



Academy of Applied Science



**Forty-Third Annual**  
**Southeastern Michigan**  
**Junior Science and**  
**Humanities**  
**Symposium**

**Program**  
**2007**

**WAYNE STATE**  
**UNIVERSITY**

**McGregor Memorial Conference Center**  
**Detroit, Michigan**

**March 8 and 9, 2007**

**Forty-Third Annual**  
**SOUTHEASTERN MICHIGAN**  
**JUNIOR SCIENCE AND HUMANITIES**  
**SYMPOSIUM**

Thursday and Friday, March 8th and 9th, 2007

*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

Association United States Army  
Detroit Chapter

National Defense Industrial Preparedness Association  
Michigan Chapter

Engineering Society of Detroit

**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 Ferreira**

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

## JSHS ADVISORY BOARD

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Senior Lecturer, College of Science—Physics  
Wayne State University

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Teacher, Sanilac County Science and Math Center

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Michigan Junior Science and Humanities Sym. – AUSA

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Associate Professor Center for Molecular Medicine & Genetics  
Wayne State University

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Mathematics/Science, Wayne State University

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Wayne State University

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Director, Honors Program  
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Secretary JSBS, College of Education  
Wayne State University

**Dr. Rubye Holloway**  
Science Administrator, Martin. L. King, Jr. Senior High School  
Detroit Public Schools

**Dr. Steven Imer**  
Associate Dean for Research, College of Education  
Wayne State University

**Dr. Don Kolhoff**  
State President AUSA, Consultant  
S. Main Company

**Dr. Karen Myhr**  
Assistant Professor of Biology  
Wayne State University

**Dr. Gerald Oglan**  
Assistant Dean, Teacher Education Division  
College of Education, Wayne State University

**Dr. Claude A. Pruneau**  
Associate Professor  
College of Science, Wayne State University

**Dr. Charles Winter**  
Associate Department Chair—Chemistry  
Wayne State University

**Dr. Paula Wood**  
Dean, College of Education  
Wayne State University



**Jeffrey A. Loeb, M.D., Ph.D.**

Associate Professor  
Department of Neurology and The Center for  
Molecular Medicine and Genetics  
Wayne State University School of Medicine

Dr. Loeb received his M.D. and Ph.D. from the University of Chicago. He subsequently completed a residency in Neurology at the Massachusetts General Hospital in Boston and fellowship training in epilepsy as an Associate Neurologist at Harvard's Beth Israel Hospital. Dr. Loeb conducted postdoctoral work in the Department of Neurobiology at Harvard Medical School with Dr. Gerald Fischbach where he became interested in brain development and how understanding development can teach us what goes wrong in human disease. He is currently an Associate Professor in the Department of Neurology and in The Center for Molecular Medicine and Genetics at Wayne State University. Dr. Loeb's work focuses on developing new treatments for human disorders based on neurodevelopment. He has also initiated a project in the field of human epilepsy genomics to identify the molecular and cellular signals that underlie the abnormal electrical activities that characterize this common neurological disorder. For more information on Dr. Loeb's work visit: <http://www.genetics.wayne.edu/jloeb/>

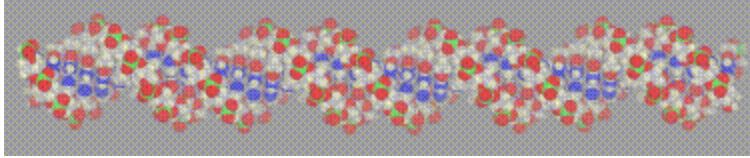
## String Quartet Soni Chordari



The string quartet Soni Chordari was started in 2004 by Anida Margariti, a graduate of Wayne State University who now teaches strings and directs the Marygrove String Ensemble at Marygrove College. From among other WSU grads now at Marygrove, she put together a quartet that specializes in researching music from the Medieval to the Classical periods. Consisting of Margariti on first violin, Joseph Deller on second violin, Michael McGillivray on viola (Ned Djordevic filling in today on viola) and Brandon Cota on cello, Soni Chordari has played many concerts at Marygrove, Wayne State University and other venues in the Detroit area.

# Campus Tour

## Applied Genomics Technology Center



The Applied Genomics Technology Center (AGTC) was established in 1998 as a centralized resource for Wayne State University researchers to provide genetic expertise, equipment and personnel and to use the resources to provide research and development of cutting edge techniques. The center is a member of the Michigan Center for Genomic Technologies (MCGT) and the Michigan Center for Biological Information (MCBI). For more information visit: <http://agtc.wayne.edu/agtc>





**Members of  
Wayne State University's  
2006 Formula SAE  
competition team**

Formula SAE is an international competition sponsored by the Society for Automotive Engineers. Over 330 university teams from around the world compete each year in competitions that are now held in the US, England, Germany, Italy, Brazil, Australia, and Japan. Every year, each team must design, build, and race a small, open-wheeled racecar – a car that is different from the previous year.

The purpose of the competition is for students to tackle a real world design project – with restrictions on what they are allowed to do, limited resources, and time constraints. Creativity is key to success. The team members not only stretch their engineering knowledge – applying what they have learned in the classroom and learning new material that they need to solve the problem – but also gain an equal amount of knowledge and experience in project management and team dynamics. Whether a Formula SAE team consists of 8 members or 80 members, the challenges of working together to bring a project in on time are greater than the students ever imagine.

The automotive industry has determined that competitions like Formula SAE provide engineering students with a breadth of experience that is unparalleled. As a result, automotive manufacturers and suppliers around the world – particularly DaimlerChrysler, Ford, and General Motors – have provided tremendous monetary and in-kind donations to support Formula SAE. The value of this experience opens doors for participating students for internships and permanent employment opportunities.

Wayne State has competed in Formula SAE since 2004. The team consists of undergraduate and graduate students from all fields of engineering, along with students from other schools and colleges within the university. The team uses basic engineering problem solving and design processes, coupled with advanced modeling techniques, to develop a car that meets goals and constraints set each summer. In 2005, the Wayne State Formula SAE team brought home the Henkel Technologies Design Award for best use of structural foam – a novel material that provides high stiffness to the frame of the car while keeping the weight down, both important factors for the performance of a race car.

The Wayne State Formula SAE team appreciates the invitation to speak to the 2007 Junior Science and Humanities Symposium about the event and their experiences. The team also encourages all of the Symposium attendees to seek out opportunities like Formula SAE at whatever university they choose to attend – the knowledge gained and lessons learned are unmatched.

## PROGRAM

THURSDAY AND FRIDAY, MARCH 8 AND 9, 2007

THURSDAY, MARCH 8, 2007

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

### REGISTRATION

Lobby  
McGregor Memorial Conference Center  
Wayne State University

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

**Ms. 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. Gerry Oglan**, 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:*       **Mr. Anton Puvirajah**  
Science Education  
Wayne State University

*STUDENT PRESENTERS:*

**Valerie Bays**  
*Who can change your mind?: A look at the Effectiveness of Audio Subliminal Advertising on Teenagers*

**Katrina Diaz**  
*Factors Associated with the Parental Decision to Vaccinate Infants, Toddlers and Early School-Age Children Against Influenza*

**Jacob Soule**  
*Bathrooms Under the Microscope*

**Rahul Dalal**  
*Vancomycin vs. Metronidazole in the Treatment of C.difficile Associated Diarrhea.*

**Subha Perni**  
*Analysis of the Impact of Cryopreservation on T-cell Function Using Flow Cytometry.*

*JUDGES:*

**Dr. Karen Beningo**  
Biological Sciences  
Wayne State University

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

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

## SECTION II ROOM F, McGREGOR

*MODERATOR:*       **Ms. Rubye Holloway**  
Assistant Principal  
Martin Luther King H.S, Detroit Public Schools

### *STUDENT PRESENTERS:*

**Sravani Alluri**  
*The Effects of Curry Leaf Extract and Green Tea Derived EGCG on the Proliferation of Barrett's Esophageal Adenocarcinoma Cells*

**Mandalyn Griffin**  
*Growth of Common Apples (*Malus sylvestris*)*

**Amelia Menton**  
*Analysis of Effects of Acid Rain on Root and Stem Lengths of Corn and Radish Plants*

**Andria Kohler**  
*High Nitrate Levels in Ground Water Run Off*

**Bo Zhu**  
*Physiological Characterization of Compact Cucumber PI308916*

**Sarah Veeck**  
*Paleo Diet of Early Eocene Mammals from  $\delta^{18}O$  and  $\delta^{13}C$*

### *JUDGES:*

**Dr. Bill Moore**  
Biological Sciences  
Wayne State University

**Dane' Orlovic**  
Science Education  
Wayne State University

**Ms. Kariann Reno**  
Science Education  
Wayne State University

## SECTION III ROOM G, McGREGOR

*MODERATOR:*       **Dr. Karen Myhr**  
Biological Sciences  
Wayne State University

*STUDENT PRESENTERS:*

**Christie Cheng**  
*Sensitivity to X-rays and Hyperthermia in Two Mesothelioma Cell Lines*

**Amardeep Grewal**  
*An Extra Spin on Nerve Regeneration Scaffolds: Synthesis of an Electrospun Spinal Cord Nerve Conduit*

**Danielle Mai**  
*The Effect of Ionic Solutions of Varying Concentrations of the Neurosecretory Cell Size of the Earthworm *Lumbricus terrestris**

**Kunal Mehta**  
*Assessing the Response Rates to AZD2171 and Pemetrexed Sodium (Alimta) Treatment in Non-Small Cell Lung Cancer Patients through Analysis of PET Images*

**Melissa Paape**  
*A Study of How Sodium Fluoride Affects Bone Mineral Density*

*JUDGES:*

**Dr. Russell Finley**  
Medical School  
Wayne State University

**Dr. Susan Xiaoxin Xu**  
Institute of Environmental Health Science  
Wayne State University

## SECTION IV ROOM H, MCGREGOR

*MODERATOR:*       **Dr. Bob Arking**  
Biological Sciences  
Wayne State University

### *STUDENT PRESENTERS:*

**Hari Arul**  
*Functionalization of Zeolites Using the Biotin-Avidin Interaction for Potential Gene Delivery Use*

**Katherine Fang**  
*Leptin's Downstream Signaling Pathway that is Related to Obesity*

**Svetlana Ikonomova**  
*Comparison of Properties of Phosphatidylserine and Phosphatidylcholine Mixture Vesicle to Phosphatidylcholine -Only Vesicle*

**Nikhil Iyer**  
*A Comparative Analysis of Protein Functions Associated with Genetic Disorders Across the Phylogenetic Tree*

**Shravani Mikkilineni**  
*Dendritic Polymer-Dopamine Conjugation for Targeted Drug Delivery*

**Erika Sims**  
*Constructing Custom Nanostructures Using the Scaffolded DNA Origami Method*

### *JUDGES:*

**Mr. Jamie Benigna**  
Roeper School

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

**Dr. Dan Kashian**  
Biological Sciences  
Wayne State University

## SECTION V ROOM I, MCGREGOR

*MODERATOR:*       **Dr. Daniel Frohardt**  
                          Mathematics  
                          Wayne State University

### *STUDENT PRESENTERS:*

**Marie LaCombe**  
*Static Properties of Dust*

**Sohan Mikkilineni**  
*A Finiteness Property for Integral Points in a Family of Conics*

**Thiago Olson**  
*Neutron Activation Analysis Using an Inertial Electrostatic Confinement Fusion Device*

**Zackery Schroeder**  
*A Study of the Environmental Effects on the Star Formation Rates of Three Intermediate Redshift Galaxy Clusters*

**Nathan Stano**  
*An Exploration for Extended Clusters in M33*

### *JUDGES:*

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

**Mr. Aaron Martinak**  
Wayne State University

**Dr. Scott Payson**  
Physics  
Wayne State University

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

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

*PRESENTATION:*     **String Quartet Soni Chordari**

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

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

*PRESIDING:*

**Dr. Jerry Herron**  
Director, Honors Program  
Professor of English and American Studies  
Wayne State University

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

*SPEAKER:*     **Dr. Jeffrey A. Loeb**  
School of Medicine, Wayne State University

*TOPIC:*         *When Learning Too Much Goes Wrong: Common Molecular  
Pathways in Human Epilepsy*

*ANNOUNCEMENT OF FRIDAY'S STUDENT PAPERS:*

**Dr. Maria Ferreira**  
Director, JSHS



**FRIDAY, MARCH 9, 2007**

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

**CONTINENTAL BREAKFAST**  
Community Arts Building—Outer Gallery

**9:30-11:00 a.m.**

**CAMPUS TOUR: Applied Genomics Technology Center**  
**Dr. Susan Land**, Biological Sciences (5<sup>th</sup> Floor)

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

**Final Judging**  
McGregor Conference Center, Room I

*Moderator:*

**Dr. Thomas Edwards**, Mathematics Education

*Judges:*

**Dr. Vicky Meller**, Biological Sciences  
**Dr. Karur Padmanabhan**, Physics

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

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

*PRESIDING:*

**Dr. Steven Ilmer**  
Associate Dean, College of Education

*WELCOME:*

**Dr. Michele Grimm**  
Associate Dean, College of Engineering

*SPEAKER:*

**Formula SAE Team**  
Wayne State University

*TOPIC:*

*“Formula SAE – Xtreme Engineering for Xtreme Education”*

*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

**WSU Awards: Dr. Jerry Herron**  
Director, Honors Program

*PRESENTATION FROM STUDENT FINALIST*

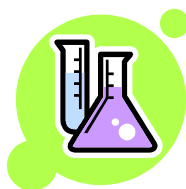
*EVALUATION OF PROGRAM:*

**Participants please complete evaluation forms**

## **REGISTRATION COMMITTEE**

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

**Tyniqua Hunter  
Jasma Johnson  
Tayuanna Norman  
Larisha Owens  
Britney Sharp  
Nia Wolfe**



## STUDENT RESEARCH PAPERS

Name	School	City
Sravani Alluri	International Academy	Bloomfield Hills
Hari Arul	Detroit Country Day	Beverly Hills
Valerie Bays	Deckerville High School	Deckerville
Christie Cheng	Detroit Country Day	Beverly Hills
Rahul Dalal	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Katrina Diaz	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Katherine Fang	Pioneer High School	Ann Arbor
Amardeep Grewal	Detroit Country Day	Beverly Hills
Mandalyn Griffin	Fowlerville High School	Fowlerville
Svetlana Ikonomova	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Nikhil Iyer	Detroit Country Day	Beverly Hills
Andria Kohler	Brown City High School	Brown City
Marie LaCombe	Grosse Pointe North High School	Grosse Pointe Woods
Danielle Mai	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Kunal Mehta	Detroit County Day	Beverly Hills
Amelia Menton	Detroit Country Day	Beverly Hills
Shravani Mikkilineni	Detroit Country Day	Beverly Hills
Sohan Mikkilineni	Detroit Country Day	Beverly Hills
Thiago Olson	Stoney Creek High	Rochester Hills
Melissa Paape	Sandusky High School	Sandusky
Subha Perni	Detroit County Day	Beverly Hills
Zackery Schroeder	Grosse Pointe North High School	Grosse Pointe Woods
Erika Sims	Detroit Country Day	Beverly Hills
Jacob Soule	Brown City Community Schools	Brown City
Nathan Stano	Grosse Pointe North High School	Grosse Pointe Woods
Sarah Veeck	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Bo Zhu	Detroit County Day	Beverly Hills

## STUDENT PARTICIPANTS

Name	School	City
Sravani Alluri	International Academy	Bloomfield Hills
Hari Arul	Detroit Country Day	Beverly Hills
Valerie Bays	Deckerville High School	Deckerville
Jillian Brace	Roseville High School	Roseville
Christie Cheng	Detroit Country Day	Beverly Hills
Rahul Dalal	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Katrina Diaz	Kalamazoo Area Mathematics and Science Center	Kalamazoo
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Nikhil Iyer	Detroit Country Day	Beverly Hills
Jasma Johnson	Martin Luther King Jr. High School	Detroit
Andria Kohler	Brown City High School	Brown City
Marie LaCombe	Grosse Pointe North High School	Grosse Pointe Woods
Danielle Mai	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Kimberly Mangum	Roseville High School	Roseville
Kunal Mehta	Detroit County Day	Beverly Hills
Amelia Menton	Detroit Country Day	Beverly Hills
Shravani Mikkilineni	Detroit Country Day	Beverly Hills
Sohan Mikkilineni	Detroit Country Day	Beverly Hills
Tayuanna Norman	Martin Luther King Jr. High School	Detroit
Lauren Nowacki	Roseville High School	Roseville
Thiago Olson	Stoney Creek High School	Rochester Hills
Larisha Owens	Martin Luther King Jr. High School	Detroit
Melissa Paape	Sandusky High School	Sandusky
Subha Perni	Detroit County Day	Beverly Hills
Katherine Reyes	Roseville High School	Roseville
Zackery Schroeder	Grosse Pointe North High School	Grosse Pointe Woods
Britney Sharp	Martin Luther King Jr. High School	Detroit
Erika Sims	Detroit Country Day	Beverly Hills
Sandra Skelton	Roseville High School	Roseville
Jacob Soule	Brown City Community Schools	Brown City
Nathan Stano	Grosse Pointe North High School	Grosse Pointe Woods
Sarah Veeck	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Delaney Warren	Roseville High School	Roseville
Meagan Wiseman	Roseville High School	Roseville
Nia Wolfe	Martin Luther King Jr. High School	Detroit
Bo Zhu	Detroit County Day	Beverly Hills

**TEACHER/SUPERVISOR/ADMINISTRATIVE  
PARTICIPANTS**

<b>Name</b>	<b>School</b>	<b>City</b>
Sandra Dejoie	Martin Luther King Jr. High School	Detroit
Chris Forbush	Fowlerville High School	Fowlerville
Amy Ford	Brown City Community Schools	Brown City
Jeff Ford	Deckerville High School	Deckerville
John Goudie	Kalamazoo Area Mathematics and Science Center	Kalamazoo
Lesley Haxer	Brown City High School	Brown City
Jack Hentz	Pioneer High School	Ann Arbor
Ardis Herrold	Grosse Pointe North High School	Grosse Pointe Woods
Ruby Holloway	Martin Luther King Jr. High School	Detroit
David Lyons	International Academy	Bloomfield Hills
Gene Menton	Detroit Country Day	Beverly Hills
Mark Sheler	Sandusky High School	Sandusky
Eric Thuma	Stoney Creek High School	Rochester Hills
Scott Wheeler	Roseville High School	Roseville
Julia Winter	Detroit Country Day	Beverly Hills

## Judges

**Dr. Bob Arking**  
Biological Sciences  
Wayne State University

**Mr. Jamie Benigna**  
Roeper School

**Dr. Karen Beningo**  
Biological Sciences  
Wayne State University

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

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

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

**Dr. Russell Finley**  
Medical School  
Wayne State University

**Dr. Daniel Frohardt**  
Mathematics  
Wayne State University

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Assistant Principal  
Martin Luther King H. S  
Detroit Public Schools

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Biological Sciences  
Wayne State University

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Wayne State University

**Dr. Bill Moore**  
Biological Sciences  
Wayne State University

**Dr. Karen Myhr**  
Biological Sciences  
Wayne State University

**Dane' Orlovic**  
Science Education  
Wayne State University

**Dr. Karur Padmanabhan**  
Physics  
Wayne State University

**Dr. Scott Payson**  
Physics  
Wayne State University

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

**Mr. Anton Puvirajah**  
Science Education  
Wayne State University

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

**Ms. Kariann Reno**  
Science Education  
Wayne State University

**Dr. Susan Xiaoxin Xu**  
Institute of Environmental Health Science  
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

**Ms. Rubye Holloway**

Assistant Principal, Martin. L. King, Jr. Senior High School  
Detroit Public Schools

**Ms. Tina Lyles**

McGregor Conference Center

**Dr. Daniel Frohardt**

Professor of Mathematics, Wayne State University

**Ms. Margaret Hoard**

TED Secretary, College of Education  
Wayne State University

**Mrs. Sandra Jenkins**

TED Division Secretary, College of Education  
Wayne State University

**Mr. Donald Kolhoff**

Consultant  
State President of AUSA

**Ms. Joyce Martin**

Administrative Assistant, College of Education  
Wayne State University

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