative Bacteria

Phillip Yang

Osteocytic Osteolysis in a Large Animal Model of Postmenopausal Osteoporosis and Metabolic Acidosis

JUDGES:

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

SECTION IV ROOM H, McGREGOR

MODERATOR: **Dr. Michele Grimm**, Biomedical Engineering – Wayne State University

STUDENT PRESENTERS:

Yusuf Ahmed

Key Words that Influence Voting Decisions

Debbie Mosley

Conformity in Middle School

Kevin Beach

Analysis of Standard Geomagnetic Indexes and Development of the Geomagnetic Variational Intensity Scale

Lydia Wang

A Novel Approach of Quadrilateral Mesh Generation Over Unstructured 2D Regions

Annie Li Yang

Optima Processing Parameters of Press Hardening for Lightweight Automotive Structure Parts

JUDGES:

Dr. David Cinabro, Physics Department– Wayne State University

5:30 p.m.- 6:30 p.m.

INTERLUDE - McGregor Lobby

Student Poster Presentations

Music by students from the String Ensemble: Weekend School of Music

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. Larry Lemke, Associate Professor**
Geology Department, Wayne State University

***TOPIC:* Linking Air Pollution to Health Outcomes in Detroit and Windsor: The Importance of
Collaboration and Teamwork in Science**

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: Geology Department

(wait in breakfast area for tour guides)

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

Final Judging

McGregor Conference Center, Room I

Moderator:

Dr. Joy Alcedo, Biology Department – Wayne State University

Judges:

Dr. Sarah Trimpin, Chemistry Department - Wayne State University

Dr. Karur Padmanabhan, Physics Department – Wayne State University

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

11:45 p.m. - 2:00 p.m.

LUNCHEON BANQUET

Room BC – First Level, McGregor Conference Center

PRESIDING:

Dr. Maria Madalena Ferreira

College of Education

WELCOME:

Dr. Thomas Edwards

Associate Dean of Research, College of Education

SPEAKERS:

Mr. Matthew Orr, Program Coordinator

Undergraduate Research Opportunities Program (UROP) – WSU

TOPIC:

Mr. Orr, will talk about research opportunities for undergraduate students at WSU.

Ms. Amy Cooper – Student Success and Learning Communities at WSU

Sherwin Wu

TOPIC:

Where Is He Now? – Sherwin Wu, 1st place finalist at the 2010 National JSHS will talk about his research experiences during high school and how his participation in the JSHS impacted his 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
Yusuf Ahmed	Detroit Country Day	Canton
Phillip An	International Academy East	Troy
Ashi Arora	Novi High School	Novi
Kevin J. Beach	Chippewa Hills High School	Stanwood
Elizabeth A. Benzik	Battle Creek Area Math and Science Center	Battle Creek
Sujay M. Dewan	Kalamazoo Area Math and Science Center	Portage
Anirudh Ghantasala	Kalamazoo Area Math and Science Center	Portage
Juhi Katta	Detroit Country Day	Farmington
Abhiram N. Krishnan	Kalamazoo Area Math and Science Center	Portage
Ashley N. Lowery	Kalamazoo Area Math and Science Center	Vicksburg
Deborah E. Mosley	Detroit Country Day	Farmington Hills
Neha Nayak	Detroit Country Day	Bloomfield Hills
Lilia T. Popova	Huron High School	Ann Arbor
Dhiraj C. Surapareni	Detroit Country Day	Farmington Hills
Madhavi G. Venugopal	Kalamazoo Area Math and Science Center	Portage
Raoul R. Wadhwa	Kalamazoo Area Math and Science Center	Portage
Lydia Wang	Detroit Country Day	Novi
Annie L. Yang	Troy High School	Troy
Phillip Yang	Troy High School	Troy

STUDENT PARTICIPANTS

Name	School	City
Dante Addison	Martin Luther King Jr. High School	Detroit
Yusuf Ahmed	Detroit Country Day	Canton
Phillip An	International Academy East	Troy
Ashi Arora	Novi High School	Novi
Nadim Bari	Cass Technical High School	Detroit
Kevin J. Beach	Chippewa Hills High School	Stanwood
Elizabeth A. Benzik	Battle Creek Area Math and Science Center	Battle Creek
Tiffany Brookins	Martin Luther King Jr. High School	Detroit
Lamar Cherry	Martin Luther King Jr. High School	Detroit
Elijah Clayton	Frederick Douglas Academy for Young Men	Detroit
Olonzo Clayton	Frederick Douglas Academy for Young Men	Detroit
Jamyia Craig	Martin Luther King Jr. High School	Detroit
Dasia Dawson	Cass Technical High School	Detroit
Sujay M. Dewan	Kalamazoo Area Math and Science Center	Portage
Donovan Dugan	Frederick Douglas Academy for Young Men	Detroit
Dalanena Frierson	Martin Luther King Jr. High School	Detroit
Anirudh Ghantasala	Kalamazoo Area Math and Science Center	Portage
Taleshia Goodman	Northwestern High School	Detroit
Bria Grays	Detroit International Academy for Young Women	Detroit
Taviana Hale	George Washington Carver School	Detroit
Alexus Holloway	Northwestern High School	Detroit
Brandon Holt	Brewer Academy	Detroit
Crystal James	Martin Luther King Jr. High School	Detroit
Shannon Johnson	John R. King Academy	Detroit
Stacey Johnson	John R. King Academy	Detroit
Juhi Katta	Detroit Country Day	Farmington
Abhiram N. Krishnan	Kalamazoo Area Math and Science Center	Portage
Ashley N. Lowery	Kalamazoo Area Math and Science Center	Vicksburg
Deborah E. Mosley	Detroit Country Day	Farmington Hills
Neha Nayak	Detroit Country Day	Bloomfield Hills
Fahmida Parvin	Detroit International Academy for Young Women	Detroit
Syhan Perkins	Frederick Douglas Academy for Young Men	Detroit
Tyrice Pigler	Martin Luther King High School	Detroit
Lilia T. Popova	Huron High School	Ann Arbor
Blake Richardson	Cass Technical High School	Detroit
Dhiraj C. Surapareni	Detroit Country Day	Farmington Hills
Vincent Sweet	Cass Technical High School	Detroit
Dana Talos	Cass Technical High School	Detroit
Makayah Thomas	John R. King Academy	Detroit
Tyjuan Thomas	Brewer Academy	Detroit
Madhavi G. Venugopal	Kalamazoo Area Math and Science Center	Portage
Raoul R. Wadhwa	Kalamazoo Area Math and Science Center	Portage
Lydia Wang	Detroit Country Day	Novi
Ashanti Whitt	Martin Luther King Jr. High School	Detroit
Moesha Woods	Northwestern High School	Detroit
Annie L. Yang	Troy High School	Troy
Phillip Yang	Troy High School	Troy
Tasha Young	John R. King Academy	Detroit

TEACHER/SUPERVISOR/ADMINISTRATIVE PARTICIPANTS

Name	School	City
Faris Al-Nsour	Martin Luther King Jr. High School	Detroit
Ross Arsenoe	Detroit Country Day School	Beverly Hills
Rebecca Brewer	Troy High School	Troy
Devette Brown	Brewer Academy	Detroit
David Caine	Huron High School	Ann Arbor
Rodwell Campbell	Cass Technical High School	Detroit
Lynn Chudy	George Washington Carver	Detroit
Donald Crockett	Novi High School	Novi
Mr. Cris DeWolf	Chippewa Hills High School	Remus
John Dougherty	Detroit Country Day School	Beverly Hills
Marco Goosey	Martin Luther King Jr. High School	Detroit
John W. Goudie	Kalamazoo Math and Science Center	Kalamazoo
Scott Hanson	Battle Creek Area Math and Science Center	Springfield
Sharon Holloway	Northwestern High School	Detroit
Gene Menton	Detroit Country Day School	Beverly Hills
Kelly Paterson	International Academy East	Troy
Emily Parker Pohlonski	Novi High School	Novi
Sonya Ross	Cass Technical High School	Detroit
Sheryl Rucker	Frederick Douglas Academy for Young Men	Detroit
Kavita Sadwal	Detroit International Academy for Young Women	Detroit
Nicole Samuel	John R. King Academy	Detroit
Amanda Silic	Martin Luther King Jr. High School	Detroit
Velma Snow	Cass Technical High School	Detroit
Laurence Stewart	Martin Luther King Jr. High School	Detroit
Rose Trotter	Martin Luther King Jr. High School	Detroit
Ameena Watkins	Cass Technical High School	Detroit

Judges

Dr. Joy Alcedo

Biology Department
Wayne State University

Dr. Amar Basu

College of Engineering
Wayne State University

Dr. Ashley Campanali

Chemistry 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

Dr. Chuanzhu Fan

Biology Department
Wayne State University

Dr. Russell Finley

School of Medicine
Wayne State University

Dr. Michele Grimm

Biomedical Engineering
Wayne State University

Lillian El-Gothamy

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

Dr. Haidong Gu

Biology Department
Wayne State University

Dr. Xiangyi Lu

School of Medicine
Wayne State University

Dr. Karen Myhr

Biology Department
Wayne State University

Dr. Karur Padmanabhan

Physics Department
Wayne State University

Ms. Katrina Prantzos

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

Shahriar Shidfar

TARDEC- U.S. Army Tank Automotive
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Dr. Kezhong Zhang

School of Medicine
Wayne State University

SPECIAL ARRANGEMENTS AND ACKNOWLEDGMENTS

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

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

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

Dr. Thomas Edwards
Professor of Mathematics Education
Wayne State University

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

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

Mr. Matthew Orr
Undergraduate Research Program
Wayne State University

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

Ms. Debbie Moore
McGregor Conference Center

Wayne State University
World-Class Education in the Real World