

NOVA

ILLINOIS MATHEMATICS AND SCIENCE ACADEMY

IMSA A Pioneering Educational Community

Volume 11 No. 1 • Fall 1996

Partners from Illinois Schools Share Success Stories with IMSA's Board of Trustees

"I can honestly say that my six-year association with IMSA's outreach programs has been the most rewarding experiences of my professional career."

Tim McCollum
IMSA Partner
Science Teacher
Charleston Junior High School

Similar sentiments were echoed by six other Illinois educators who met with IMSA's Board of Trustees October 22 to discuss how partnering with IMSA has impacted them, their students, their fellow teachers, and their schools and districts.

McCollum was introduced to IMSA six years ago when he received the Academy's Award of Excellence. Each year, IMSA sophomores are invited to nominate a former teacher who most challenged, inspired

and supported their academic or personal growth prior to IMSA. Since then, McCollum has participated in various professional development opportunities offered or sponsored by IMSA.

"Being recognized by the Academy for my own performance has given me the confidence to incorporate exciting new programs, expose my students to new technologies, work effectively in a team environment, and most importantly—re-ignite my love for teaching," McCollum said. "I am now proud to report that, during the Academy's 10-year history, I have had former students in all but one of its graduating classes."

Another partner, teacher Ellen Jo Ljung from Glenbard West High School, reported that her involvement with IMSA ignited her interest in problem-based learning. "I teach a PBL elective

class which never would have happened without my connection to IMSA," Ljung said. She said her new learning has made her a better facilitator and coach in the classroom. "It's amazing what kids will do when you get out of the way!"

Rebecca Jaramillo, a teacher from Norwood Grade School in Peoria, said that participating in IMSA's professional development programs has resulted in meaningful changes in her classroom. "My curriculum has become much more learner-driven. ... I've put the 'oh wow!' back into my classroom," Jaramillo said. She also has sharpened her computer skills. "As a direct result of my involvement here, I've become computer literate," she added.

Ed Caster, a teacher at Dunne Elementary School in Chicago, has served as a teacher in IMSA's Summer 'AD' Ventures Program for six years and Early Involvement Program for nine years. "It's been very positive ... if more people were involved, this feeling about education would spread throughout the state," Caster said.

(continued on page 3)



IMSA students question Democratic National Committee Chairman Senator Chris Dodd during a video news conference sponsored by Ameritech the day before the presidential elections. See related story on page 6. (© 1996 Bob Mason)

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Editor and Writer
Brenda Buschbacher

From the Executive Director



Dear Members of the IMSA Community,

This fall, the Illinois Mathematics and Science Academy celebrated our first decade and launched our second in an exciting way.

On September 7, IMSA held its 10th Anniversary Gala with more than 400 guests at the Four Seasons Hotel in Chicago. The Gala was a wonderful way to recognize our friends, our founding fathers Dr. Leon Lederman and James R. Thompson, and the recipient of the IMSA Pioneer Award, Dr. Carl Sagan. The Gala also raised more than \$50,000 for the IMSA Fund for Advancement of Education.

On October 16, IMSA celebrated Founders' Day, honoring founding trustees who still serve on the board, charter staff members who are still employed by the Academy and other individuals and organizations that supported IMSA's early development. Many other events are scheduled in 1996-97 to commemorate IMSA's 10th Anniversary including a special lecture series, an open house, an artist-in-residence and a community concert celebration.

This year also is one of Reinvention and Transformation as we look to the future. Our internal and external programs are evolving and expanding to serve IMSA students and educators in Illinois and beyond in more rigorous, personalized, flexible and coherent ways.

The Academy now is accepting applications for the 1997 Summer 'AD' Ventures in Mathematics, Science and Technology program for students in grades 7-10. We are also accepting applications for various professional development programs as part of IMSA's service to the state of Illinois; teachers from throughout our state are invited and encouraged to partner with us!

Internally IMSA students continue to excel and grow as integrative thinkers and ethical leaders. This year they are experiencing some different learning opportunities and experiences including self-directed plans of inquiry. It is gratifying to learn and grow together.

On behalf of IMSA, best wishes for the holiday season!

Sincerely,

Stephanie Pace Marshall, Ph.D.
Executive Director

IMSA and Partners Produce Videotape on Student Teaching Practices that Improve Achievement in Science

By Cathy Veal, director of communications



Teachers from the Illinois Mathematics and Science Academy and several of IMSA's partner schools are featured in a new videotape, "Improving Student Achievement in Science: Teaching Practices That Work."

The videotape, produced by IMSA in collaboration with the Educational Research Service and the Alliance for Curriculum Reform, illustrates the 12 research-based practices featured in the Handbook of Research on Improving Student Achievement by Dr. Dorothy Gabel, professor of science education at Indiana University.

For each practice, the impact on students is cited briefly. This includes improved performance on tests, better attitudes toward science, and improved thinking skills. Each practice also includes information on the implications for teaching practice.

The videotape emphasizes the importance of supporting the professional development needs of science teachers:

"Because teacher practice represents the most promising leverage point for transforming teaching and learning in science, we must focus on the initial

training and ongoing professional development needs of teachers.

"There is much research to assist teachers, however few have time to consult it, see it in action, practice and master it. Teachers need tools to observe and emulate proven best practices. This videotape is intended to help teachers do just that, by showing 'what it looks like' ... by demonstrating research-based teaching practices that improve significant outcomes in science."

Teachers demonstrating the practices include: Richard Dods, Diane Hinterlong, Bernard Hollister, Mark Horrell, Tom Jordan, Michael Sloan, John Thompson and David Workman, Illinois Mathematics and Science Academy; Patti Kenton, Naperville Central High School; Dan Fraker and Bill Stepien, St. Charles High School; and Tim McCollum, Charleston Junior High School.

The videotape, which also features comments by IMSA Executive Director Dr. Stephanie Pace Marshall, was produced and directed by Brian Thornburg, audiovisual technician in IMSA's Toyota Video Production Laboratory. IMSA students as well as

students from participating partner schools are featured in the videotape.

For more information about the handbook or videotape, or to order copies, contact the Educational Research Service in Arlington, Virginia, by telephone, (703) 243-2100 or by e-mail <ers@access.digex.net>.

The Teaching Practices:

The Learning Cycle Approach

Cooperative Learning

Use of Analogies

Wait Time

Concept Mapping

Computer Simulations

Microcomputer-based Laboratories

Systemic Approaches in Problem Solving

Conceptual Understanding in Problem Solving

Science-Technology-Society

Real-Life Situations

Discrepant Events

Share Success Stories (continued from cover)

Partners Who Presented:

Partner	School/District
Pierre Barrette	Southern Illinois University-Carbondale
Ed Caster	Dunne Elementary School-Chicago
Rebecca Jaramillo	Norwood Grade School-Peoria
Ellen Jo Ljung	Glenbard West High School
Tim McCollum	Charleston Junior High School
William Myers	Wheeling School District #21
Lauren Rentfro	Allen B. Shepard High School—Palos Heights

IMSA Service Programs

Illinois Scientific Literacy Network
Summer 'AD' Ventures I and Early Involvement Program
I-TEAMS with Illinois State University and Illinois Problem-Based Learning Network
Illinois Problem-Based Learning Network
Summer 'AD' Ventures II and Teaching Practices Videotape
1st in the World Consortium, District Learning Leadership Teams, Harris Institute (on Problem-based Learning)
ASCD Consortium on Interdisciplinary Curriculum

For information on IMSA's statewide partnerships and professional development programs, call (630) 907-5069.

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*Honorary Members



IMSA founding trustees James Pearson, Jesus Mammel Sosa, Sheila MB Griffin, Dr. Leon Lederman, John McEachern Jr. and "founding father" James R. Thompson (back).

Founders' Day



IMSA charter staff member Mary McCracken is congratulated by Board of Trustees President James Pearson.



IMSA "founding father" Dr. Leon Lederman stops to answer questions from IMSA students.

(photos by Julie Fabiszak)

Tenth Anniversary Gala Ball



State Comptroller Loleta Didrickson, Jane Thompson, IMSA Founders Award recipient James R. Thompson and Dr. Dolores Cross, president of Chicago State University, visit during the Gala. (© 1996 John Reilly Photography)



IMSA friends dance the night away at the Four Seasons Hotel in Chicago. (© 1996 John Reilly Photography)



Robert W. Galvin
Gala Co-Chairman



Robert H. Malott
Gala Co-Chairman



Gala Co-Chairman Robert Galvin, chairman of the executive committee of Motorola, Inc., presents the IMSA Founders Award to Dr. Leon Lederman. (© 1996 John Reilly Photography)

IMSA Students Interview Presidential Campaign Representatives; Ameritech Sponsors Video News Conference the Day Before the Election

The costs of higher education. Space exploration and NASA's budget. Teen curfew laws. Welfare reform. The environment. Immigration laws. The national debt.

On November 4, in a video news conference sponsored by Ameritech, students from IMSA and three other schools in the Midwest questioned Democratic National Committee Chairman Senator Chris Dodd, Republican National Committee Chairman Haley Barbour and Reform Party National Chairman Russel Verney on these and other topics.

Seniors Castor Armesto, Suzie Chang, Doug Pratt, Erin Slone and Jennifer Tietz were IMSA's student press corps members. Approximately 20 other students and social science teacher Ken Guest attended the news conference which was broadcast from the Academy's Toyota Video Production Laboratory.



Reporter Art Norman (NBC-TV, Chicago) gives tips to IMSA students as they question Republican National Committee Chairman Haley Barbour. (photo by Cathy Veal)

Q & A Examples

Pratt asked Verney whether he felt the Republican plan to cut income taxes by 15 percent would help the economy flourish and help balance the budget.

"The proposal to cut taxes by 15 percent anticipating that that will grow the economy is a proposal that was tried in the early 80s—it was called trickle-down economics," Verney said. "We've been there, done that, didn't work. We created national debt that skyrocketed in the 80s. ... I think what you have to do is first cut federal spending to balance the budget before you start giving away money."

Slone asked Barbour whether he felt a balanced budget was a major concern to the American public. "A balanced budget is a major concern to the American public, Erin, because President Clinton this year, the year that just ended, proposed a budget with a deficit of 211 billion dollars," Barbour said. "We *can* reduce spending, we *have* to."

Tietz asked Dodd what Clinton planned to do to "ensure that males and females are given the exact same opportunities in the military?"

"One of the things that has happened in recent years is making sure that our Academies are open to men *and* women who are qualified to serve in our nation's military," Dodd said. "The president feels very strongly about equal opportunity. He has certainly applied those standards in his own White House."

Ameritech Long Distance LearningLink

Ameritech's "Meet the Candidates" project, part of its Long Distance LearningLink program which brings the world to classrooms, also included a straw poll of students from participating schools and a training session with Art Norman, reporter/anchor for Channel 5, the NBC-TV affiliate in Chicago.

"We believe enhancing the educational experience of America's students is one of the best uses of our technology," said Steven Nowick, president of Ameritech's long distance subsidiary.

Executive Director Dr. Stephanie Pace Marshall thanked Ameritech for sponsoring this unique election-year project. "This is yet another wonderful opportunity for IMSA and for our students made possible by our friends at Ameritech," she said.

1996-97 Admissions Information

To help prospective students and parents learn more about the Academy, activities are scheduled this fall and winter:

***Statewide Informational Meetings** (45). Sites include Belleville, Bolingbrook, Carlinville, Carmi, Carterville, Champaign, Chicago, Danville, Decatur, Dixon, East St. Louis, Effingham, Evanston, Flora, Freeport, Galesburg, Grayslake, Harvey, Hazel Crest, Jacksonville, Jerseyville, Joliet, Kankakee, Macomb, Mattoon, Maywood, Moline, Mt. Vernon, Normal, Northbrook, Oglesby, Peoria, Quincy, Robinson, Rockford, Sparta, Springfield, Wheeling and Woodstock.

***Visitor Information Program Days** (2). These will be held at IMSA at 1:00 p.m. on February 1 and February 16.

The deadline for application to IMSA's 12th sophomore class—the Class of 2000—is March 1, 1997. For more information, call (630) 907-5027 or in Illinois 1-800-500-IMSA.

State, National and International Leadership

For the third year, Executive Director **Dr. Stephanie Pace Marshall** was invited to serve as the Chairman of the Rhodes Scholarship Committee for the Great Lakes nine-state region. The committee met on December 6 and 7, 1996, in Chicago.

IMSA's Calculus-Based Physics Study and work with female students is featured in the Fall 1996 *What's Working for Girls in Illinois* newsletter, a quarterly publication of AAUW-Illinois, Inc. (American Association of University Women).

Presentations by science teachers at the annual meeting in Chicago of the Illinois Science Teachers Association October 11-13 included **Dr. John Eggebrecht, Dr. Sue Styer, Dr. Don Dosch** and **Margaret Park**, *Integrated Science at IMSA*; and **Branson Lawrence**, *The Brooklyn Bridge*. **Park** also made the same presentation at the annual meeting of the National Association of Biology Teachers October 17 in Charlotte, N.C. **Styer** and **Dosch** presented *An Integrated Science Program for Secondary Schools* at the National Science Teachers Association western area convention October 17-19 in Phoenix, AZ.

Presentations by mathematics teachers at the annual meeting in Springfield of the Illinois Council of Teachers of Mathematics October 18-19 included **Sue Eddins**, *Apply Yourself and Ideas for Implementing the New Illinois Data Analysis Standards*; **Dr. Micah Fogel**, *ICTM State Math Contest AA Oral Topic*; **Chuck Hamberg**, *Using Patterns and Connections to Construct Mathematical Understandings and High School Contest Question Writing Workshop*; **George Milauskas**, *Using Technology to Make Algebra Dynamic*; and **Ron Vavrinek**, *A Report From the*

APCS Ad Hoc C++ Committee. In addition, **Eddins** also served on the panel, *AP Statistics: A Panel Discussion* and **Milauskas** served as a moderator during the *Geometry Round Table*.

Mathematics teacher **Ruth Dover** presented *Bringing in Euler's Method* at the regional meeting of the National Council of Teachers of Mathematics October 31-November 2 in South Bend, IN.

Michael Sloan, mathematics teacher, gave two presentations on IMSA's Mathematical Investigations curriculum October 11 during an institute day for teachers in the Freeport, IL, area.

IMSA, in collaboration with Waubesa Community College, hosted a National Science Teachers Association Electronic Town Meeting focused on the National Science Education Standards on October 17. Twenty-two science educators attended the meeting from Aurora East School District #131, Aurora West School District #129, Indian Prairie School District #204, Community Unit School District #205, Community Consolidated School District #15, and Regional Offices of Education in Joliet and Lombard. **Dr. Raymond Dagenais**, curriculum and action research specialist, served as moderator.

Physics teacher **Dr. David Workman** and IMSA students **Molly Breslin** of Ottawa, **Robert Gienko** of South Barrington and **Ryan Giordano** of Crystal Lake presented *Dynamics of the Hannaford Woods Great Blue Heron Rookery* at the 23rd Natural Areas, 15th North American Prairie and Indiana Dunes Ecosystems Conference October 23-26 in St. Charles, IL. The presentation was the result of the students' research on the Great Blue Heron.

Biology teacher **John Thompson** serves as a columnist in the *Call of the Wild*, A Journal of Yellowstone Wolf Restoration from the Call of the Wild Foundation. His column, *Learning*

Center, provides students and teachers activities to expand their interest in the wolf such as games, puzzles, books and videos. In addition, the column also will feature more complex teaching practices such as the use of the Internet or problem-based learning.

Student and Staff Achievements

Mathematics teacher **Sue Eddins** received the T. E. Rine Award from the Illinois Council of Teachers of Mathematics (ICTM). The award, presented to one Illinois mathematics teacher annually, recognizes his/her contributions to mathematics teaching in Illinois at the secondary level. Eddins was presented the award at the ICTM Annual Banquet in Springfield on October 18.

IMSA student **Lynna Quandt** of Hampshire was selected to serve as the Yearbook Chairperson in 1996-97 for the Illinois Junior Academy of Science.

IMSA students **Clair Null**, **Drew Van Pelt**, **Nalo Jackson**, **Andy Torres**, **Jason Wiley** and **Elissa Larkin** presented *PME: Raising Consciousness on a High School Campus* at the National Association of Multicultural Educators National Conference November 6-10 in St. Paul, MN. Resident counselor **Sherry Collins** and **Robert Hernandez**, minority recruitment and retention coordinator, serve as advisors to IMSA's Peer Multicultural Educators group.

Students Hold First IMSA Math Intramural

By Dyanna Gregory, student writer

On Friday, November 15 at 7:15 p.m., more than 100 IMSA students flocked to the main building with a common purpose—to do math. Now, SAT reviews were over, finals were months away. No, their motivation was neither grades nor standardized test scores. They had come to do math - gasp - just for fun.

They had come for the IMSA Student Math Intramural, a cooperative project between the mathematics faculty and IMSA's chapter of Mu Alpha Theta, a national honor society for high school mathematics. The intramural was designed to involve more IMSA students in mathematical competition.

"The number of people we can include in Math Team is limited, and there are so many talented students here, we can not possibly take them all to competition," said mathematics

teacher Chuck Hamberg, a faculty sponsor. However, he, teacher George Milauskas, and the board of Mu Alpha Theta wanted to tap the student body's talent and ability.

"We wanted to broaden our base," said senior David Shih, Mu Alpha Theta president. One goal was to attract many students, especially more females, to participate in math activities. The hard work of the planners paid off as a total of 118 students participated in the first meet of the intramural.

Math, Music and Beanbags

The contest featured two divisions: Delta, for students in Geometry through Mathematical Investigations Level IV, and Epsilon, for students enrolled in Calculus I or higher. Within each division, students worked in groups of nine. Teams

had 45 minutes to complete 20 questions.

Students came equipped not only with calculators and pencils but also guitars and tape players for background music. To the delight of the Mu Alpha Theta board, one team even settled comfortably on beanbags as they solved the problems.

"We wanted to show (students) that math is fun," Milauskas said. "We wanted them to come and have a good time." Obviously, this goal was achieved.

Junior Irene Ma said, "I'm not usually the type who does math for fun but it was great ... definitely worth the time."

Mu Alpha Theta plans to hold more meets in the future.

Dyanna Gregory, a senior from Joliet, is a work service student in the IMSA Office of Institutional Advancement.



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IMS A A Pioneering Educational Community

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IMS A Teams with Nine Schools in Integrated Science Partnership to Transform Science Teaching and Learning

"...I have seen dramatic changes in my science students. Paradoxically, they are still very excited but frustrated at the same time. For me, I enjoy myself a lot more!"

Hillary Tulley, science teacher
Niles North High School

Since last summer, nine Illinois high schools have been working with IMSA in a unique partnership designed to transform the way teachers teach and students learn science.

The IMSA-Smithsonian Institution Integrated Science Partnership Initiative includes educators from Belleville West High School, Francis Parker School in Chicago, Minooka Community High School, Niles North High School in Skokie, Plano High School, Roxana High School, St. Charles High School, St. Ignatius College Prep School in Chicago and Waubesa Valley High School in Aurora.

Teams have met at IMSA several times this year and came together on March 19 to present their curricular products and associated student assessment strategies at IMSA's 1997 Science Symposium on Integrated Learning Approaches. Each partner school adapted IMSA's Integrated Science foundational groundings to meet its needs.

Integrated Science at IMSA

IMSA's Integrated Science Program connects and integrates teaching and learning in biology, chemistry, earth and space sciences, and physics. Its foundational groundings are based on the transfer of authority to the students and transfer of knowledge across disciplines.

The curriculum is structured around a series of "problem platforms" which provide students with real-world scenarios not constrained by disciplinary boundaries for student-centered inquiry. Students and teachers use a modifiable, interactive text and image database, rather than a textbook.

An example of a problem platform is the construction of the Mars base for human habitation. Students posed questions such as: *How do we get to Mars? What conditions exists on Mars? How can a sustainable habitat be created? Is colonization a "right" of our species?* While exploring these, students learned about mechanics, atmospheric and geologic phenomena, energy transformations and

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President Clinton Salutes IMSA

(See story on page 3)



Photo courtesy of White House Press Office



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Editor and Writer
Brenda Buschbacher

From the Executive Director



Dear Members of the IMSA Community,

I am pleased to report a most productive and exciting beginning to 1997 at the Illinois Mathematics and Science Academy, as we continue to celebrate IMSA's 10th Anniversary. Let me cite a few highlights at this time.

In January for the second year we held an Intersession, a weeklong program of focused learning experiences for students which were outside the structure of the classroom. The activities this year included a wide variety of subject areas which were covered in seminars and workshop formats.

As part of our 10th Anniversary Lecture Series, Yolanda King, the daughter of Dr. Martin Luther King, Jr., visited the Academy in February to present *The Dream is Still a Dream*. Co-sponsored by the City of Aurora, the IMSA community and approximately 500 students from area schools, local city officials and special friends of the Academy attended the event.

In March, Dr. John Dossey, past president of the National Council of Teachers of Mathematics and a major force behind the NCTM standards, also visited the Academy and met with students. Also in March, IMSA held the 10th Anniversary Community Concert Celebration which included a concert at the Paramount Arts Centre in Aurora and dinner following at Walter Payton's Roundhouse. The concert brought together 650 members of the IMSA community including many alumni, family and friends and 200 guests for the dinner.

Internationally renowned photographer Elizabeth Gill Lui will be on IMSA's campus for the month of April working with students and staff as part of our first Artist-in-Residence Program. During the month, IMSA will host a 10th Anniversary Aurora Arts Open House April 12 featuring work from local artists, an exhibition from Ms. Lui, tours of the Academy, free raffle drawing for prizes and entertainment by Waubesa Community College's Steel Drum Band. We are grateful to Old Second National Bank in Aurora for sponsoring the Aurora Arts Open House.

As we look forward to IMSA's next decade, we remain inspired by all that has been accomplished during our first ten years. We look forward to continuing our work with Illinois educators and expanding our network of those dedicated to the work of transformation of mathematics and science education.

Sincerely,

Stephanie Pace Marshall, Ph.D.
Executive Director

President Clinton Salutes the Work of IMSA and Northern Cook County, IL, School Districts

By Catherine C. Veal

"...the wealth of our country now no longer primarily depends upon our oil, our gold, our land or our factories. It is now and will increasingly be measured in the minds and creativity of our people, and our achievements in science and technology."

President Bill Clinton
January 22, 1997

On January 22nd, a 105-member IMSA contingency attended President Bill Clinton's education address in Northbrook, Illinois. There the President paid tribute to members of the 1st in the World Consortium, a group that includes IMSA and 19 school districts from northern Cook County, Illinois.

During the past two years, the Consortium has launched several ambitious projects including Teacher Learning Networks and Third International Mathematics and Science Study testing. In his address, Clinton announced the initial Consortium TIMSS testing results (8th graders). What did the report say? "It says, in effect, that the 8th graders from the 1st in the World Consortium tied for first in the world in science and tied for second in the world in math," Clinton reported.

The President saluted the Consortium for its courage to seek the truth. He worried that some schools might shy away from the challenge of assessing their students against international benchmarks, especially since the U.S. as a country was not among the top-performing nations. Scores and rankings are "not the point," Clinton said. "The point is to know the truth so you can do better."

Teacher Learning Networks

Recently, the U.S. Department of Education awarded the Consortium a grant of \$150,000 to support its four Teacher Learning Networks. The Consortium also received a \$300,000 grant from the Illinois State Board of Education for this purpose.

Each network includes 15 to 25 teachers who share ideas and resources with the express purpose of improving their knowledge and teaching through an ongoing process of reflective inquiry.

IMSA participates in the networks in several ways. Executive Director Stephanie Marshall co-chairs the Professional Development Committee, and Sue Eddins, mathematics teacher, and Ed Moyer, science teacher, are members of the teacher learning networks on assessment and technology respectively. Linda Torp, who heads IMSA's Center for Problem-based Learning, is a member of the models of instruction network, and Martin Ramirez, director of curriculum and learning assessment, participates in the curriculum network.

Michele Micetich, who directs IMSA's statewide collaborative partnerships, participates in the Consortium's instructional support network which assists the teacher learning networks.

Reflections on the Day

IMSA's group enjoyed the opportunity to hear a presidential address. "I was impressed with his understanding of learning and risk taking and I was encouraged by his focus on everyone can improve," Micetich said.

Another message, according to student Nooreen Dabbish, focused on the source of societal change. "He affirmed once again that only through grass roots educational shifts will the American population be prepared to handle this new age of technological wonder," she said.

Jane Kim, a junior class officer, said she was pleased that "even though President Clinton has achieved such great success, he still took time to acknowledge his teachers and what they had done for him."

Catherine C. Veal is IMSA's director of communications. Student writer Arati Shroff, a junior from Libertyville, contributed to this article.

IMSA Schedules Summer Service Programs

This summer, the Illinois Mathematics and Science Academy once again will fill its classrooms and corridors with students and teachers from throughout Illinois.

Calendar of IMSA Summer Programs

June 22-28

Summer 'AD' Ventures II

professional development for teachers and program for students entering grades 9-10 in 1997, to be held at Eastern Illinois University

June 23-28

Mathematical Investigations Workshop

professional development for high school mathematics teachers

June 25

Illinois Scientific Literacy Network Conference

see article page 6

July 7-18

Illinois Problem-Based Learning Network Summer Institute

professional development for teachers new to problem-based learning - teachers will implement a problem-based learning experience with students.

July 13-19

Summer 'AD' Ventures I

professional development for teachers and program for students entering grades 7-8 in 1997, to be held at Illinois State University

July 12-19

ITEAMS

for middle school teacher teams in central Illinois, to be held at Illinois State University

July 15-17

Summer Sleuths

middle school students in the Fox Valley will be introduced to problem-based learning

August 5-8

Harris Institute for Introduction to Problem-Based Learning

to be held in Lisle

For more information on these or other statewide service initiatives, call (630) 907-5069.

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Science Teaching and Learning (continued from cover)

conservation, chemical reactions, gravity and force, cell structure and metabolism, and other physical, chemical, biological and engineering principles and concepts.

Integrated Science at Partner Schools

After Niles North decided it wanted to replace Earth Science with something integrated for freshman students, teachers researched various programs before making their recommendations. Tulley learned of IMSA's program after attending a presentation at an Illinois Science Teachers Association meeting.

"IMSA was able to give us a template to base our work on and then develop our curriculum. We didn't have to re-invent the wheel," she said.

The Integrated Lab Science (ILS) class at Niles North began as a pilot this year, but will be permanent in the 1997-98 school year. "Students are more excited about science now because it's coming from them and they're taking ownership for what they're doing," Tulley said.

"Funky Water" and "Energy"

Tulley said Integrated Lab Science students recently finished a "Funky Water" chemistry-oriented unit. This focused on the conflict created when industrial products impact the biological diversity of an ecosystem. The purpose of the unit was to "determine how industry and environmentalists can collaborate in order to preserve the animal and plant biodiversity of an ecosystem, yet develop products to increase sustenance and productivity for the economy of the community."

Students made soap, evaluated its potential impact on the environment, looked for ways to improve the product then conducted product testing to determine the best soaps. As part of the assessment process, students presented their recommendations through a computerized hypertext presentation.

At the Francis Parker School in Chicago, teachers are in the first year of a two-year Chemistry/Physics/Biology pilot for 9th and 10th graders. The theme of the first year is "Energy" and students experience six units of study including fuel, foods, the cell, robotics, sports mechanics and environmental impact.

During the unit on robotics, they learned physics principles of magnetism, torque, electricity, kinetic and potential energy, work, force and how they relate to energy use. As part of the assessment process, students designed a machine that "performs a task." They presented a wiring diagram which included the polarity and energy flow of the device and a working prototype of the machine.

Next Steps

In July, a representative from each partner team will return to the Academy for a week to ready their curriculum portfolios for dissemination to other schools. In addition, IMSA faculty will begin placing the partners' curriculum units on IMSA's home page and the home pages of the partner schools, create a partnership directory and write a synopsis of the partnership symposium.

In the fall, IMSA faculty and staff will again visit the nine partner schools to continue the collaboration by collecting more data and assisting in curriculum development. Also in the fall, IMSA plans to solicit 10 more partner schools.

"Ultimately, we hope our work will continue with other high schools from around Illinois and that the partnership grows into a statewide network of teachers dedicated to the work of transformation of science education," said Dr. Don Dosch, IMSA Integrated Science teacher. "We are very grateful to the Smithsonian Institution, the State of Illinois and our partner schools for supporting this ambitious project."

COMMUNITY *Concert* CELEBRATION



IMSAs staff members Michele Micetich (l), Dr. Martin Ramirez (r) and his wife Maureen enjoy an evening at Walter Payton's Roundhouse following the concert at the Paramount Arts Centre.



IMSAs Parents Association President Arlene Quinn reflects on a busy 10th Anniversary year!



Platform Party Members: (left to right) Executive Director Dr. Stephanie Pace Marshall; Yolanda King; IMSA junior Nalo Jackson and Aurora Mayor David Pierce.



Aurora Mayor David Pierce welcomes guests to the lecture.



YOLANDA *King* LECTURE

Yolanda King visits with IMSA students following her lecture, "The Dream is Still a Dream."

Photos by DRG-IT photography

IMSA Hosts Conferences for Illinois Educators

Illinois educators interested in learning about scientific literacy and integrated learning approaches attended two professional development conferences hosted by IMSA.

■ On March 19, 1997, IMSA hosted the 1997 Science Symposium on Integrated Learning Approaches, sponsored by the Smithsonian Institution. During the day, educators learned about curricular products and student assessment strategies developed by partner schools participating in the IMSA-Smithsonian Integrated

Science Partnership Initiative, explored the Integrated Science approach as it relates to science standards and benchmarks, and discussed the obstacles and barriers to implementation (see cover story).

■ On June 25, 1997, IMSA will host the Second Annual Illinois Scientific Literacy Network Conference. This conference is open to all Illinois educators interested in scientific literacy. During the day, educators will learn and share information about the Illinois Scientific Literacy Projects,

the ISLN website and other topics. The ISLN, coordinated by the Illinois Mathematics and Science Academy, promotes scientific literacy in the State of Illinois through ongoing dialogue, collaborative learning, project development and shared opportunities with the support of the Illinois State Board of Education.

To register for the Second Annual Illinois Scientific Literacy Network Conference, contact Jack Wentland 630-907-5949 or e-mail jwentlud@imsa.edu.

Illinois Teachers Win IMSA IMPACT II Awards

Twenty-one Illinois teachers are the latest recipients of the IMPACT II Mentor Awards for Illinois mathematics and science teachers.

IMPACT II, a national grant program, is designed to encourage teachers to share their professional knowledge with each other. The goal of Illinois' IMPACT II program, administered by IMSA, is to build a network of and for teachers to

share innovative learning experiences in mathematics, science and/or technology.

Eligible applicants include all K-12 public mathematics and science teachers in Illinois who have developed, implemented and measured a creative and successful learning experience in mathematics, science or an interdisciplinary mathematics and science field.

Awards include \$400 for individual teacher learning experiences or \$600 for team (2-5) teacher learning experiences in addition to World Wide Web instruction and implementation, annual conference registration and network privileges.

ILLINOIS IMPACT II AWARD RECIPIENTS

Teacher	School	School City
Timothy Brinker	Westfield Elementary School	Glen Ellyn
Eileen Bunting	Middletown Early Childhood Center	Mahomet
Tracy Busche	South East High School	Springfield
Donna Christensen	Edmund F. Lindop Elementary School	Broadview
Susan Cook	Franklin Center Elementary School	Franklin Grove
Lynne Cunningham	Edmund F. Lindop Elementary School	Broadview
Monica Deutsche	Oster-Oakview Middle School	New Lenox
Thea Halvorson	Kingsley Elementary School	Evanston
Catherine Herman	Lockport Township High School	Lockport
Kathy Hulcher	Iles Elementary School	Springfield
Jennifer Klein	Edmund F. Lindop Elementary School	Broadview
Ingrid Korb	Westfield Elementary School	Glen Ellyn
Julia Myers	Middletown Early Childhood Center	Mahomet
Dorothy Nagelbach	Kingsley Elementary School	Evanston
Cindi Nolen Allen	Winkler Elementary School	Carbondale
Evelyn Ponsolle	Edmund F. Lindop Elementary School	Broadview
Julie Reinhart	Franklin Center Elementary School	Franklin Grove
Betsy Rothery	Churchill Elementary School	Glen Ellyn
Barbara Thomas	Beaubien Elementary School	Chicago
John Thompson	Illinois Mathematics and Science Academy	Aurora
Tony Veeneman	A.B. Shepard High School	Palos Heights

State, National and International Leadership

Executive Director **Dr. Stephanie Pace Marshall** presented the lecture session *Do Current Educational and Training Structures Get in the Way of Real Learning?* at the Royal Society for the encouragement of Arts, Manufactures & Commerce January 15 in London, England.

Dr. Michael Palmisano, director for research and design, served on three panels at the annual conference of the Illinois State Council on Business-Education Partnerships January 6-7 in Chicago, IL. The panel presentations were entitled *Academic and Occupational Standards: A Foundation for Learning*; *Academic and Occupational Standards: Strategies for Implementation* and *Hot Topics*. Palmisano serves as a leader for the Illinois Academic Standards Project for the Illinois State Board of Education.

Rick Bryant, college and academic counselor/coordinator for higher education initiatives, became president of the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology (NCSSSMST) at its annual professional conference March 6-9 in New Orleans, LA. IMSA is a founding member of the consortium.

Mathematics teacher **Sue Eddins** serves as the Illinois mathematics liaison to the INTASC (Interstate New Teacher Assessment and Support Consortium) project, a consortium of several states under the auspices of the Council of Chief State School Officers. Its purpose is to develop "model standards for beginning teacher licensing and development" and to develop and pilot portfolio assessment experiences for beginning teachers.

Science teachers **Dr. Sue Styer** and **Dr. Don Dosch** presented *Integrating the Disciplines of Science to Support Student Inquiry* at the 7th Annual Regional Office of Education Science Conference February 7 in Carlinville, IL.

Presentations by mathematics teachers

at the 8th Annual Metropolitan Mathematics Club Conference in Homewood-Flossmoor, IL., February 1, included:

Ruth Dover, *Mathematica in the Classroom and Calculus Reform and Mathematica*; **Dr. Ann Hohbs**, *Bellybuttons, Best Fit Lines and the Golden Ratio* and **Chuck Hamberg**, *Making Connections Using Random Numbers*.

Social science teacher **Bernie Hollister** co-authored the chapter *Introducing Students to Civilization in Teaching World History*, a resource book for teachers that includes essays on relevant topics, conceptual overviews, courses of study, successful lessons and other ideas for teaching world history.

IMSA's Scientific Visualization (SciVis) classroom was a recipient of a 1996 Pioneering Partners Foundation Award. The foundation recognizes programs that achieve results based on technological innovation. Team members include physics teachers **Dr. Mark Horrell**, **Ed Moyer, Jr.**, **Tom Jordan** and **Michele Micetich**, director of statewide collaborative partnerships.

Dr. Raymond Dagenais, curriculum and action research specialist, and science teachers **Dr. Donald Dosch**, **Dr. Susan Styer**, **Dr. John Eggebrecht**, **Norman Merczak**, **Dr. Margaret Park** and **Dr. David Workman** authored *Developing Scientific Capacity in all Learners: Integrated Science and the Science Content Standards* in the Winter 1996 issue of *Spectrum*, the journal of the Illinois Science Teachers Association.

Student and Staff Achievements

IMSA students **Ariel Herrmann** of Chicago and **Grace Lee** of Macomb were named two of 300 semifinalists in the prestigious Westinghouse Science Talent Search Competition. Herrmann's research project was *Moment Arm and Force-Generating Potential of Extensor Carpi Ulnaris After Transfer to Extensor Carpi Radialis Brevis* and Lee's research project was *A New Constrained Reconstruction Method for Nuclear Magnetic*

Resonance Imaging (NMR) of a Rotating Solid Object.

IMSA student **Abidemi Adeboje** of Dolton, along with two high school students from New Jersey, won second place in the nationwide ThinkQuest competition. Adeboje and his two partners each received \$12,000 scholarships as a result of winning the award. Their award-winning project included the design of an on-line Web site that includes a Chemistry 101 course complete with experiments and videos.

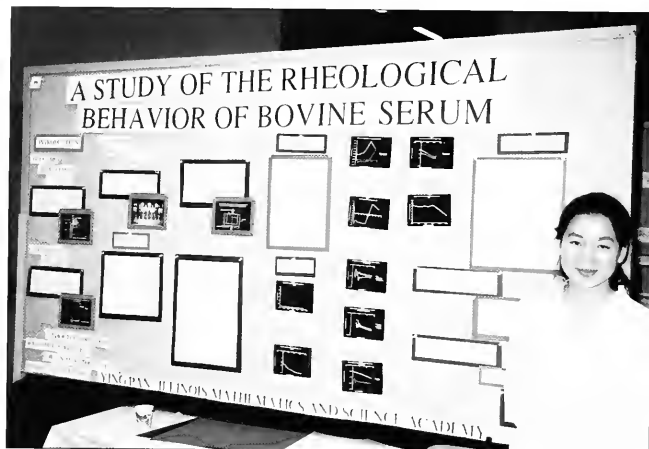
Ted Parge, director of institutional advancement, was awarded the certification of Certified Fund Raising Executive (CFRE) from The National Society of Fund Raising Executives (NSFRE) professional certification process. Requirements for CFRE include a minimum of five years full-time successful development experience and the passing of an examination testing knowledge in a variety of areas of philanthropy.

A team of 18 IMSA students finished first in Illinois and fifth in the nation in the December 4, 1996, Knowledge Master Open competition. A total of 43 Illinois high schools and 1,272 high schools nationally participated in the event. The test covers 15 curriculum areas and students are scored on the basis of accuracy and speed in answering 200 multiple choice questions.

Four IMSA music students placed either first or second in the Illinois Music Educators Association All-State composition competition. They are **Drew Massey** of DeKalb (1st-piano solo division), **Mark Ciaccio** of Kankakee (1st-instrumental ensemble division), **Michael Suh** of Skokie (1st-orchestra solo division) and **Mark Hoemmen** of Dallas City (2nd-instrumental ensemble division).

The IMSA Dance Squad took first place in the pom category at the January 19 Stevenson High School Invitational sponsored by Half-time Illinois (sanctioned by I.H.S.A.). In addition, the team took third place at the state competition March 9 at Downers Grove South High School.

IMSA Students and Staff Present at Prestigious National Science Conference



Ten IMSA students and several staff members attended the 1997 American Association for the Advancement of Science (AAAS) Annual Meeting and Science Innovation Exposition February 13-18 in Seattle, Washington.

IMSA Executive Director Dr. Stephanie Pace Marshall led the program *High School Science Reform: History, Standards, and Ongoing Activities*. This included speakers from IMSA, the National Science Teachers Association, AAAS, National Academy of Sciences, Airborne Research and Services, Inc., the Illinois Institute of Technology and Fermi National Accelerator Laboratory. IMSA science teacher Dr. John Eggebrecht presented IMSA's Integrated Science Program.

Students who made poster presentations were: Safia Abidi of Elmhurst, Julie Comerford of Charleston, Edward Concar of Naperville, Manu Goyal of Naperville, Ariel Herrmann of Chicago, Andrew Hong of Naperville, Grace C.H. Lee of Macomb, Ying Pan (pictured) of Mt. Prospect, Jason Roh of Freeport and Girim Sung of Naperville.



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NOVA

ILLINOIS MATHEMATICS AND SCIENCE ACADEMY

IMSA A Pioneering Educational Community

Volume 11 No. 3 • Summer 1997

IMSA Embraces the Digital Communications Age; Uses Information Technology to Expand Service

A teacher from a southern Illinois school surfs the Internet for some challenging real-world problems to use in her science class. A curriculum director from the northwest corner of Illinois finds several award-winning learning experiences in mathematics and science that his teachers can adapt and use in their school.

A Chicago teacher finds an on-line network of colleagues with whom to share questions and ideas for professional growth. Meanwhile, a teacher from central Illinois just wants some help—some tools—to learn how to use the Internet efficiently and powerfully to improve teaching and learning.

For each, IMSA's web site (www.imsa.edu) is a valuable resource. Learning technologies, especially the Internet, have enabled the Academy to expand its work with and service to schools, teachers and students throughout Illinois and beyond exponentially in recent years. In addition to offering products and services on-line, the Academy assists other schools that are wrestling with ethical, legal and policy questions related to life on the electronic frontier, such as student access and publishing.

www.imsa.edu

Teachers and others who want to learn more about IMSA, use some of its materials and engage in on-line inquiry and professional development can do so by visiting the Academy's web site.

There they can find information about



IMSA's Integrated Science program as well as astrophysics, geophysics and modern physics course materials.

Award-winning IMPACT II learning experiences in mathematics, science and technology also are available, as is information about the Illinois Scientific Literacy Network which IMSA administers.

The Academy's Center for Problem-based Learning and its Summer 'AD' Ventures in Mathematics, Science and Technology program offer various materials and professional development services on IMSA's homepage.

As IMSA's web site continues to develop, many more products and services will be available to schools, teachers and students in Illinois and beyond.

Internet Toolkit

The outer voice: Great news! We've got our computers. We've wired the school building. The network is working. The Internet is ours. Teaching and learning will never be the same. (The inner voice: Gulp, now what do I do?)

As we approach the new millennium, this question is hitting teachers in Illinois and the nation head-on. New information and learning technologies, especially the Internet, do indeed have the potential to help transform teaching and learning but only if teachers and students learn to use them in the right way for the right things.

For the first time, teachers are confronted with full text databases, organized in unfamiliar ways, rather than traditional databases organized in familiar ways (by indexes, Dewey Decimal System, etc.). Teachers need to understand and use the new type of databases the Internet has spawned so they, in turn, can engage students in rigorous and meaningful learning experiences using the Internet.

(continued on back cover)

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Editor and Writer*
Brenda Buschbacher

*this issue, Catherine C. Veal

From the Board Chairmen

Dear IMSA Shareholders,

The 1996-97 academic year, during which we commemorated our first decade and began to launch our second, was a remarkable one for the Illinois Mathematics and Science Academy.

Special events included our Gala in Chicago, Founders Day, and guest speakers Dr. John Dossey, Ms. Yolanda King and Dr. Rocky Kolb. The year also saw the continuing growth of innovative programs for our students and educational partners and increasing evidence of IMSA's impact on student learning (page 6) and professional development of teachers (page 3).

As we continue our journey in the second decade, we now are focusing on "growing our business" so we can serve more students, teachers, educational systems and the interests of our state, nation and world in the years ahead. The Academy's Second Decade Growth Plan, endorsed by the Board this spring, charts a significant course for the IMSA learning enterprise. The Growth Plan is built around three program challenges:

- *To increase IMSA's capacity to help IMSA students become integrative learners and ethical leaders with a deep understanding of themselves, their world and their place in it*
- *To lead the transformation of teaching and learning in mathematics and science in Illinois and beyond*
- *To build the capacity of Illinois educators (including IMSA educators) to transform mathematics and science teaching and learning in their settings*

To support the second decade work, various structures and staff roles are changing. This is essential for IMSA to remain a flexible, adaptive and vital learning enterprise.

Several years ago, Dr. Carl Sagan, whose death we mourn but whose life and work we celebrate, called IMSA "a gift from the People of Illinois to the human future." On behalf of the entire Board of Trustees and IMSA's President Dr. Stephanie Pace Marshall, thank you for continuing to support this very special gift.

Sincerely,



John H. McEachern Jr.

John H. McEachern Jr.
Chairman



James D. Pearson

James D. Pearson
Past Chairman, 1985-1997

For more information on the Second Decade Growth Plan, contact Catherine C. Veal, chief of staff, 630-907-5034.

Statewide Impact

The information presented in this map reflects county representation from 1990-1997 for the following IMSA partnership initiatives:

• **Summer 'AD' Ventures** offers professional development and a field experience for teachers and students in grades 7-10 in mathematics, science and technology.

• **Illinois Partners in Learning** serves school-based teams in a collaborative approach on such concepts as Interdisciplinary Curriculum Models, Integrating Technology in the Classroom, Authentic Assessment, Problem-based Learning, Gender Issues, Mathematical Investigations, Integrated Science, District Learning Leadership Teams and Pioneering Partners.

• **Illinois Scientific Literacy Network** focuses on the dissemination and sharing of the Illinois State Board of Education Scientific Literacy grant projects through electronic and traditional communications.

• **ITEAMS**, (Interdisciplinary Teams Educating for the Advancement of Mathematics and Science) – these middle school teams develop curriculum which is embedded within technology in conjunction with IMSA and Illinois State University.

• **IMPACT II** teacher-to-teacher network recognizes and disseminates mathematics/science/technology programs statewide.

• **Urban Minority Student Experiences** including Early Involvement Program, Math Partnership Program, Project School Visit, Tutor/Model Program, EXCEL and SEAMS.

• **IMSA Award of Excellence** program recognizes teachers of all disciplines who have significantly impacted an IMSA sophomore's life prior to starting their education at IMSA.



"We also want to make better use of another great resource in our state, the Illinois Math and Science Academy...to transform the teaching of math, science and technology in schools across Illinois."

— Jim Edgar

Illinois Governor

• Electronic networking/professional development via the World Wide Web and list memberships.

• IMSA's home page can be found at <http://www.imsa.edu/>

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IMSA Fund Supports Eventful Year Helps IMSA "Touch the Future"

The IMSA Fund for Advancement of Education is a not-for-profit 501(c)(3) corporation that enlists support of "margin of excellence" initiatives at the Illinois Mathematics and Science Academy. These include curriculum development projects, statewide service programs, minority recruitment programs, laboratory equipment purchases, special student activities and a permanent endowment.

Among the IMSA Fund highlights in 1996-97 were:

IMSA's 10th Anniversary Celebration

The IMSA Fund supported numerous 10th Anniversary programs and special events in 1996-97 including the Gala in Chicago, Founders Day, guest speakers such as Dr. Rocky Kolb, Dr. John Dossey and Ms. Yolanda King, a Community Concert celebration and the Artist-in-Residence and Arts Open House programs. The theme of the yearlong celebration was "Touch the Future."

Investments and Program Support

Funding of Academy programs exceeded \$970,000 from 775 donors. Leadership support from the Smithsonian Institution (\$90,000) was designated to advance the partnership activities of IMSA's Integrated Science program. Other major grants included the support of the Alfred P. Sloan Foundation and the Lloyd A. Fry Foundation designated to specialized minority recruitment and retention initiatives.

New Board Members

In May, the IMSA Fund for Advancement of Education elected four new Board members, Robert M. Malchione, Andrew M. Oh, Wharton B. "Zie" Rivers and William A. Van Santen. Oh, a Charter Class of 1989 graduate, is the first IMSA alumnus to serve on one of its boards.



Photo by Brenda Buschbacher

September 7, 1996: To kick off the Academy's yearlong 10th Anniversary celebration, Charter Class of 1989 graduate Badri Rengarajan joined 1996-97 Student Council President Beth Greiner to cut IMSA's birthday cake.



Photo by Brenda Buschbacher

On April 12, IMSA hosted an Aurora Arts Open House. Sponsored by the Old Second National Bank in Aurora, the Open House featured artwork for sale by several area art leagues and a special exhibition by internationally renowned photographer Elizabeth Gill Lui (left), IMSA's Artist-in-Residence for the month of April. Pictured with her is IMSA's senior class president, Erin Slone.

Presentation Days Showcase Student Projects

By Dyanna Gregory

Every year, many IMSA students take advantage of the Academy's mentorship program and work with mentors from throughout the Chicagoland area in a variety of projects and scientific research.

The program has grown significantly over the years. In 1989, 24 IMSA students participated in mentorship; this year, more than 150 did so.

In addition, in 1996-97 IMSA began a new Inquiry program, required of all sophomores and optional for juniors and seniors. This program enabled students to study a particular interest in depth, directing their own learning with assistance from IMSA staff inquiry guides.

In April, students presented the results of their mentorship and inquiry projects on IMSA Exhibition Day (April 23) and IMSA Presentation Day (April 30). A large number of students, staff, parents, mentors and other guests turned out to recognize the students for their work.

Perhaps the large crowds could be attributed, in part, to the diversity of the presentations. Topics ranged from gene transformation and Kristin Krukenberg's search for a malaria cure to musical composition by Mark Ciacchio and virtually everything between, including the replication of the fort at Starved Rock and a series of math books for children authored by Sarah Moss. There was even

a showing of 3 AM Eternal, a movie filmed on campus, starring IMSA students, and directed by senior Jeff Underwood.

Regardless of the topic of study, students find both Mentorship and Inquiry to be interesting and beneficial experience. With options available in all subjects from science and mathematics to foreign language and the arts, more students are expressing showing interest in research. Many feel that the addition of the Inquiry study allows added freedom for discovery and is a big step forward for the Academy.

"No one subject is right for everyone, and it's important to give kids room to explore different fields to figure out what it is that they love," sophomore Myra



Sibley said. "That's part of the academic experience."

Dyanna Gregory '97 of Joliet was a student writer in the Institutional Advancement Office.

Student Research and Inquiry at IMSA

The Student Research and Inquiry Program at IMSA supports the development of students as highly skilled and integrative problem finders, problem solvers and apprentice investigators.

The program provides learning experiences for students to pursue compelling questions of interest, conduct original research in science and other fields, create and invent products and services, share their work through presentations and publications, and collaborate with other students, mentors, scholars, researchers and inventors throughout the world. These are provided in courses, a mentorship program, independent study projects, individual and group plans of inquiry, and selected cocurricular activities.

The Student Research and Inquiry Program is supported by both public and private sector investor-partners.

"Landmark" Longitudinal Study Reveals Trends

...a landmark longitudinal study...an amazing thing to do...

Dr. Raymond Costa

To determine the impact of the IMSA experience on students' development, obtain valuable recommendations for program improvement, and track how graduates contribute to the betterment of Illinois and the nation and world, the Illinois Mathematics and Science Academy conducts the Longitudinal Study of IMSA Graduates.

The study includes comparison students, other academically talented students from Illinois who did not attend IMSA.

In conjunction with the 10th Anniversary year, IMSA conducted an internal and external formal review of all past longitudinal study reports (Classes of 89-95) to identify trends and patterns that have emerged across the first decade.

Internal Review Results

An example from "Trends Among IMSA Graduates as College Freshmen:"

- IMSA graduates consistently attribute specific dimensions and characteristics of an integrated living and learning experience as critical contributors to their intellectual and ethical development. They cite IMSA's emphasis on seeking and making connections, thinking in broad conceptual frameworks, looking beyond the immediate and asking questions as important dimensions of their development. Comparison graduates tend to identify isolated mechanisms (specific courses and people) rather than characteristics of a connected, holistic experience.

Two examples from "Trends Among IMSA Graduates as College Seniors:"

- IMSA graduates (both genders) have had significantly higher percentages of degrees earned in both math and science than the national norms.

- Of the students who intend to seek employment immediately following college graduation, a significant percentage will work in specialized, technological fields, and there is an increasingly large group that intends to work in either volunteer or human services work, such as the Peace Corps and church or missionary work.

External Review Results

Knowledgeable individuals from relevant fields reviewed the reports and data to identify trends and patterns they deemed important and substantive.

The external reviewers were Dr. Helen Khoury, mathematics faculty, Northern Illinois University; Dr. Bob Dillon, computer science faculty, Aurora University; Dr. Raymond Costa, past professor of biochemistry, Northwestern University; and Thomas Jordan, IMSA physics teacher.

Examples of their reflections:

- "I have an impression that the teaching of mathematics and the sciences at IMSA, unlike in many other leading high schools in Illinois, tends to be more student-centered and process-oriented than textbook-centered or procedural-driven. Students' intellectual engagement counts much more than textbook coverage!" —Khoury
- "...the way information is taught appears to make students both better individual thinkers and team participants than they would otherwise be upon high school graduation." —Costa
- "IMSA graduates are highly confident in their abilities to analyze and evaluate their world accurately and successfully...IMSA graduates are likely to be conscientious citizens that scrupulously reflect on the ethical and moral implications of their decisions and actions." —Dillon

- "IMSA is preparing its students to be active, engaged, participative, critical, excited, anxious and ready learners."

—Jordan

The longitudinal study methodology has evolved over time and a new two-tiered study design will guide the second decade of this research. Tier One focuses on core questions about graduates' preparedness and accomplishments in their college, work and community lives. Tier Two allows for focused, in-depth investigations of issues IMSA wants to probe more deeply, and timely, ad hoc investigations related to questions of various stakeholders.

For more information, contact Jay Thomas at 630-907-5991.



Among IMSA's new alumni are Jason Bould of Dahinda and Anna Para of St. Charles, members of the Class of 1997 which graduated May 31. Nobel Prize-winning scientist Dr. Harold Varmus, director of the National Institutes of Health, gave the commencement address. Dawn Prude of East St. Louis and Erin Slone of Park Forest were the student speakers.

MSA Class of 2000

MSA has invited 240 Illinois students to enroll this fall as members of its 20th sophomore class. Chosen from 45 applicants, the invited class represents 172 schools throughout the state. The average SAT mathematics and verbal scores for the students, most of whom are high school freshmen, are 628 and 591 respectively. The gender, racial, ethnic, geographic and socioeconomic profile of the class is diverse. CONTACT: Dr. LuAnn Smith, 630-907-5027.

IMPACT II Mentor Awards

MSA recently announced the latest recipients of IMPACT II Mentor Awards for Illinois mathematics and science teachers. IMPACT II, a national network, is designed to encourage teachers to share their professional knowledge with each other. Illinois' IMPACT II network, administered by IMSA, enables teachers to share innovative learning experiences for students in mathematics, science and/or technology. Entry into the network is through a grant award program which occurs cyclically through the year. Projects are published and the teachers receive network privileges for the statewide IMPACT II network. CONTACT: Michelle Adams, 630-907-5921.

MSA Alumni Association

The IMSA Alumni Association held its annual meeting June 21 at IMSA; the Class of '92 held its 5-year reunion in conjunction with this event. The Association elected new officers including Michael Peil '90 who will serve as its president. CONTACT: Britta McKenna, 630-907-5040, <britta@imsa.edu>.

Ethics Curriculum Project

This summer, eight IMSA students and two faculty members traveled to Jerusalem to help develop an ethics in science and humanities curriculum that its sponsor, The Society for Excellence Through Education, anticipates will be used by secondary schools worldwide. The conference was hosted by the Israel Arts and Science Academy. The IMSA delegation's was supported by The Harris Family Foundation, a major investor-partner in IMSA's Center for Problem-based Learning. CONTACT: Dr. Gregg Sinner, 630-907-5053.

Student Achievements

IMSA students captured first place awards in various academic competitions in the spring including the Illinois Council of Teachers of Mathematics State Math Contest, Scholastic Bowl, and Knowledge Master Open. IMSA also tied for the highest number of students in the nation to qualify take the USA Mathematical Olympiad exam, and one student was named to the U.S. Physics

team. Several students placed first or second in the Illinois Music Educators Association All-State composition competition, five student teams earned superior ratings at this year's Illinois History Exposition (one project qualified for national competition), and the chess team won the IHSA State tournament championship. CONTACT: Glenn Schwartzwalder, 630-907-5026.

ISLN Conference

IMSA hosted the Second Annual Illinois Scientific Literacy Network Conference June 25. The conference featured 54 award-winning grant projects from throughout the state. More than 200 educators and some parents and students attended. Participants examined the impact of specific projects and the scientific literacy network as a whole on student, teacher and educational system learning. IMSA administers the statewide network program which is funded by the Illinois State Board of Education. CONTACT: Jack Wentland, 630-907-5949.

Photo by Cathy Yeal



Barbara Thomas and Judy Trammell, teachers at Beaubien Elementary School in Chicago, and Michelle Adams, IMSA's IMPACT II program manager, discuss the program's growth at the recent Illinois Scientific Literacy Network Conference.

To respond to this need, the Illinois Mathematics and Science Academy is developing a prototype Internet Toolkit to help teachers learn how to search, use and evaluate the new full text databases on the Internet. The kit contains learning tools, search tools, analysis/evaluation tools, and construction tools to assist teachers from Internet novices to experts.

The kit enables teachers to build their knowledge base, develop and practice new skills and build their own tool kit, then use this to engage students in challenging and relevant learning experiences. Students identify and pursue important questions, build a broad and deep knowledge base, and find and solve complex problems using real-time data and information.

Ethical, Legal and Policy Issues

In the spring of 1996, IMSA came face-to-face with some difficult, yet important questions about life on the electronic frontier and the implications

for teaching and learning. Several problems required staff and students to confront and learn more about numerous issues related to on-line access and publishing.

Some of these issues included: rights and responsibilities of students and schools; staff technical expertise; students' roles in network and computing services; nature of on-line communication; risks and the need for self-protection; privacy; criteria for accounts and privileges for student, staff and other system users; network security and system administrators' and users' responsibilities; accountability for inappropriate use of computing and network resources; and free speech and free press questions.

In the year and a half since, IMSA staff and students have worked together to address various questions, issues and concerns, and to share first-hand, hard-fought lessons learned with other schools, educators, policymakers, students and parents. For example, members of the IMSA community

have presented sessions at various professional conferences including:

- Illinois Association of School Boards
Illinois Association of School Administrators, Illinois Association of School Business Officials
- Illinois Principals Association
- National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology
- Second Annual Ethics and Technology Conference, Loyola University of Chicago
- National School Public Relations Association

To learn more about IMSA's web site, resources, Internet Toolkit and work with digital communications legal, ethical and policy issues, contact Dr. David Barr at 630-907-5016, or <barr@imsa.edu>.

Student writer Arati Shroff '98 of Libertyville contributed to this article.



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