

Subject Index

Aircraft Technology, Conventional, STOL/VTOL

Aerospace Plane

Aerospace Plane Cooling with H_2 , CH_4 , He, Ne, N_2 , and Ar T96-016

Energy

Laser Integration/Systems

Terrestrial Solar-Pumped Iodine Gas Laser with Minimum Threshold Concentration Requirements T96-007

Solar Power

Terrestrial Solar-Pumped Iodine Gas Laser with Minimum Threshold Concentration Requirements T96-007

Stirling Engine

Simple Harmonic Analysis of Regenerators T96-095

Fluid Dynamics

Boundary Layers and Heat Transfer—Laminar

Diffusion Flame over a Continuous Moving Fuel Plate Under Microgravity T96-013
Heat Transfer Transients in Stagnation Flows Due to Changes in Flow Velocity T96-027
Electron and Vibrational Kinetics in the Boundary Layer of Hypersonic Flow T96-057
New Chill-Block Melt Spinning Relations to Predict Ribbon Thickness T96-079
Injection Cooling of Blunt Bodies Flying at High Mach Numbers T96-086
Thin-Film Thermocouples for Localized Heat Transfer Measurements T96-089
Natural Convection in a Porous Cavity Saturated with a Non-Newtonian Fluid T96-094

Boundary Layers and Heat Transfer—Turbulent

Assessment of Turbulence and Chemistry Models for Film-Cooled Nozzle Flows T96-039
Effect of Turbulence on Heat Transfer in Stagnation Flow T96-040
Thin-Film Thermocouples for Localized Heat Transfer Measurements T96-089
Turbine Blade Heat Transfer Prediction in Flow Transition Using k - ω Two-Equation Model T96-090

Computational Fluid Dynamics

Mesh Generation and Numerical Simulation of Fluid Entering a Large Tube Bundle T96-015
Exponential Box-Schemes for Boundary-Layer Flows with Blowing T96-017
Numerical Investigation of Thermal and Chemical Nonequilibrium Flows past Slender Blunted Cones T96-019
Kinetics of Nitric Oxide Formation Behind Shock Waves T96-028

Application of a Genetic Algorithm to the Optical Characterization of Propellant Smoke T96-051

Natural Convection in the Annulus Between Concentric Horizontal Circular and Square Cylinders T96-073

High-Resolution Solutions of Stiff Chemically Reacting Flows T96-084

Conservative Species Weighting Scheme for the Direct Simulation Monte Carlo Method T96-085

Injection Cooling of Blunt Bodies Flying at High Mach Numbers T96-086

Turbine Blade Heat Transfer Prediction in Flow Transition Using k - ω Two-Equation Model T96-090

Full Viscous Modeling in Generalized Coordinates of Heat Conducting Flows in Rotating Systems T96-091

Natural Convection in a Porous Cavity Saturated with a Non-Newtonian Fluid T96-094

Hypersonic Flow

Material-Dependent Catalytic Recombination Modeling for Hypersonic Flows T96-018

Numerical Investigation of Thermal and Chemical Nonequilibrium Flows past Slender Blunted Cones T96-019

Kinetics of the $N_2 + O \rightarrow NO + N$ Reaction Under Thermodynamic Nonequilibrium T96-020

Shock-Tube Analysis of Argon Influence in Titan Radiative Environment T96-022

Computations of Axisymmetric Flows in Hypersonic Shock Tubes T96-023

Maximum Entropy Analysis of Chemical Reaction Energy Dependence T96-031

Effects of Freestream Nonequilibrium on Convective Heat Transfer to a Blunt Body T96-033

Viscous Shock-Layer Study of Thermochemical Nonequilibrium T96-036

Two- and Three-Dimensional Analysis of Hypersonic Nonequilibrium Low-Density Flows T96-037

Application of a Genetic Algorithm to the Optical Characterization of Propellant Smoke T96-051

Direct Simulation of Shock Front Radiation in Air T96-058

Radiative Emission from the Simulated Shock Layer of the Huygens Probe T96-083

Injection Cooling of Blunt Bodies Flying at High Mach Numbers T96-086

Nose-Tip Surface Heat Reduction Mechanism T96-088

Inlet, Nozzle, Diffuser, and Channel Flows

Thermodynamic Charts for Nonequilibrium Plasma Flow in a Supersonic Nozzle T96-021

Assessment of Turbulence and Chemistry Models for Film-Cooled Nozzle Flows T96-039

Jets, Wakes, and Viscid-Inviscid Flow Interactions

Effect of Turbulence on Heat Transfer in Stagnation Flow T96-040

Self-Oscillation Enhancement of Impingement Jet Heat Transfer T96-053

Multiphase Flows

Application of a Genetic Algorithm to the Optical Characterization of Propellant Smoke T96-051

Determining Electron Temperature and Density in a Hydrogen Microwave Plasma T96-060

Nonequilibrium Evaporation from a Heated Liquid Layer T96-069

Heat Transfer to Annular Gas-Liquid Mixtures at Reduced Gravity T96-093

Plasmadynamics and MHD

Thermodynamic Charts for Nonequilibrium Plasma Flow in a Supersonic Nozzle T96-021

Mass Spectrometry and Optical Spectroscopy in N_2 - CO_2 and N_2 - CH_4 Plasma Jets T96-059

Plasmadynamics Model for Nonequilibrium Processes in N_2/H_2 Arcjets T96-082

Rarefied Flows

Maximum Entropy Analysis of Chemical Reaction Energy Dependence T96-031

Assessment of Schemes for Coupling Monte Carlo and Navier-Stokes Solution Methods T96-034

Convective Instabilities in Rarefied Gases by Direct Simulation Monte Carlo Method T96-035

Two- and Three-Dimensional Analysis of Hypersonic Nonequilibrium Low-Density Flows T96-037

Conservative Species Weighting Scheme for the Direct Simulation Monte Carlo Method T96-085

Reacting Flows and Combustion

Numerical Investigation of Thermal and Chemical Nonequilibrium Flows past Slender Blunted Cones T96-019

Approximate Calculation of Transport Coefficients of Earth and Mars Atmospheric Dissociating Gases T96-030

Maximum Entropy Analysis of Chemical Reaction Energy Dependence T96-031

Two- and Three-Dimensional Analysis of Hypersonic Nonequilibrium Low-Density Flows T96-037

Determining Electron Temperature and Density in a Hydrogen Microwave Plasma T96-060

Radiative Emission from the Simulated Shock Layer of the Huygens Probe T96-083

High-Resolution Solutions of Stiff Chemically Reacting Flows T96-084

Separated Flows

Laminar Natural Convection Flow over a Vertical Forward-Facing Step T96-072

Shock Waves and Detonations

Kinetics of Nitric Oxide Formation Behind Shock Waves T96-028

Role of Mainstream Flow Velocity in Film Cooling in a Duct T96-054

Subsonic Flow

Role of Mainstream Flow Velocity in Film Cooling in a Duct T96-054

Supersonic Flow

- Role of Mainstream Flow Velocity in Film Cooling in a Duct **T96-054**
 Mass Spectrometry and Optical Spectroscopy in N_2 - CO_2 and N_2 - CH_4 Plasma Jets **T96-059**

Unsteady Flows

- Mesh Generation and Numerical Simulation of Fluid Entering a Large Tube Bundle **T96-015**
 Heat Transfer Transients in Stagnation Flows Due to Changes in Flow Velocity **T96-027**
 Nose-Tip Surface Heat Reduction Mechanism **T96-088**

Viscous Non-Boundary-Layer Flows

- Oscillatory Convection Due to Combined Buoyancy and Thermocapillarity **T96-014**
 Viscous Shock-Layer Study of Thermochemical Nonequilibrium **T96-036**

Interdisciplinary Topics

Analytical and Numerical Methods

- Direct Least-Square Solutions to Integral Equations Containing Discrete Data **T96-026**

Lasers and Laser Applications

- Terrestrial Solar-Pumped Iodine Gas Laser with Minimum Threshold Concentration Requirements **T96-007**
 Thermal Modeling and Analysis of Laser Calorimeters **T96-048**

Launch Vehicle and Missile (LV/M) Technology

Testing, Flight and Ground

- Effects of Freestream Nonequilibrium on Convective Heat Transfer to a Blunt Body **T96-033**

Thermal Protection Systems

- Scattering Characteristics of Fibrous Media Containing Closely Spaced Parallel Fibers **T95-060**
 Application of Moving Grid Control Volume Finite Element Method to Ablation Problems **T96-043**

Propulsion

Airbreathing Propulsion

- Full Viscous Modeling in Generalized Coordinates of Heat Conducting Flows in Rotating Systems **T96-091**

Electric and Advanced Space Propulsion

- Thermodynamic Charts for Nonequilibrium Plasma Flow in a Supersonic Nozzle **T96-021**
 Plasmadynamics Model for Nonequilibrium Processes in N_2/H_2 Arcjets **T96-082**

Space Technology

Aerobraking

Configurations/Aerothermodynamics

- Analytical Fits for the Determination of the Transport Properties of Air **T96-100**

Space Experiments

- Diffusion Flame over a Continuous Moving Fuel Plate Under Microgravity **T96-013**

Spacecraft Contamination/Sterilization

- Comparison of Mass Sensitivities of 10- and 15-MHz Quartz Crystal Microbalances **T96-074**

Spacecraft Thermal Management

- Moving Gas Front Effects on Heat Pipe Transient Behavior **T96-010**
 Evaporative Heat Transfer at the Evaporative Section of a Grooved Heat Pipe **T96-011**
 Thermal Control System for Lunar Base Cooling **T96-068**
 Heat Transfer to Annular Gas-Liquid Mixtures at Reduced Gravity **T96-093**

Structural Mechanics and Materials

Structural Composite Materials

- Axisymmetric Analysis of Transient Thermoelastic Behaviors in Composite Brake Disks **T96-009**
 Thermal Conductivity of a Thermosetting Advanced Composite During Its Cure **T96-065**

Structural Design

- Axisymmetric Analysis of Transient Thermoelastic Behaviors in Composite Brake Disks **T96-009**

Thermal Effects

- Axisymmetric Analysis of Transient Thermoelastic Behaviors in Composite Brake Disks **T96-009**

Thermophysics and Heat Transfer

Ablation, Pyrolysis, Thermal Decomposition and Degradation

- Application of Moving Grid Control Volume Finite Element Method to Ablation Problems **T96-043**
 Theoretical Analysis for Mechanical Erosion of Carbon-Base Materials in Ablation **T96-087**

Aerothermodynamics/Thermal Protection

- Aerospace Plane Cooling with H_2 , CH_4 , He, Ne, N_2 , and Ar **T96-016**
 Material-Dependent Catalytic Recombination Modeling for Hypersonic Flows **T96-018**
 Computations of Axisymmetric Flows in Hypersonic Shock Tubes **T96-023**
 Approximate Calculation of Transport Coefficients of Earth and Mars Atmospheric Dissociating Gases **T96-030**
 Viscous Shock-Layer Study of Thermochemical Nonequilibrium **T96-036**

- Assessment of Turbulence and Chemistry Models for Film-Cooled Nozzle Flows **T96-039**
 Modeling of Nonequilibrium Radiation Phenomena: An Assessment **T96-055**
 Theoretical Analysis for Mechanical Erosion of Carbon-Base Materials in Ablation **T96-087**
 Two-Flux Green's Function Analysis for Transient Spectral Radiation in a Composite **T96-098**

- Analytical Fits for the Determination of the Transport Properties of Air **T96-100**
 Internal Radiation Effects in Zirconia Thermal Barrier Coatings **T96-104**

Boiling/Condensation

- Performance Characteristics of a Stainless Steel/Ammonia Loop Heat Pipe **T96-045**

Computational Heat Transfer

- Mesh Generation and Numerical Simulation of Fluid Entering a Large Tube Bundle **T96-015**
 Exponential Box-Schemes for Boundary-Layer Flows with Blowing **T96-017**
 Effects of Freestream Nonequilibrium on Convective Heat Transfer to a Blunt Body **T96-033**
 Application of Moving Grid Control Volume Finite Element Method to Ablation Problems **T96-043**
 Radiative Heat Transfer Effects in Chemically Reacting Nozzle Flows **T96-061**
 Approximate Solution to Radiative Transfer in Two-Dimensional Cylindrical Media **T96-063**
 Laminar Forced Convection at Zero Gravity to Water near the Critical Region **T96-070**
 Natural Convection in the Annulus Between Concentric Horizontal Circular and Square Cylinders **T96-073**
 Analytical Expression for a Concentric-Cylinder Radiation View Factor **T96-075**
 Nose-Tip Surface Heat Reduction Mechanism **T96-088**
 Turbine Blade Heat Transfer Prediction in Flow Transition Using k - ω Two-Equation Model **T96-090**
 Full Viscous Modeling in Generalized Coordinates of Heat Conducting Flows in Rotating Systems **T96-091**
 Gravitational Effects on Laminar Convection to Near-Critical Water in a Vertical Tube **T96-092**
 Natural Convection in a Porous Cavity Saturated with a Non-Newtonian Fluid **T96-094**
 Simple Harmonic Analysis of Regenerators **T96-095**

Cryogenics

- Simple Harmonic Analysis of Regenerators **T96-095**
 Entropy Balance and Performance Characterization of the Narrow Basic Pulse-Tube Refrigerator **T96-096**

Electronics Cooling

- Thermal Contact Conductance of Refractory Ceramic Coatings **T96-001**
 Thermal Contact Conductance of Diamond-Like Films **T96-002**
 Thermal Contact Conductance of Selected Polymeric Materials **T96-046**
 Self-Oscillation Enhancement of Impingement Jet Heat Transfer **T96-053**

Air-Cooling System for Metal Oxide Semiconductor Controlled Thyristors Employing Miniature Heat Pipes **T96-067**

Forced Convection

Diffusion Flame over a Continuous Moving Fuel Plate Under Microgravity **T96-013**
Heat Transfer Transients in Stagnation Flows Due to Changes in Flow Velocity **T96-027**
Self-Oscillation Enhancement of Impingement Jet Heat Transfer **T96-053**
Heat Transfer Inside and Downstream of Cavities Using Transient Liquid Crystal Method **T96-071**
Thin-Film Thermocouples for Localized Heat Transfer Measurements **T96-089**
Gravitational Effects on Laminar Convection to Near-Critical Water in a Vertical Tube **T96-092**

Heat Transfer to Annular Gas-Liquid Mixtures at Reduced Gravity **T96-093**

Heat Conduction

Thermal Contact Conductance of Refractory Ceramic Coatings **T96-001**
Thermal Contact Conductance of Diamond-Like Films **T96-002**
Thermal Contact Conductance of Selected Polymeric Materials **T96-046**
Thermal Conductivity of a Thermosetting Advanced Composite During Its Cure **T96-065**
Effective Stagnant Thermal Conductivity of Wire Screens **T96-078**
Efficient Linear Multistep Method for Nonlinear Volterra Integral Equations **T96-099**
Matching Solutions for Unsteady Conduction in Simple Bodies with Surface Heat Fluxes **T96-101**
Combined Conduction and Nongray Radiation Heat Transfer in Carbon Dioxide **T96-102**

Heat Pipes

Moving Gas Front Effects on Heat Pipe Transient Behavior **T96-010**
Evaporative Heat Transfer at the Evaporative Section of a Grooved Heat Pipe **T96-011**
Longitudinal Vibration Effects on a Copper/Water Heat Pipe's Capillary Limit **T96-012**
Optimization Analysis of a Disk-Shaped Heat Pipe **T96-025**
Shape of an Evaporating Completely Wetting Extended Meniscus **T96-044**
Performance Characteristics of a Stainless Steel/Ammonia Loop Heat Pipe **T96-045**
Air-Cooling System for Metal Oxide Semiconductor Controlled Thyristors Employing Miniature Heat Pipes **T96-067**
Effective Stagnant Thermal Conductivity of Wire Screens **T96-078**

Melting/Solidification

New Chill-Block Melt Spinning Relations to Predict Ribbon Thickness **T96-079**

Mixed Convection

Oscillatory Convection Due to Combined Buoyancy and Thermocapillarity **T96-014**
Natural Convection Heat Transfer from Helicoidal Pipes **T96-041**
Laminar Forced Convection at Zero Gravity to Water near the Critical Region **T96-070**
Gravitational Effects on Laminar Convection to Near-Critical Water in a Vertical Tube **T96-092**

Natural Convection

Oscillatory Convection Due to Combined Buoyancy and Thermocapillarity **T96-014**
Convective Instabilities in Rarefied Gases by Direct Simulation Monte Carlo Method **T96-035**
Natural Convection Heat Transfer from Helicoidal Pipes **T96-041**
Natural Convection over Rotating Cylindrical Heat Source in an Enclosure **T96-042**
Laminar Natural Convection Flow over a Vertical Forward-Facing Step **T96-072**
Natural Convection in the Annulus Between Concentric Horizontal Circular and Square Cylinders **T96-073**

Nonintrusive Diagnostics

Measurements of Radiative Properties of Cellular Ceramics at High Temperatures **T96-004**
Shock-Tube Analysis of Argon Influence in Titan Radiative Environment **T96-022**
Measurement of Catalytic Recombination Coefficients on Quartz Using Laser-Induced Fluorescence **T96-032**

Radiation in Participating Media

Scattering Characteristics of Fibrous Media Containing Closely Spaced Parallel Fibers **T96-060**
Measurements of Radiative Properties of Cellular Ceramics at High Temperatures **T96-004**
Temperature Distributions in Semitransparent Coatings—A Special Two-Flux Solution **T96-005**
Predictions of Radiative Transfer in Two-Dimensional Nonhomogeneous Participating Cylindrical Media **T96-006**
Wideband Correlated- k Method Applied to Absorbing, Emitting, and Scattering Media **T96-050**
Modeling of Nonequilibrium Radiation Phenomena: An Assessment **T96-055**
Direct Simulation of Shock Front Radiation in Air **T96-058**
Radiative Heat Transfer Effects in Chemically Reacting Nozzle Flows **T96-061**
Approximate Solution to Radiative Transfer in Two-Dimensional Cylindrical Media **T96-063**
Radiative Properties of Fibrous Insulations: Theory Versus Experiment **T96-064**
Ignition of Propane-Air Mixture by Radiatively Heated Small Particles **T96-077**
Comparison of Numerical Quadrature Schemes Applied in the Method of Discrete Transfer **T96-081**
Two-Flux Green's Function Analysis for Transient Spectral Radiation in a Composite **T96-098**
Efficient Linear Multistep Method for Nonlinear Volterra Integral Equations **T96-099**
Combined Conduction and Nongray Radiation Heat Transfer in Carbon Dioxide **T96-102**
Internal Radiation Effects in Zirconia Thermal Barrier Coatings **T96-104**

Radiation Interchange Between Surfaces

Direct Least-Square Solutions to Integral Equations Containing Discrete Data **T96-026**
Spectral-Directional Emittance of Oxidized Copper **T96-047**
Analytical Expression for a Concentric-Cylinder Radiation View Factor **T96-075**
Comparison of Numerical Quadrature Schemes Applied in the Method of Discrete Transfer **T96-081**

Thermal Control

Thermal Contact Conductance of Diamond-Like Films **T96-002**
Optimization Analysis of a Disk-Shaped Heat Pipe **T96-025**
Shape of an Evaporating Completely Wetting Extended Meniscus **T96-044**
Thermal Contact Conductance of Selected Polymeric Materials **T96-046**
Effective Emittance for Cassini Multilayer Insulation Blankets and Heat Loss near Seams **T96-049**
Emittance Measurements for a Thin Liquid Sheet Flow **T96-080**

Thermal Modeling and Analysis

Thermal Contact Conductance of Refractory Ceramic Coatings **T96-001**
Temperature Distributions in Semitransparent Coatings—A Special Two-Flux Solution **T96-005**
Moving Gas Front Effects on Heat Pipe Transient Behavior **T96-010**
Evaporative Heat Transfer at the Evaporative Section of a Grooved Heat Pipe **T96-011**
Aerospace Plane Cooling with H_2 , CH_4 , He, Ne, N_2 , and Ar **T96-016**
Shape of an Evaporating Completely Wetting Extended Meniscus **T96-044**
Performance Characteristics of a Stainless Steel/Ammonia Loop Heat Pipe **T96-045**
Thermal Modeling and Analysis of Laser Calorimeters **T96-048**
Effective Emittance for Cassini Multilayer Insulation Blankets and Heat Loss near Seams **T96-049**
Wideband Correlated- k Method Applied to Absorbing, Emitting, and Scattering Media **T96-050**
Thermal Conductivity of a Thermosetting Advanced Composite During Its Cure **T96-065**
Air-Cooling System for Metal Oxide Semiconductor Controlled Thyristors Employing Miniature Heat Pipes **T96-067**
Nonequilibrium Evaporation from a Heated Liquid Layer **T96-069**
Analytical Expression for a Concentric-Cylinder Radiation View Factor **T96-075**
Novel Stokesmeter **T96-076**
Ignition of Propane-Air Mixture by Radiatively Heated Small Particles **T96-077**
New Chill-Block Melt Spinning Relations to Predict Ribbon Thickness **T96-079**
Comparison of Numerical Quadrature Schemes Applied in the Method of Discrete Transfer **T96-081**
Plasmadynamics Model for Nonequilibrium Processes in N_2/H_2 Arcjets **T96-082**
Entropy Balance and Performance Characterization of the Narrow Basic Pulse-Tube Refrigerator **T96-096**

Thermochemistry and Chemical Kinetics

Kinetics of Nitric Oxide Formation Behind Shock Waves **T96-028**
Measurement of Catalytic Recombination Coefficients on Quartz Using Laser-Induced Fluorescence **T96-032**
Modeling of Nonequilibrium Radiation Phenomena: An Assessment **T96-055**
Nonequilibrium Vibrational Kinetics in the Boundary Layer of Re-Entering Bodies **T96-056**
Electron and Vibrational Kinetics in the Boundary Layer of Hypersonic Flow **T96-057**

Direct Simulation of Shock Front Radiation in Air **T96-058**

Mass Spectrometry and Optical Spectroscopy in N_2 - CO_2 and N_2 - CH_4 Plasma Jets **T96-059**

Radiative Heat Transfer Effects in Chemically Reacting Nozzle Flows **T96-061**

Ignition of Propane-Air Mixture by Radiatively Heated Small Particles **T96-077**

Conservative Species Weighting Scheme for the Direct Simulation Monte Carlo Method **T96-085**

Thermophysical Properties

Approximate Calculation of Transport Coefficients of Earth and Mars Atmospheric Dissociating Gases **T96-030**

Natural Convection Heat Transfer from Helicoidal Pipes **T96-041**

Spectral-Directional Emittance of Oxidized Copper **T96-047**

Effective Emittance for Cassini Multilayer Insulation Blankets and Heat Loss near Seams **T96-049**

Wideband Correlated-k Method Applied to Absorbing, Emitting, and Scattering Media **T96-050**

Comparison of Mass Sensitivities of 10- and 15-MHz Quartz Crystal Microbalances **T96-074**

Novel Stokesmeter **T96-076**

Emittance Measurements for a Thin Liquid Sheet Flow **T96-080**

Analytical Fits for the Determination of the Transport Properties of Air **T96-100**