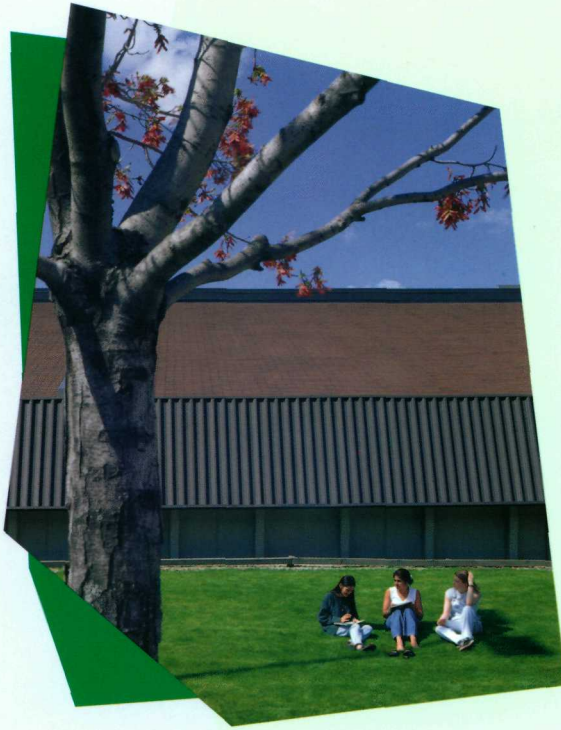


*Building the  
capacity of*

**learners & leaders**

Illinois Mathematics and Science Academy

1996-97 Annual Report



*The mission of the Illinois Mathematics and Science Academy, a pioneering educational community, is to transform mathematics and science teaching and learning by developing ethical leaders who know the joy of discovering and forging connections within and among mathematics, science, the arts, and the humanities by means of an exemplary laboratory environment characterized by research, innovative teaching, and service.*

# to our shareholders



Dear IMSA Shareholders,

It is our pleasure to share with you the eleventh annual report of the Illinois Mathematics and Science Academy. As a unique learning enterprise, IMSA builds the capacity of students, teachers and policymakers to improve and transform mathematics and science teaching and learning.

The 1996-97 year was marked with many historic events...events that commemorated our past as well as events that charted our course for the next decade.

In the fall, IMSA celebrated its 10th Anniversary (September 7, 1996) with a number of activities including the 10th Anniversary Gala which was attended by more than 400 guests. The Gala was a wonderful way to recognize our friends, our founding fathers Dr. Leon Lederman and James R. Thompson, and the late Dr. Carl Sagan, the recipient of the first IMSA Pioneer Award. The event also raised more than \$50,000 for the IMSA Fund for Advancement of Education.

The year continued with many other 10th Anniversary events including the Founders' Day celebration, a special lecture series featuring prominent speakers including Yolanda King, and an artist-in-residence featuring world-renowned photographer Elizabeth Gill Lui. The images of living and learning at IMSA were captured by Ms. Gill Lui and are featured throughout this annual report.

The year was also one of Reinvention and Transformation as IMSA implemented many new changes to its educational programs in order to better serve each individual student learner. Changes included a new schedule framework, more opportunities for student research and expanded program pathways for sophomores. In the spring, the IMSA Board of Trustees also endorsed the Second Decade Growth Plan. It is designed to strengthen IMSA's capacity to realize its mission, achieve its objectives and fulfill its legislative charge.

IMSA also greatly expanded its presence on the World Wide Web with numerous service program websites that provide networking opportunities for professionals and learning resources for students and teachers. Please visit us at <http://www.imsa.edu>!

On behalf of the Academy's board of trustees, faculty, staff, students, parents, alumni and educational partners, thank you for your investing in the goodness and genius of children, and for helping us to build human capacity so that, together, we can better prepare our children to become leaders in the 21st Century.

Sincerely,

Stephanie Pace Marshall, Ph.D.  
President

James D. Pearson  
Chairman, Board of Trustees



# fall

## **Ameritech Video News Conference**

One day before the presidential elections, IMSA students and those from 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 during a video news conference sponsored by Ameritech and broadcast from the Academy's Toyota Video Production Laboratory.

## **National Education Video**

Teachers from IMSA and several partner schools are featured in the 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.

## highlights & special e v e n t s

## **President Clinton Visit**

A 108-member IMSA contingency attended President Bill Clinton's education address in Northbrook, IL. 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 several years, the Consortium launched several ambitious projects including Teacher Learning Networks and Third International Mathematics and Science Study testing.

## **IMSA-Smithsonian Institution Integrated Science Partnership Initiative**

Nine Illinois high schools met at IMSA as part of a partnership designed to transform the way teachers teach and student learn science. Each partner school adapted IMSA's Integrated Science foundational groundings to meet its needs. In the spring, the teams came together to present their curricular products and associated student assessment strategies at IMSA's 1997 Science Symposium on Integrated Learning Approaches.

## **10th Anniversary Gala**

More than 400 guests attended this black tie fundraising event held at the Four Seasons Hotel in Chicago, honoring IMSA's founding fathers Nobel Laureate Dr. Leon Lederman and former Illinois Governor James R. Thompson, and the late Dr. Carl Sagan who received the IMSA Pioneer Award.

## **Founders' Day Celebration**

Held at IMSA, this event honored IMSA's founding trustees who still served on the board, charter staff members who are still employed by the Academy and other individuals and organizations that supported IMSA's early development.

## **Yolanda King Lecture**

Yolanda King, the daughter of human rights activist Dr. Martin Luther King, Jr. and Coretta Scott King, presented *The Dream is Still A Dream* to an audience of more than 2,000 including students and teachers from other Illinois schools. The presentation was part of IMSA's 10th Anniversary Touching the Future Lecture Series.

## **AAAS National Science Conference**

A group of 10 IMSA students and several staff members were invited to present at the 1997 American Association for the Advancement of Science (AAAS) Annual Meeting and Science Innovation Exposition in Seattle, Washington. Students made poster presentations about their research and IMSA President Dr. Stephanie Pace Marshall led the program High School Science Reform: History, Standards, and Ongoing Activities. IMSA science teacher Dr. John Eggebrecht presented IMSA's Integrated Science Program.

# winter

## **1997 Science Symposium on Integrated Learning Approaches**

Sponsored by the Smithsonian Institution, IMSA hosted this day long symposium where IMSA partners learned about curricular products and student assessment strategies developed by partner schools participating in the IMSA-Smithsonian Integrated Science Partnership Initiative. Educators also explored the Integrated Science approach as it relates to science standards and benchmarks, and discussed the obstacles and barriers to implementation.

### **Fifth Annual Richard L. Horwitz Lecture on Ethics**

Dr. Jean Bethke Elshtain, the Laura Spelman Rockefeller Professor of Social and Political Ethics at the University of Chicago Divinity School, presented American Democracy at Century's End to IMSA staff, seniors, alumni, friends and family of Richard Horwitz, and the public.

### **Second Decade Growth Plan**

The IMSA Board of Trustees endorsed the Second Decade Growth Plan. It is designed to strengthen IMSA's capacity to realize its mission, achieve its objectives and fulfill its legislative charge.



### **Commencement of the Class of 1997**

Nobel Laureate Dr. Harold Varmus, director of the National Institutes of Health, gave the commencement address on May 31 to IMSA's ninth senior class at Aurora's Paramount Arts Centre.

### **IMSA Scientific Literacy Conference**

Approximately 200 Illinois educators who are members of the Illinois Scientific Literacy Network presented their award-winning grant projects at the Second Annual Illinois Scientific Literacy Network Conference hosted by IMSA. IMSA administers the statewide network which promotes scientific literacy through ongoing dialogue, collaborative learning, and project development dissemination and evaluation.

### **Ethics in Science and Humanities Project**

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, anticipated will be used by secondary schools worldwide. The conference was hosted by the Israel Arts and Science Academy and the trip was supported by The Harris Family Foundation, a major investor-partner in IMSA's Center for Problem-based Learning.

### **IMSA Alumni Association**

The IMSA Alumni Association held its annual meeting at IMSA; the Class of 1992 held its five-year reunion in conjunction with this event. The Association elected new officers including Michael Peil '90 who will serve as its president until June 1999. Peil is a Post-Doctoral Associate at Cornell Law School.

*spring*

*summer*

# reinventing teaching *and* learning at IMSA

Students and Staff  Explore New Possibilities

For the IMSA community, 1996-97 will be known forevermore as the year of **Reinvention**. The previous spring, students, staff, parents and others engaged in a comprehensive, highly participatory Reinvention process designed to improve selected aspects of the Academy's learning and living program for IMSA students. These "reinvention volunteers" served on task forces, shared information about research and best practice in teaching and learning, and designed new programs and schedule frameworks to support these. **Why?** In short, to better serve student learners...different kinds of learners...each individual learner.

The goals of Reinvention were to strengthen the **personalization, flexibility, rigor** and **coherence** of academic programs; increase opportunities for students to become **integrative learners** and **ethical leaders**; and improve the overall quality of life.

In 1996-97, the IMSA community implemented several Reinvention changes.

Some highlights included: .....

Incoming students were given an opportunity to indicate pathway preferences and then were assigned to one of three program pathways—

## three program pathways for sophomores

### **Existing Core Program; Integrated Science/ Integrated Learning Experience; and Perspectives.**

Each pathway had unique characteristics and supported student learning in different ways. Each also enabled IMSA, as an educational laboratory, to test different programs and methods to see if they can advance the transformation of mathematics and science teaching and learning through an emphasis on ethical leadership and connections across academic disciplines.

### student research and inquiry

IMSA greatly expanded opportunities for students to develop as highly skilled and integrative problem finders, problem solvers and apprentice investigators.

All sophomores and volunteering juniors and seniors participated in the pilot year of systemic Student Inquiry. Students were asked to develop their own Plans of Inquiry, areas for focused learning and investigation around meaningful questions of interest to the student. Faculty and staff served as Inquiry guides.

*Examples of self-directed Student Inquiry projects by Junior students during the 1996-97 academic year included:*

### 1996-97 Self-Directed Student Plans of Inquiry

- Composition of a Piece of Chamber Music
- Differential Equations and Neural Networks
- Fabrication and Corrosion Tests of Ceramic Composites
- Health Issues as Related to Various Professions
- Inquiry into the Natural History of Local Fauna and Flora
- Investigations in Cinema and Its Relationship to the Ideological State Apparatus
- Investigations into Recombinant DNA Technology
- Research in Sports Psychology
- A Research Project with Elementary School Students and Science
- A Study of a Comparative History of Warfare – Eastern and Western



In addition, more than 150 students participated in the mentorship program, working on Wednesdays with scientists and researchers at area laboratories, corporations and universities. In April, students presented the results of their mentorship and inquiry projects on IMSA Exhibition Day and IMSA Presentation Day.

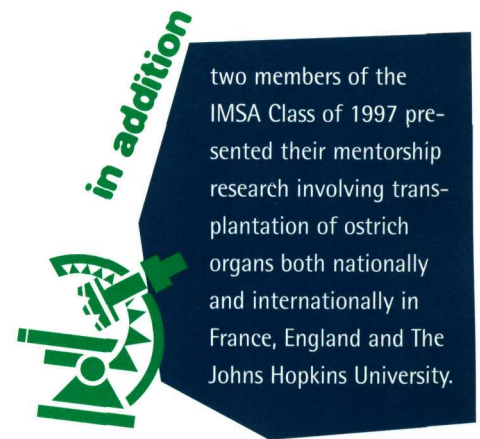
*Examples of student mentorship research topics conducted during the 1996-97 academic year included:*

**1996-97  
Mentorship  
Student  
Research  
Projects**

- Chaos in Periodic Systems
- Dynamics of the Hannaford Woods Great Blue Heron Rookery
- Go West: Web-Enabled SNMP Traversal
- Microbiological Analysis of Anti-Herpes viral Drugs
- Potential Role of Glial Cell Signaling in Alzheimer's Disease
- The Right to Die from a Hermeneutics Viewpoint
- Safety Critical Examination of the Use of a Microprocessor to Control a Railroad Grade Crossing
- Urinary Modified Nucleoside Excretion in Brain Tumor Patients

Students received state, national and international recognition for the quality of their research. For example, 10 students were invited to make poster presentations at the 1997 American Association for the Advancement of Science (AAAS) Annual Meeting and Science Innovation Exposition Feb. 13-18 in Seattle.

For abstracts of 1996-97 Mentorship Research Projects, contact the Office of Institutional Advancement at (630) 907-5040.



**navigation  
experiences**

IMSA designed and implemented Navigation experiences to help students assess, on a continual basis, where they are (with their academic and personal development), where they want to go, and how they intend to get there. Some programs addressed some of the same issues and needs as in previous years but in a different, more personalized manner (often through small rather than large group sessions). Significant additions included discussions about how to become a powerful, integrative learner and how to use computer and network resources in an ethical manner.

**modular schedule  
framework**

IMSA implemented a new schedule framework based on 20-minute time units. This enabled IMSA to schedule different types of courses and learning experiences in different combinations of time periods, as well as different meeting frequencies. This reduced "wasted" class time (start and stop time, for example) and fragmentation, increased opportunities for program integration and coordination, and focused greater attention on learning in terms of "commitment time" rather than "seat time."



## other 1996-97 highlights

**Learning Standards and Assessment System** IMSA faculty and staff identified the design principles and parameters for creating content and performance standards and for creating an assessment protocol. International benchmarks and in particular the Third International Mathematics and Science Study (TIMSS) helped inform IMSA's work. IMSA also established a partnership with The College Board and Educational Testing Service to address strategic issues related to assessment of student learning and the future of standardized assessment. Staff also provided leadership to the Illinois Learning Standards Project.


**Ethical Leadership** Ten students and two faculty members were selected to represent IMSA in the Ethics in Science and Humanities Project, a global curriculum project sponsored by the Society for Excellence Through Education. Ten schools from several countries were invited to participate (IMSA and two others from the U.S.). The Project began in 1996-97, included a summer workshop at the Israel Arts and Science Academy, and continues in 1997-98.

The Residential Life staff organized the first Student Ethical Leadership Conference, featuring a number of presentations and discussions about ethical issues and questions in various fields. Approximately 130 IMSA students attended.

**Enrollment Services** Staff and students designed and implemented several strategies and programs designed to create a more seamless process of student recruitment and admissions, support and retention, and transition to college. For example, 18 staff trained as "case managers" provided additional support to students in need; and an expanded peer tutor program and organized study groups increased academic support.

Admission counselors held 45 informational meetings throughout the state and two Visitor Information Program Days at IMSA. Pre-admission programs for talented students from underrepresented areas were expanded. College and academic counseling staff held mini-college fairs, a college information day, and workshops on the college application essay and interviewing skills.

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**Interscholastic Athletics and Wellness** A total of 370 students participated in 21 interscholastic sports. The wellness team used the Prudential FitnessGram to help students assess their aerobic capacity; muscle strength, endurance and flexibility; and body composition.

**Parental Support** The IMSA Parents Association and individual parents supported students' needs and teaching and learning programs in various ways. Examples of special projects included the Hubs and Hearth Program (student lounge areas) and the Parents-to-Parents Handbook and Parents-to-Parents Newsletter.

**Tenth Year Review:  
Longitudinal Study of IMSA Graduates**

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, the nation and world, the Academy conducts the Longitudinal Study of IMSA Graduates.

The study includes a comparison group of 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.

Examples include:

- IMSA graduates cite living and learning in an integrated fashion, 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.
- IMSA graduates (both genders) have had significantly higher percentages of degrees earned in both mathematics 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, Habitat for Humanity, Special Olympics and the Leukemia Society of America.

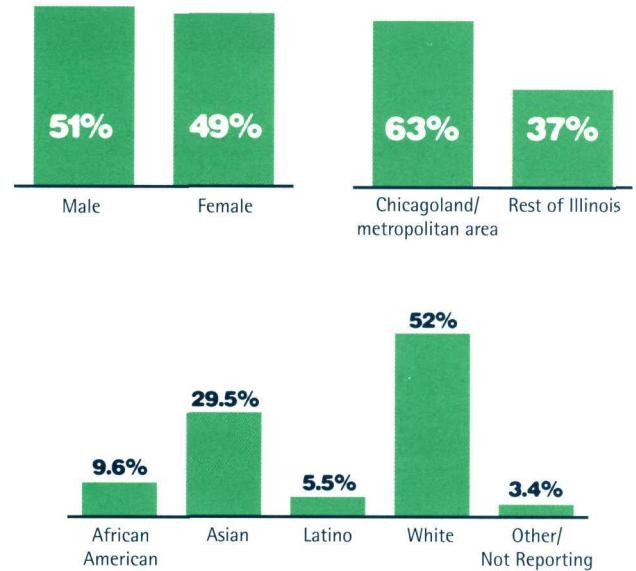
## student testing

### highlights

- Mean SAT I composite score for IMSA seniors was 1382, 366 points above the national average for college-bound seniors.
- Mean ACT composite score for IMSA seniors was 30.1, 9.1 points above the national average for college-bound seniors.
- Of IMSA juniors and seniors taking the Advanced Placement Examinations, 84% scored "3" or better and 58% scored "4" or better.
- Mean SAT II score for IMSA seniors taking the Mathematics-Level IIC Test was 746, 99 points higher than the national average for college-bound seniors. Mean IMSA score for the English Writing SAT II Test was 670, 102 points higher than the national average for college-bound seniors.

For more detailed information regarding student testing, you can request a copy of the IMSA Profile by contacting the College and Academic Counseling Office at (630) 907-5056.

## 1996-97 student demographics



## student competition

### highlights

#### Mathematics, Science and Technology

*United States Mathematical Olympiad*

Five students qualified to take the exam

*1997 U.S. Physics Team*

One student made the U.S. Physics Team

Two students qualified to take the semifinal exam

*ICTM State Math Contest*

1st place, team

*Westinghouse Science Talent Search*

Two students were named semifinalists

*American Computer Science League*

1st place in state, intermediate team

2nd place in state, senior team

*North Suburban Math League*

2nd place, team

#### Humanities and Foreign Language

*National Russian Essay Contest*

Four gold medals

Four silver medals

Three bronze medals

*Illinois History Expo*

One project advanced to national competition

*National German Honor Society*

27 Students

*Illinois Association of Teachers of English*

One student had poem published in the Illinois English Bulletin

#### Fine Arts

*Illinois Music Educators Association*

14 All-State Awards

4 All-State Composition Awards

*Illinois High School Association State Music Contest*

1<sup>st</sup> place, chamber choir

*Illinois High School Association State Solo and Ensemble Contest*

69 superior ratings

6 excellent ratings

Three perfect scores

#### Other

*ThinkQuest Competition*

One student took second place

*Knowledge Master Open*

5<sup>th</sup> place in nation; 1<sup>st</sup> place in state - fall

4<sup>th</sup> place in nation; 1<sup>st</sup> in state - spring

*IHSA Competition*

1<sup>st</sup> place in Class AA State Final Chess Tournament

1<sup>st</sup> place in Illinois State Scholastic Bowl

Qualified for state finals (girls diving)

IMSA

**expands**

scope of  
statewide service

Programs Explode



on World Wide Web

Visit us on the World Wide Web! Our URL address is

**<http://www.imsa.edu/>**



During 1996-97, the work of IMSA and its partners exploded onto the Internet scene. In this year alone, thousands of Internet users from across the world visited IMSA's content-rich websites ... and the numbers continue to grow in leaps and bounds as more students and teachers take advantage of IMSA's **service program websites.**

IMSA helps to transform mathematics and science teaching and learning through **capacity-building** programs, products and services for teachers. In 1996-97, IMSA provided five "program pathways" for educators to follow in their quest to transform mathematics and science teaching in their own classrooms. They included: **partnerships, networks, institutes and conferences, websites and products.**

Some 1996-97 highlights in these .....  
five "program pathways" included:

In IMSA's K-16 school-based partnerships, Illinois teachers learn to design and implement integrative, standards-based learning experiences for their students. These sustained partnerships are informed by current research and best practices, strengthened through the use of technology, and designed to meet the needs of students in partner schools.

*Partnership highlights in 1996-97 included:*

### **Integrated Science/Smithsonian Partnership**

The foundational groundings of IMSA's Integrated Science Program are: IMSA's Standards of Significant Learning, Transfer of Knowledge, and Transfer of Authority. The purpose of this partnership, supported by the Smithsonian Institution, is to determine whether these groundings can help transform science teaching and learning in other schools. To determine this, teams of teachers from nine partner schools were selected in the summer of 1996. These teams attended four working sessions at IMSA during the 1996-97 academic year and presented their Learning Experience Designs, including student assessments, at a symposium hosted by IMSA on March 19, 1997. Some partners are seeking to develop an entire integrated curriculum for their schools.

The partnership continues in 1997-98 with 10 more schools. The goal is to develop a network of teachers who develop integrative science curriculum for many Illinois students.

Visit our Integrated Science Website at

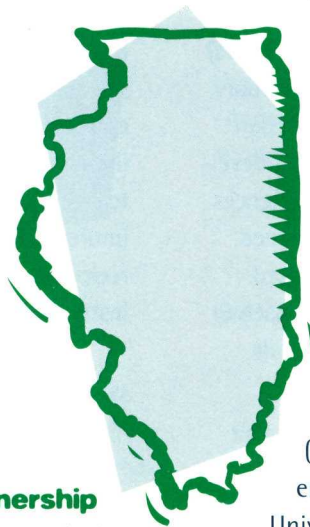
<http://www.imsa.edu/edu/intsci/>

### **Problem-Based Learning Research Partnership**

IMSA's Center for Problem-Based Learning (PBL) has worked with Arlington Heights District 25 and Barrington's Prairie Middle School for several years to expand teachers' PBL knowledge base, improve teaching practices for PBL, and create a collaborative culture for research, both action and impact. This year's Implementation Partnership involving educators from Arlington Heights' Westgate Elementary School and Barrington's Prairie Middle School focused on synthesizing and deriving meaning from the data gathered over the previous year.

Visit our Problem-based Learning Website at

<http://www.imsa.edu/team/cpbl/>



### **Lisle Mathematics Research Partnership**

This partnership investigates student learning which occurs using IMSA's Mathematical Investigations integrated curriculum and that which occurs using a traditional Algebra II curriculum to determine differences in knowledge, skills and attitudes.

Mathematics teachers from IMSA and Lisle High School co-taught a non-honors section that normally would be designated an Algebra II class. Research will be conducted in 1997-98 to compare student performance and attitudes between this and another Algebra II class, although the study also will focus on measures used only with the MI class.

### **Summer 'AD'Ventures I and II**

This professional development experience for Illinois teachers includes opportunities to develop and field-test innovative curriculum aligned with the national reports in mathematics, science, and technology education. Participating students actively experience and explore these opportunities.

In 1997, two sessions of Summer 'AD'Ventures (SAD'V) were offered - one - for 40 students entering ninth and tenth grades at Eastern Illinois University (EIU); and one for 100 students entering seventh and eighth grades at Illinois State University. These were preceded by at least six months of professional development meetings and preparation by the 22 teachers involved. Various assessments provided feedback on the learning process to teachers and students, documented service quality, and provided evidence of overall impact on students and teachers.

Visit our Summer 'AD'Ventures Website at

<http://www.imsa.edu/team/spi/SADVI>

or

<http://www.imsa.edu/team/spi/SADVII>

IMSA creates and supports professional development networks for educators who are committed to scientifically literate classrooms, want to learn from and network with other educators who are applying new knowledge in the classroom, and are willing to gather data to examine their practice ... through the lens of student achievement.

*Network highlights in 1996-97 included:*

### **Association for Supervision and Curriculum Development's Problem-Based Learning Network**

With the support of the Association for Supervision and Curriculum Development (ASCD), The Hitachi Foundation, and IMSA, ASCD's Problem-Based Learning Network (PBL Net) has grown to over 186 members from around the world. Two issues of our newsletter, "The Problem LOG", were published in 1996-1997, with a planned future output of three issues per year. Our first PBL Net Forum was conducted concurrently with ASCD's National Conference in New Orleans.

### **Illinois Problem-Based Learning Network (IPBLN)**

Seventeen teacher leaders met monthly at IMSA from January through May, 1997 to enhance their skills in problem design and scientific literacy and to develop skills in the design, development, and delivery of professional development experiences for other educators. In July these teacher-leaders welcomed 29 teacher learners to IMSA to learn about Problem-Based Learning (PBL) from the inside out, first as learners themselves then as coaches as they worked with over 63 middle grade students from surrounding communities.

**PBL - IMSACPBL-L (Internet Listserve)** The Center for Problem-Based Learning (PBL) K-16 Dialogue List (IMSACPBL-L) is for educators using problem-based learning or anyone interested in PBL at the K-16 levels, in any discipline area. The Listserve meets the needs of approximately 225 educators world-wide who share information and dialogue about PBL in varying contexts.

**First in the World Consortium** This is an educational consortium of 19 northeastern Illinois school districts partnered with IMSA, the U.S. Department of Education, The North Central Regional Educational Laboratory, the National Academy of Sciences, and the National Alliance of Businesses. The consortium is built around cross-school Teacher Learning Networks. The school districts' goal is to examine data and to design, share, implement, and disseminate exemplary programs and practices which enhance student achievement in mathematics and science.

**Illinois Scientific Literacy Network** The primary emphasis for the Illinois Scientific Literacy Network (ISLN) is to build a human and electronic network to support teachers in their design and implementation for scientific literacy classrooms. The network is coordinated and facilitated by IMSA, and much of its work is conducted with Illinois State Board of Education (ISBE) grant recipients, totaling 83 sites throughout Illinois.

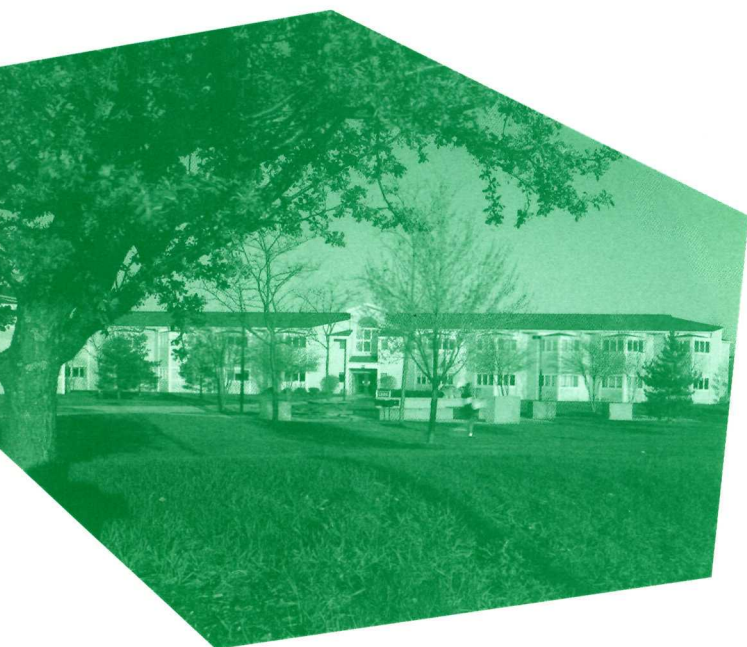
**IMPACT II Teacher to Teacher Network-IMPACT II**, an interactive professional program that recognizes and rewards exemplary programs in mathematics and science instruction developed by teachers, shares with other educational professionals through collaborative activities. In Illinois since 1990, IMPACT II has made modest financial awards to over 1,100 public Illinois mathematics and science teachers (more than 35,000 Illinois students have been the direct recipients of these teachers' creative instructional programs).



## institutes & conferences

IMSA held a number of partnership and network institutes and conferences on campus and at sites off campus for educators in Illinois and beyond, both members of IMSA's service partnership programs or service networks and/or educators who want to learn more about a particular teaching method for students.

*Conference highlights in 1996-97 included:*



### **Illinois Scientific Literacy Network Conference**

As part of the IMSA Scientific Literacy Network for the Illinois State Board of Education Scientific Literacy grant winners, two one-day conferences were held at IMSA for all interested educators. The conferences were held in December, 1996 and June 1997, and were attended by 216 educators. They focused on the showcasing of ISLN projects (to highlight what received funding, what was learned, and what was working), the introduction of the new website, a discussion of current thinking about scientific literacy, and the discussion of the connection between scientific literacy and the Illinois Academic Standards Project.

**Neison and Bette Harris Institute** The Neison and Bette Harris Institute for Introduction to Problem-Based Learning was held in Lisle during the first week of August, 1996 and was attended by 57 educators from across the United States and Mexico. The institute is an intense four day session where educators experience PBL (as learners, designers, and coaches) and are provided instruction, dialogue, guided practice, and mentoring in designing PBL curriculum and developing implementation strategies.

Specific outcomes included recognizing the power of PBL as an approach to teaching and learning, considering the relationship of ill-structured problems in the classroom to problems in the real world, developing a common vocabulary for PBL, knowing the critical components of PBL, appreciating the role of teacher as coach, experiencing the critical teaching and learning events defining PBL, and understanding assessment in PBL.



In 1996-97, IMSA greatly expanded the number of service program websites. These content-rich websites provide networking opportunities for professionals and learning resources for students and teachers in an interactive learning setting.

*Website highlights in 1996-97 included:*

### **Illinois Scientific Literacy Network Website**

The Illinois Scientific Literacy Network (ISLN) website was established to provide and collect the best educational materials and information from members of the network. Visitors to the ISLN web site will encounter four areas: information about the ISLN (its goals and guidelines, who participates), teacher support (information and links for classroom support, professional development, and communication), grant projects (access to information on current and past ISLN grants), and keyword searching of the ISLN site. The site maintains a profile page for each project, and viewers can search them by grade level, subject, project type or key word.

Visit our ISLN Website at

**<http://www.imsa.edu>**

**Integrated Science Website** IMSA's Integrated Science program connects and integrates teaching and learning in biology, chemistry, earth and space sciences, and physics. It is offered at IMSA as an alternative to a core sequence of separate courses in physics, chemistry and biology. Visitors to the website will encounter a series of "problem platforms" developed by partner teachers in other Illinois schools. These platforms provide students with real world scenarios, not constrained by disciplinary boundaries, for student-centered inquiry. In 1996-97, the website was transformed into the Smithsonian Secondary Science Network, including principles, curriculum, and a partnership directory. *(see above mention)*

Visit our Integrated Science Website at

**<http://www.imsa.edu/edu/intsci/>**



### **IMSA Scientific Visualization Website**

This IMSA service website contains three Internet-centered courses devoted to exploring the use of information technology as a means for visualizing complex scientific phenomena in the areas of Astrophysics, Geophysics, and Modern Physics. Known also as IMSA's SciVis project, this initiative won a Pioneering Partners dissemination grant. IMSA presented SciVis at various conferences and selected teacher teams to work with us on the project during the course of 1996-97.

Visit our Scientific Visualization Website at

**<http://www.imsa.edu/edu/astro/ils/mat/scivis/>**

**Problem-Based Learning Website** With the support of The Hitachi Foundation and IMSA, this multi-dimensional website serves as an information source and as a connective device linking educators interested in PBL. The website includes a description of problem-based learning, the Center for Problem-Based Learning, and what PBL looks like in the classroom (e.g., problems to be answered through PBL with accompanying instructional materials). It also contains links to PBL-related sites.

Visit our Problem-based Learning Website at

**<http://www.imsa.edu/team/cpbl/>**



## products

IMSA, as a result both of teaching and service experiences, generates a number of products through its Center for Collaborative Inquiry in Mathematics and Science and Center for Problem-Based Learning.

*Product highlights in 1996-97 included:*

**Math Journal** The Mathematics Department at IMSA has published one issue of its journal each year, beginning in 1993. Each issue contains articles and problems spanning a wide variety of topics of interest to high school mathematics teachers and students. The fourth edition of the "IMSA Math Journal" was distributed during the Fall 1996 semester.

**Newsletters** The *IMPACT II Newsletter* is mailed to the 1500 members of the Illinois IMPACT II Network. *The Problem Log* is a newsletter through IMSA's Center for Problem-Based Learning, with a distribution of 200 three times a year.

### **Problem-Based Learning Resource Manual**

The updated *Introduction to PBL* manual is a complete professional development program. It is a modular and customizable training resource document consisting of five sections: PBL Background, Problem Designing, Problem Coaching (what is needed to work with students as a cognitive coach), Information Resources (PBL, change, and professional development for instruction), and a Teaching and Training Template (lesson planning). This manual is produced and shared through partnerships, institutes and grant contract services.

**Real Science** Real Science is an interactive multimedia CD-ROM science magazine for third, fourth, and fifth grade elementary school students. This magazine has been coordinated and produced entirely by students at IMSA.

There are four major sections in "Real Science": News, Features, Experiments, and Interactive Laboratory. The interactivity of the sections provides students with full control over the material covered and allows students to proceed at their own pace.

A teacher's packet that includes tips, in-depth facts on specific areas, topics for discussion, and the Faculty Initiative section also is part of the magazine. The Faculty Initiative section serves as a forum for teachers across the State of Illinois to share new and innovative ideas about teaching.

The CD was distributed to 20 educational sites for field testing and evaluation.



# 1996-1997

## Illinois Service Initiatives

### networks

institutions	ASCD's PBL Net
<b>146</b>	Illinois Problem-Based Learning Network
educators	PBL - IMSACPBL-L (Internet Listserve)
<b>2,009</b>	First in the World Consortium
students	Illinois Scientific Literacy Network
<b>63</b>	IMPACT II Teacher to Teacher Network

### service program websites

visitors	Illinois Scientific Literacy Network Website
<b>17,350<sup>1</sup></b>	Integrated Science Website
	IMSA Scientific Visualization Website
	CPBL Website
	PBL-Net Website
	I-Teams/I-teams II Website
	Summer 'AD'Ventures I Website
	Summer 'AD'Ventures II Website

### partnerships

Mathematics Partnership Program (East St. Louis)	
PBL - Batavia Middle School Partnership	
PBL - Du Page Area Occupational Education System Partnership	
PBL - Hinsdale Partnership	
IPBLN - Research Partnerships	
PBL - Research Partnerships	institutions
Allen B. Shepard High School Research Partnership	<b>88</b>
Lisle High School Research Partnership	educators
Smithsonian Partnership	<b>289</b>
Summer 'AD'Ventures I and II	students
I-TEAMS	<b>168</b>

### institutes and conferences

PBL - Harris Institute	institutions	educators
Illinois Scientific Literacy Network	<b>215</b>	<b>273</b>

### service program products

Selected IMSA Articles Used as Service Resources	
Math Journal	
Newsletters	
PBL Resource Manual Update	products
PBL - ASCD Book <i>Problems as Possibilities</i>	<b>15</b>
PBL Videos	distributed
Real Science	<b>2,890</b>

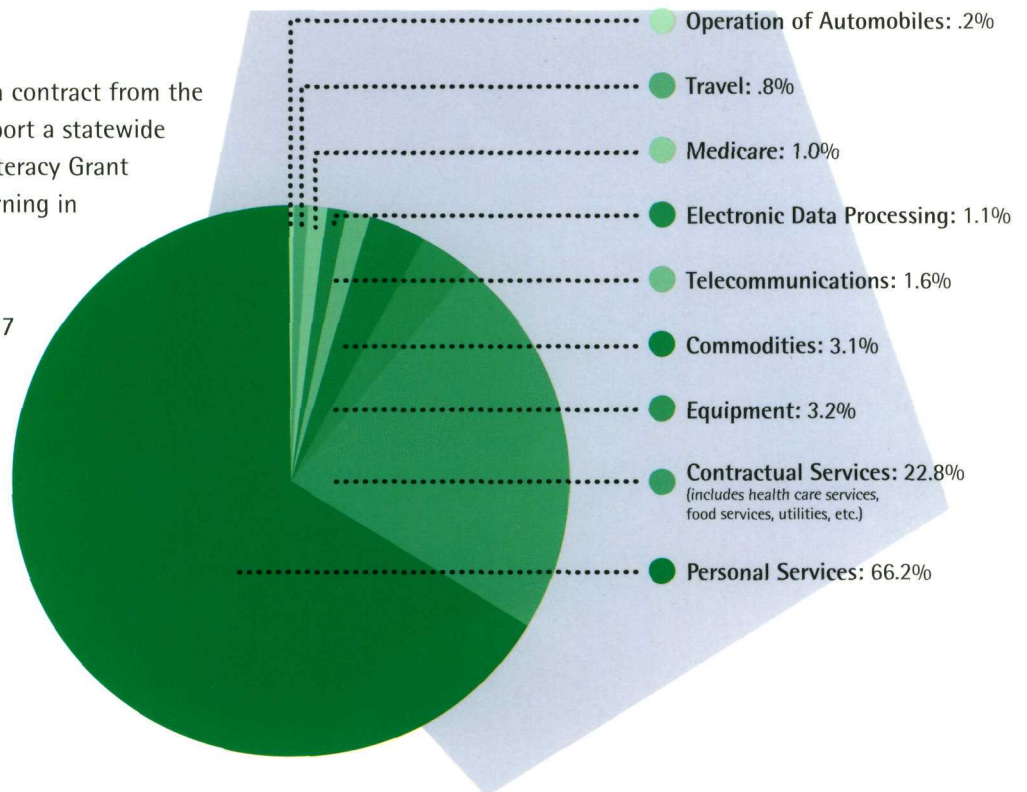
<sup>1</sup> extrapolated from partial year figures

## Illinois' investment

To support and expand the Academy's research, innovative teaching and service programs/initiatives, the Illinois General Assembly appropriated an operating budget of \$12.87 million in 1996-97. Expenditures, allocated according to the state comptroller's guidelines, included:

In addition, the Academy was awarded a contract from the Illinois State Board of Education to support a statewide service program, the Illinois Scientific Literacy Grant Program, to transform teaching and learning in mathematics, science and technology.

IMSA parents paid a \$845 fee in 1996-97 to offset some of the costs of cocurricular programs and residential services. The most significant capital projects included the expansion of the Information Resource Center and technology improvements.



The IMSA Fund for Advancement of Education works to secure the support and participation of various constituencies including individuals, corporations, foundations, educational institutions and governmental agencies to advance the Academy's mission. During 1996-97, the IMSA Fund supported various special events to celebrate and commemorate the Academy's 10th Anniversary.

## private sector investment

### Fundraising Results and 10th Anniversary Special Events

- **10th Anniversary Gala:** Former Illinois Governor James R. Thompson, Nobel Laureate Dr. Leon Lederman, the late Dr. Carl Sagan, Dr. Stephanie Pace Marshall, honorees
- **Founders' Day Celebration:** Former Illinois Governor James R. Thompson and Nobel Laureate Dr. Leon Lederman, speakers
- **Touching the Future Lecture Series:** Dr. Rob Kolstad, Astrophysicist Dr. Edward "Rocky" Kolb, Dr. John Dossey, Yolanda King, daughter of Dr. Martin Luther King, Jr.
- **Fifth Annual Richard L. Horwitz Lecture on Ethics:** Dr. Jean Bethke Elshtain, professor of social and political ethics at the University of Chicago Divinity School
- **10th Anniversary Community Concert Celebration:** Musical program for students, families, alumni, faculty, staff and friends of the Academy featuring a performance by IMSA students at the Paramount Arts Centre followed by a dinner
- **10th Anniversary Aurora Arts Open House:** A day for the Fox Valley community to visit IMSA and enjoy the artwork of Illinois artists
- **IMSA's April Artist-in-Residence Elizabeth Gill Lui**
- **Gifts of \$125,275.00 from IMSA Fund Board of Directors**
- **Total contributions of \$9,074,042.00 since 1987**

To receive a copy of the 1996-97 Year End Summary of the IMSA Fund for Advancement of Education, contact the Office of Institutional Advancement and Public Policy at (630) 907-5040.

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"Entelechy" (Bruce White, sculptor)  
Photographed by Elizabeth Gill Lui  
Entelechy is part of IMSA's "Potential for  
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Illinois Mathematics and Science Academy  
1500 West Sullivan Road  
Aurora, Illinois 60506-1000  
(630) 907-5000