



Academy of Applied Science



53rd Annual

Southeastern Michigan

**Junior Science and
Humanities
Symposium**

Program
2017

**WAYNE STATE
UNIVERSITY**

**McGregor Memorial Conference Center
Detroit, Michigan**

March 10th, 2017

53rd Annual

SOUTHEASTERN MICHIGAN

**JUNIOR SCIENCE AND HUMANITIES
SYMPOSIUM**

Friday, March 10th, 2017

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. Sandra Yarema, Director and Coordinator of JSHS
Lecturer and Coordinator of the Science Education Program
College of Education, Wayne State University

JSHS ADVISORY BOARD

Dr. Monica Brockmeyer

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VP Academic Affairs
Wayne State University

Dr. Christine Chow

Associate Dean and Professor, Chemistry
College of Liberal Arts and Sciences
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Dr. Maria M. Ferreira

Associate Professor, College of Education
Wayne State University

Dr. Russell L. Finley

Professor
Center for Molecular Medicine & Genetics
Wayne State University

Dr. John Goudie

Kalamazoo Area Mathematics and
Science Center

Dr. Stanislav Groysman

Professor, Chemistry
Wayne State University

Dr. Patricia Hanlan

Detroit Country Day

Dr. Padu Karur

Associate Professor, Physics
Wayne State University

Dr. Daniel Kashian

Assistant Professor, Biological Sciences
Wayne State University

Ms. Teneshia Moore

Science Consultant,
Detroit Public Schools Community District

Ms. Deb Peek-Brown

Deputy Director, Math/Science Center
Detroit Public Schools Community District

Mr. Kevin Rashid

Honors College
Wayne State University

Ms. Audrey Richardson

Science Consultant
Detroit Public Schools Community District

Dr. Jasmine Roberson

Program/Project Coordinator,
College of Engineering
Wayne State University

Dr. Jennell White

Post-Doctoral Fellow
Pediatrics, Children's Hospital of Michigan
Wayne State University



Welcome

from the JSHS Director
Dr. Sandra Yarema

Dear Students, Teachers, Parents and Colleagues,

It is my great privilege to welcome you to the 53rd 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 help make this event possible every year: the members of the Advisory Board, judges, speakers and the administration of the College of Education at Wayne State University. A special thanks to Dr. Maria Ferreira and Ms. Marion Tate for their help in the planning and running of the symposium.

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. Each 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. 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.

Sandra Yarema, Director JSHS

Welcome from the Dean



Russell Whitman, Ph.D.

**Professor and Dean
College of Education
Wayne State University**

Dean Whitman was named Dean of the College of Education at Wayne State University in January, 2016, after serving as interim dean since 2014. He joined the faculty of the Psychology Department in 1973, as a professor of clinical psychology, where he served as Director of Training for the APA accredited program in clinical psychology and as the Department Chair.

Under his leadership, the College of Education has revamped programming, recruitment and outreach efforts as well as its focus on student retention. Other accomplishments include significant growth in research and grants, launching the TeachDETROIT initiative to train teachers to work in Detroit Public Schools and several new community partnerships.

In his previous role with the Psychology Department, Dean Whitman was instrumental in several projects including expansion of the Psychology Clinic Training facilities, developing annual workshops in conjunction with the Michigan State Psychological Association, and in developing a Psychology Alumni Association.

His many research and training projects have been funded by nearly three million dollars in grants from agencies such as the Ethel and James Flinn Family Foundation and the State of Michigan.

Dean Whitman is the author of two books and more than 60 articles published in peer-reviewed journals. His early research focused on the genetic foundations of learning disabilities and, more recently, on asymmetrical, lateralized cognitive processing in personality disorders and in individuals evidencing high levels of creativity

Dean Whitman will provide the welcome remarks at the opening session.

Thomas Edwards, Ph.D.

**Associate Dean and
Professor College of
Education
Wayne State University**



Dr. Thomas Edwards joined the faculty of the College of Education at Wayne State University in 1994, where he is the Associate Dean of Research and Community Engagement, and Professor of Mathematics Education.

In his many roles, Dr. Edwards oversees the operation of the Research Office in the College of Education, teaches graduate courses in the mathematics education program, and advises doctoral students.

Dr. Edwards's primary research interests are teaching school mathematics in the context of real world problems, the integration of technology, especially graphing calculators, and the means by which students of all ages acquire mathematical understanding. He has published articles that address these issues across a number of grade levels, as evidenced by his publications in *Teaching Children Mathematics*, *Mathematics Teaching in the Middle School*, *Mathematics Teacher*, and the *College Mathematics Journal*.

Dr. Edwards will provide the welcome remarks at the Luncheon banquet.

Keynote Speaker



Maik Hüttemann, Ph.D.

**Associate Professor
Center for Molecular Medicine and
Genetics**

Dr. Hüttemann first joined Wayne State University as a postdoctoral researcher and later became a faculty member in the Center for Molecular Medicine and Genetics at Wayne State University's School of Medicine, where he teaches courses related to genetics, metabolism, and mitochondrial disease.

Professor Hüttemann earned his Bachelor's degree in Chemistry and his Masters and PhD degrees in Biochemistry and Molecular Biology from the University of Marburg, Germany.

Dr. Hüttemann's research focuses on mitochondrial energy metabolism covering topics ranging from basic protein biochemistry to translational research on diseases including cancer and stroke. His research program is supported by grants from the National Institutes of Health, the Department of Defense, and foundations. He has published over 80 research papers and holds several patents.

At the dinner banquet, Dr. Hüttemann will discuss the role of mitochondrial energy production and damaging 'free radicals' in the context of human disease, and present new concepts and wacky ideas to overcome the latter. The presentation is titled: *Mitochondrial energy and free radical production in health and disease: from dark chocolate to red light*.

Where is She Now?



Isabel J. Hsu
Past JSHS Finalist

Isabel Hsu is a 2015 JSHS finalist, who is currently a sophomore in the molecular biology department at Princeton University in New Jersey. She plans to graduate in 2019.

Isabel tutors engineering physics, molecular biology, and calculus on campus, and serves as an undergraduate course assistant in the physics department. She is also a Princeton Student Ambassador for the Admissions Office.

Other achievements and activities include:

- Chief copy editor at the Daily Princetonian
- Founding member of Princeton Envision
- Editor-in-chief of the Princeton Journal of East Asian Studies
- Senior editor of the Princeton Traveler

Isabel serves as President of the following organizations:

- Institute for Chocolate Studies
- Minority Association of Pre-Health Students
- Taiwanese American Students Association

Isabel spent last summer at the National Institutes of Health Clinical Center studying chemokines, the basic signaling molecules of the immune system. This summer she will be conducting immunology research at Harvard Medical School. Please ask about her research, she is always happy to talk about it!

At the luncheon, Isabel will discuss the ways in which her participation in the JSHS has impacted her experiences in college and future research interests.

Interlude with Music

Sposa String Quartet



Sposa String Quartet is made up of four current music students, majoring in music performance and composition at Wayne State University.

Sposa String Quartet is based in Detroit and plays weddings, parties, corporate events, and any other opportunity that can use musicians.

Sean O'Connell-Violin
Emily Paye-Violin
Gabriele Paese- Viola
Christian Sands- Cello

Campus Tour

IBio: Integrative Bio-Sciences Center



The Integrative Bio-Sciences Center includes a clinical research center as well as the WSU NIEHS-supported Center for Urban Responses to Environmental Stressors and established research teams at WSU in behavioral health, biomaterials and molecular imaging, diabetes and obesity.

IBio programs focus on five primary areas: Brain & Behavioral Health; Bio & Systems Engineering; Interface of Genes, Ethnicity, Environment and Health; Metabolic Diseases (Diabetes and Obesity); and Urban Health Equity. Each theme includes basic discovery-driven research as well as translational, community and implementation sciences cutting across departments, programs, centers and colleges.

IBio Faculty integrate with departments, colleges or schools consistent with their area of training, expertise, and shared interests. Faculty engage in all aspects of our academic mission including research, education and service.

For more information visit: <http://ibio.wayne.edu/about.php>

On Friday afternoon, students and guests will be able to visit the IBio building. Wayne State University - Detroit's public, urban research university - is home to the new Integrative Biosciences Center (IBio), a \$90 million facility dedicated to studying and eliminating the many health disparities that plague the city's residents. IBio will be home to faculty with expertise in environmental sciences, bio and systems engineering, heart disease, diabetes, obesity, asthma and biobehavioral health.

The building, strategically positioned near TechTown, Wayne State's business incubator, will move discoveries and technologies from the laboratory to the community, and will eventually house over 400 individuals within 200,000 square feet of lab and clinical space designed to foster a collaborative and flexible team science approach to research.

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.

At the luncheon, the following students will discuss their research:

Maricruz Moya is a Community Health Education student at Wayne State University. She enjoys serving her community by promoting well-being and educating others through research and program implementation. As a first generation student, she understands the challenges that confronted when achieving dreams and hopes to mentor others as they achieve their fullest potential. She's grateful for the McNair Scholars Program and the Undergraduate Research Opportunity Program for equipping her with the necessary skills and tools needed in the field of research. After graduation in May 2018, she will pursue a Master's degree in Public Health and continue towards a doctorate degree.

Andrea Prenkocevic is a 3rd year biochemistry student, involved in research with Dr. Robert Akins since fall 2014.

Farah Sattar is an Electrical & Computer Engineering Major, performing research in the Department of Biochemistry & Molecular Biology at the WSU School of Medicine. She was awarded the WSU Undergraduate Research and Creative Projects award in both 2015 and 2016, and her abstract was accepted to be presented at the National Conference of Undergraduate Research (NCUR).

PROGRAM

Friday, MARCH 10th, 2017

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

REGISTRATION & CONTINENTAL BREAKFAST

Lobby
McGregor Memorial Conference Center
Wayne State University

9:30 a.m. - 10:00 a.m.

OPENING SESSION

Room BC, First Level, McGregor Conference Center

PRESIDING:

Dr. Sandra Yarema Director - JSHS
Science Education Faculty
College of Education
Wayne State University

WELCOME/OVERVIEW OF WAYNE STATE UNIVERSITY:

Dr. Russell Whitman
Dean, College of Education

ORIENTATION:

Dr. Sandra Yarema
JSHS Director and Coordinator

10:00 a.m. - 11:30 a.m.

PRESENTATION OF STUDENT PAPERS

McGregor Conference Center

STUDENT PRESENTATIONS

SECTION I ROOM E, McGREGOR

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

STUDENT PRESENTERS:

Astha Dalal

Noninvasive Measure of cancer Stem Cells CD44 vs TIFP

Shrikant Chand

Encapsulated Cadmium Sulfide Quantum Dot Synthesis Aqueous room temperature one step quantum dot synthesis with PCB-DSPE micelles as capping agent.

Emma Hall

Evaluation of IL-6 and SAA as Biomarkers for Depression and Suicidality

Justine Thomas

The Effects of Acid and Sugar on Teeth

JUDGES:

Anna Boegehold, Biology Department, Wayne State University

Dr. Russell Finley, School of Medicine- Wayne State University

Dr. Douglas Halleaux, Public Affairs Officer/Space Scientist, TARDEC

Katrina Harris, Mechanical Engineer, TARDEC

Raymond Womack, Mechanical Engineer, TARDEC

SECTION II ROOM F, MCGREGOR

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

STUDENT PRESENTERS:

Robert Mu

Genetic Bioengineering of Arabidopsis thaliana to Produce Serotonin

Katharine Shao

Engineering Artificial Cells Using Bottom-Up Synthetic Biology

Michelle Zhang

Quorum Sensing Regulation of the Violacein Biosynthetic Gene Cluster

JUDGES:

Dr. Siddhesh Aras, Molecular Biology- Wayne State University

Dr. Christy Chow, Chemistry Department – Wayne State University

Mr. Greg Chappelle, STEM Coordinator/Scientist/Electrical Engineer, TARDEC

Corey Krabbenhoft, Biology- Wayne State University

Dr. Douglas Rose, Physicist/STEM Consultant, TARDEC

SECTION III ROOM I, McGREGOR

MODERATOR: Dr. Jasmine Roberson, College of Engineering, Wayne State University

STUDENT PRESENTERS:

Ajay Arora

Strong Matching Preclusion of the Generalized Petersen Graph

Lily Kitagawa

Efficient k -mer Counting in DNA Sequencing

Julia Shen

Real-time Detection of Human Drowsiness via a Portable Brain-Computer Interface

JUDGES:

David Brown, Computer Scientist/Adjunct Professor, TARDEC

David Daniszewski, Computer Scientist/Adjunct Professor, TARDEC

Chetan Patil, College of Engineering, Wayne State University

Dr. Jasmine Roberson, College of Engineering, Wayne State University

Dr. Ravi Thyagarajan, Electrical Engineer, TARDEC

SECTION IV ROOM J, McGREGOR

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

STUDENT PRESENTERS:

Marinos Bernitsas

Hydrokinetic Power Conversion Mimicking Fish-School Kinematics: Use of Flow Induced Vibrations of Two Tandem Cylinders with Nonlinear Restoring Springs

Nikhil Mantena

Bamboo Toothbrush

Praneeth Medepalli

A Novel Technique to Simulate Two Dimensional Vortex Flow by the Acoustic Excitation of a Flat Bubble Film

Helen Xu

Inexpensive 3D Microfabrication for Customizable, Complex Microfluidics Systems

Richard Yang

Optimization of Electro Pulsing on Yttria-Stabilized Tetragonal Polycrystalline Zirconia (3Y-TZP) Ceramic Water Filter Sintering

JUDGES:

Dr. David Cinabro, Physics Department, Wayne State University

Dr. Thomas Meitzler, Physicist/Electrical Engineer, TARDEC

Michael Shen, Mechanical Engineer, TARDEC

Anoorag N. Sunkari, College of Engineering, Wayne State University

LaTonya Waller, College of Engineering, Wayne State University

11:45 p.m. – 1:30 p.m.

LUNCHEON BANQUET
Room LM – Lower Level, McGregor Conference Center

PRESIDING: **Dr. Sandra Yarema**
College of Education

WELCOME: **Dr. Thomas Edwards**
Associate Dean of Research & Community Engagement,
College of Education, Wayne State University

SPEAKERS: **Maricruz Moya**
 Andrea Prenkocevic
 Farah Sattar
Undergraduate Research Opportunities Program (UROP) – WSU
Research Warriors Organization- WSU

TOPIC: Will discuss research opportunities for undergraduate students at WSU.

TOPIC: **Isabel J. Hsu – *Where is She Now?***
Isabel Hsu, finalist at the 2015 JSJS will talk about her research experiences during high school and how her participation in the JSJS impacted her college experiences and future research interests.

ANNOUNCEMENT OF FINAL STUDENT PAPERS

1:30-3:45 p.m. **CAMPUS TOUR: including I-Bio Research Labs**
(Wait in lobby area for directions- shuttle bus)

3:45 p.m. - 5:00 p.m.

INTERLUDE – McGregor Conference Center Lobby

Student Poster Presentations

Music by WSU students from the *Sposa Strings Quartet*

5:00 p.m. - 6:30 p.m.

Final Judging

Room BC, Main level McGregor Conference Center

Moderator: **Dr. Thomas Edwards**, Associate Dean of Research and Professor,
Mathematics Education - Wayne State University

Judges:

Whitney Lee, School of Medicine – Wayne State University

Dr. Karur Padmanabhan, Physics Department, Wayne State University

Dr. Roger Pique-Regi, Center Molecular Medicine/Genetics- WSU

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

6:30 p.m.

BANQUET SESSION

Room LM – Lower Level, McGregor Conference Center

PRESIDING: **Dr. Sandra Yarema**
Director, JSHS

KEYNOTE SPEAKER: **Maik Hüttemann, Ph.D.**,
Center for Molecular Medicine and Genetics, WSU

TOPIC: *Mitochondrial energy and free radical production in health and disease: from dark chocolate to red light*

AWARDS: **Presentation of Student Speaker Finalist Awards**
Dr. Sandra Yarema, Director

Student Participants – Evaluation Questionnaire Invitation

Dear JSHS participant,

Evaluators from Purdue University are conducting a study to learn about student experiences in Junior Science & Humanities Symposium (JSHS). We are asking you to fill out this survey because you participated in JSHS. Your feedback will be used to help us improve JSHS for students in the future and provide important information about your experiences. The sponsor of JSHS, the Army Educational Outreach Program (AEOP), is paying for this study. In 2017, more than 7000 students and 1000 adults will participate in JSHS and evaluators from Purdue University want to hear from you and your research mentor.

Here's how you can help:

- 1) Complete the JSHS Regional Survey using the hyperlink below. Your parent or guardian has already provided permission for us to ask you to participate in the survey. Now, it is up to you to decide whether you want to participate or not. The survey takes 25-30 minutes to complete on average.*

JSHS Regional Student Survey Link:

<https://www.cvent.com/d/5vqb6g>

- 2) Pass this email along to adult(s) who supported you as you as you prepared for JSHS. Ask them to complete the **JSHS Mentor Survey** using the hyperlink below. The survey will take 25-30 minutes.*

JSHS Mentor Survey Link:

<https://www.cvent.com/d/svq5j0>

If you have any questions about these surveys or your participation in the evaluation study please contact the AEOP Evaluation team at Purdue University – Dr. Carla C. Johnson – carlacjohnson@purdue.edu or at (765) 494-0780.

Thank you so much for your participation in the evaluation of JSHS!



STUDENT RESEARCH PAPERS

Name	School	City
Ajay Arora	Novi High School	Novi
Marinos Bernitsas	Northville High School	Northville
Shrikant Chand	Detroit Country Day	Beverly Hills
Astha Dalal	Troy High School	Troy
Emma Hall	Forest Hills Central High School	Grand Rapids
Lily Kitagawa	Kalamazoo Area Math/Science Center	Kalamazoo
Nikhil Mantena	Detroit Country Day	Beverly Hills
Praneeth Medepalli	Kalamazoo Area Math/Science Center	Kalamazoo
Robert Mu	Troy High School	Troy
Katharine Shao	Detroit Country Day	Beverly Hills
Julia Shen	Detroit Country Day	Beverly Hills
Justine Thomas	Detroit Country Day	Beverly Hills
Helen Xu	Detroit Country Day	Beverly Hills
Richard Yang	Troy High School	Troy
Michelle Zhang	Battle Creek Area Math/Science Center	Battle Creek

STUDENT POSTER PARTICIPANTS

Name	School	City
Ajay Arora	Novi High School	Novi
Marinos Bernitsas	Northville High School	Northville
Shrikant Chand	Detroit Country Day	Beverly Hills
Astha Dalal	Troy High School	Troy
Emma Hall	Forest Hills Central High School	Grand Rapids
Lily Kitagawa	Kalamazoo Area Math/Science Center	Kalamazoo
Nikhil Mantena	Detroit Country Day	Beverly Hills
Praneeth Medepalli	Kalamazoo Area Math/Science Center	Kalamazoo
Robert Mu	Troy High School	Troy
Katharine Shao	Detroit Country Day	Beverly Hills
Julia Shen	Detroit Country Day	Beverly Hills
Justine Thomas	Detroit Country Day	Beverly Hills
Helen Xu	Detroit Country Day	Beverly Hills
Richard Yang	Troy High School	Troy
Michelle Zhang	Battle Creek Area Math/Science Center	Battle Creek

**TEACHER/SUPERVISOR/ADMINISTRATIVE
PARTICIPANTS**

Name	School	City
Kathleen Ader	Novi High School	Novi
Rebecca Brewer	Troy High School	Troy
Kristy Butler	Forest Hills Central High School	Grand Rapids
Dr. John Dogherty	Detroit Country Day School	Beverly Hills
R. DiPasquo	Detroit Country Day School	Beverly Hills
Richard Fitzner	Detroit Country Day School	Beverly Hills
Dr. John W. Goudie	Kalamazoo Math/Science Center	Kalamazoo
Dr. Patricia Hanlan	Detroit Country Day School	Beverly Hills
Scott Hanson	Battle Creek Area Math & Science Center	Battle Creek
Paul Polanski	Northville High School	Northville

Judges

Dr. Siddesh Aras
Molecular Biology
Wayne State University

Dr. Anna Boegehold
Biology Department
Wayne State University

Mr. David Brown
Computer Scientist/Adjunct Professor
U.S. Army TARDEC/DoD Personnel

Mr. Greg Chappelle
STEM Coordinator/Scientist/Electrical Engineer
U.S. Army TARDEC/DoD Personnel

Dr. Christine Chow
Chemistry Department
Wayne State University

Dr. David Cinabro
Physics Department
Wayne State University

Mr. David Daniszewski
Computer Scientist/Adjunct Professor
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Dr. Russell Finley
School of Medicine
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Dr. Douglas Halleaux Ph.D.
Public Affairs Officer/Space Scientist
U.S. Army TARDEC/DoD Personnel

Ms. Katrina Harris
Mechanical Engineer
U.S. Army TARDEC/DoD Personnel

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Biology Department
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College of Engineering
Wayne State University

Mr. Raymond Womack
Mechanical Engineer
U.S. Army TARDEC/DoD Personnel

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

Mr. Greg Chappelle

Tank-Automotive Research, Development, and Engineering Center
(TARDEC)

Dr. Thomas Edwards

Associate Dean of Research & Community Engagement
College of Education
Wayne State University

Dr. Maria M. Ferreira

Associate Professor and Former Director JSHS
College of Education
Wayne State University

Dr. Maik Hüttemann

Center for Molecular Medicine and Genetics
Wayne State University

Ms. Jasmine Roberson

Undergraduate Research Program
College of Engineering
Wayne State University

Ms. Marion Tate

College of Education
Wayne State University

Dr. Russell Whitman

Dean and Professor
College of Education
Wayne State University

Wayne State University

*Create and Advance Knowledge, Prepare a Diverse Student Body to Thrive, and Positively
Impact Local and Global Communities*