

Topic Index 1957-1993

Volume 6, Number 1, January, 1962 Superconductivity

- Foreword: Fundamental Research in Superconductivity, *Marcus*, p. 2.
- Review of the Present Status of the Theory of Superconductivity, *Bardeen*, p. 3.
- On the Influence of Free Path on the Meissner Effect, *von Hagenow*, p. 12.
- Solutions of the BCS Integral Equation and Deviations from the Law of Corresponding States, *Swihart*, p. 14.
- Nuclear Spin Relaxation in Superconducting Cadmium, *Masuda*, p. 24.
- Experimental Work on Superconductivity, *Mendelssohn*, p. 27.
- The Kapitza Resistance of Metals in the Normal and Superconducting States, *Little*, p. 31.
- Superconductivity and Electron Tunneling, *Shapiro*, p. 34.
- Magnetic Field Dependence of the Superconducting Energy Gap in Ginzburg-Landau Theory with Application to Al, *Douglass, Jr.*, p. 44.
- Dependence of the Energy Gap in Superconductors on Position and Magnetic Field, *Tinkham*, p. 49.
- Far-Infrared Absorption in a Lead-Thallium Superconducting Alloy, *Ginsberg*, p. 55.
- Ultrasonic Attenuation in Superconductors, *Morse*, p. 58.
- The Magnetic Behavior of Superconductors of Negative Surface Energy, *Goodman*, p. 63.
- Effects of Electron Concentration and Mean Free Path on the Superconducting Behavior of Alloys, *Coles*, p. 68.
- Surface Energy Effects at the Boundary between a Superconductor and a Normal Conductor, *Meissner*, p. 71.
- Some Elementary Theoretical Considerations Concerning Superconductivity of Superimposed Metallic Films, *Cooper*, p. 75.
- Thermodynamic Consistency of Magnetic and Calorimetric Measurements on Superconductors, *Mapother*, p. 77.
- The Temperature and Pressure Dependence of Critical Field Curves, *Swenson*, p. 82.
- Mechanical Effects at the Superconducting Transition, *Andres*, p. 84.

Variation of the Elastic Moduli at the Superconducting Transition, *Alers*, p. 89.

First- and Second-Order Stress Effects on the Superconducting Transitions of Tantalum and Tin, *Seraphim*, p. 94.

Thermal Conductivity of Dilute Indium-Mercury Superconducting Alloys, *Chang*, p. 112.

The Superconductivity of Some Intermetallic Compounds, *Blaugher*, p. 116.

High-Field Superconductivity in Some bcc Ti-Mo and Nb-Zr Alloys, *Hake*, p. 119.

Anomalous Resistive Transitions and New Phenomena in Hard Superconductors, *Le Blanc*, p. 122.

Volume 8, Number 3, May, 1964 Semimetals

- Foreword, *Price*, p. 214.
- Crystal Chemistry and Band Structures of the Group V Semimetals and the IV-VI Semiconductors, *Cohen*, p. 215.
- The Effective g-factor of Holes in Bismuth, *Smith*, p. 228.
- High Field Galvanomagnetic Effects in Bismuth, *Vuillemin*, p. 232.
- Piezo-Resistance and Piezo-Hall Effect in Bismuth, *Jain*, p. 233.
- Phonon Dispersion Curves in Bismuth, *Yarnell*, p. 234.
- Transport Properties and Band Structure in Bismuth, Antimony and their Alloys, *Hall*, p. 241.
- Cyclotron Resonance and the Fermi Surface of Antimony, *Datars*, p. 247.
- Growth and Transport Properties of Bi-Sb Single Crystal Alloys, *Brown*, p. 253.
- Energy Band Structure of Graphite, *McClure*, p. 255.
- The Fermi Surface of Graphite, *Dresselhaus*, p. 262.
- Change in Fermi Surfaces of Graphite by Dilute Acceptor Doping, *Soule*, p. 268.
- STB Model and Transport Properties of Pyrolytic Graphites, *Klein*, p. 274.
- Alfvén Wave Propagation in Bismuth: Quantum Oscillations of the Fermi Surface, *Williams*, p. 276.

Infrared Reflectivity of Bismuth in the Quantum Limit, *Hebel*, p. 284.
 Acoustic Plasma Waves in Semimetals, *McWhorter*, p. 285.
 Effect of the Self-Magnetic Field on Galvanomagnetic Effects in Bismuth, *Tosima*, p. 291.
 Non-Ohmic Conduction in Bismuth, *Schillinger*, p. 295.

Volume 8, Number 4, July, 1964

Surface effects

Surface Effects on Silicon: Introduction, *Young*, p. 366.
 Space-Charge Model for Surface Potential Shifts in Silicon Passivated with Thin Insulating Layers, *Thomas, Jr.*, p. 368.
 Stabilization of SiO₂ Passivation Layers with P₂O₅, *Kerr*, p. 376.
 Effect of Temperature and Bias on Glass-Silicon Interfaces, *Kerr*, p. 385.
 Electrode Control of SiO₂ Passivated Planar Junctions, *Castrucci*, p. 394.
 Electrochemical Phenomena in Thin Films of Silicon Dioxide on Silicon, *Seraphim*, p. 400.
 Carrier Surface Scattering in Silicon Inversion Layers, *Fang*, p. 410.
 Effect of Low Temperature Annealing on the Surface Conductivity of Si in the Si-SiO₂-Al System, *Cheroff*, p. 416.
 Chemical and Ambient Effects on Surface Conduction in Passivated Silicon Semiconductors, *Lehman*, p. 422.
 Hall Measurements on Silicon Field Effect Transistor Structures, *Fowler*, p. 427.

Volume 9, Number 4, July, 1965

Communications

On Communications and Data Processing: A Foreword, *Andrews*, p. 226.
 A New Approach to Time-Domain Equalization, *Gorog*, p. 228.
 Decoding of Cyclic Codes Using Position Invariant Functions, *Ullman*, p. 233.
 A Comparison of Pseudo-Noise and Conventional Modulation for Multiple-Access Satellite Communications, *Blasbalg*, p. 241.
 A Pulsed Pseudo-Noise VHF Radio Set, *Corr*, p. 256.
 Analysis and Simulation of a Digital Matched Filter Receiver of Pseudo-Noise Signals, *Van Blerkom*, p. 264.
 Design of an Automatic Telephone Intercept Switch, *Abbott*, p. 274.
 Filter Performance in Integrated Switching and Multiplexing, *Roehr*, p. 282.
 On Definitions of a Burst, *Chien*, p. 292.

Volume 11, Number 1, January, 1967

System/360 Model 91

The IBM System/360 Model 91: Some Remarks on System Development, *Flynn*, p. 2.
 The IBM System/360 Model 91: Machine Philosophy and Instruction-Handling, *Anderson*, p. 8.
 An Efficient Algorithm for Exploiting Multiple Arithmetic Units, *Tomasulo*, p. 25.
 The IBM System/360 Model 91: Floating-Point Execution Unit, *Anderson*, p. 34.
 The IBM System/360 Model 91: Storage System, *Boland*, p. 54.

Design of a High-Speed Transistor for the ASLT Current Switch, *Langdon*, p. 69.

ASLT Circuit Design, *Sechler*, p. 74.

ASLT: An Extension of Hybrid Miniaturization Techniques, *Lloyd*, p. 86.

Volume 11, Number 2, March, 1967

Difference equations

On the Partial Difference Equations of Mathematical Physics, *Courant*, p. 215.
 Hyperbolic Difference Equations: A Review of the Courant-Friedrichs-Lewy Paper in the Light of Recent Developments, *Lax*, p. 235.
 On Difference Methods for Parabolic Equations and Alternating Direction Implicit Methods for Elliptic Equations, *Widlund*, p. 239.
 Elliptic Equations, *Parter*, p. 244.

Volume 11, Number 4, July, 1967

Controls

A Generalized Legendre-Clebsch Condition for the Singular Cases of Optimal Control, *Robbins*, p. 361.
 Rapid Computation of Optimal Trajectories, *Brown, Jr.*, p. 373.
 Some Results in Two-Point Boundary Value Problems, *Roberts*, p. 383.
 Computer Control of a Paper Machine—an Application of Linear Stochastic Control Theory, *Åström*, p. 389.
 On-Line Identification of Process Dynamics, *Dahlin*, p. 406.
 Sensitivity Constrained Optimal Control Synthesis, *Budurka*, p. 427.
 Synchronization of Traffic Signals in Grid Networks, *Chang*, p. 436.
 Design Principles for Sampled-Data Systems with Application to Attitude Control of a Large, Flexible Booster, *Gilson*, p. 442.
 A Computer-Operated Manufacturing and Test System, *Stuehler*, p. 452.

Volume 12, Number 5, September, 1968

IBM 1975 Optical Page Reader

The IBM 1975 Optical Page Reader Part I: System Design, *Hennis*, p. 346.
 The IBM 1975 Optical Page Reader Part II: Video Thresholding System, *Bartz*, p. 354.
 The IBM 1975 Optical Page Reader Part III: Recognition Logic Development, *Andrews*, p. 364.

Volume 13, Number 1, January, 1969

Laboratory automation

Foreword, *Swalen*, p. 2.
 Computer-operated X-ray Laboratory Equipment, *Cole*, p. 5.
 Automation of a Wide-range, General-purpose Spectrophotometric System, *Grant*, p. 15.
 New Research Techniques for the Life Sciences, *McCann*, p. 28.
 Computer-assisted Spectroscopy, *Johnson*, p. 36.
 Combination of On-line Analysis with Collection of Multicomponent Spectra in an On-line Computer, *Wilburn*, p. 46.
 An Interactive Graphics System for Nuclear Data Acquisition, *Birnbaum*, p. 52.

- Simulation and Experimental Research, *Byerley*, p. 61.
- Computer Facilities for the Laboratory, *Lusebrink*, p. 65.
- Use of a Time-sharing Computer in Nuclear Chemistry, *Fryklund*, p. 75.
- Computer-controlled Optical Spectrometer, *Hannon*, p. 79.
- Growth of a Laboratory Computer System for Nuclear Physics, *Mollenauer*, p. 87.
- Measuring Optical Transfer Functions of Lenses with the Aid of a Digital Computer, *Davis*, p. 93.
- The Use of Computers at CERN, *Bell*, p. 104.
- An Experimental System for Time-shared, On-line Data Acquisition, *Reich*, p. 114.
- Real-time Reduction of Nuclear Physics Data, *Bevington*, p. 119.
- The Use of a Control Computer in a Chemistry Department, *Okaya*, p. 126.
- Use of a Terminal System for Data Acquisition, *Konnerth*, p. 132.

Volume 13, Number 2, March, 1969

Optical science and technology

- The Kinoform: A New Wavefront Reconstruction Device, *Lesem*, p. 150.
- Associative Holographic Memories, *Gabor*, p. 156.
- Computer-generated Binary Holograms, *Brown*, p. 160.
- Electron Beam Writing of Spatial Filters, *Wieder*, p. 169.
- Graphic Computer-assisted Design of Optical Filters, *Gracer*, p. 172.
- Switchable Total Internal Reflection Light Deflector, *Rabedeau*, p. 179.
- Efficiencies and Bandwidths of Intracavity Acousto-optic Devices, *Lean*, p. 184.
- High Performance Reduction Lenses for Microelectronic Circuit Fabrication, *Tibbetts*, p. 192.

Volume 13, Number 3, May, 1969

Chip interconnection metallurgy

- SLT Device Metallurgy and its Monolithic Extension, *Totta*, p. 226.
- Controlled Collapse Reflow Chip Joining, *Miller*, p. 239.
- Geometric Optimization of Controlled Collapse Interconnections, *Goldmann*, p. 251.
- Reliability of Controlled Collapse Interconnections, *Norris*, p. 266.
- Parametric Study of Temperature Profiles in Chips Joined by Controlled Collapse Techniques, *Oktay*, p. 272.
- Studies of the SLT Chip Terminal Metallurgy, *Berry*, p. 286.

Volume 13, Number 4, July, 1969

Operations research

- Stochastic Model for Manufacturing Cost Estimating, *Abraham*, p. 343.
- Dynamic Inventory Models and Stochastic Programming, *El Agizy*, p. 351.
- Programmed Automatic Customer Engineer (PACE) Dispatch, *Evers*, p. 357.
- Model of Competition in a Two-seller Market, *Savir*, p. 366.
- Maximal Biflow in an Undirected Network, *Arinal*, p. 373.

- Algorithm and Average-value Bounds for Assignment Problems, *Donath*, p. 380.

- Shortcut in the Decomposition Algorithm for Shortest Paths in a Network, *Hu*, p. 387.

- Minimaximal Paths in Disjunctive Graphs by Direct Search, *Raimond*, p. 391.

- Heuristic Algorithm for the Traveling-salesman Problem, *Raymond*, p. 400.

Volume 13, Number 4, July, 1969

IBM 2750

- IBM 2750 Voice and Data Switching System: Organization and Functions, *Corby*, p. 408.

- Electronic Switching Network of the IBM 2750, *Reynier*, p. 416.

- Operational Program for the IBM 2750, *Colas*, p. 428.

- Semiconductor Crosspoints, *Rosier*, p. 439.

- Response Time of Thyristors: Theoretical Study and Application to Electronic Switching Networks, *Rocher*, p. 447.

Volume 13, Number 5, September, 1969

Instabilities in semiconductors

- A Perspective on Acoustoelectric Instabilities, *Bray*, p. 487.

- Parametric Amplification and Frequency Shifts in the Acoustoelectric Effect, *Zemon*, p. 494.

- A Brillouin Scattering Study of Acoustoelectric Domain Formation in *n*-GaAs, *Spears*, p. 499.

- Off-axis Acoustoelectric Domains in CdS, *Moore*, p. 503.

- Acoustoelectric Amplification in InSb, *Route*, p. 507.

- Characteristics of Semiconducting Glass Switching/Memory Diodes, *Pearson*, p. 510.

- Physics of Instabilities in Amorphous Semiconductors, *Fritzsche*, p. 515.

- Current Filaments in Semiconductors, *Barnett*, p. 522.

- Current Oscillations in Deep-level Doped Semiconductors, *Streetman*, p. 529.

- Space-charge-limited Current Instabilities in *n*⁺-*π*-*n*⁺ Silicon Diodes, *Hagenlocher*, p. 533.

- Time Response of the High-field Electron Distribution Function in GaAs, *Rees*, p. 537.

- Negative Conductivity Effects and Related Phenomena in Germanium. Part I, *McGroddy*, p. 543.

- Negative Conductivity Effects and Related Phenomena in Germanium. Part II, *Smith, Jr.*, p. 554.

- Bulk Negative Differential Conductivity in Germanium: Theory, *Paige*, p. 562.

- Wave Propagation in Negative Differential Conductivity Media: *n*-Ge, *Baynham*, p. 568.

- Trap-controlled Field Instabilities in Photoconducting CdS Caused by Field-quenching, *Böer*, p. 573.

- The Effects of Hydrostatic Pressure on Hot-electron Phenomena in *n*-InSb, *McGroddy*, p. 580.

- Location of the <111> Conduction Band Minima in the Ga_{1-x}In_xSb Alloy System, *Lorenz*, p. 583.

- The Influence of Boundary Conditions on Current Instabilities in GaAs, *Shaw*, p. 587.

- A Topological Theory of Domain Velocity in Semiconductors, *Gunn*, p. 591.

Avalanche Shock Fronts in p-n Junctions, *Bartelink*, p. 596.

Coherent Microwave Emission from an Electron-hole Plasma, *Robinson*, p. 601.

Negative Differential Mobility in Nonparabolic Bands, *Persky*, p. 607.

The Role of Acoustic Wave Amplification in the Emission of Microwave Noise from InSb, *Turner*, p. 611.

Noise Emission from InSb, *Thompson*, p. 616.

Microwave Emission and High-frequency Oscillations in *n*-Type InSb, *Ferry*, p. 621.

Summary of Microwave Emission from InSb: Gross Features and Possible Explanations, *Glicksman*, p. 626.

Volume 14, Number 2, March, 1970

Schottky-barrier transistor

Dynamic Performance of Schottky-barrier Field-effect Transistors, *Drangeid*, p. 82.

Computer Aided Two-dimensional Analysis of the Junction Field-effect Transistor, *Kennedy*, p. 95.

Projection Masking, Thin Photoresist Layers and Interference Effects, *Middelhoek*, p. 117.

Microwave Properties of Schottky-barrier Field-effect Transistors, *Wolf*, p. 125.

Silicon and Silicon-dioxide Processing for High-frequency MESFET Preparation, *Mohr*, p. 142.

Metallization Processes in Fabrication of Schottky-barrier FET's, *Middelhoek*, p. 148.

Volume 14, Number 2, March, 1970

RF sputtering of insulators

Application of RF Discharges to Sputtering, *Koenig*, p. 168.

Control of RF Sputtered Film Properties Through Substrate Tuning, *Logan*, p. 172.

Re-emission of Sputtered SiO₂ During Growth and Its Relation to Film Quality, *Maissel*, p. 176.

Metal Edge Coverage and Control of Charge Accumulation in RF Sputtered Insulators, *Logan*, p. 182.

Automatic Impedance Matching System for RF Sputtering, *Mazza*, p. 192.

Volume 14, Number 3, May, 1970

Symposium on magnetic semiconductors

Survey of the Field of Magnetic Semiconductors, *Methfessel*, p. 207.

Exchange Mechanisms in Europium Chalcogenides, *Kasuya*, p. 214.

Long-range Magnetic Interactions (RKKY-type) in the UP-US Solid Solutions, *Kuznietz*, p. 224.

Ordered Moment of NiS₂, *Hastings*, p. 227.

Specific Heat of SnTe-MnTe System from 2 to 25°K, *Mathur*, p. 229.

Localized and Itinerant Electrons in Oxides, *Honig*, p. 232.

Hall Mobility Measurements on Magnetite above and below the Electronic Ordering Temperature, *Simons*, p. 245.

Transport Properties of Iron-nickel Ferrites, *Nicolau*, p. 248.

Metal-insulator Transition in Transition Metal Oxides, *Rice*, p. 251.

Magnetic and Electrical Properties of (La_{1-x}Ca_x)MnO₃, *Matsumoto*, p. 258.

Band Structure of Magnetic Semiconductors, *Adler*, p. 261.

Transport Properties of the Europium Chalcogenides, *von Molnar*, p. 269.

Temperature and Magnetic Field Dependence of the Conductivity of EuO, *Oliver*, p. 276.

Tunneling Spectroscopy in Ferromagnetic Semiconductors, *Thompson*, p. 279.

Spin-disorder Scattering and Band Structure of the Ferromagnetic Chalcogenide Spinel, *Haas*, p. 282.

Hole and Electron Bands in *n*-type CdCr₂Se₄, *Friedman*, p. 289.

High-field Nonohmic Behavior of the *p*-type Ferromagnetic Semiconductor Ag₂Cd_{1-x}Cr_{2x}Se₄, *Vural*, p. 292.

Comments on Electronic Transport in Transition Metal Oxides, *Frederikse*, p. 295.

Optical Properties of the Europium Chalcogenides, *Dimmock*, p. 301.

Optical Reflectance Study of Magnetic Ordering Effects in EuO, EuS, EuSe and EuTe, *Pidgeon*, p. 309.

Magneto-optical Investigation of the Band Edge of CdCr₂S₄ and Related Absorption Measurements on Cr-doped CdIn₂S₄, *Wittekoek*, p. 312.

Influence of Magnetic Ordering on the Faraday Effect in CdCr₂Se₄, *Kuse*, p. 315.

Magnetic Field Dependence of Indirect Transitions in Ferromagnetic Semiconductors, *White*, p. 318.

Photoinduced Magnetic Effects in YIG(Si), *Gyorgy*, p. 321.

Volume 14, Number 4, July, 1970

Coding theory and application

Coding for Error Control in a Computer-Manufacturer's Environment: A Foreword, *Chien*, p. 342.

Coding Schemes for Reduction of Intersymbol Interference in Data Transmission Systems, *Kobayashi*, p. 343.

Introduction to Pseudoternary Transmission Codes, *Croisier*, p. 354.

Application of Partial-response Channel Coding to Magnetic Recording Systems, *Kobayashi*, p. 368.

Sequence-state Methods for Run-length-limited Coding, *Franszek*, p. 376.

Error Correction for IBM 800-bit-per-inch Magnetic Tape, *Brown*, p. 384.

Orthogonal Latin Square Codes, *Hsiao*, p. 390.

A Class of Optimal Minimum Odd-weight-column SEC-DED Codes, *Hsiao*, p. 395.

b-Adjacent Error Correction, *Bossen*, p. 402.

Error Control for Terminals with Human Operators, *Tang*, p. 409.

Three Measures of Decoder Complexity, *Savage*, p. 417.

An Analysis of the Effectiveness of Hybrid Transmission Schemes, *Rocher*, p. 426.

Maximal Group Codes with Specified Minimum Distance, *Patel*, p. 434.

Volume 14, Number 5, September, 1970

Holography

The Conference on Holography and the Computer, *Jordan, Jr.*, p. 476.

Some Effects of Fourier-domain Phase Quantization, *Goodman*, p. 478.

Incoherent Filtering Using Kinoforms, *Pataut*, p. 485.

Acoustic Holography with Crossed Linear Arrays, *Milder*, p. 492.

Structural-information Storage in Holograms, *Winthrop*, p. 501.

Laser Speckle and Its Elimination, *Gabor*, p. 509.

A Theory of Granularity and Bleaching for Holographic Information Recording, *Lorber*, p. 515.

Noise and Distortion in Photographic Data Storage, *Falconer*, p. 521.

Characteristics of Dielectric Holograms, *Upatnieks*, p. 527.

High-efficiency Phase-hologram Gratings, *Schmackpfeffer*, p. 533.

Volume 14, Number 6, November, 1970

Plant automation

Plant automation in IBM: a Preface, *Neudecker*, p. 588.

Integrated Manufacturing Systems: Architectural Considerations, *Kinberg*, p. 589.

An Integrated Manufacturing Process Control System: Implementation in IBM Manufacturing, *Stuehler*, p. 605.

A Transmission Control Unit for High-speed Computer-to-computer Communication, *Thoburn*, p. 614.

PCOS: A Process Control Extension to Operating System/360, *Calva*, p. 620.

Computer-aided Testing and Fabrication of Magnetic Tape Heads, *Fischer*, p. 633.

Precision Automatic Measuring of X-Y Coordinates, *Radio*, p. 641.

Volume 15, Number 1, January, 1971

Chemistry

Digital Simulation of the Global Transport of Carbon Monoxide, *Kwok*, p. 3.

A New Technique for Gas-phase Kinetic Spectroscopy of Molecules in the Triplet State, *Hunziker*, p. 10.

Photoconduction in Aromatic Hydrocarbons, *Castro*, p. 27.

Photochemical Addition of Benzene to Cyclobutene, *Srinivasan*, p. 34.

Preparation and Thermodynamics of Some Homologous Nitrones, a New Group of Liquid Crystals, *Young*, p. 41.

Polymorphism in Cholesteryl Esters: Cholesteryl Palmitate, *Vogel*, p. 52.

On Measuring Nuclear Magnetic Shielding Anisotropies in Liquid Crystal Solvents, *Yannoni*, p. 59.

Volume 15, Number 2, March, 1971

Mechanics of materials

Preface to papers on Mechanics of Materials, *Hibbard*, p. 102.

Wear of Electrical Contacts due to Small-amplitude Motion, *Bayer*, p. 103.

Effect of Hammer Length and Nonlinear Paper-ribbon Characteristics on Impact Printing, *Jones*, p. 108.

Adhesion and Partial Slip between Normally Loaded Round Surfaces, *Engel*, p. 116.

Analysis of Defect Distribution in Transistor Structures with Reflection and Transmission X-Ray Topography, *Howard*, p. 123.

Effect of Extremely Thin Nitrogenous Surface Films on Phosphorus-impurity Profiles in Silicon, *Makris*, p. 132.

Molecular Engineering in the Development of Materials for Thermoplastic Recording, *Anderson, Jr.*, p. 140.

On the Correlation between Domain Size and Coercive Force in Grain-oriented 3.25% Si-Fe, *Pesch*, p. 151.

Volume 15, Number 6, November, 1971

Exploratory semiconductor technology

A Self-Isolation Scheme for Integrated Circuits, *Vora*, p. 430.

Design and Development of an Ultralow-Capacitance, High-Performance Pedestal Transistor, *Ghosh*, p. 436.

Planar Mesa Schottky Barrier Diode, *Anantha*, p. 442.

Electron Beam Fabrication of Micron Transistors, *Magdo*, p. 446.

Experimental Evaluation of High Energy Ion Implantation Gradients for Possible Fabrication of a Transistor Pedestal Collector, *Ziegler*, p. 452.

Volume 15, Number 6, November, 1971

Arsenic-emitter transistors

An Arsenic Emitter Structure for High-Performance Silicon Transistors, *Ghosh*, p. 457.

Arsenic Source Vapor Pressure Kinetics and Capsule Diffusion, *Sandhu*, p. 464.

A Diffusion Model for Arsenic in Silicon, *Chiu*, p. 472.

On the Relationship of Resistivity to Arsenic Concentration for Heavily Doped *n*-type Silicon, *Chiu*, p. 477.

Volume 16, Number 2, March, 1972

Environmental science

Model for Time-dependent Raindrop Size Distributions; Application to the Washout of Airborne Contaminants, *Abraham*, p. 91.

Rationale, Limitations, and Assumptions of a Northeastern Forest Growth Simulator, *Botkin*, p. 101.

Subsurface Hydrology at Waste Disposal Sites, *Freeze*, p. 117.

Estimate of Subsidence in Venice Using a One-dimensional Model of the Subsoil, *Gambolati*, p. 130.

Nonsupervised Crop Classification through Airborne Multispectral Observations, *Nagy*, p. 138.

Interactive Computer-based Game for Decision-making in Ecology, *Peterson*, p. 154.

Air Quality Diffusion Model; Application to New York City, *Shieh*, p. 162.

Numerical Investigation of the Atmospheric Dispersion of Stack Effluents, *Shir*, p. 171.

Appendix—Three-dimensional interpretation of the two-dimensional advection-diffusion equation, *Langlois*, p. 178.

Overlap Emissivity of CO₂ and H₂O in the 15- μ m Spectral Region, *Braslaw*, p. 180.

Volume 16, Number 3, May, 1972

Mechanical technology

Preface: Mechanical Technology, *Hibbard*, p. 202.

Mechanics of Film Adhesion: Elastic and Elastic-Plastic Behavior, *Chen*, p. 203.

Viscoelastic Behavior of Computer Tape Subjected to Periodic Motion, *Baumann*, p. 214.

Dynamic Control of Spring-driven Mechanisms, *Bishop*, p. 222.

IBM Copier Scanning System, *Beaty*, p. 231.

Some Design Considerations for a Document Sorting Machine, *Zable*, p. 239.

Acoustic Signal Analysis for Noise Source Identification in Mechanisms, *Peterson*, p. 249.

Holographic Interferometry Deformation Study of a Printer Type-piece, *Wilson*, p. 258.

An Application of White Light Interferometry in Thin Film Measurements, *Lin*, p. 269.

Removal of Numerical Instability in the Solution of Nonlinear Heat Exchange Equations, *White*, p. 277.

Design and Fabrication of Heat Transfer Surfaces from Superplastic Material, *Randolph*, p. 283.

Stationary Temperature Profiles and Heat Flux Distribution in a Plastic-encapsulated Circuit Package, *Paivanas*, p. 292.

Analytical and Experimental Thermal Analysis of Multiple Heat Sources in Integrated Semiconductor Chips, *Lindsted*, p. 303.

Volume 16, Number 4, July, 1972

Numerical computation

Preface: Mathematics of Numerical Computation, *Winograd*, p. 334.

A-stable, Accurate Averaging of Multistep Methods for Stiff Differential Equations, *Liniger*, p. 335.

Hopscotch Difference Methods for Nonlinear Hyperbolic Systems, *Gourlay*, p. 349.

Parallel Shooting Method for Boundary-value Problems: Application to the Neutron Transport Equation, *Canosa*, p. 354.

Finite Difference Formulas for Neumann Conditions on Irregularly Shaped Boundaries, *Alsop*, p. 365.

Turán Formulae and Highest Precision Quadrature Rules for Chebyshev Coefficients, *Micchelli*, p. 372.

Automatic Computation of Exponentials, Logarithms, Ratios and Square Roots, *Chen*, p. 380.

Enveloping an Iteration Scheme, *Miranker*, p. 389.

Numerical Properties of a Multivariate Ritz-Trefftz Method, *Bosarge, Jr.*, p. 393.

Recursive Evaluation of Padé Approximants for Matrix Sequences, *Rissanen*, p. 401.

On the Convergence of Gradient Methods under Constraint, *Wolfe*, p. 407.

Finding All Shortest Distances in a Directed Network, *Hoffman*, p. 412.

Maintaining a Sparse Inverse in the Simplex Method, *Tomlin*, p. 415.

Mixed-integer Algorithms for the (0,1) Knapsack Problem, *Guignard*, p. 424.

Linear Convergence of the Conjugate Gradient Method, *Crowder*, p. 431.

On the Davidenko-Branin Method for Solving Simultaneous Nonlinear Equations, *Brent*, p. 434.

Volume 17, Number 4, July, 1973

Non-linear wave propagation

Numerical Calculation of Self-Focusing and Trapping of a Short Light Pulse in Kerr Liquids, *Shimizu*, p. 286.

Effects of Dispersion on Steady State Electromagnetic Shock Profiles, *Peng*, p. 299.

On a Nonlinear Diffusion Equation Describing Population Growth, *Canosa*, p. 307.

Linearization of Cauchy's Problem for Quadratic Semilinear Partial Differential Equations, *Gerber*, p. 314.

Volume 17, Number 4, July, 1973

APL

The Design of APL, *Falkoff*, p. 324.

General Arrays, Operators and Functions, *Ghandour*, p. 335.

System Formulation and APL Shared Variables, *Lathwell*, p. 353.

Volume 17, Number 6, November, 1973

Optical measurement

Design and Operation of ETA, an Automated Ellipsometer, *Hauge*, p. 472.

Rapid, Precise, Computer-controlled Measurement of X-Y Coordinates, *Kallmeyer*, p. 490.

Interactive Use of a Time-shared Process Control Computer in Electrophotographic Sensitometry, *Schechtman*, p. 500.

Dimensional Measurement and Defect Detection Using Spatial Filtering, *Flamholz*, p. 509.

Optical Techniques for Measurement of Chamber Spacing, *Chastang*, p. 519.

Volume 18, Number 6, November, 1974

Magnetic recording

Preface, *Michaelson*, p. 479.

Aerodynamic Aspects of Disk Files, *Lenemann*, p. 480.

Engineering Design of a Disk Storage Facility with Data Modules, *Mulvany*, p. 489.

Design of a Disk File Head-Positioning Servo, *Oswald*, p. 506.

Dynamic Response of Self-acting Foil Bearings, *Stahl*, p. 513.

White Light Interferometry of Elastohydrodynamic Lubrication of Foil Bearings, *Vogel*, p. 521.

Infrared Laser Interferometer for Measuring Air-bearing Separation, *Fleischer*, p. 529.

Transition from Boundary Lubrication to Hydrodynamic Lubrication of Slider Bearings, *Tseng*, p. 534.

Hand-held Magnetoresistive Transducer, *Bajorek*, p. 541.

Thermally Induced Pulses in Magnetoresistive Heads, *Hempstead*, p. 547.

Numerical Analysis of the Shielded Magnetoresistive Head, *Cole*, p. 551.

Ferrite Film Recording Surfaces for Disk Recording, *Comstock*, p. 556.

The Remanent State of Recorded Tapes, *Bate*, p. 563.

Noise in Disk Data-recording Media, *Su*, p. 570.

Switching Speeds in Magnetic Tapes, *Thornley*, p. 576.

Optimal Rectangular Code for High Density Magnetic Tapes, *Patel*, p. 579.

Volume 19, Number 3, May, 1975

System performance evaluation

Preface, *Ashany*, p. 210.

Application of the Page Survival Index (PSI) to Virtual-memory System Performance, *Bard*, p. 212.

Predicting Working Set Sizes, *Bryant*, p. 221.

Patterns in Program References, *Freiberger*, p. 230.

Tailoring Programs to Models of Program Behavior, *Ferrari*, p. 244.

Design of Experiments in Simulator Validation, *Schatzoff*, p. 252.

Performance Analysis of a Multiprogrammed Computer System, *Chiu*, p. 263.

Terminal Response Times in Data Communications Systems, *Chang*, p. 272.

Queuing Networks with Multiple Closed Chains: Theory and Computational Algorithms, *Reiser*, p. 283.

Solution of Queuing Problems by a Recursive Technique, *Herzog*, p. 295.

Approximate Analysis of Central Server Models, *Sauer*, p. 301.

Central Server Model for Multiprogrammed Computer Systems with Different Classes of Jobs, *Chow*, p. 314.

Volume 20, Number 1, January, 1976

Space-related technology

Preface, *Ashany*, p. 2.

Computers and the Space Program: An Overview, *Kraft, Jr.*, p. 3.

Development of On-board Space Computer Systems, *Cooper*, p. 5.

Redundancy Management Technique for Space Shuttle Computers, *Sklaroff*, p. 20.

Performance Modeling of Earth Resources Remote Sensors, *Kidd*, p. 29.

Digital Image Processing of Earth Observation Sensor Data, *Bernstein*, p. 40.

Skylab Attitude Control System, *Coon*, p. 58.

Large Space Telescope, *Hudson*, p. 67.

Launch Processing System, *Byrne*, p. 75.

Real-Time Orbiter Abort Guidance, *Sohoni*, p. 84.

Volume 21, Number 1, January, 1977

Ink-jet printing

Application of Ink Jet Technology to a Word Processing Output Printer, *Buehner*, p. 2.

Scale Model of an Ink Jet, *Curry*, p. 10.

Satellite Droplet Formation in a Liquid Jet, *Pimbley*, p. 21.

Effect of Parameter Variations on Drop Placement in an Electrostatic Ink Jet Printer, *Twardeck*, p. 31.

Drop Charging and Deflection in an Electrostatic Ink Jet Printer, *Fillmore*, p. 37.

Boundary Layer Around a Liquid Jet, *Lee*, p. 48.

Controlling Print Height in an Ink Jet Printer, *Carmichael*, p. 52.

Study of Fluid Flow through Scaled-up Ink Jet Nozzles, *Levanoni*, p. 56.

Development and Characterization of Ink for an Electrostatic Ink Jet Printer, *Ashley*, p. 69.

Materials Selection for an Ink Jet Printer, *Beach*, p. 75.

Volume 21, Number 2, March, 1977

Polymers

Preface, *Flory*, p. 98.

Preparation and Properties of (SN)_n, *Street*, p. 99.

NMR Study of the Chain Microstructure of P(MMA-co-MAA), *Lyerla, Jr.*, p. 111.

Radiation Chemistry of Poly(methacrylates), *Hiraoka*, p. 121.

Model for the Kinematics of Polymer Dissolution, *Tu*, p. 131.

Parameters Affecting the Electron Beam Sensitivity of Poly(methyl methacrylate), *Gipstein*, p. 143.

Strength and Related Properties of Elastomeric Block Copolymers, *Smith*, p. 154.

Properties of Polymeric Thin Films by Integrated Optical Techniques, *Swalen*, p. 168.

Solubility and Diffusion of Sulfur in Polymeric Materials, *Berry*, p. 176.

Rheology and Modeling of the Spin Coating Process, *Washo*, p. 190.

Volume 21, Number 3, May, 1977

Analysis of positive photoresists

Thermal Effects on the Photoresist AZ1350J, *Dill*, p. 210.

Thermal Analysis of Positive Photoresist Films by Mass Spectrometry, *Shaw*, p. 219.

Volume 22, Number 1, January, 1978

IBM 3800 Printer

Control of the IBM 3800 Printing Subsystem, *Findley*, p. 2.

Paper Path of an On-Line Computer-Output Printer, *Svensden*, p. 13.

Paper Servo Design for a High Speed Printer Using Simulation, *Cameron*, p. 19.

Design of the Fusing System for an Electrophotographic Laser Printer, *Brooms*, p. 26.

Electrophotographic Process in a High Speed Printer, *Vahtra*, p. 34.

Volume 22, Number 3, May, 1978

Surface science

Preface, *Kay*, p. 212.

Model Study in Chemisorption: Molecular Orbital Cluster Theory for Atomic Hydrogen on Be(0001), *Bauschlicher, Jr.*, p. 213.

Core-Level Photoemission and LEED Studies of Adsorption at Fe Surfaces: Comparison Between CO and O₂, *Brundle*, p. 235.

Reaction of Atomic Hydrogen with Si(111) Surfaces: Formation of Monohydride and Trihydride Phases, *Pandey*, p. 250.

Chemisorption of Ethane on W(111), *Winters*, p. 260.

Molecular Geometries of Acetylene and Ethylene Chemisorbed On Cu, Ni, Pd, and Pt Surfaces, *Demuth*, p. 265.

Sputter Profiling Through Ni/Fe Interfaces by Auger Electron Spectroscopy, *Chuang*, p. 277.

Characterization of Electron Traps in Aluminum-Implanted SiO₂, *Young*, p. 285.

Location of Trapped Charge in Aluminum-Implanted SiO₂, *DiMaria*, p. 289.

X-Ray Photoelectron Spectroscopy of SiO₂-Si Interfacial Regions: Ultrathin Oxide Films, *Raider*, p. 294.

Electronic Properties of (100) Surfaces of GaSb and InAs and Their Alloys with GaAs, *Ludeke*, p. 304.

Oriented Epitaxial Films of (NMP) (TCNQ), *Simonyi*, p. 315.

Volume 22, Number 4, July, 1978

Solar energy conversion

Low Cost Silicon for Solar Energy Conversion Applications, *Schwutke*, p. 335.

Growth of Polycrystalline GaAs for Solar Cell Applications, *Blakeslee*, p. 346.

Organic Photovoltaic Materials: Squarylium and Cyanine-TCNQ Dyes, *Merritt*, p. 353.

Solar Absorbing Surfaces of Anodized Dendritic Tungsten, *Pettit*, p. 372.

Optimization Applied to the Design of an Energy-Efficient Building, *Jurovics*, p. 378.

Volume 22, Number 5, September, 1978

IBM Scientific Centers

Preface, *Branscomb*.

Principal Components of a Multispectral Image: Application to a Geological Problem, *Santisteban*, p. 444.

Machine Processing of Remotely Sensed Data: Three Applications in Mexico, *Hernández V.*, p. 455.

Using a Desk-Top Computer for an On-Line Flood Warning System, *Todini*, p. 464.

Hydrodynamic Numeric Modeling of the Lagoon of Venice, *Sguazzero*, p. 472.

Extrapolation of Seismic Waveforms by Fourier Methods, *Gazdag*, p. 481.

A Directed Weather Data Filter, *Low*, p. 487.

An Analytic Model of the VM/370 System, *Bard*, p. 498.

Algorithm and Hardware for a Merge Sort Using Multiple Processors, *Todd*, p. 509.

Computer-Aided Diagnosis with an Application to Endocrinology, *Schild*, p. 518.

Noun-Phrase Model and Natural Query Language, *Sibuya*, p. 533.

AQL: A Problem-solving Query Language for Relational Data Bases, *Antonacci*, p. 541.

Interpretation of Natural Language in an Information System, *Lehmann*, p. 560.

Volume 22, Number 6, November, 1978

AC gas panel displays

AC Gas Discharge Panels: Some General Considerations, *Reisman*, p. 589.

Single-Cycle Gas Panel Assembly, *Reisman*, p. 596.

Obtaining Gas Panel Metallization Patterns by Vacuum Deposition Through Rib-supported Mask Structures, *Hammer*, p. 601.

E-Beam Evaporated Glass and MgO Layers for Gas Panel Fabrication, *Park*, p. 607.

Electrical and Optical Characteristics of Evaporable-Glass-Dielectric AC Gas Display Panels, *O'Hanlon*, p. 613.

Effect of Reactive Gas Dopants on the MgO Surface in AC Plasma Display Panels, *Ahearn*, p. 622.

A Phenomenological Study of AC Gas Panels Fabricated with Vacuum-Deposited Dielectric Layers, *O'Hanlon*, p. 626.

Characterization of Voltage and Charge Transfer in AC Gas Discharge Displays, *Schlig*, p. 634.

Numerical Calculation of the Characteristics of an Isolated AC Gas Discharge Display Panel Cell, *Lanza*, p. 641.

Al-Cu Alloy for Gas Panels, *Brusic*, p. 647.

Tribology

Contact Stress and Wear Study for Type Characters, *Chow*, p. 658.

Mechanism of Wear by Ribbon and Paper, *Bayer*, p. 668.

Work-hardening of Ferrite Head Surfaces by Wear with Flexible Recording Media, *Polleys*, p. 675.

Electroplated Diamond-Composite Coatings for Abrasive Wear Resistance, *Roshon*, p. 681.

Volume 23, Number 1, January, 1979

Sputtering and plasma etching

Electrical Properties of RF Sputtering systems, *Keller*, p. 3.

Influence of Scattering and Ionization on RF Impedance in Glow Discharge Sheaths, *Pennebaker*, p. 16.

Sputtering Process Model of Deposition Rate, *Keller*, p. 24.

Some Chemical Aspects of the Fluorocarbon Plasma Etching of Silicon and Its Compounds, *Coburn*, p. 33.

Volume 23, Number 2, March, 1979

Parallel-plate laser fabrication

HeNe Parallel Plate Laser Development, *Chance*, p. 108.

Cathodes for HeNe Lasers, *Chance*, p. 119.

Nondestructive Analysis for HeNe Lasers, *Ahearn*, p. 128.

Polarization Problems of Parallel Plate Lasers, *Chastang*, p. 132.

Volume 23, Number 3, May, 1979

Energy technology

Simulation of a Moving Bed Gasifier for a Western Coal, *Stillman*, p. 240.

The Analysis and Comparison of Actual to Predicted Collector Array Performances, *McCumber*, p. 253.

Solar-Grade Silicon by Directional Solidification in Carbon Crucibles, *Ciszek*, p. 270.

Volume 23, Number 4, July, 1979

Mechanics in computing systems

Guest Editorial, *Engel*, p. 360.

Air Film System for Handling Semiconductor Wafers, *Paivanas*, p. 361.

Micromechanical Membrane Switches on Silicon, *Petersen*, p. 376.

An Application of Beam Dynamics to a Damper Design, *Lee*, p. 386.

Interposer for Disk Printer, *Meier*, p. 392.

A Cylindrical Print Element System for a Serial Impact Printer, *Zable*, p. 396.

Dynamic Response of a Print Belt System, *Engel*, p. 403.

Harmonic-Drive Ribbon Stuffer for Impact Printers, *Helinski*, p. 411.

Document Scanner Mechanism, *Clark*, p. 415.

Planning and Execution of Straight Line Manipulator Trajectories, *Taylor*, p. 424.

A Numerical and Experimental Study of the Bistable-Unstable Transition in Pressurized Flexible Disk Files, *Bogy*, p. 437.

Experimental Determination of Creep Functions for Thin Orthotropic Polymer Films, *Bogy*, p. 450.

Volume 23, Number 5, September, 1979

Lasers: science and technology

Contributions of IBM to Laser Science—1960 to the Present, *Sorokin*, p. 476.

Systematic Behavior in Alkaline Earth Spectra: A Multichannel Quantum Defect Analysis, *Wynne*, p. 490.

Two-Photon Coherent Transients, *Loy*, p. 504.

Cooperative Emission of an Excited Monolayer into Surface Plasmons, *Morawitz*, p. 517.

Subnanosecond Optical Free-Induction Decay, *DeVoe*, p. 527.

One- and Two-Photon Laser Photochemistry in Organic Solids, *Burland*, p. 534.

Photochemical Hole Burning in Free-Base Porphyrin and Chlorin in n-Alkane Matrices, *Völker*, p. 547.

Time-Resolved Infrared Spectral Photography: A New Technique, *Bethune*, p. 556.

(GaAl)As Laser Requirements for Local Attached Data Link Applications, *Crow*, p. 576.

GaAs/(GaAl)As Laser Technology, *Lynch, Jr.*, p. 585.

Molecular Beam Laser-Induced Fluorescence Studies of Chemical Reactions, *Luntz*, p. 596.

Forced Rayleigh Scattering, *Pohl*, p. 604.

Volume 23, Number 6, November, 1979

LSI packaging analysis

Survey of Computer-Aided Electrical Analysis of Integrated Circuit Interconnections, *Ruehli*, p. 626.

Potential Distribution and Multi-Terminal DC Resistance Computations for LSI Technology, *Sakkas*, p. 640.

Resistive and Inductive Skin Effect in Rectangular Conductors, *Weeks*, p. 652.

Three-Dimensional Inductance Computations with Partial Element Equivalent Circuits, *Brennan*, p. 661.

Exploiting Symmetry in Electrical Packaging Analysis, *Weeks*, p. 669.

Transient Analysis of Uniform Resistive Transmission Lines in a Homogeneous Medium, *Gruodis*, p. 675.

Geometry Effects of Small MOSFET Devices, *Gaensslen*, p. 682.

Stability of Lateral pnp Transistors During Accelerated Aging, *Gillespie*, p. 689.

Volume 24, Number 1, January, 1980

Programmable logic array (PLA) macros

Design of Large ALUs Using Multiple PLA Macros, *Schmookler*, p. 2.

A Heuristic Test-Pattern Generator for Programmable Logic Arrays, *Eichelberger*, p. 15.

Design Automation and the Programmable Logic Array Macro, *Golden*, p. 23.

Volume 24, Number 2, March, 1980

Josephson computer technology

Josephson Computer Technology: An IBM Research Project, *Anacker*, p. 107.

Overview of Josephson Technology Logic and Memory, *Matisoo*, p. 113.

Design of 2.5-Micrometer Josephson Current Injection Logic (CIL), *Gheewala*, p. 130.

Basic Design of a Josephson Technology Cache Memory, *Faris*, p. 143.

Investigations for a Josephson Computer Main Memory with Single-Flux-Quantum Cells, *Guéret*, p. 155.

An Overview of Josephson Packaging, *Brown*, p. 167.

The Characteristics of Chip-to-Chip Signal Propagation in a Package Suitable for Superconducting Circuits, *Jones*, p. 172.

Modeling of Characteristics for Josephson Junctions Having Nonuniform Width or Josephson Current Density, *Broom*, p. 178.

An Overview of Materials and Process Aspects of Josephson Integrated Circuit Fabrication, *Ames*, p. 188.

Fabrication Process for Josephson Integrated Circuits, *Greiner*, p. 195.

Effect of Process Variables on Electrical Properties of Pb-Alloy Josephson Junctions, *Broom*, p. 206.

Fabrication and Properties of Niobium Josephson Tunnel Junctions, *Broom*, p. 212.

Structure of Tunnel Barrier Oxide for Pb-Alloy Josephson Junctions, *Baker*, p. 223.

Properties of AuIn₂ Resistors for Josephson Integrated Circuits, *Kircher*, p. 235.

JSP—A Research Signal Processor in Josephson Technology, *Tsui*, p. 243.

Volume 24, Number 3, May, 1980

Semiconductor memory technology

Preface, *Husson*, p. 267.

A Silicon and Aluminum Dynamic Memory Technology, *Larsen*, p. 268.

Cross-Coupled Charge-Transfer Sense Amplifier and Latch Sense Scheme for High-Density FET Memories, *Gray*, p. 283.

Circuit Implementation of Fusible Redundant Addresses on RAMs for Productivity Enhancement, *Fitzgerald*, p. 291.

VLSI Device Phenomena in Dynamic Memory and Their Application to Technology Development and Device Design, *Troutman*, p. 299.

Reduction of Leakage by Implantation Gettering in VLSI Circuits, *Geipel*, p. 310.

A 64K FET Dynamic Random Access Memory: Design Considerations and Description, *Lo*, p. 318.

A 256K-Bit Charge-Coupled Device Memory, *Tzou*, p. 328.

A One-Device Memory Cell Using a Single Layer of Polysilicon and a Self-Registering Metal-to-Polysilicon Contact, *Rideout*, p. 339.

Near-Ideal Si-SiO₂ Interfaces, *Kasprzak*, p. 348.

Reliability of SiO₂ Gate Dielectric with Semi-Recessed Oxide Isolation, *Ormond*, p. 353.

Implanted Source/Drain Junctions for Polysilicon Gate Technologies, *Geipel*, p. 362.

A Contactless Method for High-Sensitivity Measurement of p-n Junction Leakage, *Verkuil*, p. 370.

1/N Circuit and Device Technology, *Bhattacharyya*, p. 378.

A System Solution to the Memory Soft Error Problem, *Bossen*, p. 390.

Yield Model for Productivity Optimization of VLSI Memory Chips with Redundancy and Partially Good Product, *Stapper*, p. 398.

A Charge Injection Transistor Memory Cell, *Ho*, p. 410.

Volume 24, Number 4, July, 1980

Lithography

Computer Simulation of Electron-Beam Resist Profiles, *Kyser*, p. 426.

Proximity Effects in Electron Lithography: Magnitude and Correction Techniques, *Parikh*, p. 438.

Single-Step Optical Lift-Off Process, *Hatzakis*, p. 452.

Overlay in Lithography, *Rottmann*, p. 461.

Defect-Related Breakdown and Conduction in SiO₂, *Shatzkes*, p. 469.

Volume 24, Number 5, September, 1980

E-beam lithography

Pattern Partitioning for Enhanced Proximity-Effect Corrections in Electron-Beam Lithography, *Parikh*, p. 530.

Proximity Correction Enhancements for 1- μ m Dense Circuits, *Grobman*, p. 537.

Registration Mark Detection for Electron-Beam Lithography—EL1 System, *Davis*, p. 545.

Electron-Beam Resists for Lift-Off Processing with Potential Application to Josephson Integrated Circuits, *Magerlein*, p. 554.

Volume 24, Number 6, November, 1980

Programming languages and language processors

Preface, *Husson*, p. 658.

Improved Optimization of FORTRAN Object Programs, *Scarborough*, p. 660.

Optimization and Code Generation in a Compiler for Several Machines, *Boyle*, p. 677.

Compilation to Compact Code, *Marks*, p. 684.

Strength Reduction for Division and Modulo with Application to Accessing a Multilevel Store, *Cocke*, p. 692.

The Experimental Compiling System, *Allen*, p. 695.

Some Techniques for Compile-Time Analysis of User-Computer Interactions, *Lafuente*, p. 716.

A Business Language, *Denil*, p. 732.

A Language for Extended Queueing Network Models, *Sauer*, p. 747.

Grammar Characterization of Flowgraphs, *Becerril*, p. 756.

A Data Definition Facility Based on A Value-Oriented Storage Model, *Lomet*, p. 764.

Volume 25, Number 1, January, 1981

Network problem determination

Network Problem-Determination Aids in Microprocessor-Based Modems, *Huon*, p. 3.

A 2400-Bit/s Microprocessor-Based Modem, *Godard*, p. 17.

Volume 25, Number 2/3, March, 1981

VLSI circuit design

Preface, *Husson*, p. 106.

Techniques for Improving Engineering Productivity of VLSI Designs, *Logue*, p. 107.

Bipolar Circuit Design for a 5000-Circuit VLSI Gate Array, *Dansky*, p. 116.

A 1024-Byte ECL Random Access Memory Using a Complementary Transistor Switch (CTS) Cell, *Dorler*, p. 126.

Delay Regulation—A Circuit Solution to the Power/Performance Tradeoff, *Berndlmaier*, p. 135.

A High-Density Bipolar Logic Masterslice for Small Systems, *Chen*, p. 142.

Volume 25, Number 4, July, 1981

Finite element analysis

Finite-Element Analysis of Semiconductor Devices: The FIELDAY Program, *Buturla*, p. 218.

Semiconductor Analysis Using Finite Elements—Part I: Computational Aspects, *Hachtel*, p. 232.

Semiconductor Analysis Using Finite Elements—Part II: IGFET and BJT Case Studies, *Hachtel*, p. 246.

Volume 25, Number 5, September, 1981

25th anniversary issue

The Architecture of IBM's Early Computers, *Bashe*, p. 363.

System/360 and Beyond, *Padegs*, p. 377.

IBM Data Communications: A Quarter Century of Evolution and Progress, *Jarema*, p. 391.

Real-Time Systems for Federal Applications: A Review of Significant Technological Developments, *Olsen*, p. 405.

Evolution of Real-Time Computer Systems for Manned Spaceflight, *James*, p. 417.

Low-End General-Purpose Systems, *Taylor*, p. 429.

Evolution of Small Real-Time IBM Computer Systems, *Harrison*, p. 441.

Reliability, Availability, and Serviceability of IBM Computer Systems: A Quarter Century of Progress, *Hsiao*, p. 453.

The Evolution of the MVS Operating System, *Auslander*, p. 471.

The Origin of the VM/370 Time-Sharing System, *Creasy*, p. 483.

The IBM History of Memory Management Technology, *Belady*, p. 491.

Data Base Technology, *McGee*, p. 505.

History of IBM's Technical Contributions to High Level Programming Languages, *Sammet*, p. 520.

The History of Language Processor Technology in IBM, *Allen*, p. 535.

Formal Semantics of Programming Languages: VDL, *Lucas*, p. 549.

IBM Contributions to Computer Performance Modeling, *Bard*, p. 562.

Computer Modeling in Energy and the Environment, *Flatt*, p. 571.

Solid State Memory Development in IBM, *Pugh*, p. 585.

Semiconductor Logic Technology in IBM, *Rymaszewski*, p. 603.

Electronic Packaging Evolution in IBM, *Seraphim*, p. 617.

Design Automation in IBM, *Case*, p. 631.

Semiconductor Manufacturing in IBM, 1957 to the Present: A Perspective, *Harding*, p. 647.

The Evolution of Magnetic Storage, *Stevens*, p. 663.

A Quarter Century of Disk File Innovation, *Harker*, p. 677.

Innovations in the Design of Magnetic Tape Subsystems, *Harris*, p. 691.

The IBM Diskette and Diskette Drive, *Engh*, p. 701.

Innovations in Disk File Manufacturing, *Mulvany*, p. 711.

IBM Typewriter Innovation, *Beattie*, p. 729.

IBM Word Processing Developments, *May*, p. 741.

Printer Technology in IBM, *Nickel*, p. 755.

Laser Electrophotographic Printing Technology, *Elzinga*, p. 767.
 Semiconductors at IBM: Physics, Novel Devices, and Materials Science, *Keyes*, p. 779.
 Electronic Structure Theory, *Bagus*, p. 793.
 Phase Transitions, *Müller*, p. 811.
 Algebraic Complexity Theory, *Pippenger*, p. 825.

Volume 25, Number 6, November, 1981

Computer system performance evaluation

Design of Experiments in Computer Performance Evaluation, *Schatzoff*, p. 848.
 Adaptive Spectral Methods for Simulation Output Analysis, *Heidelberger*, p. 860.
 The Software-Cache Connection, *Voldman*, p. 877.
 Approximate Solution of Queueing Networks with Simultaneous Resource Possession, *Sauer*, p. 894.
 Collision-Free Local Area Bus Network Performance Analysis, *Hamacher*, p. 904.
 Delay Analysis of a Two-Queue, Nonuniform Message Channel, *Calo*, p. 915.
 Message Reassembly Times in a Packet Network, *Stroebel*, p. 930.

Volume 26, Number 1, January, 1982

IBM 3081 system development technology

System Development and Technology Aspects of the IBM 3081 Processor Complex, *Pittler*, p. 2.
 IBM 3081 Processor Unit: Design Considerations and Design Process, *Gustafson*, p. 12.
 Processor Controller for the IBM 3081, *Reilly*, p. 22.
 Thermal Conduction Module: A High-Performance Multilayer Ceramic Package, *Blodgett*, p. 30.
 A New Set of Printed-Circuit Technologies for the IBM 3081 Processor Unit, *Seraphim*, p. 37.
 Conduction Cooling for an LSI Package: A One-Dimensional Approach, *Chu*, p. 45.
 A Conduction-Cooled Module for High-Performance LSI Devices, *Oktay*, p. 55.
 Model for Transient and Permanent Error-Detection and Fault-Isolation Coverage, *Bossen*, p. 67.
 Automated Diagnostic Methodology for the IBM 3081 Processor Complex, *Tendolkar*, p. 78.
 Design Verification System for Large-Scale LSI Designs, *Monachino*, p. 89.
 Timing Analysis of Computer Hardware, *Hitchcock, Sr.*, p. 100.
 Boolean Comparison of Hardware and Flowcharts, *Smith*, p. 106.

Volume 26, Number 2, March, 1982

Laser applications

Laser-Enhanced Plating and Etching: Mechanisms and Applications, *von Gutfeld*, p. 136.
 Laser-Enhanced Chemical Etching of Solid Surfaces, *Chuang*, p. 145.
 Ultrafast High-Resolution Contact Lithography with Excimer Lasers, *Jain*, p. 151.
 Image Projection with Nonlinear Optics, *Levenson*, p. 160.

Modification of Semiconductor Device Characteristics by Lasers, *Kiang*, p. 171.

The Application of GaAlAs Lasers to High-Resolution Liquid-Crystal Projection Displays, *Dewey*, p. 177.

Lasers in Electrophotography, *Tam*, p. 186.

Multiple Photochemical Hole Burning in Organic Glasses and Polymers: Spectroscopy and Storage Aspects, *Gutiérrez*, p. 198.

Integrated Optics and Raman Scattering: Molecular Orientation in Thin Polymer Films and Langmuir-Blodgett Monolayers, *Rabolt*, p. 209.

A New Class of Materials for Holography in the Infrared, *Bräuchle*, p. 217.

Holography in the IBM 3687 Supermarket Scanner, *Dickson*, p. 228.

Laser-Induced Arcing in Cathode Ray Tubes, *Hodgson*, p. 235.

Volume 26, Number 3, May, 1982

Computer packaging

Cost/Performance Single-Chip Module, *Bendz*, p. 278.
 The Thin-Film Module as a High-Performance Semiconductor Package, *Ho*, p. 286.
 Advanced Printed-Circuit Board Design for High-Performance Computer Applications, *Bonner*, p. 297.
 High-Density Board Fabrication Techniques, *Bupp*, p. 306.
 Development of Interconnection Technology for Large-Scale Integrated Circuits, *Babuka*, p. 318.
 Influence on LSI Package Wireability of Via Availability and Wiring Track Accessibility, *Koch III*, p. 328.
 Lead Reduction Among Combinatorial Logic Circuits, *Vilkelis*, p. 342.
 Electrical Design of a High Speed Computer Package, *Davidson*, p. 349.
 A VLSI Bipolar Metallization Design with Three-Level Wiring and Area Array Solder Connections, *Fried*, p. 362.
 Optimization of Indium-Lead Alloys for Controlled Collapse Chip Connection Application, *Howard*, p. 372.
 Immersion Wave Soldering Process, *Getten*, p. 379.

Volume 26, Number 4, July, 1982

Microprocessor systems development

Preface, *Galli*, p. 399.
 Microprocessor Implementation of Mainframe Processors by Means of Architecture Partitioning, *Agnew*, p. 401.
 A Microprocessor for Signal Processing, the RSP, *Mintzer*, p. 413.
 Rectangular Transforms for Digital Convolution on the Research Signal Processor, *Cooley*, p. 424.
 Real-Time Signal Processor Software Support, *Davies*, p. 431.
 Common Chip for Use in Disk and Diskette Controllers, *Dix*, p. 440.
 Physical Design of a Custom 16-Bit Microprocessor, *Correale*, p. 446.
 Design Considerations for a VLSI Microprocessor, *Campbell*, p. 454.
 Bipolar Chip Design for a VLSI Microprocessor, *Mathews*, p. 464.
 A VLSI Design Verification Strategy, *Tran*, p. 475.
 A Bipolar VLSI Custom Macro Physical Design Verification Strategy, *McCabe*, p. 485.
 Plant Automation in a Structured Distributed System Environment, *Mescia*, p. 497.

Construction of Bounded Delay Codes for Discrete Noiseless Channels, *Franaszek*, p. 506.

Volume 26, Number 5, September, 1982 **Semiconductor manufacturing technology**

Semiconductor Manufacturing Technology at IBM, *Carre*, p. 528.

Evolution and Accomplishments of VLSI Yield Management at IBM, *Stapper*, p. 532.

Oxygen Incorporation and Precipitation in Czochralski-Grown Silicon, *Murgai*, p. 546.

Metrology in Mask Manufacturing, *Rottmann*, p. 553.

Feature Size Control in IC Manufacturing, *Frasch*, p. 561.

Electron-Beam Proximity Printing—A New High-Speed Lithography Method for Submicron Structures, *Bohlen*, p. 568.

Optimization of Plasma Processing for Silicon-Gate FET Manufacturing Applications, *Bergendahl*, p. 580.

The Mechanism of Single-Step Liff-off with Chlorobenzene in a Diazo-Type Resist, *Halverson*, p. 590.

Process Control of the Chlorobenzene Single-Step Liff-off Process with a Diazo-Type Resist, *Collins*, p. 596.

Semiconductor Final Test Logistics and Product Dispositioning Systems, *Burgess*, p. 605.

Quality and Reliability Assurance Systems in IBM Semiconductor Manufacturing, *Melan*, p. 613.

Volume 26, Number 6, November, 1982 **Image processing and pattern recognition**

Document Analysis System, *Wong*, p. 647.

Automatic Scaling of Digital Print Fonts, *Casey*, p. 657.

Analysis of Linear Interpolation Schemes for Bi-Level Image Applications, *Abdou*, p. 667.

Word Autocorrelation Redundancy Match (WARM) Technology, *Brickman*, p. 681.

Digital Halftoning of Images, *Anastassiou*, p. 687.

An Improved Segmentation and Coding Algorithm for Binary and Nonbinary Images, *Danielsson*, p. 698.

Reduced Data Re-Order Complexity Properties of Polynomial Transform 2D Convolution and Fourier Transform Methods, *Kriz*, p. 708.

Importance of Higher-Order Components to Multispectral Classification, *Dave*, p. 715.

Some Experiments in Image Vectorization, *Jimenez*, p. 724.

Digital Multi-Image Analysis: Application to the Quantification of Rock Microfractography, *Montoto*, p. 735.

Backscatter and Attenuation Imaging from Ultrasonic Scanning in Medicine, *Farrell*, p. 746.

An Algorithm for Separating Patterns by Ellipsoids, *Barnes*, p. 759.

Cursive Script Recognition by Elastic Matching, *Tappert*, p. 765.

Volume 27, Number 1, January, 1983 **Manufacturing technology - packaging**

Product Quality Level Monitoring and Control for Logic Chips and Modules, *Cleverley*, p. 4.

Multi-Layer Ceramics Manufacturing, *Burger*, p. 11.

Precise Numerical Control for the Thermal Conduction Module, *Sanborn*, p. 20.

Multi-Chip Module Test and Diagnostic Methodology, *Curtin*, p. 27.

The LT1280 for Through-the-Pins Testing of the Thermal Conduction Module, *Pierson*, p. 35.

Failure Diagnosis on the LT1280, *Barry*, p. 41.

Computer-Controlled Optical Testing of High-Density Printed-Circuit Boards, *West*, p. 50.

A Model for the Prediction of Assembly, Rework, and Test Yields, *Dooley*, p. 59.

Volume 27, Number 2, March, 1983 **Constrained channel coding**

Arithmetic Codes for Constrained Channels, *Martin*, p. 94.

A General Fixed Rate Arithmetic Coding Method for Constrained Channels, *Todd*, p. 107.

Volume 27, Number 3, May, 1983 **Systems architecture**

System/370 Extended Architecture: Design Considerations, *Padeys*, p. 198.

System/370 Extended Architecture: The Channel Subsystem, *Cormier*, p. 206.

A Fault-Tolerant System Architecture for Navy Applications, *Comfort*, p. 219.

The 801 Minicomputer, *Radin*, p. 237.

Integration of Machine Organization and Control Program Design—Review and Direction, *Rao*, p. 247.

Volume 27, Number 4, July, 1983 **Polymer characterization**

High-Resolution Carbon-13 NMR of Polymers in the Solid State, *Lyerla*, p. 302.

Magic Angle Spinning NMR of Conducting Polymers, *Clarke*, p. 313.

Polymer Structure Determination Using Electron Diffraction Techniques, *Geiss*, p. 321.

Electrochemical Synthesis of Electrically Conducting Polymers from Aromatic Compounds, *Bargon*, p. 330.

Mechanical Properties of Electrochemically Prepared Polypyrrole Films, *Diaz*, p. 342.

Electron Microscopy of Carbon-Loaded Polymers, *Hanchett*, p. 348.

Volume 27, Number 4, July, 1983 **Image processing/pattern recognition**

Color Display and Interactive Interpretation of Three-Dimensional Data, *Farrell*, p. 356.

Row-by-Row Dynamic Image Analysis of a Matrix of Scanned Points, *McAuley*, p. 367.

A Hybrid Optical-Digital Image Processing Method for Surface Inspection, *Wahl*, p. 376.

A Processor-Based OCR System, *Casey*, p. 386.

Image Thresholding for Optical Character Recognition and Other Applications Requiring Character Image Extraction, *White*, p. 400.

Volume 27, Number 5, September, 1983 **Communications technology**

Periodic Sequences with Optimal Properties for Channel Estimation and Fast Start-Up Equalization, *Milewski*, p. 426.

An Analysis of the Tolerance to Crosstalk Noise of a Pulse Width Modulation System, *Park*, p. 432.

A DC-Balanced, Partitioned-Block, 8B/10B Transmission Code, *Widmer*, p. 440.

Some Methods for Providing OSI Transport in SNA, *François*, p. 452.

Address-Independent Routing for Local Networks, *Franaszek*, p. 464.

Simulation of Non-Markovian Systems, *Iglehart*, p. 472.

A Local Communications Network Based on Interconnected Token-Access Rings: A Tutorial, *Strole*, p. 481.

Volume 28, Number 1, January, 1984

Software quality

Optimizing Preventive Service of Software Products, *Adams*, p. 2.

Combined Network Complexity Measures, *Hall*, p. 15.

Interactive Language Implementation System, *Sowa*, p. 28.

Experience with Access Functions in an Experimental Compiler, *Ris*, p. 40.

A New Programming Methodology for Long-Lived Software Systems, *Strom*, p. 52.

A Program Development Tool, *Alberga*, p. 60.

Managing Multi-Version Programs with an Editor, *Kruskal*, p. 74.

Volume 28, Number 2, March, 1984

Coding and error control

Error-Correcting Codes for Semiconductor Memory Applications: A State-of-the-Art Review, *Chen*, p. 124.

An Introduction to Arithmetic Coding, *Langdon, Jr.*, p. 135.

A Universal Reed-Solomon Decoder, *Blahut*, p. 150.

Implementation and Evaluation of a (b,k) -Adjacent Error-Correcting/Detecting Scheme for Supercomputer Systems, *Arlat*, p. 159.

Fault Alignment Exclusion for Memory Using Address Permutation, *Bossen*, p. 170.

Fault-Tolerant Design Techniques for Semiconductor Memory Applications, *Aichelmann, Jr.*, p. 177.

Fault-Tolerant Memory Simulator, *Chen*, p. 184.

A General-Purpose Memory Reliability Simulator, *Libson*, p. 196.

Analysis of Correctable Errors in the IBM 3380 Disk File, *Howell*, p. 206.

Iterative Exhaustive Pattern Generation for Logic Testing, *Tang*, p. 212.

Volume 28, Number 3, May, 1984

Non-impact printing technology

Preface, *Lucente*, p. 233.

Introduction to Topical Issue on Non-Impact Printing Technologies, *Myers*, p. 234.

Technology Trends in Electrophotography, *Lee*, p. 241.

Introduction to the IBM 3800 Printing Subsystem Models 3 and 8, *Miller, Jr.*, p. 252.

Technology of the IBM 3800 Printing Subsystem Model 3, *McMurtry*, p. 257.

Electrophotographic Printer Control as Embodied in the IBM 3800 Printing Subsystem Models 3 and 8, *Barrera*, p. 263.

Print Quality Measurements for High-Speed Electrophotographic Printers, *Crawford*, p. 276.

Paper Material Considerations for System Printers, *Borch*, p. 285.

Flash Fusing in Electrophotographic Machines, *Baumann*, p. 292.

Multiple-Nozzle Ink Jet Printing Experiment, *Darling*, p. 300.

The Application of Drop-on-Demand Ink Jet Technology to Color Printing, *Lee*, p. 307.

Experimental and Theoretical Study of Wave Propagation Phenomena in Drop-on-Demand Ink Jet Devices, *Bogy*, p. 314.

Numerical Calculation of the Fluid Dynamics of Drop-on-Demand Jets, *Fromm*, p. 322.

Volume 28, Number 5, September, 1984

Design automation

A software architecture for a mature design automation system, *Taylor*, p. 501.

A device-independent graphics package for CAD applications, *Capelli*, p. 512.

An interactive system for VLSI chip physical design, *Elder*, p. 524.

LSS: A system for production logic synthesis, *Darringer*, p. 537.

Automated technology mapping, *Gilkinson*, p. 546.

Hardware design and description languages in IBM, *Maissel*, p. 557.

Using a hardware simulation engine for custom MOS structured designs, *Barzilai*, p. 564.

PSI: A symbolic layout system, *Fiebrich*, p. 572.

Constraint solver for generalized IC layout, *Cook*, p. 581.

Custom Chip/Card Design System, *Barone*, p. 590.

ACORN: A system for CVS macro design by tree placement and tree customization, *Hauge*, p. 596.

KWIRE: A multiple-technology, user-reconfigurable wiring tool for VLSI, *Elmendorf*, p. 603.

An iterative-improvement penalty-function-driven wire routing system, *Linsker*, p. 613.

A CMOS LSSD test generation system, *Leet*, p. 625.

Volume 28, Number 6, November, 1984

Materials/packaging

Preface: Advances in materials and processes for printed circuit packaging technology, *Seraphim*, p. 652.

Moisture solubility and diffusion in epoxy and epoxy-glass composites, *Marsh*, p. 655.

Bending-cantilever method for the study of moisture swelling in polymers, *Berry*, p. 662.

Mechanisms of electroless metal plating: I. Mixed potential theory and the interdependence of partial reactions, *Bindra*, p. 668.

Mechanisms of electroless metal plating: II. Decomposition of formaldehyde, *Bindra*, p. 679.

Initiation of electroless Cu plating on nonmetallic surfaces, *Horkans*, p. 690.

Microstructure evolution during electroless copper deposition, *Kim*, p. 697.

Micromechanics of multilayer printed circuit boards, *Lee*, p. 711.

Optimization of interconnections between packaging levels, *Kelly*, p. 719.

Immersion tin: Its chemistry, metallurgy, and application in electronic packaging technology, *Kovac*, p. 726.

High-temperature stability of a polyimide film, *Ginsburg*, p. 735.
Determination of Gafac in complex solution matrices, *Schubert*, p. 741.

Volume 29, Number 2, March, 1985

Microprocessors and digital signal processing

Microprocessors in brief, *Stanley*, p. 110.
Architecture of a digital signal processor, *Ungerboeck*, p. 132.
Signal processor chip implementation, *Beraud*, p. 140.
Voice-excited predictive coder (VEPC) implementation on a high-performance signal processor, *Galand*, p. 147.
Personal Instrument (PI)—A PC-based signal processing system, *Shichman*, p. 158.
An approach to DFT calculations using standard microprocessors, *Rayfield*, p. 170.
Image processing applications for geologic mapping, *Abrams*, p. 177.
Parameter reduction and context selection for compression of gray-scale images, *Todd*, p. 188.

Volume 29, Number 3, May, 1985

Semiconductor device modeling

Advanced bipolar transistor modeling: Process and device simulation tools for today's technology, *Knepper*, p. 218.
Two-dimensional process modeling: A description of the SAFEPRO program, *O'Brien*, p. 229.
Two-dimensional device simulation program: 2DP, *Gaur*, p. 242.
The generation of three-dimensional bipolar transistor models for circuit analysis, *Chang*, p. 252.
FEDSS—A 2D semiconductor fabrication process simulator, *Borucki*, p. 263.
VLSI wiring capacitance, *Cottrell*, p. 277.
Semiconductor device simulation using generalized mobility models, *Laux*, p. 289.
Animation and 3D color display of multiple-variable data: Application to semiconductor design, *Farrell*, p. 302.

Volume 29, Number 4, July, 1985

Computers in manufacturing

Analysis of manufacturing systems by the Research Queueing Package, *Chow*, p. 330.
Integrated Manufacturing Modeling System, *Engelke*, p. 343.
An algorithm for carrier routing in a flexible material-handling system, *Haines*, p. 356.
Precise manipulation with endpoint sensing, *Taylor*, p. 363.
On the analysis and design of CUSUM-Shewhart control schemes, *Yashchin*, p. 377.
Short-term production scheduling of an automated manufacturing facility, *Gershwin*, p. 392.
Scheduling algorithms for flexible flow lines, *Wittrock*, p. 401.
A prototype manufacturing knowledge base in Syllog, *Fellenstein*, p. 413.

Volume 29, Number 5, September, 1985

SELECTRIC System/2000

Preface, *Voit, Jr.*, p. 442.

Design and implementation of the SELECTRIC System/2000, *Williams*, p. 443.

Resistive ribbon thermal transfer printing: A historical review and introduction to a new printing technology, *Pennington*, p. 449.

Implementation of the resistive ribbon technology in a printer and correcting typewriter, *Applegate*, p. 459.

Characterization of a resistive ribbon thermal transfer printing process, *Twardeck*, p. 470.

Development of a membrane switch-type full-travel tactile keyboard, *DeFosse*, p. 478.

System control for a printwheel typewriter, *Mayo*, p. 488.

System controls for a resistive ribbon printer, *Bohnhoff*, p. 494.

Ink temperatures in resistive ribbon thermal transfer printing, *Chieu*, p. 509.

Electrical properties of resistive ribbon, *Shih*, p. 519.

Thermal behavior of resistive ribbon for single-stylus excitation, *Laff*, p. 527.

Volume 30, Number 1, January, 1986

Knowledge systems

Knowledge systems: Principles and practice, *Walker*, p. 2.
A continuous real-time expert system for computer operations, *Ennis*, p. 14.
Interfaces for knowledge-base builders' control knowledge and application-specific procedures, *Hirsch*, p. 29.
A theory for the representation of knowledge, *Guenthner*, p. 39.
Implementing a semantic interpreter using conceptual graphs, *Sowa*, p. 57.
Conceptual graphs for semantics and knowledge processing, *Fargues*, p. 70.
Storing and evaluating Horn-clause rules in a relational database, *van Emde Boas*, p. 80.
Structures of rule-based belief functions, *Eddy*, p. 93.
An experimental computer architecture supporting expert systems and logic programming, *Diel*, p. 102.

Volume 30, Number 2, March, 1986

Vector processing

New scalar and vector elementary functions for the IBM System/370, *Agarwal*, p. 126.
Fourier transform and convolution subroutines for the IBM 3090 Vector Facility, *Agarwal*, p. 145.
A vectorizing Fortran compiler, *Scarborough*, p. 163.
Seismic migration on the IBM 3090 Vector Facility, *Gazdag*, p. 172.
Parallel iterative linear solvers for oil reservoir models, *Efrat*, p. 184.
Monte Carlo photon transport on a vector supercomputer, *Martin*, p. 193.

Volume 30, Number 4, July, 1986

Scanning tunneling microscopy I

Preface, *Chaudhari*, p. 354.
Scanning tunneling microscopy, *Binnig*, p. 355.
Squeezable tunneling junctions, *Hansma*, p. 370.
Electronic structure and tunneling current for chemisorbed atoms, *Lang*, p. 374.

Application to biology and technology of the scanning tunneling microscope operated in air at ambient pressure, *Baró*, p. 380.

Tunneling microscopy from 300 to 4.2 K, *Elrod*, p. 387.

A scanning tunneling microscope for surface science studies, *Demuth*, p. 396.

Defects on the Pt(100) surface and their influence on surface reactions—A scanning tunneling microscopy study, *Hösler*, p. 403.

Spectroscopy of electronic states of metals with a scanning tunneling microscope, *Kaiser*, p. 411.

Some design criteria in scanning tunneling microscopy, *Pohl*, p. 417.

Possible mechanisms of atom transfer in scanning tunneling microscopy, *Gomer*, p. 428.

Volume 30, Number 5, September, 1986

Scanning tunneling microscopy II

Wide-range, low-operating-voltage, bimorph STM: Application as potentiometer, *Murali*, p. 443.

Traversal time for tunneling, *Büttiker*, p. 451.

Properties of vacuum tunneling currents: Anomalous barrier heights, *Coombs*, p. 455.

Mono-atomic tips for scanning tunneling microscopy, *Fink*, p. 460.

Scanning tunneling microscopy of cleaved semiconductor surfaces, *Feenstra*, p. 466.

Scanning tunneling microscopy of surface microstructure on rough surfaces, *Gimzewski*, p. 472.

Near-field optical scanning microscopy with tunnel-distance regulation, *Dürig*, p. 478.

Chemical applications of scanning tunneling microscopy, *West*, p. 484.

Surface modification with the scanning tunneling microscope, *Abraham*, p. 492.

STM activity at the University of Basel, *Ringger*, p. 500.

Applications of a high-stability scanning tunneling microscope, *van Kempen*, p. 509.

Construction of a UHV scanning tunneling microscope, *Chiang*, p. 515.

A scanning tunneling microscope for the investigation of the growth of metal films on semiconductor surfaces, *Berghaus*, p. 520.

Scanning tunneling microscope automation, *Aguilar*, p. 525.

Theory of scanning tunneling microscopy and spectroscopy: Resolution, image and field states, and thin oxide layers, *Garcia*, p. 533.

Computer automation for scanning tunneling microscopy, *Schroer*, p. 543.

The behavior and calibration of some piezoelectric ceramics used in the STM, *Vieira*, p. 553.

Volume 30, Number 6, November, 1986

Processing programming languages

Microtasking on IBM multiprocessors, *Carnevali*, p. 574.

Compiling APL: The Yorktown APL Translator, *Driscoll, Jr.*, p. 583.

Program analysis and code generation in an APL/370 compiler, *Ching*, p. 594.

An automatic overlay generator, *Cytron*, p. 603.

An execution architecture for FP, *Huynh*, p. 609.

Early error detection in syntax-driven parsers, *Moura*, p. 617.

Volume 31, Number 1, January, 1987

Office automation technologies

Digital halftoning on the IBM 4250 Printer, *Goertzel*, p. 2.

Binary-image-manipulation algorithms in the Image View Facility, *Anderson*, p. 16.

PANDA: Processing Algorithm for Noncoded Document Acquisition, *Chen*, p. 32.

YODA: An advanced display for personal computers, *Gupta*, p. 44.

Document convergence in an interactive formatting system, *Chamberlin*, p. 58.

LEXX—A programmable structured editor, *Cowlshaw*, p. 73.

A method for efficient storage and rapid application of context-sensitive phonological rules for automatic speech recognition, *Mercer*, p. 81.

Feature analysis for symbol recognition by elastic matching, *Kurtzberg*, p. 91.

Drop formation by DOD ink-jet nozzles: A comparison of experiment and numerical simulation, *Shield*, p. 96.

Volume 31, Number 2, March, 1987

Mathematics and computing

Preface, *Winograd*, p. 150.

Science in industry, *Gomory*, p. 151.

Reflections on the early days of the department, *Goldstine*, p. 154.

Applied mathematics, a national view, *Cohen*, p. 158.

A view of Approximation Theory, *Rivlin*, p. 162.

Numerical analysis and the scientific method, *Glimm*, p. 169.

Some stability techniques for multistep methods, *Odeh*, p. 178.

Factoring logic functions, *Brayton*, p. 187.

Some aspects of the theory of statistical control schemes, *Yashchin*, p. 199.

The group problem and integer programming duality, *Johnson*, p. 206.

Fourier transforms that respect crystallographic symmetries, *Auslander*, p. 213.

The torus and the disk, *Adler*, p. 224.

The complexity of computations by networks, *Pippenger*, p. 235.

Cryptography, *Coppersmith*, p. 244.

Efficient randomized pattern-matching algorithms, *Karp*, p. 249.

Volume 31, Number 3, May, 1987

Computer-aided design

Preface, *Wesley*, p. 276.

Solid modeling for production design, *Wolfe*, p. 277.

Piecewise-circular curves for geometric modeling, *Rossignac*, p. 296.

Trimmed-surface algorithms for the evaluation and interrogation of solid boundary representations, *Farouki*, p. 314.

Simple unit vectors orthogonal to a given vector, *O'Connor*, p. 335.

Shaping geometric objects by cumulative translational sweeps, *Evans*, p. 343.

Voronoi diagram for multiply-connected polygonal domains I: Algorithm, *Srinivasan*, p. 361.

Voronoi diagram for multiply-connected polygonal domains II: Implementation and application, *Meshkat*, p. 373.

An algorithm for automatic identification of R-fields in bond graphs, *Hood*, p. 382.

Parallel algorithms for chip placement by simulated annealing, *Darema*, p. 391.

Volume 31, Number 4, July, 1987

Aspects of computer performance

Reducing execution parameters through correspondence in computer architecture, *Wakefield*, p. 420.

Performance analysis of the FFT algorithm on a shared-memory parallel architecture, *Cvetanovic*, p. 435.

Best and worst mappings for the omega network, *Cvetanovic*, p. 452.

Efficient search techniques—An empirical study of the *N*-Queens Problem, *Stone*, p. 464.

The inconsistency index method for estimating the accuracy of Schweitzer's approximation, *Sitaram*, p. 475.

Exact analysis of round-robin scheduling of services, *Takagi*, p. 484.

Volume 31, Number 5, September, 1987

Formal definition/design of computer systems

Direct semantics of concurrent languages in the SMO LCS approach, *Astesiano*, p. 512.

Transaction processing primitives and CSP, *Woodcock*, p. 535.

Specification statements and refinement, *Morgan*, p. 546.

A CCS semantics for NIL, *Smolka*, p. 556.

Volume 31, Number 6, November, 1987

Metal-semiconductor contacts

Contact metallurgy development for VLSI logic, *Geffken*, p. 608.

Electrical and microstructural investigation of polysilicon emitter contacts for high-performance bipolar VLSI, *Stork*, p. 617.

Study of contact and shallow junction characteristics in submicron CMOS with self-aligned titanium silicide, *Taur*, p. 627.

Oxidation of Si-rich chemical-vapor-deposited films of tungsten silicide, *Krusin-Elbaum*, p. 634.

Volume 32, Number 1, January, 1988

Basic concepts in quantum and stochastic transport

Preface, *Büttiker*, p. 3.

World as system self-synthesized by quantum networking, *Wheeler*, p. 4.

Notes on the history of reversible computation, *Bennett*, p. 16.

Miniaturization of electronics and its limits, *Keyes*, p. 24.

Information transport obeying the continuity equation, *Toffoli*, p. 29.

Origin of life and physics: Diversified microstructure—Inducement to form Information-Carrying and Knowledge-Accumulating systems, *Kuhn*, p. 37.

Density of states of one-dimensional random potentials, *Erdős*, p. 47.

Bloch electron in a magnetic field: Mixed dimensionality and the magnetic-field-induced generalized quantum Hall effect, *Azbel*, p. 52.

Residual resistivity dipoles, electromigration, and electronic conduction in metallic microstructures, *Sorbelli*, p. 58.

Coherent and sequential tunneling in series barriers, *Büttiker*, p. 63.

Diffusion from an entrance to an exit, *Fisher*, p. 76.

Band tails, path integrals, instantons, polarons, and all that, *Cohen*, p. 82.

Fundamental questions in the theory of electromigration, *Verbruggen*, p. 93.

Tunneling times and a quantum clock, *Foden*, p. 99.

Coherent voltage oscillations in small normal tunnel junctions and the crossover to the incoherent regime, *Gefen*, p. 103.

Relative stability in nonuniform temperature, *van Kampen*, p. 107.

Boundary-layer theory for the extremely underdamped Brownian motion in a metastable potential, *Risken*, p. 112.

Bistability in active circuits: Application of a novel Fokker-Planck approach, *Hänggi*, p. 119.

Quantum noise and quantum Langevin equations, *Gardiner*, p. 127.

Symmetry and transport in disordered systems, *Pendry*, p. 137.

Correlated discrete transfer of single electrons in ultrasmall tunnel junctions, *Likharev*, p. 144.

Volume 32, Number 2, March, 1988

Natural language and computing

A flexible graph-unification formalism and its application to natural-language processing, *Bouma*, p. 170.

An experiment in computational discrimination of English word senses, *Black*, p. 185.

Spelling assistance for compound words, *Frisch*, p. 195.

CRITAC—An experimental system for Japanese text proofreading, *Takeda*, p. 201.

Large-vocabulary speech recognition: A system for the Italian language, *D'Orta*, p. 217.

Multilevel decoding for Very-Large-Size-Dictionary speech recognition, *Merialdo*, p. 227.

A Japanese sentence analyzer, *Maruyama*, p. 238.

Conceptual graphs for the analysis and generation of sentences, *Velardi*, p. 251.

Volume 32, Number 3, May, 1988

Mesoscopic phenomena and nanolithographic technology I

Preface, *Webb*, p. 304.

Spatial variation of currents and fields due to localized scatterers in metallic conduction, *Landauer*, p. 306.

Symmetry of electrical conduction, *Büttiker*, p. 317.

Fluctuations in the extrinsic conductivity of disordered metal, *Washburn*, p. 335.

Mesoscopic coherence phenomena in semiconductor devices, *Kaplan*, p. 347.

Isolated rings of mesoscopic dimensions. Quantum coherence and persistent currents, *Cheung*, p. 359.

Electronic transport in small strongly localized structures, *Fowler*, p. 372.

What is measured when you measure a resistance?—The Landauer formula revisited, *Stone*, p. 384.

Scanning tunneling measurements of potential steps at grain boundaries in the presence of current flow, *Kirtley*, p. 414.

Volume 32, Number 4, July, 1988

Mesoscopic phenomena and nanolithographic technology II

Preface, *Laibowitz*, p. 440.

Materials and processes for microstructure fabrication, *Hatzakis*, p. 441.

Nanolithography with a high-resolution STEM, *Umbach*, p. 454.

Nanostructure technology, *Chang*, p. 462.

High-throughput, high-resolution electron-beam lithography, *Pfeiffer*, p. 494.

Resolution limits for electron-beam lithography, *Broers*, p. 502.

Advanced electron-beam lithography for 0.5- μm to 0.25- μm device fabrication, *Hohn*, p. 514.

Volume 32, Number 5, September, 1988

Electronic packaging

Ion transport through protective polymeric coatings exposed to an aqueous phase, *Leidheiser, Jr.*, p. 582.

Characterization of PdSn catalysts for electroless metal deposition, *O'Sullivan*, p. 591.

Chemistry at interfaces: Electropositive metals on polymer surfaces, *Kovac*, p. 603.

Characterization of a bis-maleimide triazine resin for multilayer printed circuit boards, *Gotro*, p. 616.

Improvement of adhesion of copper on polyimide by reactive ion-beam etching, *Ruoff*, p. 626.

Developer-induced debonding of photoresist from copper, *Ruoff*, p. 631.

Physical limits to the useful packaging density of electronic systems, *Pease*, p. 636.

Electrical design of signal lines for multilayer printed circuit boards, *Chang*, p. 647.

Delocalized bonding at the metal-polymer interface, *Ho*, p. 658.

Surface analysis and characterization of large printed-circuit-board circuitization process steps, *Auerbach*, p. 669.

Volume 32, Number 6, November, 1988

Q-Coder

An overview of the basic principles of the Q-Coder adaptive binary arithmetic coder, *Pennebaker*, p. 717.

Optimal hardware and software arithmetic coding procedures for the Q-Coder, *Mitchell*, p. 727.

Probability estimation for the Q-Coder, *Pennebaker*, p. 737.

Software implementations of the Q-Coder, *Mitchell*, p. 753.

A multi-purpose VLSI chip for adaptive data compression of bilevel images, *Arps*, p. 775.

Volume 33, Number 2, March, 1989

Geometric modeling

Geometric tolerancing: I. Virtual boundary requirements, *Jayaraman*, p. 90.

Geometric tolerancing: II. Conditional tolerances, *Srinivasan*, p. 105.

Vector processing

Conjugate-gradient subroutines for the IBM 3090 Vector Facility, *di Brozolo*, p. 125.

Lattice-gas hydrodynamics on the IBM 3090 Vector Facility, *Succi*, p. 136.

Volume 33, Number 3, May, 1989

High- T_c superconductivity

Preface, *Müller*, p. 199.

Current understanding of electronic structure and some difficulties with cuprate semiconductors, *Kitazawa*, p. 201.

High- T_c superconductivity in bismuthates—How many roads lead to high T_c ?, *Batlogg*, p. 208.

Interim report on the charge-transfer resonance model for the Cu-O superconductors, *Varma*, p. 215.

Oxygen "disorder" and the structures of high- T_c superconductors by neutron powder diffraction, *Hewat*, p. 220.

Tl-Ca-Ba-Cu-O superconducting oxides, *Beyers*, p. 228.

Infrared studies of the normal and superconducting states of $\text{Y}_1\text{Ba}_2\text{Cu}_3\text{O}_7$, *Collins*, p. 238.

On the nature of high-temperature superconductivity, *Emery*, p. 246.

Measurements on thin-film high- T_c superconductors, *Kapitulnik*, p. 252.

Granular Josephson and quantum interference effects in HTC ceramic superconductors, *Gough*, p. 262.

Quasi-elastic and inelastic neutron-scattering studies of superconducting $\text{La}_{2-x}\text{Sr}_x\text{CuO}_4$, *Birgeneau*, p. 270.

NMR study of magnetism and superconductivity in high- T_c oxides, *Kitaoka*, p. 277.

Magnetic frustration model and superconductivity in doped planar CuO_2 systems, *Aharony*, p. 287.

Short-coherence-length superconductors, *Deutscher*, p. 293.

Critical current measurements in single crystals and single-grain boundaries in $\text{YBa}_2\text{Cu}_3\text{O}_7$ films, *Chaudhari*, p. 299.

Glassy behavior of high- T_c superconductors, *Morgenstern*, p. 307.

Muon-spin rotation experiments in high- T_c superconductors and related materials, *Keller*, p. 314.

Low-field microwave absorption in single-crystal superconducting $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$, *Blazey*, p. 324.

Memory effects in $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ single crystal, *Rossel*, p. 328.

Positron annihilation and high-temperature superconductivity, *Peter*, p. 333.

Nuclear magnetic resonance in high- T_c superconductors, *Mehring*, p. 342.

Critical temperature and the Ginzburg-Landau theory of layered high-temperature superconductors, *Schneider*, p. 351.

Instability and high- T_c superconductivity, *Kitaoka*, p. 356.

A review of elastic properties of high- T_c superconductors and some related C_p results, *Fossheim*, p. 365.

Electronic structure studies of high- T_c superconductors by high-energy spectroscopies, *Fink*, p. 372.

A new structural modification of superconducting $\text{La}_{2-x}\text{M}_x\text{CuO}_4$, *Axe*, p. 382.

Energy dependence of the Andreev reflection of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$, *van Kempen*, p. 389.

Volume 34, Number 1, January, 1990

IBM RISC System/6000 processor

Preface, *Donofrio*, p. 2.

The evolution of RISC technology at IBM, *Cocke*, p. 4.

The IBM RISC System/6000 processor: Hardware overview, *Bakoglu*, p. 12.

IBM RISC System/6000 processor architecture, *Oehler*, p. 23.

Machine organization of the IBM RISC System/6000 processor, *Grohoski*, p. 37.

Design of the IBM RISC System/6000 floating-point execution unit, *Montoye*, p. 59.

Leading-zero anticipator (LZA) in the IBM RISC System/6000 floating-point execution unit, *Hokenek*, p. 71.

Pseudorandom built-in self-test methodology and implementation for the IBM RISC System/6000 processor, *Ratiiu*, p. 78.

Instruction scheduling for the IBM RISC System/6000 processor, *Warren, Jr.*, p. 85.

Instruction scheduling beyond basic blocks, *Golumbic*, p. 93.

Managing programs and libraries in AIX Version 3 for RISC System/6000 processors, *Auslander*, p. 98.

Evolution of storage facilities in AIX Version 3 for RISC System/6000 processors, *Chang*, p. 105.

Computation of elementary functions on the IBM RISC System/6000 processor, *Markstein*, p. 111.

Volume 34, Number 2/3, March, 1990

VLSI electrical testing

Preface, *May*, p. 139.

Electro-optic sampling of high-speed devices and integrated circuits, *Wiesenfeld*, p. 141.

Picosecond noninvasive optical detection of internal electrical signals in flip-chip-mounted silicon integrated circuits, *Heinrich*, p. 162.

Picosecond photoemission probing of integrated circuits: Capabilities, limitations, and applications, *Clauberg*, p. 173.

Flexible picosecond probing of integrated circuits with chopped electron beams, *Winkler*, p. 189.

Picosecond photoelectron microscope for high-speed testing of integrated circuits, *May*, p. 204.

A submicron electron-beam tester for VLSI circuits beyond the 4-Mb DRAM, *Fox*, p. 215.

Internal probing of submicron FETs and photoemission using individual oxide traps, *Restle*, p. 227.

A submicron MOSFET parameter extraction technique, *El-Kareh*, p. 243.

Electron-beam technology for open/short testing of multi-chip substrates, *Golladay*, p. 250.

The development of ultra-high-frequency VLSI device test systems, *Rodriguez*, p. 260.

Test generation for VLSI chips with embedded memories, *Vida-Torku*, p. 276.

Simulation of embedded memories by defective hashing, *Huisman*, p. 289.

A logic chip delay-test method based on system timing, *Motika*, p. 299.

An ac test structure for fast memory arrays, *Wong*, p. 314.

Gross delay defect evaluation for a CMOS logic design system product, *Bula*, p. 325.

Boundary-scan design principles for efficient LSSD ASIC testing, *Bassett*, p. 339.

Design for testability and diagnosis in a VLSI CMOS System/370 processor, *Starke*, p. 355.

Aliasing errors in linear automata used as multiple-input signature analyzers, *Daehn*, p. 363.

Improved cutting algorithm, *Savir*, p. 381.

Cellular automata circuits for built-in self-test, *Hortensius*, p. 389.

Built-in self-test support in the IBM Engineering Design System, *Keller*, p. 406.

Self-testing the 16-Mbps adapter chip for the IBM token-ring local area network, *Oakland*, p. 416.

LAN interface chip and mixed-signal testing developments, *Van Horn*, p. 428.

Volume 34, Number 4, July, 1990

High-speed semiconductor devices

Preface, *Heiblum*, p. 450.

Experimental technology and performance of 0.1- μ m-gate-length FETs operated at liquid-nitrogen temperature, *Sai-Halasz*, p. 452.

Monte Carlo analysis of semiconductor devices: The DAMOCLES program, *Laux*, p. 466.

Submicron-gate-length GaAs MESFETs, *Jackson*, p. 495.

Heterojunction FETs in III-V compounds, *Kiehl*, p. 506.

Ballistic hot-electron transistors, *Heiblum*, p. 530.

Compound semiconductor heterostructure bipolar transistors, *Tiwari*, p. 550.

High-speed GaAs/AlGaAs optoelectronic devices for computer applications, *Harder*, p. 568.

Volume 34, Number 5, September, 1990

Computer modeling of products and processes

Preface, *Wesley*, p. 634.

A modeling system for top-down design of assembled products, *Mäntylä*, p. 636.

Computer-aided design of slider bearings in magnetic disk files, *Deckert*, p. 660.

Disk file access-time constraints imposed by magnetic air-bearing compliance, *Cooper*, p. 668.

A simple finite element model for reactive sputter-deposition systems, *Jones*, p. 680.

Computation of current distribution in electrodeposition, a review, *Dukovic*, p. 693.

Finite element analysis of planar stress anisotropy and thermal behavior in thin films, *Young*, p. 706.

Thermoelastic behavior of X-ray lithography masks during irradiation, *Shareef*, p. 718.

Pythagorean hodographs, *Farouki*, p. 736.

Finding compact coordinate representations for polygons and polyhedra, *Milenkovic*, p. 753.

Finding the distance between two circles in three-dimensional space, *Neff*, p. 770.

Volume 34, Number 6, November, 1990

Thin layer formation

Preface, *Kuech*, p. 794.

Design of low-temperature thermal chemical vapor deposition processes, *Beach*, p. 795.

Low-temperature Si and Si:Ge epitaxy by ultrahigh-vacuum/chemical vapor deposition: Process fundamentals, *Meyerson*, p. 806.

Selective epitaxial growth of silicon and some potential applications, *Ginsberg*, p. 816.

Advances in metalorganic vapor-phase epitaxy, *Tischler*, p. 828.

Diamondlike carbon films by rf plasma-assisted chemical vapor deposition from acetylene, *Grill*, p. 849.

On-chip wiring for VLSI: Status and directions, *Small*, p. 858.

Surface and interfacial energies of CoSi₂ and Si films: Implications regarding formation of three-dimensional silicon-silicide structures, *Tu*, p. 868.

Surface chemistry of the WF₆-based chemical vapor deposition of tungsten, *Yu*, p. 875.

Magnetic thin films in recording technology, *Speriosu*, p. 884.

Magnetic multilayer structures, *Farrow*, p. 903.

Lanthanide gallate perovskite-type substrates for epitaxial, high-*T*_c superconducting Ba₂YCu₃O_{7-δ} films, *Giess*, p. 916.

Volume 35, Number 1/2, January, 1991

Visual interpretation of complex data

Preface, *Farrell*, p. 3.

FEMvis: An interactive visualization tool for mechanical analysis, *Bala*, p. 4.

Volume visualization of 3D finite element method results, *Koyamada*, p. 12.

Visual interpretation of multidimensional computations and transistor design, *Farrell*, p. 26.

Data visualization using a general-purpose renderer, *Doi*, p. 45.

Interactive analysis of the topology of 4D vector fields, *Dickinson*, p. 59.

Picture processing and three-dimensional visualization of data from scanning tunneling and atomic force microscopy, *Stoll*, p. 67.

Displaying morphological and lithological maps: A numerically intensive computing and visualization application, *Barberi*, p. 78.

IDB: An image database system, *Turtur*, p. 88.

Visualizing structure in high-dimensional multivariate data, *Young*, p. 97.

Visualization of molecular dynamics via ray-tracing and animation in a vectorized environment, *Williams*, p. 108.

Animation of computer simulations of two-dimensional turbulence and three-dimensional flows, *Briscolini*, p. 119.

A numerically intensive computing environment: IBM 3090 and the PS/2 Model 80, *Arnold*, p. 140.

Application of visualization tools in solid mechanics, *Moini*, p. 156.

Graphic workstations and supercomputers: An integrated environment for simulation of fluid dynamics problems, *Piccolo*, p. 167.

Correlative visualization techniques for multidimensional data, *Treinisch*, p. 184.

Interactive Quantitative Visualization, *Peskin*, p. 205.

Picturing randomness on a graphics supercomputer, *Pickover*, p. 227.

An interactive graphic tool to plot the structure of large sparse matrices, *Paolini*, p. 231.

Visualization in a VLSI design automation system, *DeMaris*, p. 238.

Visualizing processes in neural networks, *Wejchert*, p. 244.

Three-dimensional visualization of many-body system dynamics, *Bernaschi*, p. 254.

Visualizing parallel execution of FORTRAN programs, *Szelényi*, p. 270.

Volume 35, Number 3, May, 1991

IBM Enterprise System/9000 air-cooled processor

Preface, *Nohilly*, p. 306.

The IBM Enterprise System/9000 Type 9121 air-cooled processor, *Hajek*, p. 307.

Differential current switch—High performance at low power, *Eichelberger*, p. 313.

A 128Kb CMOS static random-access memory, *Chu*, p. 321.

IBM System/390 air-cooled alumina thermal conduction module, *Knickerbocker*, p. 330.

IBM Enterprise System/9000 Type 9121 Model 320 air-cooled processor technology, *Gani*, p. 342.

An adder design optimized for DCS logic, *Weinberger*, p. 352.

IBM Enterprise System/9000 Type 9121 system controller and memory subsystem design, *Curran*, p. 357.

Design and performance of the IBM Enterprise System/9000 Type 9121 Vector Facility, *Slegel*, p. 367.

Two approaches to array fault tolerance in the IBM Enterprise System/9000 Type 9121 processor, *Turgeon*, p. 382.

Enhanced self-test techniques for VLSI systems applied to the IBM Enterprise System/9000 Type 9121 processor, *Sarma*, p. 390.

Volume 35, Number 4, July, 1991

Electroerosion negatives and plates for printing

Making negatives and plates for printing by electroerosion: Introduction and overview, *Pennington*, p. 458.

Making negatives and plates for printing by electroerosion: I. Physical principles, *Cohen*, p. 466.

Making negatives and plates for printing by electroerosion: II. Larger-scale fabrication and testing, *Cohen*, p. 489.

Making negatives and plates for printing by electroerosion: III. Use of the direct negative and direct plate, *Cohen*, p. 512.

Volume 35, Number 5/6, September, 1991

Parallel processing

Preface, *Kleinfelder*, p. 571.

The IBM Victor V256 partitionable multiprocessor, *Shea*, p. 573.

Design choices for the TOP-1 multiprocessor workstation, *Shimizu*, p. 591.

Hierarchically interconnected multiprocessors, *Franaszek*, p. 603.

Operating system support for parallel programming on RP3, *Bryant*, p. 617.

The RP3 program visualization environment, *Kimelman*, p. 635.

The Parallel Processing Compute Server, *Ammann*, p. 653.

Clustering IBM Enterprise System/3090 computers for parallel execution of FORTRAN programs, *Scarborough*, p. 667.

Exploiting database parallelism in a message-passing multiprocessor, *Lorie*, p. 681.

Multiplication of a symmetric banded matrix by a vector on a vector multiprocessor computer, *Reuter*, p. 697.

Waveform-relaxation-based circuit simulation on the Victor V256 parallel processor, *Johnson*, p. 707.

Further results using the overhead model for parallel systems, *Flatt*, p. 721.

The parallel C (pC) programming language, *Canetti*, p. 727.

Low-overhead scheduling of nested parallelism, *Hummel*, p. 743.

Execution of automatically parallelized APL programs on RP3, *Ching*, p. 767.

Automatic partitioning of a program dependence graph into parallel tasks, *Sarkar*, p. 779.

Volume 36, Number 1, January, 1992

Thin-film-transistor liquid crystal display technology

Preface, *McGroddy*, p. 2.

Thin-film-transistor/liquid crystal display technology—An introduction, *Howard*, p. 3.

A gray-scale addressing technique for thin-film-transistor/liquid crystal displays, *Alt*, p. 11.

Cell design of gray-scale thin-film-transistor-driven liquid crystal displays, *Takano*, p. 23.

Color filter for 10.4-in.-diagonal 4096-color thin-film-transistor liquid crystal displays, *Koseki*, p. 43.

Lateral field effect in twisted nematic cells, *Lien*, p. 51.

Functional testing of TFT/LCD arrays, *Jenkins*, p. 59.

Reactive ion etching technology in thin-film-transistor processing, *Kuo*, p. 69.

Study of the V_{th} shift of the thin-film transistor by the bias temperature stress test, *Fujimoto*, p. 76.

Volume 36, Number 2, March, 1992

Materials science for silicon technology

Preface, *Lipari*, p. 138.

Plasma-based dry etching techniques in the silicon integrated circuit technology, *Oehrlein*, p. 140.

Stress-induced dislocations in silicon integrated circuits, *Fahey*, p. 158.

Application of electron and ion beam analysis techniques to microelectronics, *Kuan*, p. 183.

Numerical modeling of advanced semiconductor devices, *Lee*, p. 208.

Integrated processing for microelectronics science and technology, *Rubloff*, p. 233.

Volume 36, Number 3, May, 1992

Artificial intelligence

Preface, *Griesmer*, p. 328.

Arthur Samuel: Pioneer in Machine Learning, *Wiederhold*, p. 329.

Capturing the deep meaning of texts through deduction and inference, *Antonacci*, p. 333.

Explaining SLDNF resolution with non-normal defaults, *Casanova*, p. 347.

STORK and PENGUIN: Logic programming systems using general clauses and defaults, *de T. Guerreiro*, p. 361.

Logic programming with typed unification and its realization on an abstract machine, *Beierle*, p. 375.

Zephyr: Toward true compiler-based programming in Prolog, *Asakawa*, p. 391.

An experiment in constructing an open expert system using a knowledge substrate, *Apté*, p. 409.

Use of natural language for knowledge acquisition: Strategies to cope with semantic and pragmatic variation, *Wetter*, p. 435.

Topological reasoning about dextrous grasps, *Nguyen*, p. 469.

Volume 36, Number 4, July, 1992

S/390: architecture & design

Preface, *Donofrio*, p. 533.

Enterprise Systems Connection (ESCON) Architecture—System overview, *Calta*, p. 535.

IBM Enterprise Systems multimode fiber optic technology, *Aulet*, p. 553.

The IBM Enterprise Systems Connection (ESCON) Architecture, *Elliott*, p. 577.

The IBM Enterprise Systems Connection (ESCON) Director: A dynamic switch for 200Mb/s fiber optic links, *Georgiou*, p. 593.

The IBM Enterprise Systems Connection (ESCON) channel—A versatile building block, *Flanagan*, p. 617.

MVS Dynamic Reconfiguration Management, *Cwiakala*, p. 633.

Fiber Distributed Data Interface attachment to System/390, *Coleman*, p. 647.

Coordination of time-of-day clocks among multiple systems, *Dhondy*, p. 655.

MVS/ESA coupled-systems considerations, *Swanson*, p. 667.

Integrated Cryptographic Facility of the Enterprise Systems Architecture/390: Design considerations, *Smith, Sr.*, p. 683.

Design of the IBM System/390 computer family for numerically intensive applications: An overview for engineers and scientists, *Gibson*, p. 695.

Design of the IBM Enterprise System/9000 high-end processor, *Liptay*, p. 713.

A single-chip IBM System/390 floating-point processor in CMOS, *Dao-Trong*, p. 733.

Simulation of IBM Enterprise System/9000 Models 820 and 900, *Ackerman*, p. 751.

Fault-tolerance design of the IBM Enterprise System/9000 Type 9021 processors, *Chen*, p. 765.

Three-loop feedback control of fault-tolerant power supplies in IBM Enterprise System/9000 processors, *Covi*, p. 781.

System cooling design for the water-cooled IBM Enterprise System/9000 processors, *Delia*, p. 791.

Dual-tapered-piston (DTP) module cooling for IBM Enterprise System/9000 systems, *Goth*, p. 805.

Volume 36, Number 5, September, 1992

S/390: materials & packaging

Preface, *Attardo*, p. 819.

Advancing the state of the art in high-performance logic and array technology, *Brown*, p. 821.

Improved performance of IBM Enterprise System/9000 bipolar logic chips, *Barish*, p. 829.

A statistical approach to quality control of non-normal lithographical overlay distributions, *Booth, Jr.*, p. 835.

A four-level VLSI bipolar metallization design with chemical-mechanical planarization, *Guthrie*, p. 845.

Directory and Trace memory chip with active discharge cell, *Bunce*, p. 859.

IBM Enterprise System/9000 clock system: A technology and system perspective, *Chiu*, p. 867.

Physical and electrical design features of the IBM Enterprise System/9000 circuit module, *Davidson*, p. 877.

High-performance glass-ceramic/copper multilayer substrate with thin-film redistribution, *Tummala*, p. 889.

Equipment-related advances in the fabrication of glass-ceramic/copper/polyimide substrates, *Kranik*, p. 905.

Electrical connections to the thermal conduction modules of the IBM Enterprise System/9000 water-cooled processors, *Brofman*, p. 921.

Low-inductance decoupling capacitor for the thermal conduction modules of the IBM Enterprise System/9000 processors, *Humenik*, p. 935.

Aspects of the electrical design and analyses of the printed circuit boards of the IBM Enterprise System/9000 water-cooled processors, *Boone*, p. 943.

Volume 37, Number 2, March, 1993 Electrochemical science and technology

Preface, *Horkans*, p. 83.

In situ surface pH measurement during electrolysis using a rotating pH electrode, *Deligianni*, p. 85.

A rotating ring-disk stripping technique used to study electroplating of Sn-Pb from methane sulfonic acid solutions, *Horkans*, p. 97.

Mechanistic insights into metal-mediated electroless copper plating employing hypophosphite as a reducing agent, *Gaudiello*, p. 107.

Electroless plating of copper at a low pH level, *Jagannathan*, p. 117.

Feature-scale simulation of resist-patterned electrodeposition, *Dukovic*, p. 125.

Mass transfer of an impinging jet confined between parallel plates, *Moreno*, p. 143.

The quartz resonator: Electrochemical applications, *Kanazawa*, p. 157.

Corrosion and protection of thin-line conductors in VLSI structures, *Brusic*, p. 173.

Application of X-ray spectroscopy to the study of electrochemically formed surface oxide films, *Schrott*, p. 191.

Anodic dissolution of metals at high rates, *Datta*, p. 207.

In situ infrared spectroscopy of the electrode-electrolyte interface, *Seki*, p. 227.

Conduction mechanisms in contaminant layers on printed circuit boards, *White*, p. 243.

Contact charging of organic materials: Ion vs. electron transfer, *Diaz*, p. 249.

Volume 37, Number 3, May, 1993 X-ray lithography

Preface, *Warlaumont*, p. 288.

Early history of X-ray lithography at IBM, *Spiller*, p. 291.

X-ray lithography in IBM, 1980-1992, the development years, *Wilson*, p. 299.

X-ray lithography from 500 to 30 nm: X-ray nanolithography, *Smith*, p. 319.

Modeling X-ray proximity lithography, *Guo*, p. 331.

The Helios 1 compact superconducting storage ring X-ray source, *Wilson*, p. 351.

Performance of the IBM synchrotron X-ray source for lithography, *Archie*, p. 373.

Design considerations for the IBM X-ray lithography facility, *Leavey*, p. 385.

X-ray lithography beamlines in the IBM Advanced Lithography Facility, *Silverman*, p. 395.

Electron beam lithography tool for manufacture of X-ray masks, *Groves*, p. 411.

X-ray mask repair, *Blauner*, p. 421.

Resist materials and processes for X-ray lithography, *Seeger*, p. 435.

Volume 37, Number 4, July, 1993 Manufacturing

Head actuator dynamics of an IBM 5 1/4-inch disk drive, *Fazzio*, p. 479.

Statistical modeling in manufacturing: Adapting a diagnostic tool to real-time applications, *Osborn*, p. 491.

Flexible simulation of a complex semiconductor manufacturing line using a rule-based system, *Tibbitts*, p. 507.

Component procurement and allocation for products assembled to forecast: Risk-pooling effects, *Grotzinger*, p. 523.

Modeling the cost of data communication for multi-node computer networks operating in the United States, *Irvin*, p. 537.

A load-instruction unit for pipelined processors, *Eickemeyer*, p. 547.

Volume 37, Number 5, September, 1993 Solder ball connect (SBC) technology

Preface, *Lim*, p. 582.

Solder Ball Connect (SBC) assemblies under thermal loading: II. Strain analysis via image processing, and reliability considerations, *Choi*, p. 649.

Attachment of Solder Ball Connect (SBC) packages to circuit cards, *Ries*, p. 597.

Thermal modeling of the infrared reflow process for Solder Ball Connect (SBC), *Mahaney*, p. 609.

Thermal-mechanical strain characterization for printed wiring boards, *Wu*, p. 621.

Solder Ball Connect (SBC) assemblies under thermal loading: I. Deformation measurement via moiré interferometry, and its interpretation, *Guo*, p. 635.

