

NOVA

ILLINOIS MATHEMATICS AND SCIENCE ACADEMY

IMSAs A Pioneering Educational Community

Volume 14 No. 1 • Winter 2000

IMSAs-Chicago Public Schools Consortium to Prepare Quality Teachers Speaker Hastert, Congressman Blagojevich Help Secure \$4 Million Grant

On December 20, Speaker of the House Dennis Hastert, U.S. Representative Rod Blagojevich, Chicago Public Schools CEO Paul Vallas and IMSA President Dr. Stephanie Pace Marshall announced the establishment of a unique partnership designed to increase the number of well qualified teachers for the 21st Century. Special emphasis will be given to the high needs areas of mathematics, science and technology, and urban and rural settings.

At a press conference held in the Tellabs Studio for Professional Development at IMSA, Speaker Hastert said the IMSA-Chicago Public Schools (CPS)

partnership was an important step in ensuring every student a good education.

"We need to put the best teacher in every classroom in this state and in this nation," Hastert said. "Every kid in this country deserves a good school and a good learning experience."

The three components of the Consortium include:

1 Jointly, the CPS and IMSA will plan, develop, implement and disseminate model programs to address the critical needs of recruitment, preparation and retention of quality teachers in Chicago and other urban centers;

2 The CPS will develop programs to help launch the National Teaching Academy of Chicago (in Chicago);

3 IMSA will develop programs to help launch the Institute for the Advancement and Renewal of Learning

and Teaching in Mathematics, Science and Technology (on IMSA's campus).

Initial funding includes a \$4 million grant from the U.S. Department of Education; the CPS will receive \$2.3 million and IMSA will receive \$1.7 million. Public and private sector investments also will be sought.

Among other things, The Consortium will:

- Attract exceptional teachers to teach in Chicago and other areas of Illinois
 - Provide ongoing professional development and mentoring
 - Create alternative pathways to teacher licensure
 - Recruit some of Illinois' best and brightest high school and college students to explore careers in teaching
 - Support career teachers in their pursuit of advanced certification through the National Board of Professional Teaching Standards
- "Already the National Commission on Teaching and America's Future has reported that 50,000 unqualified teachers have been hired annually on an emergency basis to meet this growing demand."

(Continued on page 8)



Speaker of the House Dennis Hastert visited IMSA December 20, 1999 to announce a \$1.7 million gift from the U.S. Department of Education. The grant will be used to help increase the number of well qualified teachers for the 21st century.

Photo by Rich Malec Photography

INSIDE

Center@IMSA Activities.....	5
From the President.....	2
Great Minds Program/Calendar.....	3
IMSA Open House	7
News in Brief.....	7
Real Science CD-ROM.....	4
Women Leaders Luncheon	6



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From the President



Dear IMSA shareholders,

Welcome to the new millennium! It is indeed exciting to be a part of history as we celebrate the new century. At the Illinois Mathematics and Science Academy, I am pleased to report many new and exciting initiatives for the beginning of the year 2000. Let me cite a few highlights:

First, we are very proud to announce that two IMSA faculty members, Mathematics teacher Susan Eddins and Biology teacher Dr. Donald Doseh, successfully completed all of the requirements for certification with the National Board of Professional Teaching Standards (NBPTS). This is a rigorous and competitive national certification process that credentials successful candidates as Master Teachers. The success rate is less than 50% of those applying so we congratulate and celebrate their success.

As noted in the cover story, we are excited to announce the formation of a unique partnership between IMSA and the Chicago Public Schools, designed to increase the number of well qualified teachers for this new century. The partnership, the *Consortium for the Advancement of Teaching*, was announced at a special press conference at IMSA by Speaker of the House Dennis Hastert, U.S. Representative Rod Blagojevich and Chicago Public Schools CEO Paul Vallas. We are extremely excited about the impact that this unique partnership can make and hope that it can serve as a model to be replicated nationwide.

From March 1-4, we will host the 13th Annual Professional Conference of the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology (NCSSSMST). IMSA is a founding member of the Consortium so we are especially pleased to host the event which will bring together approximately 300 educators from around the country.

Keynote speeches will be presented by Robert W. Galvin, chairman of the executive committee, Motorola, Inc., Dr. Paul Sereno, world-renowned paleontologist and dinosaur hunter, and Benjamin Zander, conductor of the Boston Philharmonic Orchestra. We are delighted to have the Motorola Foundation as our exclusive corporate sponsor. You can visit our website at www.imsa.edu/ncsssmst/ for additional conference information.

Finally, on April 4 IMSA will be hosting the Annual Horwitz Lecture on Ethics featuring keynote speaker Rabbi Lawrence Kushner. Rabbi Kushner, who will present *Invisible Lines of Connection: Social Responsibility and Cowardice*, has served as rabbi of Congregation Beth El in Sudbury, Massachusetts for the past 27 years and is widely regarded as one of the most creative religious writers in America.

As the NCSSSMST conference host this year, IMSA has chosen the theme *Liberating Goodness and Genius for the World*. What greater calling can you imagine? As we enter into a new century, we hope you will join us in our quest to liberate the goodness and genius of *all* children.

Sincerely,

Stephanie Pace Marshall, Ph.D
President

1999-2000 IMSA Great Minds Program Draws Sold-Out Crowds

Bill Kurtis One of Headline Speakers



Photo by Cindy Xi

The IMSA Great Minds Program, now in its second year, got off to a successful start in 1999 and most recently featured some of the prominent figures in national print and television media.

On December 1, 1999, Malcolm Browne, *New York Times* Senior Writer, Paula Apsell, Executive Producer of the award-winning PBS television series *NOVA*, and Bill Kurtis (pictured), Executive Producer and host of the award-winning *The New Explorers* and

Investigative Reports with Bill Kurtis visited IMSA to present the Great Minds Program dialogue *Science and the Media*.

During the dialogue, which was attended by more than 430 middle and high school students and teachers from throughout the Chicagoland area, the three panelists discussed how media coverage influences the public perception of science, and the challenges media face in communicating science in an informative yet interesting way. The

panelists also answered questions from the audience such as "how does the media decide what science stories to report?", "how does the media educate themselves about science?," and "how does the media separate science from science fiction?"

Earlier in the year on October 12, IMSA Resident Scholar and Nobel Laureate Dr. Leon Lederman presented the Great Minds Program community lecture *Science in the 21st Century: Issues and Predictions*. The evening lecture, which was open to the public, was attended by approximately 250 guests.

On October 13, Dr. Lederman and Dr. Edward "Rocky" Kolb, professor of Astronomy and Astrophysics at the University of Chicago and Member of the NASA Fermilab Astrophysics Group, presented the dialogue *Stories of a Scientist*. The dialogue was filled to capacity by middle and high school students and educators. Because of the overwhelming response, an encore performance is being held February 9, 2000.

Watch for future stories in *NOVA* on the following Great Minds Program Events listed in the chart at lower left.

For more information on a particular event, contact Dr. Judy Scheppler at (630) 907-5899 or visit the Great Minds Program website at webdb.imsa.edu/greatminds.

Spring 2000 Great Minds Program Calendar of Events

- | | |
|--|--|
| 1/06/00 <i>The Science and Politics of Climate Change</i>
Nobel Laureate
Dr. Mario Molina | 2/23/00 <i>Science, Law & Technology</i>
Dr. Marsha Rosner and
Attorney Charles Laff |
| 1/24/00 <i>Frontiers of Educational Technology</i>
Roger Schank, Robert
Tinker, Louis Gomez,
Alan November | 4/04/00 <i>Richard L. Horwitz
Lecture on Ethics</i>
Rabbi Lawrence Kushner |
| 2/09/00 <i>Stories of a Scientist</i>
Sold Out!
Physicists Dr. Leon Lederman
& Dr. Edward "Rocky" Kolb | 4/12/00 <i>Science Education in the 21st Century</i>
Ronald Anderson, Rodger
Bybee, George "Pinkey"
Nelson, Lynn Haeffele,
Jane Kahle, Ronald Gidwitz
and Norman Lederman |



Photo by Brian Quimby

Dr. Edward "Rocky" Kolb talks with students following the dialogue, *Stories of a Scientist* on October 13, 1999.

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The Center@IMSA Programs

IMSA Students Share Love of Science through the *Real Science* CD-ROM



Photo by Britta Mackenna

IMSA students have developed the second issue of *Real Science*, an interactive CD-ROM designed for upper elementary school students (grades 3-5). In it, students can learn everything from Atoms to Rockets.

The 1999 issue was developed during the 1998-99 school year by students involved in the Real Science club, headed by Editors Jorge Reyes '99 (Chicago), Janessa Stream '99 (Rossville), Hari Phatak '99 (Wilmette) and Neha Narula '99 (Barrington). More than 1200 elementary schools were mailed surveys in 1998 about Real Science topic development; 350 schools returned the survey and as a result received a free Real Science CD-ROM this fall. The concept and first issue of Real Science was developed in 1995 by IMSA students Matt Brody '95 (Highland Park) and Arvind Sekar '95 (Danville).

Huong Banh, ESL/Computer Teacher from Willard Elementary in Evanston, is pleased with the 1999 issue and gives it high marks for ease of use and content. Students use the CD-ROM individually in the computer lab and in a classroom setting. "It's great. My students really enjoy this," Huong said. Topics in the *Real Science* '99 issue include:

Aerodynamics, Atoms, Cell City, Polymers, Plutonium and Rockets. Interviews with Nobel Laureate Dr. Leon Lederman and Captain James Lovell are also included. The printing of Real Science '99 CD-ROMS and booklets was donated by Mr. John Benson of Beta Graphics Corporation in Aurora.

Real Science 2000 is currently under development and will contain articles to address curriculum areas needing more information, technology or resources as identified in the fall '98 survey. Some of the topics for the 2000 issue include: Seasons, Tropical Rainforests, The Lives of Stars, Parts of Plants, Our Solar System and "On the Road at Fermilab."

Editors for *Real Science* 2000 include: Jonathan Berger '00 (Wayne), Ashlee Riddle '00 (Elgin), Denny Tu '00 (Naperville), Cindy Xi '01 (Naperville) and Margaret Wat '01 (Naperville). Senior Editor Ashlee Riddle has this to say about her experience, "Real Science has been a wonderful way for IMSA students to acquire new writing and multimedia skills, and to find a way to reach out to the young, curious minds of Illinois' children." *Real Science* 2000 will be mailed out to participating Chicagoland elementary schools in May, 2000.

Shannon Dobson
'02 interviews
Dr. Lederman for
the *Real Science*
CD-ROM at the
Lederman Center.

Services for Illinois Students & Teachers

Registration Now Open for Programs of The Center@IMSA

This spring and summer, the Illinois Mathematics and Science Academy will once again fill its classrooms with students and teachers from throughout Illinois. For the following opportunities, student ages are specified; professional development experiences are most appropriate for middle and high school teachers.

Call *The Center@IMSA* at (630) 907-5956 or email center@imsa.edu for more detailed information on these or other programs available, or to register for the following professional development programs:

FOR TEACHERS

Spring 2000 Experiences in Mathematics

2/5 *So, What is Mathematica?*

2/16 *Paper, Pencil or Graphing Calculator?*

2/16 *Patterning, Discoveries, Connections*

2/23 *My Students Have TI-89's, Now What Do I Do?*

Reform Based Calculus: A Series of 3 Individual Workshops (participate in one or all three)

3/8 *Workshop I: Differential Equations*

Fall *Workshop II: Derivatives*

Fall *Workshop III: Integrals*

3/14 *Assessing What Counts*

4/14 *Mathematical Investigations (IMSA's curriculum)*

Summer 2000 Experiences in Mathematics and Other Areas

6/16 or *How to Apply for Teaching Awards or Master Teacher Certification*

6/12-15 *Patterning, Discoveries, Connections*

6/26-30 *C++ Practicum*

7/10-12 *T3 PCALC-CALC Seminar*

7/13-14 *Mathematica in the Classroom (no previous experience required)*

7/10-21 *Illinois Problem-Based Learning Network Summer Institute (Summer Sleuths)*

7/10-14 *Biotechnology in the Classroom*

8/7-10 *Harris Institute for Introduction to Problem-Based Learning (Morton Arboretum location)*

In addition to the above scheduled professional development programs, *The Center@IMSA* is also coordinating Project Keystone, funded by the ISBE Scientific Literacy Program. A series of two-day Institutes offered in six locations across Illinois immerses teachers in strategies for curriculum alignment with Illinois Learning Standards while addressing implications of international research findings relating to curriculum and instruction.

Numerous learning opportunities in other areas will also be available this spring and summer including:

- **Standards-based Education** curriculum materials evaluation, unburdening the curriculum, etc.
- **Science Content and Pedagogy** physical and earth science concepts and strategies, scientific inquiry, etc.
- **Strategies for Learning: Technology** – *IMSA Internet Toolkit*, locating/evaluating/integrating information resources, online opportunities, etc.

Problem-based learning-specific to special education, gifted, action research, cognitive coaching, measurement strategies and tools, etc.

For more information on dates and locations, contact *The Center@IMSA* at (630)907-5956 or email center@imsa.edu or check our website: www.imsa.edu/center (some customizing opportunities are also available to meet your specific district's or school's needs; please call us).

Registration for summer programs for Illinois students begins March 1, 2000. Call the IMSA Kids Institute at (630) 907-5041 or email klong@imsa.edu to be placed on the mailing list for the following programs.

FOR STUDENTS

Science Explorers

6/19-23 *Session I*

7/31-8/4 *Session II*

For students entering 4-6th grades

6/26-30 Math Explorers

For students entering 7th and 8th grades

7/17-20 Summer Sleuths

For students entering 7-9th grades

Explorations in Biotechnology

6/19-30 *Session I*

7/17-28 *Session II*

For high school science students

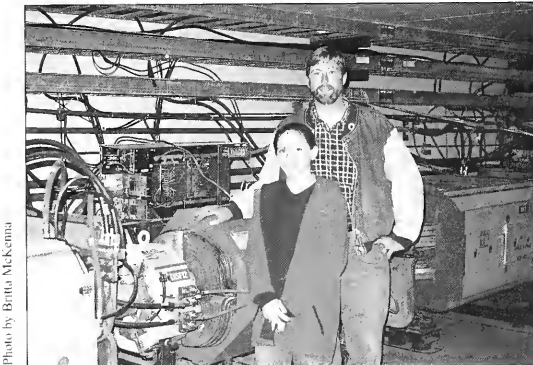


Photo by Britta McKenna

Elvin Harms, Jr. Fermilab Engineering Physicist, gives a tour of the Antiproton Source enclosure to Real Science inter-viewer Shannon Dobson '02.

IMSA Fund Hosts Luncheon for Women Leaders

Focus on Female Student Research and Preparing Tomorrow's Workforce

Several female IMSA students recently had the unique opportunity of discussing their passion for inquiry and research at a luncheon held for Chicago area women leaders.

The luncheon, sponsored by the IMSA Fund for Advancement of Education, was held to raise awareness about IMSA and its programs, and more specifically, to showcase the unique learning opportunities available for female students. The event was co-chaired by IMSA Fund Board Member Honey Jacobs Skinner and Former First Lady of Illinois Jayne Carr Thompson. In welcoming the guests, Thompson spoke about the importance of preparing tomorrow's women leaders.

"Although more women are beginning to pursue careers in mathematics, science and technology, women are still underrepresented in these fields," Thompson said. "This must change, for the sake of women and for the sake of business and society who simply need more talented women to provide expertise and leadership in these fields which are so important to future economic development and quality of life in our state, nation and world."

During the luncheon, women leaders from the corporate, education and private sectors who have an interest in exemplary educational programs heard research presentations by IMSA seniors Alexa Bisinger of Naperville and Mita Patel of Mattoon. Both Alexa and Mita participate in mentorship at IMSA, and have made substantive contributions to their respective fields of research.

"Through their research, IMSA students' substantive contributions are making the world better; from discovering a new technique in immunology to identifying better intervention programs for abused children, from identifying why prostheses disintegrate in the human body to creating mathematical formulas to predict the shelf life of products," said Mentorship Coordinator Dr. Peggy Connolly. "Thanks to the support of people like you, IMSA students are transforming human thought and experience."

Other IMSA student participants at the event included IMSA seniors Annie Vankata Narla of Springfield, Ashlee Riddle of Elgin, Donielle Newell of Naperville and Grace Yang of Chicago. IMSA student Kathleen King of St. Charles served as the pianist for the event.



Event co-chair Jayne Carr Thompson



IMSA senior Mita Patel presents the findings of her research on heart disease conducted at Loyola University Medical Center.

(At right) IMSA senior Donielle Newell discusses education with event co-chair Honey Jacobs Skinner (left) and luncheon guest Melanie Hummer, president of Hummer Financial Advisory Services, Inc. in Chicago.



Photos by Rich Malace Photography

Photo by Rich Malace Photography

Photo by Rich Malace Photography

Professional Contributions

Recent examples include:

President Dr. Stephanie Pace Marshall co-produced the play *21st Century Learning: Education on Trial* presented during the annual State of the World Forum in San Francisco, CA. The play was written by IMSA Social Science teacher Dr. Robert Kiely and Novice Network Administrator Anthony DiSanto.

Mathematics teacher **Susan Eddins** and biology teacher **Dr. Donald Dosch** recently earned certification with the National Board for Professional Teaching Standards. The NBPTS designation is a rigorous and competitive national certification process that credentials successful candidates as Master Teachers. Eddins also recently presented *Good Tasks + Discourse = Mathematical Connections* at the National Council of Teachers of Mathematics Western Regional Conference.

Mathematics teacher **Don Porzio** presented *Using TI-92 Geometry to Create Geometric Models for Optimization Problems* at the 12th Annual International Conference on Technology in Collegiate Mathematics.

Director of Enrollment Services **Dr. LuAnn Smith** co-presented *Advising and Recruiting the Young Intellectual* at the 55th National Conference of the National Association for College Admission Counseling.

Dr. Susan L.S. Bisinger, coordinator for strategic initiatives, co-presented *Effective Staff Development in 20 Minutes* at the annual conference of the National Staff Development Council.

8 faculty and staff members presented at the 51st Annual Meeting of the Illinois Council of Teachers of Mathematics.

Deb Gerdes, professional development and research coordinator, co-presented *Investigation II: Problem-based Learning with the Centers for Disease Control* at the Fall Forum Pre-conference for the Coalition of Essential Schools. Classroom teachers were engaged in a one-day PBL immersion experience organized around data from the CDC.

Karen Meyer, research associate, and **Dr. Steve Cordogan**, coordinator of research and evaluation, presented a research paper on *SAT Scores and the*

Student Descriptive Questionnaire at the 29th Annual Conference of the Illinois Association for Institutional Research. In addition, Cordogan and Research Specialist Jay Thomas presented a research paper on *Web-based Surveys in Institutional Research and Evaluation*.

Dr. Ray Dagenais, coordinator of strategic science initiatives, co-authored the chapter *The Emeritus Teacher* in the book *Life Cycle of the Career Teacher*. In addition, Dagenais' past publication on the subject of Mentoring was referenced in another chapter titled *The Apprentice Teacher*.

Dr. David Barr, director of Learning-at-a-Distance Programs, presented *Searching the Internet: Tools/Techniques* at the Illinois Education and Technology Conference.

Tracey Rosenberg, instructional program assistant in English, was awarded a Fulbright grant to Romania for the 1999-2000 school year. The Fulbright Program is designed to "increase mutual understanding between the people of the United States and the people of other countries." Rosenberg is based in Bucharest, Romania, and is researching and writing a novel about Jewish dissidents during the communist era.

Charter Librarian and Archivist **Martha Guarin** assisted Peoria High School (PHS) for two days with the preservation of school and community documents. PHS was founded in 1856 and is the oldest high school in Illinois. Guarin studied archival preservation at the National Archives in Washington, D.C.

Student Achievements

Recent examples include:

Akhil Narang of Crystal Lake and **Samir Meghani** of Naperville were named two of only 10 Midwestern Regional Finalists in the national Siemens-Westinghouse Science & Technology Competition. The competition, in its inaugural year, was open to individuals or teams of high school students who develop independent research projects in the physical or biological sciences, or mathematics.

In addition, Jason Chang of Glenview was named a regional semifinalist in the competition.

Heidi Kim of Flossmoor (1999 graduate) co-authored the paper *A role for hepatocyte growth factor during early post-implantation growth of the placental lineage* to be published in the medical journal, *Biology of Reproduction*.

Loretta Li of Naperville was one of 50 students selected from U.S. high schools to attend the 16th annual Research Science Institute at the Massachusetts Institute of Technology. During the six-week session, Loretta attended classroom instruction and research activities on the MIT campus in the summer.

Andrea Llenos of Carol Stream received a perfect score of 36 on the ACT exam. She was one of only 60 students nationwide to receive a perfect score.

43 IMSA seniors qualified as semifinalists in the 2000 National Merit Scholarship Corporation competition. Three qualified as semifinalists in the 2000 National Achievement Scholarship Program and two students qualified as finalists in the 2000 National Hispanic Recognition Program.

40 IMSA students attended the workshop *Don't Put The Flames Out: A Life in the Arts* by nationally recognized functional potter Steven Hill at Waubensee Community College.

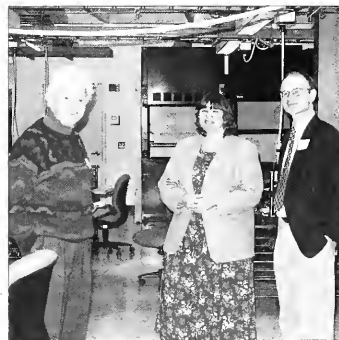


Photo by Britta McKenna

Fermilab Director Michael Witherell (right) gets a tour of the new Grainger Center for Imagination and Inquiry during the IMSA Open House. Also pictured are Dr. Judy Scheppler, IMSA Coordinator of Student Inquiry/Director of the Grainger Center, and IMSA Resident Scholar Dr. Leon Lederman. The Open House was held Dec. 7 and was attended by 200 guests.

Consortium (continued from cover)

Blagojevich said. "We cannot afford to ignore this disturbing trend."

The Institute

(envisioned for IMSA's campus)

The Institute is envisioned to be an interactive, intergenerational learning and teaching laboratory/center in mathematics, science and technology for Illinois teachers, educational leaders, policymakers and students. It will be closely linked to IMSA's pioneering academic/residential program for Illinois students and will build on and significantly scale up programs and services for Illinois educators, policymakers and students currently offered by *The Center@IMSA* (see pp. 4-5).

Marshall thanked Hastert for his leadership in helping to create this partnership. "We believe this partnership and The Institute to be designed on IMSA's campus will enable us to fulfill in an innovative and bold manner, our legislative mandate to the teachers and school systems of the State of Illinois," Marshall said.

National Teaching Academy (Chicago)

The National Teaching Academy is a Pre K-8 Chicago Public Elementary School and a 9-12 Chicago Public High School that combines classroom instruction and student learning with teacher recruitment and preparation.



Photo by Rich Aldice Photography

pictured l-to-r: Chicago Public Schools CEO Paul Vallas; IMSA Vice President for Public Policy and Service Dr. Michael Palmisano; Diane Grigsby Jackson, Chief of Staff to Paul Vallas; IMSA President Dr. Stephanie Pace Marshall; Speaker of the House Dennis Hastert; U.S. Rep. Rod Blagojevich; Board of Trustees Chairman John McEachern, Jr.

Vallas said IMSA will play an active role in the training of teachers who attend the National Teaching Academy.

"In partnering with IMSA, our mentor (master) teachers will go through various training programs at IMSA so that we can take their skills up to another level," Vallas said.

IMSA mathematics teachers Sue Eddins, who was recently certified by the National Board of Professional Teaching Standards and serves on the board of the

National Council for Teachers of Mathematics, said the focus on teacher recruitment, preparation and retention makes the IMSA-CPS partnership very compelling.

"It is incredibly exciting to know that IMSA will be working on the grassroots level of a unique partnership that can have such a significant impact on teaching and student performance nationwide, she said."



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IMS

Hosts National Education Conference

Theme: Liberating Goodness and Genius for the World

Approximately 300 educators from around the country gathered at the Illinois Mathematics and Science Academy March 2-4 for the 13th Annual Professional Conference of the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology (NCSSMST). IMSA is a founding member of the Consortium.

The conference, sponsored by a generous contribution from the Motorola Foundation, featured keynote speakers Robert Galvin, chairman of the executive committee, Motorola, Inc.; Dr. Paul Sereno, professor at The University of Chicago and world-renowned paleontol-

ogist and dinosaur hunter; and Benjamin Zander, conductor of the Boston Philharmonic Orchestra (see photos inset).

Educators attended presentations and panel discussions by IMSA faculty and staff and educators from other Consortium schools in five strands— Student Research and Inquiry, Student Leadership Development, Underrepresented/Underserved Populations, Professional Development, and Public Policy for Mathematics, Science and Technology Education.

Conference Program Coordinator Dr. Susan Bisinger said she was extremely pleased with the quality of programming for this year's conference.

"The individual break-out sessions covered a breadth of topics that engaged all the participants," Bisinger said. "The presenters did a terrific job!" (see page 3 for highlights of these sessions.)

Steve Howard, mathematics teacher at Central Virginia Governor's School, was especially impressed with the keynote speakers. "The speakers you had were FABULOUS! They could have been a conference all by themselves!"

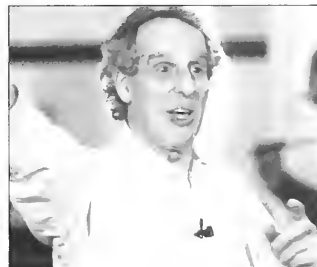
The most interactive keynote presentation was given by Zander, whose transformational, motivational and inspirational speech *Leadership, Teamwork, Creativity, Relationship, Partnership and the Liberation of the Human Spirit* featured a German sing-a-long, an impromptu cello performance and a lesson in how to transform the "ordinary" song "Happy Birthday to You" into something "extraordinary."

"The role of classical music is to take people out of the box of ordinary life ... and take people into the world of possi-

(Continued on page 3)



Robert Galvin, chairman of the executive committee, Motorola, Inc.



Benjamin Zander, conductor, Boston Philharmonic Orchestra

Dr. Paul Sereno, professor at The University of Chicago



Photos by Brian Quimby

INSIDE	
AAAS Research Conference	6
From an IMSA Partner in Education	2
Great Minds Program	5
Horwitz Lecture on Ethics	4
National Education Conference	3
News in Brief	7
Smithsonian Network	8
Summer Program Registration	8



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State Superintendent
Illinois State Board of Education

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Chemist
Separation Science and Technology Section
Argonne National Laboratory

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Aurora Metals Division L.L.C.

Dr. Marsha R. Rosner
Professor
The Ben May Institute for Cancer Research
The University of Chicago

Dr. Keith Sanders
Executive Director
Illinois Board of Higher Education

Jesus Manuel Sosa
Administrator
Chicago Public Schools, Region One

Sharon Tenhouse
Teacher and Parent Educator
Community Unit School District #2 (Liberty, IL)

Dr. Alfonso Thurman
Dean, College of Education
Northern Illinois University

Dr. Michael S. Turner
Department Chairman
Department of Astronomy & Astrophysics
The University of Chicago

President

Dr. Stephanie Pace Marshall

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brenda@imsa.edu

From an IMSA Partner in Education



Dear IMSA Shareholders,

As a long-term partner in education and teacher professional development with the Illinois Mathematics and Science Academy, I am pleased to share highlights of the Smithsonian Institution's work with IMSA to help transform mathematics and science teaching and learning in Illinois.

The Smithsonian Institution's support of IMSA began in 1992 with a unique partnership designed to develop innovative curriculum models in mathematics and science that could be shared with teachers to help improve mathematics and science teaching and learning. Eight years later, the IMSA-Smithsonian Partnership continues to grow and is now focused on measuring the impact of curriculum models in schools.

This year, 11 Illinois middle and high schools are working with IMSA as part of the Smithsonian Research and Diffusion Network. The Network is supported by a grant from the Smithsonian Institution and is designed to gather evidence to see how innovative educational approaches are transforming teaching and learning in Illinois.

Members of the Smithsonian Research and Diffusion Network use several IMSA-developed curriculum models in their classrooms including problem-based learning, integrated science, mathematical investigations, interdisciplinary instruction and curriculum alignment with state standards.

As Director of the Smithsonian Institution's Center for Education and Museum Studies, working with IMSA gives me great hope and excitement for the future of education in America. IMSA's commitment to educational excellence and teacher professional development serve as a model for the rest of the country.

I am proud to work in collaboration with IMSA and want to thank you, our shareholders in the public and private sectors, for supporting IMSA's work.

Sincerely,

Ann Bay
Director, Smithsonian Center for
Education and Museum Studies

Conference *(continued from cover)*

bility," Zander said. "My job is to remind people of the rhythm of transformation."

Speaking on the theme of leadership, Zander said that we all have the choice to lead and to transform all of life's experiences.

"There are three possible responses for all life's situations: resignation, anger and possibility," Zander said. "It's all invented ... so why don't we invent something that lights up our life and the life of the people around us, because we actually have the choice to do that all the time."

The NCSMST is the nation's foremost alliance of schools dedicated to

transforming mathematics, science and technology education. There are more than 60 member schools in the Consortium representing about half the states. Affiliate members include colleges and universities throughout the U.S.

Two IMSA staff members serve on the NCSMST Board of Directors. They are mathematics teacher Susan Eddins and research specialist Jay Thomas.

**Examples of
NCSMST
Conference
Sessions**

*Fostering Leadership
through the Community
Development Program*

*Unlocking Goodness and
Genius through Research,
Inquiry and Investigations*

*Teaching Inquiry with the
Latest Technologies*

Physics for Everyone

*Crossing Boundaries:
Integrating Math
and Science*

*State Standards and the
Specialized School*

*Where Do They Go From
Here? A Longitudinal Study
of NCSMST Graduates*

*Panel: Identifying
and Serving
Talented Minorities*

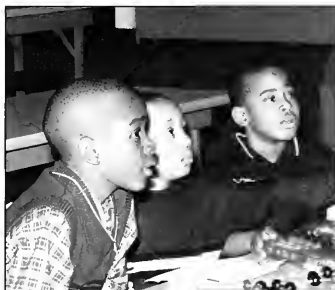
*Economic Theory, Derivative
Trading and the Internet*

*Forensic Science in
High School*

*The Discovery-Based
Learning Approach
to Diversity*



Presenter Dana Yancoskie shows how to use patty paper to explore math topics such as Algebra I & II and Precalculus.



Children from Cabrini Green in Chicago demonstrate their love for biochemistry in a DNA Learning Lab presentation. IMSA students help to teach the children as part of a mentorship and community service project.



Benjamin Zander leads NCSMST conference participants in a rousing rendition of "Happy Birthday to You."

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*Honorary Members

Rabbi Lawrence Kushner Attracts Crowd of 400 to Ethics Lecture

Rabbi Lawrence Kushner attracted more than 400 people to the eighth annual Richard L. Horwitz Lecture on Ethics held April 4 in the IMSA auditorium.

Rabbi Kushner, widely regarded as one of the most creative religious writers in America, presented his lecture *Invisible Lines of Connection: Social Responsibility and Cowardice*.

The lecture series is held in memory of Aurore Richard Horwitz, IMSA's first legal counsel, who died in August 1990. Lectures are presented by prominent leaders in education, government and the private sector for IMSA faculty, staff, alumni and seniors, and friends and family of Richard Horwitz.

Rabbi Kushner served as rabbi of Congregation Beth El in Sudbury, Massachusetts, a suburb of Boston, for the past 27 years. Through his lectures, articles and 10 books, he has helped

shape the agenda for personal and institutional spiritual renewal.

A well-published author, his most recent books include *Eyes Remade for Wonder* (1998) and *Invisible Lines of Connection* (1996). Following the lecture, Kushner signed copies of his books and met with students, staff and guests for a special reception.

The Horwitz lecture is supported by the Richard L. Horwitz Ethics Lecture Fund within the IMSA Fund for Advancement of Education. The IMSA Fund is a not-for-profit corporation that enlists investments of corporate, foundation and individual donors in the Academy. These investments support curriculum development projects, statewide outreach programs, minority recruitment programs, laboratory equipment purchases, facility enhancements, special student activities and a permanent endowment.

Photo by Rich Malac Photography



Registration Open for Summer Programs of The Center@IMSA

IMSA is accepting registration for a variety of professional development experiences being offered from May through August in mathematics, science and problem-based learning. These experiences are most appropriate for middle and high school teachers. Call The Center@IMSA at (630) 907-5956 or email center@imsa.edu for more information or to register for a professional development program.

In addition, registration is open for programs of the IMSA Kids Institute for students in grades 7-12. Call the IMSA Kids Institute at (630) 907-5041 or email klong@imsa.edu to register.

Great Minds 2000 Program Events



Dr. Louis Gomez speaks about educational technology during the Great Minds Dialogue "Frontiers of Educational Technology" held January 24.

Photo by Rich Malec Photography



Nobel Laureate Dr. Mario Molina speaks about global warming during the Great Minds Lecture "The Science and Politics of Climate Change" held January 6.



Dr. Bob Tinker & Alan November discuss their views of educational technology in the future.



(l-to-r) Nobel Laureate Dr. Mario Molina, IMSA President Dr. Stephanie Pace Marshall and Nobel Laureate Dr. Leon Lederman.



Photo by Brian Quinby

Photo by Brian Quinby

Photo by Brian Quinby

Photo by Rich Malec Photography

IMSA Students Present Impressive Work at National Professional Conferences

IMSA students recently showcased the results of their hard work while attending several national professional conferences.

Nineteen IMSA students and one student from Niles West High School represented the Illinois Junior Academy of Science at the AAAS/AJAS Annual Meeting and Science Innovation Exposition February 17-22 in Washington, D.C.

The 166th national meeting of the American Association for the Advancement of Science (AAAS) brought together more than 5,000 scientists, engineers, educators, policy-makers, and researchers in a multi-disciplinary forum to share the latest research advances.

Students from IMSA and Niles West made oral and poster presentations on their research projects as representatives of the Illinois Junior Academy of Science (*see list*). As part of the annual AAAS meeting, the American Junior Academy of Science showcases the work of promising future scientists who represent their state Junior Academies from across the nation.

IMSA students conducted their research as part of the Student Inquiry and Research Program (SIR). This challenges students to engage in scholarly and scientific investigation, as well as creative and artistic expression. This process culminates in the exhibition of products of ethical research, study and creativity.

In addition to presenting at the AAAS conference, students also made presentations at the joint National Conferences of the National Association of African American Studies, National Association of Hispanic and Latino Studies, National Association of Native American Studies and International Association of Asian Studies.

The joint national minority conference was held February 21-26 in Houston, Texas, and IMSA was the only high school invited to attend.

Students Bayly Wheeler of Glen Ellyn and Anjali Joshi of Schaumburg made presentations on the CYCLE's WIZ Factory of Learning program for students from North Town Cabrini Green.

Wheeler and Joshi created the "Girls Love Math Lab" for students in grades K-2 from the Cabrini Green low-income housing development. Students Kiyomi Davis of Calumet City and Nicole Brown of Oak Lawn made a presentation on the IMSA Science Explorers program for students in grades 4-6.

The trips for the IMSA students were sponsored in part by the Lucent Young Scientist Program, created by a grant from Lucent Technologies of Naperville.



In partnership with the Smithsonian Institution, IMSA student Jennifer Vanichsombat of Chicago introduces 5th grade students at Stuart-Hobson Magnet School in Washington D.C., to IMSA's Science Explorers Program.

Photo by Britta McKenna

IMSA Research Presenters
2000 AAAS Annual Meeting and Science Innovation Exposition

<p>Alexa Bisinger (Naperville) <i>The Effects of Hypoxia on the Frequency of Gasp-like Rhythm Generation in Mice</i></p> <p>Jason Chang (Glenview) <i>Cloning and Characterization of a Novel NLS Receptor, Importin 4, from Caenorhabditis elegans</i></p> <p>Sylvie Chau (North Aurora) <i>The ADP Pathway as a Mechanism for Platelet Activation in HIT</i></p> <p>Jennifer Creamer (Brimfield) <i>Underhair Structure of Castor Canadensis and Its Historical Implications</i></p> <p>Thomas Kim (Naperville) <i>Isolation and Characterization of Human Anti-alphaGal IgG Antibodies</i></p> <p>Jennifer Leung (South Barrington) and Jill Starzyk (St. Charles) <i>Pediatric AIDS: HIV-1 Viral Burden, VIRAL BURDEN, CD4/CD8 Counts, and the role of VPR in Disease Prevention</i></p> <p>Loretta Li (Naperville), Steven Andreoli (Wheaton), and Matthew Noesen (Bartlett) <i>Analysis of the MLL Breakpoint Cluster Region to Identify Sequence Polymorphisms</i></p>	<p>Melvy Mathew (Downers Grove) <i>Investigations of How Mutations in Large T-Antigen Affect SV40 Growth</i></p> <p>Akhil Narang (Crystal Lake) and Samir Meghani (Naperville) <i>Optimization of Magnetic Field Homogeneity With Respect to the Nuclear Magnetic Resonance Spectrometer Coil Geometry</i></p> <p>Donielle Newell (Naperville) & Jennifer Vanichsombat (Chicago) <i>Science Explorers: Hands-On Learning.</i></p> <p>Mita Patel (Mattoon) <i>Monitoring of the Anti-platelet Effects of New Drugs for the Management of Acute Myocardial Infarction</i></p> <p>Ashlee Riddle (Elgin) <i>Fabrication of Porous Structures Using Layered Manufacturing</i></p> <p>Clara Shih (Arlington Heights) <i>Development of a PVDF film sensor for infrastructure monitoring</i></p> <p>Himabindu Vidula (Naperville) <i>Assaying the Effects of FGF on Mouse Embryonic Stem Cell Differentiation to Myocardial Cells</i></p>
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Grainger Center Awards

IMSA's Grainger Center for Imagination and Inquiry received the Shirley Cooper Award from the American Association of School Administrators, American Institute of Architects and Council of Educational Facilities Planners; this is one of the top honors given by AASA each year. The Grainger Center also was recognized for excellence in the design of Educational Environments by the Illinois Association of School Boards.

Fort St. Louis des Illinois



For three+ years, IMSA students under the supervision of social science teacher **Dr. Claiborne Skinner**, have researched and built an incredible diorama that depicts "The Siege," a 10-day battle between the Iroquois, the French officers, and Illiniwek Indians in the Fort (see photo). The defeat of the Iroquois was a prelude to the French and Indian Wars and France's claim to the entire Mississippi Valley. It marked a turning point in the history of colonial America.

Fort St. Louis des Illinois, from 1682-1691 France's westernmost outpost, will go on permanent display at Starved Rock State Park in Utica, Illinois, this year.

Professional Contributions

Recent examples include:

President **Dr. Stephanie Marshall** was recently appointed to a national commission for the National Academy of Science to recommend programming for the advanced study of math and science for American youth.

German teacher **John Stark's** article "Educating Global Citizens," was published in the January-August 2000

edition of *Lernwelten*, Issue 3, a journal of the Goethe Institute, New York, for German students in the USA.

Tonda Hager, coordinator for professional development in mathematics, presented a workshop on advocacy for girls in mathematics and science at the Association of Girl Scout Executive Staff's spring 2000 conference in Elgin, IL.

Mathematics teacher **Ruth Dover** recently presented a workshop on technology applications in the mathematics classroom at the Teachers Teaching with Technology Annual Conference in Dallas, Texas.

Julia Husen, Russian teacher, presented a session on video assessment in foreign language classrooms at the American Association for the Advancement of Slavic Studies conference in St. Louis.

Mathematics teacher **Dr. Don Porzio** is serving on the Program Committee for the 13th Annual Illinois Council of Teachers of Mathematics (ICTM) International Conference on Technology.

Ted Parge, vice-president for institutional advancement, was appointed to the board of directors for Avery Coonley School in Downers Grove, IL.

Eight staff members presented sessions for 320 Illinois educators at IMSA's Great Minds Program *Frontiers of Education Technology* Jan. 24. They were **Dr. David Barr**, **Ruth Dover**, **Dr. Don Porzio**, **Dr. Mark Horrell**, **Britta McKenna**, **Dr. Steven Rogg**, **Catherine Veal** and **Matt Wicks**.

Dr. David Barr, director of Online Learning Programs, presented *Introduction to Internet Information Literacy Concepts* to school and public librarians in Illinois School Districts 203 and 204.

English teacher **Dr. Riva Kuhl** served as Poet-in-Residence at the Mary Anderson Center for the Arts in Mt. St. Francis, Indiana, from May 1-7.

Student Achievements

Recent examples include:

IMSA captured first place in overall points in this year's North Suburban Math League competition. **Kartik Lamba** of Downers Grove placed first overall at the Senior level.

Donielle Newell of Naperville, one of 20 outstanding African-American high school seniors nationwide, is the only student from Illinois to be named a Ron Brown Scholar. She was awarded a \$40,000 college scholarship by the CAP Charitable Foundation (USA).

Jason Chang of Glenview was named a semifinalist in this year's Intel Science Talent Search competition for his research on a cell's regulation of the nuclear transport process.

Yogesh Raut of Springfield was named First Team All-State for the 1999-2000 season by the Illinois High School Scholastic Bowl Coaches' Association.

The Science Olympiad Team recently won the regional competition and qualified for state competition. Eleven of the 15 team members earned one or more first place medals.

Matt Noesen of Bartlett, **Margaret Anderson** of Chicago and **Carl Pickerill** of Genoa have won a year-long student trip to Germany sponsored by the U.S. Congress and the German Bundestag.

Because of their high scores on the American Mathematics Competition test, 96 students are eligible to participate in the American Invitational Math Exam. Fourteen students are on the Chicago Area All Star Math Team.

Student saxophonist **Mark Zelesky** of Calumet City received an award in the National Foundation for Advancement in the Arts' 2000 Arts Recognition and Talent Search program.

Winn Wasson of Dixon, **Christopher Young** of Westchester and **Ryan Kelly** of Makanda scored in the 99th percentile on this year's national German exam sponsored by the American Association of Teachers of German.

Angela Campbell of Geneva participated in the NASA Reduced Gravity Student Flight at Johnson Space Center in Houston.

Seven students won awards in the Advanced level of the 18th National Russian Contest.

Smithsonian Partnership Flourishes: Network Established to Research Effects on Student Learning

Since 1992, the Smithsonian Institution has generously supported IMSA's work to develop innovative curriculum models in science and mathematics to share with schools throughout Illinois. Eight years later, the IMSA-Smithsonian Partnership continues to flourish with the recently established Smithsonian Research and Diffusion Network.

The Smithsonian Research and Diffusion Network, developed this year and supported by a grant from the Smithsonian Institution, is designed to gather evidence to see how these innovative approaches are transforming teaching and learning in Illinois schools.

Dr. Linda Brazdil, coordinator of the Network, said it is important to help support teachers in their work and to gather evidence that shows how innovations are affecting changes in classroom instruction and school-wide practices.

"While the ultimate goal is improved student learning, it is changes in teachers' knowledge, skills and attitudes that lead to modifications in classroom conditions and activities that enhance student learning," Brazdil said. "Changes in school-wide practices also are necessary

to sustain and support innovations so that student achievement is improved."

Illinois schools selected for the network represent urban, suburban and rural communities. All of the schools in the network have a history of long-term involvement in IMSA's professional development programs and have teachers and administrators that are committed to curriculum innovation. Members of the Smithsonian Research and Diffusion Network in the 1999-2000 year include:

Alan B. Shepard High School

Aurora West High School

Burr Ridge Middle School

Charleston Middle School

Hinsdale Central High School

Lisle High School

Morton High School

Newark High School

Niles North High School

Roxana High School

Williamsville Junior High School

The curriculum models being tested at partner schools include problem-based learning, integrated science, mathematical investigations, interdisciplinary instruction and curriculum alignment with state standards.

In addition to gathering important evidence about student learning in the classroom, the network also provides opportunities for professional development in classroom-based action research.

The Smithsonian Research and Diffusion Network provides valuable benefits for both IMSA and the member schools. "The network schools are able to receive technical support from IMSA in the design of action research projects, data collection/analysis and reporting of results," Brazdil said. "Most importantly, the network schools will have data highlighting the effects of their innovations and supporting continued innovation to enhance student achievement in mathematics and science."

"IMSA's involvement with the Smithsonian Research and Diffusion Network gives us formative data to help improve our professional development programs statewide and to measure the usefulness of IMSA-developed models to teachers in local school settings."



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Volume 14 No. 3 • Summer 2000

Seniors Present at Prestigious Russian Research Conference; Elsenheimer Wins Highest Honor

In 1999-2000, IMSA student researchers presented their work at several national and international scientific conferences. The year's presentations ended half way around the globe in Russia May 14-21 at Sakharov's Readings, a highly selective research conference in St. Petersburg.

Sakharov's Readings Presentations St. Petersburg, Russia • May 14-21, 2000

Probing the Birth of the Solar System – this research involves the analysis of meteorites to determine the chemical and environmental conditions present during the creation of the solar system. **IMSA Student Researcher:** Rebecca Elsenheimer (Lisle) **Mentors:** Drs. Steven Simon and Lawrence Grossman, University of Chicago

Underhair Structure of Castor Canadensis and its Historical Implications – this research challenges centuries-old beliefs about the morphological structure of animal pelts.

IMSA Student Researcher: Jennifer Creamer (Brimfield); **Co-Investigators:** Erika Conrad (IMSA '99); Nicole Gerlach (IMSA '98); Zachary Shipp (IMSA '98) **Mentor:** John Thompson, IMSA

Optimization of Magnetic Field Homogeneity with Respect to the Nuclear Magnetic Resonance Spectrometer Coil Geometry – this research involves refining imaging equipment with applications for medicine such as more sensitive diagnosis of brain tumors. **IMSA Student Researcher:** Akhil Narang (Crystal Lake); Samir Meghani (Naperville) **Mentor:** Dr. Alan Feinerman, University of Illinois at Chicago

Monitoring of the Anti-Platelet Effects of New Drugs for the Management of Acute Myocardial Infarction – this research involves determining the efficacy of new medicines used to treat coronary disease. **IMSA Student Researcher:** Mita Patel (Mattoon) **Mentors:** Drs. Jawed Fareed and Debra Hoppenssteadt, Loyola University Medical Center

Development of a PVDF Film Sensor for Infrastructure Monitoring – this research involves developing a technology to monitor stresses in structures such as bridges and highways as well as medical equipment. **IMSA Student Researcher:** Clara Shih (Arlington Heights) **Mentors:** D. Satpathi, J.P. Victor, M. L. Wang, H. Y. Yang and C. C. Shih, University of Illinois

Six seniors were among 210 young researchers from throughout the world who were invited by the Russian Academy of Sciences to participate in the conference. IMSA students' research, which was reviewed by a panel of scientists and researchers from the Academy and the Ioffe Physics Institute, represents geophysics, imaging technology, pathology and engineering fields.

The research conference is held annually as a tribute to the memory of physicist and Nobel Peace Laureate Dr. Andrei Dmitrievich Sakharov. The IMSA students' trip was underwritten in part by The Lucent Technologies Young Scientist Fund.

"The invitation to present research at this prestigious conference is an acknowledgment of the substantive contributions to science these young researchers have made," said Mentorship Coordinator Dr. Peggy Connolly. "It is a well-deserved honor, and I am very appreciative of the mentors who guided the students to this level of accomplishment."

Rebecca Elsenheimer of Lisle received the highest recognition given at the conference for her work on the birth of the solar system. Delivered in Russian, Elsenheimer's presentation was cited for "fundamental and physically significant choice of problem."

In addition, Akhil Narang of Crystal Lake and Samir Meghani of Naperville were awarded honors for "Impressive synthesis of theoretical research and experimental development."



IMSA student Rebecca Elsenheimer of Lisle delivered her research in Russian.



Mita Patel of Mattoon presents her research on coronary disease treatments. Standing with Patel is IMSA Russian teacher Julia Husen.

Photo by Dr. Peggy Connolly

Commencement – Class of 2000	3
From IMSA Parents	2
Great Minds Program Calendar	3
IMSA Fund Highlights	4
IMSA Kids Institute	5
IMSA-Shepard Research Partnership	8
Staff Professional Contributions	6
Student Achievements	7



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From IMSA Parents



Dear IMSA Shareholders,

Graduation 2000 was a wonderful day that will forever be fondly remembered by our family and others. Many emotions, reflections and ideas for the future all converged upon us as we watched the graduates receive their diplomas and academic medallions.

An emotional day... thinking about how our first born soon would be attending an educational institution 2000 miles away. An emotional day... appreciating that our son, Jonathan, had been given a wonderful opportunity at IMSA, receiving one of the best educations possible. An emotional day... saying goodbye to people who cared for and about Jonathan with extraordinary dedication. We savored these emotions because as parents, we knew we had helped direct Jonathan to the "right" place.

A day of reflection... recalling how overwhelmed we were three years ago to learn of the vast number of opportunities that awaited each IMSA student. A day of reflection... remembering how initially at IMSA we felt technologically and scientifically in a different world. We didn't care, however, because it seemed to be what the students were looking for. A day of reflection... recalling how Jonathan organized his room away from home and how we took comfort in IMSA's high expectations for ethical behavior.

A day viewing the future... being grateful for an institution that has shaped and expanded inquisitive minds, preparing them for a world with many unknowns ready to be discovered. A day viewing the future... admiring dedicated students who embrace a larger service that transcends individual self-interest. A day viewing the future... appreciating students who are genuinely committed to improving their respective locales and the entire universe.

Graduation solidified our commitment to a renaissance development for our children. A craving for expansion was evident, and the excitement of approaching scientific mysteries is ever present. However, fostering a renaissance atmosphere does not occur automatically or magically. It requires hard work, discipline, consistency, an integrated approach and dedication from all involved – the board, staff, students and parents. We appreciate IMSA's commitment to the renaissance student. Our sincere thanks to the People of Illinois for supporting IMSA's work and to an institution that make us feel proud.

Sincerely,

Carol and John Berger

Former NASA Astronaut Dr. Mae Jemison Urges Graduates to Take Risks and Care for Planet Earth



Photo by Rich Malice Photography

As the first African American female astronaut to travel into space, Dr. Mae C. Jemison knows what risk-taking means. As the owner of a company dedicated to using science and technology for the benefit of everyday life, she understands what caring for Planet Earth means.

"Technology is just a tool," Jemison told IMSA Class of 2000 graduates. "At its best, technology should address and further three needs: to be loved, to feel safe and to be happy."

Proud family members and friends assembled on June 3 at the Paramount Arts Centre in Aurora to hear Jemison's words of wisdom and honor 191 seniors as they received their diplomas and academic medallions.

Jemison said that the field of science is misunderstood by many, including those who are closest to it. She said there is much more to science than just the mathematical, technical side.

"At the heart of science are the words I think, I wonder and I understand," Jemison said. "To me, science is a search for understanding and technology is putting that understanding into some practical use."

Donielle Newell of Naperville and Mathew Blaine Eubanks of Eldorado were the student speakers.

Impressive Service to Illinois

All members of the Class of 2000 contributed at least 80 hours of community service to Illinois. However, the Class' cumulative hours totaled more than 20,000 with 70 students completing 100 or more hours. Examples included:

Michael Sunu—324 hours at Edward Hospital in Naperville and the Muscular Dystrophy Association in Hinsdale

Ajali Vijayakumar—301 hours at Veteran's Administration Hospital in Chicago and CYCLE Program in Cabrini Green in Chicago

Stacey Cruz—296 hours at Elssy Fabela Foundation and McCleery Accelerated School, Aurora

Amith Bokka—266 hours at Rush Copley Medical Center, Aurora

Sarah Hoffman—257 hours at Alexian Brothers Medical Center in Palatine and McCleery Accelerated School in Aurora

Jessica McAlear—250 hours at ADOPT (Animals Deserving of Proper Treatment) in Naperville.



Photo by Carol and John Berger



Photo by Rich Malice Photography

Above: IMSA President Dr. Stephanie Marshall is pictured with Stanford University graduate Dr. Mae Jemison and soon-to-be Stanford student Jonathon Berger.

Below: Vanessa Clark is overjoyed that her years of hard work at IMSA have finally paid off!

Great Minds Program - Save the Dates!

The Great Minds Program supports IMSA's learning agenda by creating unique teaching and learning opportunities to help shape mathematics and science education policy in Illinois and the nation. The intellectual resources of the Great Minds Program are shared with students and teachers throughout Illinois and the nation through seminars, dialogues, community lectures, on-line chat groups and the website (<http://webdb.imsa.edu/greatminds/>).

Fall 2000 Great Minds Program Calendar of Events

Great Minds Seminars

for IMSA students, staff and invited guests
September 18, 2000
Douglas Hofstadter, Mathematician
Title: *A Jolly Romp in the Euclidian Plane, Where Points and Lines Have Their Roles Reversed*

October 5, 2000, 10:30 am—noon
Lynn Margulis, Biologist on Endosymbiotic Theory

Title: *The Living Earth from Space*

Great Minds Community Lecture for the general public

October 17, 2000, 7:30 pm
(post-reception with book signing)
Nobel Laureate and IMSA Resident Scholar Dr. Leon Lederman
Title: *Science and Anti-Science: Technology and Its Burdens*

Great Minds Dialogues

for Illinois educators and students
October 25, 2000, 10:00 am—noon
for high school students only
Chemist Dr. Luis Nuñez and Physicist Dr. Herman White
Stories of a Scientist

For more information, contact Dr. Judith Scheppler at (630) 907-5899 or email greatminds@imsa.edu.

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Internet Toolkit Gets \$50,000 Boost; IMSA Fund Welcomes New Investors

This summer, State Senator Chris Lauzen presented IMSA with a \$50,000 check from the Illinois Department of Commerce and Community Affairs (IDCCA). (See photo below). The grant will support further dissemination of IMSA's Internet Toolkit to Illinois educators. This is part of IMSA's Internet Information Fluency project.

The Toolkit, developed by IMSA, includes a set of learning materials and software tools that helps educators more easily and effectively navigate the web (<http://toolkit.imsa.edu>).

"In the coming year, the grant will help us to field test the online workshop with 50 Illinois educators (teachers, librarians and media/technology coordinators) and develop model lesson plans using Internet Toolkit materials and tools," said Dr. David Barr, director for development of online resources.

SBC Supports Minority Recruitment

The IMSA Fund was named one of five not-for-profit organizations to share a \$210,000 contribution awarded in connection with the SBC 2000 Senior Open golf tournament held June 8, 2000.

The \$25,000 contribution will advance outreach programs for minority students in mathematics and science. Some of these include the Early Involvement

Program for 9th graders from Aurora, East St. Louis Joliet and the Summer Enrichment for Academics in Mathematics and Science program for 8th graders from Chicago.

"This recent contribution will allow us to expand our outreach efforts throughout Illinois so that we can recruit and retain more minorities who want to pursue careers in mathematics and science." Ted Parge, IMSA vice-president for institutional advancement said.

New Investors

Several new investors were recently added to the ranks of those contributing to IMSA's external and internal programs for students and teachers.

These include:

- Pritzker Foundation (for the Great Minds Program-see pg. 3).
- Nalco Foundation (for minority recruitment and retention programs).
- American Honda Foundation (for the Kids Institute-see opposite page).
- ComEd (for minority recruitment and retention programs).

Other 1999-2000 highlights included a \$20,000 grant from The Lumpkin Foundation for development and dissemination of the Internet Toolkit and \$5,000 from Ford Motor Co. for scholarship support of deserving IMSA students.

In reflecting on the fiscal 2000 year, Parge noted that the additional

\$1.6 million federal grant for IMSA (part of the IMSA-Chicago Public Schools partnership) brings the total amount for external funding of Academy programs to a record \$2.9 million.

"IMSA was formed as a working partnership between the public and private sector and the financial results of FY 2000 clearly demonstrate growth in these key areas." Parge said.



Photo by Brenda Buschbacher

Pictured (l-to-r) are Dr. David Barr, State Senator Chris Lauzen and IMSA President Dr. Stephanie Marshall.

IMSA Kids Institute Expands Summer Programs

Biotechnology and Math Explorers Attract New Illinois Students

In 1998, the IMSA Kids Institute began with just 50 students who signed on as IMSA's first class of *Science Explorers*. Since then, the Kids Institute has grown to serve nearly 300 Illinois students in the summer and 600 students during the school year. In addition, 350 Illinois schools each received a copy of the 1999 edition of the *Real Science* CD-ROM.

Building on this success, IMSA hosted two new "camps" this year. *Math Explorers*, for students entering 8th and 9th grades in the fall of 2000, was held June 26-30. *Explorations in Biotechnology*, sponsored by the Chicago Public Schools for Chicago students entering 10th grade in the fall, was held June 19-30.

IMSA also hosted two sessions of *Science Explorers* for students entering 4th-6th grades and *Summer Sleuths* for students entering 7th-9th grades.

Chicago Students Delve into DNA

Students from seven Chicago high schools spent two weeks at IMSA, performing experiments such as bacterial transformation, DNA spooling, polymerase chain reaction, restriction enzyme analysis, and gel electrophoresis of proteins.

These experiments were part of the *Explorations in Biotechnology* camp, a program led and developed by IMSA staff members Dr. Don Dosch, Dr. Steve Rogg, Dr. Judith Scheppeler and Dr. Sue Styer.

Guest Speakers Kelly Connerton-Moyer of Loyola University Medical Center, and Russell "Bo" Kowalczyk from MediChem, spoke about genetic birth defects and work at biotechnology companies respectively.

The final day, students presented posters about medical advances related to biotechnology.

Math Explorers Solve Complex Problems

More than 50 Chicagoland students cracked codes using cryptography, constructed mobiles using geometry principles, designed fractals on computers and played mathematical games



Photos by Britta McKenna

Clockwise from top: "Science Explorers" Emily Burkner (left) and Sara Shankman of St. Charles are testing natural water filtration techniques.

Chicago Public School students perform experiments in IMSA's Grainger Center for Imagination and Inquiry.

Science Explorers students demonstrate what type of shoes are needed on Mars during the Mars Millennium Day.



using logic during IMSA's inaugural *Math Explorers* Program.

This experience was developed by IMSA students with assistance from Academy mathematics faculty.

Mathematics teacher Chuck Hamberg, featured mathematician for the week, said the 'explorers' were introduced to mathematical concepts not typically found in a middle school math curriculum including branches of discrete mathematics. He said it was exciting to see IMSA students sharing their passion for mathematics.

"It was wonderful to watch the IMSA students grow as 'coaches' and build upon and modify their curriculum based upon the learners' questions," Hamberg said.

Real Science 2000 CD-ROM

The Kids Institute recently released the newest issue of its *Real Science* CD-ROM and plans to distribute it to more than 500 Illinois schools this fall.

The *Real Science 2000* CD-ROM, funded in part by Nortel Networks, is an interactive science CD entirely produced by IMSA students for Illinois 3rd-5th grade classrooms. The purpose of the project is to help spark young students' interest in science.

The latest version is now compatible on Windows or Macintosh platforms.

For a free copy of the *Real Science 2000* CD-ROM, contact Kathleen Long at 630.907.5041 or email klong@imsa.edu.

Professional Contributions of IMSA Staff Benefit Education

By Catherine C. Veal

One way the Illinois Mathematics and Science Academy serves the educational community in Illinois and beyond is through the professional contributions of its faculty and staff. Many give generously of their time, expertise and talent to help improve education in Illinois and beyond.

Examples of professional contributions by IMSA staff in 1999-2000 include:

Dr. Stephanie Pace Marshall, president, wrote an invited article "A New Story of Learning and Schooling" for the millennial edition of *The School Administrator*, December 1999. She also was named to the National Academy of Sciences Committee for the Study of Programs for Advanced Study of Mathematics and Science in American High Schools. Nobel Laureate and Resident Scholar **Dr. Leon Lederman** presented *Science Education Research* on IMSA's Great Minds Program and the ARISE program at the National Association for Research in Science Teaching Conference.

Susan Eddins, curriculum and assessment leader in mathematics, was a co-teacher on a grant given to The University of Chicago to upgrade the mathematical content knowledge of teachers in the Chicago Public Schools. She also helped write the *Principles and Standards for School Mathematics* (2000), the update of the original National Council of Teachers of Mathematics Standards (1989).

Dr. Raymond Dagenais, curriculum and assessment leader in science, was the principal author of the chapter *The Emeritus Teacher* in the book *Life Cycle of the Career Teacher*, published by Corwin Press in January 2000.

Dr. Judy Scheppeler, coordinator of student inquiry, co-authored the book *Biotechnology Explorations: Applying the Fundamentals*, Washington, D.C.: ASM Press. The book (see graphic above) exposes high school and college students to modern DNA technologies.

Mathematics teacher **Chuck Hamberg** was a member of the AYA/Mathematics Standards Committee for the National Board for Professional Teaching Standards. His colleague **Ruth Dover** presented *Logistic Differential Equations* at this year's National Council of Teachers of Mathematics Annual Meeting and sessions at the Teachers Teaching with Technology national conference.

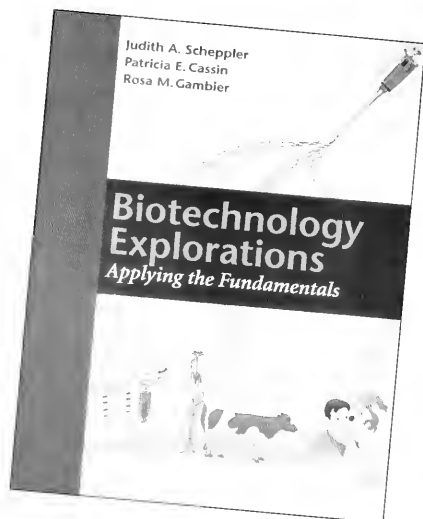
Matthew Wicks, director of virtual learning, co-chaired the Illinois Virtual High School Steering Committee.

Mentorship Coordinator **Dr. Peggy Connolly** presented *Creating Power from Potential: Young Women Scientists & Scholars* at the Women's Leadership Institute Symposium.

Willa Shultz, foreign language teacher, led a National Coalition Building Institute Diversity Workshop for The Institute for Educational Leadership. Her colleague **John Stark** served on the editorial board of *The Unterrichtspraxis*, a journal devoted to applied linguistics and the teaching of German published by the American Association of Teachers of German.

A number of staff presented sessions at the 13th Annual Professional Conference of the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology Conference. Examples include:

- **Paula Altekruse**, study skills specialist, a session on empowering passive learners;
- **Don Porzio** and **Michael Sloan**, mathematics teachers, a workshop on the Texas Instruments TI-89 calculator;
- **Dr. John Eggebrecht**, science teacher, and **Susan Yates**, mathematics teacher, a session on integrating mathematics and science (they also presented at the National Science Teachers Association and the National Council of Teachers of Mathematics Annual Meeting);



• **Jay Thomas**, research specialist, (see photo opposite page) a session on the results of the first year of the NCSSMST longitudinal study, an investigation involving 10 member schools and more than 400 student interviews and

• **Dr. Steve Cordogan**, a session on SAT scores, weighting and prediction (he also presented papers at the Annual Meeting of the American Educational Research Association).

Dalia Bach, music teacher, led a session for choral educators from Illinois and neighboring states at the American Choral Directors Association Annual State Conference. Wellness Team members **Barbara Baber**, **John Martin** and **Nancy Todnem** presented the Wellness standards-based curriculum to the Naperville Central High School health and physical education staff. The editor of the society newsletter *News and Notes*, **Dr. Christian Nokkented**, social science teacher, served on the executive council of the Society for the Advancement of Scandinavian Studies.

Sandee Donahue, coordinator of information resource center and electronic media, served as chair of the Illinois Library Association (ILA) Awards Committee. In April, she was elected Vice-President/President Elect

(continued on page 7)

Kelly McArdle of Elmwood Park, **Brian Park** of Park Ridge, **Erica** and **Alison Ruddy** of Aurora, and **Margaret Wat** of Naperville presented their research at the Seventh Annual Student Research Symposium of the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology June 8-11 at Lynchburg College in VA.

Jung Hong of Niles won first place for the Individual Written Competition (Senior Division) at the Future Problem Solving Program International Conference June 8-11 at the University of Georgia in Athens, GA.

Nia Dukov of Chicago took first place in the National Spanish Exam competition (Level 2) for the Chicagoland area. More than 600 secondary school students took the exam.

Clara Shih of Arlington Heights was one of only two Illinois students selected to be a 2000 Presidential Scholar by The White House Commission on Presidential Scholars.

Kartik Lamba of Downers Grove and **Dan Mellis** of Chicago were two of only 175 students nationwide who qualified to take the semi-final exam for the U.S. Physics team.

Christine Tsai of Naperville was accepted to MIT's Research Science Institute this summer. Only 51 U.S. high school juniors are selected each year.

Maria Wilson of Quincy, **Susan Johnson** of St. Charles, **Noah Lauricella** of Dwight, **Kevin White** of Bartlett and **Mark Zelesky** of Calumet City were named to the Illinois Music Educators Association 1999-2000 All-State Honor Roll in Band, Choir and Orchestra.

Brian Fitting of North Aurora, **Yun Ji** of Hoffman Estates, **Zhihao Liu** of Lisle, **Nicholas Rupprecht** of Gurnee and **Denny Tu** of Naperville were among 200 students nationally who qualified to take the USA Mathematical Olympiad (USAMO). IMSA had the second highest number of qualifying students in the nation.

Catherine Kuo of Skokie, **Andrea Llenos** of Carol Stream and **Katassa Tenhouse** of Liberty received the rank of "National Outstanding" in the second annual High School Mathematical Contest in Modeling (HiMCM). Only 11 teams out of 128 that competed nationwide received this ranking.

Nicholas Rupprecht of Gurnee, **Zhihao Liu** of Lisle, **Taiyang Liang** of Naperville, and **Charles Wang** of

Machesney Park helped the Chicago A team win a first place tie (Division A) in the 25th Annual American Region Math League (ARML) Competition. Rupprecht and Liu also were two of only 14 students nationwide who correctly answered 7 out of 8 possible individual problems.

Four projects by IMSA students received superior ratings at the 14th Annual Illinois History Exposition in Springfield. A video by **Kathleen King** of St. Charles and **Lisa Kelly** of Libertyville qualified for National History Day competition.



Photo by Brian Quinby

IMSA Research Specialist Jay Thomas serves on the NCSSTMST Board of Directors.

of the Illinois Association of College and Research Libraries which represents the interests and concerns of academic libraries in the state.

Charter Librarian **Marti Guarin**, who serves on the Board of the Illinois School Library Media Association represented public libraries at the American Library Association's 35th Annual Legislative Day in Washington, D.C., meeting with legislators about library and education issues.

Vicki Burgholzer, instructional program assistant in science, presented a hands-on demonstration of biodiversity in the animal kingdom for 7th and 8th graders at Our Lady of the Wayside School in Arlington Heights, Illinois.

At the American Association for College Registrars and Admission Officers annual convention, Registrar

Sandi Miller facilitated several sessions dealing with high school issues and federal record keeping regulations. Miller has served as the National Committee Chair on High School Issues for the AACRAO.

Through their professional contributions, faculty and staff demonstrate their strong commitment to teaching and learning, professional development, and educational research and public policy.

Catherine C. Veal is IMSA's chief of staff.

Interdisciplinary Curriculum Program Receives Favorable Marks in IMSA Research Study

A multi-year research study between IMSA and Shepard High School in Palos Heights, Illinois, is showing promising results in measurements of student performance and behaviors after implementation of an interdisciplinary curriculum program.

The research partnership began in 1993 when Shepard teachers and administrators wanted to better meet the needs of "at-risk" students. They joined the Interdisciplinary Teaching and Learning Consortium, co-sponsored by IMSA and the Association for Supervision and Curriculum Development (ASCD).

The Interdisciplinary Teaching and Learning (ITL) Program at Shepard began in Fall 1993 with one coordinator and four teachers who shared the same 48 students for two of their five-period teaching load. The ITL Program integrated English I, Algebra, World History and Biology through themes, concepts, skills and strategies.

Because of the positive outcomes the first year, the ITL Program expanded the following year to include mainstream students, including an honors group. Later changes included the incorporation

of problem-based learning, in which the role of 'teacher' is transformed to that of 'facilitator' as students work collaboratively to solve real-world problems. IMSA and other proponents of this approach maintain that the 'real-life relevance' in problem-based learning is more meaningful to students than the traditional, discipline-based approach.

By 1998-99, participation had increased to 600 freshmen, sophomores and juniors, as well as 39 teachers from various disciplines and academic levels serving on 14 interdisciplinary teams.

Interdisciplinary Findings Positive

The research study of the ITL Program focused on the 461 students who were members of the Shepard Class of 2000, tracking the initial members of the Class and other students who enrolled in the ITL Program during high school.

The study compared the interdisciplinary students to the traditional-curriculum students using academic performance measures including GPA, scores on the Iowa Test of Educational Development and its subsections, percentages of students taking the ACT tests and ACT scores. The study also

used behavioral measures including attendance, tardiness and suspensions.

Findings of the first three years of the four-year study include:

- Academic performance levels as measured by GPA, were much higher for interdisciplinary students;
- The percentage of interdisciplinary students taking the ACT by the end of their junior year was much higher and their average scores were higher;
- The Iowa Test of Educational Development scores were equal or higher for the interdisciplinary students;
- Students in the interdisciplinary program demonstrate lower rates for absences, suspensions and leaving school. Transfer patterns in and out of both the interdisciplinary and discipline-based programs strongly demonstrate a preference for the former by most students;
- Interdisciplinary teachers expressed a strong preference for their current teaching experience over prior non-integrative ones.

For more information, contact Dr. Steve Cordogan at (630) 907-5071 or cordogan@imsa.edu.



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