

tion of Energy in Closed and Open Systems—The First Principle of Thermodynamics; 3) Entropy Production—The Second Principle of Thermodynamics; 4) General Statements Concerning Entropy Production and Rates of Irreversible Processes; 5) The Phenomenological Laws—Interference of Irreversible Processes; 6) Stationary Nonequilibrium States; 7) Nonlinear Problems.

This book presents a short and simple account of recent developments in the thermodynamics of irreversible processes.

Technical Literature Digest

M. H. Smith, Associate Editor

The James Forrestal Research Center, Princeton University

Propulsion and Power (Combustion Systems)

Noise Measurements during Captive and Launch Firings of a Large Rocket-Powered Vehicle, W. H. Mayes and P. M. Edge Jr. NASA TN D-1502, Nov. 1962, 33 pp.

A Digital Propellant Utilization System, R. L. Rod and J. A. Massa. Aerospace Eng. 21, 27-32 (Nov. 1962).

Charge Buildup on Solid Rockets as a Flame Burst Mechanism, R. M. Fristrom, F. A. Oyhus, and G. H. Albrecht. ARS J. 32, 1729-1730 (1962).

Influence of Heterogeneous Reaction Processes on Atomic Recombination Rates in Rocket Nozzles, S. S. Penner and J. W. Porter. Astronaut. Acta 8, 240-242 (1962).

Propulsion and Power (Noncombustion)

Nonsimilar Numerical Methods of Solution for Electrode Boundary Layers in a Crossed Field Accelerator, G. L. Grohs. Boeing Sci. Research Labs., Flight Sci. Lab. Rept. D1-82-0192, Rept. 63, Aug. 1962, 56 pp.

A Composite Energy Gas Photovoltaic Cell, J. D. Nixon and N. E. Heydahl. Air Force Aeronaut. Research Labs. ARL 62-395, Aug. 1962, 39 pp.

Experimental Investigation of a 90° Flat-Plate Magnetic Triode for Direct Energy Conversion, R. R. Cullom. NASA TN D-1532, Nov. 1962, 13 pp.

Analytical Investigation of a Bipropellant Arc Jet, H. O. Noeske and R. R. Kassner. ARS J. 32, 1701-1708 (1962).

Neutralization of Ion Beams from Engines of Annular Geometry, J. W. Ward and R. A. Hubach. ARS J. 32, 1730-1731 (1962).

Propellants and Combustion

Theoretical Vibrational Energy Levels of H₂ Associated with Various Combinations

EDITOR'S NOTE: Contributions from Professors E. R. G. Eckert, E. M. Sparrow, and W. E. Ibele of the Heat Transfer Laboratory, University of Minnesota, are gratefully acknowledged.

It is not necessary for the reader to be fully acquainted with classical thermodynamics, although a certain familiarity with its methods will facilitate understanding of the text.

Principles of Mechanics and Dynamics (formerly titled *Treatise on Natural Philosophy*), William Thomson and Peter Guthrie Tait (Dover Publications Inc., New York, 1962, orig. publ. 1879), paperback reprint in two volumes. Vol. 1, 508 pp., \$2.35. Vol. 2, 527 pp., \$2.35.

of Molecular-Orbital Configurations, G. M. Leies. J. Chem. Phys. 37, 1418-1424 (Oct. 1, 1962).

Reactions of Hydrogen Atoms with Hydrazine, Ammonia, and Nitrous Oxide, M. Schiavello and G. G. Volpi. J. Chem. Phys. 37, 1510-1513 (Oct. 1, 1962).

Effects of Water on the Burning Velocity of Hydrogen-Air Flames, D. K. Kuehl. ARS J. 32, 1724-1726 (1962).

Deflagration of Pressed Ammonium Perchlorate, M. D. Horton and E. W. Price. ARS J. 32, 1745 (1962).

The Problem of an Explosion on the Surface of a Liquid, A. A. Deribas and S. I. Pokhozhaev. Soviet Phys.—Doklady 7, 383-385 (1962).

Effect of Oxidizer Particle Size on Additive Agglomeration, L. A. Povinelli. NASA TN D-1438, Nov. 1962, 32 pp.

Bibliography on the High Temperature Chemistry and Physics of Gases and Gas-Condensed Phase Reactions, No. 5, L. Brewer. Internatl. Union of Pure and Appl. Chem., Commission on High Temperatures and Refractories, Sub-Commission on Gases, Sept. 30, 1962, 24 pp.

Materials and Structures

Investigation of High-Speed Impact: A Technique, W. B. Stephenson. Aerospace Eng. 21, 10-16 (Nov. 1962).

A Method for Reducing the Number of Degrees of Freedom in Mathematical Models of Damped Linear Dynamic Systems, S. E. Staffeld. J. Eng. Ind. 84, 418-422 (1962).

A Note on the Shielding of Energetic Particles in Space, S. P. Shun. Astronaut. Acta 8, 228-231 (1962).

Measurement of the Density of Solid Bodies with a Gradient Tube, M. Ya. Kats. Instr. Exptl. Tech., no. 1, 180-183 (Sept. 1962).

Determination of the Heat and Electric Conductivity of Metals at Temperatures in Excess of 1000°C, V. S. Gumenyuk, V. E. Ivanov, and V. V. Lebedev. Instr. Exptl. Tech., no. 1, 188-192 (Sept. 1962).

Design Parameters for Elliptical Toroidal Pressure Vessels, H. M. Turner. Aerospace Eng. 21, 33-38 (Nov. 1962).

National Electronics Conference, Proceedings (National Electronics Confer-



STRUCTURES AND DYNAMIC TEST ENGINEERS FOR ADVANCED MISSILES AND SPACECRAFT

Unusually interesting positions exist for qualified engineers who can perform on a variety of high interest aerospace vehicle studies and who have a capability for proposal preparation.

Responsibilities for the area will include: Preparation of preliminary concepts, structural and component installation designs for proposals and advanced studies in missiles and spacecraft programs; performance of weight, balance and inertia studies; providing written proposal materials.

Experience in aircraft or missile structural design is essential, with a working knowledge of preliminary stress analysis, effects of extreme environment, and applicable materials. Applicants should be generally familiar with various vehicle subsystems, particularly in the propulsion and altitude control areas.

Qualifications should include a B.S. degree from an accredited university with 5 to 10 years applicable experience.

Please airmail your resume to:

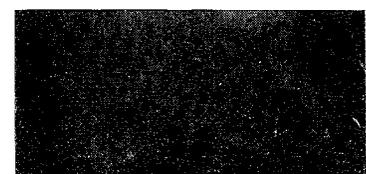
MR. ROBERT A. MARTIN
Head of Employment
Hughes Aerospace Divisions
11940 W. Jefferson Blvd.
Culver City 27, California

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
AEROSPACE DIVISIONS

An equal opportunity employer.



ence, Chicago, Ill., 1962), Vol. 18, 859 pp.

Electron, Ion, and Light Beams as Present and Future Material Working Tools, H. Schwarz and A. J. DeMaria, pp. 351-365.

Fluid Dynamics, Heat Transfer, and MHD

Fundamental Solution to the Diffusion Boundary Layer Equation for Nearly Separated Flow Over Solid Surfaces at Very Large Prandtl Numbers, D. E. Rosner. AeroChem Research Labs. Inc., TP-52, Nov. 1962, 24 pp.

An Experimental Study of a High Density Plasma in a Magnetic Pipe, A. M. Schneiderman. Mass. Inst. Tech., Magnetogasdynamics Lab. Rept. 62-4, July 1962, 64 pp.

Heat Transfer Probe Measurements as a Technique to Demonstrate MHD Containment, K. A. Rathjen. Mass. Inst. Tech., Magnetogasdynamics Lab. Rept. 62-3, July 1962, 35 pp. (AFCLR-62-857).

Helium Film Cooling on a Hemisphere at a Mach Number of 10, R. E. Cannenberg. NASA TN D-1550, Nov. 1962, 27 pp.

On the Effect of Heat Addition in the Empirical Correlation of Void Fractions for Steam-Water Flow, U. H. von Glahn and R. P. Polyn. NASA TN D-1440, Nov. 1962, 37 pp.

Matching Conditions for the Modified Newtonian, Prandtl-Meyer Expansion, Pressure Estimation Technique for Hypersonic Flows Over Blunt Bodies, L. G. Kaufman II. Grumman Aircraft Eng. Corp., Research Dept. Memo. RM-205, July 1962, 65 pp.

A Five-Node Prototype Liebmans Analogue for the Solution of Transient Heat Transfer Problems—Construction and Calibration, N. H. Freed and C. J. Rallis. Witwatersrand Univ. Rept. 11, Aug. 1962, 10 pp.; reprinted from S. African Mech. Engr., 410-419 (July 1962).

The Ablation of Graphite in Dissociated Air. I. Theory, S. M. Scala. General Electric Co., Missile and Space Div. Tech. Info. Series R62SD72, Sept. 1962, 88 pp.

Irreversible Thermodynamics of Steady-State Processes, W. Bernard. Phys. Rev. 128, 421-433 (Oct. 1, 1962).

Measurement of Electrical Conductivity of Ionized Air During Re-Entry, R. Betchov, A. E. Fuhs, R. X. Meyer, and A. B. Schaffer. Aerospace Eng. 21, 54-55 (Nov. 1962).

Rapid Calculation of Radiant Energy Transfer Between Nongray Walls and Isothermal M_2O or CO Ions, D. K. Edwards and K. E. Nelson. J. Heat Transfer 84, 273-278 (1962).

Thermal Efficiency of Coated Fins, J. A. Plamondon. J. Heat Transfer 84, 279-282 (1962).

Radiant Absorption Characteristics of Concave Cylindrical Surfaces, E. M. Sparrow. J. Heat Transfer 84, 283-293 (1962).

An Enclosure Theory for Radiative Exchange Between Specularly and Diffusely Reflecting Surfaces, E. M. Sparrow, E. R. G. Eckert, and V. K. Jensson. J. Heat Transfer 84, 294-300 (1962).

Heat Transfer by Combined Forced Convection and Thermal Radiation in a Heated Tube, M. Permuter and R. Siegel. J. Heat Transfer 84, 301-311 (1962).

Effect of Arbitrary Nonsteady Wall Temperature on Incompressible Heat

Transfer, T. R. Goodman. J. Heat Transfer 84, 347-352 (1962).

Laminar Forced Convection of Liquids in Tubes with Variable Viscosity, K. T. Yang. J. Heat Transfer 84, 353-362 (1962).

Laminar Heat Transfer in Tubes under Slip-Flow Conditions, E. M. Sparrow and S. H. Lin. J. Heat Transfer 84, 363-369 (1962).

Comparison of Dynamic Models of a Superheater, M. Enns. J. Heat Transfer 84, 375-385 (1962).

Diffusion and Chemical Surface Catalysis in a Low Temperature Plasmajet, D. E. Rosner. J. Heat Transfer 84, 386-395 (1962).

Attainment of Interface Matching in a Chemical Shock Tube, D. H. Nappler and J. R. Simonson. ARS J. 32, 1736-1737 (1962).

Hypervelocity Laminar Convective Flat Plate Heating, G. M. Hanley. ARS J. 32, 1740-1743 (1962).

Correlation of Surface Temperature Effect on Nonequilibrium Heat Transfer, G. R. Inger. ARS J. 32, 1743-1744 (1962).

Optimum Contour Heat Rejection Fins Coated by Radiation, G. L. Grodovsky. Astronaut. Acta 8, 232-239 (1962).

Kinetic Equation of a Plasma in Weak Static Electric and Magnetic Fields, M. K. Sundaresan and T. Y. Wu. Can. J. Phys. 40, 1494-1820 (1962).

Kinetic Equation of a Plasma in a Strong Static Magnetic Field, M. K. Sundaresan and T. Y. Wu. Can. J. Phys. 40, 1537-1546 (1962).

Simpler Formulae for the Thermal Diffusion Factor of Binary Gas Mixtures, S. C. Saxena, S. M. Dave, and P. A. Pardeshi. Can. J. Phys. 40, 1608-1613 (1962).

Some Comments on the Statistical Mechanics of Irreversible Processes in Gases, R. Balescu. Can. J. Phys. 40, 1664-1669 (1962).

Application of the Entropy Method to Investigation of Transonic Adiabatic Flows, A. A. Gukhman. Internatl. J. Heat Mass Transfer 5, 889-896 (1962).

Heat Transfer at the Interface of Dissimilar Materials: Evidence of Thermal-Comparator Experiments, R. W. Powell, R. P. Tye, and B. W. Jolliffe. Internatl. J. Heat Mass Transfer 5, 897-902 (1962).

Stability and Transition of the Free-Convection Layer Along a Vertical Flat Plate, A. A. Szewczyk. Internatl. J. Heat Mass Transfer 5, 903-914 (1962).

Measurement of Low Speed Gas Flows by Particle Trajectories: A New Determination of Free Convection Velocity Profiles, R. Eichhorn. Internatl. J. Heat Mass Transfer 5, 915-928 (1962).

Film Condensation in a Forced-Convection Boundary-Layer Flow, J. C. Y. Koh. Internatl. J. Heat Mass Transfer 5, 941-954 (1962).

Coaxial Turbulent Jets, B. R. Morton. Internatl. J. Heat Mass Transfer 5, 955-966 (1962).

A Theoretical Consideration of Directional Effects in Heat Flow at the Interface of Dissimilar Metals, J. S. Moon and R. N. Keeler. Internatl. J. Heat Mass Transfer 5, 967-972 (1962).

Heat Transfer in the Thermal Entry Length with Laminar Flow in an Annulus, A. P. Hatton and A. Quarmby. Internatl. J. Heat Mass Transfer 5, 973-980 (1962).

Experiments on Pool-Boiling Heat Transfer, P. J. Berenson. Internatl. J. Heat Mass Transfer 5, 985-1000 (1962).

Method for Determining Size and Shape of Optically Black Emitting Systems, D. T. Kokorev. Internatl. J. Heat Mass Transfer 5, 981-984 (1962).

Heat and Mass Transfer with Liquid Evaporation, B. M. Smolsky and G. T. Sergeev. Internatl. J. Heat Mass Transfer 5, 1011-1022 (1962).

Heat Transfer, a Review of Current Literature, E. R. G. Eckert, T. F. Irvine Jr., E. M. Sparrow, and W. E. Ibele. Internatl. J. Heat Mass Transfer 5, 1023-1050 (1962).

Stability of a Hard-Core Fluid Jet of Small Electrical Conductivity, S. P. Talwar and J. N. Tandon. J. Fluid Mech. 14, 178-186 (1962).

Three-Dimensional Viscous Wakes, M. H. Steiger and M. H. Bloom. J. Fluid Mech. 14, 233-240 (1962).

Similarity in Swirling Wakes and Jets, A. J. Reynolds. J. Fluid Mech. 14, 241-243 (1962).

The Motion of Rigid Particles in a Shear Flow at Low Reynolds Number, F. P. Bretherton. J. Fluid Mech. 14, 284-304 (1962).

Radial Jets with Swirl, I: Incompressible Flow; II: Compressible Flow, N. Riley. Quart. J. Mech. Appl. Math. 15, 448-470 (1962).

Transonic Flow in Two-Dimensional and Axially-Symmetric Nozzles, I. M. Hall. Quart. J. Mech. Appl. Math. 15, 487-501 (1962).

The Formation of a Shock Wave by Reflection of a Weak Discontinuity from the Sound Line, L. P. Gorkov and L. P. Pitaevskii. Soviet Phys.—Doklady 7, 377-379 (1962).

Dissipation Fluctuations in Locally Isotropic Turbulent Flow, G. S. Golitsyn. Soviet Phys.—Doklady 7, 380-382 (1962).

An Optical Investigation of Phase Transitions Under Pressure, Yu. A. Klyaev. Soviet Phys.—Doklady 7, 422-424 (1962).

Excitation of Oscillations by Passage of a Slow Ion Beam Through a Plasma, M. D. Gabovich and G. S. Kirichenko. Soviet Phys.—JETP 15, 1026-1027 (1962).

The Nonlinear Theory of Interaction Between Charged Particle Beams and a Plasma in a Magnetic Field, V. D. Shapiro and V. I. Shevchenko. Soviet Phys.—JETP 15, 1053-1062 (1962).

Flight Mechanics

Roll Control Problem of Finned Rocket Vehicles with Winged Payload, J. L. Decker. Aerospace Eng. 21, 58-59 (Nov. 1962).

Impulsive Interplanetary Transfers for Prescribed Launch Date, H. B. Schechter. ARS J. 32, 1716-1723 (1962).

Stochastic Models of the Errors in Orbital Predictions for Artificial Earth Satellites, K. Moe. ARS J. 32, 1726-1728 (1962).

Coupling Effects of Gravity-Gradient Satellite Motions, I. Michelson. ARS J. 32, 1735 (1962).

Optimum Transfer Between Circular and Hyperbolic Orbits, H. Munick. ARS J. 32, 1739-1740 (1962).

Optimum Transfer Between Non-Coplanar Elliptical Orbits, K. Eckel. Astronaut. Acta 8, 177-192 (1962).

Selected Problems in Optimum Ballistic Descent from Orbit, W. H. Templeman. Astronaut. Acta 8, 193-204 (1962).

The Perturbation of Satellite Orbits by Extra-Terrestrial Gravitation, D. E.

Smith. *Planetary Space Sci.* 9, 659-674 (1962).

The Evolution of Orbits of Artificial Satellites of Planets Under the Actions of Gravitational Perturbations of External Bodies, M. L. Lidov. *Planetary Space Sci.* 9, 719-760 (1962).

An Earth Trajectory Model for Sub-surface Ballistic and Thrusted Vehicles, P. B. Chrisholm, R. M. Pelzl, and F. L. Pugh. *Air Force Special Weapons Center TDR-62-106*, Sept. 1962, 72 pp.

Experimental Determination of Pitching Moment and Damping Coefficients of a Cone in Low Density, Hypersonic Flow, W. L. Maas. *Calif. Univ., Berkeley Inst. Eng. Research TR HE-150-190*, Oct. 1961, 32 pp.

Static Stability Investigation of Proposed Project Fire Space-Vehicle and Re-entry-Package Configurations at Mach Numbers for 1.47 to 4.63, D. E. Fuller and C. D. Babb. *NASA TN D-1497*, Nov. 1962, 21 pp.

Computation of Satellite Orbits by the Hansen Method as Modified by Musen, H. T. Phelan. *NASA TR R-147*, 1962, 122 pp.

Optimum Soft Landing Trajectories, Part 2: Numerical Results, L. J. Berman. *Mass. Inst. Tech., Dept. Aeronaut. and Astronaut. AFOSR 519*, March 1962, 33 pp.

The Critical Inclination Problem in Satellite Orbit Theory, W. A. Mersman. *NASA TR R-148*, 1962, 66 pp.

Survey of Current Literature on Satellite Lifetimes, B. Billik. *ARS J.* 32, 1641-1650 (1962).

Vehicle Design, Testing, and Performance

Heat-Transfer Characteristics of Several Radiator Finned-Tube Configurations, E. M. Sparrow and W. J. Minkowycz. *NASA TN D-1435*, Nov. 1962, 46 pp.

Statistical Design of Complex Experimental Programs, Part I: Optimum Experimental Designs Obtained by Minimizing a Loss Function, K. W. Last. *Air Force Aeronaut. Research Labs. ARL 62-373*, July 1962, 39 pp.

Statistical Design of Complex Experimental Programs, Part II: The Decision Theory of Approach to Complex Experimentation, M. O. Locks. *Air Force Aeronaut. Research Labs. ARL 62-373*, July 1962, 58 pp.

National Electronics Conference, Proceedings (National Electronics Conference, Chicago, Ill., 1962), Vol. 18, 859 pp.

Use of Integrated Circuitry in a Digital System, L. Thayne, pp. 575-584.

Some Abort Techniques and Procedures for Manned Spacecraft, J. M. Eggleston. *Aerospace Eng.* 21, 17-26 (Nov. 1962).

Manned Entry Missions to Mars and Venus, R. E. Lowe and R. L. Gervais. *ARS J.* 32, 1660-1667 (1962).

Optimum Thrust Programs for Power-Limited Propulsion Systems, W. G. Melbourne and C. G. Sauer Jr. *Astronaut. Acta* 8, 205-225 (1962).

Guidance and Control

Automatic Latitude/Longitude Sensing Technique for Earth Satellites, D. J. Freeman. *Aerospace Eng.* 21, 48-53 (Nov. 1962).

Determination of the Closing Time of a Solenoid Actuated Mechanism, J. R.

Baumgarten. *J. Eng. Ind.* 84, 423-430 (1962).

A Statistical Optimizing Navigation Procedure for Space Flight, R. H. Battin. *ARS J.* 32, 1681-1696 (1962).

Evaluating the Quality of Prediction for a Position-Predicting or Tracking System, R. Leach. *ARS J.* 32, 1697-1700 (1962).

Terminal Satellite Rendezvous by Continuous Thrust and Impulse Combination, D. H. Hengeveld and Y. Shulman. *ARS J.* 32, 1733-1735 (1962).

A New Proof of the Routh-Hurwitz Stability Criterion Using the Second Method of Liapunov. *Proc. Cambridge Phil. Soc.* 58, 694-702 (1962).

A Satellite Computer for Control, D. P. Eckman, A. Bublitz, and E. Holben. *Instr. Soc. Am. J.* 9, 59-64 (Nov. 1962).

Optical Trackers in Space, W. L. Harman, G. J. Shroyer, and K. J. Gilkey. *Instr. Soc. Am. J.* 9, 70-73 (Nov. 1962).

The Influence of Random Noise on the Dynamic Behavior of Closed Loop Control Systems, Part I, G. Schweizer. *Regelungstechn.* 10, 537-542 (1962). In French.

A Contribution to the Dynamics of Interacting Pneumatic Measuring and Control Devices, R. Winckler. *Regelungstechn.* 10, 545-546 (1962). In French.

A Comparison of Electronic and Pneumatic Means for a Simple Control Loop, K. Hengst. *Regelungstechn.* 10, 386-392 (1962). In German.

Zero-Point Reliability, Smoothness of Operation and Performance of Standard Pneumatic Controllers, E. Pavlik. *Regelungstechn.* 10, 393-397 (1962). In German.

An Electro-Hydraulic Regulating Drive, R. Winckler. *Regelungstechn.* 10, 397-402 (1962). In German.

The Representation of Operators Over Memory, N. L. Glebov. *Soviet Phys.—Doklady* 7, 371-372 (1962).

Stochastic Disturbance Data for Flight Control System Analysis, J. E. Hart, L. A. Adkins, and L. L. Lacau. *Air Force Aeronaut. Systems Div. Rept. ASD-TDR-62-347*, Sept. 1962, 254 pp.

Measurement of the State Vector, C. A. Harvey. *NASA TN D-1590*, Nov. 1962, 22 pp.

Modes of Control, C. A. Harvey. *NASA TN D-1589*, Nov. 1962, 14 pp.

National Electronics Conference, Proceedings (National Electronics Conference, Chicago, Ill., 1962), Vol. 18, 859 pp.

Design Capabilities of Model Reference Adaptive Systems, H. P. Whitaker, pp. 241-249.

Convergence Properties of a Model-Reference Adaptive Control System from a Simple Stability Criterion, J. J. Bongiorno, pp. 250-257.

Aerospace Vehicles and Adaptive Flight Control, M. W. Reed, pp. 260-270.

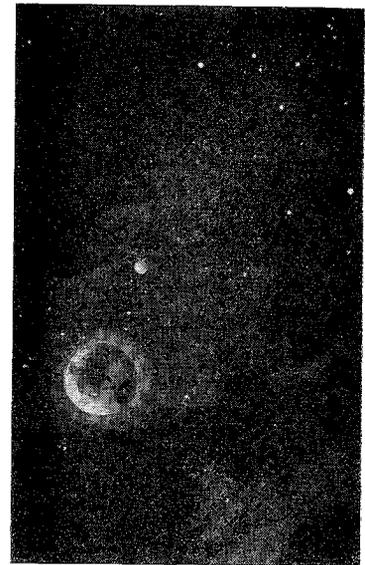
The Use of Pulse-Frequency Modulation for Adaptive Control, G. Murphy and R. L. West, pp. 271-278.

Adaptive Learning Systems, J. E. Gibson, pp. 795-799.

A Simulation-Calibration System for Space Flight Landing and Rendezvous Control Systems, W. J. Hollandsworth and D. F. Wann, pp. 585-589.

Instrumentation and Communications

Scanning Mechanism for a Satellite Borne X-Ray Spectrometer, G. L. Hemp-



AERODYNAMICISTS FOR ANALYTICAL WORK IN CONFIGURATION DESIGN

Important aerospace opportunities are offered to Aerodynamicists with M.S. degrees and 3 to 10 years' experience which can be related to several new and continuing studies and programs at Hughes. Such programs include: BAMB1, SYNCOM, SURVEYOR and others of a classified nature.

Successful candidates for these positions will conduct preliminary design studies; establish aerodynamic configurations, propulsion requirements and stability control characteristics; perform trajectory optimization.

Analytical work is required in subsonic, transonic, supersonic and hypersonic aerodynamics with particular emphasis on configuration design.

Areas of interest include: Wing-body interference effects, jet-boundary layer-shock interaction effects for calculations of stability and control effects and missile configuration optimization particularly in the high supersonic to hypersonic regime.

To assure immediate consideration, please airmail your resume to:

MR. ROBERT A. MARTIN
Head of Employment
Hughes Aerospace Divisions
11940 W. Jefferson Blvd.
Culver City 28, Calif.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
AEROSPACE DIVISIONS

An equal opportunity employer.



fling. NASA TN D-1097, Nov. 1962, 14 pp.

Effects of Long Term Vacuum on Commercial Silicon Radiation Detectors, W. L. Weiss and E. M. Whatley. Air Force Aeronaut. Research Labs. ARL 62-416, May 26, 1962, 137 pp.

Solid State Charged Particle Silicon Detectors, J. W. Hallam and R. L. Williams. Air Force Aeronaut. Research Labs. ARL 62-406, Aug. 1962, 15 pp.

An Analytical and Experimental Study Concerning an Infrared Image Converter System for Observation by Means of the Sequential Light Amplification System, F. F. Hall Jr. and R. K. Orthuber. Air Force Aeronaut. Research Labs. ARL 62-411, Aug. 1962, 170 pp.

Application of the Modularization Concept to Satellite Tape Recorders, P. T. Cole, H. J. Peake, and C. F. Rice. NASA TN D-1451, Nov. 1962, 12 pp.

National Electronics Conference, Proceedings (National Electronics Conference, Chicago, Ill., 1962), Vol. 18, 859 pp.

Application of Electron Beam Techniques for Electronics, J. W. Meier and F. R. Schollhammer, pp. 371-380.

A Rugged, Low-Noise, Solid-State Infrared Detection System, M. C. Baum, pp. 210-214.

A Calibrated Infrared Signal Generator, A. Glaser and A. Ross, pp. 228-235.

Some Electronics Problems in Infrared Systems Design, F. G. Whelan, pp. 542-548.

Optical Techniques for Target Enhancement and Background Rejection, R. S. Neiswander and C. W. Harris, pp. 549-555.

Recent Advances in Infrared Detectors for the 8.5 to 13.5 Micron Spectral Band, J. K. Lennard, pp. 816-832.

Status Report on Infrared Thermistor Detectors, I. J. Melman and I. M. Meltzer, pp. 556-567.

Rapid-Response Heat Flux Probe for High Temperature Gases, P. L. Blackshear Jr. and L. Fingerson. ARS J. 32, 1709-1715 (1962).

Atmospheric Refraction as Seen from Space, R. J. Munick. ARS J. 32, 1731-1732 (1962).

A Multiple-Probe Microwave System for Plasma Studies, F. J. Fitz Osborne. Can J. Phys. 40, 1620-1625 (1962).

Apparatus for Measuring the Compressibility of Liquids, G. P. Shakhovskoi, I. A. Lovtov, M. D. Pushkinskii, and M. G. Genikberg. Instr. Exptl. Tech., no. 1,

183-185 (Sept. 1962).

The Use of the Doppler Effect to Deduce an Accurate Position for an Artificial Earth Satellite, E. Golton. Planetary Space Sci. 9, 607-624 (1962).

Instrumental Optics and Problems of the Earth's Atmosphere, A. H. Jarrett. Planetary Space Sci. 9, 675-700 (1962).

Amplifiers with Negative Feedback Through a Twin T-Bridge Network, V. O. Kobak. Telecommunications Radio Eng. 1, no. 2, 9-15 (1962).

Analysis and Design of a Tuned Amplifier with Frequency-Dependent Feedback, E. B. Gribov. Telecommunications Radio Eng. 1, no. 2, 16-24 (1962).

Frequency Stability of Double-Tuned Parametric Oscillator, S. A. Akhmanov and Yu. Ye. D'yakov. Telecommunications Radio Eng. 1, no. 2, 25-30 (1962).

Frequency-Modulated Quartz Oscillator, A. D. Artym and V. V. Volodin. Telecommunications Radio Eng. 1, no. 2, 31-35 (1962).

Relative Change in Basic Circuit Parameters with Variation of n Parameters on Their Elements, L. Ya. Nagorayy. Telecommunications Radio Eng. 1, no. 2, 36-44 (1962).

Method for the Design of Four-Terminal Variable Equalizers, O. F. Kosminskiy. Telecommunications Radio Eng. 1, no. 2, 45-50 (1962).

Single-Section Narrowband Magnetostrictive Filters, Ya. I. Velikin, E. V. Zelyakh, and A. I. Ivanova. Telecommunications Radio Eng. 1, no. 2, 51-60 (1962).

Noise Immunity of Communications Systems Using Pulse-Position Modulation in the Presence of Strong Signals, V. I. Ayzenberg. Telecommunications Radio Eng. 1, no. 4, 1-9 (1962).

Designing Operating-Point Stabilization Circuits for Transistor Stages, G. S. Tsykin and C. Jung-Fu. Telecommunications Radio Eng. 1, no. 4, 10-19 (1962).

Experimental Investigation of the Action of Normally Distributed Noise on a Difference Detector, V. T. Goryainov and M. A. Kirillov. Telecommunications Radio Eng. 1, no. 4, 20-26 (1962).

Methods for Generating a Set of Stable Frequencies Using a Pulsed Oscillator with Initial Phase Control, V. F. Yelizev. Telecommunications Radio Eng. 1, no. 4, 27-31 (1962).

Magnetostrictive Band-Elimination Filters, Ya. I. Velikin, E. V. Zelyakh, and A. I. Ivanova. Telecommunications Radio Eng. 1, no. 4, 49-55 (1962).

Errors in the Measurement of Lag Characteristic of Communications Channels Due to Nonlinear Distortion, A. V. Knipper. Telecommunications Radio Eng. 1, no. 4, 33-37 (1962).

Atmospheric and Space Physics

On the Nature of Clear-Air Turbulent (CAT), E. R. Reiter. Aerospace Eng. 21, 39-47 (Nov. 1962).

Gravity and Antigravity, R. L. Forward. Aerospace Eng. 21, 56-57 (Nov. 1962).

Land Locomotion on the Surface of Planets, M. G. Bekker. ARS J. 32, 1651-1659 (1962).

Nuclear Power Charging of the Radiation Belts, R. P. Haviland. ARS J. 32, 1726 (1962).

Usefulness of Solar Outburst Prediction, B. W. Shore. ARS J. 32, 1737-1739 (1962).

Helium Ions in the Upper Atmosphere, D. R. Bates and T. N. L. Patterson. Planetary Space Sci. 9, 599-606 (1962).

The Internal Constitution of the Moon, Z. Kopal. Planetary Space Sci. 9, 625-638 (1962).

The Admittance of an Electric Dipole in a Magneto-Ionic Environment, T. P. Kaiser. Planetary Space Sci. 9, 639-658 (1962).

Metastable Helium Atom Concentrations in the Earth's Atmosphere, E. E. Ferguson and H. Schluter. Planetary Space Sci. 9, 701-710 (1962).

Auroral Hydrogen Emission Related to Charge Separation in the Magnetosphere, W. Stoffregen and H. Derblom. Planetary Space Sci. 9, 711-718 (1962).

A Profile of Sporadic E -Ionization, G. L. Wrenn, A. P. Willmore, and R. L. F. Boyd. Planetary Space Sci. 9, 765-766 (1962).

Multiple Creation of Nucleon Pairs by Thermal Photons in a Cosmological Model, D. A. Frank-Kamenetskii. Soviet Phys.—Doklady 7, 408-410 (1962).

The Magnetic Field of a Model Radiation Belt Numerically Computed, S. I. Akasofu, J. C. Cain, and S. Chapman. NASA TN D-1447, Nov. 1962, 18 pp.

An Investigation of the Effect of High Temperature on the Schumann-Runge Ultraviolet Absorption Continuum of Oxygen, J. S. Evans and C. J. Schexnayder Jr. NASA TR R-92, 1961, 44 pp.

Spectroscopic Temperature and Pressure Measurements in the Venus Atmosphere, H. Spinrad. Calif. Inst. Tech., Jet Propulsion Lab. TR 32-251, June 1962, 15 pp.; reprinted from Publ. Astron. Soc. Pacific 74, 187-201 (June 1962).

The Effect on the Lunar Orbit of Meteoritic Secretion, R. A. Lyttleton. Calif. Inst. Tech., Jet Propulsion Lab. TR 32-293, Sept. 1962, 7 pp.; reprinted from Icarus 1, 137-143 (1962).

Human Factors and Bioastronautics

Evaluation of Space Radiation Doses Received Within a Typical Spacecraft, A. J. Beck and E. L. Divita. ARS J. 32, 1668-1676 (1962).

Change in Human Center of Gravity Produced by Change in Direction of Acceleration, J. W. Chaffee. ARS J. 32, 1677-1680 (1962).

A Study of a Pilot's Ability to Control During Simulated Stability Augmentation System Failures, M. Sadoff. NASA TN D-1552, Nov. 1962, 36 pp.

CHANGE-OF-ADDRESS NOTICE

In the event of a change of address, it is necessary to include both your old and new addresses, as well as your membership number and coding, when notifying AIAA Headquarters, in order to insure prompt service. If you are moving or have moved, send the following form to Membership Dept., American Institute of Aeronautics and Astronautics, 2 East 64th St. New York 21, N. Y.

Name _____

Title _____

Old Address _____

New Address _____