

Preliminary Program

Revised: July 31, 2001.

MICROGRAVITY TRANSPORT PROCESSES IN FLUID, THERMAL, BIOLOGICAL AND MATERIALS SCIENCES II

September 30 – October 5, 2001

Banff Centre for Conferences

Banff, Alberta, Canada

Conference Chair & Scientific Secretary:

Prof. S.S Sadhal, University of Southern California, USA

Co-Chairs:

Prof. V.K. Dhir, UCLA, USA

Prof. J. Straub, Technical University of Munich, Germany

Prof. H. Ohta, Kyushu University, Japan

Prof. R.W. Smith, Queen's University, Canada



United Engineering Foundation, Inc.

Three Park Avenue, 27th Floor

New York, NY 10016-5902

T: 1-212-591-7836 - F: 1-212-591-7441

E: engfnd@aol.com - www.engfnd.org/1ay.html

MONDAY, OCTOBER 1, 2001 (continued)

2. STRUCTURES OF SOLID AND LIQUID DURING MELTING AND SOLIDIFICATION OF INDIUM (Paper No.: MTP-01-05)

Roberto Montanari, Franco Gauzzi and Girolamo Costanza, Dipartimento di Ingegneria Meccanica –Università di Roma 'Tor Vergata', ITALY

3. UNIDIRECTIONAL SOLIDIFICATION OF MAGNETOSTRICTIVE MATERIALS USING MAGNETIC FIELD IN MICROGRAVITY (Paper No.: MTP-01-06)

Hideki Minagawa, Hideaki Nagai, Yoshinori Nakata and Takeshi Okutani, Hokkaido National Industrial Research Institute, JAPAN,
Keiji Kamada, Japan Space Utilization Promotion Center

4. DIELECTRIC IN-SITU MONITORING OF MICROGRAVITY POLYMERIZATIONS

(Paper No.: MTP-01-07)

Alvin P. Kennedy, Solomon Tadesse and Tanika Allen, Morgan State University, Department of Chemistry, USA

12:30 pm – 1:30 pm

Lunch

1:30 pm – 3:30 pm

Session 3

Crystal Growth

Session Co-Chairs: R.W. Smith and B. Andrews

1. KEYNOTE LECTURE: SYNTHESIS OF InSb SEMICONDUCTOR CRYSTAL BY UNIDIRECTIONAL SOLIDIFICATION IN SHORT-DURATION MICROGRAVITY (Paper No.: MTP-01-13)

Takeshi Okutani, Hideko Minagawa, Hideaki Nagai and Yoshinori Nakata, Hokkaido National Industrial Research Institute, JAPAN
Keiji Kamada, Japan Space Utilization Promotion Center

2. MICROGRAVITY EFFECTS ON SOME THERMODYNAMIC AND KINETIC PROPERTIES OF COLLOIDAL DISPERSIONS (Paper No.: MTP-01-12)

Tsuneo Okubo and Akira Tsuchida, Department of Applied Chemistry, Gifu University, JAPAN

3. HEAT AND MASS TRANSPORT AT PLANAR AND DENDRITIC SOLIDIFICATION FRONTS UNDER MICROGRAVITY AND 1G CONDITIONS (Paper No.: MTP-01-14)

Hans M. Tensi, Technical University of Munich (TUM - FATUM), GERMANY

4. INFLUENCE OF INDUCED HYDRODYNAMICS ON THE MASS TRANSFER AT THE AQUEOUS SOLUBLE CRYSTAL GROWTH IN NORMAL AND LOW GRAVITY CONDITIONS

(Paper No.: MTP-01-15)

V.V. Zilberberg, V.A. Brailovskaya and L.V. Feoktistova, Institute of Applied Physics Russian Academy of Sciences, RUSSIA

5. QUALITY IMPROVEMENT OF CASTINGS FOR AIRPLANES AND CARS BY MICROGRAVITY CRYSTALLIZATION EXPERIMENTS (Paper No.: MTP-01-86)

Hans M. Tensi, Technical University of Munich (TUM - FATUM), GERMANY

MONDAY, OCTOBER 1, 2001 (continued)

3:30 pm – 5:00 pm Informal Discussion

5:00 pm – 7:00 pm **Session 4**
Materials Processing II
Session Co-Chairs: K. Rezkallah and Takeshi Okutani

1. **THE INFLUENCE OF GRAVITY ON COMPOSITIONAL UNIFORMITY AND MICROSTRUCTURE IN IMMISCIBLE Al-In ALLOYS** (Paper No.: MTP-01-08)
Prof. J. Barry Andrews, Leticia J. Hayes, University of Alabama at Birmingham, USA
2. **HOT TEARING IN CAST METALS** (Paper No.: MTP-01-09)
Reginald W. Smith, Queen's University, Department of Materials & Metallurgical Engineering, CANADA
M. Sahoo, CANMET, NRC Canada, CANADA
3. **THERMAL DIFFUSIVITY COEFFICIENT OF GLYCERIN DETERMINED ON AN ACOUSTICALLY LEVITATED DROP** (Paper No.: MTP-01-10)
Kenichi Ohsaka, Alexei Rednikov and Satwindar S. Sadhal, University of Southern California, USA
4. **REDUCED ALGORITHMS FOR MASS AND THERMAL DIFFUSIVITY DETERMINATIONS** (Paper No.: MTP-01-87)
R. Michael Banish, Lyle B. Jalbert, Timothee L. Pourpoint, CMMR, University of Alabama in Huntsville, Huntsville, Alabama USA
J. Iwan D. Alexander¹ and Robert F. Sekerka²,
¹ Case Western Reserve University, Cleveland, Ohio, USA, ²Carnegie Mellon University, Pittsburgh, Pennsylvania 15213 USA
5. **ATEN - A NEW HIGH TEMPERATURE MATERIALS PROCESSING FACILITY FOR THE INTERNATIONAL SPACE STATION** (Paper No.: MTP-01-88)
Wayne N.O. Turnbull, Lowell Misener, Timothy J.N. Smith and Guy Oram
Millenium Biologix Inc., Kingston, Ontario, Canada.

7:00 pm – 8:30 pm Dinner

TUESDAY, OCTOBER 2, 2001

7:00 am – 8:00 am Breakfast

8:00 am – 9:45 am **Session 5**
Interfacial Phenomena I
Session Co-Chairs: L.G. Leal and Yoshiyuki Abe

1. **FOAMS IN MICROGRAVITY** (Paper No.: MTP-01-19)
S.J. Cox, D. Weaire and G. Bradley, Trinity College Dublin, Physics Department, IRELAND
G. Verbist, Shell Research and Technology Centre, THE NETHERLANDS

TUESDAY, OCTOBER 2, 2001 (continued)

2. **VELOCITY FIELD MEASUREMENT OF MISCIBLE DISPLACEMENT IN ROUND TUBES**
(Paper No.: MTP-01-20)
J. Kuang and T. Maxworthy, Department of Aerospace and Mechanical Engineering, University of Southern California, USA
P. Petitjeans, Ecole Supérieure de Physique et Chimie Industrielles, Paris, FRANCE
3. **UNSTABLY STRATIFIED MISCIBLE FLUIDS IN A HELE-SHAW CELL: THREE-DIMENSIONAL LINEAR STABILITY RESULTS BASED ON THE STOKES EQUATIONS**
(Paper No.: MTP-01-21)
Eckart Meiburg and Frank Graf, Mechanical and Environmental Engineering Department, University of California, Santa Barbara, USA
Carlos Haertel, ETH Zurich
4. **OPTICAL MEASUREMENT OF CONCENTRATION GRADIENT NEAR MISCIBLE INTERFACES** (Paper No.: MTP-01-22)
Nasser Rashidnia and R. Balasubramaniam, National Center for Microgravity Research on Fluids and Combustion NASA GRC, USA
5. **STUDIES OF THIN FILM EVAPORATION IN THE FRAMEWORK OF THE CIMEX CONVECTION AND INTERFACIAL MASS EXCHANGE) RESEARCH PROGRAM** (Paper No.: MTP-01-25)
P. Stephan, T. Gambaryan-Roisman, C. Brandt and C. Hoehmann, Darmstadt University of Technology, Institute of Technical Thermodynamics, GERMANY
J.-C. Legros, Université Libre de Bruxelles, Microgravity Research Centre, BELGIUM
G. Bekaert, Société Anonyme Belge de Constructions Aéronautiques, Belgium

9:45 am – 10:00 am

Coffee Break

10:00 am – 12:30 pm

Session 6

Two-Phase Flows I: Drops, Bubbles and Particles

Session Co-Chairs: S.S. Sadhal and J. Kim

1. **KEYNOTE LECTURE: FLOW-INDUCED COALESCENCE OF DROPS IN A VISCOUS LIQUID**
(Paper No.: MTP-01-26)
L. Gary Leal, University of California at Santa Barbara, Department of Chemical Engineering, Santa Barbara, California, 93106, USA
2. **EXPERIMENTAL INVESTIGATION OF A TWO PHASE FLOW BEHAVIOUR (AIR-WATER) IN A DISPERSE BUBBLE REGIME THROUGH ULTRASONIC SIGNALS AND DIGITAL**
(Paper No.: MTP-01-27)
Manolo Pires and V.C.S. Ferreira, Universidade Federal do Rio Grande do Sul , BRAZIL
3. **SPRAY COOLING HEAT TRANSFER IN REDUCED GRAVITY** (Paper No.: MTP-01-28)
Yoshiyuki Abe, Electrotechnical Laboratory, JAPAN
Ken-ichi Yoshida, Former Graduate Student of Keio Univ.
Toshiharu Oka, IHI Co., Ltd.
Yasuhiko H. Mori and Akira Nagashima, Keio University, JAPAN

TUESDAY, OCTOBER 2, 2001 (continued)

4. CONDENSATE REMOVAL MECHANISMS IN A CONSTRAINED VAPOR BUBBLE HEAT EXCHANGER (Paper No.: MTP-01-29)

Joel L. Plawsky, Ling Zheng, Yingxin Wang and Peter C. Wayner, Jr., Rensselaer Polytechnic Institute, Chemical Engineering Department, USA

5. HEAT TRANSFER AT BUBBLING OF DIELECTRIC LIQUID IN AN ELECTRIC FIELD (Paper No.: MTP-01-89)

Oleg V. Motorin and Tudor F. Sajin, Institute of Applied Physics of Academy of Sciences of Moldova, MOLDOVA

6. NUMERICAL SIMULATIONS OF BUBBLE MOTION IN A VIBRATED CELL UNDER MICROGRAVITY USING LEVEL SET AND VOF ALGORITHMS (Paper No.: MTP-01-30)

Hiroyuki Takahira, Department of Energy Systems Engineering, Osaka Prefecture University, JAPAN
Timothy Friesen, Yoshitaka Yasuda*, Lisa Allegro and Masahiro Kawaji, Department of Chemical Engineering and Applied Chemistry, University of Toronto, CANADA
*Graduate School of Engineering, Osaka Prefecture University

7. STUDIES OF FUNDAMENTAL PARTICLE DYNAMICS IN MICROGRAVITY (Paper No.: MTP-01-32)

Roger Rangel, University of California at Irvine, Dept. Mech. and Aerospace Eng, USA
James Trolinger, MetroLaser inc.
Carlos Coimbra, University of Hawaii
William Witherow and Jan Rogers, NASA MSFC

8. STUDIES ON FLAME EXTINCTION BY INERT PARTICLES IN NORMAL- AND MICROGRAVITY (Paper No.: MTP-01-50)

F. N. Egolfopoulos, M.G. Andac and C.S. Campbell, University of Southern California, Department of Aerospace & Mechanical Engineering, USA

12:30 pm – 1:30 pm

Lunch

1:30 pm – 3:30 pm

Ad hoc sessions / Free Time

3:30 pm – 5:30 pm

Session 7

Interfacial Phenomena II

Session Co-Chairs: R. Balasubramaniam and W. Grassi

1. AGGREGATION OF BUBBLES AND PARTICLES ON SURFACES BY THERMOCAPILLARY AND ELECTROOSMOTIC FLOWS (Paper No.: MTP-01-35)

Paul J. Sides, John L. Anderson, Hiroki Kasumi and Scott Guelcher, Carnegie Mellon University, Department of Chemical Engineering, USA
Yuri E. Solomentsev, Motorola

2. THERMOCAPILLARY CONVECTION AROUND GAS BUBBLES - AN IMPORTANT NATURAL EFFECT FOR THE ENHANCEMENT OF HEAT TRANSFER IN LIQUIDS UNDER MICROGRAVITY (Paper No.: MTP-01-36)

J. Betz, GERMANY
J. Straub, Lehrstuhl A für Thermodynamik, Technical University of Munich, GERMANY

TUESDAY, OCTOBER 2, 2001 (continued)

3. **EXPERIMENTAL INVESTIGATION OF THE LIQUID INTERFACE REORIENTATION UPON STEP REDUCTION IN GRAVITY** (Paper No.: MTP-01-23)
Mark Michaelis, Michael E. Dreyer and Hans J. Rath, Center of Applied Space Technology and Microgravity - University of Bremen, GERMANY
4. **CHARACTERISTICS OF MARANGONI CONVECTION DURING WATER EVAPORATION**
(Paper No.: MTP-01-24)
C. A. Ward, F. Duan, D. Stanga and Z. Saghir, University of Toronto, Dept. of Mechanical & Industrial Engineering, CANADA
5. **NEAR-CRITICAL CONVECTION IN GROUND-BASED AND MICROGRAVITY ENVIRONMENTS**
(Paper No.: MTP-01-17)
V.I. Polezhaev, M. Emelianov, A.A. Gorbunov and E.B. Soboleva, The Institute for Problems in Mechanics Russian Academy of Sciences, RUSSIA
6. **MICROSCALE HEAT TRANSFER TO SUBCOOLED WATER: 10 - 400 ATM, 0 - 4000 W/CM²**
(Paper No.: MTP-01-18)
Robert H. Leyse, Inz, Incorporated, USA

5:30 pm – 5:45 pm Refreshment Break

5:45 pm – 7:15 pm **Session 8**
Two-Phase Flows II
Session Co-Chairs: H. Ohta and E. Meiburg

1. **MICROWAVE HEATING OF MULTIPHASE FLUIDS** (Paper No.: MTP-01-37)
Alvin P. Kennedy, Solomon Tadesse and Janine Nunes, Morgan State University, Department of Chemistry, USA
2. **A STUDY OF ANNULAR FLOW FILM CHARACTERISTICS IN MICROGRAVITY AND HYPERGRAVITY CONDITIONS** (Paper No.: MTP-01-38)
Ryan MacGillivray and Kamel S. Rezkallah, Microgravity Research Group, Mechanical Engineering, University of Saskatchewan, CANADA
3. **A STUDY FOR GAS-LIQUID TWO-PHASE FLOW IN HORIZONTAL TUBE UNDER MICROGRAVITY** (Paper No.: MTP-01-39)
Buhong Choi, Terushige Fujii, Hitoshi Asano and Katsumi Sugimoto, Department of Mechanical Engineering Kobe University
4. **FREE SURFACE TRACKING AND COMPUTATIONAL SIMULATIONS FOR INTERNAL CONDENSING FLOWS'** (Paper No.: MTP-01-40)
Amitabh Narain and Q. Liang, Michigan Technological University, USA
G. Yu, Durr Industries - USA

7:15 pm – 8:45 pm Dinner

WEDNESDAY, OCTOBER 3, 2001

7:00 am – 8:00 am Breakfast

8:00 am – 10:00 am **Session 9**
Boiling Phenomena I
Session Co-Chairs: V.K. Dhir and S.G. Bankoff

1. **KEYNOTE LECTURE: VAPOR BUBBLES IN SOUND AND FLOW FIELDS** (Paper No.: MTP-01-85)
Andrea Prosperetti and Y. Hao, Department of Mechanical Engineering, The Johns Hopkins University, USA
2. **ORIGIN AND EFFECT OF THERMOCAPILLARY CONVECTION IN SUBCOOLED BOILING** (Paper No.: MTP-01-41)
Johannes Straub, Technische Universitaet Muenchen, Institut fuer Thermodynamik, GERMANY
3. **HIGH HEAT FLUX COOLING BY MICROBUBBLE EMISSION BOILING** (Paper No.: MTP-01-42)
Koichi Suzuki, Hiroki Saitoh and Kazuaki Matsumoto, Graduate School, Science University of Tokyo, JAPAN
4. **MULTIPLE BUBBLE DYNAMICS AND ASSOCIATED HEAT TRANSFER DURING NUCLEATE BOILING UNDER LOW GRAVITY CONDITIONS** (Paper No.: MTP-01-43)
Dongming Qiu, Gihong Son and Vijay K. Dhir, Dept. of Mech. & Aerospace Eng., University of California at Los Angeles, USA
David Chao, NASA Glenn Research Center, Microgravity Division, USA
5. **RAPIDLY EXPANDING VISCOUS DROP FROM A SUBMERGED ORIFICE AT FINITE REYNOLDS NUMBERS** (Paper No.: MTP-01-44)
Nivedita R. Gupta and Kathleen J. Stebe, Johns Hopkins University, USA

10:00 am – 10:15 am Coffee Break

10:15 am – 12:30 pm **Session 10**
Boiling Phenomena II
Session Co-Chairs: J. Straub and M. Kawaji

1. **KEYNOTE LECTURE: REVIEW OF EXISTING RESEARCH ON MICROGRAVITY BOILING/TWO-PHASE FLOW AND FUTURE EXPERIMENTS ON THE INTERNATIONAL SPACE STATION** (Paper No.: MTP-01-90)
Haruhiko Ohta, Dept. Aeronautics and Astronautics, Kyushu University, JAPAN
Atushi Baba, NASDA, JAPAN
Kamiel S. Rezkallah, Microgravity Research Group, Mechanical Engineering, University of Saskatchewan, CANADA
2. **POOL FILM BOILING EXPERIMENTS ON A WIRE IN LOW GRAVITY: PRELIMINARY RESULTS** (Paper No.: MTP-01-45)
Walter Grassi, Dipartimento di Energetica - Università di Pisa, ITALY
Paolo Di Marco, Federico Trentavizi,

WEDNESDAY, OCTOBER 3, 2001 (continued)

3. **POOL BOILING HEAT TRANSFER ON SMALL HEATERS: EFFECTS OF GRAVITY AND SUBCOOLING** (Paper No.: MTP-01-46)
Jungho Kim and John F. Benton, University of Maryland, Dept. of Mechanical Engineering, USA
4. **MECHANISMS ON STEADY-STATE NUCLEATE BOILING IN MICROGRAVITY** (Paper No.: MTP-01-47)
Ho Sung Lee, Western Michigan University, Mechanical and Aeronautical Engineering, USA
5. **HEAT TRANSFER MECHANISMS IN MICROGRAVITY FLOW BOILING** (Paper No.: MTP-01-48)
Haruhiko Ohta, Kyushu University, Dept. Aeronautics and Astronautics, JAPAN
6. **CRITERIA FOR APPROXIMATING MICROGRAVITY FLOW BOILING CHARACTERISTICS IN EARTH GRAVITY** (Paper No.: MTP-01-49)
Herman Merte Jr., Jaeseok Park, William W. Schultz and Robert B. Keller, University of Michigan, Department of Mechanical Engineering, Ann Arbor, USA

12:30 pm – 1:45 pm	Lunch
1:45 pm – 5:30 pm	Informal Discussion
5:30 pm – 7:00 pm	Free Time
7:00 pm – 9:00 pm	Banquet Banquet Speaker: TBA

THURSDAY, OCTOBER 4, 2001

7:00 am – 8:00 am Breakfast

8:00 am – 10:00 am **Session 11**
Bio-Transport Processes I
Session Co-Chairs: P.S. Ayyaswamy and Marc Pusey

1. **KEYNOTE LECTURE: MICROGRAVITY STUDIES OF CELLS AND TISSUES** (Paper No.: MTP-01-53)
Gordana Vunjak-Novakovic and Lisa E. Freed, M.I.T., USA
Javier de Luis, Payload Systems Inc.
Nancy Searby, NASA Ames Research Center
2. **COLLAGEN FIBRIL FORMATION AT MICROGRAVITY CONDITIONS: FIBRILLOGENESIS UNDER DIFFUSION CONTROL** (Paper No.: MTP-01-56)
Dale P. DeVore, Collagenesis, Inc., USA
Arthur Veis and Thomas Dahl, Northwestern University, Department of Cell and Molecular Biology, USA
Kenneth E. Hughes, Cornerstone Solutions, Inc., USA
3. **FLOW FIELD MEASUREMENTS IN THE CELL CULTURE UNIT** (Paper No.: MTP-01-57)
Steve Walker, Michael Wilder, Donovan Mathias and Nancy Searby NASA Ames Research Center, USA

THURSDAY, OCTOBER 4, 2001 (continued)

4. **COMPACT OPTICAL INSTRUMENTATION FOR THE ON-LINE MONITORING OF BACTERIAL GROWTH IN SPACE** (Paper No.: MTP-01-58)
R.C. van Benthem and D. van den Assem, Dutch National Laboratory, NLR, THE NETHERLANDS
Janneke Krooneman, Bioclear Environmental Biotechnology, Groningen, THE NETHERLANDS.
5. **BACTERIAL-HOST CELL INTERACTION IN SIMULATED MICROGRAVITY** (Paper No.: MTP-01-59)
A.K. Chopra, D.W. Niesel and V. Chopra
Departments of Microbiology & Immunology and Obstetrics & Gynecology, UTMB, USA
6. **EFFECTS OF MICROGRAVITY ON THE SELF-ASSEMBLY OF TYPE I COLLAGEN** (Paper No.: MTP-01-68)
Fredrick H. Silver, Department of Pathology and Laboratory Medicine, UMDNJ-Robert Wood Johnson Medical School, USA
Michael Jaffee, Medical Device Concept Laboratory, New Jersey Institute of Technology
Dale DeVore, Collagenesis, Inc.

10:00 am – 10:15 am Coffee Break

10:15 am – 12:30 pm **Session 12**
Protein Crystal Growth
Session Co-Chairs: G. Vunjak-Novakovic and N. Searby

1. **KEYNOTE LECTURE: PROTEIN CRYSTAL GROWTH IN MICROGRAVITY: PRACTICAL EXPERIMENTS VERSUS THEORY** (Paper No.: MTP-01-60)
Naomi E. Chayen, Imperial College of Science, Technology and Medicine, Biological Structure and Function Section, Division of Biomedical Sciences, UNITED KINGDOM
2. **PRIMARY STRUCTURE AND CRYSTALLIZATION OF PROKARYOTIC EXTREMELY THERMOPHILIC OUTER SURFACE LAYER GLYCOPROTEINS** (Paper No.: MTP-01-61)
Helmut König and H. Claus, Institut für Mikrobiologie und Weinforschung, Johannes Gutenberg-Universität, Mainz, GERMANY
C. Evrard, J.-P. Declercq, Université Catholique de Louvain, BELGIUM
T. Debaerdemaeker, Universität Ulm, GERMANY
3. **NUMERICAL SIMULATION OF PROTEIN CRYSTAL GROWTH USING A COUPLED DIFFUSION MODEL** (Paper No.: MTP-01-62)
Roberto Sartorio and Luigi Paduano, University of Naples, ITALY
Dario Castagnolo and Luigi Carotenuto, MARS Center
Alessandro Vergara, University of Naples and MARS Center
4. **NEW FLIGHT HARDWARE FOR MICROGRAVITY CRYSTAL GROWTH EXPERIMENTS** (Paper No.: MTP-01-63)
Karen Moore, Robyn Rouleau and Lawrence DeLucas, University of Alabama at Birmingham, USA
5. **A MODEL FOR MACROMOLECULAR CRYSTALLIZATION** (Paper No.: MTP-01-64)
Marc L. Pusey, Biophysics, NASA/MSFC, USA

THURSDAY, OCTOBER 4, 2001 (continued)

6. **SPACE GROWN PROTEIN CRYSTALS ARE MORE USEFUL FOR STRUCTURAL DETERMINATION** (Paper No.: MTP-01-65)
Joseph D. Ng, University of Alabama in Huntsville, Laboratory for Structural Biology, Dept. of Biological Sciences, USA

7. **USE OF MULTICOMPONENT DIFFUSION COEFFICIENTS TO MODEL CRYSTAL GROWTH CONDITIONS IN MICROGRAVITY** (Paper No.: MTP-01-66)
John G. Albright and Onofrio Annunziata, Texas Christian University, Chemistry Department, USA
Daniela Buzatu, 'Politehnica' University Bucharest
Luigi Paduano, University of Naples
Arne J. Pearlstein, University of Illinois

12:30 pm – 1:30 pm Lunch

1:30 pm – 4:30 pm Informal Discussion

4:30 pm – 7:00 pm **Session 13**
Bio-Transport Processes II
Session Co-Chairs: Naomi Chayen and Joseph Ng

1. **KEYNOTE LECTURE: COMPOSITE MICROSPHERE: EFFECTS OF DIFFERENT FILLER MATERIALS ON POLYMERIC SURFACE BIOACTIVITY** (Paper No.: MTP-01-67)
P.S. Ayyaswamy, Q. Qiu*, and P. Ducheyne, University of Pennsylvania, Department of Mechanical Engineering and Applied Mechanics, USA, *Gliatech Inc., USA
2. **VAPOR TRANSPORT GROWTH OF ORGANIC SOLIDS IN MICROGRAVITY AND UNIT GRAVITY: SOME COMPARISONS AND RESULTS TO DATE.** (Paper No.: MTP-01-69)
Maria Ittu Zugrav, William E. Carswell and Glen B. Haulenbeek, University of Alabama in Huntsville, Center for Microgravity and Materials Research, USA
3. **ANALYSIS OF GRAVITY-DEPENDENT AND INDEPENDENT EXTRACELLULAR MASS TRANSPORT PHENOMENA** (Paper No.: MTP-01-70)
David M. Klaus and John D. Jost, University of Colorado, Aerospace Engineering Sciences, USA
4. **SLIDING CAVITY FLUID CONTACTORS IN LOW-GRAVITY FLUIDS, MATERIALS AND BIOTECHNOLOGY RESEARCH** (Paper No.: MTP-01-71)
Paul Todd and John C. Vellinger, Space Hardware Optimization Technology, Inc., USA
Shramik Sengupta and Michael G. Sportiello, University of Colorado, USA
William B. Krantz, University of Cincinnati
5. **VERSATILE RESEARCH TOOLS FOR BIOTECHNOLOGY AND LIFE SCIENCES EXPERIMENTS IN SPACE** (Paper No.: MTP-01-72)
John C. Vellinger, Anthony Sharpe, William M. Jennings, Heidi Platt and Paul Todd, Space Hardware Optimization Technology, Inc., USA
6. **CULTURE OF CELLS IN SIMULATED MICROGRAVITY ENVIRONMENT** (Paper No.: MTP-01-73)
Vimlarani Chopra*, Edward V Hannigan* and Neal R Pellis^o. Department of Ob-Gyn, UTMB, Galveston*, and Cellular Biotechnology Program, NASA JSC, Houston TX^o, USA

FRIDAY, OCTOBER 5, 2001

7:00 am – 8:00 am

Breakfast

8:00 am – 10:00 am

Session 14

Space Systems Fluid and Thermal Management I

Session Co-Chairs: H.S. Lee and Oleg V. Motori

1. **COUPLED MEAN FLOW-AMPLITUDE EQUATIONS FOR NEARLY INVISCID PARAMETRICALLY DRIVEN FLOWS** (Paper No.: MTP-01-76) Edgar Knobloch, University of California at Berkeley, Department of Physics, USA.
Jose M Vega and Carlos Martel, Polytechnic University of Madrid, SPAIN
2. **USING THE EFFECT OF MICROGRAVITY IN THE PROCESS OF COOLING CANNED PRODUCT IN METAL JARS** (Paper No.: MTP-01-78)
Jacov G. Verkhivker, VISMA LTD., UKRAINE
3. **TRANSPORT FROM HIGHER ORDER G-JITTER EFFECTS** (Paper No.: MTP-01-80)
Robert J. Naumann, Center for Microgravity and Materials Science, University of Alabama in Huntsville, USA
4. **THE ELEMENTS OF MOTIVE THERMODYNAMICS FOR NEW SOLAR SPACE SYSTEMS** (Paper No.: MTP-01-82)
Anatoly Sukhodolsky, General Physics Institute of Russian Academy of Sciences, RUSSIA
5. **NORMAL AND MICROGRAVITY GRAVITY TESTING OF A MICROCHANNEL PHASE SEPARATOR** (Paper No.: MTP-01-83)
V. Susie Stenkamp and Ward E. TeGrotenhuis, Battelle Memorial Institute, Pacific Northwest Division, USA
6. **THE USE OF PULSATILE FLOW TO SEPARATE SPECIES- AN APPLICATION TO THE SPACE PROGRAM** (Paper No.: MTP-01-84)
R. Narayanan and Aaron Thomas, University of Florida, Department of Chemical Engineering, USA

10:00 am – 10:30 am

Coffee Break

10:30 am – 11:45 am

Closing Remarks, Panel Discussions and Wrap up

11:45 am – 1:15 pm

Lunch