

Monday Morning, 6 June 1994
9:45 am—Barranca
Oral Session 1A: Computational Plasma Physics I
Chair: L. Chandler

- 1A1-2 *Invited*—Mach3: A Three-Dimensional MHD Code**
U. Shumlak, T. W. Hussey, R.E. Peterkin
Phillips Laboratory Kirtland AFB NM USA
- 1A3 *Inertial Effects in Plasma Compact Toroids***
M.H. Freese, J. H. Watrous
NumerEx Albuquerque NM USA
- 1A4 *Collisional Plasmas: Monte Carlo Calculations Without Sampling Errors***
D.S. Lemons, M.E. Jones¹
Amherst College
¹Los Alamos National Laboratory, Los Alamos, NM 87545
- 1A5-6 *Invited*—Time-Dependent Numerical Simulation of Vertical Cavity Lasers**
L.E. Thode, G. Csanak, L. So, T.J.T. Kwan, M. Campbell¹
Los Alamos National Laboratory Los Alamos NM USA
¹PASTDCO, Albuquerque, NM
- 1A7 *Spatially Averaged (Global) Model of Time Modulated High Density Discharges***
S. Ashida, C. Lee, C.K. Birdsall, M.A. Lieberman, V. Vahedi
University of California, EE&CS and The Electronics Research Laboratory, Berkeley
CA USA
- 1A8 *Modeling the Electromagnetic Fields and the Plasma Excitation in Moderate Pressure Microwave Cavity Plasma Sources***
W. Tan, T.A. Grotjohn
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 1A9 *Numerical Simulation of Long, Explosively Driven, Magnetocumulative Generators***
J. H. Watrous, M.H. Freese
NumerEx Albuquerque NM USA

Monday Morning, 6 June 1994
9:45 am—Chamisa
Oral Session 1B: Vacuum Electronics I
Chair: C. Armstrong

- 1B1-2 **Invited—Harmonic Converters as High Power Microwave and Millimeter Wave Source**
A.K. Ganguly, J.L. Hirshfield
Omega-P Inc. New Haven CT USA
- 1B3-4 **Invited—Predicted Performance of the Emission-Gated Amplifier at 487 MHz and 6–18 GHz**
B. Goplen, D.N. Smithe, M.A. Kodis, N.R. Vanderplaats
Mission Research Corporation Newington VA USA
- 1B5 **Deflection Microwave and Millimeter-Wave Amplifiers**
C.-M. Tang, Y. Y. Lau, T.A. Swyden
Naval Research Laboratory Washington DC USA
- 1B6 **Analytic Expressions for Emission in Sharp Field Emitters**
E.G. Zaidman, K.L. Jones
Naval Research Laboratory Washington DC USA
- 1B7 **Electron Emission: From the Fowler-Nordheim Relation to the Child-Langmuir Law**
Y. Y. Lau, Y. F. Liu, R.K. Parker¹
University of Michigan, Department of Nuclear Engineering, Ann Arbor MI, USA
¹Naval Research Laboratory, Washington, DC
- 1B8 **Investigation of Electron Emission from Thin Film and Bulk PLZT Ferroelectric Ceramics**
T. Cavazos, W. Wilbanks, C. Fleddermann, D. Shiffler
University of New Mexico, Dept. of Electrical and Computer Engineering, Albuquerque NM USA
- 1B9 **Dielectrics in Demeos**
R. True
Electron Devices Division, Litton Systems San Carlos CA USA

Monday Morning, 6 June 1994

9:45 am—Otwi

Oral Session 1C: Basic Phenomena in Fully Ionized Plasmas

Chair: S. Robertson

1C1-2 *Invited*—Measurement of Shear Alfvén Waves in the LAPD Device

W. Gekeman, D. Leneman, J. Maggs

University of California at Los Angeles, Dept. of Physics, Los Angeles CA USA

1C3 Fluid Description of Velocity-Space Instabilities

Y. Y. Lau, P.J. Christenson, G.J. Beach

University of Michigan, Intense Energy Beam Interaction Lab., Dept. of Nuclear Engr.
Ann Arbor MI USA

1C4 Evolution of Circular Shear Layers

J.P. Lynov, K. Bergeron, E.A. Coutsiaris

University of New Mexico, Dept. of Mathematics and Statistics, Albuquerque NM, USA

1C5 Maximum Orbit Excursion Near Magnetoresponse in a Magnetostatic Wiggler With a Guide Magnetic Field

J. Yu, W.A. Gillespie Dundee Institute of Technology, Dept. Electronic & Electrical Engineering,
Dundee UK

1C6 Superconducting Plasmas

T. Ohnuma, J. Ohno

Tohoku University, Dept. Electrical Engr, Sendai Japan

1C7 Microwave Plasma Discharge Produced and Sustained by the Surface Wave Propagating Along a Metal Wire

N. A. Azarenkov, I. B. Denisenko, K. N. Ostrikov

Kharkiv State University Kharkiv Ukraine

1C8 Adiabatic Change of State of Photon Gas

M. Mészáros

Budapest University of Technology, Institute of Physics, 1521 Budapest Hungary

Monday Morning, 6 June 1994
9:45 am—Pinon A
Oral Session 1D: Plasma, Ion, and Electron Sources
Chair: J. Asmussen, Jr.

- 1D1-2 ***Invited***—Review of Electron Cyclotron Resonance Ion Sources for Multiply Charged Positive Ions
T.A. Antaya
Michigan State University, National Superconducting Cyclotron Laboratory
East Lansing MI USA
- 1D3-4 ***Invited***—High Charge State Metal Ion Production in Vacuum Arc Ion Sources
I.G. Brown, A. Anders, S. Anders
Lawrence Berkeley Laboratory, University of California Berkeley CA USA
- 1D5 **Metal Vapor Vacuum Arc Ion Sources for Implantation and Plasma Processing**
S. Humphries Jr, T.R. Lockner
Arc Engineering Albuquerque NM USA
- 1D6-7 ***Invited***—Inductively Coupled Plasma and Ion Sources: History and State-of-the-Art
J. Hopwood
Northeastern University Boston MA USA
- 1D8 **Downstream Comparison of Four Inductive Plasma Sources**
M. Tuszewski, J. T. Scheur, J. A. Tobin
Los Alamos National Laboratory Los Alamos NM USA
- 1D9 **An Evaluation of an End Excited Electron Cyclotron Resonance Plasma Source**
P. Mak, J. Asmussen
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 1D10 **Measurements of the Impressed Electric Field Inside a Coaxial ECR Plasma Source**
A.K.Srivastava, J. Asmussen
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 1D11 **ECR Ion/Free-Radical Plasma Source Simulation in Two and Three Dimensions**
V. Gopinath, T.A. Grotjohn
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 1D12 **Investigation of the Hollow Cavity Effects on the Breakdown Voltage Characteristic of a Single-Gap Pseudospark Device**
M. J. Rhee, C. J. Liu
University of Maryland, Insitute for Plasma Research, College Park MD USA

Monday Morning, 6 June 1994

9:45 am—Pinon B

Oral Session 1E: Environmental/Energy Issues in Plasma Science I

Chair: E. L. Neau

- 1E1-2 *Invited*—Non-Thermal Plasma Reactors for Treatment of Flue Gases and Other Hazardous Gases**
B. M. Penetrante
Lawrence Livermore National Laboratory Livermore CA USA
- 1E3 Silent Discharge Plasma Destruction of Hazardous Wastes**
J. J. Coogan, A. E. Greene, M. Kang, L. A. Rosocha, A. D. Sappey
Los Alamos National Laboratory Los Alamos NM USA
- 1E4 Use of Silent Electrical Discharges for Environmental Remediation**
L. A. Rosocha, J.J. Coogan, M. Kang
Los Alamos National Laboratory Los Alamos NM USA
- 1E5 Remediation of NO (NxOy) From Air Streams Using Dielectric Barrier Discharges**
A.C. Gentile, M. J. Kushner
University of Illinois, Dept. Electrical and Computer Engineering, UrbanaIL USA
- 1E6 Toxic Gas Decomposition by Surface Discharge**
V.F. Puchkavev, G.J. Roth, M.A. Gundersen
University of Southern California, Dept of Electrical Engineering—Electrophysics,
Los Angeles CA USA
- 1E7 NO_x Dissociation Phenomenon in Using Catalyst and Plasma Treatment Device**
T. Yanobe, K. Itoyama¹, Y. Hayashi²
Hokushin Industries, Inc. Tsurumi-ku Yokohama Japan
¹Nagasaki University, Nagasaki, Japan
²Fujitsu Limited, Kawasaki, Japan

Monday Morning, 6 June 1994
Poster Session 1P01-10: Space Plasmas

- 1P01 Simulated Particle Beam Antennas in Space**
T. Ohnuma, M. Shimegi
Tohoku University, Dept. Electrical Engr, Sendai Japan
- 1P02 Plasma Chemistry of the Beam-Disturbed Ionosphere**
B. A. Klumov
Institute for Geosphers Dynamics 17334 Moscow Russia
- 1P03 Charging Dust Grains in Plasma with Energetic Ions**
B. Walch¹, M. Johnson¹, M. Horányi, S. Robertson
University of Colorado Boulder CO USA
¹University of Northern Colorado, Greeley, CO
- 1P04 Single Particle Motion in a Rapidly Spatially Varying Electric Field**
P.L. Rothwell, M.B. Silevitch¹, L.R. Block², C.-G. Fälthammar²
Phillips Laboratory, Space Physics Division, Geophysics Directorate, Hanscom AFB
MA USA
¹Center for Electromagnetics Research, Northeastern University, Boston
²Dept. of Plasma Physics, The Royal Institute of Technology, Stockholm
- 1P05 Kinetic Simulations of the Kelvin-Helmholtz Instability: Application to Boundary Layers**
V.A. Thomas, D. Winske
Los Alamos National Laboratory Los Alamos NM USA
- 1P06 Two-Dimensional Particle Simulations of the Low Frequency Electric Fields in Ionospheric Injection Experiments**
O. Bolin, N. Brenning
Royal Inst. of Technology, Alfvén Laboratory, Dept. of Plasma Physics, Stockholm, Sweden
- 1P07 A Plasma Beam Perpendicular to a Magnetic Field**
C.W. Dubs
Phillips Laboratory, WSSI Hanscom AFB, MA USA
- 1P08 Over-Reflection of Fast Magnetosonic Waves at a Vortex Sheet**
V.M. Nakariakov, Yu.A. Stepanyantz
Nizhny Novgorod State Technical University Nizhny Novgorod Russia
- 1P09 Equilibrium of Intergalactic Currents in the Plasma Universe**
B.E. Meierovich
P.L. Kapitza Institute of Physics Problems Moscow Russia
- 1P10 Diamagnetic Cavity of Exploding Plasmas**
Yu. P. Zakharov, A.V. Melekhov, A.G. Ponomarenko
Institute of Laser Physics Novosibirsk Russia

Monday Morning, 6 June 1994
Poster Session 1P11-34: Plasma Processing

- 1P11 **Computer Simulation of Ion Implantation**
A. Amin, H.-S. Kim, S. Yi, K.E. Lonngren
University of Tennessee Knoxville TN USA
- 1P12 **Factors Affecting the Plasma Ion Implantation of Metallic Samples**
S. Kamath, J. R. Roth
University of Tennessee, Department of Electrical and Computer Engineering, Knoxville
TN USA
- 1P13 **Experimental Study of Sheaths During Plasma Ion Implantation**
M. Laroussi, S. Kamath, J. R. Roth
University of Tennessee, Department of Electrical and Computer Engineering, Knoxville
TN USA
- 1P14 **Depth Distribution of Nitrogen in Silicon from Plasma Ion Implantation**
J. J. Vajo, J.D. Williams, R. Wei, R.G. Wilson, J.N. Matossian
Hughes Research Laboratories Malibu, CA USA
- 1P15 **Cost Estimates for Commercial Plasma Source Ion Implantation**
D. J. Rej, R.B. Alexander¹
Los Alamos National Laboratory Los Alamos NM USA
¹R.B. Alexander and Associates, Huntington Woods, MI
- 1P16 **Numerical Study of Capacitive and Inductive Modes in RPECVD Reactors**
I. Pérès, M.J. Kushner
University of Illinois, Dept. Electrical and Computer Engineering, Urbana, IL USA
- 1P17 **A Novel Technique for Semiconductor Thin Film Growth**
J. A. Tobin, M. Tuszewski, I. H. Campbell, J. T. Scheur
Los Alamos National Laboratory Los Alamos NM USA
- 1P18 **Analysis of Closed-Form EM Modes and Reactor Geometries for Inductively Coupled Plasma Sources**
F. Dai, C.-H. Wu
Auburn University, Dept. Electrical Engineering, Auburn AL USA
- 1P19 **Particle-in-Cell Monte Carlo Simulations of Time Modulated Discharges**
V. Vahedi, D. Cooperberg, M.A. Lieberman, C. K. Birdsall
University of California, ERL and EECS Dept., Berkeley CA USA
- 1P20 **Fluid PIC Simulation of Plasma Processing Devices**
G. Lapenta, J. U. Brackbill
Los Alamos National Laboratory Los Alamos NM USA
- 1P21 **Parametric Studies of Electron-Energy-Distribution Function and Rate Constants for Plasma-Etching Reactors**
J. W. Shon, E. Meeks, R.J. Kee, B. Penetrante¹
Sandia National Laboratories Livermore CA USA
¹Lawrence Livermore National Laboratory, Livermore, CA
- 1P22 **Density Enhancement in Helicon Sources by Aperature Control**
I.D. Sudit, F.F. Chen
University of California at Los Angeles Los Angeles CA USA

- 1P23 **Wave Excitation with Helical Antennas**
M.E. Light, F.F. Chen
University of California at Los Angeles Los Angeles CA, USA
- 1P24 **Frequency Independence of Helicon Discharges**
D.D.Blackwell, I.D. Sudit, M.E. Light, F.F. Chen
University of California at Los Angeles Los Angeles CA USA
- 1P25 **Electrical and Plasma Characteristics of a One Atmosphere Glow Discharge Plasma Reactor**
P. D. Spence, J. R. Roth
University of Tennessee, Department of Electrical and Computer Engineering, Knoxville
TN USA
- 1P26 **An Atmospheric Glow Discharge Plasma for Aerodynamic Boundary Layer Control**
C. Liu, J. R. Roth
University of Tennessee, Department of Electrical and Computer Engineering, Knoxville
TN USA
- 1P27 **LTE and Non-LTE Numerical Modelings for Characterization of Inductively Coupled Plasma Torches**
J. H. Park, S. H. Hong, B. L. Choi
Seoul National University, Department of Nuclear Engineering, Seoul Korea
- 1P28 **Velocity Measurements of Sprayed Particles in Atmospheric and Low Pressure Plasma Spraying Systems by a Low-Cost Laser Interferometry**
S. I. Lee, S. H. Hong, B. L. Choi
Seoul National University, Department of Nuclear Engineering, Seoul Korea
- 1P29 **An Advanced Ionizer for Atmospheric Plasma**
M. Rader, I. Alexeff
University of Tennessee Knoxville TN USA
- 1P30 **High Pressure Pulsed Avalanche Discharges: Scaling of Required Preionization Rate for Homogeneity**
N. Brenning, I. Axnäs, O. Nilsson, J. Eninger
Royal Inst. of Technology, Alfvén Laboratory, Dept. of Plasma Physics Stockholm
Sweden
- 1P31 **Numerical Modelling of Ozone Production in Pulsed Homogeneous Oxygen Discharge**
J.O. Nilsson, J.E. Eninger
Royal Institute of Technology, Dept. of Industrial Electrotechnology, Stockholm
Sweden
- 1P32 **Study of the Plasma Centrifuge as a Compact, Low Cost, Stable Isotope Separator**
N. Qi, P. Greene, R. Prasad
Science Research Laboratory Alameda CA USA
- 1P33 **Laser Ablation of Al₂O₃ Ceramic in Gas and Plasma Environments**
C. H. Ching, R.M. Gilgenbach, J.S. Lash¹, R.A. Lindley²
University of Michigan, Intense Energy Beam Interaction Lab., Dept. of Nuclear Engr.
Ann Arbor MI USA
¹National Science Foundation Fellowship
²Physics Dept., University of Sheffield, UK
- 1P34 **Effets of Selected Process Parameters on the Properties of TiN Coatings Produced by Plasma-CVD**
C. Lasorsa, M. Shimosuma¹, A. Rodrigo
Argentine Atomic Energy Commission 1429 Buenos Aires Argentina
¹College of Medical Technology, Hokkaido University

Monday Afternoon, 6 June 1994
2:00 pm — Main Floor

**MAGNETOSPHERE-IONOSPHERE
INTERACTIONS: NEAR EARTH MANIFESTATIONS OF
THE PLASMA UNIVERSE**

Nils Brenning
Alfvén Laboratory
Department of Plasma Physics
Royal Institute of Technology
Stockholm, Sweden

Chair: M. B. Silevitch

Monday Afternoon, 6 June 1994
3:15 pm—Barranca
Oral Session 2A: Space Plasmas I
Chair: S. T. Lai

A1-2 *Invited*—Active Remote Sensing of Space Plasmas with High Power Radio Waves

P. A. Bernhardt

Naval Research Laboratory, Plasma Physics Division, Washington DC USA

A3 Substorm Onsets and Single Ion Motion

P.L. Rothwell, M.B. Silevitch¹, L.R. Block², C.-G. Fälthammar²

Phillips Laboratory, Space Physics Division, Geophysics Directorate, Hanscom AFB, MA

¹Center for Electromagnetics Research, Northeastern University, Boston

²Dept. of Plasma Physics, The Royal Institute of Technology, Stockholm

A4 Wave Injection Experiments at Arecibo, Puerto Rico

M.C. Lee, K.D. Vilece, D.T. Moriarty, J.M. Sourci, M.P. Sulzer¹, K.M. Groves², S.P. Kuo³

MIT Plasma Fusion Center Cambridge MA USA

¹Arecibo Observatory, Arecibo, Puerto Rico

²Air Force Phillips Laboratory, Hanscom AFB, MA

³Polytechnic University, Farmingdale, NY

A5 New Features in Recent Critical Velocity Ionization Experiments in Space

S. T. Lai, E. Murad, W.J. McNeil¹

Phillips Laboratory Hanscom AFB MA USA

¹Radex, Inc., Bedford, MA

A6 3D Monte Carlo Particle-in-Cell Simulations of Critical Ionization Velocity Experiments in the Ionosphere

J. Wang, P.C. Liewer, G. Murphy, R. Biasca¹

Jet Propulsion Laboratory, California Institute of Technology Pasadena CA, USA

¹Phillips Laboratory, Hanscom AFB

A7 Generation of ELF and VLF Waves in the HF Heater-Modulated Polar Electrojet

J. Faith, S.P. Kuo

Polytechnic University Farmingdale NY USA

A8 Beam-Plasma Discharge in the Ionosphere During Active Experiments

B. A. Klumov, A. A. Rukhadze, V. P. Tarakanov

Institute for Geospheres Dynamics 17334 Moscow Russia

Monday Afternoon, 6 June 1994
3:15 pm—Chamisa
Oral Session 2B: Ball Lightning/Spherical Plasma Configurations
Chair: Y. Chia Thio

- 2B1-2 *Invited*—Recent Results from Compact Toroid Experiments at Phillips Laboratory**
G. F. Kiuttu, J.H. Degnan, R.E. Peterkin, E.L. Ruden, F.M. Lehr, C.A. Outten, C.D. Holmberg, G.P. Baca, D.E. Bell, G. Bird, Y.G. Ghen, A.L. Chesley, S.K. Coffey, M.E. Dearborn, M.R. Douglas, J. L. Eddleman, S.E. Englert, T. J. Englert, A. Ya. Faenov, D. Gale, J.D. Graham, J. H. Hammer, C.W. Hartman, J. Havranek, T.W. Hussey, G. Marklin, H.S. McLean, A.W. Molvik, B.W. Mullins, S.A. Pikuz, D.W. Price, N.F. Roderick, S.W. Seiler, U. Shumlak, P.J. Turchi
Phillips Laboratory, High Energy Plasma Division, Kirtland AFB NM USA
- 2B3 **Spherical Solid Liner Implosion Driven by 4.7 Megajoule Capacitor Discharge****
J.H. Degnan, R. M. Lehr, D.E. Bell, A.L. Chesley, S.K. Coffey¹, S.E. Englert, T.J. Englert, D.G. Gale², J.D. Graham², C.D. Holmberg, T.W. Hussey, R.A. Lewis³, C. Outten, R.E. Peterkin, D.W. Price, N.F. Roderick, E.L. Ruden, U. Shumlak, G.A. Smith³, P.J. Turchi
Phillips Laboratory, High Energy Plasma Division, Kirtland AFB NM USA
¹Physical Sciences Inc., Alexandria, VA
²Maxwell Laboratories Inc., Albuquerque, NM
³Pennsylvania State University, State College, PA
- 2B4 **Interpretations of Instabilities Observed in Electromagnetically Imploded Solid Liners****
E.L. Ruden, J.H. Degnan, S.E. Englert, F. M. Lehr, C.A. Outten, D.W. Price, J.D. Graham², S.K. Coffey¹
Phillips Laboratory, High Energy Plasma Division, Kirtland AFB NM USA
¹Physical Sciences Inc., Alexandria, VA
²Maxwell Laboratories Inc., Albuquerque, NM
- 2B5-6 *Invited*—Plasma Formation Experiments Relevant to Magnetized Target Fusion**
I. R. Lindemuth, R.C. Kirkpatrick, R.E. Reinovsky, P. Sheehy, R.S. Thurston
Los Alamos National Laboratory Los Alamos NM USA
- 2B7 **Overview of IEC Neutron Source Studies****
A. J. Satsangi, G.H. Miley, J. Javedani, Y. Gu, P. Heck
University of Illinois, Fusion Studies Department, Urbana, IL USA
- 2B8 **1- and 2-D Numerical Simulations of Spherical Pinches****
H. Chen¹, B. Hilko¹, J. Chen¹, E. Panarella
University of Tennessee, Department of Electrical and Computer Engineering, Ottawa, Canada
¹Advanced Laser and Fusion Technology, Hull, Canada
- 2B9 **Analysis of the Mechanism of Soft X-Ray Emission from a Spherical Pinch Radiation Source (SPX II)****
J. Chen¹, B. Hilko¹, H. Chen¹, E. Panarella
University of Tennessee, Department of Electrical and Computer Engineering,
¹Advanced Laser and Fusion Technology, Hull, Canada
- 2B10 **Magnetokinetic Compression of Compact Toroids****
Y. C. Thio
University of Miami Coral Gables FL USA
- 2B11 **Spherical Unsteady Radiative Heat Waves in Air: Dynamics, Structure and Luminosity****
S.L. Minko, I.M. Kozlov, G.S. Romanov
Belorussian Academy of Sciences, Heat and Transfer Institute, Tallinn Estonia

Monday Afternoon, 6 June 1994
3:15 pm—OtoWi
Oral Session 2C: Plasma Processing I
Chair: E. Meeks

- 2C1 **Spatial Profiles of Plasma Properties in Planar RF Inductive Discharges—1) Role of Chamber Length and 2) Anisotropy of Electron Velocity Distributions**
L. J. Mahoney, A.E. Wendt, J. L. Shohet
University of Wisconsin, Dept. ECE and ERC for Plasma-Aided Manufacturing, Madison WI USA
- 2C2 **Analytic Modeling of Power Deposition in Inductive Sources**
V. Vahedi¹, G. DiPeso¹, M.A. Lieberman, D. Hewett¹
University of California, Electrical Engineering Department, Berkeley CA, USA
¹Lawrence Livermore National Laboratory
- 2C3 **Radical and Ion Flux Uniformity in a Low Pressure Inductively Coupled Plasma Reactor Predicted by Direct Simulation Monte Carlo Method**
T. Bartel¹, J. Payne¹, T. Sterk¹, R. Wise, D. Lymberopoulos, D. Economou
University of Houston, Department of Chemical Engineering, Houston TX, USA
¹Sandia National Laboratories, Albuquerque, NM
- 2C4 **Effects of EM Modes to 2D Landau Damping in Inductively Coupled Plasma Sources and Optimal Geometry Design of Reactors for Exciting Appropriate Modes**
C.-H. Wu, F. Dai
Auburn University, Dept. Electrical Engineering, Auburn AL USA
- 2C5 **Design Considerations for Inductively Coupled Plasma Etching Reactors**
P.L.G. Ventzek, R.J. Hoekstra, M. Grapperhaus, M.J. Kushner
University of Illinois, Dept. Electrical and Computer Engineering, Urbana IL USA
- 2C6 **FTIR Spectroscopy Measurements of CF₄ and C₂F₆ Concentrations in a Planar RF Inductively-Coupled Plasma**
L. J. Mahoney, S.G. Yulke, J. L. Shohet, M.J. Goeckner
University of Wisconsin, Dept. ECE and ERC for Plasma-Aided Manufacturing, Madison WI USA
- 2C7 **Statistical Models of Ion Energy, Ion Density and Neutral Species Temperature in a Multipolar ECR Argon-SF₆ Discharge**
G.L. King, T.A. Grotjohn
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 2C8 **Chemical Etching of SiO₂ by CF₄ at Low Pressure—Does it Really Depend on the Plasma Chemistry?**
N. Hershkowitz, J. Ding, J. Jenq
University of Wisconsin, ERC for Plasma-Aided Manufacturing, Madison, WI USA
- 2C9 **Diagnostic Characterization and Theoretical Modeling of ECR Plasmas**
S.R. Douglass, B. V. Weber, C. Eddy, M. Lampe, G. Joyce, W. Manheimer
Naval Research Laboratory Washington DC USA

Monday Afternoon, 6 June 1994
3:15 pm—Pinon A
Oral Session 2D: Fast Wave Devices
Chair: W. Lawson

- 2D1-2 *Invited*—Mode Coupling in Closed Cavity Gyrotrons**
A.H. McCurdy, R. Liou
University of Southern California, Dept of Electrical Engineering—Electrophysics,
Los Angeles CA USA
- 2D3 Experimental Study of a Megawatt Gyrotron with Internal Mode Converter**
K. E. Kreischer, M. Blank, B.G. Danly, T. Kimura, R.J. Temkin
MIT Plasma Fusion Center Cambridge MA USA
- 2D4 Design of 8.5 GHz Fundamental and 17 GHz Second Harmonic Gyroklystron Experiments with 100 MW Output Power Capability**
J.P. Calame, W. Lawson, J. Cheng, M.K.E. Flaherty, B. Hogan, P.E. Latham, V. Irwin, H.W. Matthews, M. Reiser, V.L. Granatstein
University of Maryland, Institute for Plasma Research, College Park MD USA
- 2D5 Experimental Investigation of a Two-Stage Tapered Gyro-Traveling Wave Tube**
G.S. Park, J.J. Choi, S.Y. Park, C.M. Armstrong, A.K. Ganguly, R.H. Kyser
Naval Research Laboratory Washington DC USA
- 2D6 Gyro-Peniotron Forward Wave Oscillators**
A. T. Lin
University of California at Los Angeles, Department of Physics, Los Angeles CA, USA
- 2D7 Nonlinear Theory of the CHI-Wiggler Free-Electron Laser**
H.P. Freund¹, R.H. Jackson, D.E. Pershing², J.M. Taccetti
Naval Research Laboratory Washington DC USA
¹Science Applications International Corp, McLean, VA
²Mission Research Corp, Newington, VA
³University of Maryland, College Park, MD
- 2D8 The Resistive-Wall Klystron for High-Power Microwave Amplifiers**
H. S. Uhm
Naval Surface Warfare Center Silver Spring MD USA
- 2D9 A Theoretical Analysis of Relativistic Klystron Oscillators for High-Power Microwave Source**
H. S. Uhm
Naval Surface Warfare Center Silver Spring MD USA
- 2D10-11 *Invited*—Experimental Studies of a High Gradient RF Accelerating Structure Driven by a 33 GHz Free Electron Laser Amplifier**
G. Bekefi, B. Chen, I. Mastovsky, P. Volfbeyn, I. Wilson¹, W. Wuensch¹
Massachusetts Institute of Technology Cambridge MA USA
¹CERN-CLIC, Geneva, Switzerland

Monday Afternoon, 6 June 1994
3:15 pm—Pinon B
Oral Session 2E: Magnetic Fusion
Chair: A. Hirose

2E1-2 *Invited*—D-T Experiments on TFTR

D. Mueller and the TFTR Group

Princeton Plasma Physics Laboratory Princeton NJ USA

2E3 *Advances in Fusion Reactors—Science in TPX*

K. I. Thomassen

Lawrence Livermore National Laboratory Livermore CA USA

2E4 *Higher Order Collisionless Ballooning Mode in Tokamaks*

A. Hirose, L. Zhang

University of Saskatchewan, Dept. Physics & Engineering Physics, Saskatoon
Canada

Monday Afternoon, 6 June 1994

Poster Session 2P01-21: Basic Phenomena in Fully Ionized Plasma

- 2P01 **Interaction Between Two Electromagnetic Solitary Waves in a Plasma**
H. H. Kuehl, C. Y. Zhang¹
University of Southern California Los Angeles CA USA
¹University of California, Los Angeles
- 2P02 **Self Focusing of Electron Bunches in a Nonlinear Plasma**
V.B. Krasovitskii, S.I. Osmolovsky
Rostov State University, Department of Theoretical Physics, Rostov on Don, Russia
- 2P03 **Magic Simulation of Nonrelativistic and Relativistic Beam-Plasma Instability**
J. Masten, O. Ishihara
Texas Tech University, Dept. Electr. Engr., Lubbock TX, USA
- 2P04 **Exploding Plasma in Dipole Magnetic Field**
S.A. Nikitin, A.G. Ponomarenko
Institute of Laser Physics Novosibirsk Russia
- 2P05 **Collective Effects in the Charged Dust Orrery**
S. Robertson, T. Biewer, D. Alexander, B. Walch¹
University of Colorado Boulder CO USA
¹University of Northern Colorado, Greeley, CO
- 2P06 **Threshold of the Ion Acoustic Instability in the Beam Plasma System in One and Two Ion Species**
C. Cereceda, J. Puerta
Dept. de Física, Universidad Simon Bolivar Caracas Venezuela
- 2P07 **Linear and Nonlinear Ion Beam Instabilities in a Double Plasma Device**
S-G. Lee, D. Diebold, N. Hershkowitz
University of Wisconsin, ERC for Plasma-Aided Manufacturing, Madison WI, USA
- 2P08 **Nonlinear Stabilization of Satellite Instability of BGK-Wave in Plasma because of a Anharmonicity of Trapped Particle Oscillations**
V.G. Dorofeenko
General Physics Institute Rostov on Don Russia
- 2P09 **Stability in Linear, Time-Dependent, Fields**
J. R. Sobehart
Los Alamos National Laboratory, Center for Nonlinear Studies Los Alamos NM, USA

- 2P10 **The Impedance Vibrator in an Anisotropic Plasma**
 N.A. Khijniak, N.M. Yatsenko, E.A. Yatsenko
 Kharkov Institute of Physics and Technology Kharkov Ukraine
- 2P11 **Transformation of Magnetohydrodynamic Waves on the Plasma Layer**
 A. A. Aleksandrova, N. A. Khiznyak
 Kharkov Institute of Physics and Technology Kharkov Ukraine
- 2P12 **Self-Organization in Strongly Drift-Wave Turbulence**
 E. A. Fedutenko, V. I. Lapshin
 Kharkov State University Kharkov Ukraine
- 2P13 **Arrest of Langmuir Collapse by Highest Nonlinearities**
 V. V. Gushchin, V. V. Gulenko
 Kharkiv State University Kharkiv Ukraine
- 2P14 **Kinetic Theory of Axis Encircling Ion Cyclotron Instabilities**
 V. S. Mikhailenko, D. V. Chibisov, K. N. Stepanov, El.el. Ussef
 Kharkov State University Kharkov Ukraine
- 2P15 **The Mechanism of Wave-Turbulent Instability in Nonequilibrium Systems**
 V. Kuklin, A. Kirichok
 Kharkov State University Kharkov Ukraine
- 2P16 **Spatial Structures in Nonlinear Nonequilibrium Plasma**
 V. Kuklin, A. Kirichok, I. Panchenko, V. Vorb'ev
 Zaporozh'e University Zaporozh'e Ukraine 0612
- 2P17 **Surface Magnetoplasma Waves in the Rectangular Cross-Sectional Metallic Waveguide with Uniform Plasma Filling**
 I. A. Girka
 Kharkiv State University Kharkiv Ukraine
- 2P18 **Surface Cyclotron Waves on the Plasma-Metal Boundary**
 V. A. Girka, I. V. Pavlenko
 Kharkiv State University Kharkiv Ukraine
- 2P19 **Control of Ultrarelativistic Electron Beam Instability in a Nonlinear Plasma**
 V.G. Dorofeenko, V.B. Krasovitskii, V.G. Fomin
 Rostov State University, Department of Theoretical Physics Rostov on Don, Russia
- 2P20 **Nonlinear Dynamic of Interaction of the Relativistic Electron Beam with Plasma**
 V.G. Dorofeenko, V.B. Krasovitskii, S.I. Osmolovsky
 Rostov State University, Department of Theoretical Physics, Rostov on Don, Russia
- 2P21 **Quantization Problems of Electromagnetic Fields**
 M. Mészáros
 Budapest University of Technology, Institute of Physics, 1521 Budapest Hungary

Monday Afternoon, 6 June 1994
Poster Session 2P22-34: Basic Phenomena in Partially Ionized Plasma

- 2P22 Pressure Dependence on He RF Discharges**
T. Kimura, K. Ohe
Nagoya Institute of Technology, Dept. Systems Engr., Nagoya Japan
- 2P23 Plasma Parameters of Ar-N₂ Positive Column**
T. Kimura, K. Ohe
Nagoya Institute of Technology, Dept. Systems Engr., Nagoya Japan
- 2P24 Spectroscopic Investigations of an Exploding Semiconductor**
K. A. Thomas, T. Baginski, J. W. Rogers
Wright Laboratory Eglin AFB FL USA
- 2P25 Plasma Microwave Mirror Experiments**
J.A. Gregor¹, J. Mathew, R.F. Fernsler, W. Manheimer, R.A. Meger, R.E. Pechacek², A.E. Robson
Naval Research Laboratory Washington DC USA
¹Inst. Plasma Research, University of Maryland
²Sachs Freeman Assoc.
- 2P26 Influence of Ponderomotive Force for Inductive Plasma Sources**
T. D. Rognlien, G.J. DePeso, D.W. Hewett, V. Vahedi
Lawrence Livermore National Laboratory Livermore CA USA
- 2P27 Effect of Axial Magnetic Field on Characteristics of a Wire Ion Plasma Source**
H. Urai, T. Kurosawa, E. Hotta, M.S. Maeyama¹, H. Yasui², T. Tamagawa²
Tokyo Institute of Technology, Dept. Electr. & Electron. Engr., Tokyo Japan
- 2P28 Mode Measurement of Discharge-Pumped KrF Laser under High Repetition-Rate Operation**
K. Kasuya, S. Matsuno, T. Suzuki, M. Watanabe, Y. Kawakita¹, T. Kuwahara¹, K. Shioda², H. Kanazawa²
Tokyo Institute of Technology Midori-ku Japan
¹Nissin Electric Co., Ltd. Kyoto, Japan
²Toshiba Co, Ltd., Yokohama, Japan
- 2P29 Phenomenological RF Breakdown Curves in the Broad Pressure Range**
V.A. Lisovsky, V.D. Yegorenkov
Kharkov University, Scientific Center of Physics and Technology, Kharkov, Ukraine

- 2P30 Steady RF Discharge Regimes and LF Instability**
V.A. Lisovsky, V.D. Yegorenkov
Kharkov University, Scientific Center of Physics and Technology, Kharkov, Ukraine
- 2P31 Numerical Model of an AC Plasma Display Panel Cell in Neon-Xenon Mixtures**
J. Meunier, Ph. Belenguer, J. P. Boeuf
Centre de Physique Atomique de Toulouse 31062 Toulouse Cedex France
- 2P32 Is This An Arc or a Glow Discharge**
V.F. Puchkavev, M.B. Bochkarev¹
University of Southern California, Dept of Electrical Engineering–Electrophysics,
Los Angeles CA USA
¹Institute of Electrophysics of Russian Academy of Sciences, Yekaterinburg, Russia
- 2P33 Characteristics of an Inductively Coupled RF Discharge**
W. McColl, B. Coonan, M. Hopkins, M. Turner
Dublin City University, Dept. of Physical Science, Dublin Ireland
- 2P34 An Overview of Breakdown Formation Processes in the Transient Hollow Cathode Discharge**
P. Choi, M. Favre¹, R. Aliaga, H. Chuaqui¹, Y. Kaufman², J. Moreno¹, E. Wyndham¹, M. Zambra¹
The Blackett Laboratory, Imperial College London UK
¹Pontifica Universidad Católica de Chile, Santiago, Chile
²Physics Department, NRCN, Beer-Sheva, Israel

Monday Afternoon, 6 June 1994
Poster Session 2P35-38: Environmental/Energy Issues in Plasma Science

- 2P35 Effect of the Efficiency of Plasmachemical Reaction by Electrodynamics of Nanosecond Corona Discharge**
R. H. Amirov, Yu. N. Desyaterik, I.S. Samoilov, A.V. Shepelin
Institute for High Temperatures, IVTAN Moscow Russia
- 2P36 Oxidation of NO and SO₂ by Pulse Corona Discharge in Exhaust Gases**
R. H. Amirov, E.I. Asinovsky, L.I. Kropp¹, I.S. Samoilov, A.M. Zykov¹
Institute for High Temperatures, IVTAN Moscow Russia
¹Russian Heat Engineering Institute, Moscow, Russia
- 2P37 A Non-Thermal Plasma Discharge for Hazardous Gas Abatement**
M.G. Grothaus¹, R.K. Hutcherson, R.A. Korzekwa
Naval Surface Warfare Center, Pulsed Power Systems and Technology Group, Dahlgren
VA USA
¹Southwest Research Institute, San Antonio, TX
- 2P38 Development of a Low-Frequency Plasma Torch for the Destruction of Toxic Solvents**
H. R. Snyder, C. B. Fleddermann, J.M. Gahl
University of New Mexico, Dept. of Electrical and Computer Engineering, Albuquerque
NM USA

Tuesday Morning, 7 June 1994
8:30 am — Main Floor

PLASMA PHYSICS IN LATIN AMERICA

Adolpho Rodrigo
Argentine Atomic Energy Commission
Plasma Physics and Technology Division

Chair: J. C. Fernandez

Tuesday Morning, 7 June 1994
9:45 am—Barranca
Oral Session 3A: Dense Plasma Focus
Chair: K. Ware

- 3A1 Progress Report: Plasma Focus Research at LANL**
B.L. Freeman, I.L. Morgan², K.D. Sowder
Los Alamos National Laboratory Los Alamos NM USA
²North Texas Research and Development Corporation
- 3A2 Design and Construction of a 1-MJ DPF**
S. DelMedico, J. Javedani, R. Wimmer, D. Neupert, O. Barnoiu, R. Burton, M. Williams¹,
B. Bromley¹, J. DeMora¹, G.H. Miley¹
Rockford Technology Assoc., Inc. Champaign IL USA
¹Fusion Studies Laboratory, University of Illinois Urbana, IL
- 3A3 X-Ray Radiation from Dense Plasma Focus**
I. Vitkovitsky, P. Herbert¹, K. Ware¹
LOGICON R&D Associates Arlington VA USA
¹Defense Nuclear Agency, Washington, DC
- 3A4 Oscillation of the Current Sheet Velocity in Plasma Focus Discharges**
K. Melzacki, V. Nardi
Stevens Institute of Technology Hoboken NJ USA
- 3A5 Plasma Focus Discharges with Multiple Current Sheets**
A. Bortolotti, F. Mezzetti, T. Montanari¹, V. Nardi, C. Powell, L. Scheider
Stevens Institute of Technology Hoboken NJ USA
¹Universita' di Ferrara
- 3A6 Azimuthal Anisotropy in the Distribution of Fusion Products and Fast Ion Emission in Plasma Focus Discharges**
J. S. Brzosko, V. Nardi, D. B. Goldstein, J. R. Brzosko
Stevens Institute of Technology Hoboken NJ USA
- 3A7 Energy Density of Self-Field-Dominated Plasma Structures**
V. Nardi, C. Powell
Stevens Institute of Technology Hoboken NJ USA
- 3A8 Neon Dense Plasma Focus Point X-Ray Source for $\leq 0.25 \mu\text{m}$ Lithography**
R.R. Prasad, M. Krishnan, K. Berg, D. Conlon, J. Mangano
Science Research Laboratory Alameda CA USA
- 3A9 Processes of Self Organization in Plasma Focus Discharges—Final Phase**
V. A. Gribkov, V. Ya. Nikulin, N. N. Komarov, V.M. Fadeev
Lebedev Physical Institute of Russian Academy of Sciences, Moscow, Russia

Tuesday Morning, 7 June 1994
9:45 am—Chamisa
Oral Session 3B: Plasma Diagnostics
Chair: R. J. Leeper

- 3B1-2 *Invited*—25-ps Detector for Fusion Burn-History Measurements**
R.A. Lerche, D.W. Phillion, G.L. Tietbohl
Lawrence Livermore National Laboratory Livermore CA USA
- 3B3 Radiachromic Film as a Fluence Diagnostic for Intense Pulsed Proton Beams**
F.C. Young, J.R. Boller, S. J. Stephanakis
Naval Research Laboratory, Plasma Physics Division, Washington DC USA
- 3B4 A Multiplexed Spectrograph for Space- and Time-Resolved Visible-Light Plasma Spectroscopy**
J. Bailey, A.L. Carlson, P. Lake
Sandia National Laboratories Albuquerque NM USA
- 3B5 Energetic Neutral Atom Imaging Detectors for Fusion and Space Plasmas**
E. E. Scime, H. O. Fusten, D. J. McComas
Los Alamos National Laboratory, NIS-1 Los Alamos NM USA
- 3B6 Diagnostics of Plasma Propulsion Devices**
M.A. Cappelli, D.H. Manzella¹
Stanford University, Mechanical Engineering Department, USA
¹Sverdrup Technology Inc., Brrokpark, OH
- 3B7 Theory of Langmuir Probes in Anisotropic Plasmas**
I. D. Sudit¹, R. C. Woods University of Wisconsin-Madison, Department of Chemistry,
Madison WI USA
¹University of California, Los Angeles
- 3B8 Measurements of Two Dimensional Velocity Distributions of Ions in a Plasma Chamber**
G. Hancock, L. Lanyi, B.K. Woodcock
Oxford University, Physical Chemistry Lab, Oxford UK
- 3B9 Diagnostics of a DC Arcjet Diamond CVD Reactor**
W.A. Weimer, S.W. Reeve
Naval Air Warfare Center, Chemistry Division, China Lake CA USA
- 3B10 Charge Transfer In Optical Diagnostics**
A.G. Ponomarenko, I. F. Shaikhislamov
Institute of Laser Physics Novosibirsk Russia

Tuesday Morning, 7 June 1994

9:45 am—Otowi

Oral Session 3C: Basic Phenomena in Partially Ionized Gases I

Chair: V. Godyak

- 3C1-2 *Invited*—Study of Capacitive RF Discharge Characteristics Through Particle Simulations**
M. Surendra
IBM T. J. Watson Research Center Yorktown Heights NJ USA
- 3C3-4 *Invited*—Two-Dimensional Kinetic and Fluid Models for Parallel-Plate RF Glow Discharges**
C.-H. Wu, X. Wu, J.-H. Tsai¹, F. F. Young², C. Li³
Auburn University, Dept. Electrical Engineering, Auburn AL USA
¹National Center for High-Performance Computing, Taiwan, R.O.C.
²Dept. Electronic Engr., Fong Chia University, Taiwan, R.O.C.
³Dept. Electrical Engr., National I-Lan Inst. Agriculture and Technology, Taiwan, R.O. C.
- 3C5 Energy Distributions of Positive Ions at the Grounded Electrode of a Radio-Frequency Glow Discharge in Hydrogen**
S. B. Radovanov, J. K. Olthoff, R. J. Van Brunt, M. A. Sobolewski
National Institute of Standards and Technology Gaithersburg MD USA
- 3C6 Helicon Wave Plasma Production and Study of its Characteristics**
J.H. Kim, S.K. Song, H.Y. Chang
Korea Advanced Institute of Science and Technology, Physics Department, Taejon, Korea
- 3C7 Measurement of Electromagnetic Wave Structure in Novel Geometry Helicon Source**
R. Jewett, H. Anderson, A.J. Perry¹, R.W. Boswell¹
University of New Mexico, Chemical and Nuclear Engineering, Albuquerque NM, USA
¹Plasma Research Laboratory, The Australian National University, Canberra
- 3C8 Observation of Non-Thermal Electron Tails in Novel Geometry Helicon Plasma**
R. Jewett, H. Anderson, H. Persing¹, R.W. Boswell¹
University of New Mexico, Chemical and Nuclear Engineering, Albuquerque NM, USA
¹Plasma Research Laboratory, The Australian National University, Canberra
- 3C9 Electrical Characteristics of Capacitive RF Discharges over a Wide Frequency Range**
V. A. Godyak, R. B. Piejak, B. M. Alexandrovich Osram Sylvania Inc. Danvers MA USA
- 3C10 Non-Local Electron Kinetics in an Inductively Coupled RF Discharge**
V. Kolobov
Engineering Research Center for Plasma-Aided Manufacturing, Univ. Wisconsin Madison WI USA

Tuesday Morning, 7 June 1994
9:45 am—Pinon A
Oral Session 3D: Fast Opening Switches
Chair: B. Weber

- 3D1-2 *Invited*—Spectroscopic Investigations of the Plasma Behavior in a Plasma Opening Switch Experiment**
M. Sarfaty, Y. Maron, Ya.E. Krasik, A. Weingarten, R. Arad, R. Shpitalnik, A. Fruchtman, S. Alexiou
Department of Particle Physics, Weizmann Institute of Science Rehovot Israel
- 3D3 Plasma Opening Switch Research at Physics International Company**
J.R. Goyer, D. Kortbawi, P.S. Sincerny
Physics International Company San Leandro CA USA
- 3D4 Axially-Resolved Density Measurements in a Plasma Opening Switch**
G.G. Spanjers, E.J. Yadlowsky, R.C. Hazelton, J.J. Moschella, T. B. Settersten
HY-Tech Research Corp. Radford VA USA
- 3D5 2-D Snowball Analysis of Radial and Chordal Line-Integrals in ACE 4**
R. Ingermanson, D. Parks, K. Robertson, J. Thompson, E. Waisman
Maxwell Laboratories San Diego CA USA
- 3D6 MHD Modeling of Plasma Opening Switch Experiments on HAWK**
J. H. Watrous, M.H. Freese
NumerEx Albuquerque NM USA
- 3D7 Hall MHD Modelling of Long Conduction Time Plasma Opening Switches**
J.D. Huba, J.M. Grossman, P.F. Ottinger
Naval Research Laboratory, Plasma Physics Division Washington DC USA
- 3D8-9 *Invited*—Gap Opening Processes in a Long-Conduction Time POS**
J.M. Grossman, S.B. Swankekamp, P.F. Ottinger, R.J. Comisso, D.D. Hinshelwood, B.V. Weber
Naval Research Laboratory, Pulsed-Power Physics Branch, Plasma Physics Division
Washington DC USA
- 3D10 High Voltage Plasma Opening Switches**
R. J. Mason
Los Alamos National Laboratory Los Alamos NM USA
- 3D11 Results of the First Joint Russian-American High-Explosive Pulsed-Power Experiment at Arzamas-16**
A.M. Buyko, N.P. Bidylo, V.K. Chernyshev, V.A. Demidov, S.F. Garanin, V.N. Kostyukov, A.A. Kulagin, A.I. Kuzyaev, A.B. Mezhevov, V.N. Mokhov, E.S. Pavlovskiy, A.A. Petrukhin, V.B. Yakubov, J.W. Canada¹, C.A. Ekdahl¹, J.H. Goforth¹, J.C. King¹, I.R. Lindemuth¹, R.E. Reinovsky¹, P. Rodriguez¹, R.C. Smith¹, L.R. Veesser¹, S.M. Younger¹
All-Russian Scientific Research Institute of Experimental Physics, Nizhni Novgorod, Russia
¹Los Alamos National Laboratory

Tuesday Morning, 7 June 1994

9:45 am—Pinon B

Oral Session 3E: Environmental/Energy Issues in Plasma Science II

Chair: E. L. Neau

3E1-2 *Invited*—The Use of Electron Beam Irradiation for the Treatment of Water and Other Environmental Applications

C. N. Kurucz, T. D. Waite¹, W. J. Cooper²

University of Miami, Depts. of Management Science and Industrial Engr, Coral Gables FL

¹Dept. of Civil and Archetectural Engineering, Univ. of Miami

²Drinking Water Research Center, Florida International University

3E3 Mass Balance of Reaction Products from Irradiated TCE Vapor

S. M. Matthews, F.T.S. Wang, T. Mill¹, M. Su¹, C.C.D. Yao¹

Lawrence Livermore National Laboratory Livermore CA USA

¹SRI International

3E4 Potential Applications of Plasma Science Techniques for Water Treatment Systems

D. Pavlik

Westinghouse Electric Corporation, Science and Technology Center,, Pittsburgh PA, USA

3E5 Energetic Plasma and Charged Particle Beam Methods for the Destruction of Chemical Warfare Agents

C.B. Wallace

BDM Federal, Inc. Albuquerque NM USA

3E6 The Challenge of Treating Aqueous Munitions Waste Streams

P. Rodacy, M. Prairie, P. Leslie, B. Stange

Sandia National Laboratories Albuquerque NM USA

3E7 Repetitively Pulsed Power for Meat Pasteurization

E.L. Patterson, R.J. Kaye, E.L. Neau

Sandia National Laboratories Albuquerque NM USA

Tuesday Morning, 7 June 1994
Poster Session 3P01-04: MHD

3P01 An AC MHD Energy Converter

J. P. Freidberg, J. McCarrick
MIT Plasma Fusion Center Cambridge MA USA

3P02 Coaxial Plasma Thruster with Applied Magnetic Nozzle Fields

R.P. Hoyt, J.T. Scheuer, K.F. Schoenberg, R.A. Gerwin, R.W. Moses, I. Henins
Los Alamos National Laboratory Los Alamos NM USA

3P03 Behaviour of Shock Waves in a Radiating Magnetofluid

T. Nagy
University of Miskolc, Department of Physics,
Miskolc-Egyetemvaros Hungary

3P04 High Precision Runge-Kutta Like Finite Difference Method for MHD Channel Flows

Z. Demenday, T. Nagy
University of Miskolc, Department of Physics,
Miskolc-Egyetemvaros Hungary

Tuesday Morning, 7 June 1994
Poster Session 3P05-13: Magnetic Fusion

- 3P05 Soft X-Ray Measurements in the Reversatron RFP**
D. Alexander, S. Robertson
University of Colorado Boulder CO USA
- 3P06 Toroidal Equilibrium and Stability Analysis of RFP Plasma**
M. Maeyama, S. Iwashita, K. Hoshi, S-I. Kobayashi, N. Sato, E. Hotta¹
Saitama University Saitama Japan
¹Tokyo Institute of Technology, Tokyo, Japan
- 3P07 Analysis of the Incident Plasma and Vapor Shield Plasma in PLADIS I, A Plasma Disruption Simulator**
J. Bradley III, G. Sharp, J. Gahl, S. Suzuki¹, P. Rockett², J. Hunter², I. Ovchinnikov³
University of New Mexico, Dept. of Electrical and Computer Engineering, Albuquerque NM USA
¹ Japan Atomic Energy Research Institute (JAERI), Japan
²Fusion Technology Dept., Sandia National Laboratories, Albuquerque, NM
³D.B. Efremov Institute of Electrophysical Apparatus, St. Petersburg, Russia
- 3P08 Preliminary Results from Pladis II, A Plasma Disruption Simulator**
G. Sharp, J. Gahl, J. Bradley III
University of New Mexico, Dept. of Electrical and Computer Engineering, Albuquerque NM USA
- 3P09 Neutron Production and Detection on the TFTR Tokamak during DT Operation**
C. W. Barnes¹, H. H. Duong, D.L. Jassby, L.C. Johnson, A. R. Larson¹, M.J. Loughlin, A.L. Roquemore, J.D. Strachan, G. A. Wurden¹
Princeton Plasma Physics Laboratory, Princeton, NJ Los Alamos NM USA
¹Los Alamos National Laboratory
- 3P10 Coaxial Helicity Injection Current Drive in the Helicity Injection Tokamak (HIT)**
B.A. Nelson, T.R. Jarboe, O. Jones, A.K. Martin, L. McCullough, D.J. Orvis, J.A. Rogers, J.P. Xie, C. Zhang, L.Y. Zhou
University of Washington Seattle WA USA
- 3P11 Fluctuations at the Edge of CASTOR Tokamak**
V. Dhyani, V. Svoboda, J. Stöckel, J. Petrzilka, F. Záček
Czech Academy of Sciences, Institute of Plasma Physics Prague Czech Republic
- 3P12 Limiter Biasing Experiments on the STOR-M Tokamak**
W. Zhang, C. Xiao, L. Zhang, A. Hirose
University of Saskatchewan, Dept. Physics & Engineering Physics, Saskatoon Canada
- 3P13 University of Saskatchewan Compact Torus Injector**
C. Xiao, A. Hirose, W. Zawalski, R. Raman¹, R. Décoste², B.C. Gregory², F. Martin²
University of Saskatchewan, Dept. Physics & Engineering Physics, Saskatoon, Canada
¹Canadian Fusion Fuels Technology Project
²Centre canadien de fusion magnétique

Tuesday Morning, 7 June 1994
Poster Session 3P14-24: Fast Z-Pinches and X-Ray Lasers

- 3P14 **Gas-Puff Implosion Experiments on the Inductive Storage Generator GIT-4**
R.B. Baksht, I.M. Datsko, A.A. Kim, B.M. Koval'chuk, V.A. Kokshenev, S.V. Loginov, A.G. Russkich, A.V. Fedunin, A.V. Shishlov
High Current Electronics Institute Tomsk Russia
- 3P15 **Spin Control of the Rayleigh-Taylor Instability in a Dense Z-Pinch**
G.G. Peterson, N. Rostoker, H. Tahsiri¹
University of California, Department of Physics, Irvine Irvine CA USA
¹Dept. Physics & Astronomy, California State University, Long Beach
- 3P16 **Cryogenic High Current Discharges**
B.E. Meierovich
P.L. Kapitza Institute of Physics Problems Moscow Russia
- 3P17 **On Aspects of Nuclear-Pumped Laser Power Beaming**
M. Petra, E. Suzuki, E. Batyrbekov, E. Poletaev, G. H. Miley
University of Illinois, Fusion Studies Department, Urbana IL USA
- 3P18 **Two-Dimensional Simulations of Radiation Production from Stagnating Compact Toroids**
M.R. Douglas, N. F. Roderick¹, R.E. Perkin Jr, T.W. Hussey, D. Dietz
Phillips Laboratory Kirtland AFB NM USA
¹The University of New Mexico, Albuquerque, NM
- 3P19 **Compact Toroid Radiation Production**
D. Dietz, T.W. Hussey, N.F. Roderick¹, M.R. Douglas, J.H. Degnan
Phillips Laboratory, High Energy Plasma Division, Kirtland AFB NM USA
¹The University of New Mexico, Albuquerque, NM
- 3P20 **Magnetic Flux Penetration of an Aluminum Liner during Working Fluid Compression**
D.E. Bell, T. W. Hussey
Phillips Laboratory, High Energy Plasma Division, Kirtland AFB NM USA
- 3P21 **New Scheme of Charge-Transfer Pumping for VUV**
Yu. P. Zakharov, A.G. Ponomarenko, I.F. Shaikhislamov
Institute of Laser Physics Novosibirsk Russia
- 3P22 **Pulsed Hollow Cathode Capillary Discharge**
P. Choi, M. Favre¹, C. Dumitrescu-Zoita²
The Blackett Laboratory, Imperial College London UK
¹Pontifica Universidad Católica de Chile, Santiago, Chile
²University of Bucharest, Bucharest, Romania
- 3P23 **Magnetic Field Compression by Hollow Cylindrical Gas Puff Liner**
V. I. Oreshkin, I.E. Gorel'chanik
Institute of High Current Electronics Tomsk Russia
- 3P24 **Double Shell Liner Implosion Experiments**
S.A. Sorokin, S.A. Chaikovsky
Institute of High Current Electronics Tomsk Russia

Tuesday Morning, 7 June 1994
Poster Session 3P25-35: Intense Ion and Electron Beams

- 3P25 **Generation and Application of Focused High Power Ion Beam in the Br-Applied Diode.**
V. M. Bystritskii, S. N. Volkov, I. V. Lisitsyn, A. V. Mytnikov
Institute of Electrophysics Tomsk Russia
- 3P26 **Technological Application of High Power Ion Beam in the Plasma Opening Switch.**
V. M. Bystritskii, S. V. Grigor'ev, I. V. Lisitsyn, G. A. Mesyats, A. A. Sinebryukhov, V. A. Sinebryukhov
Institute of Electrophysics Tomsk Russia
- 3P27 **PIC Simulation and Analytic Modelling of Both Long and Short-Pulse Magnetically Insulated Transmission Lines**
S. E. Rosenthal, C. W. Mendel Jr
Sandia National Laboratories Albuquerque NM USA
- 3P28 **"Double-Wall" IFR Cell for Conditioning Intense Relativistic Electron Beams**
M.C. Myers, R.A. Meger, D.P. Murphy, D.J. Weidman, R.F. Fernsler, R. F. Hubbard, S.P. Slinker
Naval Research Laboratory, Plasma Physics Division Washington DC USA
- 3P29 **Synchronization of Streak and Framing Camera Measurements of an Intense Relativistic Electron Beam Propagating Through Gas**
D.J. Weidmann¹, D.P. Murphy, M.C. Myers, R.A. Meger
Naval Research Laboratory, Plasma Physics Division Washington DC USA
¹Institute for Plasma Research, University of Maryland, College Park, MD
- 3P30 **Time-Resolved Magnetic Spectrometer Measurements of the SABRE Positive Polarity Magnetically Insulated Transmission Line Voltage**
P.R. Menge, M.E. Cuneo, D.L. Hanson, J. E. Maenchen, J.W. Poukey, M.A. Bernard¹
Sandia National Laboratory, Intense Beam Research Dept., Albuquerque NM USA
¹Ktech Corp., Albuquerque, NM
- 3P31 **Electron Beam Generation During the Hollow Cathode Phase of Pseudospark Operation**
L.C. Pitchford¹, J. P. Boeuf¹, V. Puech², R. Liou³, M.A. Gundersen³
University of Colorado, Joint Institute for Laboratory Astrophysics, Boulder, CO, USA
¹CNRS URA 277, Univ. P. Sabatier, Toulouse, France
²CNRS URA 073, Univ. Paris Sud, Orsay, France
³University of Southern California, Los Angeles, CA
- 3P32 **Power Efficiency Tuning Considerations for Light-Ion Inertial Confinement Fusion**
D.V. Rose¹, P.F. Ottinger, C.L. Olson²
Naval Research Laboratory, Plasma Physics Division Washington DC USA
¹JAYCOR, Vienna, VA
²Sandia National Laboratories, Albuquerque, NM
- 3P33 **Study of Transport of the Electron Beam Produced by a Pseudospark**
C. J. Liu, M. J. Rhee
University of Maryland, Insitute for Plasma Research, College Park MD USA
- 3P34 **Neutralization of Low Energy Broad Ion Beam**
S.V. Dudin, A.V. Zykov, V.I. Farenik
Kharkov University, Scientific Center of Physics and Technology, Kharkov, Ukraine
- 3P35 **Magnetic Insulation of Electron Flow in Curved Transmission Lines**
J. Geary, J. Grossman¹, S. Swankekamp²
Berekeley Research Associates Springfield VA USA
¹Naval Research Laboratory, Washington, DC
²Science Applications International Corporation, McLean, VA

Tuesday Morning, 7 June 1994
Poster Session 3P36-40: Laser-Produced Plasmas

- 3P36 Laser Propagation in a Gas-Filled Target with 0.53 and 0.35 μm at Various Electron Densities on Nova**
D. H. Kalantar, B.J. MacGowan, T. Bernat, D.E. Klem, J.D. Moody, D. H. Munro, G.F. Stone, R. Wallace
Lawrence Livermore National Laboratory Livermore CA USA
- 3P37 Stochastic Instability and Filamentation Instability of Laser Beams in Plasmas**
C. Zhou, X. T. He
Inst. of Applied Physics and Computational Mathematics, Lab. of Comp. Math, Beijing, China
- 3P38 Hot Electron and Stimulated Raman Scattering in Laser Cavity Target Plasma**
Z. Jia-tai
Inst. of Applied Physics & Computational Mathematics Beijing China
- 3P39 Anisotropic Instability of the Photoelectrons Generated by Soft X-ray Radiation of the Laser Produced Plasma Focus**
B. A. Klumov, V. P. Tarakanov
Institute for Geospheres Dynamics 17334 Moscow Russia
- 3P40 Trident Colliding Plasma Experiments and Modeling**
M. Wilke, M. E. Jones, A. W. Obst, S. E. Caldwell, R. G. Watt, S. R. Goldman, D. Winske, K. R. Alrick, G. G. Schmitt, R. E. Chrien, R. B. Gibson
Los Alamos National Laboratory Los Alamos NM USA

Tuesday Afternoon, 7 June 1994
2:00 pm — Main Floor

Plasma Science and Applications Committee
Prize Address

THE 'SOURCES' OF PLASMA PHYSICS

Francis Chen
UCLA

Chair: R. J. Barker

Tuesday Afternoon, 7 June 1994
3:15 pm—Barranca
Oral Session 4A: Microwave-Plasma Interactions
Chair: S. Kuo

- 4A1 Parametric Plasma Surface Instabilities with P-Polarized Radiation**
H.L. Rappaport
University of Maryland, Institute for Plasma Research, College Park MD USA
- 4A2 Electron Cyclotron Waves in a Highly Inhomogeneous Plasma**
B.E. Chapman, J.E. Scharer, W. Shen, Y.S. Zhang
University of Wisconsin, Electrical and Computer Engineering Dept., Madison, WI, USA
- 4A3 Two-Dimensional Calculation of Short Electromagnetic Pulse Propagation and Ionization in Low-Pressure, Argon-Filled Cylindrical Cavities**
D. J. Mayhall, J. H. Yee
Lawrence Livermore National Laboratory Livermore CA USA
- 4A4 Frequency Downshift in Rapidly Ionizing Media**
S.P. Kuo, A. Ren
Polytechnic University Farmingdale NY USA
- 4A5-6 *Invited*—A DC to Optical Frequency Converter Based on Plasma Ionization**
T. Katsouleas, P. Lai, R.L. Liou, W.B. Mori¹, J.M. Dawson¹, C. Joshi¹
University of Southern California Los Angeles CA USA
¹University of California, Los Angeles

Tuesday Afternoon, 7 June 1994
3:15 pm—Chamisa
Oral Session 4B: Fast Z-Pinches and X-Ray Lasers
Chair: J. Giuliani

- 4B1 Modeling of Al Wire-Array Implosions on Existing Generators with the "ZPIMP" Code**
J.L. Giuliani Jr, J. Rogerson, J. Davis, C. Deeney¹, R. Spielman²
Naval Research Laboratory, Plasma Physics Division Washington DC USA
¹Physics International Co., San Leandro, CA
²Sandia National Laboratories, Albuquerque, NM
- 4B2 Producing High Energy Photons Using Titanium PRS Loads**
J.W. Thornhill, K.G. Whitney
Naval Research Laboratory, Plasma Physics Division Washington DC USA
- 4B3-4 Invited—A Multi Stage Plasma-on-Wire Z-Pinch Configuration on the Megajoule GIT-4 Generator**
B. Etlicher, A. Chuvatin, P. Zehnter, N.S. Edison, M Darrigol¹, D. Friart¹, C. Nazet¹, P. Choi², C. Zoita², R. Baksh³, I. Datsko³, A. Fedunin³, A. Shishlov³, A.A. Kim³, V.A. Kokshenev³, B.M. Kovalchuk³, A. Russkich³, A.V. Shislov³, M.O. Kosheroi⁴, D.A. Fedin⁴
Laboratoire de Physique des Milieux Ionises, Ecole Polytechnique F91128 Palaiseau France
¹CEA Centre d'Etude de Bruyères le Chatel, France
²The Blackett Laboratory, Plasma Physics Dept., Imperial College, London, UK
³High Current Electronics Inst., Tomsk, Russia
⁴Lebedev Physical Institute, Russia
- 4B5 Influence of L-Shell Dynamics on K-Shell X-rays from a Krypton Gas Puff Z-Pinch Plasma**
J. Davis, J. Guiliani, M. Mulbrandon
Naval Research Laboratory, Plasma Physics Division Washington DC USA
- 4B6 High-Velocity Krypton Z-Pinch Implosions on Saturn**
R.B. Spielman, T.L. Gilliland, R. Humphries, D. Jobe, J.S. McGurn, T.J. Nash, J.L. Porter, L.E. Ruggles, J. Seaman, K.W. Struve, V. Vargas
Sandia National Laboratories Albuquerque NM USA
- 4B7 Hydrodynamic Instability Activity in High Current PRS Implosions**
F.L. Corchran, J. Davis¹
Berkeley Research Associates Springfield VA USA
¹Plasma Physics Division, Naval Research Laboratory, Washington, DC
- 4B8 Implosion of Aluminum Wire Arrays Coated with Magnesium on the 4 MA Double-EAGLE Generator**
C. Deeney, P.D. LePell, B. Failor, S. Wong, E. Yadloski¹, B. Hazelton¹, J.P. Apruzese², K.G. Whitney², J.W. Thornhill², T. Nash³
Physics International Company San Leandro CA USA
¹HYTECH Research Company, Washington, DC
²Naval Research Laboratory, Washington, DC
³Sandia National Laboratory, Albuquerque, NM
- 4B9 The Time Dependent Structure of an Imploding Z-Pinch Plasma**
G. Davara, L. Gregorian, E. Kroupp, Y. Maron
Weizmann Institute of Science Rehovot Israel

Tuesday Afternoon, 7 June 1994
3:15 pm—Otowi
Oral Session 4C: Plasma Processing II
Chair: J. Wu

- 4C1-2 Invited—High Velocity, Low Density ARC Heated Plasma Jets for Diamond Synthesis**
M.A. Cappelli, M.A. Loh
Stanford University, Mechanical Engineering Department, USA
- 4C3 Characterization of a Microwave Cavity Plasma Reactor under Large Area Diamond Film Deposition Conditions**
J.Zhang, J. Asmussen
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 4C4 Microwave Plasma Considerations for CVD of Diamond Films at Low Substrate Temperatures**
M. Ulczynski, D.K. Reinhard, M. Prystajko, J. Asmussen
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 4C5 Thermal Plasma CVD of Diamond: Relation Between Flow Velocity and Film Growth Chemistry**
S.L. Girshick, B. W. Yu
University of Minnesota, Dept. of Mechanical Engineering, Minneapolis MN USA
- 4C6 Deposition of Diamond-Like Carbon Films with Intense Ion Beams**
H.A. Davis, D.J.Rej, G.P. Johnston¹, R.E. Muenchhausen, H.K. Schmidt², D.R. Tallant³, M. Thompson⁴, W.J. Waganaar, D.B. Williams⁵
Los Alamos National Laboratory Los Alamos NM USA
¹Dept. Chemical Engr., University of New Mexico, Albuquerque, NM
²SI Diamond Inc., Houston, TX
³Sandia National Laboratories, Albuquerque, NM
- 4C7 Simulations and Measurements of Alumina Particles in Plasma Spraying**
W.H. Zhuang, H.F. Chen, K. Etemadi, D. M. Benson
State University of New York at Buffalo, Dept. Electrical and Comp. Engr., Buffalo NY USA
- 4C8 Copper Oxide Films Formed by Reactive Cathodic Arc Deposition**
S. Anders, A. Anders, I.G. Brown, R.A. MacGill, M.R. Dickinson, R.A. Castro
Lawrence Berkeley Laboratory, University of California Berkeley CA USA
- 4C9 Recent Results from a Large-Scale Plasma Source Ion Implantation Experiment**
B.P. Wood, I. Henins, W. A. Reass, R. J. Faehl, D. J. Rej, M. A. Nastasi, K. C. Walter
Los Alamos National Laboratory Los Alamos NM USA
- 4C10 Buried Ceramic Layer Formation in Glass and Silicon Using Plasma Source Ion Implantation**
J.H. Booske, L. Zhang, R.F.Cooper¹, J. L. Shohet, K. Shenai, D. Dallman, M.J. Goeckner, R. Breun, W.N.G. Hitchon, E. Wickesberg, R. Speth, J.R. Jacobs
University of Wisconsin, ERC for Plasma-Aided Manufacturing, Madison WI, USA

Tuesday Afternoon, 7 June 1994
3:15 pm—Pinon A
Oral Session 4D: Intense Ion and Electron Beams
Chair: S. Humphries

- 4D1-2 *Invited*—Electron Scrubbing of Flue Gases from High Sulfur Fuel to Remove Unwanted By-Products**
R.D. Genuario
Berkeley Research Associates, Inc. Springfield VA USA
- 4D3 Time Resolved Li Beam Divergence Studies on PBFAII**
D.J. Johnson, M. P.Desjarlais, T.R. Lockner, T.A. Mehlhorn, W.A. Stygar, D.R. Wenger
Sandia National Laboratory, Intense Beam Research Dept., Albuquerque NM USA
- 4D4 Dynamics of a Very Intense Pulsed Electron Beam**
T.W.L. Sanford, J.A. Halbleib, D.R. Welch, R.C. Mock
Sandia National Laboratory Albuquerque NM USA
- 4D5 Characteristics of a Large Vacuum Wave Precursor on the SABRE Voltage Adder MITL and Extraction Ion Diode**
M.E. Cuneo, D.L. Hanson, P.R. Menge, J.W. Poukey, M.E. Savage
Sandia National Laboratory, Intense Beam Research Dept., Albuquerque NM USA
- 4D6 High Power Linear Inductive Voltage Adder as PRS Driver**
M.G. Mazarakis, J.W. Poukey, J.P. Corley, P. Pankuch, K. R. Prestwich, D.L. Smith, I. Smith¹, P. Corcoran¹, P. Spence¹
Sandia National Laboratory, Intense Beam Research Dept., Albuquerque NM USA
¹Pulse Sciences, Inc., San Leandro, CA
- 4D7 Numerical Modeling of the Plasma Wakefield Light Source**
J. C. Goldstein, M. E. Jones
Los Alamos National Laboratory Los Alamos NM USA
- 4D8 Collimating Structure for Intense Pseudospark Electron Beams**
T-Y Hsu, M. A. Gundersen, K. Frank¹
University of Southern California, Dept of Electrical Engineering—Electrophysics,
Los Angeles CA USA
¹Physikalisches Institut, University of Erlangen-Nurnberg, Germany
- 4D9 Effects of a Low Work Function Cathode on Electron Beam Generation in a Hollow Cathode Discharge**
G.J. Roth, V.F. Puchkavev, R. Liou, T-Y Hsu, M.A. Gundersen
University of Southern California, Dept of Electrical Engineering—Electrophysics,
Los Angeles CA USA

Tuesday Afternoon, 7 June 1994
3:15 pm—Pinon B
Oral Session 4E: EM & ETH Launchers
Chair: R.A. Meger

- 4E1 **A Global Theoretical Approach for the Plasma of the Electrothermal Gun: Scaling Laws and a 0-D Time Dependent Model**
E. Jacob, S. Bouquet, B. Tortel
Commissariat energie Atomique Paris Courtry France
- 4E2 **Plasma Formation and Expansion in an Electrothermal Plasma Injector**
J.D. Hurley, M.A. Bourham, J.G. Gilligan
North Carolina State University, Dept. Nuclear Engineering, Raleigh NC, USA
- 4E3 **Surface Erosion Studies in a Plasma Propellant Interaction Experiment**
M.A. Bourham, J.G. Gilligan, C.M. Edwards, M. L. Nahm
North Carolina State University, Dept. Nuclear Engineering, Raleigh NC, USA
- 4E4 **The Measurement and Evaluation of the Effect of Fuse Materials and Masses on Railgun Performances**
M.C. Baker, M.R. Tanner
Texas Tech University Lubbock TX USA

Tuesday Afternoon, 7 June 1994
Poster Session 4P01-06: Fast Opening Switches

- 4P01 Plasma Flow Switch Experiments on Pegasus-II**
J.S. Shlachter, R.R. Bartsch, J.F. Benage, J.C. Cochrane, J.S. Ladish, D.W. Scudder, F.J. Wysocki, H. Oona, J.V. Parker¹, R.F. Gribble, W.B. Broste², B. Warthen², J. L. Stokes
Los Alamos National Laboratory Los Alamos NM USA
¹Institute of Advanced Technology, Austin, TX
²EG&G, Los Alamos, NM
- 4P02 MACH2 Modeling of LANL Plasma-Flow-Switch Experiments**
F. J. Wysocki
Los Alamos National Laboratory Los Alamos NM USA
- 4P03 The Role of Potential Hills and Reflexing Electrons in the Operation of a Plasma Opening Switch**
R. J. Kares
Los Alamos National Laboratory Los Alamos NM USA
- 4P04 Simulations of Fast Magnetic Field Penetration into a Plasma**
W. Peter, A. Fruchtman, J. Geary¹, J. Grossman²
Weizmann Institute of Science, Dept. of Physics, Rehovot, Israel Fairfax VA USA
¹Berkeley Research Associates, Springfield, VA
²Naval Research Laboratory, Washington, DC
- 4P05 GIT8 Long Conduction POS Operation at 5MA Current Level**
A. A. Kim, B. M. Kovalchuk, V. A. Kokshenev, S. V. Loginov
High Current Electronics Institute Tomsk Russia
- 4P06 Microsecond Plasma Opening Switch with Gas-Puff Plasma Guns at GIT-4 Accelerator**
B. M. Koval'chuk, V. A. Kokshenev, F. I. Fursov, V. P. Yakovlev
Institute of Electrophysics Tomsk Russia

Tuesday Afternoon, 7 June 1994
Poster Session 4P07-16: Plasma, Ion, and Electron Sources

- 4P07 High Current Metal Vapor Vacuum Arc (MEVVA) Ion Source**
P. Greene, M. Krishnan
Science Research Laboratory Alameda CA USA
- 4P08 Plasma Production Using an Asmussen Cavity in a Magnetic Field**
S. de Souza-Machado, J.J. Curry, F. Skiff
University of Maryland, Institute for Plasma Research, College Park MD USA
- 4P09 Quasistationary Source of the High-Power Plasma Streams**
A. I. Morozov, I. E. Garkusha, D. G. Solyakov, N. I. Mitina, M.A. Tiarov, S.A. Trubchaninov,
V. I. Tereshin, V.V. Chebotarev, A.V. Tsarenko
NNC Kharkov Institute of Physics & Technology Kharkov Ukraine
- 4P10 Comparison of Etch Performance in the GEC Reference Cell with a Commercial Etcher**
J. Pender, M. Buie, M.L. Brake, M. Elta¹
University of Michigan, Department of Nuclear Engineering, Ann Arbor MI, USA
¹Department of Electrical Engineering, University of Michigan
- 4P11 Properties of Argon-Lithium Discharges in a Microwave Resonant Cavity**
C.B. Brooks, M.L. Brake, R.M. Gilgenbach
University of Michigan, Department of Nuclear Engineering, Ann Arbor MI, USA
- 4P12 Effects of a Transverse-Magnetic Field on a Laser-Ablation-Assisted -Plasma-Discharge Ion Source**
J.S. Lash¹, R.M. Gilgenbach, C.H. Ching
University of Michigan, Intense Energy Beam Interaction Lab., Dept. of Nuclear Engr.
Ann Arbor MI USA
¹National Science Foundation Fellowship
- 4P13 Dynamics of Electrons in Anode Layer of Hall-Type Ion Source**
S.V. Dudin, A.V. Zykov, A.V. Ushakov
Kharkov University, Scientific Center of Physics and Technology, Kharkov, Ukraine
- 4P14 Experiments on the Coupling Mechanisms of a Compact ECR Plasma Source**
A.K. Srivastava, J. Asmussen
Michigan State University, Dept. of Electrical Engineering, East Lansing MI USA
- 4P15 Measurement of Beam Currents in the Hollow Cavity of a Pseudospark**
C. J. Liu, M. J. Rhee
University of Maryland, Institute for Plasma Research, College Park MD USA
- 4P16 Numerical Experiment on Relativistic Cherenkov Backward Wave Oscillator**
I.V. Pegel¹, S.D. Korovin¹
University of New Mexico Albuquerque NM USA
¹Institute of High Current Electronics, Russian Academy of Sciences, Tomsk, Russia

Tuesday Afternoon, 7 June 1994
Poster Session 4P17-22: Dense Plasma Focus

- 4P17 Gas-Injection Experiments of a Dense Plasma Focus**
O. Barnouin, S. DelMedico, G.H. Miley¹, B. Bromley¹
Rockford Technology Assoc., Inc. Champaign IL USA
¹Fusion Studies Laboratory, University of Illinois Urbana, IL
- 4P18 Soft X-rays Measurements in a Dense Plasma Focus**
F. Castillo, M. Milanese, R. Moroso, J. Pouzo
Instituto de Ciencias Nucleares, UNAM 04510 Mexico D.F. Mexico
- 4P19 Simulation of a Dense Plasma X-Ray Source**
R. A. Stark, R. R. Prasad¹, M. Krishanan¹
Naval Surface Warfare Center Silver Springs MD USA
¹Science Research Laboratory, Alameda, CA
- 4P20 2 and 3-D MHD Calculations of the Plasma Focus and Flow-Through Z-Pinch**
J. Eddleman, C. Hartman, U. Shumlak¹
Lawrence Livermore National Laboratory Livermore CA USA
¹Phillips Laboratory
- 4P21 A Gas Puff Experiment for Partial Simulation of Compact Toroid Formation on MARAUDER**
S. E. Englert¹, T. J. Englert¹, J. H. Degnan, J.M. Gahl²
Phillips Laboratory Kirtland AFB NM USA
¹and The University of New Mexico, Albuquerque, NM
²The University of New Mexico, Albuquerque, NM
- 4P22 Ti:Sapphire Tube Laser by Hypocycloidal-Pinch Plasma Array**
K.S. Han, J.H. Lee¹, L.Zhang, J.T. Seo
Hampton University, Dept. Physics, Hampton VA USA
¹NASA Langley Research Center, Hampton, VA

Tuesday Afternoon, 7 June 1994
Poster Session 4P23-32: Plasma Diagnostics

- 4P23 **Laser-Induced Fluorescence Measurements of Fokker-Planck Diffusion**
J.J. Curry, F. Skiff
University of Maryland, Institute for Plasma Research, College Park MD USA
- 4P24 **Resonances in a Radio-Frequency Plasma**
V.P.T. Ku, B.M. Annaratone, J.E. Allen
Oxford University, Plasma Physics Group, Dept. Engr. Science Oxford UK
- 4P25 **Mach Probe Measurements of Flow Velocity in RF Plasma**
J.-G. Yang, H.-Y. Chang
Korea Advanced Institute of Science and Technology, Physics Department, Taejon, Korea
- 4P26 **Measurements of HF Electric Fields in Plasmas by Short-Circuited Double Probes**
N. Brenning, M. Wohlin, S. Torvén
Royal Inst. of Technology, Alfvén Laboratory, Dept. of Plasma Physics, Stockholm, Sweden
- 4P27 **Probe Measurements in Ion-Beam Plasma**
S.V. Dudin
Kharkov University, Scientific Center of Physics and Technology, Kharkov, Ukraine
- 4P28 **Development of Transient Internal Probe (TIP) Magnetic Field Diagnostic**
J.P. Galambos, M.A. Bohnet, T.R. Jarboe, A.T. Mattick
University of Washington Seattle WA USA
- 4P29 **Comprehensive Diagnostic Set for Intense Lithium Ion Hohlraum Experiments on PBFA II**
R.J. Leeper, J.E. Bailery, A.L. Carlson, G.A. Chandler, M.S. Derzon, R.J. Dukart, D.E. Hebron, L. P. Mix, A.R. Moats, T.J. Nash, D.D. Noack, W.R. Olson, J.L. Porter, C. L. Ruiz, F. A. Schmidlapp, M.A. Stark, J.A. Torres, D.F. Wenger, R.W. Olsen¹
Sandia National Laboratories Albuquerque NM USA
¹EG&G Kirtland Operations, Albuquerque, NM
- 4P30 **Direct Nuclear Activation Diagnostics for Intense Particle Beams**
C.L. Ruiz, W.A. Stygar, R.J. Leeper, G.W. Cooper¹, F.A. Schmidlapp²
Sandia National Laboratories Albuquerque NM USA
¹University of New Mexico, Albuquerque, NM
²Ktech Corporation
- 4P31 **Characterization of a Two-Dimensional, Thermoluminescent, Dose-Mapping System: Uniformity, Reproducibility, and Calibrations**
D.L. Fehl, D.J. Muron, D.W. Vehar, L.J. Lorence Jr, S.C. Jones¹, J.A. Sweet¹, P. Braunlich¹
Sandia National Laboratories Albuquerque NM USA
¹International Sensor Technology, Inc., Pullman, WA
- 4P32 **On Improving the Efficiency of Plasma Diagnostics with the Help of a Computer**
S.W. Temko, K.W. Temko, S.K. Kuz'min
MGRI 117485 Moscow Russia

Wednesday Morning, 8 June 1994
8:30 am — Main Floor

**DEUTERIUM-TRITIUM EXPERIMENTS ON TFTR:
THEIR IMPLICATIONS FOR
CONTROLLED NUCLEAR FUSION**

Robert Krakowski
Los Alamos National Laboratory

Emilio Panarella
Advance Laser and Fusion Technology, Inc.

Keith Thomassen
Lawrence Livermore National Laboratory
and
Princeton Plasma Physics Laboratory

Joe Mather
Los Alamos National Laboratory

Chair: G. H. Miley

Wednesday Morning, 8 June 1994
9:45 am—Barranca
Oral Session 5A: Computational Plasma Physics II
Chair: L. J. Chandler

5A1-2 *Invited*—Applications of an Object-Oriented PIC Code to Problems in Beam Physics
W. Peter^{1,7}, J. Verboncoeur², T. Gladd³, A.B. Langdon⁴, C.K. Birdsall², C.-C. Lee⁵, F. Dandashi⁵, J. Acquah⁵, P. Mardahl², K. Cartwright², T. Karas⁵, J. Geary³, G. Gisler⁶, D. Rine⁵

¹FM Technologies Fairfax VA USA

²U.C. Berkeley, Berkeley, CA USA

³Berkeley Research Assoc., Berkeley, CA USA

⁴LLNL, Livermore, CA USA

⁵George Mason University USA

⁶LANL, Los Alamos, NM USA

⁷Weizmann Institute of Science, Israel

5A3 Three Dimensional Plasma Modeling Using PIC Techniques on Parallel Architectures
B.M. Minor, L.J. Chandler, P.J. Helles, J.S. Wagner, M.W. Trahan
Phillips Laboratory Kirtland AFB NM USA

5A4 3-D Electromagnetic Particle-in-Cell Calculations Using Non-Orthogonal Unstructured Grids
S. Brandon, D. J. Larson, N. Madsen, D.E. Nielsen Jr, P. Weidhass
Lawrence Livermore National Laboratory Livermore CA USA

5A5-6 *Invited*—Portable Parallel Code for Plasma Simulations: Development Experience and Initial Results
P. Liewer, J. Brackbill¹, S. R. Karmesin²
Jet Propulsion Laboratory Pasadena CA USA
¹Los Alamos National Laboratory, Los Alamos, NM
²Caltech, Pasadena, CA

5A7 3D Electromagnetic Plasma Particle Simulations on the Intel Delta Parallel Computer
J. Wang, P.C. Liewer, V.K. Decyk¹
Jet Propulsion Laboratory, California Institute of Technology Pasadena CA, USA
¹University of California, Los Angeles

5A8 Approximations of the Bounded Plasma Model by the Plasma and the Sheath Models
N. Sternberg, V. A. Godyak¹
Clark University Worcester MA USA
¹Osram Sylvania, Danvers, MA

5A9 Computer Simulation of Strong Shock Wave Dynamics in Noble Gas Plasmas
I. I. Oleinik, N. M. Kuznetsov¹
Volgograd State University Volgograd Russia
¹Institute of Chemical Physics, Moscow, Russia

Wednesday Morning, 8 June 1994
9:45 am—Chamisa
Oral Session 5B: Vacuum Electronics II
Chair: D. Shiffler

- 5B1 Cold Test, Spontaneous Emission and Gain in a Rectangular Cerenkov Amplifier**
J.E. Scharer, J. Joe, J.H. Booske, M. Basten, H. Kirolos
University of Wisconsin, Electrical and Computer Engineering Dept., Madison, WI, USA
- 5B2 Formation and Transport of PCM-Focused Sheet Electron Beams**
M.A. Basten, J. H. Booske, J. Anderson, J.E. Scharer, R. True¹
University of Wisconsin, Electrical and Computer Engineering Dept., Madison WI USA
¹Litton Electron Devices, San Carlos, CA
- 5B3 Field Analysis of Helix Traveling Wave Tube Interaction**
N.R. Vanderplaats, M.A. Kodis, H.P. Freund
Naval Research Laboratory Washington DC USA
- 5B4 Nonlinear Analysis of Helix Traveling Wave Tubes**
H.P. Freund¹, E.G. Zaidman, N.R. Vanderplaats, M.A. Kodis
Naval Research Laboratory Washington DC USA
¹Science Applications International Corp., McLean, VA
- 5B5 Reentrant Electron Beam Effects in a Circular Crossed-Field Amplifier—Experiments and Numerical Simulations**
R. MacGregor, C. Chan, J. Ye, T. Nakatsugawa
Plasma Science & Microelectronics Laboratory, Northeastern University Boston MA, USA
- 5B6 Electron Sheaths in a Crossed-Field Gap**
P.J. Christenson, Y.Y. Lau, D. Chernin¹
University of Michigan, Intense Energy Beam Interaction Lab., Dept. of Nuclear Engr.
Ann Arbor MI USA
¹SAIC, Mclean, VA
- 5B7 Two-Stream Klystron and Cyclotron Maser Driven by Mildly Relativistic Electron Beams**
C. Chen, G. Bekefi, P. Catravas, W. Hu
MIT Plasma Fusion Center, Cambridge MA USA
- 5B8 High Power Folded Waveguide Millimeter-Wave Gyro-TWT**
J.J. Choi, A.K. Ganguly, C.M. Armstrong
Naval Research Laboratory Washington DC USA

Wednesday Morning, 8 June 1994

9:45 am—Otowi

Oral Session 5C: Basic Phenomena in Partially Ionized Gases II

Chair: R. Piejak

- 5C1-2 *Invited*—Quasi-Neutral Particle Simulations of Magnetized Low Pressure Discharges**
W. Manheimer, M. Lampe, G. Joyce, S. Slinker
Naval Research Laboratory Washington DC USA
- 5C3-4 *Invited*—Review on Laser-Induced Fluorescence Methods for Measuring RF- and Microwave Electric Fields in Discharges**
V. Gavrilenko, E. Oks
Auburn University, Physics Department, Auburn AL USA
- 5C5 Theory of the Plasma-Sheath Transition and the Bohm Criterion**
K.-U. Riemann
Ruhr-Universität Bochum D-44780 Germany
- 5C6 Two-Dimensional Model of Stationary Plasma Thruster**
J. P. Boeuf, L. C. Pitchford
University of Colorado, Joint Institute for Laboratory Astrophysics, Boulder CO USA
CNRS URA 277, Univ. P. Sabatier, Toulouse, France
- 5C7 Non-Maxwellian Bounded Plasma Model with Charge Exchange Ion Collisions**
V. A. Godyak, V. P. Meytlis¹, H. R. Strauss¹
Osram Sylvania Inc. Danvers MA USA
¹Courant Institute of Mathematical Science, New York University
- 5C8 Computational Characterization of AC Plasma Display Panels**
B. M. Penetrante, J. N. Bardsley
Lawrence Livermore National Laboratory Livermore CA USA
- 5C9 The Electrical Boundary Layer and Current Transfer Between a Thermal Plasma and a Plane Electrode**
E. Meeks¹, M.A. Cappelli
Stanford University, Mechanical Engineering Department, USA
¹also with Sandia National Laboratories, Livermore, CA

Wednesday Morning, 8 June 1994
9:45 am—Pinon A
Oral Session 5D: Solid State Plasmas and Switches
Chair: M. S. Mazzola

- 5D1-2 *Invited*—Two Dimensional Time Dependent Modeling of Optically Switched GaAs**
P. J. Stout, M.J. Kushner
University of Illinois, Dept. Electrical and Computer Engineering, Urbana, IL USA
- 5D3 Coupling of the PISCES Semiconductor Device Modeler to a 3D Maxwell FD-TD Solver**
V. A. Thomas, R.J. Mason, M. E. Jones
Los Alamos National Laboratory Los Alamos NM USA
- 5D4 High-Power Subnanosecond Operation of a Bistable Optically Controlled Semiconductor Switch (BOSS)**
D.C. Stout, M.A. Richardson, D.L. Demske, R.A. Roush, K.W. Eure
Naval Surface Warfare Center Dahlgren VA USA
- 5D5-6 *Invited*—The Temporal Development of Electrical Breakdown in Laser Triggered GaAs-Switches**
K.H. Schoenbach, F.E. Peterkin, R. Block
Old Dominion University, Physical Electronics Research Institute, Norfolk, VA USA
- 5D7 Characteristics of Current Filaments in GaAs Photoconductive Semiconductor Switches**
F. J. Zutavern, G.M. Loubriel, W.D. Helgeson, M. W. O'Malley, R.R. Gallegos
Sandia National Laboratories Albuquerque NM USA
- 5D8 Semi-insulating 6H-SiC Epitaxial Films**
M.S. Mazzola, S. E. Sadow¹
Mississippi State University, Dept. Electrical and Computer Engineering,
Mississippi State MS USA
¹Army Research Laboratory, Adelphi, MD

Wednesday Morning, 8 June 1994
Poster Session 5P01-19: Intense Beam Microwaves

- 5P01 Progress in the Long-Pulse BWO Experiment at the University of New Mexico**
C. Grabowksi, J. Gahl, E. Schamiloglu, D. Shiffler
University of New Mexico, Dept. of Elect. and Computer Engineering, Albuquerque NM, USA
- 5P02 Power and Frequency Measurements from a Uniform Backward Wave Oscillator as a Function of Length**
L.D. Moreland, A.M. Roitman¹, E. Schamiloglu, R.W. Lemke², I.V. Pegel¹
University of New Mexico Albuquerque NM USA
¹Institute of High Current Electronics, Russian Academy of Sciences, Tomsk, Russia
²Sandia National Laboratories, Albuquerque, NM
- 5P03 A High Efficiency Relativistic Uniform Backward Wave Oscillator**
A.M. Roitman¹, L.D. Moreland, E. Schamiloglu, R.W. Lemke², I.V. Pegel¹
University of New Mexico Albuquerque NM USA
¹Institute of High Current Electronics, Russian Academy of Sciences, Tomsk, Russia
²Sandia National Laboratories, Albuquerque, NM
- 5P04 Modulation of an Annular Electron Beam by a Two Cavity Klystron Amplifier**
K.J. Hendricks, W.R. Fayne, L.A. Bowers, T.A. Spencer, M. J. Arman, M.D. Sena¹, D.R. Ralph¹, P.D. Coleman², R. Lemke², M.C. Clark²
Phillips Laboratory Kirtland AFB NM USA
¹Maxwell Laboratories
²Sandia National Laboratory
- 5P05 Experiments on High Power, Long-Pulse Gyrotron-Backward-Wave Oscillators**
T. A. Spencer, C.E. Davis, M.J. Arman, K.J. Hendricks, R.M. Gilgenbach¹
Phillips Laboratory, The Air Force Kirtland AFB NM USA
¹Intense Energy Interaction Laboratory, University of Michigan
- 5P06 Magnetic Tapering of Intense e-Beam Long-Pulse Gyro-BWOS**
M. T. Walter, R.M. Gilgenbach, J. Hochman, T.A. Spencer¹
University of Michigan, Intense Energy Beam Interaction Lab., Ann Arbor MI USA
¹Air Force Phillips Lab, Kirtland AFB, NM
- 5P07 Numerical Simulation of Backward Wave Oscillators having Nonuniform Amplitude Slow Wave Structures**
R.W. Lemke, L.D. Moreland¹, E. Schamiloglu¹, S.D. Korovin², I.V. Pegel², A.M. Roitman²
Sandia National Laboratories Albuquerque NM USA
¹Dept. of Elect. and Computer Engineering, University of New Mexico, Albuquerque, NM
² Institute of High Current Electronics, Siberian Branch, Russian Academy of Sciences, Tomsk, Russia
- 5P08 Recent Results from the Plasma Microwave Electronics Program at the U. of Maryland**
Y. Carmel, T.M. Antonsen Jr, J. Rodgers, B. Levush, G.S. Nusinovich, J. Weaver, S. Miller, S.Kobayashi, W.W. Destler, V.L. Granatstein
University of Maryland, Insitute for Plasma Research, College Park MD USA
- 5P09 Studies of Low Q Slow Wave Structures for Relativistic Backward Wave Devices**
J. Weaver, S. Kobayashi, Y. Carmel, W. Main¹, G.S. Nusinovich, K. Ogura², M.R. Amin², S. Watanabe², K. Minami², J.P. Tate, A. Bromborsky³, W.W. Destler, V.L. Granatstein
University of Maryland, Insitute for Plasma Research, College Park MD USA

- ¹Accuracy, Inc. Santa Clara, CA
²Niigata University, Japan
³Army Research Laboratory, Adelphi, MD
- 5P10 **Starting Energy and Current for a Large Diameter Backward Wave Oscillator**
 K. Minami, K. Ogura, Y. Aiba, M.R. Amin, T. Watanabe¹, Y. Carmel², W.W. Destler², V.L. Granatstein²
 Niigata University, Graduate School of Science and Technology, Niigata City, Japan
¹National Institute for Fusion Science, Nagoya, Japan
²Institute for Plasma Research, University of Maryland, College Park, MD
- 5P11 **Studies of a Pre-Bunched Backward Wave Oscillator**
 C. Alexander, D. Shiffler
 University of New Mexico, Dept. of Electrical and Computer Engineering, Albuquerque NM, USA
- 5P12 **Numerical Simulation and Experimental Measurement of Pulse Generation in Coaxial Forming Lines**
 I.V. Pegel¹, L.D. Moreland, A.M. Roitman¹, E. Schamiloglu, V.P. Gubanov², A.V. Gunin², S.D. Korovin², V.V. Rostov², V.P. Tarakanov³
 University of New Mexico Albuquerque NM USA
¹Institute of High Current Electronics, Russian Academy of Sciences, Tomsk, Russia
²Institute of High Current Electronics, Russian Academy of Sciences, Tomsk, Russia
³Institute of General Physics, Moscow, Russia
- 5P13 **Computer Simulations of Relativistic MIG's with Magnetically Compressed Beams for High Power Microwave Tubes**
 J. E. Boers
 Thunderbird Simulations Garland TX USA
- 5P14 **Analysis and Simulation of Vircaters with Step Circular Waveguides**
 Y. Hu, Y. C. Lan
 National Tsing Hua University, Department of Nuclear Engineering, Hsinchu, Taiwan R.O.C.
- 5P15 **Long Pulse and High Repetition Rate Operation of a Relativistic Klystron Amplifier**
 J.S. Levine, B.D. Harteneck
 Physics International Company San Leandro CA USA
- 5P16 **Experimental Investigation of a "Scanner" Microwave Amplifier**
 J.E. Velazco, P.H. Ceperley, W.M. Black, K. Thomason, T.F. Godlove¹, F.M. Mako¹
 George Mason University Fairfax VA USA
¹FM Tech., Inc. Fairfax, VA
- 5P17 **Raman-Regime Dispersion Relation for Relativistic Traveling Wave Tubes**
 C. Chen
 MIT Plasma Fusion Center Cambridge MA USA
- 5P18 **Three Dimensional Simulations of the LANL Large Orbit Gyrotron Using ISIS on the Connection Machine**
 R. J. Kares, V.A. Thomas, M. E. Jones
 Los Alamos National Laboratory Los Alamos NM USA
- 5P19 **Low Voltage Rep-Rate Cathode Investigations**
 M.S. Litz, J. Golden¹
 Army Research Laboratory Adelphi MD USA
¹Berkeley Research Associates

Wednesday Morning, 8 June 1994
Poster Session 5P20-31: Fast Wave Devices

- 5P20 **Initial Tests of an 11.4 GHz Magnicon Amplifier**
S. H. Gold, C.A. Sullivan, B. Hafizi¹, W. M. Manheimer
Naval Research Laboratory, Plasma Physics Division Washington DC USA
¹Icarus Research, Bethesda, MD
- 5P21 **Time-Dependent Simulation of a Magnicon Output Cavity**
B. Hafizi¹, S. H. Gold
Naval Research Laboratory, Plasma Physics Division Washington DC USA
¹Icarus Research, Bethesda, MD
- 5P22 **Design and Performance Calculations for a Ka-band CHI Wiggler Ubitron Amplifier**
J. M. Taccetti, R. H. Jackson, H. P. Freund, D. E. Pershing, V. L. Granatstein
Naval Research Laboratory Washington DC USA
- 5P23 **Green's Function Analysis of Free-Electron Laser Amplifiers and Oscillators**
G. Shvets, J.S. Wurtele
MIT, Dept. of Plasma Physics and Plasma Fusion Center Cambridge MA USA
- 5P24 **Further Experiments on a Wiggler-Focused Sheet Electron Beam Small Period Free Electron Laser Amplifier**
S. Cheng, W. W. Destler
University of Maryland, Electrical Engr. Dept. and Institute for Plasma Research,
College Park, MD, USA
- 5P25 **Study of Mode Locking in Tapered Cavity Gyrotron Oscillators**
H. Wu, A.H. McCurdy
University of Southern California, Dept of Electrical Engineering-Electrophysics, Los Angeles CA USA
- 5P26 **Mode Conversion and Coupling in a Low Q Gyrotron**
V. Kasibhotla, A.H. McCurdy
University of Southern California, Dept of Electrical Engineering-Electrophysics, Los Angeles CA USA
- 5P27 **A Study of Parametric Instability in a Harmonic Gyrotron: Designs of Third Harmonic Gyrotrons at 94 GHz and 210 GHz**
G.P. Saraph, T.M. Antonsen Jr, G. S. Nusinovich, B. Levush
University of Maryland, Insitute for Plasma Research, College Park MD USA
- 5P28 **Design and Experimental Results of Coaxial Circuits for Gyroklystron Amplifiers**
M.K.E. Flaherty, W. Lawson, J. Cheng, J.P. Calame, B. Hogan, P.E. Latham, V.L. Granatstein
University of Maryland, Insitute for Plasma Research, College Park MD USA
- 5P29 **Design of High Efficiency, High Harmonic Gyro-Amplifiers**
W. Lawson, W.W. Destler
University of Maryland, Electrical Engineering Dept. and Inst. for Plasma Research,
College Park MD USA
- 5P30 **A 95 GHz, 4th Harmonic Gyro-Oscillator**
T.A. Hargreaves, G.P. Scheitrum, T. Bemis, L. Higgins
Electron Devices Division, Litton Systems, Inc. San Carlos CA USA
- 5P31 **High Harmonic Cusptron Device with an Inverted Structure**
J. Kim, J. Faith, S.P. Kuo
Polytechnic University Farmingdale NY USA

Wednesday Morning, 8 June 1994
Poster Session 5P32-41: Microwave-Plasma Interactions

- 5P32 Parametric Plasma Surface Instabilities with S-Polarized Radiation**
H.L. Rappaport
University of Maryland, Institute for Plasma Research, College Park MD USA
- 5P33 Interaction of High-Power Microwaves with Plasma in a Corrugated Wall Waveguide**
K. Minami, A. Sugawara, Y. Naito, K. Ogura, T. Watanabe¹, Y. Carmel², W.W. Destler², V.L. Granatstein²
Niigata University, Graduate School of Science and Technology, Niigata City, Japan
¹National Institute for Fusion Science, Nagoya, Japan
²Institute for Plasma Research, University of Maryland, College Park, MD
- 5P34 A MAGIC Simulation Study of the Effects of Bipolar Flow on Microwave Emission in a Vircator**
D. Young, O. Ishihara, M. Yatsuzuka¹
Texas Tech University, Dept. Electr. Engr., Lubbock TX USA
¹Himeji Institute of Technology, Japan
- 5P35 XUV Laser Produced Plasma Sheet Beam and Microwave Agile Mirror**
W. Shen, J.E. Scharer, B. Porter, N.T. Lam
University of Wisconsin, Electrical and Computer Engineering Dept. Madison WI, USA
- 5P36 Numerical Calculation of Ion Charge State Distributions of ECR-Discharges in the Mixture (Ar-N)**
J. Puerta, C. Cereceda
Dept. de Física, Universidad Simon Bolivar Caracas Vernezucla
- 5P37 On the Ponderomotive Force of a High-Frequency Field in a Cold Plasma**
S.V. Bepalov, V.P. Milantiev
Dept. of Experimental Physics, Russian Friendship University Moscow, Russia
- 5P38 On the Possibility of the Autoresonant Motion of an Electron in a Slow Electromagnetic Wave**
V.P. Milantiev
Dept. of Experimental Physics, Russian Friendship University Moscow, Russia
- 5P39 Plasmoid Formation and Expansion in a Microwave Field**
J. P. Boeuf, Ph. Belenguer¹
University of Colorado, Joint Institute for Laboratory Astrophysics, Boulder, CO, USA
¹CNRS URA 277, Univ. P. Sabatier, Toulouse, France
- 5P40 Modeling and Numerical Simulation of Microwave Pulse Propagation in Air Breakdown Environment**
J. Kim, S.P. Kuo
Polytechnic University Farmingdale NY USA
- 5P41 Stimulated Plasma Waves in the Versatile Toroidal Facility (VTF)**
D.T. Moriarty, M.C. Lee, D.F. Beals, J. M. Sourci, S. M. Murphy, R.R. Parker
MIT Plasma Fusion Center, Cambridge MA USA

Wednesday Morning, 8 June 1994
Poster Session 5P42-46: Plasmas for Lighting

- 5P42 Excited Krypton and Mercury Density Measurements in an RF Capacitive Discharge**
J. D. Michael
GE Lighting Cleveland OH USA
- 5P43 Barium Atom and Ion Densities in a Fluorescent Lamp Obtained from Measurements and Computer Simulations**
J. Shi¹, W. E. Ernst¹, D. A. Santavicca²
Fusion Systems Corporation Rockville MD, USA
¹Department of Physics, The Pennsylvania State University
²Mechanical Engineering Department, The Pennsylvania State University
- 5P44 Studies of Microwave-Driven Sodium Fluorescence: Atomic and Excimer Emissions**
L. Lin, Z. He, M.A. Prelas, J.T. Bahns¹, W.C. Stwalley¹, G.H. Miley²
University of Missouri-Columbia Columbia MO USA
¹University of Connecticut
²University of Illinois at Urbana-Champaign
- 5P45 Parallel Operation of Miniature Hollow Cathode Discharges**
K.H. Schoenbach, F.E. Perkin, R. Verhappen
Old Dominion University Norfolk VA USA
- 5P46 Analysis of Barium Loss from Fluorescent Lamp Electrodes**
Y. M. Li, P. Moskowitz
OSRAM Sylvania Inc. Danvers MA USA

Wednesday Afternoon, 8 June 1994
2:00 pm — Main Floor

**THE PLASMA SCIENCE AND TECHNOLOGY
INITIATIVE**

Tim Eastman
Institute for Physical Science and Technology
University of Maryland

Chair: A. L. Peratt

Wednesday Afternoon, 8 June 1994
3:15 pm—Barranca
Oral Session 6A: Space Plasmas II
Chair: S. T. Lai

6A1-2 *Invited*—Theory of The Van Allen Hypothesis

I. Alexeff, M. Rader

University of Tennessee Knoxville TN USA

6A3-4 *Invited*—An Alternative Explanation of the COBE Data

E. J. Lerner

Lawrenceville Plasma Physics Lawrenceville NJ USA

6A5 *Diffusion at the Magnetopause*

D. Winske, V. A. Thomas

Los Alamos National Laboratory, Applied Theoretical Physics Division Los Alamos
NM USA

6A6 *Magnetic Field Generation in Shock Waves*

F. Schwirzke, J.P. Carter

Naval Postgraduate School, Physics Department, Monterey CA USA

6A7 *Electrodynamical Interaction Between Comet Shoemaker-Levy 9 and Jupiter's Magnetosphere*

N. Brenning, I. Axnäs, O. Nilsson, J. Eninger

Royal Inst. of Technology, Alfvén Laboratory, Dept. of Plasma Physics Stockholm
Sweden

6A8 *The Plasma Aspects of a New Method of the Radioactive Waste Disposal in the Cosmic Space*

U.G. Kirichenko, V.I. Tkachenko Kharkov State University Kharkov, Ukraine

Wednesday Afternoon, 8 June 1994
3:15 pm—Chamisa
Oral Session 6B: Intense Beam Microwaves
Chair: R. M. Gilgenbach

- 6B1 One Microsecond Pulse-Width Annular Beam Relativistic Klystron Operating at 500 MW**
M. V. Fazio, W. B. Haynes, B.E. Carlsten, R.M. Stringfield
Los Alamos National Laboratory Los Alamos NM USA
- 6B2-3 *Invited*—Interest in High Power Microwave Research**
F. J. Agee, N. Chesser¹
Phillips Laboratory Kirtland AFB NM USA
¹Directed Technologies Inc., Arlington, VA
- 6B4 Inductively-Loaded Extended Gaps for Relativistic Klystrons**
M. Lampe, R. F. Hubbard, M. Friedman, V. Serlin
Naval Research Laboratory Washington DC USA
¹Icarus Research, Bethesda, MD
- 6B5 Propulsion of Small Launch Vehicles Using High Power Millimeter Waves**
J. Benford, L. Myrabo¹
Physics International Company San Leandro CA USA
¹Rensselaer Polytechnic Institute
- 6B6-7 *Invited*—Can Plasma Microwave Devices Revitalize and Broaden the Scientific and Technological Base of Microwave Sources**
Y. Carmel, T.M. Antonsen Jr, B. Levush, G. Nusinovich, W. W. Destler, V.L. Granatstein
University of Maryland, Institute for Plasma Research, College Park MD USA
- 6B8 Design of a Heavily Loaded Output Cavity for the One-Microsecond, One Kilojoule Per-Pulse L-Band Relativistic Klystron**
W.B. Haynes, B.E. Carlsten, M.V. Fazio, R. M. Stringfield
Los Alamos National Laboratory Los Alamos NM USA
- 6B9 Experimental Demonstration of a High-Power Slow Wave Electron Cyclotron Maser Utilizing Corrugated Metal Structure**
K. Minami, K. Ogura, K. Kurashina, W. Kim, T. Watanabe¹, Y. Carmel², W.W. Destler², V.L. Granatstein²
Niigata University, Graduate School of Science and Technology, Niigata City Japan
¹National Institute for Fusion Science, Nagoya, Japan
²Institute for Plasma Research, University of Maryland, College Park, MD

Wednesday Afternoon, 8 June 1994
3:15 pm—Otowi
Oral Session 6C: Plasma Processing III
Chair: L. Mahoney

- 6C1 Correlating Plasma Emissivity and Etch Depth**
M. J. Buie, J.T. Pender, H.L. Spindler, J. Soniker, M.L. Brake, M. Elta¹
University of Michigan, Department of Nuclear Engineering, Ann Arbor MI, USA
¹Department of Electrical Engineering, University of Michigan
- 6C2 Modeling of Plasma Etch Processes Using Well Stirred Reactor Approximations and Including Complex Gas-Phase and Surface Reactions**
E. Meeks, J. W. Shon, R.J. Kee, H.K. Moffat¹
Sandia National Laboratories Livermore CA USA
¹Sandia National Laboratories, Albuquerque, NM
- 6C3 Electron Collision Data for BCL3 Plasmas**
C. Winstead, H. P. Pritchard, V. McKoy
California Institute of Technology Pasadena CA USA
- 6C4 A Toroidal ECR System for Thin Film Deposition**
W. Grieg, X. Zhang, M. Baker, S. Gangopadhyay
Texas Tech University, Dept. of Physics, Lubbock TX USA
- 6C5 Multi-Variable Feedback Regulation of Plasma Processing Reactors**
M. A. Firestone
JAYCOR Santa Barbara CA USA
- 6C6 Consequences of Particulate Charging in RF Discharge Sheaths**
D. Winske, M. E. Jones
Los Alamos National Laboratory, Los Alamos NM USA
- 6C7 Transport of Dust Particles in Inductively Coupled Discharges**
H.H. Hwang, P.L.G. Ventzek, R. Hoekstra, M.J. Kushner
University of Illinois, Dept. Electrical and Computer Engineering, Urbana, IL USA
- 6C8 Nucleation in Plasmas at High and Low Pressures**
A.S. Kumar, A. Garscadden
Wright-Patterson Air Force Base Wright-Patterson AFBOH USA
- 6C9 Dynamics of Charged Particulates in Plasmas**
S. Hamaguchi, R.T. Farouki
IBM, T. J. Watson Research Center Yorktown Heights NY USA

Wednesday Afternoon, 8 June 1994
3:15 pm—Pinon A
Oral Session 6D: Laser Produced Plasmas
Chair: J. Sethian

- 6D1 One-Dimensional Plane Wave Simulation of Laser Beam Propagation and Breakdown in the Atmosphere**
D. J. Mayhall, J. H. Yee, G.E. Sieger
Lawrence Livermore National Laboratory Livermore CA USA
- 6D2 Ponderomotive Effects on Magnetic Fields and Electron Transport Under Fast Ignitor Conditions**
R. J. Mason, M. Glinsky¹, M. Tabak¹
Los Alamos National Laboratory Los Alamos NM USA
¹Lawrence Livermore National Laboratory, Livermore, CA
- 6D3 The Nature of Spontaneous Magnetic Fields and RF-Radiation in Laser-Produced Plasmas**
V. Afeyev, V. Belyaev
Russian Space Agency, Russian Federation Government, Kaliningrad, Russia
- 6D4 Reflectivity of Intense Femtosecond Laser Pulses from a Simple Metal**
A. Ng, P. Celliers, A. Forsman, R.M. More¹, Y.T. Lee¹, F. Perrot²,
M.W.C. Dharma-wardana³, G.A. Rinker⁴
Physics Department, University of British Columbia Vancouver BC Canada
¹Lawrence Livermore National Laboratory
²Centre d'Etudes de Limeil
³National Research Council, Canada
⁴Colorado State University

Wednesday Afternoon, 8 June 1994
3:15 pm—Pinon B
Oral Session 6E: Plasmas for Lighting
Chair: V. Byszewski

6E1-2 *Invited*—Lighting Plasmas, Energy and the Environment

G. L. Rogoff Osram Sylvania, Inc. Salem MA USA

6E3 Radiant Emittance of Xenon Positive Column

D. A. Doughty, D. F. Fobare

General Electric Company, Corporate Research and Development, Schenectady NY, USA

6E4 Model of a Low Pressure Argon-Xenon Positive Column

T. J. Sommerer

General Electric Company, Corporate Research and Development, Schenectady NY, USA

6E5-6 *Invited*—Modelling the High Pressure Mercury Discharge Lamp Warm-Up

G. Zisis, M. Stambouli¹, K. Charrada

Laboratory Gas Discharges, University P. Sabatier, URA CNRS 277 31062 Toulouse
CEDEX, France

¹E.N.S.S.T.T., Tunis, Tunisia

6E7-8 *Invited*—Species Densities and Hg/Na Ratio in AC Metal Halide Discharges

D. Karabourniotis, E. Drakakis

University of Crete, Physics Department, Heeraklion Crete Greece

Wednesday Afternoon, 8 June 1994
Poster Session 6P01-10: Computational Plasma Physics

- 6P01 Power Flow in Long MITLs with High-Inductance Loads**
J. W. Poukey, M. G. Mazarkis
Sandia National Laboratories Albuquerque NM USA
- 6P02 The BLOB Method for Kinetic Plasma Simulation Using Variable Size Particles**
G.G.M. Coppa¹, G.Dellapiana¹, F. Donato¹, G. Lapenta
Los Alamos National Laboratory Los Alamos NM USA
¹Departimento di Energetica-Politecnico di Torino, Torino, Italy
- 6P03 Numerical Simulations of Liner Implosions Over Plasma Injection Vanes**
J.J. Havranek
Phillips Laboratory Kirtland AFB NM USA
- 6P04 Computational Modeling of Magnetized Target Fusion Experiments**
P. Sheehy, R.C. Kirkpatrick, I.R. Lindemuth, J.L. Eddleman¹, C.W. Hartman¹
Los Alamos National Laboratory Los Alamos NM USA
¹Lawrence Livermore National Laboratory
- 6P05 An Implicit Algorithm for the Ideal MHD Equations**
O. S. Jones, D.S. Eberhardt
University of Washington Seattle WA USA
- 6P06 Simulation of Plasma Cloud Expansion**
G.I. Dudnikova, V.A. Vshivkov
Institute of Computational Technologies Novosibirsk Russia
- 6P07 Inclusion of Lumped Elements in Finite Difference Time Domain Electromagnetic Calculations**
V.A. Thomas, M. E. Jones, R.J. Mason
Los Alamos National Laboratory Los Alamos NM USA
- 6P08 Two and Three Dimensional Simulation of Disk-Loaded Travelling-Wave Output Structures for High-Power Klystrons**
K. R. Eppley
Stanford Linerar Accelerator Center Stanford CA USA
- 6P09 Spectral Collocation, Domain Decomposition and their Parallel Implementation for the Vlasov Equation in One-D**
J.P. Holloway
University of Michigan, Department of Nuclear Engineering, Ann Arbor MI, USA
- 6P10 A 3-D, Time-Domain Algorithm for EM Fields**
D. Mitrovich
Consultant
Albuquerque NM USA

Wednesday Afternoon, 8 June 1994
Poster Session 6P11-18: Vacuum Electronics

- 6P11 **Demonstration of MMACE Prototype TWT Design System**
J.A. McDonald
Naval Research Laboratory, Vacuum Electronics Branch Washington DC USA
- 6P12 **The OOPIC Simulation Project: Progress and Validation**
N.T. Gladd, J.P. Verboncoeur¹, C.K. Birdsall¹, K. Cartwright¹, P. Mardahl¹, W. Peter²
Berkeley Research Associates, Berkeley, CA Berkeley CA USA
¹University of California, Berkeley, CA
²FM Technologies, VA
- 6P13 **Application of the Finite-Element Method to the Design of High-Power Beam Systems**
S. Humphries Jr
Acceleration Associates Albuquerque NM USA
- 6P14 **Simulations of Limiting Current in a Crossed-Field Gap: Hull Diode**
J. P. Verboncoeur, C. K. Birdsall
University of California, ERL and EECS Dept., Berkeley CA USA
- 6P15 **Scaling Experiments on a Magnetically Insulated Thermionic Vacuum Switch**
J.E. Eninger, B.H. Vanderberg
Royal Institute of Technology, Dept. of Industrial Electrotechnology,
Stockholm Sweden
- 6P16 **Digital Noise Analysis System for Pulsed Power Tubes**
M.L. Barsanti, L.S. Smutek, P.M. Malouf, C.M. Armstrong
Naval Research Laboratory, Vacuum Electronics Branch
Washington DC USA
- 6P17 **Emission Gating at UHF and Microwave Frequencies**
M.A. Kodis, N. R. Vanderplaats, H.P. Freund¹, E.G. Zaidman
Naval Research Laboratory Washington DC USA
¹Science Applications International Corp., McLean, VA
- 6P18 **Sheet Beam Slow-Wave Amplifiers**
H. Kirolos, J. Joe, M.A. Basten, J.H. Booske, J.H. Scharer, J. Anderson, R. True¹, G. Scheitrum¹
University of Wisconsin, Electrical and Computer Engineering Dept., Madison, WI, USA
¹Litton Electron Devices, San Carlos, CA

Wednesday Afternoon, 8 June 1994
Poster Session 6P19: Solid State Plasmas and Switches

- 6P19 **Electron-Beam Activated GaAs-Switches**
G. Kirkaman¹, J. Hur¹, B. Jiang¹, N. Reinhardt¹, R.J. Allen, K.H. Schoenbach
Old Dominion University, Physical Electronics Research Institute,
Norfolk VA USA
¹Integrated Applied Physics, Inc. Waltham, MA