

## Introductory Sketch

**Dr. Paul G. Huray** is currently Professor of Electrical Engineering at the University of South Carolina (USC) where he serves:

- The Regional research community as Principal Investigator for the SouthEast Partnership to Share Computational Resources (SEPSCoR).
- The U. S. research community as chairman of the review board for the Argonne National Laboratory Decision and Information Science division.

Between 1988 and 2000 he was Senior Vice President, Vice Provost for Research, and Interim chairman of the Computer Science and Engineering department at USC where he served:

- The U. S. Department of Commerce as vice-chairman of the steering committee for Intelligent Manufacturing Systems (IMS), and
- The State of South Carolina as Vice Chairman of the Governor's Math and Science Advisory Board.

Between 1985 and 1988 he was a senior policy analyst for the White House - Office of Science and Technology Policy (OSTP) where he helped develop:

- The NSF Science and Technology Centers and an Administration commitment to double the budget of the NSF,
- A White House S&T Initiative for Historically Black Colleges and Universities,
- A Presidential Initiative for High Performance Computing and Communications by chairing the committee<sup>1</sup> that created of the Internet,

Between 1969 and 1985 he held a joint appointment as professor of physics at the University of Tennessee (UT) and research physicist at the Oak Ridge National Laboratory (ORNL).

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<sup>1</sup> The Federal Coordinating Council on Science Engineering and Technology (FCCSET) committee on Computer Research and Applications.

## **Biographical Summary for Dr. Paul G. Huray**

### **Education:**

B. S. in Engineering 1964 & Ph.D. in Physics 1968 from University of Tennessee.  
Post Doc.; Physics, University of North Carolina 1969; Higher Ed. Management, Harvard 1982.

### **Employment:**

Oak Ridge National Lab; Physicist in Solid State, Physics, Chemistry Divisions.  
University of Tennessee; Asst., Assoc., Full Professor, Assoc. Dean, Director - Science Alliance.  
Centre D'Etudes Nucleaires de Grenoble; Cherchur.  
The White House (OSTP); Senior Policy Analyst.  
University of South Carolina; Senior Vice President, Vice Provost, Distinguished Professor of Physics and Electrical Engineering, Interim Chairman of Computer Sciences and Engineering, Professor of Electrical Engineering.

### **Honors:**

University of Tennessee Outstanding Teacher Award 1976.  
Industrial Research Magazine, IR-100 Award 1982.  
University of Tennessee Phi Beta Kappa Faculty Award 1988.  
The Order of The Palmetto 1994.  
University of South Carolina Distinguished Professor 1994.

### **Teaching:**

5 Ph.D. students  
Undergraduate Courses – Freshman level Honors Physics for Scientists and Engineers, Freshman level Modern Technology, Junior level Electromagnetic Theory I and II, Senior level Thermodynamics and Statistical Mechanics.  
Graduate courses - Mathematical Methods of Physics, Communications Technology, Advanced Electromagnetic Theory, Superconducting Devices, Mathematical Methods of Electrical Engineers, Signal Integrity of high speed circuits, Signal Integrity on the system bus.

### **Funding:**

PI or Co-PI on 74 awards for \$248 Million.

### **Publications:**

111 Publications, 319 invited talks (24 keynote), 9 U. S. Congressional Testimonies.

### **Boards:**

FCCSET committee on Computer Research and Applications (Chair).  
Academic Coalition for Intelligent Manufacturing Systems (Chair)  
Argonne National Lab Review Committee (Decision and Info. Sciences Division Chair).  
National Coalition for R&D (University - National Laboratory Chair).  
S.C. EPSCoR programs (PI and Program Director).  
White House S&T Initiative on Historically Black Colleges and Universities (Co-Chair).  
Oak Ridge Associated Universities (Vice Chair).

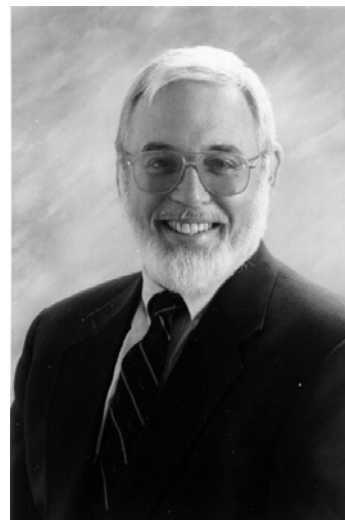
U.S. Delegation for the Intelligent Manufacturing Systems (IMS) program (Vice Chair).  
S.C. Governor's Mathematics and Sciences Advisory Board (MSAB) (Vice Chair).  
Department of Energy Basic Energy Sciences Advisory Board (BESAC).  
Presidential PCAST panel on High Performance Computing and Communications.  
AMA, IRI, 88-Open, RCI, SURA, SC ETV, Columbia Technology Advisory Board.  
USC Electrical Engineering Department Chair Search Committee (Chair).  
SC ETV New Media Advisory Board.

**Program Creation:**

UT/ORNL "Science Alliance" and "Distinguished Scientist" program.  
NSF "S&T Centers" and administration commitment to double the annual NSF budget.  
FCCSET High Performance Computing and Communications "the Internet".  
U.S. / Japan Bilateral Agreement on R&D Cooperation in Science and Technology.  
S.C. Universities Research and Ed. Found. "SCUREF" and "Distinguished Scientist" program.  
NIST "Southeast Manufacturing Technology Center".  
DOE Grand Challenge Consortium "The Partnership in Computational Sciences".  
NSF State Systemic Initiative "SSI for South Carolina Science and Math Education".  
The Academic Coalition for Intelligent Manufacturing Systems "A-CIMS".  
South Carolina Supercomputer Network.  
South East Partnership to Share Computational Resources "SEPSCoR".  
South Carolina Information Technology Institute.  
NSF "TechnoAngels"  
USC / Intel "Signal Integrity Program"

## Biosketch For Paul G. Huray

**Education:** Paul G. Huray was born on Nov. 3, 1941 in Knoxville, and grew up in Oak Ridge, Tennessee. He pursued undergraduate work and graduated first in his engineering class in 1964 from The University of Tennessee (UT). During this study he was a co-op student in the Solid State Division at the Oak Ridge National Laboratory (ORNL). His graduate research was carried out in the Physics Division at ORNL. In 1968, he received a Ph.D. degree in physics at UT and began postdoctoral research at the University of North Carolina. In 1982, he completed the Institute for Higher Education Management at Harvard.



**Academic:** In 1969 Huray became assistant professor of physics at UT, teaching the introductory honors physics sequence and the graduate sequence in the mathematical methods of physics. He was promoted to full professor in 1980. During this time his research was conducted in the Chemistry Division at ORNL in the Transuranium Research Laboratory where he and his students carried out magnetic studies on the transamericium elements (Cm, Bk, Cf and Es). In 1976 he was named Alumni Outstanding Teacher. In 1984, he helped create a center of excellence called "The Science Alliance" between ORNL and UT and in 1988 he was named UT Phi Beta Kappa faculty scholar. At the University of South Carolina, he helped create the South Carolina Universities Research and Education Foundation (SCUREF), the Governor's Math And Science Advisory Board (MSAB), the State Systemic Initiative (SSI) for Science and Math Education, and the S. C. Supercomputer Network (SCSN). In 1994, Governor Campbell conferred upon him The Order of the Palmetto and he was named Carolina Distinguished Professor of Physics and Engineering. In 1995 he helped create the national Academic Coalition for Intelligent Manufacturing Systems (A-CIMS), in 1996 he helped create the SouthEast Partnership for Sharing Computational Resources (SEPSCoR) and in 2000 he helped create the "TechnoAngels" program for physically-disabled persons. In 2003 he was nominated for the E.T.S. Walton award by the National Science Foundation of Ireland and in 2003 he worked with the Intel Corporation to create the USC / Intel Signal Integrity program. In total, he has received 74 awards for \$248 million, has published 111 articles, has given 319 invited talks (24 keynote), and has testified 9 times before the U. S. Congress.

**Administration:** From 1981 to 1985, Huray was Associate Dean of the UT College of Liberal Arts and in 1984 he became the first director of the UT/ORNL Science Alliance. In 1988, Huray became Senior Vice President for Research at the University of South Carolina and in 1992 was renamed Vice Provost for Research. In 1992, he served as Vice Chairman of the South Carolina Governor's Math and Science Advisory Board. In 1993-94 he served as Program Director for the State's EPSCoR programs and as principal investigator (PI) for the NSF Experimental Systemic Initiative in South Carolina and in 1999-2000 for DoEd's project to Prepare Tomorrow's Teachers to use Technology (PT<sup>3</sup>). Between 1998-2001 he was PI for NSF's SEPSCoR program and in 2000 he served as the Interim Chairman of the USC Computer Science and Engineering department.

**Government:** In 1985 he worked as a senior policy analyst at the White House Office of Science and Technology Policy (OSTP) to help create the NSF Science and Technology centers and to double the NSF budget. At OSTP he wrote portions of two executive orders and the 1987 State of the Union address. He co-chaired the White House S&T Initiative on Historically Black Colleges and Universities and chaired the Federal FCCSET committee on Computer Research and Applications. The FCCSET work produced the Presidential initiative on High Performance Computing and Communications (HPCC) and created the Internet. In 1988 he represented the U. S. for the US/Japan Agreement on Cooperation in R&D, between 1989 and 1991 he was a member of the President's Council of Advisors on Science and Technology (PCAST) panel on HPCC, between 1992 and 1994 he was vice chairman of the international steering committee for Intelligent Manufacturing Systems (IMS) and served on the Department of Energy's Basic Energy Sciences Advisory Committee (BESAC). Between 1994 and 1998 he served as chairman of the University-Laboratory task force for the National Coalition for R&D.

**Service:** Huray has served on technical advisory or review Boards for the National Academy of Sciences, the Office of Technology Assessment, the American Management Association, the Industrial Research Institute, the Department of Energy, the Research Consortium Inc., the U.S. Department of Commerce, Southeast Universities Research Association, Oak Ridge Associated Universities, the 88-Open industrial consortium, South Carolina Educational Television, the City of Columbia, the Oak Ridge National Laboratory, the Argonne National Laboratory and the White House.

**Personal:** Dr. Huray and his wife of 40 years, Susan, live at 110 Summer Haven Court, in DeBordieu Colony, Georgetown, SC 29440. Their son, William, is an RN in intensive care and is now a traveling trauma nurse in San Jose, CA. Their daughter, Jennifer teaches American and English Literature at Amherst High School in Amherst, NH. Their daughter, Stephanie, teaches English as a second language at the British Embassy and assists the "CONCERN" program to protect indentured children in Kathmandu Nepal.

**Phone numbers and e-mail:** 843-527-2197 (home), 803-777-9520 (work), [huray@sc.edu](mailto:huray@sc.edu)

**Curriculum Vita**  
**for**  
**Paul G. Huray**

Oct. 1, 2003

## Resume of Paul G. Huray

Current Position: Professor of Electrical Engineering, University of South Carolina  
Work Address: Swearingen Engineering Building, Room 3A18  
Columbia, SC 29208  
Work Phone: (803) 777-9520, FAX: (803) 777-8045, e-mail: [huray@sc.edu](mailto:huray@sc.edu)  
Home Address: 110 Summer Haven Court  
Georgetown, S.C. 29440  
Home Phone: (803) 527-2197 home e-mail: [huray@sccoast.net](mailto:huray@sccoast.net)  
Married: L. Susan Lyons, 9/12/62 – present.

### **Educational Background:**

University of Tennessee, B.S. in Engineering	1964
University of Tennessee, Ph.D. in Physics	1968
University of North Carolina, Post Doctoral in Physics	1969
Harvard University, Post Doc, Institute for Educational Management	1982

### **Employment Record:**

The Oak Ridge National Laboratory:	
Co-Op Student, Solid State Division	1960-1964
Staff, Physics Division	1966
Part-time, Chemistry Division	1971-1985
The University of North Carolina:	
Instructor of Physics	1968-1969
Centre D'Etudes Nucleaires de Grenoble:	
Cherchur, Physique du Solide	1983
The University of Tennessee:	
Assistant Professor of Physics	1969-1972
Associate Professor of Physics	1973-1979
Professor of Physics	1980-1987
Associate Dean of Liberal Arts	1981-1984
Director of ORNL/UT Center of Excellence	1984-1985
The White House Science Office (OSTP):	
Senior Policy Analyst	1985-1988
The University of South Carolina:	
Senior Vice President for Research	1988-1994
Carolina Distinguished Professor (Physics and EE)	1994-2000
Interim Chairman of Computer Science and Engineering	2000-2001
Professor of Electrical Engineering	2001-present

### **Associations:**

Sigma Pi Sigma, Tau Beta Pi, Phi Kappa Phi, Sigma Xi, SC Academy of Sciences, American Association for the Advancement of Science, American Physical Society, Phi Beta Kappa.

## Administration

### Honors:

The Order of the Palmetto: by Governor Carrol Campbell

1994

### Federal Programs:

Department of Energy, Basic Energy Sciences Advisory Committee (BESAC).

U.S. Department of Commerce, Intelligent Manufac. Systems (IMS) Steering Comm. (Co Chair)

White House, Office of Science and Technology Policy (Senior Policy Analyst).

White House Science Council panel on Federal science and technology (Secretary).

Federal Coordinating Council for Science Engineering and Technology (FCCSET), Committee on Computer Research and Applications (Chair).

White House S&T Initiative on Historically Black Colleges and Universities (Co Chair).

President Bush's Council of Advisors for Science and Technology (PCAST) panel on High Performance Computing and Communications.

National Coalition for R&D (University-Laboratory task force Chair).

### Corporate and Educational Boards:

U.S. Academic Coalition for Intelligent Manufacturing Systems (Board Chair).

Oak Ridge Associated Universities (Board Vice Chair).

Southeastern Universities Research Association (SURA Board of Trustees).

Advisory Board of the Industrial Research Institute (IRI Board of Directors).

The Research Consortium, Inc. (RCI).

88-Open, Ltd. (Consortium Board of Directors).

American Management Association (Technical Advisory Board).

UTK / ORNL Distinguished Scientist program (Review Board Chair).

South Carolina Educational Television (Digital Media Advisory Board).

Argonne National Laboratory (Decision and Info. Sciences division Review Board Chair).

### South Carolina Programs:

University of South Carolina Senior Vice President for Research.

S.C. Governor's Math and Science Advisory Board (Vice Chair).

S.C. Research Parks Authority.

South Carolina EPSCoR Programs (PI and Program Director).

S.C. Universities Research and Education Foundation (Executive Director).

South Carolina Supercomputer Network (Director).

USC Computer Science and Engineering department (Interim Chair).

USC / Intel Signal Integrity Program

### Tennessee Programs:

Director, "Science Alliance" Center of Excellence

Chairman, UT/ORNL Distinguished Scientist Program

Associate Dean, College of Liberal Arts

Director, UT College Bowl Program

Advisory Board, Art and Architecture Gallery and Opening Night Club

Alumni Outstanding Teacher Committee

Chairman, National Laboratories Study Team

Board of Directors, Tennessee Biotechnology Center and the UT Research Corporation

## Teaching

### **Honors:**

University of Tennessee Alumni Outstanding Teacher 1976  
Nomination for USC Mungo Undergraduate Teaching Award 2002

### **Interdisciplinary Teaching:**

Mathematical Methods (Physics, Electrical Engineering and Mathematics departments).  
Communications Technology (Electrical Engr. and Computer Science and Engr. departments).

### **Undergraduate Courses:**

**Honors Physics:** Calculus based mechanics, dynamics, thermodynamics, electricity and magnetism, light, and modern physics for physics majors and engineers.

**Physics of Music:** Foundations of musical acoustics, waves and vibrations, architectural acoustics, digital techniques for generating and recording sound, perception and measures of sound for liberal arts and education majors.

**Electrical and Electronics Engineering:** Electrical engineering in a global economy, role of an engineer in society, mathematical fundamentals, effective communications, and team projects.

**Electromagnetic Theory I and II:** Basic concepts of electric and magnetic fields, and applications of Maxwell's Equations to transmission lines, waveguides and antennas.

### **Graduate Courses:**

**Thermal Physics:** Microscopic and macroscopic principles of equilibrium thermodynamics, kinetic theory and statistical mechanics.

**Mathematical Methods of Physics:** Vector and tensor analysis, eigensolutions, complex variables, solutions to partial differential equations of nature, transforms, Green's functions and integral equations for students in physics and engineering.

**Communications Technology:** Interdisciplinary electromagnetic theory of digital signal processing, application to practical communications devices, and a forecast of future technology.

**Advanced Electromagnetic Theory:** Solutions of Maxwell's equations, vector and scalar potentials, Green's functions, applications to radiation and guided wave propagation.

**Superconducting Devices:** Fundamental theory of superconductivity, practical use of low temperature systems, design of magnets and shields, magnetic measuring systems, SQUIDs (Superconducting Quantum Interference Devices), and superconducting resonance circuits.

**Mathematical Methods of Electrical Engineers:** Solutions to electric and magnetic boundary value problems using complex variables, vector analysis, Fourier series and transforms, eigenanalysis, wavelets, integral equations, and retarded potentials.

**Signal Integrity of high speed circuits:** The concept of signal integrity for high speed circuits, signal parameters, transmission lines, I/O buffer models, clock schemes, serial data, package/die/connector modeling, I/O power delivery, measurement.

**Signal Integrity on the system bus:** System analysis for industry buses, budget making, cost performance trade off, system bussing block diagrams, case studies for SCSI, IDE, Serial ATA, GTL, DDR, PCI, PCI express, and industrial's direction on new buses.

## Research Direction

### Honors:

Industrial Research Magazine IR-100 Award;	
"High-level Radioactive Waste Stabilization Process."	1982
U.T. Science Alliance Research Awards (3)	1984-88
U.T. Phi Beta Kappa Faculty Award	1988
Nominated for E.T.S. Walton Award (Science Foundation of Ireland)	2003

### Ph.D. Dissertations Directed:

Joyce A. Monard	"Mossbauer Studies of Electrostatic Hyperfine Interactions in $^{238}\text{U}$ , $^{236}\text{U}$ , and $^{234}\text{U}$ ."	1972
Cheng May Tung	"Electron Charge Density Distributions Surrounding Impurities in Gold."	1976
Stanley E. Nave	"Micromagnetic Susceptometer for the Measurement of the Magnetic Susceptibility of the Actinides."	1980
James R. Moore	"Magnetism in Californium."	1988

### Masters Theses Directed:

Thomas J. Kirthlink	"Effects of Substitutional s-p Metal Impurities on the Mossbauer Isomer Shift of Gold."	1971
Roger A. Villecco	"Mossbauer Investigation of Weyl's Theory of the Unified Field."	1972
Peter Angelini	"Determination of the Melting Point and Phase Transformation Temperatures of Promethium 147 Metal and Vapor Pressure of Curium 244."	1974
Kenneth F. Kelton	"Preparation and Properties of Solid Solution Gold Calcium Alloys."	1978
Trent L. Nichols	"Angular Momentum Character of the Electronic Charge Density Perturbations in Gold Alloys."	1979
John Mark Legan	"Mossbauer Studies of $^{237}\text{Np}$ in a Synthetic Monazite "	1981

### Interdisciplinary Teaching and Research:

"Technology-Society Interaction Assessment of the Clinch River Breeder Reactor"	1974-76
"Physical Chemical Studies of the Transuranium Elements"	1977-88
"State Systemic Initiative for K-12 Science and Math Education"	1988-98
"High Performance Networks for Web-based learning"	1994-99

**Research Grants and Fellowships**

		<b><u>Year</u></b>	<b><u>Award</u></b>	
Nat. Defense and Ed Act	Fellowship	1964-67	13,500	
Oak Ridge Assoc. Univ. Research Corporation	Fellowship Basic Research	1967-69	12,000 1970-72	12,250
NSF	Fellowship	1973	6,000	
Univ. of Tenn.	Basic Research	1974	2,000	
Westinghouse	Clinch River Breeder Reactor*	1974-76	200,000	
Energy R&D Admin.	Basic Research	1977-78	94,000	
Energy R&D Admin.	Basic Research	1979	30,000	
DOE	Basic Research	1980	65,000	
DOE	Basic Research	1981	85,000	
DOE	Basic Research	1982	90,000	
DOE	Basic Research	1983	95,000	
DOE	Basic Research	1984	100,000	
TN, DOE, MM,ARCO, IBM	The Science Alliance*	1984-7	33,500,000	
DOE	Basic Research	1985	97,000	
DOE	Equipment	1985	95,000	
DOE	Computational Applications	1985	143,780	
State of Tenn.	Heavy Elements Equip.	1985	100,000	
DOE	Basic Research	1986	100,000	
DOE	Computational Applications	1986	353,920	
State of Tenn.	Heavy Elements Equipment	1986	100,000	
Industry Consortium**	HBCU Alliances*	1986	150,000	
DOE	Basic Research	1987	97,000	
Industry Consortium**	HBCU Alliances*	1987	210,000	
DOE	Basic Research	1988	102,000	
DOE	Basic Research	1989	107,000	
NIST, SC, IBM, DEC	Southeast Man. Tech. Ctr.*	1989-94	30,000,000	
Westinghouse	Parallel Computing	1990	1,100,000	
Industry & Gov Agencies	5th Dist. Mem.Computing Conf*	1990	500,000	
DOE and SC	Hazardous Waste Pilot Center*	1990-3	29,500,000	
DOE	Computational Start-up	1991	25,000	
DOE	Distinguished Scientist I	1991	150,000	
DOE	Pre-College Science & Math Ed. I	1991	100,000	
DOE	Computational Grand Challenge*	1991-6	118,943,000	
DOE	High Perf. Computing Applications	1992	130,000	
DOE	Workshop for Pre-College Ed.	1992	28,325	
NSF	IMS Academic Partnering Program	1992	34,188	
NSF	SC EPSCoR program*	1992-95	3,900,000	
DOE	High Perf. Computing Equip.	1993	500,000	
Intel	Infrastructure Grant	1993	769,000	
DOD	EPSCoR Planning Grant*	1993	50,000	
NSF	EPSCoR Rural Minority Program*	1993-94	75,000	

NSF and SC	SC Statewide Systemic Initiative *	1993-8	19,676,696
EPA	SC EPSCoR program	1993-95	400,000
DOE	Distinguished Scientist II	1994	125,000
NSF	A-CIMS Workshop	1994	8,141
SURA	IMS Testbed Strategy	1994	10,000
NSF	Experimental Systemic Initiative	1994	938,221
DOE	EPSCoR Planning Grant	1994	20,000
NSF, ARPA, NIST	Academic Coalition for IMS	1995	150,000
Silicon Graphics	Infrastructure Grant	1995	75,000
SC Dept of Insurance	Advanced Solutions Subcontract	1995	36,000
State Dept of Ed.	Pre-College Science & Math Ed.II	1995	15,000
CHE: Eisenhower	Pre-College Science & Math Ed.II	1995	15,000
State of SC	SC Supercomputer Network	1995	40,000
SC Dept. of Insurance	Advanced Solutions Subcontract	1996	56,000
NSF, ARPA, DOC	Academic Coalition for IMS	1996	150,000
NSF	SE P'ship to Share Comp Resources*	1996-98	1,282,000
State of SC	SC Supercomputer Network	1996	60,000
BMW Corporation	SC-Austria Network Exchange	1997	10,000
NRL	Cryogenic Cooling of Comp Chips*	1997	500,000
CDD	Video Conferencing	1997	7,500
DoEd	Project Connect	1997	200,000
NSF, ARPA, DOC	Academic Coalition for IMS	1997	150,000
Microsoft Corporation	Disabilities Assistance	1997	25,000
DoEd	Project Connect	1998	200,000
NSF	High Bandwidth Applications Test	1998-01	800,000
NSF	KDI-Knowledge Networking	1998-01	800,000
NRL	A Functional Cryo-Computer*	1998	500,000
SC-EPSCoR	Instructional Innovation	1999	3,749
DoEd	Bridging the Digital Divide	1999-00	234,700
NSF	Access Grid	2000-01	62,000
NSF	Tachyon Geosynchronous Comm.	2003	68,950
Intel, Ansoft, Synopsis	Signal Integrity: High Speed Circuits	2003	400,000
Total:			248,783,925

† Proposal Submitted

\* Co-PI with others

\*\* AT&T, ARCO, Mott, DEC, Standard Oil, GM, IBM, HP, Ratheon, Rockwell

**APPENDIX A**

**PRESENTATIONS**

**OF**

**PAUL G. HURAY**

**International Conferences before 1986:**

Asilomar, California	Boston, Massachusetts
Washington, DC	Corfu, Greece
Philadelphia, Pa.	Zurich, Switzerland
Asilomar, Calif.	Los Angeles, Calif.
Orsay, France	Tallahassee, Florida
Venice, Italy	St. Polten, Austria
Swansea, Wales	

**19 (7 invited)**

Rehovoth, Israel  
 Grenoble, France  
 Vienna, Austria  
 Boston, Mass  
 Elat, Israel  
 Aix-en-provence, France

**American Physical Society before 1986:****15 (2 invited)****American Chemical Society before 1986:****3 (1 invited)****Colloquia at Labs before 1986:**

Pierre Et Marie Curie Institute, France  
 Fontenay-aux-Roses, France  
 Centre D'Etudes Nucleaires de Grenoble, 2  
 Kernforschungszentrum Karlsruhe, Germany

**14 (14 invited)**

Lawrence Berkeley Laboratory  
 Oak Ridge National Laboratory, 7  
 Argonne National Laboratory, 3  
 Lawrence Livermore Laboratory  
 Los Alamos National Lab, 2

**Colloquia at Universities before 1986:**

The University of Tennessee, Knoxville, 8  
 The University of North Carolina, Chapel Hill  
 The University of North Carolina, Wilmington  
 Catholic University of America  
 The University of Heidelberg, Germany  
 The University of Munich, Germany  
 Domaine University, Grenoble, France  
 The University of South Carolina  
 The University of Paris, Orsay, France

**25 (25 invited)**

Wake Forest University, 2  
 King College  
 Davidson College  
 East Carolina University  
 The University of Cincinnati  
 Florida State University  
 Lycoming College  
 Louisiana State University

**Presentations in 1986:****15**

77. National Coalition for Science and Technology. "The Evolution of Science and Technology Centers." Washington, D.C., Feb. 13, 1986.
78. American Federation of Information Processing Societies, "Perspectives on the Continuing Evolution of Information Needs and Policies", Washington DC, Feb. 13, 1986.
79. Research and Development Council of the American Management Association, "The role of the federal government in catalyzing University/Industry Science and Technology centers." Tucson, Arizona, Feb. 15-19, 1986.

80. Research on Research Committee of the Industrial Research Institute, "University/Industry Science and Technology partnerships: vehicles for long-range research," Marco Island, Florida, Feb. 20-22, 1986.
81. Eleventh National Conference on Blacks in Higher Education, "Historically Black Colleges and University Alliances with Frontier Sciences." Washington DC, April 10-13, 1986.
82. Federal Laboratory Consortium, Keynote Address: "Science and Technology Centers: A boost for American Industrial Competitiveness." Annapolis, Md., May 6, 1986.
83. Annual Meeting of American Foundations, Principal Address: "Under-Representation of Blacks in Science and Technology: Models for correction." Rockefeller Foundation, New York, July 8, 1986.
84. Third International Symposium on Resonance Ionization Spectroscopy and its Applications. Session Chairman on Resonance Ionization and Materials Separations. University College of Swansea, Wales, Sept. 11, 1986.
85. White House Conference on HBCU Alliances with Frontier Sciences. Co-chairman, moderator and panelist. National Academy of Sciences, Washington DC, Sept. 18, 19, 1986.
86. Office of Technology Assessment Panel on International Participation in Controlled Thermonuclear Fusion Program. Washington, D.C., Oct. 15, 1986.
87. Southeastern Universities Research Association Annual Meeting, "Plans for a National Fiber-Optic Network Study." Washington, D.C., Oct, 23, 1986.
88. Anna G. Mendez University, Jackson State University, Lawrence Berkeley Laboratory Consortium Review Board Meeting. Keynote Address: "The Role of Alliances in Science and Technology." San Juan, Puerto Rico, Oct. 31, 1986.
89. National Geographic Information and Analysis Center Advisory Panel, "The National Geographic Information Center as a S&T Center." NSF, Washington, D.C., Nov. 18, 1986.
90. National Science Foundation Computer Science Advisory Board, "Restructuring of the FCCSET committee on Computer Science and Applications." Washington DC Nov. 20, 1986.
91. The Coddington Breakfast Club, "The role of S&T Centers in the Administrations Strategy." Washington, D.C., Dec. 11, 1986.

**Presentations in 1987:**

**15**

92. Southeastern Universities Research Association Annual Meeting, "S&T Centers as a Mechanism for Local Economic Development." Washington, D.C., Feb. 26, 1987.
93. American Association of Engineering Societies, Government Affairs Conference, "The FY88 S&T Strategy for Economic Competitiveness." Washington, D.C., March 3, 1987.
94. National Technology Day for the State of Massachusetts, Keynote Address, "A Science and Technology Strategy for Economic Competitiveness." Boston, Mass., April 6, 1987.
95. American Association for the Advancement of Science Colloquium on R&D Policy, Principal Speaker, "The President's R&D Strategy for FY88." Washington, D.C., April 9, 1987.
96. National Governors Association: State Initiatives in Applied Research, "An R&D Strategy for Economic Competitiveness." Washington, D.C., April 9, 1987.
97. US West Advanced Technologies - Science and Technology Seminar Series, "The FCCSET National Network Study." Denver, Colorado, June 1, 1987.
98. Tennessee Department of Education - Conference on Emerging Trends, "National Trends in Science and Technology." Nashville, Tenn., June 23, 1987.
99. White House Conference on Commercialization of High Temperature Superconductors, Chairman - Forum on University/Industry Interactions, Washington DC, July 29, 1987.
100. White House Initiative on Historically Black Colleges and Universities, "Recommendations for HBCU Participation in Science and Technology." National Academy of Sciences, Washington, D. C., Sept. 25, 1987.
101. Tenth International Conference on Applied Geography: Information Technology and Emergency Management. Luncheon Address: "National Policies which influence Geographic Research." Knoxville, Tenn., Oct. 15, 1987.
102. Industrial Research Institute Meeting - "Future Directions for National High Performance Computing Policy." Philadelphia, Pennsylvania, Oct. 27, 1987
103. Sigma Xi Invited Lecturer. "A View of National Research and Development Policy." Oak Ridge, Tenn., Nov. 3, 1987

104. International Geographic Information Systems Symposium: The Research Agenda, "Government Policy for the NSF National Geographic Information and Analysis Center." Washington, D.C., Nov. 16, 1987.
105. House of Representatives, Science and Technology Committee Staff Hearing, "A Research and Development Strategy for High Performance Computing." Washington, D.C., Dec. 2, 1987
106. House of Representatives, Science and Technology Executive Committee, "Implementation Plan for the Research and Development Strategy for High Performance Computing," Washington DC, Dec. 10, 1987

**Presentations in 1988:**

**15**

107. White House Science Council - Policy Review of: "A Research and Development Strategy for High Performance Computing." Washington, D.C., Jan 8, 1988
108. Federal Coordinating Council on Science Engineering and Technology, "Status of the U.S. Strategy for High Performance Computing." Washington, D.C., Jan. 19, 1988
109. DoD/NASA Topical Review on Computational Fluid Dynamics, "Computer Systems Forecast." Ames Research Center, Moffett Field, CA., Jan. 27, 1988
110. Industrial Research Institute, Federal Science and Technology Committee, "A Research and Development Strategy for High Performance Computing," Washington, D.C., Feb. 25, 1988.
111. House of Representatives, Science and Technology Committee, Industry / Government / Academia panel on "A Research and Development Strategy for High Performance Computing," Washington, D.C., Feb. 26, 1988.
112. IEEE International Computer Conference (COMPCON), panel on "A Research and Development Strategy for High Performance Computing," San Francisco, Calif., March 1, 1988.
113. Senate, Commerce, Science and Transportation Hearing on "A Research and Development Strategy for High Performance Computing," Washington, D.C., March 31, 1988.
114. International Workshop: Nuclear and Atomic Physics at one Gigaflop, "A Computational Grand Challenge in Wave Function Calculations," Oak Ridge, Tennessee, April 15, 1988.
115. The Symposium on Information Technology and Emergency Management, "Computing and Telecommunications for Emergency Management Planning." Gatlinburg, Tn., May 5, 1988.

116. Third International Conference on Supercomputing and Second World Supercomputer Exhibition, panel on "A Research and Development Strategy for High Performance Computing." Boston, Mass., May 18, 1988.
117. Society of Research Administrators Annual Meeting, Luncheon Address: "The Science Alliance between the University of Tennessee and the Oak Ridge National Laboratory." Chicago, Ill., May 20, 1988.
118. Senate, Committee on Commerce, Science and Transportation, Principal Testimony before the Subcommittee on Science, Technology, and Space, "Computer Networks and High Performance Computing." Washington, D.C., August 11, 1988
119. Advanced Computing Research Facility, Coming of Age Celebration, "The Future of Advanced Scientific Computing." Argonne National Laboratory, Chicago, Sept. 22, 1988.
120. Negotiations for the U.S. Joint Working Level Committee of the U.S. Agreement on cooperation in R&D for Science and Technology, "Information Sciences." Tokyo, Japan, Nov. 5, 1988.
121. National Institute for Science and Technology, "The Southeastern Manufacturing Technology Center." Department of Commerce, Washington, D.C., Dec. 20, 1988.

**Presentations in 1989:**

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122. EDUCOM Workshop on National Networking Issues, "Public Support, Federal Leadership and Roles for the Network." Washington, D.C., Jan. 24, 1989.
123. Institute for Science, Space and Technology, "Alliances between Historically Black Colleges and Universities and Majority Research Institutions." Benedict College, Columbia, SC, Jan. 31, 1989.
124. European Member High Performance Computing Symposium II, "United States Government High-Performance Computing Programs and Strategies." Brussels, Belgium, Feb. 16, 1989.
125. South Carolina Academy of Science Dinner Address, "Demographics of Science and Engineering Education." Columbia, SC, April 20, 1989.
126. South Carolina Defense Contractors Association Spring Conference, "South Carolina Technology Transfer Cooperative." Columbia, SC, April 28, 1989.

127. Third International Conference on Supercomputing, "The FCCSET Report to the Congress: A R&D Strategy for High Performance Computing." Santa Clara, CA, May 2, 1989.
128. Digital Equipment Market Exposition, Industry Panel: "Beyond Connectivity." Carter Presidential Center, Atlanta, Ga., May 10, 1989.
129. Senate, News Conference with Senator Al Gore, "Introduction of S.1067; the National High Performance Computer Technology Act of 1989" Senate Dirksen Building, Washington, D.C., May 17, 1989.
130. Industrial Research Institute 1989 Annual Meeting, theme: Preparing for the Knowledge-Based Nineties, "Demographics of Science and Engineering Education," Williamsburg, Va., May 22, 1989.
131. 88-Open Conference: "Computing Directions in the Federal Government," Boston, Mass., Sept. 13, 1989.
132. Educom Conference: "The Impact of Computer Technology on Research." Ann Arbor, Michigan, October 17, 1989.
133. Federal Laboratory Consortium for Technology Transfer: "Technology transfer from Government to Small Business." Towson, Maryland, October 18, 1989.
134. Mobility Technology Planning Forum: "Aerospace," Mobility Technology Tomorrow. Society of Automotive Engineers, Dallas, Fort Worth, October 22, 1989.
135. Junior Academy of Science: Keynote address, "The Excitement of Being a Scientist." Columbia, S.C., December 2, 1989.

**Presentations in 1990:**

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136. IBM Education Conference: "Building a World Class Research University," Palm Springs, CA, Feb. 26, 1990.
137. Hollings-Mosbacher Assessment of the Manufacturing Technology Centers: "Technological Perspective of Technology Transfer Centers in the United States," Columbia, SC, March 5, 1990.
138. The Conference Board: "Winning in the Global Technology Game," New York, N.Y., March 7, 1990.
139. National NET90 Conference: "NREN Studies Revisited," Washington, D.C., March 15,

1990.

140. The First Annual Weapons Complex Monitor Applied Research and Technology Colloquium: "The South Carolina University Consortium," Phoenix, AZ, April 19, 1990.
141. SUPER! Conference: Keynote Address, "The U.S. High Performance Computing Initiative," Gainesville, FL, April 23, 1990.
142. Worcester Polytechnic Institute: "Manufacturing Solutions: Strategies to upgrade manufacturing facilities and retrain the workforce," Worcester, MA, April 26, 1990.
143. National Symposium on Information Technology, Opening the Door to the 90s: Keynote address, "The U.S. Information Science Initiative," Myrtle Beach, S.C., April 30, 1990.
144. Superperformance Computing in the Federal Government and Industry Conference, "The National High Performance Computing Initiative," Washington, D.C., May 8, 1990.
145. Data Processing Management Association Region 7 Conference and Business Exposition: Keynote address, "The U.S. High Performance Computing Initiative." Knoxville, TN, May 10, 1990.
146. Senate, Committee on Appropriations, Subcommittee on Defense: testimony, "Department of Defense University Research Programs FY 91 Budget Request," on behalf of the AAU, AGS, CGS, and NASULGC, Washington, D.C., May 24, 1990.
147. OMB/OSTP Presidential Industrial Policy Forum: "The NIST Manufacturing Technology Centers Program," Washington, D.C., May 29, 1990.
148. The Army High Performance Computing Research Center: dedication Keynote address, "The Pace of Human Change," Minneapolis, MN, July 9, 1990.
149. President's Council of Advisors on Science and Technology panel on HPCC: "Status of HPCC legislation," Washington D.C., Aug. 1, 1990.
150. Frontiers of Supercomputing II, A National Reassessment: policy directions wrap-up panel, "What Now?," LANL, Los Alamos, NM, Aug. 24, 1990.
151. Summer Institute in Parallel Computing: kickoff address, "Federal Directions in High Performance Computing," Argonne National Lab., Argonne, Ill, Sept. 4, 1990.
152. The First Illinois Neuroengineering Research Center Workshop: Keynote address, "Federal Directions in HPCC," Southern Ill. Univ. at Carbondale, Sept. 6, 1990.

153. EDUCOM '90 Conference - Preparing for the Renaissance: "Progress towards the National Network," Atlanta, GA, Oct. 15, 1990.

154. Workshop on Aerospace Applications of Neurocontrol: Keynote Address, "Technology transfer of Research and Development in the U.S.", McDonnell Douglas World Headquarters, St. Louis, MO, Oct. 24, 1990.

**Presentations in 1991:**

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155. Theory Center Lectures: "National Initiatives in High Performance Computing and Communications," Cornell University, Ithaca, New York, Feb. 25, 1991.

156. 23rd Southeastern Symposium on System Theory: Forum on Neurocomputing and Automatic Data Processing, "Prospects for Intelligent Manufacturing", Columbia, SC, March 12, 1991.

157. The Conference Board: Racing for a Competitive Edge - Key Management Issues for Technology-based Business and Industry, "Speeding Business & Technical Solutions by Strategic Alliances," New York, New York, March 21, 1991.

158. ORAU S&T Policy Meeting: "Presidential policies for National Science Funding," Washington, D.C. March 28, 1991.

159. Senate, Committee on Appropriations, subcommittee on Labor, HHS, Education, and related agencies, "Graduate Support Programs of the Department of Education - FY 92 Budget Request", on behalf of the AAU, AGS, CGS, and NASULGC, Washington, D.C., April 23, 1991.

160. Workshop on Undergraduate and Graduate Education in Computational Sciences: Keynote Address, "A Balanced National Program," Louisiana State Univ., Baton Rouge, April 29, 1991.

161. Department of Energy review panel on the Environmental Impact Statement for the Siting, Construction, and Operation of the New Production Reactor Capacity, Savannah, Ga. May 28, 1991.

162. Department of Energy review panel on the Environmental Impact Statement for the Siting, Construction, and Operation of the New Production Reactor Capacity, Columbia, S.C, May 31, 1991.

163. Senate, Commerce, Science and Transportation Hearing on S.1330, "The Manufacturing Strategy Act of 1991," Washington, D.C., Sept 17, 1991.

164. RCI Worldwide Annual Member Executive Conference, "Federal and State Computational "Grand Challenge" Initiatives, Washington, D.C., Nov 13, 1991.

**Presentations in 1992:**

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165. Technical Day Symposium: Keynote address, "Science and Technology Trends in the U.S.," Augusta, GA Feb. 19, 1992.

166. First Meeting of the International Steering Committee on Intelligent Manufacturing Systems, Chief U.S. Negotiator, Toronto, Canada Feb 25, 26 1992.

167. Waste Management '92: Education Needs (K through PhD), "Designing the Future: Transforming Science and Math Education in South Carolina", Tucson AZ, March 5, 1992.

168. House of Representatives, Committee on Science, Space, and Technology, Subcommittee on Technology and Competitiveness, "Small Business Manufacturing and Workforce Capability," Louisburg, NC, March 9, 1992.

169. Eastern Communications Forum: Toward a National Fiber Optic Infrastructure, "Evolution of High Speed Networks for Manufacturing," Rye NY, May 5, 1992.

170. First Meeting of the International Technical Committee on Intelligent Manufacturing Systems, Tokyo, Japan, April 13-15 1992.

171. SURAnet Board Meeting, "Opportunities for a Manufacturing Free Enterprise Network, "Washington, DC, May 28, 1992.

172. NSF Computing and Engineering Program Directors, "A Community Cable TV network for Point-to-Point Communication," Washington, DC, June 23, 1992.

173. North Carolina Supercomputer Center, "Computational Applications for Groundwater Transport and for Advanced Manufacturing," Raleigh, NC, July 15, 1992.

174. Second Meeting of the International Steering Committee on Intelligent Manufacturing Systems, Stockholm, Sweden, July 18-22 1992.

175. Fripp Island Pre-College Science and Math Education Summit, "A Video Presentation of the SCUREF White Papers," Fripp Island, SC, Aug 28-30, 1992.

176. NSF Workshop on Intelligent Manufacturing Systems Workshop on Academic Information

and Partnering: Moderator, Washington, DC, Sept. 8, 1992.

177. The Citadel meeting on Business and Education Partnerships, "The Report of the Governor's Mathematics and Sciences Advisory Board," Charleston, SC, Sept 26, 1992.
178. ORAU Annual meeting, "Teaching and/or Research: Documenting the Case through the Voice of University Professors," Oak Ridge, TN, Oct. 26, 1992.
179. University of Maryland Symposium: Recent Advances in Engineering, "The IMS Program: A Step toward a Global Technology Policy?", Baltimore, MD, Nov. 16, 1992.
180. Third Meeting of the International Steering Committee on Intelligent Manufacturing Systems, Venice, Italy, Dec. 2, 1992.

**Presentations in 1993:**

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181. SMART-F\$: Society for the Management of Artificial Intelligence, "Dual Use in the Clinton / Gore Administration: IS Funding and Research for the Private Sector," New York, NY, Jan. 26, 1993.
182. Harvard University NASMAC Briefing, An Interactive Point-to-Point Cable Multimedia Network for Manufacturing," Cambridge, MA, Feb. 11, 1993.
183. Fourth Meeting of the International Steering Committee on Intelligent Manufacturing Systems, Kyoto, Japan, April 5-7, 1993.
184. Spring Allies Meeting of the State Development Board, "Technology Transfer and Product Development Activities," Columbia, SC. April 20, 1993.
185. Harvard University, John F. Kennedy School of Gov.: Industrial Extension Services and Networking, "Video and Data Services for Manufacturing," Cambridge, MA, April 27, 1993.
186. EDS Manufacturing Invitational Executive Symposium, "Impact of the Clinton Administration's proposed government policies and legislation on the Manufacturing industry, Dallas. TX, May 25, 1993.
187. Motorola Total Quality Management program for Executive DOE managers, "Academic perspective: Using DOE capabilities to assist Superfund and Private Industry Waste Management solutions," Schaumburg, IL, July 10, 1993.

188. Senate Presentation, "Bringing the Tools of Large Business to Small and Medium-Sized Businesses," Washington, DC, July 12, 1993.
189. Clemson University, Medical University of South Carolina, USC Joint Board of Trustees meeting, "University Contributions to Economic Development," Charleston, SC. Sept. 1, 1993.
190. USC Chemistry Seminar, "Words mean Things," Columbia SC, Sept. 24, 1993.
191. Fifth Meeting of the International Steering Committee on Intelligent Manufacturing Systems, Canberra, Australia, October 28-29, 1993.
192. South Carolina House of Representatives Ways and Means and Education Committees, "The Southeastern Manufacturing Technology Center," Columbia, SC, Nov. 17, 1993.
193. CIMS Roundtable: Manufacturing for the 21st Century -IMS- The Global Dimension, "The Academic Coalition for Intelligent Manufacturing Systems," Washington, DC, Nov. 19, 1993.
194. Stanford University: Japan / U.S. Manufacturing and Technology R&D Seminar, "The Intelligent Manufacturing Systems (IMS) Program," Palo Alto, CA, December 2, 1993.

**Presentations in 1994:**

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195. Sixth Meeting of the International Steering Committee on Intelligent Manufacturing Systems, Kauai, Hawaii, Jan. 24-26, 1994.
196. National Institute for Standards and Technology: Manufacturing Technology Needs and Issues: Establishing National Priorities and Strategies, Gaithersburg, MD, April 28, 1994.
197. Stanford University: Manufacturing Partnerships, "The Academic Coalition for Intelligent Manufacturing Systems (A-CIMS) Workshop," Palo Alto, CA, May 7, 1994.
198. Third Industrial Engineering Research Conference, "New Intelligent Manufacturing Systems Initiatives," Atlanta GA, May 19, 1994.
199. Austrian Forum for Holistic Manufacturing, "Manufacturing Technology Centers in the USA," Steyr, Austria, June 14, 1994.
200. North American Symposium -- Preparing for the Full-Scale IMS Program, "Turning the Vision into Reality," **Four** Presentations: a. The University Perspective, b. Special Panel on A-CIMS, c. IMS for SMEs, d. The IMS Infrastructure, Dallas, TX, June 24, 1994.

204. National Academy of Engineering / Council on Competitiveness meeting, The NSTC Civilian Industrial Technology program, "CIT-Industry Dialogue," Washington, July 19, 1994.
205. - Japan Technology Forum, Creating Next Generation Technologies: Towards a New Paradigm of Cooperative Technology Management, "Intelligent Manufacturing Systems," Kobuchizawa, Japan, Sept. 6, 1994.
206. Auburn University: "SURA Manufacturing Network Service," Auburn, AL, Oct. 17, 1994.
207. Old Dominion University: SURA Board of Trustees Meeting, "A SURA Manufacturing Network Service proposal," Norfolk, VA, Nov. 4, 1994.
208. Georgia Tech University: SURA Manufacturing Network Service Regional Conference, "The Technology Reinvestment Program", Atlanta, GA, Dec. 9, 1994.

**Presentations in 1995:**

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209. South Carolina Society of Professional Engineers: "The Future Isn't What it Used to be," Spartanburg, SC, Feb 16, 1995.
210. **Lecture Series** at DeMontfort University, Leicester England, March 7-9, 1995:
- "Building A Global Information Superhighway," Math, Engr., Computing Postgraduates,
  - "The Full Intelligent Manufacturing Systems Program," Industry and Faculty,
  - "Living in the Future", Engineering Undergraduates.
213. CIMS Workshop Meeting: "The Status of the Academic Coalition for Intelligent Manufacturing Systems," Washington, DC, March 15, 1995.
214. ORAU Chief Research Officers Forum: "University Alliances with Industry for the Intelligent Manufacturing Systems (IMS) Program," Washington, DC, April 10, 1995.
215. 2nd Annual Manufacturing Technology Conference: Toward a Common Agenda: "Government -Industry-Academic Programs, The IMS Program," NIST, Gaithersburg, MD, April 20, 1995.
216. Management Development Program for Engineers and Technical Professionals: "Use of Information Technologies," Columbia, SC April 26, 1995.

217. National Center for Manufacturing Sciences, Manufacturing Technical Conference, Intelligent Manufacturing Systems (IMS) - Finding New Partners and Markets...Internationally, Orlando Florida, May 22-23, 1995.
218. Lecture Series with the Technical University of Vienna: "Implementing a Manufacturing Network Testbed for Point-to-Point Video Conferencing," **four** lectures:
  - Opel Corporation, Vienna, Austria, June 19, 1995.
  - Small Manufacturers Conference: Steyr, Austria, June 20, 1995.
  - BMW Corporation, Steyr, Austria, June 21, 1995.
  - Chrysler and Daimler Benz Corporations, Graz, Austria, June 23, 1995.
222. Management Development Program for Engineers and Technical Professionals: "Use of Information Technologies," Columbia, SC, August 10, 1995.
223. Trans Atlantic Conference of Participants: "Intelligent Manufacturing Systems and Advanced Communications," Columbia, SC, Oct. 5, 1995.
224. Charleston Science and Math Teaching Conference: "Benchmarks for Math and Science Performance through 2004," Charleston, SC, Oct. 23, 1995.
225. Academic Coalition for Intelligent Manufacturing Systems Board Meeting: "The A-CIMS Cooperative Agreement with NSF, ARPA and NIST," Washington, DC, Dec. 13, 1995.

**Presentations in 1996:**

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226. LSU Mardi Gras Computational Conference: "The role of industry - academic partnerships in the South East Partnership for Sharing Computational Resources," Baton Rouge, LA, Feb. 13, 1996.
227. United Technologies Corporation, NIST workshop on IMS: "The role of A-CIMS in the US IMS infrastructure," Hartford, CT, Mar. 14, 1996.
228. SC Dept of Ed., Future Directions: Bringing Harmony to Educational Initiatives: "The Agenda Remaining for Science and Math Education," Columbia, SC, April 28-29, 1996.
229. 10th Annual National Symposium on Information Technology: Keynote Address, "Future impacts of High Performance Networks," Myrtle Beach, SC, May 6, 1996.
230. LLNL, LANL, ORNL, SNL - Future@Labs.Prosperty: Prosperity Game, "Ways to optimize the role of multidisciplinary Labs in Serving National Missions and Needs," Washington, DC, May 7-8, 1996.

231. Sixth Conference on Computational Research on Materials, “High Performance Computing Materials Applications,” Morgantown, WV, May 10, 1996.
232. NSF Midwest Computational Consortium, “The SEPSCoR Experience,” Kansas City, Kansas, May 20, 1996.
233. National Academy of Sciences, Committee on Science Engineering and Public Policy (COSEPUP), “Progress and Policy Issues associated with the IMS Program,” Washington, DC, July 10, 1996.
234. CIMS / A-CIMS Workshop on the CALS / STEP initiative, “Supply Chain Integration for the Automotive Sector,” Charleston, SC, July 12, 1996.
235. Future@Labs.Prosperty Follow-on Meeting #2, Council on Competitiveness, “Optimizing Roles, Exploring collaborations, and identifying champions” Washington, DC, August 8, 1996.
236. Experimental Systemic Initiative Workshop, “Computational Materials Failure Analysis for Automotive Components,” Columbia, SC, Aug. 24, 1996.
237. SURA Council of Presidents, “SouthEast Partnership to Share Computational Resources,” Washington, DC, Oct. 9, 1996.
238. Cray Users Group Annual Meeting, Keynote Address, “Design for Manufacturability and Reliability in the Automotive Sector,” Charlotte, NC, Oct. 14, 1996.
239. Future@Labs.Prosperty Follow-on meeting #3, “University / Laboratory Task Force formulation and objectives,” Los Alamos, NM Oct. 16, 1996.
240. CALS Expo Conference, “A CALS / STEP project for the IMS Program”, Long Beach CA, Oct 28, 1996.
241. Rapid Product Development Conference, Keynote Address, “Global Manufacturing Partnerships via the IMS Program”, Boston, Ma. Nov 18, 1996.
242. Automotive Industry Action Group (AIAG) QS-9000 Service Provider Information Session, “The role of A-CIMS in the Plexus Training System,” Detroit, MI, Dec. 9, 1996.
243. CIMS / A-CIMS Workshop, “Supply Chain Integration for the Automotive Sector,” Atlanta, GA, Dec. 17, 1996.

**Presentations in 1997:**

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244. NSF Design and Manufacturing Grantees Conference, "The Academic Coalition for Intelligent Manufacturing Systems," Seattle, WA, Jan 9, 1997.
245. Future@Labs.Prosperty Follow-on meeting #4, "University / Laboratory Task Force proposed actions," Livermore, CA, Jan 23, 1997.
246. SURA Science Coordinating Council, "Selection of SEPSCoR High Performance Computing Applications," Washington, DC, Jan 31, 1997.
247. SRC and NSF Operational Methods of Semiconductor Management, "The role of the IMS program in Operational Modeling and Simulation," Berkeley, CA, Feb 20, 1997.
248. Southeast Meeting: The Southern Crossroads, "The SEPSCoR network award," Atlanta Ga., Mar. 5-6, 1997.
249. National Center for Environmental Decision Making Research Symposium, "Review of Telecommunications Opportunities," Gatlinburg, TN April 28, 1997.
250. ORNL / UTK Review of the Distinguished Scientist Program, P. G. Huray – Review team Chairman, Oak Ridge TN, April 30, 1997.
251. UTK Presentation, "Potential for a High Bandwidth Communications Teaching and Learning program," Knoxville, TN, May 2, 1997.
252. 5<sup>th</sup> annual Computational Materials Research Symposium, "The MRSEC Program," Morgantown, WV, May 14, 1997.
253. National Coalition for Research and Development Formation Meeting, "Response to the Secretary of Energy Advisory Board," P.G. Huray, General Chairman, Atlanta, GA, June. 23-24, 1997.
254. U.S. Workshop on Lifelong Learning in Manufacturing, P. G. Huray Program Chairman and Host, Washington, DC, July 21, 1997.
255. CIMS / A-CIMS Joint Meeting of the Board of Directors, Chairman P. G. Huray, Washington DC., July 22, 1997.
256. Technical University of Vienna Invited Presentation, "The Holistic Eigensolution," Vienna Austria, August 8, 1997.
257. ESPRIT IMS Strategic Planning Meeting, "A U.S.-Led Program in Lifelong Learning," Porto, Portugal, Sept. 29-30, 1997.

258. SPIE's International Symposium and Education Program; Intelligent Systems & Advanced Manufacturing, "Intelligent Manufacturing," Program Chair - P. G. Huray, Pittsburgh, PA, Oct. 13-18, 1997.

259. 6<sup>th</sup> European International Conference on Rapid Prototyping, "An IMS Program on Lifelong Learning," Plenary Address, Paris, Dec. 2-3, 1997.

**Presentations in 1998:**

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260. NSF Design and Manufacturing Grantees Conference, "The Academic Coalition for Intelligent Manufacturing Systems," Monterey Mexico, Jan 8, 1998.

261. NSF Conference on Shaping the Future of Undergraduate Science, Mathematics, Engineering and Technology Education, "Linkages and Partnerships," Columbia, SC, Feb. 20, 1998.

262. Assistive Technologies Expo 98, "Project Connect," Columbia, SC, March 30, 1998.

263. Natural Science Foundation of China, "The Global IMS Program on Lifelong Learning," Beijing China, May 15, 1998.

264. Northern Jiao-Tong University, "Global-Class: Web based learning in multiple languages," Beijing China, May 14, 1998.

265. China Ministry of Science and Technology, "China Participation in the IMS program?," Beijing China, May 18, 1998.

266. PACE conference, "The U.S. Engineers Shortage - How Real?" Phoenix AZ, May, 1998.

267. University of Tennessee, "SEPSCoR Web-based learning and Video Communications R&D," Knoxville, TN, Sept. 4, 1998.

268. IRI Meeting, "Research Universities for the 21<sup>st</sup> Century," Charleston, SC., Oct 25, 1998.

269. The Sixth International Conference on Computers in Education, "Global Class: Computational sharing and advanced learning on the Net," Keynote address, Beijing China, Oct 15, 1998.

270. SPIE's 1998 Symposium and Education Program on Intelligent Systems & Advanced Manufacturing, "Creative strategies of business with the holistic eigensolutions in manufacturing industries," Boston, MA, Nov. 2, 1998.

271. Kettering University, "Distance Education and Web-based Learning," Flint Michigan, Nov. 16, 1998.
272. United States Senate presentation, "Cross Project Demonstration Event," Hart Senate Office Building, Washington DC, Nov. 18, 1988.
273. OSEP 3<sup>rd</sup> Annual Meeting, "Project Connect - Video Conferencing," Washington, DC, Nov. 19, 1998.
274. AAAS - SURA - NSF meeting of the SEPSCoR Co-PIs, Washington, DC, Dec. 14, 1998.

**Presentations in 1999:**

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275. Argonne National Laboratory Decision and Information Sciences Division, "University of Chicago Review Procedures," Chicago, IL, June 14, 1999.
276. SURA IT<sup>2</sup> meeting, "SEPSCoR Collaboration for the IT<sup>2</sup> Initiative," Washington, DC, July 29, 1999.
277. Town Meeting of the Chautauqua Innovations in Science, Computing & Grid Technology, "Technology Transfer, Deployment, and Mechanisms for Collaboration," Lexington, KY, Aug 25, 1999.
278. ORAU Council Panel, "Using IP Video for Virtual Public Policy Planning," Washington, D.C., Oct. 21, 1999.
279. ORAU Council Panel, "Customers for Public Policy Planning," Washington, D.C., Dec. 2, 1999.
280. Australian University of Kathmandu, "How to use IP Video for Economic Development," Kathmandu, Nepal, Dec. 17, 1999.
281. Royal National Academy of Science and Technology, "Using High Bandwidth Networks to employ Technology Experts in Nepal," Kathmandu, Nepal, Dec. 20, 1999.
282. Tribhuvan University Departments of Physics and Computer Science, "Proposal for a joint International Program to develop Techno Angles," Kathmandu, Nepal, Dec. 23, 1999.

**Presentations in 2000:****17**

283. Technical University of Vienna, "The Use of Eigensolutions for Business Applications," Vienna, Austria, Jan. 5, 2000.
284. USC Mechanical Engineering Colloquium, "Internet Video Group Research," Columbia, SC, March 31, 2000.
285. SURA / ViDe workshop, "Education Modules for the SouthEast Partnership to Share Computational Resources," Atlanta, GA, April 6, 2000.
286. Georgia Tech University, "TechnoAngels partnership for Rehabilitation Employment," Atlanta, GA, April 7, 2000.
287. MicroSoft Corporation, "CSE R&D and TechnoAngel Partnerships," Redmond, WA, June 1, 2000.
288. Spartanburg Regional Hospital Symposium, "The Emergency Department Communications capabilities of the Future," Spartanburg, SC, June 20, 2000.
289. PT3 Project Director's Mtg, "Implementation and Catalyst Projects," Atlanta, GA, June 23, 2000.
290. NCSA / SDSC EPSCoR symposium, "Wireless Video Communications," San Diego, CA, July 21, 2000.
291. South Carolina Society of Engineers Banquet, "The Future of Internet Video in your Home and Business," Columbia SC, July 29, 2000.
292. SEPSCoR Co-PIs conference, "Progress and Plans for the NSF SEPSCoR program," Washington, DC, July 31, 2000.
293. IEEE International Engineering Management Society Conference, "Two Policies That Will Achieve Engineering Education Reform," Albuquerque, NM, August 13 – 15, 2000.
294. NSF Corporate and Foundation Alliance Meeting, "TechnoAngels, Who are they and what can they do for your company?," Washington, DC. October 3, 2000.
295. Computer Services Division, "A USC Information Technology Institute," Columbia, SC, Oct. 9, 2000.
296. Civil and Environmental Engineering Industrial Advisory Board, "USC Plans for an Information Technology Institute," Columbia, SC, Oct. 13, 2000.

297. Microsoft Series, “Partnership plans with Training, Product Support, and University Research divisions,” Redmond Washington, Oct. 30 - Nov. 1, 2000.
298. College of Engineering Consultants meeting, “Information Technology Institute,” Hilton Head, SC, Nov. 4, 2000.
299. Mayor’s Technology Advisory Task Force, “USC Plans for Information Technology,” Columbia, SC, Nov. 8, 2000.

**Presentations in 2001:**

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300. University of Puerto Rico / Microsoft presentation, “Spanish TechnoAngels,” Redmond Washington, Jan. 17, 2001.
301. Columbia Technology Summit, “TechnoAngels, Inc.,” Columbia, SC, Feb 21, 2001.
302. North Carolina Supercomputer Center, “Carolinas Partnership in Computing and Communications,” Research Triangle Park, NC, Feb. 22, 2001.
303. South Carolina Assistive Technologies Expo, “The Use of Video Conferencing for Assistive Technology,” Columbia, SC, March 27, 2001.
304. Duke Energy Presentation, “TechnoAngels for Help Desk Support,” Charlotte, NC, April 3, 2001.
305. South Carolina Council of Engineering & Surveying Societies Spring Joint Meeting, “Broadband Internet Applications,” Columbia, SC, April 6, 2001.
306. CIO Academy presentation and panelist, “Best Practices – Sharing your Resources”, Charleston, SC, May 19, 2001.
307. Argonne National Laboratory, Decision and Information Sciences Division, “University of Chicago Review Proceedings,” Chicago, IL, June 18, 2001.
308. Hewlett Packard University Research Division and Corporate Foundation Board (invited presentation), “Using Video Technology for the Employment of Physically Disabled persons,” Palo Alto, CA, Dec, 2001.
309. Argonne National Laboratory, Decision and Information Systems Division, “Wireless Communications for Infrastructure Assurance,” Chicago, IL Dec. 2001.

**Presentations in 2002:**

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310. “Application of a 2D-CFDTD Algorithm to the Analysis of Photonic Crystal Fibers,” Yanjie Zhu, Yinchao Chen, Xiaopeng Dong, and Paul Huray, 2002 IEEE South East Conference meeting, Columbia, SC, March, 2002.
311. IEEE South East Conference Meeting, Columbia SC, ( with Yanjie Zhu, Yinchao Chen and Xiaopeng Dong – USC) “Application of a 2D-CFDTD Algorithm to the Analysis of Photonic Crystal Fibers,” April 2002.
312. American Medical Association Meeting, Charleston SC (with Jack White – SCRPP, Girish Yajnik – Impresa Corp., and Phil Macione - MUSC), “Telemedicine Now!,” April 2002.
313. IEEE AP-S International Symposium and USNC / URSI National Radio Science Meeting, San Antonio, TX (Invited presentation) (with Mingwu Yang – Hefei University PRC and Yinchao Chen – USC), “U-Shaped Planar Microstrip Antenna for Dual-Frequency Mobile Telephone Communications,” June 16-21, 2002.
314. National University of Ireland – Dublin, “Sharing Communications and Computational Resources,” Dublin, Ireland, August 13, 2002.
315. National University of Ireland – Galway, “Sharing Communications and Computational Resources,” Galway, Ireland, August 15, 2002.
316. IEEE Conference on Engineering Management, Cambridge England, (with James Gover – Kettering University), “A Model for Managing Counter-Terrorism,” August 2002.
317. USC Electrical Engineering Department Colloquium, Columbia, SC, “Magnetic Nano-probes,” January 31, 2003.
318. SEC Engineering Meeting, Vanderbilt University, Nashville, TN, “Computer Assisted Student Assessment in Electrical Engineering Courses,” May 20, 2003.
319. USC Electrical Engineering Department Colloquium, Columbia, SC, “Education and Research in Signal Integrity,” Oct. 31, 2003.

**APPENDIX B**

**PUBLICATIONS**

**OF**

**PAUL G. HURAY**

### Publications of Paul G. Huray

1. "Hyperfine Structure Coupling to  $^{197}\text{Au}$  in  $\text{Au}_2\text{Mn}$  as a Function of Pressure," Hyperfine Structure and Nuclear Radiations, North Holland Publishing Company, Amsterdam, 557-566 (1968).
2. "Dependence of the Mossbauer Isomer Shift on the Degree of Spatial Order for Copper-Gold Alloys," Hyperfine Structure and Nuclear Radiations, North Holland Publishing Company, Amsterdam, 596-601 (1968).
3. "A Study of the Inter-metallic Compounds of Gold and Manganese Through the use of the  $^{197}\text{Au}$  Mossbauer Effect at 4.2 K and as a Function of Pressure," *The Physical Review*, B2, 2440 (1970).
4. "Average Magnetic Hyperfine Fields at  $^{106}\text{Pd}$  Nuclei in NiPd Alloys," *The Physical Review*, B4, 1583-1588 (1970).
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