

HEAT TRANSFER BIBLIOGRAPHY

E. R. G. ECKERT, W. E. IBELE and R. J. GOLDSTEIN

Heat Transfer Laboratory, Department of Mechanical Engineering, University of Minnesota, Minneapolis, Minnesota

APPLICATIONS

- R. T. ACHARD, Weight minimization of honeycomb heat shields, AFFDL-TR-65-66, Flight Dynamics Lab., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- E. ADAMS, Performance of heat protection at hypersonic flight speeds (in German), DLR-FB-65-48, Deutsche Versuchsanstalt für Luft- und Raumfahrt, Freiburg, W. Germany (1965).
- M. ADELBERG and S. H. SCHWARTZ, Heat transfer domains for fluids in a variable gravity field with some applications to storage of cryogenics in space, Douglas Paper 3516, Missile and Space Div., Douglas Aircraft Co., Santa Monica, Calif. (1965).
- D. L. ADKINS, Scaling of transient temperature distributions of simple bodies in a space changer, AEDC-TR-65-177, ARO, Inc., Arnold Air Station, Tenn. (1965).
- A. L. ALEXANDER, Passive thermal control in a space environment, Navel Research Lab., Organic and Biological Chemistry Branch, Washington, D.C. in its Report of NRL Progress (1965).
- L. S. ARINUSHKIN, Y. V. BELYAYEV *et al.*, Fuel-heating units for aircraft test stands, FTD-TT-65-774/1+2+4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- J. F. BARNES, J. E. NORTHWOOD and D. E. FRAY, The behavior of extruded air-cooled rotor blades subjected to steady high temperature and rotational speed, Aeronautical Research Council, Great Britain, in its *Mechanical Aspects of Turbine Blade Cooling*, p. 21 (1965).
- J. R. BARTLIT and K. D. WILLIAMSON JR., Further experimental study of H₂O-LH₂ heat exchangers, LA-DC-7148, Los Alamos Scientific Lab., Los Alamos, N. Mex. (1965).
- R. K. BEACH, Determining the optimum thickness of insulation for heated buildings, NRC-8151, Div. of Building Research, National Research Council of Canada, Ottawa (1965).
- A. E. BERGLES and H. L. MORTON, Survey and evaluation of techniques to augment convective heat transfer, TR-5382-34, Dept. of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- R. C. BIRKEBAK, C. J. CREMERS and E. A. LEFEBVRE, Thermal modeling applied to animal systems, *J. Heat Transfer* **88**, No. 1, 125 (1966).
- W. H. CARDEN, Local heat-transfer coefficients in a nozzle with high-speed laminar flow, *AIAA JI* **3**, No. 12, 2183 (1966).
- (No author). Coating selection program. Part II. Program description and user's manual, NASA CR-69430, General Electric Co., Philadelphia, Pa. (1965).
- (No author). Coating selection program. Part III. Program listing, NASA CR-69431, General Electric Co., Philadelphia, Pa. (1965).
- J. A. DIBIASE, Combined convection and radiation in radioisotope thrusters, GSP-65A/ME/65-1, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- H. DRUXES, H. J. PATT and G. SCHMITZ, The analysis of a transpiration-cooled arc, Physikalisches Institut der Technischen Hochschule, Aachen, Germany. Paper presented at 7th International Conference on Phenomena in Ionized Gases, Beograd, August (1965).
- B. J. EASTLUND, Diffusion measurement in a fully ionized cesium plasma, *Physics Fluids* **9**, No. 3, 594 (1966).
- R. E. GITHENS, W. R. MINOR and V. J. TOMSIC, Flexible-tube heat exchangers, *Chem. Engng Prog.* **61**, No. 7, 55 (1965).
- L. S. GLOVER, Approximate re-entry velocity and heating equations, *J. Spacecraft Rockets* **3**, No. 1, 156 (1966).
- J. E. GORDON, Small heater for use in thermal measurements at low temperatures, *Rev. Scient. Instrum.* **36**, No. 9, 1372 (1965).
- R. G. GRISKEY and I. A. WIEHE, Heat transfer to molten flowing polymers, *A.I.Ch.E. JI* **12**, No. 2, 308 (1966).
- R. F. HOGLUND, Study of recirculating gas flow fields in the base region of Saturn-class vehicles, NASA CR-67707, School of Aeronautical and Engineering Sciences, Purdue University, Lafayette, Ind. (1965).
- (No author) Investigation of a moving belt radiator, R-6289-1, Spacecraft Engine Div., Rocketdyne, Canoga Park, Calif. (1965).
- S. R. IYER and P. S. MURTI, Longitudinal mixing in sieve plate columns, *Indian J. Technol.* **3**, No. 3, 75 (1965).
- V. M. KAPINOS, Heat transfer of a turbine rotor with radial flow of cooling medium, FTD-TT-65-957/1+2, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- L. KAUFMAN and E. T. PETERS, Analyses of vaporization in liquid uranium bearing systems at very high temperatures, NASA CR-353, ManLabs, Inc., Cambridge, Mass (1965).
- B. KLINGEN and W. EISEN, Improvement of tube shape for

- cast convective heat exchangers (in German), *Brennst.—Wärme—Kraft* **17**, No. 9, 449 (1965).
- M. KOIZUMI and M. ICHIKAWA, Measurement of heat transfer to furnace-walls using a thermo-electric heat-flow-meter (in Japanese), *J. Japan Soc. Mech. Engrs* **68**, No. 554, 322 (1965).
- V. KUBAIR and N. R. KULLOOR, Momentum and heat transfer analogy equations for spiral tube coils, *Indian J. Technol.* **3**, No. 6, 173 (1965).
- A. A. KUDIRKA, R. J. GROSH and P. W. MCFADDEN, Heat transfer in two-phase flow of gas-liquid mixtures, *I/EC Fundamentals* **4**, No. 3, 339 (1965).
- R. KUTHE and K. K. NEUMANN, Thermodynamische Berechnungen für hochoerhitzte Luft-Kohlenstoff-Gemische unter Einbeziehung der schwarzen Strahlung, *Z. Flugwiss.* **13**, Nr. 11, 411 (1965).
- P. S. LALL and R. J. SCHOENHALS, Dynamic analysis and experimental measurements for a single fluid heat exchanger, *J. Heat Transfer* **88**, No. 1, 137 (1966).
- M. B. LARSON, Time-temperature characteristics of thin-skinned models as affected by thermocouple variables, NASA CR-68315, Engineering Experiment Station, North Dakota University, Grand Forks, N.D. (1965).
- K. MAHLER and D. STOCKBURGER, Investigations on the heat-protecting effect of a water layer on a flat roof (in German), *Kältetechnik* **18**, No. 1, 4 (1966).
- G. L. MARLOTTE and P. D. LENN, Basic research on gas flows through electric arcs. Phase III, Studies on the inlet region, ARL 65-231, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- M. A. McDERMOTT, Compact heat exchanger test, KAPL-M-6453, Knolls Atomic Power Lab., General Electric Co., Schenectady, N.Y. (1965).
- A. J. MOUNTVALA, H. H. NAKAMURA and H. L. RECHTER, Development of lightweight thermal insulation materials for rigid heat shields, NASA CR-68709; IITR1-G6002-12, IIT Research Institute, Chicago, Ill. (1965).
- J. MURPHY and M. W. RUBESIN, A re-evaluation of heat-transfer data obtained in flight tests of heat-sink shielded re-entry vehicles, *J. Spacecraft Rockets* **3**, No. 1, 53 (1966).
- H. G. MYER, J. T. OHRENBERGER and T. R. THOMPSON, Emission and absorption of radiant energy in a model planetary atmosphere, *AIAA J* **3**, No. 12, 2203 (1966).
- T. W. MYERS, C. N. MCKINNON and J. C. LYSEN, Experimental investigation of a magnetically balanced arc in a transverse argon flow, *J. Engng Pwr* **A88**, No. 1, 27 (1966).
- G. D. NORFLEET, J. J. LACEY JR. and J. D. WITFIELD, Results of an experimental investigation of the performance of an expansion tube, AEDC-TR-10, Von Kármán Gas Dynamics Facility, Arnold Engineering Development Center, Air Force Systems Command, Arnold Air Force Station, Tenn. (1966).
- R. J. NUNGE and W. N. GILL, An analytical study of laminar counterflow double-pipe heat exchangers, *A.I.Ch.E. J* **12**, No. 2, 279 (1966).
- Y. OKAMOTO, Temperature distribution and efficiency of a single sheet of radiative and convective fin accompanied by internal heat source, *Bull. J.S.M.E.* **7**, No. 28, 751 (1964).
- G. C. PINCHERA, Heat transfer by means of organic liquids, TRG-449(W), The Reactor Group, United Kingdom Atomic Energy Authority, Risley, England (1965).
- H. F. POPPENDIEK *et al.*, High acceleration field heat transfer for auxiliary space nuclear power systems, Tech. Report, Geoscience Ltd., La Jolla, Calif. (1965).
- J. E. POWERS and F. L. RIBE, Computer program for solution of the energy balance and heat transfer of a pulsed thermonuclear reactor, LA-3347-MS, Los Alamos Scientific Lab., N. Mex. (1965).
- A. W. PRATT, Fundamentals of heat transmission through the external walls of buildings, *J. Mech. Engng Sci.* **7**, No. 4, 357 (1965).
- B. K. RAY and A. M. DAS, Influence of fluid properties in heat transfer with reference to heat exchangers, *J. Instn Engrs India* **45**, No. 5, Part ME 3, 110 (1965).
- D. W. RHODES and M. E. JACOBSON, Measurement of heat generation rate of highly radioactive calcined alumina, IDO-14665, Phillips Petroleum Co., Idaho Falls, Idaho (1965).
- H. RIEDEL, Über regenerative Wärmeübertrager mit präser Speichermass, *Forschung* **31**, No. 6, 187 (1965).
- U. SASTRY, Heat transfer by laminar forced convection in multiply connected cross section, *Indian J. Pure Appl. Phys.* **3**, No. 4, 113 (1965).
- H. SCHIDL *et al.*, Dynamic study of a heat exchanger (in German), SGAE-RE-2/1965, Österreichische Studiengesellschaft für Atomenergie G.m.b.H., Seibersdorf, Austria (1965).
- G. SCHMITZ and H. J. PATT, Determination of transport properties of a plasma from arc measurements, paper presented at 26th meeting of the AGARD Propulsion and Energetics Panel on *Fundamental Studies of Ions and Plasmas*, Pisa, Italy (1965).
- A. P. SHLOSINGER and E. W. BENTILLA, Research and development study on thermal control by use of fusible materials, NASA-CR-67695, Northrop Space Labs., Hawthorne, Calif. (1965).
- H. L. SPEROW, Development, acceptance, and qualification testing of the snap 10A ejectable heat shield, NAA-SR-10997, Atomics International, Canoga Park, Calif. (1965).
- P. C. STAINBACK, Convective and equilibrium radiation heat-transfer predictions for Project Fire reentry vehicle, NASA TN D-2867 (1965).
- K. STEPHAN, The efficiency of finned tubes with imperfectly fixed fins (in German), *Kältetechnik* **18**, No. 2, 41 (1966).
- D. STRAUB, A. SCHABER and H. GIESEN, Temperature distribution and fin efficiency under the condition of variable heat transfer number (in German), *Kältetechnik* **18**, No. 2, 48 (1966).
- W. A. SUTHERLAND and W. M. KAYS, Heat transfer in parallel rod arrays, GEAP-4637, Power Equipment Dept., General Electric Co., San Jose, Calif. (1965).
- R. T. SWANN, M. B. DOW and S. S. TOMPKINS, Analysis of the effect of environmental conditions on the performance of charring ablaters, *J. Spacecraft Rockets* **3**, No. 1, 61 (1966).
- E. THORNTON and G. W. ROBERTSHAW, Thermal design of gas-fired tubular immersion heaters, *J. Inst. Fuel* **38**, No. 294, 307 (1965).
- M. I. TSAPLIN, Heat transmission through root fixings, *Thermal Engng* **12**, No. 2, 54 (1965).

- (No author), Two-phase flow and heat transfer in multi-rod geometries, GEAP-4933, Atomic Power Equipment Dept., General Electric Co., San Jose, Calif. (1965).
- T. UEDA and I. HARADA, Experiment of heat transfer on the surfaces with transverse fins for flow direction, *Bull. J.S.M.E.* 7, No. 28, 759 (1964).
- G. VAN HULST and G. L. PIETERSE, Evaluation of the heat transfer area and the steam temperature as a function of power, for a vertical steam generator, by means of a digital computer, EUR-2183.e, Reactor Centrum Nederland, The Hague (1965).
- N. E. WALDREN and J. A. FLINT, Description of an experimental high-temperature turbine and associated test rig (cooled turbine no. 126), Aeronautical Research Council, Great Britain, in its *Mechanical Aspects of Turbine Blade Cooling*, p. 1 (1965).
- J. B. WORKMAN, Insulator ablation in magnetic piston shock tubes, MIT-39-P, Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- A. E. ZENGEL, A comparison of the capabilities of a fuel coker and the minex heat exchanger for determining hydrocarbon fuel thermal stability, AFAPL-TR-64-154, AF Aero Propulsion Lab., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).

BOOKS

- C. FERRARI, Editor, *High Temperature in Aeronautics*. Pergamon Press, New York (1963).
- A. P. FRAAS and M. N. OZISIK, *Heat Exchanger Design*. John Wiley, New York (1965).
- S. S. KUTATELADZE, *Fundamentals of Heat Transfer* (translated from the Russian). Second revised and augmented edition. Academic Press, New York (1964).
- (No Author), *Recent Developments in Boundary Layer Research, Part I*. AGARDograph-97, Part I, Advisory Group for Aeronautical Research and Development, Paris, France (1965).
- (No author), *Recent Developments in Boundary Layer Research, Part II*. AGARDograph-97, Part II, Advisory Group for Aeronautical Research and Development, Paris, France (1965).
- D. H. SAMPSON, *Radiative Contributions to Energy and Momentum Transport in a Gas*. Interscience Tracts on Physics and Astronomy, No. 26, Interscience Publishers, New York (1965).
- A. SCHACK, *Industrial Heat Transfer—Practical and Theoretical with Basic Numerical Examples* (translated from the sixth German edition by I. Gutman). John Wiley, New York (1965).
- L. S. TONG, *Boiling Heat Transfer and Two-phase Flow*. John Wiley, New York (1965).
- P. O. BARONTI and P. A. LIBBY, Velocity profiles in turbulent compressible boundary layers, *AIAA JI* 4, No. 2, 193 (1966).
- J. BITO, Studies of the increase of heat transfer coefficients on glass surfaces (in Hungarian), *Mag. Tudom. Akad. műsz. Tudom. Gsztl. Közl.* 35, 1/4, 129 (1965).
- L. BOURÉLY, Problems in ablation, SUDAER-233, Dept. of Aeronautics and Astronautics, Stanford University, Stanford, Calif. (1965).
- D. M. BUSHNELL, Interference heating on a swept cylinder in region of intersection with a wedge at Mach number 8, NASA TN D-3094 (1965).
- L. E. CLARK and A. G. MCLAIN, Performance of five ablation materials as coatings for structures in a region of separated flow, NASA TN D-3093 (1965).
- L. O. CROPP, Analytical methods used in predicting the re-entry ablation of spherical and cylindrical bodies, SC-RR-65-187, Sandia Corp., Albuquerque, N. Mex. (1965).
- D. M. CURRY, An analysis of a charring ablation thermal protection system, NASA TN D-3150 (1965).
- (No author), Experimental study at $M = 7$ of the boundary layer influence of a flat plate on the transfer of heat to the surface of a cylinder incident to that plate (in French), NT-2/7648-AY; ONERA-510.521, Inst. de Mécanique des Fluides de Marseilles, Aix-Marseilles Univ., France (1965).
- S. J. FENSTER, Stagnation-point heat transfer for a new binary air model including dissociation and ionization, *AIAA JI* 3, No. 12, 2189 (1966).
- H. FOX and P. A. LIBBY, Dissociated laminar boundary layers with heterogeneous recombination, *Physics Fluids* 9, No. 1, 33 (1966).
- R. GARDON and J. CAHIT AKFIRAT, Heat transfer characteristics of impinging two-dimensional air jets, *J. Heat Transfer* 88, No. 1, 101 (1966).
- A. A. GLADKOV, Effect of relaxation entropy layer, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- W. D. HARVEY, Effects of leading-edge bluntness on pressure and heat-transfer measurements over a flat plate at a Mach number of 20, NASA TN D-2846 (1965).
- J. D. HENDRY, Boundary-layer transition correlation for sharp slender cones, *J. Spacecraft Rockets* 3, No. 3, 426 (1966).
- E. HILGEROTH, Wärmeübergang bei Düsenströmung senkrecht zur Austauschfläche, *Chemie-Ing.-Tech.* 37, No. 12, 1264 (1965).
- M. HONKE, Phenomenons in the boundary layers during the hot pressing of cylindrical metal bodies (in German), *Z. Ver. Dt. Ing.* 108, No. 5, 184 (1966).
- I. KIMURA and A. KANZAWA, Experimental study of heat transfer to wires in partially ionized atmospheric Argon, *J. Fac. Engng Tokyo Univ. Series A*, No. 2, 22 (1964).
- P. S. KIRK and T. Y. LI, A survey of asymptotic series solutions to the boundary layer equations, ARL 65-244, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- V. V. LUNEV and A. N. RUMYNSKIY, Interaction of the boundary layer with an external flow caused by radiative heat transfer, FTD-TT-65-958/1 + 2, Foreign Technology Div., Air Force Systems Command, Wright-

BOUNDARY LAYER

- M. A. ANFIMOV, Presentation of dissociated air as a binary mixture of gases during solution of problems of boundary layer, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).

- Patterson AFB, Ohio (1965).
- R. E. LUXTON, Transition in the compressible boundary layer—review and consideration of the effects of roughness and heat transfer, *Mech. Chem. Engng Trans., Aust. MC1*, No. 1, 23 (1965).
- P. A. LIBBY and T. M. LIU, Laminar boundary layers with surface catalyzed reactions, *Physics Fluids* **9**, No. 3, 436 (1966).
- V. A. MAKSIMOV, On steady-state ablation shapes of solids around which a two-dimensional ideal fluid flows, Lockheed Missiles and Space Co., Sunnyvale, Calif. (1965).
- G. L. MELLOR, The effects of pressure gradients on turbulent flow near a smooth wall, *J. Fluid Mech.* **24**, Part 2, 255 (1966).
- G. L. MELLOR and D. M. GIBSON, Equilibrium turbulent boundary layers, *J. Fluid Mech.* **24**, Part 2, 225 (1966).
- R. MICHEL and N. DUC-LAM, Turbulent skin friction and heat transfer in two- and three-dimensional flows, ONERA-TP-151, Royal Aircraft Establishment, Farnborough, England (1965).
- R. MICHEL and P. MENTRÉ, Some results of thermal characteristics of turbulent boundary layers at high temperature (in French), Office Nationale d'Etudes et de Recherches Aeronautiques, Chatillon-Sous-Bagneux, France, (1965).
- E. M. MOURADIAN and J. E. SUNDERLAND, The velocity and temperature distributions in a liquid film, *Appl. Scient. Res.* **A14**, No. 6, 431 (1964–65).
- L. M. PAVLOV and Y. D. SHMYGLEVSKIY, Boundary layer in radiating gas, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- N. RILEY, Unsteady heat transfer in compressible boundary layers, *Proc. Camb. Phil. Soc. Math. phys. Sci.* **61**, No. 2, 555 (1965).
- V. A. SANDBORN, C. Y. LIU and M. C. TAO, Measurements in a thermal boundary layer, Fluid Dynamics and Diffusion Lab., Colorado State University, Ft. Collins (1965).
- P. K. SASMAN and R. J. CRESCI, Compressible turbulent boundary layer with pressure gradient and heat transfer, *AIAA JI 4*, No. 1, 19 (1966).
- J. A. SHUPEK, Investigation of the change of shape of an ablating hemisphere, *AIAA JI 3*, No. 2, 56 (1965).
- A. H. P. SKELLAND, Momentum, heat, and mass transfer in turbulent non-Newtonian boundary layers, *A.I.Ch.E. JI 12*, No. 1, 69 (1966).
- I. TEIPEL, Similarity solutions in unsteady boundary layer theory in magneto-fluid dynamics (in German), DVL-Bericht Nr. 405, Deutsche Versuchsanstalt für Luft- und Raumfahrt E.V., 505 Porz-Wahn, Linder Höhe, West Germany (1966).
- C. TIEN and Y. C. YEN, The effect of melting on forced convection heat transfer, *J. Appl. Met.* **4**, No. 4, 523 (1965).
- L. TING, On the initial conditions for boundary layer equations, ARL 65-208, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- W. TOLLE, The heat exchange on the flat plate with parallel and counter-flow (in German), *Kältetechnik* **18**, No. 2, 55 (1966).
- J. VALENSI, R. MICHEL and D. GUFFROY, Experimental and theoretical results on heat transfer at the leading edge of hypersonic sweptback wings, NASA-TT-F-9871, National Aeronautics and Space Administration, Washington, D.C. (1966).
- R. J. VIDAL and F. STODDARD, Measurements of non-equilibrium effects in air on wedge-flat-plate afterbody pressures, NASA-CR-32, Cornell Aeronautical Lab., Inc., Buffalo, N.Y. (1965).
- A. WALZ, Contribution on approximation theory of compressible laminar boundary layers with heat transfer (in German), DVL-281a, Institut für Angewandte Mathematik und Mechanik, Deutsche Versuchsanstalt für Luft- und Raumfahrt, Freiburg, W. Germany (1965).
- F. L. YOUNG, Experimental investigation of the effects of surface roughness on compressible turbulent boundary layer skin friction and heat transfer, DRL-532, Defense Research Lab., Texas University, Austin (1965).

CHANGE OF PHASE

- G. B. ANDEEN, The momentum flux in two-phase flow, Tech. Rept. No. 4547-38, Div. of Sponsored Research, Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- V. S. ARPACI, J. A. CLARK and P. S. LARSEN, The dynamics of gas-vapor bubbles in binary systems, *Proc. R. Soc., London A283*, No. 1392, 50 (1965).
- K. J. BAUMEISTER and T. D. HAMILL, Creeping flow solution of the Leidenfrost phenomenon, NASA TN D-3133 (1965).
- E. J. BECK, Thin-film evaporation in a single tube, Tech. Rept. R410, U.S. Naval Civil Engineering Lab., Port Hueneme, Calif. (1965).
- E. J. BECK, Thin-film evaporation in vapor-compression stills, R-364, Naval Civil Engineering Lab., Port Hueneme, Calif. (1965).
- A. W. BENNETT, G. F. HEWITT, H. A. KEARSEY and R. K. F. KEEYS, Measurements of burnout heat flux in uniformly heated round tubes at 1000 p.s.i.a., AERE-R5055, Chemical Engineering Div., Atomic Energy Research Establishment, Harwell, Berkshire, England (1965).
- A. W. BENNETT, G. F. HEWITT, H. A. KEARSEY and R. K. F. KEEYS, Experiments on burnout in a uniformly heated round tube at 1000 p.s.i.a. with steam-water mixtures at the tube inlet, AERE-R 5072, Chemical Engineering Div., Atomic Energy Research Establishment, Harwell, Berkshire, England (1965).
- F. BIANCONI, A. CAMPANILE, G. GALIMI and M. GOFFI, Forced convection burnout and hydrodynamic instability experiments for water at high pressure. Part I, Presentation of data for round tubes with uniform and non-uniform power distributions, EUR-2490.e, Sezione Energia Nucleare, Fiat S.p.A., Turin, Italy (1965).
- G. B. BIJWAARD, F. W. STAUB and N. ZUBER, A program of two-phase flow investigation, GEAP-4959, Atomic Power Equipment Dept., General Electric Co., San Jose, Calif. (1965).
- W. BORNHORST and A. SHAVIT, Bubble formation and growth. Study of the boundary conditions at a liquid-vapor interface through irreversible thermodynamics,

- NASA CR-69547, Dept. of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- C. S. BOYD, An investigation of boiling water in a porous material as a means of separating liquid and vapor in zero gravity, GAM-65A/ME/65-1, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- L. A. BROMLEY, R. F. HUMPHREYS and W. MURRAY, Condensation on an evaporation from radially grooved rotating disks, *J. Heat Transfer* **88**, No. 1, 80 (1966).
- E. BURCK and W. HUFSCHEIDT, Measurement of the critical heat-flux-density of subcooled water in tubes at forced flow (in German), EUR-2432.d, European Atomic Energy Commission, Brussels, Belgium (1965).
- J. W. H. CHI, Forced convective boiling heat transfer to hydrogen, *J. Spacecraft Rockets* **3**, No. 1, 150 (1966).
- R. W. COUGHLIN and R. L. VON BERG, Mass and heat transfer to drops in a mixer-settler, *Chem. Engng Sci.* **21**, No. 1, 3 (1966).
- S. FABREGA, Hydrodynamic instabilities which limit the power of boiling water reactors (in French), Rept. No. 909, Centre d'Etudes Nucleaires de Grenoble du CEA—Commissariat a l'Energie Atomique, France (1965).
- V. FILATKIN, Investigation of heat transfer during melting of ice under free flow conditions, NASA-TT-F-9739, NASA, Washington, D.C. (1965).
- C. R. FISHER, J. H. MOSKOWITZ and L. T. CLARK, Alkali metals evaluation program: Swirl flow boiling of alkali metals heat transfer and pressure drop, AGN-8127, Aerojet-General Nucleonics, San Ramon, Calif. (1965).
- T. H. K. FREDERKING and D. J. DANIELS, The relation between bubble diameter and frequency of removal from a sphere during film boiling, *J. Heat Transfer* **88**, No. 1, 87 (1966).
- G. C. GARDNER, Asymptotic concentration distribution of and involatile solute in an evaporating drop, *Int. J. Heat Mass Transfer* **8**, No. 4, 667 (1965).
- R. T. GODDARD, Observed supersaturation in the ARL 20-inch hypersonic wind tunnel, ARL 65-214, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- I. D. R. GRANT and T. D. PATTEN, Thickness of the thermal layer at the initiation of nucleate pool boiling, Paper #16, Symposium on Boiling Heat Transfer in Steam-Generating Units and Heat Exchangers, Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London (1965).
- O. A. GUTIERREZ, N. J. SEKAS, L. W. ACKER and D. B. FENN, Potassium condensing tests of horizontal multitude convective and radiative condensers operating at vapor temperatures of 1250° to 1500°F, NASA TM X-52148, Lewis Research Center, NASA, Cleveland, Ohio (1965).
- D. HENKEL, F. MAYINGER, O. SCHAD and E. WEISS, Research into the critical heat flux (burnout) in boiling water (in German), Rept. 09.02.07, Maschinenfabrik Augsburg-Nurnberg A.G., Nuremberg, West Germany (1965).
- G. F. HEWITT, P. M. C. LACEY and B. NICHOLLS, Transitions in Film Flow in a Vertical Tube, AERE-R 4614, Chemical Engineering Div., Atomic Energy Research Establishment, Harwell, Berkshire, England (1965).
- J. F. HOELSCHER, Study of heat transfer from a heated cylinder in two-phase water-air flow, GAM-65A/ME65-5, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- K. C. JAIN, Self-sustained hydrodynamic oscillations in a natural-circulation two-phase-flow boiling loop, ANL-7073, Argonne National Lab., Argonne, Ill. (1965).
- S. JARVIS JR., Stability of two-phase annular flow in a vertical pipe, NBS-TN-314, National Bureau of Standards, Boulder, Colo. (1965).
- F. A. JEGLIC and K. T. YANG, The incipience of flow oscillations in forced-flow subcooled boiling, NASA TM X-52081, Lewis Research Center, Cleveland, Ohio (1965).
- E. N. KAPITONOV and K. I. LEBEDEV, Investigation of hydraulic resistance and heat transfer during the movement of boiling solutions in a horizontal tube, *Int. Chem. Engng* **6**, No. 1, 41 (1966).
- H. KERKENRATH and P. MOERK-MOERKENSTEIN, Survey on problems in the field of nucleate boiling and film boiling, NASA TT-F-9809; EUR-211.D, National Aeronautics and Space Administration, Washington, D.C. (1965).
- K. K. KNAPP and R. H. SABERSKY, Free convection heat transfer to carbon dioxide near the critical point, *Int. J. Heat Transfer* **9**, No. 1, 41 (1966).
- I. A. KOMAROV, Heat transfer accompanying vapor condensation from a gas-vapor mixture, *Int. Chem. Engng* **6**, No. 1, 1 (1966).
- H. KUSUDA and K. NISHIKAWA, Boiling heat transfer in the liquid film, *Technology Rep. Fac. Engng Kyushu imp. Univ.* **37**, No. 3, 241 (1964).
- S. S. KUTATELADZE, A. I. LEONT'EV and A. G. KIRDYASHKIN, A contribution to the nucleate-boiling heat transfer theory (in Russian), *Inzh.-Fiz. Zh.* **8**, No. 1, 7 (1965).
- C. LACKME, Statistical analysis of the local structure of two-phase flow. Part II, Change of configuration and distribution with the occurrence of bubbles, ANL-TRANS-172, Argonne National Lab., Argonne, Ill. (1965).
- J. H. LIENHARD and K. WATANABE, On correlating the peak and minimum boiling heat fluxes with pressure and heater configuration, *J. Heat Transfer* **88**, No. 1, 94 (1966).
- J. MADEJSKI, The effect of molecular-kinetic resistances on heat transfer in condensation, *Int. J. Heat Mass Transfer* **9**, No. 1, 35 (1966).
- J. S. MAULBETSCH and P. GRIFFITH, A study of system-induced instabilities in forced-convection flows with subcooled boiling, TR-5382-35, Department of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- A. F. MILLS, The condensation of steam at low pressure, Space Sciences Lab., California University, Berkeley, Calif. (1965).
- A. C. MONTEFINALE and H. M. PAPEE, Nucleation of ice by some porous particles, *Z. Angew. Math. Phys.* **16**, No. 6, 740 (1965).
- R. MORIN, Schwankungen der Wandtemperatur beim Sieden an einem Heizrohr, *Chemie-Ing.-Tech.* **38**, No. 1, 73 (1966).
- M. M. NAZARCHUK, The flow of gas in channels in the presence of heat transfer, NASA TT-F-262, National

- Aeronautics and Space Administration, Washington, D.C. (1965).
- C. R. NICHOLS, J. M. SPURLOCK and M. MARKELS JR., Effects of electrical fields in boiling heat transfer, NYO-2404-70, Atlantic Research Corp., Alexandria, Va. (1965).
- J. R. O'LOUGHLIN, Evaporation from a draining liquid film, *J. Heat Transfer* **88**, No. 1, 77 (1966).
- S. S. PAPELL and O. C. FABER JR., Zero- and reduced-gravity simulation on a magnetic-colloid pool-boiling system, NASA TN D-3288 (1966).
- E. E. POLOMIK, Phase velocities in boiling flow systems by total energy and by diffusion, *J. Heat Transfer* **88**, No. 1, 10 (1966).
- B. I. REZNIKOV, The fusion of a metal body in the vicinity of critical point, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- G. R. RIPPEL, C. M. EIDT JR. and H. B. JORDAN JR., Two-phase flow in a coiled tube. Pressure drop, holdup, and liquid phase axial mixing, *I/EC Process Des. Dev.* **5**, No. 1, 32 (1966).
- D. E. RUNGE and G. B. WALLIS, Two-phase flow and boiling heat transfer. The rise velocity of cylindrical bubbles in inclined tubes, NYO-3114-8, Thayer School of Engineering, Dartmouth College, Hanover, N.H. (1965).
- C. C. ST. PIERRE, Frequency-response analysis of steam voids to sinusoidal power modulation in a thin-walled boiling water coolant channel, ANL-7041, Argonne National Lab., 9700 South Cass Avenue, Argonne, Ill. (1965).
- R. SEMERIA and B. MARTINET, Calefaction spots on a heating wall: temperature distribution and resorption, Paper #3, Symposium on Boiling Heat Transfer in Steam-Generating Units and Heat Exchangers, Institution of Mechanical Engineers, 1 Birdcage Walk, Westminster, London (1965).
- L. S. SHTOKOLOV, An attempt to generalize data on critical thermal flows for boiling liquids in region of high flow velocities, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- S. SIDEMAN and Y. GAT, Direct contact heat transfer with change of phase: spray-column studies of a three-phase heat exchanger, *A.I.Ch.E. J.* **12**, No. 2, 296 (1966).
- R. SIEGEL and J. R. HOWELL, Critical heat flux for saturated pool boiling from horizontal and vertical wires in reduced gravity, NASA TN D-3123 (1965).
- K. R. SIVIER, Digital computer studies of condensation in expanding one-component flows, ARL 65-234, Aerospace Research Labs., Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- T. N. SMITH and R. W. F. TAIT, Interfacial shear stress and momentum transfer in horizontal gas-liquid flow, *Chem. Engng Sci.* **21**, No. 1, 63 (1966).
- E. M. SPARROW, J. W. YANG and C. J. SCOTT, Free convection in an air-water vapor boundary layer, *Int. J. Heat Mass Transfer* **9**, No. 1, 53 (1966).
- K. STEPHAN, Übertragung hoher Wärmestromdichten an siedende Flüssigkeiten, *Chemie-Ingr-Tech.* **38**, No. 2, 112 (1966).
- L. S. STERMAN and V. D. MIKHAILOV, Determination of critical heat flows during the boiling of a high-boiling heat transfer agent in pipes, RSIC-485, Redstone Scientific Information Center, Army Missile Command, Huntsville, Ala. (1965).
- G. F. STEVENS, D. F. ELLIOTT and R. W. WOOD, An experimental comparison between forced convection burn-out in Freon 12 flowing vertically upwards through uniformly and non-uniformly heated round tubes, AEEW-R-426, Reactor Group, Atomic Energy Establishment, Winfrith, England (1965).
- M. A. STYRIKOVICH, E. P. SEROV, O. K. SMIRNOV and P. K. SARMA, Study of the characteristics of heat and mass transfer by the salt method, *Soviet Phys. Dokl.* **9**, No. 7, 541 (1965).
- K. SUBBARAYA and N. R. KULLOOR, Studies on evaporation in still air, *Indian J. Technol.* **3**, No. 8, 235 (1965).
- (No author) Two-phase flow and heat transfer in multirod geometries, GEAP-4863, Atomic Power Equipment Dept., General Electric Co. (1965).
- W. R. WILCOX and R. L. DUTY, Macroscopic interface shape during solidification, *J. Heat Transfer* **88**, No. 1, 45 (1966).
- N. V. ZOZULYA, Study method and physics of heat exchange during vapor condensation, NASA TT-F-369, National Aeronautics and Space Administration, Washington, D.C. (1966).

CHANNEL FLOW

- S. ACKI, T. TAKAHASHI and H. SHIMAZU, Turbulent heat transfer in a pipe with arbitrary heat flux, *Bull. Tokyo Inst. Technol.* **61**, 1 (1964).
- A. J. CORNELIUS and J. D. PARKER, Heat transfer instabilities near the thermodynamic critical point, *Proc. 1956 Heat Transfer and Fluid Mechanics Institute*, Los Angeles, Stanford University Press, Stanford, Calif. (1965).
- V. KUBAIR and N. R. KULLOOR, Heat transfer to Newtonian fluids in steam-heated helical coils in double helical streamline motion, transition and turbulent flows, *Indian J. Technol.* **3**, No. 5, 147 (1965).
- K. M. KRALL and E. M. SPARROW, Turbulent heat transfer in the separated, reattached, and redevelopment regions of a circular tube, *J. Heat Transfer* **88**, No. 1, 131 (1966).
- V. KUBAIR and N. R. KULLOOR, Heat transfer to Newtonian fluids in coiled pipes in laminar flow, *Int. J. Heat Mass Transfer* **9**, No. 1, 63 (1966).
- V. KUBAIR and N. R. KULLOOR, Momentum and heat transfer analogy equations for helical coils, *Indian J. Technol.* **3**, No. 1, 1 (1965).
- R. KUMAR, Heat transfer in laminar flow of Bingham material through a circular pipe, *Appl. Scient. Res.* **A15**, No. 2, 87 (1965).
- R. G. LUCE, G. M. GREGOREK and J. D. LEE, The laminar boundary layer in axisymmetric hypersonic nozzles with wall cooling, ARL-65-112, Ohio State University, Columbus, Ohio (1965).
- W. E. MERCER, Convection and radiation heat transfer in the entrance region between parallel plates, GSP-65A/ME/65-2, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- M. M. NAZARCHUK, The flow of gas in channels in the presence of heat transfer, NASA TT-262, National

- Aeronautics and Space Administration, Washington, D.C. (1965).
- B. PAULI, Calculation of the transfer behavior of tubes with stream flow with special consideration of the actual entrance behavior (in German), *Brennst.—Wärme—Kraft* 17, No. 8, 492 (1965).
- A. F. PRESLER, An experimental investigation of heat transfer to turbulent flow in smooth tubes for the reacting $N_2O_4-NO_2$ system, NASA TN D-3230 (1965).
- R. I. ROTHENBERG and J. M. SMITH, Heat transfer and reaction in laminar tube flow, *A.I.Ch.E. JI* 12, No. 2, 213 (1966).
- J. R. STONE, Local turbulent heat transfer for water in entrance regions of tubes with various unheated starting lengths, NASA TN D-3098 (1965).
- V. P. TYAGI, Forced convection of a dissipative liquid in a channel with Neumann conditions, *J. Appl. Mech.* E33, No. 1, 18 (1966).
- P. WELANDER, Steady and oscillatory motions of a differentially heated fluid loop, Rept. 65-48, Woods Hole Oceanographic Institution, Woods Hole, Mass. (1965).
- ### CONDUCTION
- W. C. ALLEN, Research on thermal transfer phenomena, NASA CR-68094, National Beryllia Corp., Haskell, N.J. (1965).
- B. ARLINGER, Calculation of temperature in an infinite wedge with given heat flux through its bounding surfaces, SAAB TN-59, SAAB Aircraft Co., Linköping, Sweden (1965).
- (No author) Basic studies on thermoelectric materials, QR-14, Research Labs., Westinghouse Electric Corp., Pittsburgh, Pa. (1965).
- B. BELLOW, Description of an IBM 7090 program for the calculation of transient temperature distribution in an anisotropic nonhomogeneous shell of revolution with arbitrary heat flux at one boundary for a perfect gas, TR-287, Suppl. 1, General Applied Science Labs., Inc., Westbury, N.Y. (1965).
- H. A. BLUM, Heat transfer across surfaces in contact: Practical effects of transient temperature and pressure environments, NASA CR-69696, Southern Methodist University, Dallas, Texas (1965).
- L. R. BRAGG, On associated radial heat expansions, NASA CR-69347; Rept. 217, Dept. of Mathematics, Case Institute of Technology, Cleveland, Ohio (1965).
- L. R. BRAGG, The radial heat equation and Laplace transforms, NASA CR-337, Case Institute of Technology, Cleveland, Ohio (1965).
- O. BUTURI, An approximation solution to the inverse problem of heat conduction, Japan Information Center of Science and Technology, Itibantyo 15, Tiyoda-ku, Tokyo (1964).
- J. L. EVANS, A feasibility study on the use of powders as heat transfer media in irradiation capsules, TRG-920 (D/X), International Research and Development Co., Ltd., Newcastle, England (1965).
- V. M. GEMBARA, Heat-conduction equations for plates and shells of varying thickness, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- M. HAYAKAWA, Application of Legendre functions with non-integer indices to problems of conduction of heat: Parts I and II, *Bull. Tokyo Inst. Technol.*, No. 62, 1 (1965).
- L. A. KOZDOBA and B. I. MAKHNENKO, Temperature field of a body bounded by conical surfaces affected by an instantaneous annular heat source (in Russian), *Inzh.-Fiz. Zh.* 8, No. 1, 82 (1965).
- L. S. KREMENCHUGSKIY and V. S. LYSENKO *et al.*, Determination of thickness, heat capacity, and thermal conductivity of miniature thin films, FTD-TT-65-619/1 + 2 + 4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- N. N. LEBEDEV and I. P. SKAL'SKAYA, Heat conduction in wedge-shaped bodies, Part II, *Soviet Phys. Tech. Phys.* 9, No. 9, 1207 (1965).
- V. S. MILLER, Determining the thermal contact resistance between metal-ceramic surfaces, RSIC-401, Army Missile Command, Huntsville, Ala. (1965).
- D. B. MITCHELL, An error analysis of numerical solutions of the transient heat conduction equation, GA/PH/65-10, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- C. MUSTACCHI and S. GIULIANI, Thermal and mechanical studies of solid-solid contacts, EUR-2486.e, European Atomic Energy Community, Brussels, Belgium (1965).
- N. I. NAZAROV, Concerning the question of application of variational method to problems of nonstationary thermal conductivity, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- M. J. PASCUAL, J. E. ZWEIG and S. D. BECK, Temperature field in a slab containing an insulating filament, Watervliet Arsenal, Watervliet, N.Y. (1965).
- G. I. PAVLOVSKIY, Determination of temperature field in steam turbine during start-up, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- P. D. RICHARDSON and W. W. SMITH, Use of a transcendental approximation in transient conduction analysis, NASA CR-68536, Brown University, Providence, R.I. (1965).
- M. M. SIDLYAR, On integration of heat-conduction equation in case of change in time of coefficient of heat emission, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- Y. TAKENAKA, K. EGAWA and K. OGAWA, Thermal insulation characteristics of FRP coating (in Japanese), NAL-TR-81; UDC-536.21, National Aerospace Lab., Tokyo, Japan (1965).
- E. V. TOLUBINSKII, An integral method for solving the general problem of transfer of heat and matter, *Soviet Phys. Dokl.* 10, No. 2, 120 (1965).
- S. Y. YAREMA, Fundamental solution for approximate equations of the stationary problem of the thermal conductivity of mildly sloping diaphragms, FTD-TT-65-1140/1 + 4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- Y. C. YEN, Heat transfer characteristics of naturally compacted snow, CRREL-RR-166, Army Cold Regions Research and Engineering Lab., Hanover, N.H. (1965).

FLOW WITH SEPARATED REGIONS

- J. J. GINOUX, Effect of Mach number of streamwise vortices in laminar reattaching flows, VKI-TN-26, Von Kármán Institute for Fluid Dynamics, Rhode Saint-Genese, Belgium (1965).
- P. F. HOLLOWAY, J. R. STERETT and HELEN S. CREEKMORE, An investigation of heat transfer within regions of separated flow at a Mach number of 6.0, NASA TN D-3074 (1965).
- H. H. KING and M. R. DENISON, Turbulent mixing in the base-flow region, EOS-RN-24, Electro-Optical Systems, Inc., Pasadena, Calif. (1965).
- J. ROM, Near wake flow studies in supersonic flow, TAE-38, Dept. of Aeronautical Engineering, Israel Institute of Technology, Haifa (1965).
- T. SUBOUCHI and Y. OTA, Experimental study of the heat transfer between single pin and air by forced convection, *Trans. Japan Soc. Mech. Engrs* **30**, No. 219, 1402 (1964).
- W. A. SUTHERLAND and W. M. KAYS, Heat transfer in parallel rod arrays, *J. Heat Transfer* **88**, No. 1, 117 (1966).

HEAT AND MASS TRANSFER

- E. ADAMS, Näherungslösungen mit Fehlerabschätzung für stationäre Grenzschichten mit beliebigen Verteilungen von Druck und Massenübergang an der Wand, *Z. Flugwiss.* **14**, No. 1, 19 (1966).
- N. A. ANFIMOV and V. V. AL'TOV, Heat transfer, friction, and mass transfer in a laminar multicomponent boundary layer with injection of a foreign gas, *Int. Chem. Engng* **6**, No. 1, 137 (1966).
- T. J. BLACK and A. J. SARNECKI, The turbulent boundary layer with suction or injection, ARC-R & M-3387, Aeronautical Research Council, Great Britain (1965).
- (No author) Cooling of high heat loaded surfaces by a coolant forced through the pores of the material, LF-3; FB-1470, Ministry of Supply, London, England (declassified 1965).
- L. E. ERICKSON, L. T. FAN and V. G. FOX, Heat and mass transfer on moving continuous flat plate with suction or injection, *I/EC Fundamentals* **5**, No. 1, 19 (1966).
- D. E. FRAY and J. F. BARNES, The cooling performance of a set of extruded air-cooled turbine blades, Part I, Aeronautical Research Council, Great Britain (1965).
- M. M. GURFINK, Strong blowing in the turbulent boundary layer, Lockheed Missiles and Space Co., Sunnyvale, Calif. (1965).
- M. HAHN, Pressure distribution and mass injection effects in the transitional separated flow over a spiked body at supersonic speed, *J. Fluid Mech.* **24**, Part 2, 209 (1966).
- G. R. INGER, Transient shear flows from a suddenly changed blowing current, SSD-TR-66-1, Laboratory Operations, Aerospace Corporation, El Segundo, Calif. (1965).
- P. S. KIRK, A simplified analysis of vectorial injection in hypersonic flow, ARL-65-50, Cincinnati University, Cincinnati, Ohio (1965).
- C. S. LIU, J. P. HARTNETT and H. A. SIMON, Mass transfer cooling in laminar boundary layers with hydrogen injected into nitrogen and carbon dioxide streams,

NASA CR-69443, Delaware University, Newark, Dela. (1965).

- H. LOHE, Zum Wärme- und Stoffaustausch beim senkrechten Aufblasen von Gasstrahlen auf Flüssigkeitsoberflächen, *Chemie-Ingr-Tech.* **38**, No. 3, 309 (1966).
- J. LOS and C. J. G. SLIEKER, Thermal diffusion in isotropic hydrogen and hydrogen-helium mixtures. I. Theoretical approach, *Physica's Grav.* **31**, No. 8, 1346 (1965).
- I. S. MAKAROV and B. G. KHUDENKO, Mixing of intersecting turbulent jets, ATD-T-65-48, Aerospace Technology Div., Library of Congress, Washington, D.C. (1965).
- R. N. MERONEY, The effect of mass injection on heat transfer from a partially dissociated gas stream, Ph.D. Thesis, Department of Engineering, California University, Berkeley, Calif. (1965).
- J. D. NOVOTNY, Y. TAITEL and J. P. HARTNETT, Equilibrium temperatures of mass transfer cooled walls in high-speed flows of an absorbing-emitting gas, NASA CR-69437, Delaware University, Newark, Delaware (1965).
- R. M. OLSON and E. R. G. ECKERT, Experimental studies of turbulent flow in a porous circular tube with uniform fluid injection through the tube wall, *J. Appl. Mech.* **E33**, No. 1, 7 (1966).
- B. I. REZNIKOV and G. A. TIRSKIY, Generalized analogy between the mass-transfer coefficients in a multicomponent boundary layer with an arbitrary pressure gradient, FTD-TT-65-543/1 + 4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- Y. L. ROZENSHTOK, Application of methods based on boundary layer theory to the problem of combined heat and mass transfer, *Int. Chem. Engng* **6**, No. 1, 105 (1966).
- D. RUES, Concerning the equivalence between heat-force- and mass-sources, RAE-LIB-TRANS 1119, Royal Aircraft Establishment, Farnborough, England (1965).
- J. E. SCOTT JR., Mixing and combustion of a supersonic fuel jet and a subsonic, coaxial gas stream, UVA-7-P, Dept. of Aeronautical Engineering, Virginia University, Charlottesville, Va. (1965).
- G. T. SERGEYEV and L. A. SERGEYEVA, Experimental study of heat and mass transfer during transpiration cooling of differently shaped bodies, FTD-TT-65-785/1 + 2 + 4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- P. SETO, W. F. FURTER and A. I. JOHNSON, Reaction accompanied mass transfer between liquid phases, *Can. J. chem. Engng* **43**, No. 6, 292 (1965).
- E. M. SPARROW, Thermodynamic coupling in combined heat and mass transfer in a two-component boundary layer, *Mech. Chem. Engng Trans., Aust.* MC1, No. 1, 35 (1965).
- E. D. TAYLOR, The mass transfer of single, solid uranium spheres to flowing molten cadmium in laminar and turbulent flow, ANL-7091, Argonne National Lab., 9700 South Cass Avenue, Argonne, Ill. (1965).
- W. H. THIELBAHR, Transpiration cooling with liquid metals. Part II. Theoretical determination of optimum cooling parameters near stagnation regions, NOTS-TP-3791; NAVWEPS-8732, Pt. II, Naval Ordnance Test Station, China Lake, Calif. (1965).

- D. G. THOMAS, Forced convection mass transfer. Part III, Increased mass transfer from a flat plate caused by the wake from cylinders located near the edge of the boundary layer, *A.I.Ch.E. JI* **12**, No. 1, 124 (1966).
- W. WUEST, Turbulent boundary layers with blowing out of cold and warm air through perforated and slotted walls (in German), DLR-FB-65-13; AVA-FB-65-03, Aerodynamische Versuchsanstalt, Göttingen, West Germany (1965).
- H. YAMAOKA and J. J. CORNISH, A comparison of the theoretical determination of the development of the boundary layer momentum thickness in an arbitrary pressure gradient with full-scale flight experiments on a porous airfoil section with transpiration, Res. Rept. 59, Mississippi State Univ., State College, Miss. (1965).

LIQUID METALS

- J. A. ALBERS and D. NAMKOONG JR., An experimental study of the condensing characteristics of mercury vapor flowing in single tubes, NASA TM X-5215, Lewis Research Center, NASA, Cleveland, Ohio (1965).
- R. A. AXFORD, Multiregion thermal analysis of tube bundles with molten reactor fuel in free convection, LA-3168, Los Alamos Scientific Lab., Los Alamos, N.M. (1965).
- B. F. CASWELL, A. PADILIA JR., H. MERTE JR., R. E. BARRY and R. L. GAHMAN, Investigation of liquid metal boiling heat transfer, Rept. 05750-23-P, Liquid Metals Lab., Michigan University, Ann Arbor, Mich. (1965).
- K. S. CHANG, R. G. AKINS and S. G. BANKOFF, Free convection of liquid metal from uniformly heated vertical plate, *I/EC Fundamentals* **5**, No. 1, 26 (1966).
- G. L. CONVERSE and F. E. TIPPETS, Alkali metals boiling and condensing investigations, NASA-CR-54739, Space Power and Propulsion Section, General Electric Co., Cincinnati, Ohio (1965).
- C. R. FISHER *et al.*, High-temperature liquid-metal technology review: A bi-monthly technical progress review, BNL-939(PR-15), Brookhaven National Lab., Upton, N.Y. (1965).
- U. GRIGULL and H. TRATZ, Hydrodynamisches Verhalten von Quecksilber bei laminarer und turbulenter Rohrströmung, *Chemie-Ingr.-Tech.* **37**, No. 11, 1102 (1965).
- R. E. HOLTZ, A liquid-metal heat-transfer experiment, ANL-7038, Argonne National Lab., Argonne, Ill. (1965).
- V. I. KUTOVOI and V. I. STETSENKO, Checking the temperature of liquid metals by means of the radioisotope method, *Measmt. Tech.*, *Pittsb.* **8**, 720 (1966).
- L. I. SLOBODYANYUK and V. A. OMELYUK, Cooling the moving blades of gas turbines with a liquid-metal heat-transfer agent, FTD-TT-65-1370/1 + 2 + 4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- S. P. SUKHATME and W. M. ROHSENOW, Heat transfer during film condensation of a liquid-metal vapor, *J. Heat Transfer* **88**, No. 1, 19 (1966).
- W. S. YU and O. E. DWYER, Heat transfer to liquid metals flowing turbulently in eccentric annuli, Part I, *Nucl. Sci. Engng* **24**, No. 2, 105 (1966).

LOW DENSITY

- F. O. GOODMAN and H. Y. WACHMAN, Formula for thermal accommodation coefficient, Fluid Dynamics Research Lab., Report No. 66-1, Massachusetts Institute of Technology, Cambridge, Mass. (1966).
- J. J. HINCHEM and W. M. FOLEY, Scattering of thermal energy gas beams by metallic surfaces, D910245-7, Research Labs., United Aircraft Corp., East Hartford, Conn. (1965).
- L. LEES, Kinetic theory description of rarefied gas flow, *J. Soc. Ind. Appl. Math.* **13**, No. 1, 278 (1965).
- D. MALEGUE, Study of the temperature distribution between two coaxial cylinders in a rarefied atmosphere at rest and flowing (in French), Rept. 65-7, Laboratoire d'aerothermique, Centre National de La Recherche Scientifique, Meudon, France (1965).
- H. L. ROGLER, Heat transfer, normal stress, and shear stress for a free-molecular gas impinging on several wall models, GAM-65A/AE/65-3, School of Engineering, Air Force Inst. of Tech., Wright-Patterson AFB, Ohio (1965).
- R. SCHAMBERG, On concave bodies in free molecule flow, flow, P-3164, RAND Corp., Santa Monica, Calif. (1965).
- C. H. WEISER, Research in gas-surface interaction. Part III, Surface contamination, NASA CR-67155, Research Dept., Grumman Aircraft Engineering Corp., Bethpage, N.Y. (1965).
- D. ROGER WILLIS, The effect of the molecular model on rarefied gas flows, RM-4638-PR, RAND Corp., Santa Monica, Calif. (1965).
- G. R. WILLIS, Heat-transfer and shear between coaxial cylinders for large Knudsen numbers, AS-65-7, Institute of Engineering Research, California University, Berkeley, Calif. (1965).

MAGNETOHYDRODYNAMICS

- V. F. ALEKSEIN and K. N. STEPANOV, Space correlation of fluctuating electromagnetic fields in plasma, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio, in its *Plasma Physics and Problems of Controlled Thermonuclear Fusion*, No. 3, 76 (1965).
- (No author) Arcjet technology research development, NASA CR-54687, Research and Advanced Development Div., AVCO Corp., Wilmington, Mass. (1965).
- L. A. ARTSIMOVICH, Some problems of the physics of high-temperature plasma, Joint Publications Research Service, Washington, D.C. (1965).
- V. B. BARANOV, Temperature boundary layer of a flat plate in anisotropic magnetohydrodynamics (translated from Russian), TFD-TT-65-924/1, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- L. R. BOEDEKER, J. B. COFFIN JR., E. E. COVERT and C. W. HALDEMAN, Studies on electromagnetic means of adding heat and kinetic energy to a gas, ARL-65-121, Aerophysics Lab., Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- B. T. EUBANK and J. R. JOHNSON, Radial heat transfer from a plasma stream, Dept. of Mechanical Engineering,

- Texas A & M University, College Station, Texas (1965).
- J. A. FAY, Problems in $J \times B$ plasma acceleration, NASA CR-69659, Fluid Mechanics Lab., Massachusetts Institute of Technology, Cambridge, Mass. (1966).
- U. P. HWANG, W. TRIPP, C. L. HWANG and L. T. FAN, The effects of electrical conductance of wall on magneto-hydrodynamic channel flow with heat transfer, AFOSR-65-1312, Kansas Engineering Experiment Station, Kansas State University, Manhattan (1965).
- W. C. MOFFATT, Approximate solutions for skin friction and heat transfer in MHD channel flows, MIT-TR-36-P, Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- R. L. MOORE, A general theory of stability of the motion of a fluid with heat transport and arbitrary force fields, Paper No. 3406, Aircraft Division, Douglas Aircraft Co., Inc., Long Beach, Calif. (1965).
- J. C. MORRIS, R. U. KREY and R. W. LIEBERMANN, Research on radiation from arc heated plasma, ARL-65-164, Research and Advanced Development Div., AVCO Corp., Wilmington, Mass. (1965).
- E. PFENDER, K. T. SHIH, S. WUTZKE and E. R. G. ECKERT, Thermal analysis of anode and cathode regimes in an electric arc column, NASA CR-54746, Heat Transfer Lab., University of Minnesota, Minneapolis, Minn. (1965).
- J. F. SCHMIDT, Effects of a magnetic field on the conduction heat transfer at the stagnation point of a partially ionized argon gas. NASA TN D-3251 (1966).
- P. W. SCHREIBER, Radiation from an alternating current nitrogen arc, ARL-65-105, Aerospace Research Labs., Wright-Patterson AFB, Ohio (1965).
- M. SHERMAN and S. OSTRACH, The thermal stability of completely confined fluids including magneto-hydrodynamic effects, FTAS-TR-65-1, Engineering Div., Case Institute of Technology, Cleveland, Ohio (1965).
- C. W. TAN and K. SUH, Forced convection heat transfer in fully developed laminar flow of a hydromagnetic fluid, RE-201, Research Dept., Grumman Aircraft Engineering Corp., Bethpage, N.Y. (1965).
- I. L. TRAIGER, Shape factor calculations for transparent emitter in cylindrical geometries, TR-16, Engineering Sciences Lab., Harvard University, Cambridge, Mass (1965).
- ### MEASUREMENT TECHNIQUES
- W. ALVERMANN, Determination of temperature profiles (in German). DLR-FB-65-38, Deutsche Forschungsanstalt für Luft- und Raumfahrt, Brunswick, W. Germany (1965).
- W. ALVERMANN and P. STOTTMANN, Temperature measurements with thermocouples in combustion gases, NASA TT F-9537, National Aeronautics and Space Administration, Washington, D.C. (1965).
- O. P. ASTAKHOV and V. V. LOBANKOV, Method for measuring the thermoelectric characteristics of semiconductors in solid and liquid phases at high temperatures, *Measmt. Tech., Pittsb.* **9**, 820 (1966).
- C. A. BARTH, Ultraviolet spectroscopy of planets, Tech. Rept. No. 32-822, Jet Propulsion Lab., California Institute of Technology, Pasadena, Calif. (1965).
- J. M. BEER, N. A. CHIGIER, G. KOOPMANS and K. B. LEE, Measuring instruments for the study of flames at Ijmuiden. Doc. nr. F 72/a/9, International Flame Research Foundation, Ijmuiden, Netherlands (1965).
- B. J. BELHOUSE and D. L. SCHULTZ, The measurement of skin friction in supersonic flow by means of heated thin film gauges, Rept. 1002, Department of Engineering Science, Oxford University, Oxford, England (1965).
- B. K. BRAGIN and N. G. PUPYSHEVA, Errors in individual calibrations of chromel-copel thermocouples, *Measmt. Tech., Pittsb.* **9**, 818 (1966).
- F. R. CALDWELL, Temperatures of thermocouple reference junctions in an ice bath, *J. Res. Natn. Bur. Stand., Engng Instrum.* **69C**, No. 2, 95 (1965).
- V. A. CALLCUT, Ageing of chromel-alumel thermocouples, TRG-1021(R/X), British Non-Ferrous Metals Research Association, London, England (1965).
- E. H. CARNEVALE, L. C. LYNNWORTH and S. L. KLAIDMAN, Ultrasonic temperature measuring device, NASA CR-54780, Parametrics, Inc., Waltham, Mass. (1965).
- M. B. DAS and M. A. HOSSAIN, Transient methods of measuring thermal properties of solids, *Br. J. Appl. Phys.* **17**, No. 1, 87 (1966).
- R. K. DAY, Thermal conductivity of high conductivity materials. Part I, Measurement, *Bull. Am. Ceram. Soc.* **44**, No. 8, 608 (1965).
- R. V. DELEO and A. E. SAARI, Study to determine suitable high temperature, high altitude and total temperature sensors, NASA CR-68875; REC-116528, Rosemount Engineering Co., Minneapolis, Minn. (1965).
- K. ELGETI and E. R. G. ECKERT, Mikromanometer hoher Empfindlichkeit, *Chemie-Ingr-Tech.* **37**, No. 11, 1133 (1965).
- L. A. EPSHTEYN, Method of measuring the viscosity of fluids, FTD-TT-65-199/1 + 2 + 4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- K. J. EULER, Messung der wahren Temperatur in der oprischen Pyrometrie, *Chemie-Ingr-Tech.* **38**, No. 2, 154 (1966).
- J. C. FLEMMING, An evaluation of a high-temperature blackbody as a working standard of spectral radiance, *Appl. Optics* **5**, No. 2, 195 (1966).
- W. FRITZ and K. H. BODE, Zur Bestimmung der Wärmeleitfähigkeit fester Stoffe, *Chemie-Ingr-Tech.* **37**, No. 11, 1118 (1965).
- B. GEBHART and C. P. KNOWLES, Design and adjustment of a 20-cm Mach-Zehnder interferometer, *Rev. Scient. Instrum.* **37**, No. 1, 12 (1966).
- A. N. GORDOV, Peculiarities of the measurements of temperature under conditions of alternating heat emissions, FTD-TT-64-1076/1, Air Force Systems Command, Wright-Patterson AFB, Ohio, Foreign Technology Div. (1965).
- A. N. GORDOV, Application of the heat-exchange theory to the investigation of conditions for obtaining temperature reference points, *Measmt. Tech., Pittsb.* No. 7, 623 (1966).
- M. GRIGGS and F. C. HARSHBARGER, Measurements of temperature profiles at the exit of small rockets, *Appl. Optics* **5**, No. 2, 211 (1966).

- B. F. HALL JR. and N. F. SPOONER, Study of high-temperature thermocouples, AFCRL-65-251, Hoskins Manufacturing Co., Detroit, Mich. (1965).
- G. A. HORNBECK, Optical methods of temperature measurement, *Appl. Optics* 5, No. 2, 179 (1966).
- B. KRAKOW, Spectroscopic temperature profile measurements in inhomogenous hot gases, *Appl. Optics* 5, No. 2, 201 (1966).
- G. B. LAPP and D. I. POPOVA, Thermoelectric stability of thermocouples made of high-melting metals or their alloys, *Measmt. Tech., Pittsb.*, No. 9, 816 (1966).
- R. V. MEYER, A spectral radiometer for re-entry measurements, *Appl. Optics* 5, No. 1, 159 (1966).
- Y. MINEMATU, Microtemperature difference measuring technique by thermistor bridge and its application for vapor pressure osmometry (in English), *Railway Tech. Res. Inst. Quart. Rep. Tokyo* 6, No. 1, 1 (1965).
- A. NAYSMITH, Measurement of aerodynamic heat transfer in intermittent wind-tunnels, Curr. Paper No. 780, Aeronautical Research Council, London, England (1965).
- P. G. NIKITIN and Y. N. SITNIKOV, Pyrometer for contactless measurement of temperature on the surface of a traction motor rotor when an electric locomotive is moving, NASA, Washington, D.C. in its *Autom. Control and Methods of Elec. Measmt.*, No. 2, 223 (1965).
- V. A. OGALE, Temperature measurements at high temperatures and high speeds—a literature survey, Rept. 10.m.003, voor Verbrandingsmotoren en Gasturbines, Technische Hogeschool, Delf, Netherlands (1965).
- V. PAK, Thermoelectric methods of measuring temperature incorporating a memory device, NASA, Washington, D.C. in its *Autom. Control and Methods of Elec. Measmt.*, No. 2, 205 (1965).
- L. PREUSS and E. B. BAS, Analogie-Widerstandsnetzwerk zur Messung rotationssymmetrischer Potentialfelder, *Z. Angew. Math. Phys.* 17, No. 1, 168 (1966).
- I. RECHENBERG, The measurement of turbulent wall shear stress, ARA-LIB-TRANS-11, Aircraft Research Assn., Ltd., Bedford, England (1965).
- P. R. RONY, Design, construction and operation of a differential micromanometer Part II, Theory and operational characteristics, UCRL-11218, Pt. II, Lawrence Radiation Lab., California University, Berkeley, Calif. (1965).
- H. B. SMITS, Die Untersuchung des gleichzeitigen Stoff- und Wärmeüberganges mit einer schlierenoptischen Methode, *Chemie-Ingr.-Tech.* 38, No. 3, 314 (1966).
- J. M. TONGE, An optical system using Moire patterns to obtain quantitative data in a boundary layer, GAM-65B/ME/65-9, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- (No author) Transient measurement of thermal diffusivity of refractory materials at high temperature, Institute for Direct Energy Conversion, Pennsylvania University, Philadelphia in its *Res. in Mater. Plasma and Electrochem. Engng* (1965).
- M. VAN DEN BERG and H. E. SCHMIDT, Apparatus for the measurement of diffusivity at high temperatures (in French), EUR-2424.f, European Atomic Energy Community, Brussels, Belgium (1965).
- B. E. WALKER, C. T. EWING and R. R. MILLER, A study of the instability of noble metal thermocouples in vacuum, NRL-6236, Naval Research Lab., Washington, D.C. (1965).
- Y. V. ZARUBIN, Method of determining the speed of a gas flow, FTD-TT-65-197/1+2+4, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- G. E. ZINSMEISTER and J. R. DIXON, Thermal flowmeters: The effect of axial conduction, *J. Heat Transfer* 88, No. 1, 64 (1966).

NATURAL CONVECTION

- P. BAKKE and S. J. LEACH, Turbulent diffusion of a buoyant layer at a wall, *Appl. Scient. Res.* A15, No. 2, 97 (1965).
- H. Z. BARAKAT and J. A. CLARK, Transient natural convection flows in closed containers, NASA CR-64965, Department of Mechanical Engineering, Michigan University, Ann Arbor (1965).
- A. BHATTACHARYYA, Mixed convection heat transfer on the outside of a vertical cylinder, Rept. AE-199, Aktiebolaget Atomenergi, Stockholm, Sweden (1965).
- H. BÖRNER, Über den Wärme- und Stoffübergang an umspulten Einzelkörpern bei Überlagerung von freier und erzwungener Strömung, *Forschung* 31, No. 6, 200 (1965).
- A. R. BROWN and M. A. THOMAS, Combined free and forced convection heat transfer for laminar flow in horizontal tubes, *J. Mech. Engng Sci.* 7, No. 4, 440 (1965).
- C. K. BROWN and W. H. GAUVIN, Combined free-and-forced convection. Part I, Heat transfer in aiding flow, *Can. J. Chem. Engng* 43, No. 6, 306 (1965).
- C. K. BROWN and W. H. GAUVIN, Combined free-and-forced convection. Part II, Heat transfer in opposing flow, *Can. J. Chem. Engng* 43, No. 6, 313 (1965).
- P. COLAK-ANTIĆ, Dreidimensionale Instabilitätserscheinungen des laminar-turbulenten Umschlages bei freier Konvektion langs einer vertikalen geheizten Platte, DVL-Bericht Nr. 400, Deutsche Versuchsanstalt für Luft- und Raumfahrt E.V., 505 Porz-Wahn, Linder Höhe, West Germany (1966).
- P. COLAK-ANTIĆ, Hitzdrahtmessungen des laminar-turbulenten Umschlages bei freier Konvektion, DVL-Bericht Nr. 462, Deutsche Versuchsanstalt für Luft- und Raumfahrt E.V., 505 Porz-Wahn, Linder Höhe, West Germany (1966).
- J. W. DEARDORFF, A numerical study of pseudo three-dimensional parallel-plate convection, *J. Atmos. Sci.* 22, No. 4, 419 (1965).
- A. P. DOREY, Heat transfer at low temperatures, *Cryogenics* 5, No. 3, 146 (1965).
- J. D. DYER, Laminar natural convection from a horizontal cylinder with a uniform convective heat flux, *Mech. Chem. Engng Trans., Aust. MCI*, No. 1, 125 (1965).
- R. I. ERB, Interferometer study of natural convection inside a horizontal cylindrical cavity, GAM-65A/ME/65-3, School of Engineering, Air Force Institute of Technology, Wright-Patterson AFB, Ohio (1965).
- W. N. GOLL, E. DEL CASAL and D. W. ZEH, Free and forced convection in conduits with asymmetric mass transfer, *A.I.Ch.E.Jl* 12, No. 2, 266 (1966).

- M. IQBAL and J. W. STACHIEWICZ, Influence of tube orientation on combined free and forced laminar convection heat transfer, *J. Heat Transfer* **88**, No. 1, 109 (1966).
- K. C. JAIN, Self-sustained hydrodynamic oscillations in a natural-circulation two-phase-flow boiling loop, ANL-7073, Argonne National Lab., 9700 South Cass Avenue, Argonne, Ill. (1965).
- G. N. KHLEBUTIN and G. F. SHAIUROV, Heat convection in a vertical annular tube (in Russian), *Inzh.-Fiz. Zh.* **8**, No. 1, 3 (1965).
- A. I. LEONT'EV and A. G. KIDRYASHKIN, Heat transfer during free convection in horizontal layers and in a large volume above a horizontal surface, *Int. Chem. Engng* **6**, No. 1, 126 (1966).
- I. MICHIOYOSHI, Heat transfer from an inclined thin flat plate by natural convection, *Bull. J.S.M.E.* **7**, No. 28, 745 (1964).
- Y. MORI and K. FUTAGAMI, Experimental study of the effect of buoyancy, *Trans. Japan Soc. mech. Engrs* **30**, No. 219, 1378 (1964).
- R. I. NORONHO, Free convective cooling of cabinets containing heat dissipating components, *Proc. Instn Mech. Engrs* **179**, Part 1, 13 (1964/65).
- J. H. ROBBINS and A. C. ROGERS JR., An analysis on predicting stratification in liquid hydrogen, *J. Spacecraft Rockets* **3**, No. 1, 40 (1966).
- K. A. SMITH, On convective instability induced by surface-tension gradients, *J. Fluid Mech.* **24**, Part 2, 401 (1966).

PACKED AND FLUIDIZED BEDS

- V. G. AINSHTEIN and N. I. GEL'PERIN, Heat transfer between a fluidized bed and a surface, *Int. Chem. Engng* **6**, No. 1, 67 (1966).
- L. S. AMARYAN, E. T. BAZIN and N. V. CHURAEV, Moisture transfer in porous bodies under strain (in Russian with English abstracts), *J. Engng Physics* **8**, No. 5, 639 (1965).
- S. BRETZNAJDER and D. ZIOLKOWSKI, The effective thermal conductivity of granular beds, *Int. Chem. Engng* **6**, No. 1, 85 (1966).
- J. P. CHIOU and M. M. EL-WAKIL, Heat transfer and flow characteristics of porous matrices with radiation as a heat source, *J. Heat Transfer* **88**, No. 1, 69 (1966).
- A. ENGLBERGER, Die innere Temperatur- und Feuchtigkeitsverteilung bei der Konvektions- und Kontakttrocknung eines kapillarporösen Körpers, *Chemie-Ingr-Tech.* **37**, No. 12, 1235 (1965).
- I. I. GEL'PERIN and A. M. KAGAN, Heat removal from gases in packed tubes at low temperatures, *Int. Chem. Engng* **6**, No. 1, 99 (1966).
- N. I. GEL'PERIN, P. D. LEBEDEV, G. N. NAPAL'KOV and V. G. AINSHTEIN, Heat and mass transfer in a fluidized bed and other disperse systems, *Int. Chem. Engng* **6**, No. 1, 4 (1966).
- H. GLASER, Mischung warmer und kalter Gasströme in Schüttungen, *Chemie-Ingr-Tech.* **37**, No. 11, 1095 (1965).
- B. M. GRAKHOVSKII and V. D. SEMENENKO, Particle density distribution in a fluidized bed according to the residence time (in Russian), *Inzh.-Fiz. Zh.* **7**, No. 7, 20 (1964).
- O. KRISCHER and E. MOSBERGER, Wärme- und Stoffaustausch zwischen Partikel und Luft bei Wirbelschichten und durchströmten Haufwerken, Teil II, *Chemie-Ingr-Tech.* **37**, No. 12, 1253 (1965).
- E. U. SCHLÜNDER, Wärme- und Stoffübertragung zwischen durchströmten Kugelschüttungen und festen Oberflächen von Einzelkörpern und Kanälen, *Chemie-Ingr-Tech.* **38**, No. 3, 320 (1966).
- H. P. SEIDEL, Untersuchungen zum Wärmetransport in Füllkörpersäulen, *Chemie-Ingr-Tech.* **37**, No. 11, 1125 (1965).
- E. J. WILSON and C. J. GEANKOPOLIS, Liquid mass transfer at very low Reynolds numbers in packed beds, *I/EC Fundamentals* **5**, No. 1, 9 (1966).
- T. TSUBOUCHI and H. MASUDA, Heat transfer between single particles and various fluids in relative forced convection, Rep. Inst. High Sp. Mech., Tohoku University, Japan (1964-65).
- T. TSUBOUCHI, S. SATŌ and H. MASUDA, Effect of Prandtl number on the natural convection heat transfer of small particles, *Trans. Japan Soc. Mech. Engrs* **30**, No. 219, 1386 (1964).

RADIATION

- M. M. ABU-ROMIA, Infrared radiation of carbon monoxide at high temperatures, NASA CR-68504, Institute of Engineering Research, California University, Berkeley, Calif. (1965).
- H. E. BAND and L. C. BLOCK, Spectral reflectance and Albedo measurements of the earth from high altitudes, Project 8662, Optical Physics Lab., Air Force Cambridge Research Labs., L. G. Hanscom Field, Bedford, Mass. (1965).
- D. D. BIEN, Configuration factors for thermal radiation from isothermal inner walls of cones and cylinders, *J. Spacecraft Rockets* **3**, No. 1, 155 (1966).
- J. R. BRANSTETTER and R. D. SCHAALE, Thermal emittance behavior of small cavities located on refractory metal surfaces, NASA TM X-52147, NASA Lewis Research Center, Cleveland, Ohio (1965).
- J. D. BUCKMASTER, Radiative heat transfer and conduction between parallel walls, CAL-AF-1285-A-15, Cornell Aeronautical Lab., Inc., Buffalo, N.Y. (1965).
- P. CHENG, Dynamics of a radiating gas with application to flow over a wavy wall, *AIAA Jl* **4**, No. 2, 238 (1966).
- B. J. CONRATH, A survey of the methods developed for the inversion of the radiative transfer problem for planetary atmospheres, NASA TN D-2940 (1965).
- J. A. CURCIO and D. V. ESTES BUTTREY, Transmission of infrared radiation from flames by CO₂, *Appl. Optics* **5**, No. 2, 231 (1966).
- H. B. CURTIS, Measurement of emittance and absorptance of selected materials between 280° to 600°K, *J. Spacecraft Rockets* **3**, No. 3, 383 (1966).
- R. H. EDWARDS and R. P. BOBKO, Radiant heat transfer from isothermal dispersions with isotropic scattering, Rept. No. 3, Aerospace Technology Lab., Hughes Aircraft Co., El Segundo, Calif. (1965).

- W. P. ELLIOTT and D. W. STEVENS, Long-wave radiation exchange near the ground, *Sol. Energy* **10**, No. 1, 5 (1966).
- L. A. GLENN and S. DESOTO, An analog method for the solution of unsteady radiant heat-transfer problems with combined conduction and convection, *J. Spacecraft Rockets* **3**, No. 2, 224 (1966).
- H. C. HALLER, B. G. LINDOW and B. M. AUER, Analysis of low-temperature direct-condensing vapor-chamber fin and conducting fin radiators, NASA TN D-3103 (1965).
- J. B. HEANEY, A comparison of two emittance measurement techniques, NASA TM-X-55294; X-713-65-354, Goddard Space Flight Center, NASA, Greenbelt, Md. (1965).
- R. G. HERING, Radiative heat exchange between conducting plates with specular reflection, *J. Heat Transfer* **88**, No. 1, 29 (1966).
- (No author) Investigation of a moving belt radiator, Spacecraft Engine Div., Rocketdyne, Canoga Park, Calif. (1965).
- M. C. JISCHKE, Radiation coupled wedge flow using method of integral relations, MIT-AL-TR-122; AFOSR-65-1727, Aerophysics Lab., Massachusetts Institute of Technology, Cambridge, Mass. (1965).
- L. G. LESAGE, Application of the double spherical harmonics method to the one-dimensional radiation-transfer equation, NASA TN D-2589 (1965).
- T. J. LOVE and H. M. HSIA, Radiative heat transfer between parallel plates separated by a non-isothermal medium with anisotropic scattering, ARL 65-211, Office of Aerospace Research, United States Air Force, Wright-Patterson AFB, Ohio (1965).
- C. B. LUDWIG, C. C. FERRISO, W. AMLKUMS and F. P. BOYNTON, High-temperature spectra of the pure rotational band of H_2O , *J. quantve Spectros. & radiat. Transf.* **5**, No. 5, 697 (1965).
- G. I. MARCHUK and U. M. SULTANGAZIN, Convergence of a decoupling method for the radiation transfer equation, *Soviet Phys. Dokl.* **10**, No. 3, 197 (1965).
- C. C. MASSER, Radiant heating of a seeded gas in a coaxial-flow gaseous reactor, NASA TN D-3197 (1966).
- R. V. MILLER and S. A. GOLDEN, Radiative properties of gases. Vol. I, General Discussions, R-6272, Rocketdyne, Canoga Park, Calif. (1965).
- F. K. MOORE, Effect of radiative transfer on a sound wave traveling in a gas having near one, *Physics Fluids* **9**, No. 1, 70 (1966).
- J. PASTRNAK, Thermal source of stimulated radiation, *Czech. J. Phys.* **B15**, No. 6, 379 (1965).
- J. C. RICHMOND, D. P. DEWITT and W. D. HAYES JR., Procedure for precise determination of thermal radiation properties, DO-33(616)61-02, National Bureau of Standards, Washington, D.C. (1965).
- Y. B. SAFDARI, Radiation heating through transparent and opaque walls, *Sol. Energy* **10**, No. 1, 53 (1966).
- R. E. SAMUELSON, Radiative transfer in a cloudy atmosphere, NASA TR R-215 (1965).
- A. F. SAROFIM and H. C. HOTTEL, Radiative exchange among non-Lambert surfaces, *J. Heat Transfer* **88**, No. 1, 37 (1966).
- P. J. SHEEHAN and T. S. LASZLO, Solar reflectance measurements, *Sol. Energy* **10**, No. 1, 15 (1966).
- D. R. SKINNER and J. TREGELLAS-WILLIAMS, Total energy and energy distribution in a laser crystal due to optical pumping, as calculated by the Monte Carlo method, *Aust. J. Physics* **19**, No. 1, 1 (1966).
- F. J. SMITH and R. L. OLSON, Emissivity coatings for low-temperature space radiators, NASA-CR-54807, Aerospace Sciences Lab., Lockheed Missiles and Space Co., Sunnyvale, Calif. (1965).
- I. N. SOKOLOVA, Temperature of a plate in a supersonic flow with radiation taken into account, FTD-MT-64-307, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- C. L. TIEN and L. S. WANG, Band absorption laws, gas body geometries and the mean beam length, Proceedings, 1965 Heat Transfer and Fluid Mechanics Institute, Los Angeles, Calif. Stanford University Press, Stanford, Calif. (1965).
- N. I. TIKHONOV and Y. I. DANILOV, Question of research on spalling resistance under conditions of varying heat emission, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- D. F. WINTER, Transient radiative cooling of a semi-infinite solid with parallel-walled cavities, D 1-82-0449, Geo-Astrophysics Lab., Boeing Scientific Research Labs., Seattle, Wash. (1965).
- E. P. ZIMIN, Heat exchange during the flow of liquid in a flat pipe in the presence of a weak radiation from external surfaces, Foreign Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).

ROTATING SURFACES

- W. H. H. BANKS, The thermal laminar boundary layer on a rotating sphere, *Z. Angew. Math. Phys.* **16**, No. 6, 780 (1965).
- M. BOWDEN and H. F. EDEN, Thermal convection in a rotating fluid annulus: temperature, heat flow and flow field observations in the upper symmetric regime, *J. Atmos. Sci.* **22**, No. 2, 185 (1965).
- W. P. BROWN JR., Temperature distribution in a spinning spherical shell in the solar flux. Uniformly valid perturbation expansion for a thin shell, NASA CR-233, Hughes Aircraft Co., Malibu, Calif. (1965).
- J. C. Y. KOH and J. F. PRICE, Non-similar boundary layer heat transfer of a rotating cone in forced flow, D1-92-0433 Mathematics Research Labs., Boeing Scientific Research Labs., Seattle, Wash. (1965).
- R. KUMAR, Heat transfer in steady rotary flow of Bingham material between two co-axial cylinders, *J. Franklin Inst.* **281**, No. 2, 136 (1966).
- D. E. METZGER and J. W. MITCHELL, Heat transfer from a shrouded rotating disk with film cooling, *J. Heat Transfer* **88**, No. 1, 140 (1966).
- E. J. ROSHKE and T. J. PIVROTTO, Similarity in confined vortex flows, NASA CR-67210; JPL-TR-32-789, Jet Propulsion Lab., California Institute of Technology, Pasadena, Calif. (1965).
- J. A. WALOWIT, The stability of Couette flow between rotating cylinders in the presence of a radial temperature gradient, *A.I.Ch.E. Jl* **12**, No. 1, 104 (1966).

THERMODYNAMIC AND TRANSPORT PROPERTIES

- P. Y. ACHENER, The determination of the latent heat of vaporization and vapor pressure of potassium from 1000 to 1900°F, AGN-8141, Aerojet-General Nucleonics, San Ramon, Calif. (1965).
- P. ADAMS, High temperature, equilibrium thermodynamic properties of chemically reacting mixture of N₂, O₂, CO₂, and Ne, SSD-50065R, Space Systems Div., Hughes Aircraft Co., El Segundo, Calif. (1965).
- L. T. CARMICHAEL, H. H. REAMER and B. H. SAGE, Thermal conductivity of fluids. Methane, *J. Chem. Engng Data* **11**, No. 1, 52 (1966).
- E. H. CARNEVALE, C. A. CAREY and G. S. LARSON, Experimental determination of the transport properties of gases, AFML-TR-65-141, Air Force Materials Lab., Research and Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- H. H. COE, Summary of thermophysical properties of potassium, NASA TN D-3120 (1965).
- D. J. COLLINS and W. A. MENARD, Measurement of the thermal conductivity of noble gases in the temperature range 1500 to 5000 deg Kelvin, *J. Heat Transfer* **88**, No. 1, 52 (1966).
- O. A. FARMER, Thermodynamic-transport and related properties of para-hydrogen from 36 to 5000°R at pressure to 5000 psia, LA-3405-MS, Los Alamos Scientific Lab., N. Mex. (1965).
- J. M. FOSTER, C. B. SMITH and R. I. VACHON, On predicting thermal conductivity of a binary mixture of solids, *J. Spacecraft Rockets* **3**, No. 2, 287 (1966).
- H. W. GODBEE and W. T. ZIEGLER, Thermal conductivities of MgO, Al₂O₃, and ZrO₂ powders to 850°C. II. Theoretical, *J. Appl. Physics* **37**, No. 1, 56 (1966).
- C. M. GOLDSTEIN, Monte Carlo method for the calculation of transport properties in a low-density ionized gas, NASA NT D-2959 (1965).
- R. W. HAYWOOD, Sixth international conference on the properties of steam—supplement on transport properties, *J. Engng Pwr* **88**, No. 1, 63 (1966).
- J. HERTZ and D. KNOWLES, Survey of thermal properties of selected materials, ZZL-65-008, General Dynamics/Convair, San Diego, Calif. (1965).
- L. H. JORGENSEN, Charts of isentropic exponent as a function of enthalpy for various gases in equilibrium, NASA SP-3020, Ames Research Center, NASA, Moffett Field, Calif. (1965).
- C. K. JUN and M. HOCH, Thermal conductivity of tantalum, tungsten, and tantalum-tungsten alloys, Tech. Rept. AFML-TR-75-191, Air Force Materials Lab., Research and Technology Div., Air Force Systems Command, Wright-Patterson AFB, Ohio (1965).
- S. K. KIM, G. P. FLYNN and J. ROSS, Thermal conductivity of moderately dense gases, BRN-15-P, Brown University, Providence, R.I. (1965).
- Y. T. MAZURENKO, A new method for investigating thermal diffusion in gases, *Soviet Phys. Dokl.* **10**, 3, 244 (1965).
- L. P. MEZHOV-DEGLIN, Measurement of the thermal conductivity of crystalline He⁴, *Soviet Phys. JETP* **22**, No. 1, 47 (1966).
- V. PACHAIYAPPAN, S. H. IBRAHIM and N. R. KULLOOR, Thermal conductivities of organic liquids—a new correlation, *J. Chem. Engng Data* **11**, No. 1, 73 (1966).
- I. I. SHERIF, The thermal conductivity of hydrogen between 90° and 280°K, *Appl. Scient. Res.* **A14**, No. 5, 353 (1964–65).
- C. J. G. SLIEKER, Thermal diffusion in isotopic hydrogen and hydrogen-helium mixtures—II. Experimental measurements, *Physica, 's Grav.* **31**, No. 9, 1388 (1965).
- P. SOMMELET and R. L. ORR, High-temperature thermal properties of germanium, *J. Chem. Engng Data* **11**, No. 1, 64 (1966).
- V. F. VYSHENSKAYA and N. D. KOSOV, Temperature dependence of the diffusion coefficient of gases, ORNL-TR-506, Oak Ridge National Lab., Tenn. (1965).

TRANSFER MECHANISMS

- H. ASAWO, K. FUTAGAMI and O. SUMIDA, Effect of entrance screen on turbulent heat transfer, *Bull. Fac. Engng* **12**, No. 2, 141, Hiroshima University, Japan (1964).
- M. N. BAHADORI and S. L. SOO, Non-equilibrium transport phenomena of partially ionized argon, *Int. J. Heat Mass Transfer* **9**, No. 1, 17 (1966).
- A. BHATTACHARYYA, Heat transfer analogies, Rept. AE-201, Aktebolaget Atomenergi, Stockholm, Sweden (1965).
- G. F. CRUM and T. J. HANRATTY, Dissipation of a sheet of heated air in a turbulent flow, *Appl. Scient. Res.* **A15**, No. 3, 177 (1965).
- W. R. DEBLER, On the analogy between thermal and rotational hydrodynamic stability, *J. Fluid Mech.* **24**, Part 1, 165 (1966).
- M. R. EL-SADEN, Theory of nonequilibrium thermodynamics with application to the transport processes in a solid, *J. Heat Transfer* **88**, No. 1, 57 (1966).
- H. FIEDLER and R. WILLE, Wärmetransport in Fluiden mit Volumen-Wärmequellen, *Z. Flugwiss.* **14**, No. 1, 30 (1966).
- A. I. GULYAEV, Vortex tubes and the vortex effect (Ranque effect), *Soviet Phys. Tech. Phys.* **10**, No. 10, 1441 (1966).
- C. J. KING, Turbulent liquid phase mass transfer at free gas-liquid interface, *I/EC Fundamentals* **5**, No. 1, 1 (1966).
- S. LIN, A law of similarity for heat conduction including a phase change (in German), *Kältetechnik* **18**, No. 2, 52 (1966).
- A. V. LUIKOV, The use of irreversible thermodynamics in the study of heat and mass transfer (in Russian), *Engng-Phys. J.* **9**, No. 3, 287 (1965).
- K. MURAKAWA and M. UMEKI, Heat transfer when thermal radiation, forced convection and heat conduction coexist at the same time, Japan Information Center of Science and Technology, Itibantō 15, Tiyoda-ku, Tokyo (1964).
- A. W. PETERSEN and E. B. CHRISTIANSEN, Heat transfer to non-Newtonian fluids in transitional and turbulent flow, *A.I.Ch.E. JI* **12**, No. 2, 221 (1966).
- M. A. RAO, A survey study on the effects of vibrations, sound fields, and pulsations on heat and mass transfer

- from flat plates, cylinders, and ducts, ARL 65-217, Office of Aerospace Research, U.S. Air Force, Wright-Patterson AFB, Ohio (1965).
- H. REISMANN, The moving, plane heat source in an elastic medium, *Appl. Scient. Res.* **A15**, No. 3, 216 (1965).
- D. RUES, Über die Äquivalenz von Wärme-, Kraft-, und Massenquellen, DVL-Bericht Nr. 478, Deutsche Versuchsanstalt für Luft- und Raumfahrt E.V., 505 Porz-Wahn, Linder Höhe, West Germany (1966).
- M. G. SELL JR. and J. L. HUDSON, The effect of wall conduction on heat transfer to a slug flow, *Int. J. Heat Mass Transfer* **9**, No. 1, 11 (1966).
- V. I. SUBBOTIN, M. K. İBRAGIMOV and E. V. NOMOFİLOV, A generalized relationship for turbulent heat-transfer coefficients in fluid streams, *Int. Chem. Engng* **6**, No. 1, 81 (1966).
- N. E. TODREAS and M. W. ROHSENOW, The effect of non-uniform axial heat flux distribution, TR No. 9843-37, Dept. of Mechanical Engineering, Massachusetts Institute of Technology, Cambridge, Mass. (1965).