Plenary Session

Monday Morning, 3 April, 8:45–10:30

Numerical Modeling of RF and Microwave Heating: A Review

H. Malan and A.C. Metaxas*, EUG, Engineering Department, University of Cambridge, Cambridge, England, U.K.

Dr A.C. (Ricky) Metaxas received a BSc in electrical engineering in 1965 and a Ph.D. in physics in 1968 from the University of London. After four years of post-doctoral research at the University College, Swansea, U.K., on aspects of nuclear fusion under the auspices of the UKAEA, he joined the Electricity Council Research Centre (now E A Technology) as a research officer in the electro-physics group. There followed ten years of research and development, involving close liaison with industry, on radio frequency and microwave industrial applications. In 1982 he joined the Engineering Department, University of Cambridge where he heads the EUG Group researching various topics of electroheat, with particular emphasis on computational techniques in electromagnetics. He is a Fellow and Tutor at St. John's College, Cambridge, and an Associate Editor of the Journal of Microwave Power and Electromagnetic Energy. He has delivered a number of keynote addresses world-wide on the current and future status of radio frequency and microwave heating, a subject on which he co-authored a book entitled "Industrial Microwave Heating." He is the author of more than 150 publications and also written a textbook on electroheat, entitled, "Foundations of Electroheat: a unified approach." He is a Fellow of the IEE and President of AMPERE.

Hugo Malan attained a Cum Laude standard in both his B.Eng. and M.Eng. degrees in 1994 and 1995 respectively from the Electrical and Electronic Engineering Department at the University of Stellenbosch in South Africa. His research project entailed developing a hybrid finite element-method of moments code for modelling the radiation pattern, input impedance and radar cross section of microstrip patch antennae. He joined the EUG in 1996 to carry out a Ph.D. in computational electromagnetics developing parallel codes for microwave heating using domain decomposition techniques.

Challenges for the Scientific Cultures of Industry and Academia

John Armstrong, IBM VP, Sci. & Techn. (ret) was trained in applied physics at Harvard. During his 30 years in IBM he held research and R&D management assignments in Yorktown, Zurich, East Fishkill and Armonk. He was IBM Director of Research from 1986 to 1989. Currently he is Chair of the Governing Board of the American Institute of Physics, a member of the National Science Board, Class of 2002, and an external member of the Lab Operations Board of the Dept. of Energy. He received the 1989 Pake Prize of the American Physical Society for research and R&D management in industry.

Technical Program

Monday Morning, 3 April, 11:00–12:45

An Overview of Microwave and RF Processing Systems I

Room: Crystal C

Session Chair: Robert F. Schiffmann, Robert F. Schiffmann Associates, Inc.,149 W. 88th St., New York, N.Y., 10024

(MWA-OV1-01) Principles of Industrial Microwave and RF Heating
R.F. Schiffmann *, Robert F. Schiffmann Associates, Inc., New York, NY.

Chemistry/Polymers I

Room: Crystal E

Session Chair: Richard Gedye, Laurentian University, Dept. of Chem. & Biochemistry, Ramsey Lake Rd., Sudbury, P3E 2C6, Canada

(MWB-CP1-01) Solvent-Free Microwave-Assisted Organic Synthesis (Invited Paper)
A. Loupy *, Universite de Paris Sud, Orsay, France

(MWB-CP1-02) Microwave Mediated Differential Heating of Biphase Systems Applied on Sensitive Organic Reactions
P.L. Nilsson *, M.L.E. Larhed, and A. Hallberg, Uppsala University, Uppsala, Sweden

(MWB-CP1-03) Microwave Synthesis of Alkali-Niobates
M.R. Fleming *, B. Vaidhyanathan, M. Goel, and D.K. Agrawal, Pennsylvania State University, University Park, Pa.

(MWB-CP1-04) Experimental Characterization of a System for Processing Zeolite Solutions with Homogeneous and Gradient Power Distribution During Microwave Heating
R. Schertlen *, University of Karlsruhe, Karlsruhe, Germany; C. Stenzel, and W. Grill, Dornier DASA, Friedrichshafen, Germany

Modeling I

Room: Crystal D

Session Chair: Ricky Metaxas, University of Cambridge, Engineering Dept., Trumpington St., Cambridge, CB2 1PZ, U.K.

(MWC-MO1-01) Finite Element Computations of 2D Microwave Thawing (Invited Paper)
K.G. Ayappa *, Indian Institute of Science, Bangalore, India

(MWC-MO1-02) Microwave Heating of Thermal Runaway Materials: Experimental Verification of a Coupled Model
J.R. Thomas Jr. *, J.M. Curtis Jr., C.H. Stern, W.A. Davis, and B. McConnell, Virginia Polytechnic Institute and State University, Blacksburg, Va.

(MWC-MO1-03) An Investigation of the Electromagnetic Fields and Heating in Microwave Cavities Using Multiple Inputs
A.M. Uyanik *, M. Siegel, B. Wright, and J. Asmussen Jr., Michigan State University, East Lansing, Mich.

(MWC-MO1-04) Modeling of Millimeter Wave Beam Processing of Materials
K.I. Rybakov *, and V.E. Semenov, Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

Monday Afternoon, 3 April, 13:00–15:45

An Overview of Microwave And RF Processing Systems II

Room: Crystal C

Session Chair: Robert F. Schiffmann, Robert F. Schiffmann Associates, Inc., 149 W. 88th St., New York, N.Y., 10024

(MWA-OV2-01) Industrial Heating Tubes
R. Alper *, Svetlana Electron Devices, Inc., Portola Valley, Calif.

(MWA-OV2-02) Introduction to Microwave Generators and Power Supplies
R. Winter *, Muegge Electronic GmbH, Reichelsheim, Germany

Ceramics I

Room: Crystal E

Session Chair: Lynn Johnson, Northwestern University, Dept. of Mat. Sci. & Engrg., 2225 N. Sheridan Rd., Evanston, Ill., 60208-3108

(MWB-CE1-01) Homogeneous High Temperature Heating in a Hot Wall mm-Wave Oven
G. Link *, L. Feher, and M. Thumm, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

(MWB-CE1-02) Investigation of the Dielectric Properties of Silicon, Carbon and Their Mixtures in Application to SHS Synthesis of SiC Powder
J.G.P. Binner *, Brunel University, Uxbridge, U.K.; T.E. Cross, The University of Nottingham, Nottingham, U.K.; T. Chudoba, D. Kuzmenko, and W. Lojkowski, Polish Academy of Sciences, Warsaw, Poland

(MWB-CE1-03) A Critical Assessment of Thermometric Accuracy During Microwave Sintering of Engineering Ceramics
R.S. Donnan *, and M. Samandi, University of Wollongong, Wollongong, Australia

(MWB-CE1-04) Monolithic Refractories and Microwave Drying
H. Taira *, T. Kayama, K. Sawano, and T. Nishitani, Nippon Steel Corp., Futtsu, Japan; S. Hanagiri, Nippon Steel Corp., Oita, Japan

Medicine/Biology I

Room: Crystal D

Session Chair: Susan Hagness, University of Wisconsin, Dept. of Electrical & Computer Engrg., Madison, Wis., 537016

*** Denotes presenting author**

(MWC-MB1-01) Latest Progress in Radio Frequency Dosimetry (Invited Paper)
N. Kuster *, K. Pokovic, and A. Christ, Swiss Federal Institute of Technology, Zurich, Switzerland

(MWC-MB1-02) Analysis of the Interaction Between a Layered Spherical Human Head Model and a Linear Antenna
K.S. Nikita *, G.S. Stamatakos, and N.K. Uzunoglu, National Technical University of Athens, Athens, Greece

(MWC-MB1-03) Microwave Treatment of Germinated Yellow Pea
P. Kadlec *, A. Rubecova, A. Hinkova, and J. Kaasova, Institute of Chemical Technology, Prague, Czech Republic

(MWC-MB1-04) Microwave Treatment of Rice
P. Kadlec *, J. Kaasova, Z. Bubnik, and V. Pour, Institute of Chemical Technology, Prague, Czech Republic

Monday Afternoon, 3 April, 16:15–18:00

An Overview of Microwave and RF Processing Systems III

Room: Crystal C

Session Chair: Robert F. Schiffmann, Robert F. Schiffmann Associates, Inc., 149 W. 88th St., New York, N.Y., 10024

(MWA-OV3-01) Waveguide Components and Configurations for Optimal Performance
J.F. Gerling *, GAE, Inc., Modesto, Calif.

(MWA-OV3-02) Microwave Applicators for Materials Processing
H.D. Kimrey *, Microwave Materials Technologies, Inc., Knoxville, Tenn.

General I

Room: Crystal E

Session Chair: Jon Binner, Brunel University, Dept. of Mat. Engrg., Uxbridge, Middlesex, UB8 3PH, U.K.

(MWB-GE1-01) Microwave Electromagnetic Processing Invades New Materials (Invited Paper)
R. Roy *, D.K. Agrawal, and J.P. Cheng, Pennsylvania State University, University Park, Pa.

(MWB-GE1-02) A Comparative Study on Microwave Heating of Porous Metals
H.S. Park *, and M. Willert-Porada, University of Bayreuth, Bayreuth, Germany

(MWB-GE1-03) Microwave Sintering of Metals, Powder Metals, and Alloys
D.K. Agrawal *, R.M. Anklekar, B. Vaidhyanathan, and J.P. Cheng, Pennsylvania State University, University Park, Pa.

(MWB-GE1-04) Temperature Measurement in Microwave-Heated Silicon Wafers
S. Ge, J.H. Booske *, R.F. Cooper, K. Thompson, and Y.B. Gianchandani, University of Wisconsin, Madison, Wis.

Plasmas I

Room: Crystal D

Session Chair: Vinga Szabo, Institut fur Materialforschung III, Forschungzentrum Karlsruhe, PO Box 3640, Karlsruhe, 76021, Germany

(MWC-PL1-01) Progress in the In Situ Control of Low Temperature Plasma Processing (Invited Paper)
A. Lunk *, A. Neuffer, P. Scheible, H. Schmidt, and I.P. Vinogradov, University of Stuttgart, Stuttgart, Germany

(MWC-PL1-02) Linearly Extended Bifocal Microwave Enhanced Plasma Device
M. Kaiser *, R. Emmerich, H. Urban, and P. Elsner, Fraunhofer Institute for Chemical Technology, Pfinztal, Germany

(MWC-PL1-03) Plasma Processing of Polymers: Adding Value (Invited Paper)
R.D. Short *, University of Sheffield, Sheffield, U.K.

(MWC-PL1-04) Numerical Modeling of RF Discharges
G.E. Georghiou *, and A.C. Metaxas, University of Cambridge, Cambridge, U.K.

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An Overview of Microwave and RF Processing Systems IV

Room: Crystal C

Session Chair: Robert F. Schiffmann, Robert F. Schiffmann Associates, Inc., 149 W. 88th St., New York, N.Y., 10024

(MWA-OV4-01) Control Systems and Concepts of Control for Industrial Microwave Equipment
E. Brown, T. Tella, and M. Yonnone *, Cober Electronics, Norwalk, Conn.

(MWA-OV4-02) Sensible Electrode Design for Successful RF Heating Applications
J. Zimmerly *, PSC, Inc., Cleveland, Ohio

Chemistry II

Room: Crystal E

Session Chair: Hajek Milan, Institute of Chemical Process Fundamentals, Rozvojova 135, Suchdol, Prague 6, 16502, Czech Republic

(MWB-CP2-01) The 3P's of Microwave-Induced Catalytic Processes: Potential, Planning and Profit (Invited Paper)
J. Wan *, and C. Depew, Queen's University, Kingston, Canada

(MWB-CP2-02) Microwave-Induced Catalytic Reactions in Liquid Phase
M. Hajek, Institute of Chemical Process Fundamentals, Prague, Czech Republic; M. Radoiu *, National Institute for Lasers, Plasma and Radiation Physics, Prague, Czech Republic

(MWB-CP2-03) Microwave-Assisted Heterogeneous Photocatalytic Oxidation of Benzene
J.H. Booske*, S. Kataoka, D.T. Tompkins, M.A. Anderson, M.E. Zorn, and W.A. Zeltner, University of Wisconsin, Madison, Wis.

(MWB-CP2-04) Microwave-Assisted Procedures in Organic Synthesis and Reactive Separation
B. Ondruschka *, M. Nüchter, and U. Müller, University of Jena, Jena, Germany

Dielectric Properties I

Room: Crystal D

Session Chair: Thomas Cross, University of Nottingham, School of Electrical & Electronic Engrg., Nottingham, NG7 2RD, U.K.

(MWC-DP1-01) Measurement of Microwave Permittivity Using Ferrite Loaded Cavity Resonator
T. Nakamura *, Y. Nikawa, and F. Okada, Kokushikan University, Tokyo, Japan

(MWC-DP1-02) Microwave Measurements on Substrates and Printed Wiring Board Materials
J.R. Baker-Jarvis *, and M.D. Janezic, National Institute of Standards & Technology, Boulder, Colo.

(MWC-DP1-03) Analysis of a Split-Cylinder Resonator for Nondestructive Permittivity Measurements
M.D. Janezic *, and J.R. Baker-Jarvis, National Institute of Standards & Technology, Boulder, Colo.

(MWC-DP1-04) Dielectric Measurement Methods Including Internally Calibrated Stripline Fixture
M. Rimbi *, and H.C. Reader, University of Stellenbosch, Stellenbosch, South Africa

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Industrial Applications of Microwave and RF Processing I

Room: Crystal C

Session Chair: John F. Gerling, Gerling Applied Engineering Inc., PO Box 580816, Modesto, Calif., 95358

(MWA-AP1-01) A Businessman's View Of Microwave & RF Processing
B. Krieger *, Cober Electronics, Norwalk, Conn.

(MWA-AP1-02) The Power of Partnerships for Maximum Profit
R. Paules *, Consultant, Norwalk, Conn.

Ceramics II

Room: Crystal E

Session Chair: Monika Willert-Porada, University of Bayreuth, Faculty of Applied Natural Sciences, Univer. 30, Bayreuth, D-95447, Germany

(MWB-CE2-01) Microwave Heating of Glass
H. Römer *, Schott Glas, Mainz, Germany

(MWB-CE2-02) Synthesis of Oxide Pigment Powders by Microwave Treatments
C. Leonelli *, F. Bondioli, C. Siligardi, P. Veronesi, and A.B. Corradi, University of Modena and Reggio Emilia, Modena, Italy

(MWB-CE2-03) Microwave Sintering of PZT Ceramics at 2.45 and 30 GHz Frequencies
S. Rhee *, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany; B. Vaidhyanathan, D.K. Agrawal, and T.R. Shrout, Pennsylvania State University, University Park, Pa.; M. Thumm, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

(MWB-CE2-04) Application of Microwave Joining to SiC Tubes for Radiant Burners and Furnace Coils
R.S. Silberglitt *, FM Technologies, Inc., Fairfax, Va.; G.A Danko, Pratt & Whitney, East Hartford, Conn.

Systems Design I

Room: Crystal D

Session Chair: Thomas Ohlsson, The Swedish Institute for Food, PO Box 5401, Goteborg, S-40229, Sweden

(MWC-SD1-01) Studying the Essential Parameters Affecting the Heat Uniformity in Industrial Microwave Ovens and its Improvement
M. Massoud *, S. Lefeuvre, and M. Abdelaal, ENSEEIHT, Toulouse, France

(MWC-SD1-02) Pattern Synthesis for Microwave Heating Applications
I. Meier *, and J.B. de Swardt, University of Stellenbosch, Stellenbosch, South Africa

(MWC-SD1-03) A Vertical Radio Frequency Design as a Unit Operation for the Continuous Processing of Free-Flowing, Bulk Granular or Particulate Products
J.W. Cresko *, Electrotechnology Applications Center, Bethlehem, Pa.

(MWC-SD1-04) A Constant Power, Load Independent Microwave Source
J.W. Gerber *, and J.B. de Swardt, University of Stellenbosch, Stellenbosch, South Africa

Tuesday Afternoon, 4 April, 14:00–16:00

Poster Session I

Room: Crystal A&B

(MWP-CE-01) RF Melting of Glass - an Innovative Melting Technology
W. Kiefer *, Schott Glas, Mainz, Germany

(MWP-CE-03) Microwave Synthesis of Al_2O_3 and Al_2O_3/SiC Powders by Combustion Reaction
R.H.G.A. Kiminami *, and M.R. Morelli, Federal University of Sao Carlos, Sao Carlos, Brazil; D.C. Folz, and D.E. Clark, University of Florida, Gainesville, Fla.

(MWP-CE-05) Microwave Firing of Heavy Clay Bodies: Examination of Key Variables Which Influence the Microwave Heating Process
G.V.A. Tayler *, Acme Brick Company, Fort Worth, Texas; M. Anderson and M.G. Hamlyn, Staffordshire University, Stoke-on-Trent, U.K.

(MWP-CE-07) Microwave Sintering of Ca-Doped Nanocrystalline ZrO_2 Ceramics
J.G. Huang, and S.B. Bhaduri *, University of Idaho, Moscow, Idaho; W.R. Tinga, University of Alberta, Edmonton, Canada

(MWP-CE-09) Microwave Reactive Sintering to Fully Transparent Aluminum Oxynitride (AlON) Ceramics
J.P. Cheng *, D.K. Agrawal, Y.J. Zhang, and R. Roy, Pennsylvania State University, University Park, Pa.

(MWP-CE-11) Microwave-Assisted Rapid Phase Transformation in Stabilized Zirconias: A Comparative Study Using 2.45 and 83 GHz Frequencies
K.A. Cherian, Center for Remote Sensing, Inc., Fairfax, Va.; B. Vaidhyanathan, Pennsylvania State University, University Park, Pa.; A.W. Fliflet, Naval Research Laboratory, Washington, D.C.; R.W. Bruce, Naval Research Laboratory, Bethesda, Md.; S. Ganguly, Center for Remote Sensing, Inc., Fairfax, Va.; D.K. Agrawal, and R. Roy *, Pennsylvania State University, University Park, Pa.

(MWP-CE-13) Blankets of 2.45 GHz Microwave Sintering of Traditional Ceramics
M. Sato *, T. Mutoh, T. Shimozuma, S. Ito, K. Ida, T. Inoue, K. Esaki, and O. Motojima, National Institute for Fusion Science, Toki, Japan; S. Takayama, Gifu Prefectural Research Institute of Manufactural Information Technology, Tajimi, Japan; M. Mizuno, S. Obata, T. Shimada, and K. Satake, Gifu Prefectural Institute for Ceramics Research and Technology, Tajimi, Japan

(MWP-CE-15) Sintering of Traditional Ceramics by Microwaves (84 GHz and 2.45 GHz)
S. Takayama *, Gifu Prefectural Research Institute of Manufactural Information Technology, Tajimi, Japan; M. Mizuno, S. Obata, T. Shimada, and K. Satake, Gifu Prefectural Institute for Ceramics Research and Technology, Tajimi, Japan; M. Sato, T. Mutoh, T. Shimotsuma, S. Ito, K. Ida, T. Inoue, K. Esaki, O. Motojima, and M. Fujiwara, National Institute for Fusion Science, Toki, Japan

(MWP-CE-17) Preparation of Ceramic Pigments under Microwave Irradiation
S. Lefeuvre *, G.V. Salmoria, and M. Audhuy-Peaudecerf, ENSEEIHT, Toulouse, France; M.M. da Silva Paula, Universidade do Extremo Sul Catarinense, Criciuma, Brazil

(MWP-CE-19) Microwave Joining of SiC Ceramics
S. Aravindan *, and R. Krishnamurthy, Indian Institute of Technology, Madras, India

(MWP-CE-21) Characterization of Microwave-Processed Alumina Joints
R. Krishnamurthy *, and S. Aravindan, Indian Institute of Technology, Madras, India

(MWP-CE-23) Response of Microwave-Processed Ceramic Joints to High Frequency, Low Impact Conditions
J. Ramkumar *, S. Aravindan, and R. Krishnamurthy, Indian Institute of Technology, Madras, India

(MWP-CE-25) High Thermal Conductivity AlN Ceramic Prepared by Microwave Sintering
G.F. Xu *, I.K. Lloyd, T.O. Olorunyolemi, and Y. Carmel, University of Maryland, College Park, Md.

(MWP-CE-27) Dilatometric Measurements of Nanoscaled Ceramics in a 30 GHz Millimeter Wave Field
S. Rhee *, G. Link, and M. Thumm, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

(MWP-CE-29) Millimeter-Wave Sintering of Si_3N_4-Based Ceramics with Al_2O_3 and Y_2O_3 or Yb_2O_3 as Additives
V.V. Holoptsev, I.V. Plotnikov, and Y.V. Bykov *, Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia; Y. Makino, S. Miyake, and T. Ueno, Joining and Welding Research Institute-Osaka University, Osaka, Japan

(MWP-CE-31) Microwave Firing of Low-Purity Alumina
J.M. Moore *, and D.E. Clark, University of Florida, Gainesville, Fla.

(MWP-CP-01) Synthesis of the Praseodymium-Europium Ferrites by Coprecipitation
V.R. Caffarena, and T. Ogasawara *, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

(MWP-CP-02) Synthesis of $(In_{0.67}Fe_{0.33})_2O_3$ by 28 GHz Microwave Irradiation
H. Takizawa *, T. Kimura, M. Iwasaki, K. Uheda, and T. Endo, Tohoku University, Sendai, Japan

(MWP-CP-03) Magnetic Properties of the Yttrium-Terbium Garnets Obtained by Coprecipitation
S. Da Silva Marins, and T. Ogasawara *, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil

(MWP-CP-04) Computer Simulations and Comparative Experiment: A Novel Approach Showing Evidence for a Thermal Bulk Microwave Effect in a Palladium-Catalyzed Allylic Alkylation
N.F.K. Kaiser *, Uppsala University, Uppsala, Sweden; U. Bremberg, Royal Institute of Technology, Stockholm, Sweden; M.L.E. Larhed, Uppsala University, Uppsala, Sweden; C. Moberg, Royal Institute of Technology, Stockholm, Sweden; A. Hallberg, Uppsala University, Uppsala, Sweden

(MWP-CP-05) Microwave Curing of PR500 Epoxy Resin
R.J. Day *, Manchester Materials Science Center-UMIST, Manchester, U.K.; D. Attwood, and M. Wallace, British Aerospace, Bristol, U.K.; F. Heatley, University of Manchester, Manchester, U.K.

(MWP-CP-06) Microwave-Assisted Resin Transfer Molding of Unidirectional Polyester/Aramid Composites
R.J. Day *, and A.R. Razk, Manchester Materials Science Center-UMIST, Manchester, U.K.

(MWP-CP-07) Versatility of Microwave Applications to Processing
M. Viswanath *, Indian Institute of Technology, Kharagpur, India

(MWP-GE-01) Microwave Processing of Aluminides in Ti-Al Binary System
J.R. Jokisaari, B.E. Shores, W.A. Prisbrey, M. Cirakoglu, S. Bhaduri, and S.B. Bhaduri *, University of Idaho, Moscow, Idaho

(MWP-GE-02) New Technology for Production of Wire Made of Magnetic Hard (Rigid) Steel Using High Frequency Pulse Current
O.A. Troitsky *, A.A. Blagonravov Institute for Machines Science of the Russian Academy of Sciences, Moscow, Russia

(MWP-GE-03) New Technology of Treatment of Metal-Cutting Instruments Made of Quick Cutting Steel by Pulse Current with the Aim of Increase in Wear Resistance of Instruments
Y.V. Baranov *, A.A. Blagonravov Institute for Machines Science of the Russian Academy of Sciences, Moscow, Russia

(MWP-GE-04) Testing Microwave Meltout of Explosives from Tritonal Filled Bombs
R.W. Hayes * and B. F. Crist, El Dorado Engineering Inc., Salt Lake City, Utah

(MWP-MB-01) Temperature Control Without Contact by Narrow Bandwidth Microwave Radiometry for Food Processing Industry
C. Vanoverschelde *, V. Thomy, L. Dubois, J.P. Sozanski, and M. Chive, I.E.M.N. U.M.R. C.N.R.S., Villeneuve d'Ascq, France

(MWP-SD-01) From Permittivity Measurements to Applicator Designs
S. Lefeuvre *, ENSEEIHT, Toulouse, France

(MWP-SD-02) Variable Frequency Microwave Moisture Leveling
M.R. Hamann *, ComEd, Oak Brook, Ill.

Wednesday Morning, 5 April, 8:30–10:15

Industrial Applications of Microwave and RF Processing II

Room: Crystal C

Session Chair: John Zimmerly, PSC, Inc., 21761 Tungsten Rd., Cleveland, Ohio, 44117

(MWA-AP2-01) Microwave-Assisted Processing in the Pharmaceutical Industry and Its Future
I. Smart *, Aeromatic-Fielder Ltd., Eastliegh, Hants, UK

(MWA-AP2-02) Microwave-Assisted Pressure Filter Drying
R. Meredith, Rutland Electronic Tubes, Okham, U.K.; N.G. Evans *, Petrie Technologies Ltd., Chorley, U.K.; G. Light-owlers, Charles Thompson Ltd., Kilnhurst, Mexborough, U.K.

(MWA-AP2-03) Microwave Vacuum Extraction of Waste Solvents
V.N. Tran *, RMIT, Bundoora, Victoria, Australia

(MWA-AP2-04) Continuous Microwave Re-Working of Defective Confectionary
V.N. Tran, RMIT, Bundoora, Victoria, Australia

Modelling II

Room: Crystal E

Session Chair: Greg Kriegsmann, New Jersey Institute of Technology, Dept. of Mathematics, Newark, N.J., 07102

(MWB-MO2-01) Accurate Modal Analysis for the Design of Multiple Corrugated Chokes in Microwave Heating Systems (Invited Paper)
P. Soto, V.E. Boria *, J.M. Catala-Civera, and E. de los Reyes, Technical University of Valencia, Valencia, Spain

(MWB-MO2-02) Modeling Thin Films Using the Finite Element Method
R.A. Ehlers *, and A.C. Metaxas, University of Cambridge, Cambridge, U.K.

(MWB-MO2-03) Comparative Analysis of Contemporary EM Software for Microwave Power Industry
V.V. Yakovlev *, Worcester Polytechnic Institute, Worcester, Mass.

(MWB-MO2-04) Microwave Joining of Two Long Hollow Tubes: An Asymptotic Theory and Numerical Simulation
J.H.C. Luke *, and G.A. Kriegsmann, New Jersey Institute of Technology, Newark, N.J.; R.S. Silberglitt, FM Technologies, Inc., Fairfax, Va.

Waste I

Room: Crystal D

Session Chair: George Wicks, Westinghouse Savannah River Co., PO Box 616, Aiken, S.C., 29808

(MWC-WA1-01) Developing Microwave Processes for Large Scale Industrial Usage: The Mining Industry Example (Invited Paper)
J.M. Tranquilla *, EMR Microwave Technology, Fredericton, New Brunswick, Canada

(MWC-WA1-02) The Microwave Response of Nickel-Bearing Laterite Ores and Associated Minerals Under Extraction Process Conditions
C. Pickles *, and J. Ma, Queen's University, Kingston, Ontario, Canada; R.M. Hutcheon, and J. Mouris, Microwave Properties North, Deep River, Ontario, Canada

(MWC-WA1-03) Microwave Remediation of Hazardous and Radioactive Wastes
G.G. Wicks *, and R.L. Schulz, Westinghouse Savannah River Co., Aiken, S.C.; D.E. Clark, University of Florida, Gainesville, Fla.

(MWC-WA1-04) Microwave Remediation of Electronic Circuitry Waste and Resulting Gaseous Emissions
R.L. Schulz *, and G.G. Wicks, Westinghouse Savannah River Co., Aiken, S.C.; D.E. Clark, University of Florida, Gainesville, Fla.

Wednesday Morning, 5 April, 10:45–12:30

Industrial Applications of Microwave and RF Processing III

Room: Crystal C

Session Chair: Ralph W. Bruce, R.W. Bruce Associates, 1607 Chickasaw Rd., Arnold, Md., 21012

(MWA-AP3-01) A Systematic Approach to Microwave Scale-Up (Invited Paper)
D.W. McLean *, Illawarra Technology Corp. Ltd., Wollongong, Australia; P.A. Puschner, Puschner GMBH & Co. KG, Schwanewede, Germany

(MWA-AP3-02) Radio Frequency and Microwave Solutions for Industrial Processing
P.L. Roberts *, and M.V. Vasilik, Electrotechnology Applications Center, Bethlehem, Pa.

(MWA-AP3-03) A Simple Basis for Decision to Use Microwave and Radio Frequency Energy for Industrial Processing
W.M. Van Loock *, University of Ghent, Ghent, Belgium

(MWA-AP3-04) Developing Microwave Solutions for Industry: A Case Study
S.M. Bradshaw *, H.C. Reader, J.W. Gerber, J.B. de Swardt, and T.V. Chow Ting Chan, University of Stellenbosch, Stellenbosch, South Africa

Interactions I

Room: Crystal E

Session Chair: John Booske, University of Wisconsin, Dept. of Electrical & Computer Engineering, Madison, Wis., 53706

(MWB-IN1-01) Microwave Energy Absorption and Polymer Structure (Invited Paper)
T.C. Ward *, Virginia Polytechnic Institute and State University, Blacksburg, Va.

(MWB-IN1-02) Study of Microwave-Enhanced Mass Transport in Nanostructured Alumina Membranes
Y.V. Bykov *, S.V. Egorov, A.G. Eremeev, K.I. Rybakov, V.E. Semenov, and A.A. Sorokin, Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia; S.A. Gusev, Institute for Physics of Microstructures, Nizhny Novgorod, Russia

(MWB-IN1-03) Volume and Surface Effects of Microwave Sintering in Oxide, Carbide and Nitride Ceramics
M. Willert-Porada *, and J. Grosse-Berg, University of Bayreuth, Bayreuth, Germany; R. Klupsch, University of Dortmund, Dortmund, Germany; H. Öztürk, InVerTec, Dortmund, Germany

(MWB-IN1-04) Resonant Excitation of Processes in a Solid by AM
V.N. Fleurov *, and M. Molotskii, Tel Aviv University, Tel Aviv, Israel

Medicine/Biology II

Room: Crystal D

Session Chair: Konstantina Nikita, National Technical University of Athens, Iroon Polytechnou 9, Zografos, Athens, 15780, Greece

(MWC-MB2-01) Medical Microwave Imaging: Review of the Dartmouth Experience (Invited Paper)
K.D. Paulsen *, and P.M. Meaney, Thayer School of Engineering, Hanover, N.H.

(MWC-MB2-02) Dielectric Characterization of Human Breast Tissue at Microwave Frequencies
S.C. Hagness *, K.M. Leininger, and J.H. Booske, University of Wisconsin, Madison, Wis.; M. Okoniewski, University of Calgary, Calgary, Canada

(MWC-MB2-03) Breast Cancer Detection Algorithms for Confocal Microwave Imaging
S.C. Hagness *, and X. Li, University of Wisconsin, Madison, Wis.

(MWC-MB2-04) Application of Microwaves to Dental Caries Treatment
Y. Nikawa *, Kokushikan University, Tokyo, Japan; K. Kawai, and S. Ebisu, Osaka University, Osaka, Japan

Wednesday Afternoon, 5 April, 14:00–16:00

Poster Session II

Room: Crystal A&B

(MWP-CE-02) Microwave Behavior Silicon Carbide/High Alumina Cement Composites
K.S. Leiser *, and D.E. Clark, University of Florida, Gainesville, Fla.

(MWP-CE-04) The Effect of Reaction Parameters on Microwave-Induced Combustion Synthesis of Al_2O_3/TiC Composites
D.D. Atong *, and D.E. Clark, University of Florida, Gainesville, Fla.

(MWP-CE-06) Microwave Synthesis of $CaWO_4$ and $MgWO_4$
W.A. Prisbrey, M. Cirakoglu, J.R. Jokisaari, S. Bhaduri, and S.B. Bhaduri *, University of Idaho, Moscow, Idaho

(MWP-CE-08) Novel Synthesis of Nitride Powders and Fibers by Microwave-Assisted Combustion
B. Vaidhyanathan *, D.K. Agrawal, and R. Roy, Pennsylvania State University, University Park, Pa.

(MWP-CE-10) A Comparative Study of Microwave and Conventional Clay Drying Techniques
M.R. Fleming *, D.K. Agrawal, and R. Roy, Pennsylvania State University, University Park, Pa.

(MWP-CE-12) Microwave Sintering of Multilayer Dielectrics with Base Metal Electrodes
B. Vaidhyanathan *, D.K. Agrawal, and T.R. Shrout, Pennsylvania State University, University Park, Pa.

(MWP-CE-14) Analysis of Microwave Sintered Porcelain
M. Mizuno, Gifu Prefectural Institute for Ceramics Research and Technology, Tajimi, Japan; S. Takayama *, Gifu Prefectural Research Institute of Manufactural Information Technology, Tajimi, Japan; S. Obata, T. Hirai, T. Shimada, and K. Satake, Gifu Prefectural Institute for Ceramics Research and Technology, Tajimi, Japan; M. Sato, T. Mutoh, T. Shimotsuma, S. Ito, T. Inoue, K. Esaki, and O. Motojima, National Institute for Fusion Science, Toki, Japan

(MWP-CE-16) Synthesis of n-TiO_2 for Photovoltaic Applications by Colloidal Microwave Processing (CMP)
T. Schubert *, and M. Willert-Porada, University of Bayreuth, Bayreuth, Germany

(MWP-CE-18) Microwave-Assisted Anatase-to-Rutile Phase Transition of TiO_2-Anatase Gels
I. Plazl *, D. Ravnjak, and T. Koloini, University of Ljubljana, Ljubljana, Slovenia; A. Lubej, Cinkarna Celje, Celje, Slovenia

(MWP-CE-20) A Primary Investigation on Microwave Glazing of Green and Sintered Clay Ceramics
H.X. Li *, M.R. Fleming, D.K. Agrawal, and J.P. Cheng, Pennsylvania State University, University Park, Pa.

(MWP-CE-22) Microwave-Enhanced Self-Propagating High-Temperature Synthesis of SiC
J.H. Peng *, Kunming University of Science and Technology, Kunming, P.R. China; J.G.P. Binner, Brunel University, Uxbridge, U.K.

(MWP-CE-24) Microwave Sintering of ZnO at High Heating Rates
G.F. Xu *, T.O. Olorunyolemi, I.K. Lloyd, and Y. Carmel, University of Maryland, College Park, Md.

(MWP-CE-26) Influence of the Pressure on the Microwave-Enhanced Chemical Vapor Infiltration Process for Woven Fiber SiC/SiC Composites
D. Jaglin *, University of Nottingham, Nottingham, U.K.; J.G.P. Binner, Brunel University, Uxbridge, U.K.; C. Prentice, and B. Shatwell, DERA, Farnborough, U.K.

(MWP-CE-28) Millimeter-Wave Sintering of 20% Zirconia Toughened Alumina
M. Samandi *, and J. Young, University of Wollongong, Wollongong, Australia; H.S. Shulman, and A. Clark, Industrial Research Ltd., Wellington, New Zealand

(MWP-CE-30) Influence of Different Additives on the Microwave Heating Behavior of Silicon Nitride-Based Ceramics
J. Grosse-Berg *, and M. Willert-Porada, University of Bayreuth, Bayreuth, Germany

(MWP-CE-32) A Comparison of Microwave Annealing Treatments of an Oxide Ceramic
M.S. Morrow *, D.E. Schechter, and P.A. Eggleston, Lockheed Martin Energy Systems, Oak Ridge, Tenn.; H.E. Huey, and Q.S. Wang, Micramics Inc., Santa Clara, Calif.

(MWP-DP-01) Automated Determination of Dielectric Properties of Materials with Arbitrary Section using a Hybrid Iterative Method
H. Esteban *, J.M. Catala-Civera, S. Cogollos, and V.E. Boria, Technical University of Valencia, Valencia, Spain

(MWP-DP-02) Measurements of Dielectric Loss and Microwave Absorption in Traditional Ceramics
S. Takayama *, Gifu Prefectural Research Institute of Manufactural Information Technology, Tajimi, Japan; M. Mizuno, S. Obata, T. Shimada, and K. Satake, Gifu Prefectural Institute for Ceramics Research and Technology, Tajimi, Japan; M. Sato, T. Mutoh, T. Shimotsuma, S. Ito, K. Ida, T. Inoue, K. Esaki, and O. Motojima, National Institute for Fusion Science, Toki, Japan; Y. Higashida, Japan Fine Ceramics Center, Nagoya, Japan

(MWP-DP-03) Measurements of the High-Temperature Microwave (400-3000 MHz) Complex Dielectric Constants of Monomers Epsilon-Caprolactam, Epsilon-Caprolactone, and Imide Materials PETI-5 and PEPA-3,4'-ODA
R.M. Hutcheon *, and J. Mouris, Microwave Properties North, Deep River, Ontario, Canada; X.M. Fang, and D.A. Scola, University of Connecticut, Storrs, Conn.

(MWP-DP-04) RF Characterization of Electronically Tunable Materials
R.G. Geyer *, National Institute of Standards & Technology, Boulder, Colo.

(MWP-DP-05) Application of FTIR-Reflectance Spectroscopy to Estimate the Temperature-Dependent Dielectric Loss of Engineering Ceramics
R.S. Donnan *, M. Samandi, and R. Vickers, University of Wollongong, Wollongong, Australia

(MWP-DP-06) Comparison of Measured and Calculated Powdered Mixture Permittivities
S.O. Nelson *, UDSA, ARS, Athens, Ga.

(MWP-DP-07) Dielectric Calibration Methods for Industrial Microwave Sensors
S. Trabelsi *, A.W. Kraszewski, and S.O. Nelson, UDSA, ARS, Athens, Ga.

(MWP-IN-01) Microwave Heating Behaviors of Different Materials in Electric and Magnetic Fields
J.P. Cheng *, D.K. Agrawal, and R. Roy, Pennsylvania State University, University Park, Pa.

(MWP-IN-02) A Molecular Orbital Model for Absorption of Microwave Energy by Materials
J.K. West *, Engineering Innovations, Inc., Gainesville, Fla.; D.E. Clark, University of Florida, Gainesville, Fla.

(MWP-MO-01) Computer Simulation of Microwave Ceramics Sintering in Multimode Applicator
N.A. Zharova, S.V. Egorov, and V.E. Semenov *, Institute of Applied Physics of the Russian Academy of Sciences, Nizhny Novgorod, Russia

(MWP-MO-02) Modeling Thermal Fronts Dynamics in Microwave Heating
G.A Mercado *, Universidad Autonoma de Zacatecas, Zacatecas, Mexico; B.P Luce, Los Alamos National Laboratory, Los Alamos, N.M.; J. Xin, University of Texas, Austin, Texas

(MWP-MO-03) Pattern Formation in Microwave Heated Ceramics: Cylinders and Slabs
G.A. Kriegsmann *, New Jersey Institute of Technology, Newark, N.J.

(MWP-MO-04) Microwave-Enhanced CVI Processing: A Moving Interface Model
B.S. Tilley *, and G.A. Kriegsmann, New Jersey Institute of Technology, Newark, N.J.

(MWP-MO-05) A Mathematical Model of Microwave Joining with Thermoelastic Effects
J.A. Pelesko *, Georgia Institute of Technology, Atlanta, Ga.; G.A. Kriegsmann, New Jersey Institute of Technology, Newark, N.J.

Wednesday Afternoon, 5 April, 16:30–18:15

An Industrial Roundtable: What Industry Would Like from Microwave and RF Processing

Room: Crystal C

Session Chair: Bernard Krieger, Cober Electronics, 151 Woodward Ave., Norwalk, Conn., 06854-4730

(MWA-RT-01) Panel Discussion
Panelists: B. Krieger *, Cober Electronics, Norwalk, Conn.; J. McManus, British Tire and Rubber Corporation; R.Paules, Duke Energy Corporation; A. Amamath, EPRI

General II

Room: Crystal E

Session Chair: Ralph W. Bruce, R.W. Bruce Associates, 1607 Chickasaw Rd., Arnold, Md., 21012

(MWB-GE2-01) Gyrotron-Powered 83 GHz Microwave Beam System for Material Processing (Invited Paper)
A.W. Fliflet *, Naval Research Laboratory, Washington, D.C.; R.W. Bruce, Naval Research Laboratory, Bethesda, Md.; R.P Fischer, A.K Kinkead, S.H Gold, D. Lewis III, L.K Kurihara, B.A. Bender, and R.J. Rayne, Naval Research Laboratory, Washington, D.C.; K.A. Cherian, and S. Ganguly, Center for Remote Sensing, Inc., Fairfax, Va.

(MWB-GE2-02) Innovative Challenge of Commercializing Industrial Millimeter-Wave Processing Technology at 24 GHz
L. Feher *, G. Link, and M. Thumm, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

(MWB-GE2-03) Novel Coatings for Multifold Enhancement of the Kinetics of Microwave Processing of All Materials
B. Vaidhyanathan *, S. Gedevanishvili, D.K. Agrawal, and R. Roy, Pennsylvania State University, University Park, Pa.

(MWB-GE2-04) Microwave Energy Applications on CD-ROM
M.A. Machiels *, Electrabel, Heverlee, Belgium; D.F. Van Dommelen, Catholic University of Leuven, Heverlee, Belgium; W.M. Van Loock, University of Ghent, Ghent, Belgium; G.M. De Corte, and P.E. Yde, University of Antwerp, Wilrijk, Belgium

Plasmas II

Room: Crystal D

Session Chair: Achim Lunk, University of Stuttgart, Pfaffenwaldring 31, Stuttgart, D-70569, Germany

(MWC-PL2-01) Microwave Plasma Reactors for Large Area Diamond Deposition (Invited Paper)
C. Wild *, and P. Koidl, Fraunhofer Institut IAF, Freiburg, Germany

(MWC-PL2-02) The Role of Surface Charge in Plasma Assisted CVD: A Novel Sn_2-Type Surface Reaction to Result in CH_3 Adsorbates on (111) Surface of CVD Diamond from Ethane and Surface Anion Sites
S. Komatsu *, and K. Okada, National Institute for Research in Inorganic Materials, Ibaraki, Japan; Y. Shimizu, and Y. Moriyoshi, Hosei University, Tokyo, Japan

(MWC-PL2-03) Microwave Plasma Synthesis of Nanoparticles: Application of Microwaves to Produce New Materials
D.V. Szabo *, and D. Vollath, Forschungszentrum Karlsruhe GmbH, Karlsruhe, Germany; W. Arnold, Advanced Ferrite Technology, Backnang, Germany

(MWC-PL2-04) Destruction and Valorization of Liquid Chemical Waste for the Synthesis of Si-Based Ceramic Coatings by Means of RF Plasma Technology
E. Bouyer *, M. Mueller, G. Schiller, and R.H. Henne, German Aerospace Center, Stuttgart, Germany

Thursday Morning, 6 April, 8:30–10:15

Industrial Applications of Microwave and RF Processing IV

Room: Crystal C

Session Chair: Bernard Krieger, Cober Electronics, 151 Woodward Ave., Norwalk, Conn., 06854-4730

(MWA-AP4-01) Industrial RF and Microwave Applications in Germany - Current Status and Future Development
M. Willert-Porada *, University of Bayreuth, Bayreuth, Germany

(MWA-AP4-02) Fires in Microwave and RF Heating Systems: Causes and Prevention
R.F. Schiffmann *, Robert F. Schiffmann Associates, Inc., New York, N.Y.

(MWA-AP4-03) An Industrial Sintering Application
P.A. Puschner *, Puschner GMBH & Co. KG, Schwanewede, Germany

(MWA-AP4-04) An Industrial Application of Microwave Heating: Continuous Drying of Inorganic Salts
J.I. Ortigosa *, CIM D'OR SA, Barcelona, Spain

Ceramics III

Room: Crystal E

Session Chair: David E. Clark, University of Florida, Materials Science and Engineering, Gainesville, Fla., 32611-6400

(MWB-CE3-01) Development of Industrial Microwave Sintering of Hard Metals (Invited Paper)
K. Rödiger *, K. Dreyer, G. Schaaf, and H. van den Berg, WIDIA GmbH, Essen, Germany; J.M. Keane, Valenite, Inc.

(MWB-CE3-02) Transmission Electron Microscopy Study of Milli-Wave Sintered Silicon Nitride
M.E. Brito *, M.C. Valecillos, K. Hirao, and M. Toriyama, National Industrial Research Institute of Nagoya, Nagoya, Japan

(MWB-CE3-03) Combination of Laser and Microwave Heating — A New Tool in Ceramic Processing
C. Gerk *, and M. Willert-Porada, University of Bayreuth, Bayreuth, Germany

(MWB-CE3-04) Ultra-Rapid Sintering of Ceramics by Microwaves and Plasma Heating: Modeling and Experiments
D.L. Johnson *, M.P. Henrichsen, and Y.J. Sun, Northwestern University, Evanston, Ill.

Dielectric Properties II

Room: Crystal D

Session Chair: Ronald Hutcheon, Microwave Properties North, RR# 1, Deep River, Deep River, ON, K0J 1P0, Canada

(MWC-DP2-01) The Use of Dielectric Properties in the Design of a Reactor Heated by Microwaves (Invited Paper)
F.J. Elvin *, Coastal Catalyst Technology Inc., Houston, Texas

(MWC-DP2-02) Dielectric and Thermal Properties and Their Importance in Microwave Sintering of Advanced Ceramics (Invited Paper)
Y. Carmel *, I.K. Lloyd, O.C. Wilson Jr., T.O. Olorunyolemi, A. Birnboim, D. Gershon, E.T. Pert, and G.F. Xu, University of Maryland, College Park, Md.

(MWC-DP2-03) Electromagnetic Properties Measurements as a Control of the Microwave Polymeric Materials Processing
S. Lefeuvre *, G.V. Salmoria, and M. Audhuy-Peaudecerf, ENSEEIHT, Toulouse, France; V. Soldi, Universidade Federal de Sao Carlos, Florianopolis, Brazil

(MWC-DP2-04) The Use of Dielectric Property Measurements in the Selection of a Thermosetting Resin for the Microwave Cure of Filament Wound Composites
I.J. Youngs *, T. Stickland, and S.G. Appleton, DERA, Farnborough, U.K.

Thursday Morning, 6 April, 10:45–12:30

Science and Engineering of Microwave and RF Processing

Room: Crystal C

Session Chair: Bernard Krieger, Cober Electronics, 151 Woodward Ave., Norwalk, Conn., 06854-4730

(MWA-SE1-01) Process and Product Design Fundamentals in Microwave Oven Heating for Food Applications
A. Datta *, Cornell University, Ithaca, N.Y.

(MWA-SE1-02) Self-Consistent Modeling of Microwave Heating Processes
J. Haala *, and W. Wiesbeck, Universitat Karlsruhe, Karlsruhe, Germany

Chemistry/Polymers III

Room: Crystal E

Session Chair: Jeffrey Wan, Queen's University, Dept. of Chemistry, Kingston, Ontario, K7L 3N6, Canada

(MWB-CP3-01) Optimization of the Radio Frequency Curing of Graphite Powder/Epoxy Resin Composites
P. Alazard, and A.J. Gourdenne *, Ecole National Superirure de Chimie de Toulouse, Toulouse, France

(MWB-CP3-02) Microwave Syntheses of Poly(Epsilon-Caprolactam-Co-Epsilon-Caprolactone)
X.M. Fang, and D.A. Scola *, University of Connecticut, Storrs, Conn.; R.M. Hutcheon, Microwave Properties North, Deep River, Ontario, Canada

(MWB-CP3-03) Colloidal Microwave Processing: A Method to Synthesize Catalyst Materials with Suited Structures for the Employment in Polymer Membrane Fuel Cells
T. Schubert *, and M. Willert-Porada, University of Bayreuth, Bayreuth, Germany

(MWB-CP3-04) Microwave Heating and Non-Linear Coupling Applied to a Chemical Reacton
D. Stuerga *, A.J.C. Calmels, K.K. Bellon, and P.P. Pribetich, Universite de Bourgogne, Dijon, France

Waste/Minerals Processing II

Room: Crystal D

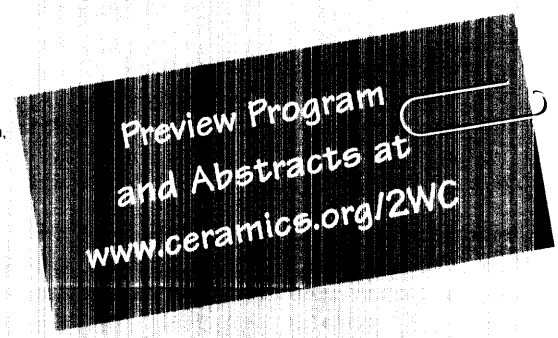
Session Chair: Steven Bradshaw, University of Stellenbosch, Dept. of Chemical Engrg., Stellenbosch, South Africa

(MWC-WA2-01) Kinetics of Desulfurization of Nickel Pyrrhotite by Steam in the Microwave Field (Invited Paper)
J.H. Peng *, and C.P. Liu, Kunming University of Science and Technology, Kunming, P.R. China

(MWC-WA2-02) Regeneration of Exhausted Adsorbents by Microwaves - An Overview
D. Bathen *, University of Dortmund, Dortmund, Germany

(MWC-WA2-03) Restoring of Catalytic Alumina Powders by Microwave Treatments
P. Veronesi *, C. Siligardi, C. Leonelli, and G.C. Pellacani, University of Modena and Reggio Emilia, Modena, Italy

(MWC-WA2-04) Multicomponent Desorption of Fixed-Bed-Adsorbers by Microwaves
J. Reuss *, D. Bathen, and H. Schmidt-Traub, University of Dortmund, Dortmund, Germany; M. Hoffmeister, and A. Binder, Engelhard Process Chemicals GmbH, Hannover, Germany



Special Events

Nuts and Bolts of Microwave Processing

Sunday, April 2, 2000
8 a.m. to 5 p.m.

A one-day applications oriented workshop will be held on Sunday, April 2, 2000. Participants will learn various techniques used for measurement, design and control in microwave and RF systems. The first session will focus on the fundamentals of microwaves and RF. The subsequent five sessions will concentrate on techniques used in research, product and process development, and experimentation. Each of these sessions will have a short lecture/discussion of the topic followed by a longer period of demonstrations and "hands-on" work.

These sessions will cover:

- Materials Interaction and Dielectric Properties Measurement
- Systems Measurement Techniques
- Measurement of Temperature in Dielectric Heating Systems
- Leakage and RFI Measurement Techniques
- Experimental Techniques

Course Instructors

Robert Schiffmann
President, R.F. Schiffmann Associates, Inc.

Trained as a physical chemist, Bob spent 11 years in R&D with a U.S. food company, after which he became a consultant, a career he has successfully pursued for more than 25 years. He and his company have developed microwave products and processes for the food, pharmaceutical, medical, chemical, textile and many other industries. He holds 24 U.S. patents and three more applications are currently under review. He lectures and publishes widely.

Ralph Bruce
President, RWBruce Associates, Inc.

Ralph has worked in the microwave engineering area for more than 25 years. He has spent more than 15 years working in the areas of dielectric properties measurement and microwave heating. His current work is founded on the dielectric heating of ceramic materials using millimeter-wave sources operating above 30 GHz and with multi-kilowatt power levels.

An Interactive Exhibition for material manufacturers, researchers, equipment manufacturers and end-users. Since the focus of this World Congress is to bridge science, technology and applications, commercial activities are strongly encouraged. Many of the visitors will be end-users and facilitators interested in hardware. The exhibition provides special focus on the products of each individual exhibitor.

Exhibit Hours	
Sunday, April 2	**20:00 - 22:00** **(Opening Reception)**
Monday, April 3	**10:00 - 11:00** **15:00 - 16:30** **(Coffee Breaks)**
Tuesday, April 4	**10:00 - 11:00** **13:00 - 16:30** **(Coffee Breaks & Poster Session)**
Wednesday, April 5	**10:00 - 11:00** **13:00 - 16:30** **(Coffee Breaks & Poster Session)**

Interested in exhibiting? Please contact Bernard Krieger, Cober Electronics, 151 Woodward Ave., Norwalk CT 06854; 203/855-8755; fax: 203/855-7511; E-mail: bern@cober.com for an exhibitor package. Limited space available.

Microwave and RF - Application, Engineering and Social Issues An Open Forum

Tuesday, April 4, 2000
4:30 to 6 p.m.

Chair: Dr. Wayne R. Tinga, University of Alberta, Edmonton, Canada

Panel Members: Frank Elvin, Coastal Catalyst Technology, USA; Harold Kimrey, Microwave Materials Technology Inc., USA; Bernie Krieger, Cober Electronics, USA; Wayne Love, USA; Ricky Metaxas, Cambridge University, UK; Per Risman, Microtrans AB, Sweden; Bob Schiffmann, RF Schiffmann & Associates, USA; Monika Willert-Porada, Bayreuth University, Germany; John Zimmerly, PSC Inc., USA

An informal forum where the audience and experts can ask questions and give answers about issues pertaining to microwave and RF technology and its applications. Experts from industry, equipment makers, technology users, researchers, consultants and designers will be on hand to share their insights. Most importantly, the audience will be encouraged to participate in lively discussion on practical and timely issues such as:

1. Microwave and RF Forecast for the 21st Century

Materials Processing, Industrial Applications

- What can we expect? Where is this technology going?
- Will there be new "Killer" applications?
- What processes need significant improvement?
- What are some of the integration of technology issues?
- What about technology resistance and its social and eco nomic costs?
- How important are energy utilization and environmental impact issues?

2. Bridging the Gap Between Industry and Academia

Industry's Concerns About Modeling Emphasis In Academia

- Can modeling be made more useful to industry?
- What are industry's needs and academia's needs?
- Can academia meet the challenges?
- Can industry become a better collaborator?
- How to stimulate solving industrial problems in a research environment?

3. Wireless Battle - Making the Most of a Crowded Spectrum

Communication Industry Versus The ISM Industry

- What are the technical and legal ramifications of sharing the ISM bands?
- Will restricting in–band ISM emissions limit high power technology growth?
- What is the difference between EM compatibility and EM interference?
- What are the limits on energy leakage design?
- Is improved signal coding the answer?
- Is spectrum re-allocation the answer?

4. Process and System Modeling Tools - Cost Versus Benefit

How Does Tool Use Result In Better System Design?
What Modeling Tools Are Available?
How Easy Are The Tools To Use?
What Tool Improvements Are Needed?

5. RF and Microwave Education

How Can We Become Better Knowledge Dispensers?
What Are The Universities Doing to Promote RF and MW Education?