

INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER

VOLUME 10 1967

BOARD OF EDITORS

E. A. BRUN

Paris

A. J. EDE

Birmingham

CARL GAZLEY, Jr.

Santa Monica

U. GRIGULL

München

J. P. HARTNETT

Chicago

A. V. LUIKOV

Minsk

TAKASHI SATŌ

Kyoto

D. B. SPALDING

London

E. HAHNE

(Associate Editor)

München

W. J. MINKOWYCZ

(Associate Editor)

Chicago

J. H. WHITELAW

(Associate Editor)

London

Assisted by an Honorary Editorial Advisory Board

Chairman

E. R. G. ECKERT

Minneapolis

Co-chairman

F. TACHIBANA

Tokyo

Past-chairman

Sir OWEN SAUNDERS

London

PERGAMON PRESS LTD.

OXFORD · LONDON · NEW YORK · PARIS

INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER

BOARD OF EDITORS

- E. A. BRUN, 8 place du Commerce, Paris 15ème, France
A. J. EDE, Mechanical Engineering Dept., University of Aston, Gosta Green, Birmingham 4, England
CARL GAZLEY, Jr., Dept. of Geophysics and Astronomy, The RAND Corporation,
1700 Main Street, Santa Monica, California 90406, U.S.A.
U. GRIGULL, Technische Hochschule, Arcisstrasse 21, München, Germany
E. HAHNE (Associate Editor), Technische Hochschule, Arcisstrasse 21, München, Germany
J. P. HARTNETT, Energy Engineering Dept., University of Illinois, Box 4348, Chicago, Illinois 60680, U.S.A.
A. V. LUIKOV, Heat and Mass Transfer Institute, Academy of Science, 25 Podlesnaya, Minsk, B.S.S.R., U.S.S.R.
W. J. MINKOWYCZ (Associate Editor), Energy Engineering Dept.,
University of Illinois, Box 4348, Chicago, Illinois 60680, U.S.A.
TAKASHI SATO, Mechanical Engineering Dept., Kyoto University, Kyoto, Japan
D. B. SPALDING, Mechanical Engineering Dept., Imperial College of Science & Technology,
Exhibition Road, London S.W.7, England
J. H. WHITELAW (Associate Editor), Mechanical Engineering Dept., Imperial College of Science & Technology
Exhibition Road, London S.W.7, England

HONORARY EDITORIAL ADVISORY BOARD

- Chairman: E. R. G. ECKERT, University of Minnesota, Minneapolis, Minnesota 55455, U.S.A.
Co-chairman: F. TACHIBANA, Dept. of Nuclear Engineering, University of Tokyo, Bunkyo-ku, Tokyo, Japan
Past-chairman: Sir OWEN SAUNDERS, F.R.S., Imperial College, London, England

- | | | |
|--|--|---|
| F. BOŠNJAKOVIĆ, Stuttgart | J. KESTIN,
Providence, Rhode Island | A. RAMACHANDRAN,
Bangalore |
| THOMAS W. F. BROWN,
Wallsend, England | S. P. KEZIOS, Chicago, Illinois | J. F. RICHARDSON,
Swansea, Wales |
| A. F. CHUDNOVSKY, Leningrad | D. T. KOKOREV, Moscow | WARREN M. ROHSENOW,
Cambridge, Massachusetts |
| Z. F. CHUKHANOV, Moscow | P. K. KONAKOV, Moscow | PETER H. ROSE,
Everett, Massachusetts |
| J. W. CIBOROWSKI, Warsaw | O. KRISCHER, Darmstadt | ERNST SCHMIDT, München |
| H. CORDIER, Poitiers | P. M. C. LACEY, Exeter, England | JIRI SCHNELLER,
Bechovice, Czechoslovakia |
| A. CRAYA, Grenoble | P. D. LEBEDEV, Moscow | H. SCHUH, Linköping, Sweden |
| S. R. DE GROOT, Amsterdam | E. J. LE FEVRE, London | A. W. SCOTT, Glasgow |
| R. G. DEISSLER, Cleveland, Ohio | SALOMON LEVY,
San Jose, California | R. A. SEBAN,
Berkeley, California |
| ROBERT M. DRAKE, JR.,
Lexington, Kentucky | PAUL A. LIBBY,
La Jolla, California | MARIO SILVESTRI, Milan |
| T. B. DREW, New York | DAVID J. MASSON,
Santa Monica, California | E. M. SPARROW,
Minneapolis, Minnesota |
| H. W. EMMONS,
Cambridge, Massachusetts | M. D. MIKHAILOV, Sofia | D. A. SPENCE,
Oxford, England |
| A. ENDRÉNYI, Budapest | TOKURO MIZUSHINA, Kyoto | M. W. THRING, London |
| R. GOULARD, Lafayette, Indiana | Y. MORI, Tokyo | Y. S. TOULOUKIAN,
West Lafayette, Indiana |
| P. GRASSMANN, Zürich | W. MURGATROYD, London | MYRON TRIBUS,
Hanover, New Hampshire |
| L. G. HAMBURGER, Bucharest | L. G. NAPOLITANO, Naples | J. W. WESTWATER,
Urbana, Illinois |
| TADEUSZ HOBLER,
Gliwice, Poland | MIODRAG NOVAKOVIĆ,
Belgrade | K. YAMAGATA, Hakozaki, Japan |
| J. N. HOOL
Kensington, New South Wales | SIMON OSTRACH,
Cleveland, Ohio | |
| H. C. HOTTEL,
Cambridge, Massachusetts | KURT PETERS, Vienna | |
| BUSUKE HUDIMOTO, Kyoto | R. L. PIGFORD, Berkeley, California | |
| T. F. IRVINE, JR.,
Stony Brook, New York | A. A. POMERANTSEV, Moscow | |
| | A. S. PREDVODITELEV, Moscow | |

Annual Subscription Rates

A. For libraries, research establishments, and all other multiple-reader institutions: £33 (\$100). B. For individuals who place their orders directly with the publisher and certify that the journal is for their personal use: £5 5s (\$15).

Back issues available—write for Back Issues Price List

Published monthly

Copyright Pergamon Press Ltd. © 1967

PERGAMON PRESS LTD

Headington Hill Hall, Oxford

44-01 21st Street, Long Island City, N.Y. 11101

CONTENTS

January	PAGE
Z. RANT: F. Bošnjaković—65 Jahre alt	1
N. I. YUSHCHENKOVA, A. A. POMERANTSEV and V. I. NEMCHENKO: Influence of real gas effects on the hypersonic rarefied flow near the sharp leading edge of a thin plate	5
E. E. GOSE, A. N. MUCCIARDI and E. BAER: Model for dropwise condensation on randomly distributed sites	15
W. F. FURTER and R. A. COOK: Salt effect in distillation: a literature review	23
Y. MORI and W. NAKAYAMA: Study on forced convective heat transfer in curved pipes (2nd report, turbulent region)	37
F. A. DVORAK and M. R. HEAD: Heat transfer in the constant property turbulent boundary layer	61
J. T. C. LIU: The effect of wall temperature on the low Reynolds number hypersonic stagnation region shock layer	83
<i>Research Note</i>	
A. CEZAIRLIYAN: Steady state temperature distribution in a disc with radial flow of electric current	97
<i>Shorter Communication</i>	
J. L. STOLLERY and A. A. M. EL-EHWANY: On the use of a boundary-layer model for correlating film cooling data	101
<i>Letter to the Editors</i>	
Y. R. MAYHEW: Comments on the paper "Theoretical study of laminar film condensation of flowing vapour"	107
<i>Book Review</i>	109
<i>Contents Lists</i>	
Journals of Engineering Physics	111
February	
W. WUEST: Die Strömung an einem Flügelprofil mit Ausblasen von Fremdgasen aus einem Nasenspalt	113
L. VAN WIJNGAARDEN: On the growth of small cavitation bubbles by convective diffusion	127
S. D. PROBERT, R. G. BROOKS, T. R. THOMAS and J. MAXWELL: Heat losses through rarefied fluids	135
F. W. LARSEN: Rapid calculation of temperature in a regenerative heat exchanger having arbitrary initial solid and entering fluid temperatures	149
M. SOLIMAN and P. L. CHAMBRÉ: On the time-dependent Lévêque problem	169
E. J. PLATE: Diffusion from a ground level line source into the disturbed boundary layer far downstream from a fence	181
K. O. WESTPHAL: Series solution of freezing problem with the fixed surface radiating into a medium of arbitrary varying temperature	195
G. SCHUBERT: Diffusion across a laminar compressible mixing zone	207
F. K. TSOU, E. M. SPARROW and R. J. GOLDSTEIN: Flow and heat transfer in the boundary layer on a continuous moving surface	219
C. C. ST. PIERRE and S. G. BANKOFF: Vapor volume profiles in developing two-phase flow	237
<i>Shorter Communications</i>	
B. J. TYLER and A. F. TUCK: Heat transfer to a gas from a spherical enclosure: measurements and mechanism	251
D. E. KAUTZKY and J. W. WESTWATER: Film boiling of a mixture on a horizontal plate	253

March

PAGE

- T. Y. LI and P. S. KIRK: Asymptotic method of solution of the frozen dissociated laminar boundary-layer flow over a flat-plate surface with arbitrarily distributed catalycity 257
- A. QUARMBY: Some measurements of turbulent heat transfer in the thermal entrance region of concentric annuli 267
- L. CIMORELLI and R. EVANGELISTI: The application of the capacitance method for void fraction measurement in bulk boiling conditions 277
- K. SCHWIER: Der Umschlag laminar-turbulent bei nicht isothermer Strömung im Rohr 289
- Y. KATTO and T. MASUOKA: Criterion for the onset of convective flow in a fluid in a porous medium 297
- P. E. DOE: A new method of measuring humidity in a small space 311
- R. J. FORSTROM and E. M. SPARROW: Experiments on the buoyant plume above a heated horizontal wire 321
- J. F. HUMPHREYS, W. D. MORRIS and H. BARROW: Convection heat transfer in the entry region of a tube which revolves about an axis parallel to itself 333
- A. B. PONTER, G. A. DAVIES, T. K. ROSS and P. G. THORNLEY: The influence of mass transfer on liquid film breakdown 349
- L. D. BOYKO and G. N. KRUSHILIN: Heat transfer and hydraulic resistance during condensation of steam in a horizontal tube and in a bundle of tubes 361
- T. SATO: Heat transfer bibliography—Japanese works 375
- E. R. G. ECKERT, W. E. IBELE and R. J. GOLDSTEIN: Heat transfer bibliography 377

Shorter Communications

- R. K. JHA and M. RAJA RAO: Heat transfer through coiled tubes in agitated vessels 395
- A. OWHADI and K. J. BELL: Forced convection boiling inside helically-coiled tubes 397
- J. R. HOWELL: On the radiation slip between absorbing-emitting regions with heat sources 401

Research Notes

- D. B. ADARKAR and L. B. HARTSOOK: Conduction with a time-varying radiation boundary condition 403
- H. A. SIMON, C. S. LIU and J. P. HARTNETT: The Eckert reference formulation applied to high speed laminar boundary layers of nitrogen and carbon dioxide 406
- A. DAS GUPTA and A. K. BARUA: On the representation of the density dependence of the thermal conductivity of superheated steam 409

Book Review

Errata

April

- A. A. HAYDAY and D. A. BOWLUS: Integration of coupled nonlinear equations in boundary-layer theory with specific reference to heat transfer near the stagnation point in three-dimensional flow 415
- K. HAMMEKE, E. HEINECKE und F. SCHOLZ: Wärmeübergangs- und Druckverlustmessungen an Querangeströmten Glatrohrbündeln, insbesondere bei hohen Reynoldszahlen 427
- P. BASSANINI, C. CERCIGNANI and C. D. PAGANI: Comparison of kinetic theory analyses of linearized heat transfer between parallel plates 447
- Z. ROTEM: The effect of thermal conduction of the wall upon convection from a surface in a laminar boundary layer 461
- G. HERPOL et N. WILLEMS: Un nouvel instrument pour la mesure de la conductibilité thermique des matières isolantes 467
- M. DALLE DONNE and F. H. BOWDITCH: A nozzle thermocouple for measurements in high-temperature gases 477
- G. F. MALLING and G. THODOS: Analogy between mass and heat transfer in beds of spheres: contributions due to end effects 489
- L. A. WALKER and E. MARKLAND: Calculation of heat transfer to turbine blading in the presence of secondary flow 499

P. M. CAMPBELL: Monte Carlo method for radiative transfer	PAGE 519
W. J. LAVENDER and D. C. T. PEI: The effect of fluid turbulence on the rate of heat transfer from spheres	529
P. M. WORSØE-SCHMIDT: Heat transfer in the thermal entrance region of circular tubes and annular passages with fully developed laminar flow	541
<i>Shorter Communication</i>	
Y. HELED and A. ORELL: Characteristics of active nucleation sites in pool boiling	553
<i>Book Review</i>	555

May

B. SARAVANOS: The calculation of heat transfer to thick metal walls of steam turbine components from ambient steam with time-dependent characteristics	557
J. GERSTMANN and P. GRIFFITH: Laminar film condensation on the underside of horizontal and inclined surfaces	567
R. W. POWELL and R. P. TYE: New measurements on thermal conductivity reference materials	581
G. POOTS and G. F. RAGGETT: Theoretical results for variable property, laminar boundary layers in water	597
D. WILKIE, M. COWIN, P. BURNETT and T. BURGOYNE: Friction factor measurements in a rectangular channel with walls of identical and non-identical roughness	611
W. B. NICOLL and J. H. WHITELAW: The effectiveness of the uniform density, two-dimensional wall jet	623
R. VISKANTA and R. L. MERRIAM: Shielding of surfaces in Couette flow against radiation by transpiration of an absorbing-emitting gas	641
T. D. TAYLOR: Radiative energy transfer through non-gray gas layers of small optical thickness	655
J. A. PLAMONDON and T. E. HORTON: On the determination of the view function to the images of a surface in a nonplanar specular reflector	665
Y. MORI and W. NAKAYAMA: Study on forced convective heat transfer in curved pipes (3rd report, theoretical analysis under the condition of uniform wall temperature and practical formulae)	681
P. GRIFFITH and M. S. LEE: The effect of surface thermal properties and finish on dropwise condensation	697
<i>Shorter Communications</i>	
A. ROBERTS: A comment on the turbulent flow velocity profile in a concentric annulus	709
H. BARROW and J. H. HORLOCK: Asymmetric heat transfer in turbulent flow between parallel plates	712

June

P. K. MUHURI and M. K. MAITI: Free convection oscillatory flow from a horizontal plate	717
A. B. PONTER, G. A. DAVIES, W. BEATON and T. K. ROSS: The measurement of contact angles under equilibrium and mass-transfer conditions	733
T. J. S. BRAIN: New thermal conductivity measurements for argon, nitrogen and steam	737
I. WYNN JONES: Calculation of the thermal conductivity of normal hydrogen in the dense gaseous and liquid states	745
J. W. ROSE: On the mechanism of dropwise condensation	755
G. C. GARDNER: Heat- and mass-transfer calculations using an exponentially curved equilibrium line with special reference to cooling towers	763
L. SZÜCS and Cs. TASNÁDI: A process for the dimensioning of the high efficiency plate fins of compact heat exchangers	771
R. E. CHILCOTT: A review of separated and reattaching flows with heat transfer	783
B. A. FINLAYSON and L. E. SCRIVEN: On the search for variational principles	799

E. R. G. ECKERT, E. M. SPARROW, W. E. IBELE and R. J. GOLDSTEIN: Heat transfer bibliography	PAGE 823
T. SATŌ: Heat transfer bibliography—Japanese works	841
<i>Erratum</i>	844

July

D. KUNII and M. SUZUKI: Particle-to-fluid heat and mass transfer in packed beds of fine particles	845
P. NORDON and H. G. DAVID: Coupled diffusion of moisture and heat in hygroscopic textile materials	853
L. K. GLOUCHKOV et M. D. MIKHAILOV: Programme optimal pour le chauffage des corps	867
G. LASSAU et B. LE FUR: Profils de concentrations dans une couche limite laminaire figée avec une repartition continue et discontinue de catalyseur sur la paroi	877
E. RUCKENSTEIN: Film boiling on a horizontal surface	911
A. DAS GUPTA: Thermal conductivity of binary mixtures of sulphur dioxide and inert gases	921
W. FROST and C. J. KIPPENHAN: Bubble growth and heat-transfer mechanisms in the forced boiling of water containing a surface active agent	931
S. LEVY: Forced convection subcooled boiling—prediction of vapor volumetric fraction	951
A. ORELL: On S-shaped boiling curves	967
E. BRUNDRETT and W. D. BAINES: A temperature probe for the determination of heat transfer at a wall in turbulent flow	973
J. NEWMAN: The effect of migration in laminar diffusion layers	983
A. V. LUIKOV: Heat transfer bibliography—Russian works	999
<i>Shorter Communications</i>	
T. MIZUSHINA, H. KAMIMURA and Y. KURIWAKI: Tetrafluoroethylene coatings on condenser tubes	1015
SZE-FOO CHIEN and W. E. IBELE: Photographic study of the interfacial disturbances of liquid films in falling film flow, and in vertical, downward, annular two-phase flow	1016
<i>Book Review</i>	1019

August

T. H. K. FREDERKING: P. Grassmann—60 Jahre alt	1021
H. J. IVEY: Relationships between bubble frequency, departure diameter and rise velocity in nucleate boiling	1023
R. GREIF and D. R. WILLIS: Heat transfer between parallel plates including radiation and rarefaction effects	1041
R. L. SPICER: Effect of volumetric absorption coefficient on Rosseland radiative heat transfer	1049
G. C. GARDNER: Unsteady-state heat generation and heat transfer in superconducting composites	1055
D. L. TURCOTTE: A boundary-layer theory for cellular convection	1065
H. POLTZ and R. JUGEL: The thermal conductivity of liquids—IV. Temperature dependence of thermal conductivity	1075
V. M. BORISHANSKY: The account for the effect of physical properties in heat- and mass-transfer phenomena	1089
I. J. KUMAR and H. N. NARANG: A boundary-layer method in porous body heat and mass transfer	1095
F. MARCEL DEVIENNE: Mesure des coefficients d'accommodation de molécules de très haute énergie et résultats	1109

	PAGE
<i>Shorter Communications</i>	
F. W. SCHMIDT and M. E. NEWELL: Heat transfer in fully developed laminar flow through rectangular and isosceles triangular ducts	1121
M. F. TAYLOR: A method of correlating local and average friction coefficients for both laminar and turbulent flow of gases through a smooth tube with surface to fluid bulk temperature ratios from 0.35 to 7.35	1123
<i>Letter to the Editors</i>	
A. WILLIAMS: Comments on the paper "Heat transfer at the interface of dissimilar metals—the influence of thermal strain"	1129
<i>Book Review</i>	1131

September

E. BRUNDRETT and P. R. BURROUGHS: The temperature inner-law and heat transfer for turbulent air flow in a vertical square duct	1133
S. Y. CHEN, J. AROESTY and R. MOBLEY: The hypersonic viscous shock layer with mass transfer	1143
D. W. ZEH and W. N. GILL: Heat transfer and binary diffusion in variable property free convection flows	1159
J. L. NOVOTNY and M. D. KELLEHER: Free-convection stagnation flow of an absorbing-emitting gas	1171
Y. MORI and W. NAKAYAMA: Forced convective heat transfer in a straight pipe rotating around a parallel axis (1st report, laminar region)	1179
T. R. GALLOWAY and B. H. SAGE: Thermal and material transport from spheres. Prediction of macroscopic thermal and material transport	1195
M. K. GUPTA, A. B. METZNER and J. P. HARTNETT: Turbulent heat-transfer characteristics of viscoelastic fluids	1211
R. C. BIRKEBAK, J. P. DAWSON, B. A. MCCULLOUGH and B. E. WOOD: Hemispherical reflectance of metal surfaces as a function of wavelength and surface roughness	1225
M. MORDUCHOW and S. P. REYLE: On the compressible laminar boundary layer with suction	1233
H. W. BUTLER and R. RACKLEY: Application of a variational formulation to nonequilibrium fluid flow	1255
D. E. ROSNER: Enhancement of diffusion-limited vaporization rates by condensation within the thermal boundary layer. 1. The critical supersaturation approximation	1267
M. H. COBBLE: Finite transform solution of the temperature of a plate heated by a moving discrete source	1281
<i>Shorter Communication</i>	
R. D. CESS and P. MIGHDOLL: Modified Planck mean coefficients for optically thin gaseous radiation	1291

October

A. S. PREDVODITELEV: In commemoration of the 100th birthday of P. N. Lebedev	1293
J. SCHMID: Solution of some boundary problems of heat conduction for cylindrical bodies provided with longitudinal fins	1305
L. S. WANG and C. L. TIEN: A study of various limits in radiation heat-transfer problems	1327
A. MOUMOUNI: Analyse des particularités du fonctionnement des radiomètres thermo-électriques à disque récepteur absorbant, en régime permanent	1339
N. G. STYUSHIN and B. S. VARSHNEI: Studies of heat-transfer rate of a subcooled boiling liquid in tubes	1349
A. V. LUIKOV, V. L. SERGEEV and A. G. SHASHKOV: Experimental study of stagnation point heat transfer of a solid in high-enthalpy gas flow	1361
P. RAZELOS and A. LAZARIDIS: A lumped heat-transfer coefficient for periodically heated hollow cylinders	1373

	PAGE
S. V. PATANKAR and D. B. SPALDING: A finite-difference procedure for solving the equations of the two-dimensional boundary layer	1389
M. A. HEASLET and R. F. WARMING: Radiative transport in an absorbing planar medium II. Predictions of radiative source functions	1413
A. V. LUIKOV: Heat transfer bibliography—Russian works	1429

Shorter Communications

K. T. SHIH, W. E. IBELE, E. R. F. WINTER and E. R. G. ECKERT: High temperature enthalpy-composition charts for carbon-nitrogen mixtures	1451
D. D. AULDS and R. F. BARRON: Three-fluid heat exchanger effectiveness	1457

Letter to the Editors

L. D. BERMAN: On the effect of molecular-kinetic resistance upon heat transfer with condensation	1463
--	------

Contents Lists

Journal of Engineering Physics	1465
--------------------------------	------

November

S. J. D. VAN STRALEN: The mechanism of nucleate boiling in pure liquids and in binary mixtures—Part III	1469
S. J. D. VAN STRALEN: The mechanism of nucleate boiling in pure liquids and in binary mixtures—Part IV. Surface boiling	1485
R. H. SABERSKY and E. G. HAUPTMANN: Forced convection heat transfer to carbon dioxide near the critical point	1499
H. E. BETHEL: A generalized Galerkin-Kantorovich treatment of transient evaporation through a finite region	1509
R. D. CESS, P. MIGHDOLL and S. N. TIWARI: Infrared radiative heat transfer in nongray gases	1521
S. KALISH and O. E. DWYER: Heat transfer to NaK flowing through unbaffled rod bundles	1533
B. GAL-OR, J. P. HAUCK and H. E. HOELSCHER: A transient response method for a simple evaluation of mass transfer in liquids and dispersions. Experimental test of a mathematical model for an ensemble of bubbles	1559
J. CHOMIAK and B. NIEDZIALEK: Measurement of rapidly varying gas temperatures in an unsteady flow	1571
R. T. BEAUBOUEF and A. J. CHAPMAN: Freezing of fluids in forced flow	1581
W. A. SUTHERLAND: Improved heat-transfer performance with boundary-layer turbulence promoters	1589
K.-Y. CHIEN: Radiation coupled shock layer including upstream absorption effects	1601

Shorter Communications

J. V. BECK: Transient sensitivity coefficients for the thermal contact conductance	1615
C. J. SCOTT and V. K. JONSSON: Diffusion thermo effects in turbulent mass transfer	1618
S. C. KACKER and J. H. WHITELAW: The dependence of the impervious wall effectiveness of a two-dimensional wall-jet on the thickness of the upper lip boundary layer	1623
M. IQBAL and J. W. STACHIEWICZ: Variable density effects in combined free and forced convection in inclined tubes	1625
J. Y. KAUH, R. E. PECK and D. T. WASAN: A correlation of psychrometric ratios for a flat plate	1629
A. B. PONTER, G. A. DAVIES, W. BEATON and T. K. ROSS: The measurement of contact angles under conditions of heat transfer when a liquid film breaks on a vertical surface	1633

Letters to the Editors

N. SPINKS: Conservation laws for two-phase flow with a change of phase	1637
N. ZUBER: Rejoinder	1638

Contents Lists

Journal of Engineering Physics	1643
--------------------------------	------

A. V. LUIKOV, N. B. KONDUKOV and N. G. STYUSHIN: To A. A. Gukhman on his 70th birthday	1645
L. TACCOEN: Contribution à l'étude des échanges thermiques en écoulement turbulent dans un tube lisse. Application aux métaux liquides	1649
A. IRIBARNE, A. D. GOSMAN and D. B. SPALDING: A theoretical and experimental investigation of diffusion-controlled electrolytic mass transfer between a falling liquid film and a wall	1661
G. POOTS and R. G. MILES: Effects of variable physical properties on laminar film condensation of saturated steam on a vertical flat plate	1677
C.-J. HSU: Analytical study of heat transfer to liquid metals flowing along a row of spheres	1693
K. E. TORRANCE and E. M. SPARROW: Directional emittance of an electric nonconductor as a function of surface roughness and wavelength	1709
R. PUZYREWSKI: Perturbation analysis of condensation controlled by heat transfer on large droplets	1717
Y. BARD and E. F. LEONARD: Heat transfer in simulated boiling	1727
B. PY: Rayonnement thermique des métaux microrugueux ou dispersés	1735
D. PNUELI: A computation scheme for the asymptotic Nusselt number in ducts of arbitrary cross-section	1743
P. H. SIH and J. NEWHAM: Mass transfer to the rear of a sphere in Stokes flow	1749
S. ESHGHY and R. W. HORNBECK: Flow and heat transfer in the axisymmetric boundary layer over a circular cylinder	1757
D. CHISHOLM: A theoretical basis for the Lockhart-Martinelli correlation for two-phase flow	1767
M. M. ABU-ROMIA and C. L. TIEN: Spectral and integrated intensity of CO fundamental band at elevated temperatures	1779
E. RUCKENSTEIN: Mass transfer between a single drop and a continuous phase	1785
S. S. ZABRODSKY: On solid-to-fluid heat transfer in fluidized systems	1793
Y. MORI and K. FUTAGAMI: Forced convective heat transfer in uniformly heated horizontal tubes (2nd report, theoretical study)	1801
A. F. MILLS and R. A. SEBAN: The condensation coefficient of water	1815
E. M. SPARROW, W. J. MINKOWYCZ and M. SADDY: Forced convection condensation in the presence of noncondensables and interfacial resistance	1829
R. CHEESEWRIGHT: Natural convection from a plane, vertical surface in non-isothermal surroundings	1847
F. P. INCROPERA and G. LEPPERT: Laminar flow heat transfer from an argon plasma in a circular tube	1861
A. V. LUIKOV: Heat transfer bibliography—Russian works	1875

Shorter Communications

D. G. KROGER and W. M. ROHSENOW: Film condensation of saturated potassium vapor	1891
J. DOENECKE: Thermal scale modeling without similitude	1894
B. B. MIKIC: A model rate equation for transient thermal conduction	1899

Letters to the Editors

S. J. D. VAN STRALEN: Comments on the paper "On the mechanism of boiling heat transfer (vapour bubbles growth rate in the process of boiling of liquids, solutions and binary mixtures)"	1905
S. J. D. VAN STRALEN: Comments on the paper "Bubble growth rates at high Jakob numbers"	1908

Book Review

1913

Contents Lists

Journal of Engineering Physics	1914
--------------------------------	------

AUTHOR INDEX

- ABU-ROMIA, M. M., 1779
 ADARKAR, D. B., 403
 AROESTY, J., 1143
 AULDS, D. D., 1457

 BAER, E., 15
 BAINES, W. D., 973
 BANKOFF, S. G., 237
 BARD, Y., 1727
 BARRON, R. F., 1457
 BARROW, H., 333, 712
 BARUA, A. K., 409
 BASSANINI, P., 447
 BEATON, W., 733, 1633
 BEAUBOUF, R. T., 1581
 BECK, J. V., 1615
 BELL, K. J., 397
 BERMAN, L. D., 1463
 BETHEL, H. E., 1509
 BIRKEBAK, R. C., 1225
 BORISHANSKY, V. M., 1089
 BOWDITCH, F. H., 477
 BOWLUS, D. A., 415
 BOYKO, L. D., 361
 BRAIN, T. J. S., 737
 BROOKS, R. G., 135
 BRUNDRETT, E., 973, 1133
 BURGOYNE, T., 611
 BURNETT, P., 611
 BURROUGHS, P. R., 1133
 BUTLER, H. W., 1255

 CAMPBELL, P. M., 519
 CERCIGNANI, C., 447
 CESS, R. D., 1291, 1521
 CEZARLIYAN, A., 97
 CHAMBRÉ, P. L., 169
 CHAPMAN, A. J., 1581
 CHEESEWRIGHT, R., 1847
 CHEN, S. Y., 1143
 CHIEN, K.-Y., 1601
 CHIEN, S.-F., 1016
 CHILCOTT, R. E., 783
 CHISHOLM, D., 1767
 CHOMIAK, J., 1571
 CIMORELLI, L., 277
 COBBLE, M. H., 1281
 COOK, R. A., 23
 COWIN, M., 611

 DALLE DONNE, M., 477
 DAS GUPTA, A., 409, 921
 DAVID, H. G., 853
 DAVIES, G. A., 349, 733, 1633
 DAWSON, J. C., 1225
 DOE, P. E., 311
 DOENECKE, J., 1894
 DVORAK, F. A., 61
 DWYER, O. E., 1533

 ECKERT, E. R. G., 377, 823, 1451
 EL-EHWANY, A. A., 101
 ESHGHY, S., 1757
 EVANGELISTI, R., 277

 FINLAYSON, B. A., 799
 FORSTROM, R. J., 321

 FREDERKING, T. H. K., 1021
 FROST, W., 931
 FURTER, W. F., 23
 FUTAGAMI, F., 1801

 GALLOWAY, T. R., 1195
 GAL-OR, B., 1559
 GARDNER, G. C., 763, 1055
 GERSTMANN, J., 567
 GILL, W. N., 1159
 GLOUCHKOV, L. K., 869
 GOLDSTEIN, R. J., 219, 377, 823
 GOSE, E. E., 15
 GOSMAN, A. D., 1661
 GREIF, R., 1041
 GRIFFITH, P., 567, 697
 GUPTA, M. K., 1211

 HAMMEKE, K., 427
 HARTNETT, J. P., 406, 1211
 HARTSOOK, L. B., 403
 HAUCK, J. P., 1559
 HAUPTMANN, E. G., 1499
 HAYDAY, A. A., 415
 HEAD, M. R., 61
 HEASLET, M. A., 1413
 HEINECKE, E., 427
 HELED, Y., 553
 HERPOL, G., 467
 HOELSCHER, H. E., 1559
 HORNBECK, R. W., 1757
 HORLOCK, J. H., 713
 HORTON, T. E., 665
 HOWELL, J. R., 401
 HSU, C.-J., 1693
 HUMPHREYS, J. F., 333

 IBELE, W. E., 377, 823, 1016, 1451
 INCROPERA, F. P., 1861
 IQBAL, M., 1625
 IRIBARNE, A., 1661
 IVEY, H. J., 1023

 JHA, R. K., 395
 JONSSON, V. K., 1618
 JUGEL, R., 1075

 KACKER, S. C., 1623
 KALISH, S., 1533
 KAMIMURA, H., 1015
 KATTO, Y., 297
 KAUH, J. Y., 1629
 KAUTZKY, D. E., 253
 KELLEHER, M. D., 1171
 KIPPENHAN, C. J., 931
 KIRK, P. S., 257
 KONDUKOV, N. P., 1645
 KROGER, D. G., 1891
 KRZHILIN, G. N., 361
 KUMAR, I. J., 1095
 KUNII, D., 845
 KURIWAKI, Y., 1015

 LARSEN, F. W., 149
 LASSAU, G., 877
 LAVENDER, W. J., 529
 LAZARIDIS, A., 1373

 LEE, M. S., 697
 LE FUR, B., 877
 LEONARD, E. F., 1727
 LEPPERT, G., 1861
 LEVY, S., 951
 LI, T. W., 257
 LIU, C. S., 406
 LIU, J. T. C., 83
 LUKOV, A. V., 999, 1361, 1429, 1645, 1875

 MAITI, M. K., 717
 MALLING, G. F., 489
 MARCEL DEVIENNE, F., 1109
 MARKLAND, E., 499
 MASUOKA, T., 297
 MAXWELL, J., 135
 MAYHEW, Y. R., 107
 MCCULLOUGH, B. A., 1225
 MERRIAM, R. L., 641
 METZNER, A. B., 1211
 MIGHDOLL, P., 1291, 1521
 MIKHAILOV, M. D., 867
 MIKIC, B. B., 1899
 MILES, R. G., 1677
 MILLS, A. F., 1815
 MINKOWYCZ, W. J., 1829
 MIZUSHINA, T., 1015
 MOBLEY, R., 1143
 MORDUCHOW, M., 1233
 MORI, Y., 37, 681, 1179, 1801
 MORRIS, W. D., 333
 MOUMOUNI, A., 1339
 MUCCIARDI, A. N., 15
 MUHURI, P. K., 717

 NAKAYAMA, W., 37, 681, 1179
 NARANG, H. N., 1095
 NEMCHENKO, V. I., 5
 NEWELL, M. E., 1121
 NEWMAN, J., 983, 1749
 NICOLL, W. B., 623
 NIEDZIALIK, B., 1571
 NORDON, P., 853
 NOVOTNY, J. L., 1171

 ORELL, A., 553, 967
 OWHADI, A., 397

 PAGANI, C. D., 447
 PATANKAR, S. V., 1389
 PECK, R. E., 1629
 PEI, D. C. T., 529
 PLAMONDON, J. A., 665
 PLATE, E. J., 181
 PNUELI, D., 1743
 POLTZ, H., 1075
 POMERANTSEV, A. A., 5
 PONTER, A. B., 349, 733, 1633
 POOTS, G., 597, 1667
 POWELL, R. W., 581
 PREDVODITELEV, A. S., 1293
 PROBERT, S. D., 135
 PUZYREWSKI, R., 1717
 PY, B., 1735

 QUARMBY, A., 267

RACKLEY, R., 1255
RAGGETT, G. F., 597
RAJA RAO, M., 395
RANT, Z., 1
RAZELOS, P., 1373
REYLE, S. P., 1233
ROBERTS, A., 709
ROHSENOW, W. M., 1891
ROSE, J. W., 755
ROSNER, D. E., 1267
ROSS, T. K., 349, 733, 1633
ROTEM, Z., 461
RUCKENSTEIN, E., 911, 1785

SABERSKY, R. H., 1499
SADDY, M., 1829
SAGE, B. H., 1195
SARAVANOS, B., 557
SATŌ, T., 375, 841
SCHMID, J., 1305
SCHMIDT, F. W., 1121
SCHOLZ, F., 427
SCHUBERT, G., 207
SCHWIER, K., 289
SCOTT, C. J., 1618
SCRIVEN, L. E., 799
SEBAN, R. A., 1815
SERGEEV, V. L., 1361
SHASHKOV, A. G., 1361

SHIH, K. T., 1451
SIH, P. H., 1749
SIMON, H. A., 406
SOLIMAN, M., 169
SPALDING, D. B., 1389, 1661
SPARROW, E. M., 219, 321, 823,
1709, 1829
SPICER, R. L., 1049
SPINKS, N., 1637
STACHIEWICZ, J. W., 1625
ST. PIERRE, C. C., 237
STOLLERY, J. L., 101
STYUSHIN, N. G., 1349, 1645
SUTHERLAND, W. A., 1589
SUZUKI, M., 845
SZÜCS, L., 771

TACCOEN, L., 1649
TASNÁDI, C. S., 771
TAYLOR, M. F., 1123
TAYLOR, T. D., 655
THODOS, G., 489
THOMAS, T. R., 135
THORNLEY, P. G., 349
TIEN, C. L., 1327, 1779
TIWARI, S. N., 1521
TORRANCE, K. E., 1709
TSOU, F. K., 219
TUCK, A. F., 251
TURCOTTE, D. L., 1065
TYE, R. P., 581

TYLER, B. J., 251

VAN STRALEN, S. J. D., 1469, 1485,
1905, 1908
VAN WIJNGAARDEN, L., 127
VARSHNEI, B. S., 1349
VISKANTA, R., 641

WALKER, L. A., 499
WANG, L. S., 1327
WARMING, R. F., 1413
WASAN, D. T., 1629
WESTPHAL, K. O., 195
WESTWATER, J. W., 253
WHITELAW, J. H., 623, 1623
WILKIE, D., 611
WILLEMS, N., 467
WILLIAMS, A., 1129
WILLIS, D. R., 1041
WINTER, E. R. F., 1451
WOOD, B. E., 1225
WORSØE-SCHMIDT, P. M., 541
WUEST, W., 113
WYNN JONES, I., 745

YUSHCHENKOVA, N. I., 5

ZABRODSKY, S. S., 1793
ZEH, D. W., 1159
ZUBER, N., 1638