



Academy of Applied Science



Fiftieth Annual

Southeastern Michigan

**Junior Science and
Humanities
Symposium**

**Program
2014**

**WAYNE STATE
UNIVERSITY**

**McGregor Memorial Conference Center
Detroit, Michigan**

March 6th and 7th, 2014

Fiftieth Annual

SOUTHEASTERN MICHIGAN

JUNIOR SCIENCE AND HUMANITIES

SYMPOSIUM

Thursday and Friday, March 6th and 7th, 2014

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

JSJS ADVISORY BOARD

Dr. Monica Brockmeyer

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Dr. Thomas Edwards

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Dr. Darin Ellis

Associate Dean, College of Engineering
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

Ms. 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. Alycia Meriweather

Director, Math/Science Center
Detroit Public Schools

Ms. Teneshia Moore

Instructional Specialist
Detroit Public Schools

Mr. Kevin Rashid

Honors College
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 50th 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. I would like to also thank two former JSHS participants - Mr. McComma Grayson and Mr. Brandon Schroeder, for attending the symposium in celebration of our 50th year of hosting the JSHS at WSU.

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. Sean Smith and the students in the String Quintet of the Detroit School of Arts 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. 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, appearing to read 'M. M.F.' with a stylized flourish.

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. Cathy Lysack, Ph.D., OT(C)
Deputy Director, Institute of Gerontology
Professor of Gerontology and Occupational Therapy
Wayne State University



Dr. Lysack is jointly appointed to the Occupational Therapy program in the College of Pharmacy and Health Sciences (Occupational Therapy program) and the Institute of Gerontology at Wayne State University. Dr. Lysack joined Wayne State University as an Assistant Professor in 1997. Presently, she is a Professor of Occupational Therapy and Gerontology. She is also the Deputy Director of the Institute of Gerontology. In Occupational Therapy she teaches research methods and aging courses. At the Institute of Gerontology she is involved in numerous research studies and is co-director of the IOG's Pre-doctoral Training Program in Aging and Urban Health. Dr. Lysack's research interests focus on the social and environmental factors that influence rehabilitation outcomes for people with disabilities and older adults.

For more information on Dr. Lysack's current research studies and publications, please visit her website at the Institute of Gerontology: www.iog.wayne.edu/profile/catherine.lysack

At the dinner banquet on Thursday Dr. Lysack will make a presentation titled, *Aging is Good for You: Opportunities in the Health Care Sciences and Research*. The presentation will describe the growing age wave in the U.S. and the implications for aging services and scientific and professional jobs in aging. The presentation will also discuss some of the exciting social and behavioral research projects being conducted at Wayne State University related to a larger and diverse population of retirees with longer life spans.

Meet Former JSHS Participants

McComma Grayson; JSHS 1996



Mr. McComma Grayson is a native of Detroit and a graduate of Cass Technical High School. In 1996, he made a presentation at the JSHS titled: *Genetic Instability in Breast Carcinoma Precursors*, on research he had conducted with Dr. Daniel Visscher at Harper Hospital/Detroit Medical Center and Wayne State University School of Medicine. The team published two papers as a result of this research.

He attended Harvard University where he received a BA in Government in 2000 and a MBA in 2007.

Currently McComma resides in Cambridge, Massachusetts and is a Vice President at HarbourVest Partners, a global private equity investment firm in Boston. His prior experiences include three years as a financial analyst in Morgan Stanley's Global Energy Group in New York, where he advised domestic and international energy companies; a position with McMaster-Carr Supply Company; an internship with Quilombo Empreendimentos e Participações in Sao Paulo, Brazil; and working with the Boston Redevelopment Authority.

Brandon Schroeder; JSHS 1995



Mr. Brandon Schroeder serves northern Lake Huron coastal communities as a Northeast Michigan District Extension Educator with the Michigan Sea Grant College Program and Michigan State University Extension. Brandon's background is in fisheries management and Great Lakes education programming, with his Bachelor's and Master's degrees through the Michigan State University Department of Fisheries and Wildlife. He previously worked with the Michigan United Conservation Clubs as a fisheries resource and policy specialist before joining the Michigan Sea Grant program in 2004. Brandon currently works with coastal communities in northeast Michigan to apply science-based knowledge to address Great Lakes issues locally. His Sea Grant Extension efforts involve fisheries science, sustainable coastal tourism development, and Great Lakes education, including leadership for a statewide 4-H Great Lakes and Natural Resources Camp and regional Northeast Michigan Great Lakes Stewardship Initiative (NE MI GLSI), a regional place-based stewardship education network.

At the dinner on Thursday, Mr. Grayson and Mr. Schroeder will talk about how their participation in JSHS influenced their career paths

Where is She Now?

Hannah Cheriyan, 2011 JSBS Finalist



Hannah Cheriyan is a junior in the Engineering Honors Program at the University of Michigan, Ann Arbor, where she is a Shipman Scholar, majoring in Biomedical Engineering and minor in Business. Since her freshman year, Hannah has worked on the anticoagulatory properties of the Thoracic Artificial Lung in the University's Extracorporeal Life Support Lab of Dr. Robert Bartlett. She recently presented this research at the 2014 National Collegiate Research Conference at Harvard. She has also received three Summer Undergraduate Research Fellowships at the University of Michigan, the St. John's Research Institute in Bangalore, India, and Washington University in St. Louis. After completing her undergraduate degree, she hopes to pursue an MD/PhD degree. Outside of schoolwork and research, Hannah is a member of the Tau Beta Pi Honors Society and is the executive director of Tech Day 2014, the University of Michigan's largest student-run high school engineering recruitment program. In her free time, Hannah enjoys writing poetry, reading the classics, and bursting into song.

At the luncheon on Friday, Hannah will share her college experiences, future career goals, and how participating in JSBS has impacted both.

Interlude with Music

String Quintet Detroit School of Arts



The String Quintet playing during the interlude and poster session is composed of Rhema Martin, Dona Worthy, Christian Sands, Joshua McClendon, and Jeffrey Trent, students at Detroit School of the Arts (DSA) and members of its orchestra, under the direction of Mr. Sean Smith.

Detroit School of Arts (DSA) is a nationally renowned Arts and Academic high school that offers a strong college preparatory Academic and Arts Curriculum, with pre-professional study in Vocal Music, Instrumental Music, Music Technology, Dance, Theater, Speech, Radio/Television production, Visual Arts and Visual Communications.

DSA's performing groups travel around the world to cities such as Toronto, London, New York, Chicago, New Orleans, Atlanta, Miami and Los Angeles. The DSA Wind Symphony has performed twice at the prestigious Carnegie Hall in New York and the DSA band performed in London, England in April 2001. The late Platinum Recording Artist "Aaliyah" Haughton, nominated for two Grammy Awards, is a 1997 graduate from the Detroit High School for the Fine and Performing Arts, DSA's former name.

Campus Tour

The Eugene Applebaum College of Pharmacy and Health Sciences (EACPHS)

Human Movement Laboratory and 3-D Scanner Tour



The Eugene Applebaum College of Pharmacy and Health Sciences (EACPHS) is one of 13 colleges and schools of Wayne State University (WSU), located on the southwest corner of the Detroit Medical Center. Established in 1924, the college is one of the founding colleges of Wayne State University and is organized into four departments — fundamental and applied sciences, health care sciences, pharmacy practice, and pharmaceutical sciences. The college offers 25 degrees and certificates through 14 academic programs. Each program maintains autonomous admission requirements, curricula, degree requirements and academic procedures.

Research in the Eugene Applebaum College of Pharmacy and Health Sciences is highly diversified with many different types of health science professionals and state-of-the-art resources, working together to advance health care through innovative basic and applied clinical research. Research topics include projects in drug delivery, medicinal chemistry, immunology, infection models, therapeutic applications, carcinogenesis, nanomedicine, air pollution, epidemiology, physiology, clinical investigations, patient management, health economics, instrumentation, motor functions, movement analysis and human behavioral studies. State of the art molecular, cellular, biochemical and physiological approaches tackle chronic diseases, such as Parkinson's, cancer, diabetes, pulmonary, neurological and cardiovascular disorders, to name a few. For more information visit: <http://www.cphs.wayne.edu/index.php>

On Friday morning, students and guests will be able to visit the Human Movement / A.R.M. Laboratory and participate in demonstrations of a 3-D Scanner. The tour will be led by Dr. Gerry Conti, Director of Human Movement Laboratories.

Research Experience for Undergraduates (REU)

Astrophysics, Particle Physics and Nuclear Physics



The Research Experience for Undergraduates (REU) Program is housed in the Department of Physics & Astronomy at Wayne State University and is funded by the National Science Foundation. The program exposes undergraduate students to leading edge scientific research in astrophysics, elementary particle physics, nuclear physics, and related technologies at Fermi National Accelerator Laboratory (FNAL), Stanford Linear Accelerator Center (SLAC), and locally at Wayne State University (WSU).

The REU program is specifically tailored as an introductory research experience for beginning undergraduates in which they do research under the guidance of faculty mentors. Following their REU experience, returning students are encouraged to continue in research in our department, supporting their work with research funds when possible, or to experience other REU programs in other locations. Our philosophy is that this REU introduction followed by further research experience can prepare a substantial number of students for admission in the best graduate schools in the nation.

Dr. David Cinabro, Professor in the Physics & Astronomy Department at WSU will discuss the REU Program during the luncheon on Friday.

PROGRAM

THURSDAY AND FRIDAY, MARCH 6th AND 7th, 2014

THURSDAY, MARCH 6th, 2014

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

REGISTRATION

Atrium – Community Arts
Wayne State University

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

OPENING SESSION Community Arts Auditorium

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. Christine Chow, Associate Dean and Professor
College of Liberal Arts and Sciences, Wayne State University

ORIENTATION:

Dr. Maria Madalena Ferreira
JSHS Director and Coordinator

4:00 p.m. - 5:30 p.m.

PRESENTATION OF STUDENT PAPERS
****Check locations in the various sessions****

STUDENT PRESENTATIONS

SECTION I ROOM – Community Arts Stage

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

STUDENT PRESENTERS:

David Huang

Exploration of Rosin as a Potential Biofuel

Anuush Vejalla

The Toxin in Rice-Arsenic in Our Food: Developing a Novel Testing Method and Analyzing Arsenic Levels in Rice

Sumita Strander

The Catalytic Properties of Palladium Nanoparticles and Carbon Microspheres in the Hydrogenation of Methyl-trans-cinnamate

Naomi Joseph

Extending Shelf Life of Commercial Potato Chips Using Natural Antioxidants

JUDGES:

Dr. Christy Chow, Chemistry Department – Wayne State University

Dr. Vladimir Chernyak, Chemistry Department - Wayne State University

Dr. Ashley Campanali, Chemistry Department - Wayne State University

SECTION II ROOM 101, Music

MODERATOR: **Mr. Brian Derowski**

STUDENT PRESENTERS:

Marisa Dallas

The Link Between Mutations in the ASPRV1 Gene and the Development of Atopic Dermatitis

Bethel Mwenze

The Effect of Seed Quality on the Foraging Behavior and Communication in the Black-Capped Chickadee Population

Lydia Wang

The Antibacterial Effect of Secondary Compounds in Plants

Abhijit Raj Das

Characterizing the Potential Role of Marek's Disease Genetic Resistance or Vaccination on Marek's Disease Virus Infectiousness

Diana Lu

Effects of Nutrient Limitation on Growth in a New Zealand Freshwater Snail

Elizabeth Ballor

Does the Ecology of Fear Hold the Key to Controlling an Invasion? Altered Migratory Behavior of Sea Lamprey When Exposed to a Natural Alarm Cue

JUDGES:

Dr. Ann Sodja, Biology Department, Wayne State University

Mr. Brandon, Schroeder, Michigan State University

Tooba Mansoor, College of Education, Wayne State University

SECTION III ROOM 107, Music

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

STUDENT PRESENTERS:

Humza Mirza

Regional Reduction in Cortical Thickness Over Time Among Healthy Elderly Men and Women

Jay Mehta

A Novel In-Clinic Patient- and Cancer-Tailored Targeted Drug Delivery System

Madhurima Das

Early Detection of Disease through Fractal Dimensional Analysis

Frank Wang

Functional Network Connectivity and Evoked Responses to Gaze Cueing: Possible Biomarkers to Autism

Rohith Pentaparth

The Effects of Education on CPAP Adherence in OSA Patients

Abhay Goel

Use of Fractals in the Pathological Analysis and Modeling of Cancerous Tissue

JUDGES:

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

Dr. Jennell White, School of Medicine, Wayne State University

Dr. Heather Lai, Biomedical Engineering, Wayne State University

SECTION IV ROOM 109, Music

MODERATOR: Dr. Karen Myhr, Biology Department, Wayne State University

STUDENT PRESENTERS:

Michael Shao

Toward Understanding the Neural Circuitry Regulating Cold Sensitivity in C. elegans

Dhara Patel

Is N-Cadherin Necessary for Vasculogenesis?

Sam Natla

The Knocking Down of Histone Acetyltransferase MOF is Insufficient to Suppress CGG Repeat-Induced Toxicity in Fly Model of FXTAS

Ashi Arora

Testing Whether Differentiated Osteoblasts and Osteocytes Exhibit to Apoptosis Induced by the Calcium Phosphate Ion Pair

Yusuf Ahmed

Changes in the Characteristics of AC133+ Stem Cells in Hypoxic U251 Glioblastoma Cell Microenvironment

Guangning (Phillip) An

Sildenafil Promotes Axonal Outgrowth in the Chondroitin Sulphate Proteoglycan Inhibitory Environment

JUDGES:

Dr. Karen Myhr, Biology Department, Wayne State University

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

Dr. Karen Beningo, Biology Department, Wayne State University

SECTION V ROOM – Alumni Lounge

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

STUDENT PRESENTERS:

Genevieve Sertic

Mathematical Modeling of the Benefits and Drawbacks of Rooftop Agriculture

Rachel Polus

Measuring the Eccentricity of the Moon's Orbit

Marie Freudenburg

Reflection Functions as Approximants of Chebyshev Polynomials

Jennie Yang

A Mixed, High Fuel Efficiency Internal Combustion Engine Utilizing Various Rotary and Stirling Engine Mechanisms

Omkar Shende

A Novel Method of Increasing Thermopower in Bulk Engineered Semiconductors

JUDGES:

Dr. David Cinabro, Physics Department– Wayne State University

Dr. Thomas Edwards, Mathematics Education - Wayne State University

Mr. Howard Weiss, Mechanical Engineering – General Motors

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

INTERLUDE – Community Arts Atrium

Student Poster Presentations

Music by students in the String Quintet: Detroit School of Arts
Directed by Mr. Sean Smith, Orchestral Director

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

MEET PAST JSHS PRESENTERS: Mr. McComma Grayson (JSHS 1996) and Brandon Schroeder (JSHS, 1995), share their career paths since their participation in JSHS

KEYNOTE SPEAKER: Dr. Cathy Lysack, Professor of Gerontology and Occupational Therapy, Wayne State University

TOPIC: *Aging is Good for You: Opportunities in the Health Care Sciences and Research*

ANNOUNCEMENT OF FRIDAY'S STUDENT PAPERS:

Dr. Maria Madalena Ferreira, Director, JSHS

FRIDAY, MARCH 7, 2014

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: Human Movement Laboratory and 3-D Scanner
College of Pharmacy**

(wait in breakfast area for directions)

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

Final Judging

McGregor Conference Center, Room F

Moderator:

Dr. Sarah Trimpin, Chemistry Department - Wayne State University

Judges:

Dr. Karur Padmanabhan, Physics Department – Wayne State University

Dr. Haidong Gu, Biology Department – Wayne State University

Kezhong Zhang, School of Medicine – Wayne State University

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

LUNCHEON BANQUET

Room LM – Lower Level, McGregor Conference Center

PRESIDING:

Dr. Maria Madalena Ferreira

College of Education

WELCOME:

Dr. Thomas Edwards

Associate Dean of Research, College of Education

SPEAKERS:

Dr. David Cinabro, Professor, Physics and Astronomy - WSU

TOPIC:

Research Experience for Undergraduates (REU) – Dr. Cinabro will explain the REU program and the types of research activities available to undergraduate students through this program.

Hannah Cheriyan

TOPIC:

Where Is She Now? – Hannah Cheriyan, finalist at the 2011 JSBS will talk about her research experiences during high school and how her participation in the JSBS impacted her college experiences and future research interests.

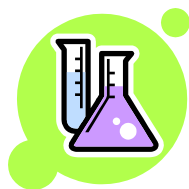
1:30 p.m. - 2:15 p.m.

CLOSING SESSION

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

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

PRESENTATION FROM STUDENT FINALIST



STUDENT RESEARCH PAPERS

Name	School	City
Yusuf Ahmed	Detroit Country Day	Canton
Guangning (Phillip) An	International Academy East	Troy
Ashi Arora	Novi High School	Novi
Elizabeth J. Ballor	Okemos High School	Okemos
Marisa E. Dallas	Okemos High School	Okemos
Abhijit Raj Das	Okemos High School	Okemos
Madhurima Das	Plymouth High School	Plymouth
Ella M. Freudenburg	Kalamazoo Area Math and Science Center	Kalamazoo
Abhay Goel	Kalamazoo Area Math and Science Center	Portage
Maria Guadino	Grand Rapids Catholic Central High School	Grand Rapids
David Huang	Troy High School	Troy
Naomi M. Joseph	Battle Creek Area Math and Science Center	Battle Creek
Diana Lu	Detroit Country Day	Farmington Hills
Jay H. Mehta	Port Huron Northern High School	Fort Gratiot
Humza N. Mirza	Kalamazoo Area Math and Science Center	Portage
Bethel A. Mwenze	Kalamazoo Area Math and Science Center	Kalamazoo
Sam Natla	Okemos High School	Okemos
Dhara Patel	Kalamazoo Area Math and Science Center	Kalamazoo
Rohith Pentaparth	Okemos High School	Okemos
Rachel A. Polus	Kalamazoo Area Math and Science Center	Portage
Genevieve C. Sertic	Kalamazoo Area Math and Science Center	Portage
Michael Shao	Detroit Country Day	Northville
Omkar Shende	Troy High School	Troy
Sumita M. Strander	Battle Creek Area Math and Science Center	Albion
Anuush Vejalla	Detroit Country Day	Novi
Frank T. Wang	Troy High School	Troy
Lydia Wang	Detroit Country Day	Novi
Jennie L. Yang	Troy High School	Troy

STUDENT PARTICIPANTS

Name	School	City
Yusuf Ahmed	Detroit Country Day	Canton
Guangning (Phillip) An	International Academy East	Troy
Ashi Arora	Novi High School	Novi
Elizabeth J. Ballor	Okemos High School	Okemos
Alexis Barker	Benjamin Carson School of Science & Medicine	Detroit
Mushtary Chowdhury	Benjamin Carson School of Science & Medicine	Hamtramck
Marisa E. Dallas	Okemos High School	Okemos
Abhijit Raj Das	Okemos High School	Okemos
Madhurima Das	Plymouth High School	Canton
Ella M. Freudenburg	Kalamazoo Area Math and Science Center	Kalamazoo
Abhay Goel	Kalamazoo Area Math and Science Center	Portage
Maria Guadino	Grand Rapids Catholic Central High School	Grand Rapids
Abrar Haydar	Benjamin Carson School of Science & Medicine	Detroit
David Huang	Troy High School	Troy
Naomi M. Joseph	Battle Creek Area Math and Science Center	Battle Creek
Diana Lu	Detroit Country Day	Farmington Hills
Jay H. Mehta	Port Huron Northern High School	Fort Gratiot
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Bethel A. Mwenze	Kalamazoo Area Math and Science Center	Kalamazoo
Sam Natla	Okemos High School	Okemos
Dhara Patel	Kalamazoo Area Math and Science Center	Kalamazoo
Rohith Pentaparthu	Okemos High School	Okemos
Rachel A. Polus	Kalamazoo Area Math and Science Center	Portage
Genevieve C. Sertic	Kalamazoo Area Math and Science Center	Portage
Michael Shao	Detroit Country Day	Northville
Omkar Shende	Troy High School	Troy
Sumita M.Strander	Battle Creek Area Math and Science Center	Albion
Samantha Turner	Benjamin Carson School of Science & Medicine	Detroit
Anuush Vejalla	Detroit Country Day	Novi
Frank T. Wang	Troy High School	Troy
Lydia Wang	Detroit Country Day	Novi
Jennie L. Yang	Troy High School	Troy

**TEACHER/SUPERVISOR/ADMINISTRATIVE
PARTICIPANTS**

Name	School	City
Linda Bradlin	Benjamin Carson High School of Science & Medicine	Detroit
Rebecca Brewer	Troy High School	Troy
John Dougherty	Detroit Country Day School	Beverly Hills
Walter Erhardt	Battle Creek Area Math & Science Center	Battle Creek
Leigh Eriks	Grand Rapids Catholic Central	Grand Rapids
Dr. Henry Fried	Detroit Country Day School	Beverly Hills
John W. Goudie	Kalamazoo Area Math & Science Center	Kalamazoo
Patricia Hanlan	Detroit Country Day School	Beverly Hills
William Hevel	Troy High School	Beverly Hills
Anna Jamison	Port Huron Northern High School	Port Huron
Karen Ludema	Plymouth High School	Canton
David Lyons	International Academy East	Troy
Andrew Moore	Okemos High School	Okemos
John Morrison	Troy High School	Troy
Emily Parker Pohlonski	Novi High School	Novi
Danielle Tandoc	Okemos High School	Okemos

Judges

Dr. Paul Albosta

School of Medicine
Wayne State University

Dr. Ashley Campanali

Chemistry Department
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

Brian Derowski

Sanilac County Schools

Dr. Russell Finley

School of Medicine
Wayne State University

Dr. Haidong Gu

Biology Department
Wayne State University

Dr. Heather Lai

Biomedical Engineering
Wayne State University

Tooba Mansoor

Biology Department
Wayne State University

Dr. Karen Myhr

Biology Department
Wayne State University

Dr. Karur Padmanabhan

Physics Department
Wayne State University

Dr. Ann Sodja

Biology Department
Wayne State University

Mr. Brandon Schroeder

Michigan State University

Dr. Sarah Trimpin

Chemistry Department
Wayne State University

Mr. Howard Weiss

Mechanical Engineering
General Motors

Dr. Jennell White

School of Medicine
Wayne State University

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. Christine Chow, Associate Dean
College of Liberal Arts and Sciences
Wayne State University

Dr. Thomas Edwards
Associate Dean of Research
College of Education
Wayne State University

Dr. Gerry Conti
Director of Human Movement Laboratories,
The Eugene Applebaum College of Pharmacy and Health Sciences
Wayne State University

Dr. Cathy Lysack
Deputy Director, Institute of Gerontology
The Eugene Applebaum College of Pharmacy and Health Sciences
Wayne State University

Mr. McComma Grayson
Vice President
HarbourVest Partners, Boston

Mr. Brandon Schroeder
Michigan Sea Grant College Program
Michigan State University

Mr. Matthew Orr
Undergraduate Research Program
Wayne State University

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

Wayne State University
World-Class Education in the Real World