

Recent Papers by IBM Authors

Reprints of the papers listed here may usually be obtained by writing directly to the authors. The authors' IBM divisions are identified as follows: DPD is the Data Processing Division; FED, Field Engineering Division; FSD, Federal Systems Division; GPD, General Products Division; GSD, General Systems Division; OPD, Office Products Division; RES, Research Division; SCD, System Communications Division; and SPD, System Products Division.

• Papers are listed alphabetically by name of journal.

A

Hole Injection Into Silicon Nitride: Interface Barrier Energies by Internal Photoemission, D. J. DiMaria and P. C. Arnett (RES Yorktown Hts., NY), *Applied Physics Letters* 26, No. 12, 711-713 (June 15, 1975).

Frequency Doubling in $\text{KB}_5\text{O}_8 \cdot 4\text{H}_2\text{O}$ and $\text{NH}_4\text{B}_5\text{O}_8 \cdot 4\text{H}_2\text{O}$ to 217.3 nm, C. F. Dewey, Jr. (MIT, Cambridge, MA), W. R. Cook, Jr. (Cleveland Crystals, Inc., OH), R. T. Hodgson and J. J. Wynne (RES Yorktown Hts., NY), *Applied Physics Letters* 26, No. 12, 714-716 (June 15, 1975).

Ballistic Overshoot in the Gradient Propagation of Bubbles in Garnet Films, A. P. Malozemoff and J. C. DeLuca (RES Yorktown Hts., NY), *Applied Physics Letters* 26, No. 12, 719-721 (June 15, 1975).

Hole Injection into Silicon Nitride: Dark Current Dependence on Electrode Materials and Insulator Thickness, P. C. Arnett and D. J. DiMaria (RES Yorktown Hts., NY), *Applied Physics Letters* 27, No. 1, 34-36 (July 1, 1975).

C

Electronic Structure of the Tetrathiofulvalene (TTF) Molecule, B. I. Bennett and F. Herman (RES San Jose, CA), *Chemical Physics Letters* 32, No. 2, 334-337 (April 15, 1975).

Electron Mobility in the 1:1 Charge-Transfer Crystal Phenanthrene-PMDA, H. Möhwald, D. Haarer and G. Castro (RES San Jose, CA), *Chemical Physics Letters* 32, No. 3, 433-437 (May 1, 1975).

Near Infrared Electronic Spectrum of TCNQ Monovalent Anion, F. B. Kaufman and I. Haller (RES Yorktown Hts., NY), *Chemical Physics Letters* 33, No. 1, 30-32 (May 15, 1975).

Optimal Tests for the Nonexistence of Immortals, A. Nadas (SPD East Fishkill, NY), *Colloquia Mathematica Societatis Janos Bolyai* 9, 701-724 (1975).

Spectroscopy of Third Order Optical Nonlinear Susceptibilities— I, J. J. Wynne (RES Yorktown Hts., NY), *Comments on Modern Physics: Part B* 6, No. 2, 31-38 (April/May 1975).

Analysis and Performance of Inverted Data Base Structures, A. F. Cardenas (RES San Jose, CA), *Communications of the Association for Computing Machinery* 18, No. 5, 253-263 (May 1975).

A Cost Oriented Algorithm for Data Set Allocation in Storage Hierarchies, V. Y. Lum, M. E. Senko, C. P. Wang and H. Ling (RES San Jose, CA), *Communications of the Association for Computing Machinery* 18, No. 6, 318-322 (June 1975).

E

Complementary Josephson-Junction Circuit, A Fast Flip-Flop and Logic Gate, W. Baechtold, Th. Forster, W. Heuberger and Th. O. Mohr (RES Zurich, Switzerland), *Electronics Letters* 11, No. 10, 203-204 (May 15, 1975).

F

A New Method for Domain Observation in TGS with Second-Harmonic Light, J. P. Bacheimer, J. Lajzerowicz and M. Vallade (Université Scientifique et Médicale de Grenoble, France) and G. Dolino (RES Zurich, Switzerland), *Ferroelectrics* 7, No. 1-4, 331-332 (1974).

G

The Averaged Lagrangian Method Applied to Resonant Nonlinear Optics: I. The Self-Steepening of Light Pulses, J. A. Armstrong (RES Yorktown Hts., NY), *General Physics* 11, No. 3, 963-972 (March 1975).

I

Oxygen-Implanted Double-Heterojunction GaAs/GaAlAs Injection Lasers, J. M. Blum, J. C. McGroddy, P. G. McMullin, K. K. Shih, A. W. Smith and J. F. Ziegler (RES Yorktown Hts., NY), *IEEE Journal of Quantum Electronics* QE-11, No. 7, 413-418 (July 1975).

Comments on "An Optimized Output Stage for MOS Integrated Circuits", R. C. Jaeger (RES Yorktown Hts., NY), *IEEE Journal of Solid-State Circuits* SC-10, No. 3, 185-186 (June 1975).

Power Dissipation in Planar Digital Circuits, R. W. Keyes (RES Yorktown Hts., NY), *IEEE Journal of Solid-State Circuits* SC-10, No. 3, 181 (June 1975).

Application of the Optimization Program AOP to the Design of Memory Circuits, G. D. Hachtel, M. R. Lightner and H. J. Kelly (RES Yorktown Hts., NY), *IEEE Transactions on Circuits and Systems* CAS-22, No. 6, 496-503 (June 1975).

The Modified Nodal Approach to Network Analysis, C. W. Ho, A. E. Ruehli and P. A. Brennan (RES Yorktown Hts., NY), *IEEE Transactions on Circuits and Systems* CAS-22, No. 6, 504-509 (June 1975).

Some Problems in Certifying Microprograms, G. B. Leeman, Jr. (RES Yorktown Hts., NY), *IEEE Transactions on Computers* C-24, No. 5, 545-553 (May 1975).

The Implanted Stepped-Oxide MNOSFET, P. J. Krick (RES Yorktown Hts., NY), *IEEE Transactions on Electron Devices* ED-22, No. 2, 62-63 (February 1975).

Optical Lithography, F. H. Dill (RES Yorktown Hts., NY), *IEEE Transactions on Electron Devices* ED-22, No. 7, 440-444 (July 1975).

Characterization of Positive Photoresist, F. H. Dill, W. P. Hornberger, P. S. Hauge and J. M. Shaw (RES Yorktown Hts., NY), *IEEE Transactions on Electron Devices* ED-22, No. 7, 445-452 (July 1975).

In-Situ Measurement of Dielectric Thickness During Etching or Developing Processes, K. L. Konnerth and F. H. Dill (RES Yorktown Hts., NY), *IEEE Transactions on Electron Devices* ED-22, No. 7, 452-456 (July 1975).

Modelling Projection Printing of Positive Photoresists, F. H. Dill, E. J. Walker (RES Yorktown Hts., NY), A. R. Neureuther (University of California, Berkeley, CA) and J. A. Tuttle (SPD East Fishkill, NY), *IEEE Transactions on Electron Devices* ED-22, No. 7, 456-464 (July 1975).

Decoding for Channels with Insertions, Deletions and Substitutions with Applications to Speech Recognition, L. R. Bahl and F. Jelinek (RES Yorktown Hts., NY), *IEEE Transactions on Information Theory* IT-21, No. 4, 404-411 (July 1975).

Analytic Expression for the Fringe Field of Finite Pole-Tip Length Recording Heads, R. I. Potter (RES San Jose, CA), *IEEE Transactions on Magnetics* MAG-11, No. 1, 80-81 (January 1975).

Anisotropic Magnetoresistance in Ferromagnetic 3d Alloys, T. R. McGuire (RES Yorktown Hts., NY) and R. I. Potter (RES San Jose, CA), *IEEE Transactions on Magnetics* MAG-11, No. 4, 1018-1038 (July 1975).

Information Systems: Records, Relations, Sets, Entities, and Things, M. E. Senko (RES Yorktown Hts., NY), *Information Systems* 1, No. 1, 3-13 (January 1975).

Singlet-Triplet Splittings as Obtained from the X α -Scattered Wave Method: A Theoretical Analysis, P. S. Bagus and B. I. Bennett (RES San Jose, CA), *International Journal of Quantum Chemistry* IX, No. 1, 143-148 (January 1975).

J

Ionization Potentials and Donor Properties of Selenium Analogs of Tetrathiafulvalene, E. M. Engler, F. B. Kaufman, D. C. Green (RES Yorktown Hts., NY), C. E. Klotz and R. N. Compton (Oak Ridge National Laboratory, Oak Ridge, TN) *Journal of the American Chemical Society* 97, No. 10, 2921-2922 (May 14, 1975).

Effect of Cloudiness on the Transfer of Solar Energy Through Realistic Model Atmospheres, J. V. Dave (DPD Scientific Center, Palo Alto, CA) and N. Braslau (RES Yorktown Hts., NY), *Journal of Applied Meteorology* 14, No. 3, 388-395 (April 1975).

A Study of the Neutral Species rf-Sputtered from Oxide Targets, J. W. Coburn, E. Taglauer and E. Kay (RES San Jose, CA), *Japanese Journal of Applied Physics* 12, No. 1, 501-504 (1974).

Effect of Oxygen on Dislocation Movement in Silicon, S. M. Hu and W. J. Patrick (SPD East Fishkill, NY), *Journal of Applied Physics* 46, No. 5, 1869-1874, (May 1975).

Laser Heating and Melting of Thin Films on Low-Conductivity Substrates, R. A. Ghez and R. A. Laff (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 5, 2103-2110 (May 1975).

Comparison of Leakage Currents in Ion-Implanted and Diffused p-n Junctions, C. J. Kircher (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 5, 2167-2173 (May 1975).

Statics and Dynamics of Domain Walls in Bubble Materials, A. Hubert (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 5, 2276-2287 (May 1975).

Etch Pits and Dislocations in (100) GaAs Wafers, J. Angilello, R. M. Potemski and G. R. Woolhouse (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 5, 2315-2316 (May 1975).

Thermally Stimulated Ionic Conductivity of Sodium in Thermal SiO₂, T. W. Hickmott (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 6, 2583-2598 (June 1975).

An Analytic Solution to Elastic Backscattering, W. K. Chu and J. F. Ziegler (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 6, 2768-2770 (June 1975).

Absence of Hillock Formation in Epitaxial Lead Films, S. K. Lahiri (RES Yorktown Hts., NY), *Journal of Applied Physics* 46, No. 6, 2791-2793 (June 1975).

Numerical Solution of Fisher's Equation, J. Gazdag and J. Canosa (DPD Scientific Center, Palo Alto, CA), *Journal of Applied Probability* 11, No. 3, 445-457 (September 1974).

Symmetric Duality, and a Convergent Subgradient Method, for Discrete, Linear, Constrained Approximation Problems with Arbitrary Norms Appearing in the Objective Function and in the Constraints, W. Oettli (RES Zurich, Switzerland), *Journal of Approximation Theory* 14, No. 1, 43-50 (May 1975).

A Direct Solution of the Spherical Harmonics Approximation to the Radiative Transfer Equation for an Arbitrary Solar Elevation, Part I: Theory, J. Dave (DPD Scientific Center, Palo Alto, CA), *Journal of Atmospheric Sciences* 32, No. 4, 790-798 (April 1975).

Coordination Number for the $\text{Li}^+\text{-F}^-$ Ion Pair in Water, J. Fromm, E. Clementi (RES San Jose, CA) and R. O. Watts (Australian National University, Canberra), *Journal of Chemical Physics* **62**, No. 4, 1388-1398 (February 15, 1975).

Ornstein-Zernike Equation for the Direct Correlation Function with a Yukawa Tail, D. Henderson (RES San Jose, CA), G. Stell (State University of New York at Stony Brook) and E. Waisman (INTI, Buenos Aires, Argentina), *Journal of Chemical Physics* **62**, No. 11, 4247-4259 (June 1, 1975).

A Theory for the Thermodynamics and Structure of Nonuniform Systems, with Applications to the Liquid-Vapor Interface and Spinodal Decomposition, F. F. Abraham (RES San Jose, CA), *Journal of Chemical Physics* **63**, No. 1, 157-164 (July 1, 1975).

Electrochromic Systems for Display Applications, I. F. Chang, B. L. Gilbert and T. I. Sun (RES Yorktown Hts., NY), *Journal of the Electrochemical Society* **122**, No. 7, 955-956 (1975).

The Use of Differential Thermal Analysis for the Examination of Glasses, A. Reisman, M. Berkenblit and S. A. Chan (RES Yorktown Hts., NY), *Journal of Electronic Materials* **4**, No. 4, 721-740 (August 1975).

Mach Bands in the Lateral Eye of Limulus Comparison of Theory and Experiment, R. B. Barlow, Jr. and D. A. Quarles, Jr. (RES Yorktown Hts., NY), *Journal of General Physiology* **65**, No. 6, 709-730 (June 1975).

Relaxed Continuous Random Network Models II: Scattering Properties, J. F. Graczyk and P. Chaudhari (RES Yorktown Hts., NY), *Journal of Non-Crystalline Solids* **17**, No. 3, 299-318 (1975).

The Shape of the Strongest Column with a Follower Load, F. Odeh and I. Tadjbakhsh (RES Yorktown Hts., NY), *Journal of Optimization Theory and Applications* **15**, No. 1, 103-118 (January 1975).

The Electrostatic Self-Focusing Process in Electron Streams, R. A. McCorkle (RES Yorktown Hts., NY), *Journal of Physics A* **8**, No. 6, 987-996 (June 1975).

Acoustic Flexure Resonance and Polarization Distribution in Potassium Dihydrogen Phosphate, U. T. Hochli (RES Zurich, Switzerland) and K. Fossheim (Norwegian Institute of Technology, Trondheim), *Journal of Physics C* **8**, No. 12, 1928-1932 (June 21, 1975).

Perturbation Theory and the Triangular-Well Potential, W. R. Smith, D. Henderson and J. A. Barker (RES San Jose, CA), *Journal of Physics* **53**, No. 1, 5-12 (1975).

Magnetic and Optical Study of NaCrO_2 , P. R. Elliston (Univ. of New South Wales, Kensington, Australia), F. Habbal (Univ. of Cincinnati, OH), N. Saleh and G. E. Watson (American University of Beirut, Lebanon), K. W. Blazey and H. Rohrer (RES Zurich, Switzerland), *Journal of Physics and Chemistry of Solids* **36**, No. 9, 877-881 (1975).

Modulus of Tightly Crosslinked Polymers Related to Chain Length and Concentration, T. L. Smith (RES San Jose, CA), *Journal of Polymer Science: Polymer Symposia*, No. 46, 97-114 (1974).

Some Evidence for the Validity of the Noise-Temperature Inequality $0 \geq T$ in the Relaxation Approximation of the One-Dimensional Electron Transport Problem in High Electric Fields, W. A. Schlup (RES Zurich, Switzerland), *Journal of Statistical Physics* **11**, No. 5, 421-431 (1974).

L

Mechanization of Cognate Recognition in Comparative Linguistics, F. J. Damerau (RES Yorktown Hts., NY), *Linguistics* **148**, 5-29 (March 15, 1975).

M

Gallium Concentration Effects on Magnetic Bubble Films of $\text{EuTm}_2(\text{Fe, Ga})_{5/12}\text{O}_{12}$ Garnet Grown by Liquid Phase Epitaxy, E. A. Giess, J. E. Davies, C. F. Guerci (RES Yorktown Hts., NY) and H. L. Hu (RES San Jose, CA), *Materials Research Bulletin* **10**, No. 5, 355-361 (May 1975).

P

Climb Trails at Dislocations in Gadolinium Gallium Garnet ($\text{Gd}_3\text{Ga}_5\text{O}_{12}$), J. W. Matthews, E. Klokholm, and T. S. Plaskett (RES Yorktown Hts., NY), *Physica Status Solidi A* **28**, No. 1, 95-105 (1975).

Electrostatic Component of Self-Focusing Electron Streams, R. A. McCorkle (RES Yorktown Hts., NY), *Physical Review A* **11**, No. 6, 2152-2155 (June 1975).

Analysis of Surface- and Bulk-Plasmon Contributions to X-Ray Photoemission Spectra, W. J. Pardee, G. D. Mahan (Indiana University, Bloomington), L. Ley, F. R. McFeely, S. P. Kowalczyk, D. A. Shirley (University of California, Berkeley, CA), D. E. Eastman and R. A. Pollak (RES Yorktown Hts., NY), *Physical Review B* **11**, No. 10, 3614-3616 (May 15, 1975).

The Structure of Overlayers. II. Si on Mo[001], A. Ignatiev and F. Jona (State University of New York at Stony Brook), D. W. Jepsen and P. M. Marcus (RES Yorktown Hts., NY), *Physical Review B* **11**, No. 12, 4780-4786 (June 15, 1975).

A Simple Molecular Model for Crystalline Tetrathiofulvalene-Tetracyanoquinodimethane (TTF-TCNQ), I. P. Batra, B. I. Bennett and F. Herman (RES San Jose, CA), *Physical Review B* **11**, No. 12, 4927-4934 (June 1975).

Conduction in the Relaxation Regime, G. H. Dohler (RES Yorktown Hts., NY) and H. Heyszenau (Institut für Theoretische Physik, Hamburg, Germany), *Physical Review B* **12**, No. 2, 641-649 (July 15, 1975).

A New Concept for Solar Energy Thermal Conversion, J. J. Cuomo, J. F. Ziegler and J. M. Woodall (RES Yorktown Hts., NY), *Physical Review Letters* **26**, No. 10, 557-559 (May 15, 1975).

Photoemission Partial State Densities of Overlapping p and d States for NiO, CoO, FeO, MnO, and Cr₂O₃, D. E. Eastman and J. L. Freeouf (RES Yorktown Hts., NY), *Physical Review Letters* **34**, No. 7, 395-398 (February 17, 1975).

Oxidation of Clean Ge and Si Surfaces, R. Ludeke and A. Koma (RES Yorktown Hts., NY), *Physical Review Letters* **34**, No. 18, 1170-1173 (May 5, 1975).

Bonding and Antibonding Potentials in Group-IV Semiconductors, R. W. Keyes (RES Yorktown Hts., NY), *Physical Review Letters* **34**, No. 21, 1334-1337 (May 26, 1975).

Effect of Relaxation and Reconstruction on the Electronic-Energy-Level Structure of the Si (111) Surface, I. P. Batra and S. Ciraci (RES San Jose, CA), *Physical Review Letters* **34**, No. 21, 1337-1340 (May 26, 1975).

Oxide-Charge-Induced Impurity Level in Silicon Inversion Layers, A. Hartstein and A. B. Fowler (RES Yorktown Hts., NY), *Physical Review Letters* **34**, No. 23, 1435-1437 (June 9, 1975).

Field-Induced Charge-Carrier Trapping in the Photoconduction of a Quasi One-Dimensional System: Phenanthrene-Pyromellitic Acid Dianhydride, D. Haarer and H. Möhwalld (RES San Jose, CA), *Physical Review Letters* **34**, No. 23, 1447-1449 (June 9, 1975).

Relation of Schottky Barriers to Empty Surface States on III-V Semiconductors, D. E. Eastman and J. L. Freeouf (RES Yorktown Hts., NY), *Physical Review Letters* **34**, No. 26, 1624-1627 (June 30, 1975).

Threshold Conditions for Electron Trapping by Nonlinear Plasma Waves, J. Canosa and J. Gazdag (DPD Scientific Center, Palo Alto, CA), *Physics of Fluids* **17**, No. 11, 2030-2039 (November 1974).

Conductivity Modulation at Metallic Point Defects, R. Landauer (RES Yorktown Hts., NY), *Physics Letters* **51A**, No. 3, 161-162 (February 24, 1975).

Antibonding Potentials and Dielectric Properties of Amorphous Phases, R. W. Keyes (RES Yorktown Hts., NY), *Physics Letters* **51A**, No. 7, 395-397 (April 21, 1975).

Roundoff Error in Fast Fourier Transforms (Decimation in Time), B. Liu and T. Kaneko (RES San Jose, CA), *Proceedings of the IEEE* **63**, No. 6, 991-992 (June 1975).

R

Microscope Stage Sample Holder Capable of Temperature Variation between 30 and 800 K, E. E. Tynan and R. J. von Gutfeld (RES Yorktown Hts., NY), *Review of Scientific Instruments* **46**, No. 5, 569-570 (May 1975).

S

A Tunneling Spectroscopy Study of Molecular Degradation due to Electron Irradiation, P. K. Hansma (University of California, Santa Barbara, CA) and M. Parikh (RES Yorktown Hts., NY), *Science* **188**, No. 4195, 1304-1305 (June 27, 1975).

Automation of Siemen's X-Ray Diffractometers, G. A. Walker and C. C. Goldsmith (SPD East Fishkill, NY), *Siemens's Review XLI*, 7th Special Issue, 48-53 (1974).

The Structure of Overlayers III. Nitrogen on Mo [001], A. Ignatiev, F. Jona (State University of New York at Stony Brook), D. W. Jepsen and P. M. Marcus (RES Yorktown Hts., NY), *Surface Science* **49**, No. 1, 189-200 (April 1, 1975).

Cluster Model Calculations for Electronic Energy Levels of Oxygen Chemisorbed on Ni, I. P. Batra and O. Robaux (RES San Jose, CA), *Surface Science* **49**, No. 2, 653-656 (April 11, 1975).

T

The Synthesis and Characterization of Spiro [3,4] Octa-1,5,7-Triene, R. D. Miller and M. Schneider (RES San Jose, CA), *Tetrahedron Letters*, No. 19/20, 1557-1560 (May 1975).

Effect of a Solute Addition (Ta) on Low Temperature Self-Diffusion Processes in Gold, D. Gupta and R. Rosenberg (RES Yorktown Hts., NY), *Thin Solid Films* **25**, No. 1, 171-180 (January 1975).

Z

Limit Theorems on the Self-Normalized Range for Weakly and Strongly Dependent Processes, B. B. Mandelbrot (RES Yorktown Hts., NY), *Zeitschrift für Wahrscheinlichkeitstheorie und Verwandte Gebiete* **31**, No. 4, 271-285 (1975).