

# SUMMARY OF TECHNICAL SESSIONS

Monday Morning, 22 June 1988  
8:30 AM - Grand Ballroom A

REVIEW 1R

## HIGH POWER MICROWAVE POWER GENERATION

### AND PARTICLE ACCELERATORS

J. A. Nation  
Cornell University  
Ithaca, NY

Chairperson: I. Alexeff

Monday Morning, 22 May 1989  
9:40 A.M. - Grand Ballroom F

Oral Sessions 1A: BASIC PLASMA PHENOMENA - I

Chairperson: R. L. Stenzel

- 1A1 A CRITICAL REVIEW BASED ON EXPERIMENTS OF THE SELF-CONSISTENT MODELLING LEADING TO THE POWER BALANCE EQUATION OF SURFACE WAVES PRODUCED PLASMAS  
J. Margot-Chaker, M. Moisan, and C. Barbeau, Universite de Montreal, Montreal, Canada
- 1A2 THEORY OF A STRONG DOUBLE LAYER IN A FRANCK-HERTZ TUBE  
H. Schamel, Universitat Bayreuth, FRG;  
P. Hatjimanolaki, Southeastern College, Kifisia, Greece;  
and P. Nicoletopoulos, Universite Libre de Bruxelles, Brussels, Belgium
- 1A3 A VISIBLE PLASMA  
I. Alexeff, F. Dyer, and M. Rader, U. of Tennessee, Knoxville, TN
- 1A4 LABORATORY MODEL OF WAVE/CURRENT WINGS LAUNCHED BY RAPIDLY MOVING CONDUCTORS IN MAGNETOPLASMAS  
R.L. Stenzel and J.M. Urrutia, U. of California, Los Angeles, CA
- 1A5 MODIFIED ELECTRON-ACOUSTIC AND LOWER-HYBRID DRIFT DISSIPATIVE INSTABILITY IN A TWO-ELECTRON TEMPERATURE PLASMA  
M. Bose, Indian Institute of Technology, New Delhi, India
- 1A6 ON THE SO-CALLED FIRST-ORDER MAGNETIC PUMPING BY SAWTOOTH-WAVEFORM MAGNETIC VARIATIONS  
J.E. Borovsky and P.J. Hansen, Los Alamos National Lab, Los Alamos, NM
- 1A7 OBSERVATION OF STRONG OSCILLATIONS IN AN EXPANDING PLASMA  
G. Hairapetian and R.L. Stenzel, U. of California, Los Angeles, CA
- 1A8 PLASMA SHEATH MODELING NEAR AN ICRF PARADAY SHIELD  
J.H. Whealton, R.J. Raridon, and P.M. Ryan, Oak Ridge National Lab, Oak Ridge, TN
- 1A9 RADIOFREQUENCY IONIZATION OF HELIUM WITH TURBULENT FLOW-MEASUREMENTS VERSUS THEORY  
M.E. Talaat and P.J. Karditsas, U. of Maryland, College Park, MD

Monday Morning, 22 May 1989  
9:40 A.M. - Grand Ballroom F

Oral Session 1B: ELECTROMAGNETIC LAUNCHERS  
Chairperson: J. V. Parker

- 1B1 EFFECTS OF WALL ABLATION ON THE INTERNAL STRUCTURE AND DYNAMICS OF A RAILGUN PLASMA ARC  
M.H. Frese, Numerex, Albuquerque, NM
- 1B2 ARMATURE FORMATION AND PERFORMANCE IN A RAILGUN USING A TWO-STAGE LIGHT-GAS GUN INJECTOR  
R.S. Hawke, A.R. Susoeff, Lawrence Livermore National Lab, Livermore, CA;  
J.R. Asay, C.A. Hall, C.H. Konrad, Sandia National Labs, Albuquerque, NM;  
R.J. Hickman, Kteck Corporation, Albuquerque, NM; and  
J.L. Sauve, EG&G, Albuquerque, NM
- 1B3 DI/DT EFFECTS IN RAILGUN LAUNCHES: PAPER WITHDRAWN  
D.A. Sink, Westinghouse R&D Center, Pittsburgh, PA
- 1B4 PLASMA ARMATURES IN LARGE BORE LAUNCHERS  
J.P. Barber, IAP Research, Inc., Dayton, OH; and  
R.A. Marshall, Australian National University, Canberra, Australia
- 1B5-6 Invited Paper  
RAIL AND INSULATOR SPECTRA FROM PLASMA RAILGUN ARMATURES  
D. Keefer and A. Sedghinasab, U. of Tennessee Space Institute, Tullahoma, TN
- 1B7 EXPERIMENTAL DETERMINATION OF PLASMA ARMATURE PROPERTIES USING RGS-II, A RAILGUN SIMULATOR  
M.C. Baker, B.D. Barrett, T.J. Pickens, W.C. Nunnally, and J.E. Thompson, U. of Texas at Arlington, Arlington, TX
- 1B8 SPECTROSCOPIC INVESTIGATION OF THE RGS-II HYPERVELOCITY PLASMA ARMATURE  
B.D. Barrett, M.C. Baker, W.C. Nunnally, U. of Texas at Arlington, Arlington, TX; and  
R.D. Bengtson, U. of Texas at Austin, Austin, TX
- 1B9 PARAMETRIC STUDIES OF HIGH-HEAT-FLUX-INDUCED EROSION OF SURFACES IN AN ELECTROTHERMAL ACCELERATOR  
O. Hankins, M. Bourham, O. Auciello, J. Stock, J.G. Gilligan, and B. Wehring, North Carolina State U., Raleigh, NC
- 1B10 MODELLING OF THE VAPOR SHIELD MECHANISM DURING HIGH HEAT FLUX ABLATION OF SURFACES  
J.G. Gilligan, D. Hahn, and R. Mohanti, North Carolina State U., Raleigh, NC

Monday Morning, 22 May 1989  
9:40 A.M. - Grand Ballroom G

Oral Session 1C: FAST OPENING SWITCHES - I  
Chairperson: P. F. Ottinger

- 1C1-2 Invited Paper  
PLASMA OPENING SWITCH EXPERIMENTS ON THE PARTICLE BEAM ACCELERATOR II  
M.A. Sweeney, D.H. McDaniel, C.W. Mendel, G.E. Rochau, W.B.S. Moore, G.R. Mowrer, W.W. Simpson, D.M. Zagar, T. Grasser, and C.D. McDougal, Sandia National Labs, Albuquerque, NM
- 1C3-4 Invited Paper  
NUMERICAL AND THEORETICAL DEVELOPMENTS IN PLASMA EROSION OPENING SWITCH RESEARCH  
J.M. Grossman, Naval Research Lab, Washington, DC
- 1C5 MAGNETOHYDRODYNAMIC SIMULATIONS OF GAMBLE I POS WITH HALL EFFECT  
N.F. Roderick, U. of New Mexico, Albuquerque, NM; M.H. Frese, Numerex, Albuquerque, NM; and R.E. Peterkin, Jr., S.S. Payne, Mission Research Corporation, Albuquerque, NM
- 1C6 SIMULATION OF LONG TIME SCALE PLASMA OPENING SWITCHES  
R.J. Mason, Los Alamos National Lab, Los Alamos, NM
- 1C7 CHARACTERIZATION OF A 1US, 1-MA PLASMA EROSION OPENING SWITCH  
R.J. Comisso, J.R. Boller, J.M. Grossman, J.C. Kellogg, D. Mosher, P.F. Ottinger, Naval Research Lab, Washington, DC; and D.D. Hinshelwood, B.V. Weber, JAYCOR, Vienna, VA
- 1C8 COMPACT PULSED POWER GENERATOR USING FUSES AND PLASMA EROSION OPENING SWITCHES  
H. Akiyama, N. Shimomura, and S. Maeda, Kumamoto University, Kumamoto, Japan
- 1C9 INVESTIGATION OF ELECTRON AND ION FLOWS IN THE MICROSECOND PLASMA OPENING SWITCH ON THE TERAWATT POWER LEVEL  
A.N. Bostrikov, S.P. Bugaev, A.M. Volkov, A.A. Kim, B.M. Koval'chuk, V.M. Kokshenev, V.A. Yakovlev, Institute of High Current Electronics, Tomsk, USSR; V.M. Bystritskii, S.V. Grigoriev, I.V. Lisitsyn, G.A. Mesyats, Institute of Electrophysics, Sverdlovsk, USSR; and Y.E. Krasik, Institute of Nuclear Physics, Tomsk, USSR
- 1C10 PLASMA OPENING SWITCH OPERATION WITH MICROSECOND GENERATOR  
P.S. Ananjin, I.B. Ivanov, V.B. Karpov, Y.E. Krasik, E.V. Paul, V.G. Tolmatheva, Institute of Nuclear Physics, Tomsk, USSR; V.M. Bystritskii, I.V. Lisitsyn, A.A. Sinebrjukhov, Institute of Electrophysics, Sverdlovsk, USSR; and B.M. Koval'chuk, Institute of High Current Electronics, Tomsk, USSR

Monday Morning, 22 May 1989  
9:40 A.M. - Grand Ballroom C

Oral Session 1D: MULTIGAP ACCELERATORS AND INERTIAL FUSION - I  
Chairperson: J. W-K. Mark

- 1D1-2 Invited Paper  
THE MIRRORTRON ION ACCELERATOR CONCEPT  
R.F. Post, Lawrence Livermore National Lab, Livermore, CA
- 1D3 ION BETATRON  
N. Rostoker, U. of California, Irvine, CA
- 1D4 AN INJECTOR FOR HEAVY ION FUSION ACCELERATOR RESEARCH  
H.L. Rutkowski, A. Faltens, D. Vanecek, C. Pike, and D. Brodzik, Lawrence Berkeley Lab, Berkeley, CA
- 1D5-6 Invited Paper  
ION BEAM GENERATION ON REIDEN-SHVS INDUCTION ADDER ACCELERATOR  
S. Miyamoto, K. Imasaki, Y. Yasuda, N. Yugami, T. Akiba, K. Tubakimoto, A. Zakou, S. Nakai, and C. Yamanaka, Osaka University, Osaka, Japan
- 1D7 TRANSVERSE EMITTANCE WITH ACCELERATION AND COMPRESSION  
K.D. Hahn and L. Smith, Lawrence Berkeley Lab, Berkeley, CA
- 1D8 ION BEAM-DENSE PLASMA INTERACTION OF ICF INTEREST  
C. Deutsch, Universite Paris XI, Orsay, France

Monday Morning, 22 May 1989

Poster Session 1P1 -7: PLASMA WAVES AND INSTABILITIES - I

- 1P1 REFLECTION OF AN IMPULSIVE PLANE WAVE BY A SWITCHED PLASMA MEDIUM  
V.R. Goteti and D.K. Kalluri, U. of Lowell, Lowell, MA
- 1P2 EFFECT OF SWITCHING-OFF OF A PLASMA MEDIUM ON A TRAVELING WAVE  
D.K. Kalluri, U. of Lowell, Lowell, MA
- 1P3 GENERALIZED LANGEVIN EQUATION FOR PLASMA TURBULENCE  
H. Xia and O. Ishihara, Texas Tech U., Lubbock, TX
- 1P4 EFFECTS OF HIGHER-ORDER DISPERSION ON ENVELOPE SOLITONS  
H.H. Kuehl and C.Y. Zhang, U. of Southern California, Los Angeles, CA
- 1P5 IMPLICIT PARTICLE SIMULATION OF VORTEX COALESCENCE IN AN ELECTROSTATIC PLASMA  
J. Schutkeker, T. Tajima, P. Morrison, W. Horton, and T. Kamimura, U. of Texas, Austin, TX
- 1P6 EFFECTS OF TEMPERATURE GRADIENTS ON THE TOROIDICITY INDUCED DRIFT MODE  
A. Hirose, University of Saskatchewan, Saskatchewan, Canada
- 1P7 A MODEL FOR ANOMALOUS THERMAL DIFFUSIVITY IN TOKAMAKS  
A. Hirose, University of Saskatchewan, Saskatchewan, Canada

Monday Morning, 22 May 1989

Poster Session 1P8-20: FAST WAVE DEVICES - I

- 1P8 EFFICIENCY OPTIMIZATION IN A CARM AMPLIFIER  
T.H. Kho and A.T. Lin, U. of California, Los Angeles, CA
- 1P9 EXPERIMENTAL STUDY OF CUSP INJECTED ELECTRON BEAM  
K. Boulais, J.Y. Choe, W. Namkung, and V. Ayres, Naval Surface Warfare Center, Silver Spring, MD
- 1P10 DYNAMICS OF CUSP PRODUCED ROTATING BEAM  
J.Y. Choe, K. Boulais, E. Choi, and V. Ayres, Naval Surface Warfare Center, Silver Spring, MD
- 1P11 HIGH EFFICIENCY 1.7 GHZ GYROPIENIOTRON AMPLIFIER  
A.K. Ganguly, S. Ahn, and E. Zaidman, Naval Research Lab, Washington, DC
- 1P12 MICROWIGGLER FREE ELECTRON LASER EXPERIMENT  
S.C. Chen, G. Bekefi, R.J. Temkin, and R. Stoner, Massachusetts Institute of Technology, Cambridge, MA
- 1P13 ANALYSIS AND NONLINEAR SIMULATION OF QUADRUPOLE AND DIPOLE PERIOD WIGGLERS FOR MILLIMETER WAVES  
S.F. Chang and J.E. Scharer, U. of Wisconsin-Madison, Madison, WI
- 1P14 HIGH POWER MICROWAVE EMISSION FROM CYCLOTRON AUTORESONANCE MASER (CARM) INTERACTIONS IN MICROSECOND, INTENSE ELECTRON BEAMS  
R.M. Gilgenbach, J.G. Wang, J.J. Choi, C.A. Outten, and T. Spencer, U. of Michigan, Ann Arbor, MI
- 1P15 PROGRESS IN HIGH POWER MILLIMETER-WAVE FELLS WITH SHORT PERIOD WIGGLERS AND SHEET ELECTRON BEAMS  
J.H. Booske, D.J. Radack, T.M. Antonsen, Jr., S. Bidwell, W.W. Destler, V.L. Granatstein, P.E. Latham, B. Levush, I.D. Mayergoyz, A. Serbeto, Z.X. Zhang, U. of Maryland, College Park, MD; and  
H.P. Freund, SAIC, McLean, VA
- 1P16 INITIAL TESTS OF A 10 MW, 35 GHZ PHASE-LOCKED GYROTRON OSCILLATOR DRIVEN BY A PULSELINE ACCELERATOR  
S.H. Gold, A.W. Fliflet, W.M. Black, W.M. Manheimer, Naval Research Lab, Washington, DC; and  
D.A. Kirkpatrick, SAIC, McLean, VA
- 1P17 A LOW FREQUENCY (100 MHZ) CROSS-FIELD AMPLIFIER DEVICE FOR MEASUREMENTS OF RF WAVE-ELECTRON INTERACTIONS  
J.J. Browning, C. Chan, and J. Ye, Northeastern U., Boston, MA
- 1P18 THEORY AND DESIGN OF A HARMONIC UBITRON/FREE-ELECTRON LASER  
H.P. Freund, Science Applications International Corporation, McLean, VA;  
H. Bluem, U. of Maryland, College Park, MD; and  
R.H. Jackson, Naval Research Lab, Washington, DC
- 1P19 A MICRO-FABRICATION COMPATIBLE WIGGLER DESIGN SCALABLE TO SUB-MILLIMETER PERIODS  
H. Bluem, U. of Maryland, College Park, MD; and  
R.H. Jackson, Naval Research Lab, Washington, DC
- 1P20 STEADY-STATE, GAS-FILLED ORBITRON MASER  
M. Rader, F. Dyer, and I. Alexeff, U. of Tennessee, Knoxville, TN

Monday Morning, 22 May 1989

Poster Session 1P21-30: BEAM AND PLASMA ACCELERATORS

- 1P21 SELF-FOCUSING OF LASER BEAMS IN MAGNETIZED RELATIVISTIC ELECTRON BEAMS  
M.H. Whang, A.Y. Ho, and S.P. Kuo, Polytechnic U., Farmingdale, NY
- 1P22 ELECTROMAGNETIC-WAVE PARTICLE ACCELERATION  
S. Kawata, K. Mizuno, U. of California, Davis, CA, and Lawrence Livermore National Lab, Livermore, CA; and  
A. Manabe, Nagaoka University of Technology, Nagaoka, Japan
- 1P23 ION CHANNEL TRANSPORT SYSTEMS FOR HIGH CURRENT ELECTRON BEAM ACCELERATORS  
J.D. Miller, R.M. Gilgenbach, R.F. Lucey, Jr., M.L. Brake, and T.E. Repetti, U. of Michigan, Ann Arbor, MI
- 1P24 A DEVICE FOR PRODUCING UNIFORM PLASMAS FOR ADVANCED ACCELERATOR EXPERIMENTS  
G. Kirkman, H. Figueroa, and M.A. Gundersen, U. of Southern California, Los Angeles, CA
- 1P25 SCALING OF A FINAL CERN PLASMA LENS DESIGN BY A ONE DIMENSIONAL MAGNETOHYDRODYNAMIC Z-PINCH MODEL  
H. Bauer, R. Tkotz, University of Erlangen-Nuernberg, Erlangen, FRG; and  
H. Riege, CERN, Geneva, Switzerland
- 1P26 BEAM INJECTION AND TRANSPORT EXPERIMENTS WITH AN UPGRADED INJECTOR IN THE UNM BETATRON  
D.M. Siergiej, E. Schamiloglu, R.L. Terry, and S. Humphries, Jr., U. of New Mexico, Albuquerque, NM
- 1P27 NUMERICAL SIMULATION OF COLLECTIVE ION ACCELERATION IN THE LASER CONTROLLED COLLECTIVE ACCELERATOR  
R.L. Yao, C.D. Striffler, and W.W. Destler, U. of Maryland, College Park, MD
- 1P28 A PLASMA LENS FOR LINEAR COLLIDER FINAL FOCUS  
C. Nantista, D. Cline, U. of California, Los Angeles, CA; and  
J. Norem, ANL
- 1P29 LASER WAKEFIELD ACCELERATION  
E. Esarey, A. Ting, and P. Sprangle, Naval Research Lab, Washington, DC
- 1P30 STUDIES OF INJECTED PARTICLE TRAJECTORIES IN THE BEAT WAVE ACCELERATOR  
R. Williams, C.E. Clayton, C. Joshi, W. Leemans, K. Marsh, T. Katsouleas, and W.B. Mori, U. of California, Los Angeles, CA

**Monday Afternoon, 22 May 1989**  
**2:00 P.M. - Grand Ballroom A**

**PSAC AWARD ADDRESS 2H**

DR. STRANGELOVE - OR, HOW I LEARNED TO  
STOP WORRYING AND LOVE PLASMA INSTABILITIES

G. Bekefi  
Massachusetts Institute of Technology, Cambridge, MA

Chairperson: M.A. Sweeney

**Monday Afternoon, 22 May 1989**  
**2:50 P.M. - Grand Ballroom E**

Oral Session 2A: TOKOMAKS, STELLARATORS,  
AND FUSION DEVICE DESIGN - I

Chairperson: J. G. Gilligan and J. C. Glowienka

- 2A1-2 Invited Paper  
IGNITEX EXPERIMENT  
R. Carrera, M. Barrington, R. Bickerton, W.D. Booth,  
Y. Chen, J. Dong, M.D. Driga, S. Eways, G. Fu, J. Gully,  
G.A. Hallock, J. Helton, N.E. Hertel, L. Hively, J. Howell,  
K.T. Hsieh, J. Ling, G. Miller, E. Montalvo, C.A. Ordonez,  
D.E. Palmrose, T.A. Parish, M.N. Rosenbluth, S. Tamor,  
D. Tesar, J. Van Dam, P. Varghese, W.A. Walls, W.F. Weldon,  
M.D. Werst, and H.H. Woodson, U. of Texas at Austin, Austin, TX
- 2A3 HIGH FIELD, SINGLE TURN TOROIDAL MAGNET TECHNOLOGY  
DEMONSTRATOR FOR IGNITEX  
M.D. Werst, M.D. Driga, K.T. Hsieh, and W.F. Weldon, U. of  
Texas At Austin, Austin, TX
- 2A4 NUCLEAR RADIATION ANALYSIS OF THE IGNITEX EXPERIMENT  
D.E. Palmrose, T.A. Parish, Texas A&M U., College Station,  
TX; and  
R. Carrera, N.E. Hertel, G. Miller, U. of Texas at Austin,  
Austin, TX
- 2A5-6 Invited Paper  
ANOMALOUS TRANSPORT IN TOKAMAKS  
A.J. Wootton, U. of Texas at Austin, Austin, TX

- 2A7-8 Invited Paper  
THE ROLE OF STELLARATORS IN UNDERSTANDING TOROIDAL TRANSPORT  
PHYSICS  
D.A. Rasmussen, T.S. Bigelow, B.A. Carreras, R.J. Colchin,  
E.C. Crume, N. Dominguez, J.L. Dunlap, A.C. England,  
J.C. Glowienka, S. Hiroe, J.H. Harris, D.L. Hillis,  
L.D. Horton, H.C. Howe, R.C. Isler, T.C. Jernigan,  
R.R. Kindsfather, J.N. Leboeuf, J.F. Lyon, C.H. Ma,  
M.M. Menon, P.K. Mioduszewski, M. Murakami, G.H. Neilson,  
V.K. Pare', R.K. Richards, J.A. Rome, T. Uckan,  
J.B. Wilgen, W.R. Wing, Oak Ridge National Lab, Oak Ridge,  
TN;  
F.S.B. Anderson, U. of Wisconsin-Madison, Madison, WI;  
G.L. Bell, R.F. Gandy, R.N. Morris, Auburn U., Auburn, AL;  
J.D. Bell, R.H. Fowler, V.E. Lynch, Martin Marietta Energy  
Systems, Inc.;  
R.D. Bengtson, K.R. Carter, T.L. Rhodes, C.P. Ritz, U. of  
Texas at Austin, Austin, TX;  
H. Kaneko, Kyoto University, Kyoto, Japan; and  
C.E. Thomas, M.C. Wade, Georgia Institute of Technology,  
Atlanta, GA
- 2A9 EXPERIMENTAL AND THEORETICAL MODELING OF RUNAWAY ELECTRON  
DAMAGE FOR THE DESIGN OF TOKAMAK PLASMA FACING COMPONENTS  
K.A. Niemer, J.G. Gilligan, North Carolina State U.,  
Raleigh, NC; and  
C.D. Croessmann, Sandia National Labs, Albuquerque, NM
- 2A10 ASH AND BURN CONTROL IN ITER-TYPE TOKAMAK  
S. Hu, V. Varadarajan, and G.H. Miley, U. of Illinois,  
Urbana, IL

**Monday Afternoon, 22 May 1989**  
**2:50 P.M. - Grand Ballroom F**

Oral Session 2B: INTENSE BEAM MICROWAVE SOURCES - I  
Chairperson: I. Alexeff

- 2B1 DISPERSION AND GAIN IN GENERIC SLOW-WAVE STRUCTURES  
J.E. Walsh, E.F. Fisch, J.A. Jackson, Y. Xu,  
and E.M. Marshall, Dartmouth College, Hanover, NH
- 2B2 EXPERIMENTAL RESULTS WITH AN A6 RELATIVISTIC MAGNETRON  
T.A. Treado, W.O. Doggett, North Carolina State U.,  
Raleigh, NC; and  
R.S. Smith III, Varian Beverly Microwave Division,  
Beverly, MA
- 2B3 PREDICTIONS FROM THE VAN DER POL EQUATION APPLIED TO HIGH  
POWER MICROWAVE PHASE-LOCKING EXPERIMENTS AT PHYSICS  
INTERNATIONAL  
D. Price, Physics International Company, San Leandro, CA
- 2B4 THE COAXIAL CAVITY LOCKED HPM TUBE AND EXTERNAL HPM FEEDBACK  
STABILIZATION  
D.A. Phelps, IRT Corp., San Diego, CA
- 2B5-6 Invited Paper  
SOVIET RESEARCH ON INTENSE -RELATIVISTIC-ELECTRON-BEAM,  
MICROWAVE SOURCES  
V.L. Granatstein, U. of Maryland, College Park, MD
- 2B7-8 Invited Paper  
PHASE LOCKING OF HIGH POWER OSCILLATORS  
J. Benford, Physics International Company, San Leandro,  
CA
- 2B9 EXPERIMENTAL VERIFICATION OF THE DOMINANT MICROWAVES FROM  
THE REFLEXING ELECTRONS  
M.W. Wu, C.Y. Chen, C.S. Hwang, T.C. Guung, K.N. Tung,  
and W.S. Hou, Institute of Nuclear Energy Research, Lungtan,  
Taiwan, R.O.C.

**Monday Afternoon, 22 May 1989**

**2:50 P.M. - Grand Ballroom G**

**Session 2C: ARC TECHNOLOGY AND MAGNETOHYDRODYNAMICS**

Chairperson: G. L. Rogoff

**ARGON TRANSITION PROBABILITIES REVISITED**

A. Sedghinasab, U. of Tennessee Space Institute,  
Tullahoma, TN

**RADIATIVE EFFECTS IN INDUCTION PLASMA MODELING**

P. Proulx, J. Mostaghimi, and M.I. Boulos, Universite de  
Sherbrooke, Sherbrooke, Canada

**NUMERICAL SIMULATION OF TURBULENT FLOW MODEL IN A R.F.  
INDUCTION PLASMA TORCH**

C.W. Zhu and K.Y. Chen, Academia Sinica, Beijing, PRC

**ELECTRON TEMPERATURE AND CURRENT DENSITY MEASUREMENTS AT THE  
ANODE OF FREE BURNING, HIGH INTENSITY ARCS**

E. Leveroni and E. Pfender, U. of Minnesota, Minneapolis, MN

**TURBULENCE STUDIES OF HIGH PRESSURE DYNAMIC NITROGEN ARCS**

U. Sen, Spectronics Corporation, Westbury, NY; and  
D.M. Benenson, State University of New York at Buffalo,  
Buffalo, NY

**VOLTAGE-CURRENT CHARACTERISTICS OF SF6 GAS ARC**

S. Sugiyama and M. Nakajima, Fuji Electric Co., Ltd., Japan

**CHARACTERISTICS OF A 30KW PLASMA TORCH**

J. Busnardo-Neto, V.A. Rodrigues, H.K. Bockelmann,  
and P.H. Sakanaka, Universidade Estadual de Campinas,  
Campinas, Brasil

**LOW EROSION RATE OF ZIRCONIUM IN A PLASMA TORCH**

A.G. Cunha and A. Marotta, Universidade Estadual de  
Campinas, Campinas, Brasil

**THE POTASSIUM ATOM DENSITY DISTRIBUTION AND PLASMA  
TEMPERATURE PROFILE IN AN MHD CANNEL**

Y. Aoki, H. Kitagawa, K. Sumi, S. Oikawa, N. Kayukawa,  
and H. Yamazaki, Hokkaido University, Sapporo, Japan

**A SIC-CUG-CU INSULATOR FOR MHD GENERATOR CHANNELS**

T. Okuo, Electrotechnical Laboratory, Tsukuba, Japan;  
T. Ookouchi, Hitachi Ltd., Katsuta, Japan; and  
Y. Aoki, Hokkaido University, Sapporo, Japan

**Monday Afternoon, 22 May 1989**

**2:50 P.M. - Grand Ballroom C**

**Oral Session 2D: DIODES; ION, ELECTRON**

**AND PLASMA SOURCES - I**

Chairperson: A. L. Pregenzer

**Invited Paper**

**THEORY OF VOLTAGE DECAY IN APPLIED-B ION DIODES**

M.P. Desjarlais, Sandia National Labs, Albuquerque, NM

**Invited Paper**

**EXPLODING METAL FILM ACTIVE ANODE SOURCE EXPERIMENTS ON THE  
LION EXTRACTOR ION DIODE**

G.D. Rondeau, G.J. Bordonaro, J.B. Greenly, and  
D.A. Hammer, Cornell U., Ithaca, NY

**2D5 DISTRIBUTIONS OF NEUTRAL ATOMS IN PULSED ION DIODES MEASURED  
BY OPTICAL INTERFEROMETRY AND SPECTROSCOPY**

K. Kasuya, K. Horioka, Tokyo Institute of Technology,  
Yokohama, Japan;  
S. Kato, Y. Goino, Nissin Denki Co., Ltd., Japan; and  
. PICA-2 Group,

**2D6 A 0.1 TW GAS-BREAKDOWN PLASMA-ANODE ION DIODE**

A. Dunning, J.B. Greenly, and G.D. Rondeau, Cornell U.,  
Ithaca, NY

**2D7 DEVELOPMENT OF THE BOLVAPS/LIBORS LITHIUM ION SOURCE FOR THE  
PBFA II ACCELERATOR**

P.L. Dreike, G.C. Tisone, D.B. Appel, F.P. Gerstle,  
K.P. Lamma, D.M. Mattox, H.L. McCollister, R.H. Moore,  
and T.J. Renk, Sandia National Labs, Albuquerque, NM

**2D8 BOLVAPS/LIBORS EXPERIMENTS ON PBFA-II**

T.J. Renk, R.R. Johnston, P.L. Dreike, G.C. Tisone,  
and J.E. Maenchen, Sandia National Labs, Albuquerque, NM

**2D9 A COMPACT AND LOW POWER MICROWAVE ECR BROAD ION BEAM SOURCE  
FOR LOW PRESSURE MATERIALS PROCESSING**

L. Mahoney and J. Asmussen, Michigan State U., East Lansing,  
MI

**2D10 WINDOWLESS WIDE AREA DISC SHAPED PLASMA SOURCE FOR ENERGY  
ASSISTED CVD**

Z. Yu and G.J. Collins, Colorado State U., Fort Collins, CO

**Monday Afternoon, 22 May 1989**

**Poster Session 2P31-46: BASIC PLASMA PHENOMENA - II**

**2P31 PLASMA PROCESSES ASSOCIATED WITH A RAPIDLY MOVING MAGNET IN  
THE IONOSPHERE**

J.D. Sullivan, R.C. Davidson, J.H. Binsack, T.S. Chang,  
B.G. Lane, Massachusetts Institute of Technology,  
Cambridge, MA;  
C.K. Goertz, U. of Iowa, Iowa;  
M.C. Kelley, Cornell U., Ithaca, NY;  
M.J. Mendillo, Boston U.;  
F. Primdahl, Danish Space Research Institute;  
P. Rodriguez, Naval Research Lab, Washington, DC;  
G.L. Siscoe, U. of California, Los Angeles, CA;  
R.B. Torbert, U. of Alabama, Huntsville, AL; and  
J.D. Winningham, Southwest Research Institute

**2P32 DEPARTURE FROM QUASILINEAR HEATING IN A CROSS-FIELD ION BEAM  
EXPERIMENT**

R.G. Greaves and P.J. Barrett, University of Natal, Durban,  
South Africa

**2P33 DOUBLE-PLASMA INSTABILITY NEAR ION PLASMA FREQUENCY**

P.J. Barrett and R.G. Greaves, University of Natal, Durban,  
South Africa

**2P34 A STUDY OF BINARY ION PLASMA EXPANSION INTO LABORATORY  
GENERATED PLASMA WAKES**

K.H. Wright, Jr., N.H. Stone, Marshall Space Flight  
Center, Huntsville, AL; and  
U. Samir, Tel-Aviv University, Tel-Aviv, Israel

**2P35 THE PLASMA WAKE OF THE SPACE SHUTTLE ORBITER**

K.H. Wright, Jr., N.H. Stone, D.L. Reasoner, Marshall  
Space Flight Center, Huntsville, AL;  
U. Samir, Tel-Aviv University, Tel-Aviv, Israel; and  
K.S. Hwang, U. of Alabama, Huntsville, AL

- 2P36 INVESTIGATION OF THE NONLINEAR BEHAVIOR OF A WEAKLY-IONIZED PLASMA  
S. Stafford and J.R. Roth, U. of Tennessee, Knoxville, TN
- 2P37 PLASMA HEATING BY COLLISIONAL MAGNETIC PUMPING IN A STEADY-STATE MODIFIED PENNING DISCHARGE  
M. Wu and J.R. Roth, U. of Tennessee, Knoxville, TN
- 2P38 CHARACTERISTICS OF PLASMA DISCHARGE IN BETA  
H.R. Prabhakara and S.K. Mattoo, Institute for Plasma Research, BHAT, Gandhinagar, India
- 2P39 LABORATORY EXPERIMENTS AND COMPUTER SIMULATIONS OF THE INTERACTION OF PLASMAS WITH RAPIDLY CHARGED OBJECTS  
J.E. Borovsky, Los Alamos National Lab, Los Alamos, NM
- 2P40 PROPAGATION OF THE FRONT OF AN ELECTRON BEAM INJECTED INTO A MAGNETIZED PLASMA  
L.Y. Chan and R.L. Stenzel, U. of California, Los Angeles, CA
- 2P41 CARBON PELLETS CLOUD STRIATIONS  
P.B. Parks, General Atomics, San Diego, CA
- 2P42 PARTICLE AND POWER BALANCES OF HOT-FILAMENT DISCHARGE PLASMAS IN A MULTI-DIPOLE DEVICE IN THE PRESENCE OF A POSITIVELY BIASED ELECTRODE  
M.H. Cho, N. Hershkowitz, and T. Intrator, U. of Wisconsin-Madison, Madison, WI
- 2P43 MEASUREMENT OF SHEATH POTENTIAL IN AN RF INDUCTIVE DISCHARGE PLASMA WITH A DC MAGNETIC FIELD  
G.H. Kim, M.H. Cho, N. Hershkowitz, M. Doczy, and T. Davis, U. of Wisconsin-Madison, Madison, WI
- 2P44 EXPERIMENTAL INVESTIGATION OF A LOCALIZED ELECTRON TEMPERATURE ELEVATION NEAR ELECTRON CYCLOTRON RESONANCE  
S.W. Lam, R.R. Mett, M. Bettenhausen, and J.E. Scharer, U. of Wisconsin-Madison, Madison, WI
- 2P45 EXPERIMENTAL PROPERTIES OF SURFACE WAVE SUSTAINED PLASMA COLUMNS CLOSE TO AND ABOVE THE ATMOSPHERIC PRESSURE  
S. Levesque, M. Moisan, and J. Hubert, Universite de Montreal, Montreal, Canada
- 2P46 THE ELECTRON ENERGY DISTRIBUTION FUNCTION OF NOBLE GASES WITH FLOW  
P.J. Karditsas, U. of Maryland, College Park, MD

### Monday Afternoon, 22 May 1989

#### Poster Session 2P47-55: REVERSED-FIELD PINCH

- 2P47 RESULTS FROM HBTX1C WITH CLOSE AND DISTANT RESISTIVE SHELLS  
B. Alper, M.K. Bevir, H.A.B. Bodin, C.A. Bunting, P.G. Carolan, J.A. Cunnane, D.E. Evans, C.G. Gimblett, R.J. La Haye, P. Martin, A.A. Newton, P.G. Noonan, A. Patel, S. Robertson, M.G. Rusbridge, H.Y.W. Tsui, and P.D. Wilcock, Culham Laboratory, Abingdon, UK
- 2P48 TEMPERATURE MEASUREMENTS ON RFP AND ULQ EXPERIMENTS IN REPETE-1  
Y. Nagayama, A. Ejiri, A. Fujisawa, T. Fujita, J. Matsui, K. Miyamoto, K. Saito, Y. Shimazu, K. Shimoji, and K. Yamagishi, University of Tokyo, Tokyo, Japan
- 2P49 STATUS OF THE DESIGN AND CONSTRUCTION OF THE CONFINEMENT PHYSICS RESEARCH FACILITY (CPRF) AND THE ZTH EXPERIMENT  
P. Thullen, K.F. Schoenberg, and J.N. Dimarco, Los Alamos National Lab, Los Alamos, NM
- 2P50 CONFINEMENT DYNAMICS IN THE ZT-40M RFP  
P.G. Weber, J.C. Ingraham, G. Miller, C.P. Munson, J.A. Phillips, M.M. Pickrell, K.F. Schoenberg, and G.A. Wurden, Los Alamos National Lab, Los Alamos, NM
- 2P51 ION TEMPERATURE IN THE REVERSATRON II RFP  
P. Greene and S. Robertson, U. of Colorado, Boulder, CO

- 2P52 DESIGN AND INITIAL OPERATION OF THE MADISON SYMMETRIC TORUS  
T.W. Lovell, R.N. Dexter, F. Feyzi, D. Kortbawi, S.C. Prager, and J.C. Sprott, U. of Wisconsin-Madison, Madison, WI
- 2P53 MAGNETIC FIELD ERROR MEASUREMENTS AND EFFECTS ON PLASMA IN THE MST REVERSED FIELD PINCH  
A.F. Almagri, R.N. Dexter, S.C. Prager, J.S. Sarff, and J.C. Sprott, U. of Wisconsin-Madison, Madison, WI
- 2P54 RFP BEHAVIOR AT VARIOUS F VALUES IN THE MST  
W. Shen, J.A. Beckstead, G. Chartas, S.A. Hokin, S.C. Prager, T.D. Rempel, C.W. Spragins, and R.N. Dexter, U. of Wisconsin-Madison, Madison, WI
- 2P55 MAGNETIC FLUX GENERATION AND SAWTEETH IN THE MST REVERSED-FIELD PINCH  
J.A. Beckstead, A.F. Almagri, S. Assadi, G. Chartas, D.J. Den Hartog, R.N. Dexter, J.S. Sarff, E.E. Scime, and W. Shen, U. of Wisconsin-Madison, Madison, WI

### Monday Afternoon, 22 May 1989

#### Poster Session 2P56-64: INTENSE ELECTRON AND ION BEAMS - I

- 2P56 FAST RISE-TIME MAGNETIC FIELD COIL STUDY  
D.J. Weidman, Advanced Technology and Research, Laurel, MD; and R.F. Schneider, Naval Surface Warfare Center, Silver Spring, MD
- 2P57 RELATIVISTIC ELECTRON BEAM TRANSPORT IN HIGH PRESSURE GASES: A WARM FLUID TREATMENT OF NOSE PHYSICS  
R. Roubaud and P. Maggi-Videlaine, Universite Joseph Fourier, Grenoble, France
- 2P58 PREPARATION OF SUPERCONDUCTING YBa2Cu3O7-X THIN FILMS BY ELECTRON BEAM EVAPORATION  
W. Benker, J. Christiansen, K. Frank, W. Hartmann, T. Redel, M. Stetter, P. Fickenscher, G. Saemann-Ischenko, and H.P. Scholch, Universitat Erlangen-Nurnberg, Erlangen, FRG
- 2P59 TIME-RESOLVED DIODE CURRENT DENSITY MEASUREMENTS FOR THE RECIRCULATING LINAC INJECTOR  
M.D. Haworth, D.L. Smith, M.G. Mazarakis, J.W. Poukey, D.E. Hasti, L.F. Bennett, and S.J. Lucero, Sandia National Labs, Albuquerque, NM
- 2P60 HIGH CURRENT PROTON BEAMS IN MULTI-STAGE LINEAR INDUCTION ACCELERATORS  
C. Golkowski, G.S. Kerslick, and J.A. Nation, Cornell U., Ithaca, NY
- 2P61 MEASUREMENT OF ION EFFECTS ON HIGH CURRENT RELATIVISTIC DIODES  
E.H. Choi, Korean Advanced Institute of Science and Technology, Seoul, Korea; R.F. Schneider, H.S. Uhm, W.C. Freeman, H.I. Cordova, M.E. Moffatt, Naval Surface Warfare Center, Silver Spring, MD; and D.J. Weidman, Advanced Technology and Research, Laurel, MD
- 2P62 OPERATION OF AN INTENSE ION BEAM DIODE AT HIGH REPETITION RATE  
W.A. Noonan, S.C. Glidden, J.B. Greenly, D.A. Hammer, K.K. Jain, N. Qi, and L. Brissette, Cornell U., Ithaca, NY
- 2P63 DYNAMIC BEHAVIOR OF IREB IN A COLLECTIVE ION ACCELERATION EXPERIMENT  
T.A. Fine and M.J. Rhee, U. of Maryland, College Park, MD
- 2P64 DESIGN STUDIES OF AN ELECTROSTATIC QUADRUPOLE CHANNEL FOR TRANSPORT OF A HIGH-BRIGHTNESS H- BEAM AND COMPARISON WITH GAS FOCUSING  
C.R. Chang, E. Horowitz, and M. Reiser, U. of Maryland, College Park, MD

Tuesday Morning, 23 May 1989  
8:30 A.M. - Grand Ballroom A

REVIEW 3R

THE PLASMA UNIVERSE

A.L. Peratt  
Los Alamos National Laboratory, Los Alamos, NM

Chairperson: S.J. Gitomer

Tuesday Morning, 23 May 1989  
9:40 A.M. - Grand Ballroom E

Oral Session 3A: PLASMA WAVES AND INSTABILITIES - II  
Chairperson: A. Hirose

TUBE DIAMETER AND WAVE FREQUENCY LIMITATIONS WHEN USING THE  
ELECTROMAGNETIC SURFACE WAVE IN THE M=1 (DIPOLAR) MODE TO  
SUSTAIN A PLASMA COLUMN

J. Margot-Chaker, M. Moisan, V.M.M. Glaude, G. Sauve,  
Universite de Montreal, Montreal, Canada;  
M. Chaker, INSR-Energie, Varennes, Canada;  
P. Lauque, Universite Paul Sabatier, Toulouse, France; and  
J. Paraszczak, IBM T.J. Watson Research Center, Yorktown  
Heights, NY

ION ACOUSTIC DECAY INSTABILITIES IN LASER PELLETT INTERACTIONS

K. Mizuno, J.S. De Groot, S. Kawata, U. of California,  
Davis/Livermore, Davis, CA;  
P.E. Young, R.P. Drake, K.G. Estabrook, Lawrence Livermore  
National Lab, Livermore, CA; and  
W. Seka, R. Bahr, U. of Rochester, Rochester, NY

Invited Paper

PARTICLE DIFFUSION IN TURBULENT FIELDS: TRANSITION FROM  
QUASILINEAR TO NONLINEAR STAGE

O. Ishihara, Texas Tech U., Lubbock, TX

EXPERIMENTAL INVESTIGATION OF HEMISPHERICAL ION-BEAM MODES

C.E. Garner, Jet Propulsion Lab, Pasadena, CA; and  
N.L. Oleson, U. of South Florida, Tampa, FL

KINETIC THEORY OF ION-CYCLOTRON WAVE USING ENERGY CONSERVING  
BGK COLLISION OPERATOR

S.K. Sharma, Indian Institute of Technology, New Delhi,  
India

Tuesday Morning, 23 May 1989  
9:40 A.M. - Grand Ballroom F

Oral Session 3B: INTENSE ELECTRON AND ION BEAMS - II  
Chairperson: S. K. Stephanakis

3B1-2 Invited Paper

PLASMA MOTION INTO A TRANSVERSE MAGNETIC FIELD AND PLASMA  
F.J. Wessel, A. Fisher, N. Rostoker, and J. Song, U. of  
California, Irvine, CA

3B3 STRONG STEERING OF INTENSE ELECTRON BEAMS IN CIRCULAR  
ACCELERATORS WITH TRANSVERSE WIRE ARRAYS

S. Humphries, Jr. and E. Schamiloglu, U. of New Mexico,  
Albuquerque, NM

3B4-5 Invited Paper

PROGRESS IN ION BEAM RESEARCH AT SANDIA NATIONAL LABORATORIES

R.W. Stinnett, T.R. Lockner, D.J. Johnson, R.S. Coats,  
T.A. Mehlhorn, M.P. Desjarlais, K.W. Bieg, A.L. Pregoner,  
J.R. Woodworth, R.J. Leeper, J.E. Maenchen, C.L. Ruiz,  
W.A. Stygar, J.E. Bailey, R.P. Kensek, J.P. Quintenz,  
S.E. Rosenthal, S.A. Slutz, D.L. Hanson, and P.F. McKay,  
Sandia National Labs, Albuquerque, NM

3B6 BEAM TRANSPORT AND FOCUSING ON PBFA II

T.R. Lockner, D.J. Johnson, T.A. Mehlhorn, R.J. Leeper,  
J.E. Maenchen, W.A. Stygar, R.S. Coats, R.P. Kensek,  
M.P. Desjarlais, C.W. Mendel, G.E. Rochau, S.E. Rosenthal,  
J.P. Quintenz, and R.W. Stinnett, Sandia National Labs,  
Albuquerque, NM

3B7 THEORETICAL ANALYSIS OF WIRE-GUIDED ION BEAM TRANSPORT

J.J. Watrous, JAYCOR, Vienna, VA; and  
P.F. Ottinger, D. Mosher, J.M. Neri, Naval Research Lab,  
Washington, DC

3B8 FINAL FOCUSING OF Z-CHARGE TRANSPORTED ION BEAMS

J.M. Neri, J.R. Boller, G. Cooperstein, D. Mosher,  
P.F. Ottinger, V.C. Scherrer, S.J. Stephanakis,  
F.C. Young, Naval Research Lab, Washington, DC; and  
P.J. Goodrich, D.D. Hinshelwood, J.J. Watrous, JAYCOR,  
Vienna, VA

3B9 GENERATION AND FOCUSING OF HIGH POWER ION BEAM IN

MAGNETICALLY INSULATED DIODE WITH APPLIED B-FIELD  
V.M. Bystritskii, I.V. Lisitsyn, Institute of  
Electrophysics, Sverdlovsk, USSR; and  
S.N. Volkov, Y.E. Krasik, N.M. Polkovnikova, Institute of  
Nuclear Physics, Tomsk, USSR

3B10 RF POWER FOR THE NEXT LINEAR COLLIDER

W.B. Herrmannsfeldt, Stanford Linear Accelerator Center,  
Stanford, CA

**Tuesday Morning, 23 May 1989**

**9:40 A.M. - Grand Ballroom G**

**Oral Session 3C: GASEOUS ELECTRONICS - I**

**Chairperson: G. A. Gerdin**

- 3C1 EXPERIMENTAL STUDY OF THE INFLUENCE OF THE GAS PRESSURE AND OF THE WAVE FREQUENCY ON THE SPATIAL DISTRIBUTIONS OF EXCITED ATOMS IN A SURFACE WAVE PRODUCED PLASMA  
J. Margot-Chaker, M. Moisan, Universite de Montreal, Montreal, Canada;  
A. Ricard, Universite Paris-sud, Orsay Cedex, France; and  
C.M. Ferreira, A.B. Sa, Universidade tecnica de Lisboa, Lisboa Codex, Portugal
- 3C2 ELECTRON COLLISIONS WITH PROCESSING PLASMA CONSTITUENTS  
K.H. Becker, City College of CUNY, NY, NY
- 3C3 TOP ELECTRON DRIFT MEASUREMENTS IN XENON DIFLOURIDE(XEF<sub>2</sub>) AND HYDROGEN SULFIDE(H<sub>2</sub>S) GAS MIXTURES  
C.A. Denman and L.A. Schlie, Air Force Weapons Division, Kirtland AFB, NM
- 3C4 PLASMA BREAKDOWN BEHAVIOR OF HYDROGEN AZIDE (HN<sub>3</sub>) GAS MIXTURES  
L.A. Schlie, M.W. Wright, and C.A. Denman, Air Force Weapons Lab, Kirtland AFB, NM
- 3C5 VOLTAGE- CURRENT CHARACTERISTICS OF A HIGH CURRENT DIFFUSE DISCHARGE  
W.W. Byszewski, GTE Laboratories Incorporated, Waltham, MA
- 3C6 THE TEMPORAL DEVELOPMENT OF HOLLOW CATHODE DISCHARGES  
M.T. Ngo, G. Gerdin, K. Schoenbach, Old Dominion U., Norfolk, VA; and  
J. Lee, NASA Langley, Hampton, VA
- 3C7-8 Invited Paper  
ELECTRON BEAM GENERATION IN HIGH VOLTAGE GLOW DISCHARGES  
J.J. Rocca, B. Szapiro, and C. Murray, Colorado State U., Fort Collins, CO
- 3C9 GENERATION OF LOW ENERGETIC INTENSE ELECTRON BEAMS IN A GLOW DISCHARGE  
C. Schultheiss, Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, FRG

**Tuesday Morning, 23 May 1989**

**9:40 A.M. - Grand Ballroom C**

**Oral Session 3D: COMPUTER APPLICATIONS IN PLASMA SCIENCE - I**

**Chairperson: E. G. Zaidman**

- 3D1 THE VIRTUAL PARTICLE EM PIC METHOD FOR MODELLING MICROWAVE DEVICES  
J.W. Eastwood, Culham Laboratory, Abingdon, UK
- 3D2 DIELECTRIC-IN-CELL AND N-BODY-DIELECTRIC SIMULATIONS OF EXB DRIFTING PLASMA CLOUDS  
P.J. Hansen, U. of Iowa, Ames, IA; and  
J.E. Borovsky, Los Alamos National Lab, Los Alamos, NM
- 3D3 CASK: AN ELECTROMAGNETIC AND ELECTROSTATIC PARTICLE-IN-CELL SIMULATION CODE WITH CONFORMAL BOUNDARIES  
I. Lottati, P.A. Wai, and A.T. Drobot, Science Applications International Corporation, McLean, VA

- 3D4-5 Invited Paper  
GLOBAL RESISTIVE MHD-CALCULATIONS FOR HIGH-BETA DIII-D DIVERTOR TOKAMAK  
J.K. Lee, E.J. Strait, L.L. Lao, and T.S. Taylor, General Atomics, San Diego, CA
- 3D6 SIMULATION OF NONLINEAR WAVE PARTICLE INTERACTIONS IN SPACE PLASMAS USING THE VHS TECHNIQUE  
D. Nunn, University of Southampton, Southampton, UK
- 3D7 NUMERICAL SIMULATION OF PLASMAS ON AN UNSTRUCTURED GRID  
A.T. Drobot, A. Friedman, M.J. Fritts, I. Lottati, Science Applications International Corporation, McLean, VA; and  
D.E. Nielsen, Lawrence Livermore National Lab, Livermore, CA
- 3D8 ABSORBING BOUNDARIES FOR SPACE PLASMA SIMULATIONS  
O. Buneman, Stanford U., Stanford, CA

**Tuesday Morning, 23 May 1989**

**Poster Session 3P1-11: SPACE PLASMAS**

- 3P1 AURORAL BREAKUP DURING SUBSTORM ONSETS  
P.L. Rothwell, Air Force Geophysics Lab, Hanscom AFB, Bedford, MA;  
M.B. Silevitch, Northeastern U., Boston, MA; and  
L.P. Block, C.G. Falthammer, The Royal Institute of Technology, Stockholm, Sweden
- 3P2 FILAMENTATION INSTABILITY OF MHD WAVES IN SOLAR WIND PLASMA  
S.P. Kuo and M.H. Whang, Polytechnic U., Farmingdale, NY
- 3P3 EXPERIMENTAL AND SIMULATION STUDIES OF COLLISIONLESS PLASMA FLOW  
M.A. Morgan, C. Chan, Northeastern U., Boston, MA;  
D. Cooke, Air Force Geophysics Lab, Hanscom AFB, Bedford, MA; and  
M. Tautz, Radex Inc., Carlisle, MA
- 3P4 EXCITATION OF HIGH FREQUENCY, ELECTROSTATIC WAVES IN THE MAGNETOSPHERES OF THE OUTER PLANETS  
I. Roth, U. of California, Berkeley, CA
- 3P5 TEST-PARTICLE SIMULATIONS OF FERMI ACCELERATION OF ELECTRONS AT QUASIPERPENDICULAR SHOCKS  
G. Gisler, Los Alamos National Lab, Los Alamos, NM
- 3P6 SHOCK WAVE ASSOCIATED IRREGULARITIES IN THE INTERPLANETARY MAGNETIC FIELD  
B. Mendoza, R. Perez-Enriquez, J.F. Valdes-Galicia, and J.A. Otaola, Ciudad Universitaria, Codigo, Mexico
- 3P7 COMPUTER SIMULATIONS OF FINITE PLASMAS CONVECTED ACROSS MAGNETIZED PLASMAS  
M. Galvez, C. Barnes, and G. Gisler, Los Alamos National Lab, Los Alamos, NM
- 3P8 DISPROOF OF COWLING'S THEOREM  
I. Alexeff, U. of Tennessee, Knoxville, TN
- 3P9 LARGE HIGH-FIELD SPACEBORNE EXPERIMENTAL MAGNET SYSTEMS: DESIGN CONSIDERATIONS  
M.P.J. Gaudreau and J.D. Sullivan, Massachusetts Institute of Technology, Cambridge, MA
- 3P10 GLOW DISCHARGE AGING OF KAPTON FILM  
W. Khachen and J.R. Laghari, State University of New York at Buffalo, Buffalo, NY
- 3P11 NUMERICAL SIMULATIONS OF RELATIVISTIC DOUBLE LAYERS  
M.E. Sulkanen and J.E. Borovsky, Los Alamos National Lab, Los Alamos, NM



Tuesday Morning, 23 May 1989

Poster Session 3P12-18: DIODES; ION, ELECTRON  
AND PLASMA SOURCES - II

LITHIUM ION BEAM EXPERIMENTS ON PBFA II

J.R. Woodworth, A.L. Pregenzer, K.W. Bieg, T.R. Lockner,  
R.A. Gerber, D.J. Johnson, R.J. Leeper, J.E. Maenchen,  
T.A. Mehlhorn, C.L. Ruiz, W.A. Stygar, R.P. Kensek,  
W.H. Jaramillo, P.R. Johnson, K.J. Penn, and  
M. Halliburton, Sandia National Labs, Albuquerque, NM

CHANGES IN DIODE OPERATING CHARACTERISTICS AS A FUNCTION OF  
APPLIED MAGNETIC FIELD GEOMETRY

A.L. Pregenzer, J.R. Woodworth, T.R. Lockner,  
S.E. Rosenthal, K.W. Bieg, M.P. Desjarlais, and  
R.S. Coats, Sandia National Labs, Albuquerque, NM

DESIGN OF A LASER-PRODUCED LITHIUM ANODE PLASMA EXPERIMENT  
ON THE HELIA EXTRACTION DIODE

K.W. Bieg, G.C. Tisone, J.E. Bailey, and R.A. Hamil, Sandia  
National Labs, Albuquerque, NM

CHARACTERIZATION OF A NOVEL ALKALI METAL AND TRANSITION  
METAL PLASMA SOURCE

A. Beaudry and T.J. Morin, U. of Idaho, Moscow, ID

PSEUDOSPARK AS AN ELECTRON BEAM SOURCE

E. Boggasch and M.J. Rhee, U. of Maryland, College Park, MD

CHARACTERIZATION OF THE TIME-EVOLUTION OF A MICROSECOND  
ELECTRON BEAM DIODE WITH ANODE EFFECTS

M.E. Cuneo, R.M. Gilgenbach, M.L. Brake, C.L. Enloe,  
J.D. Miller, and T.E. Repetti, U. of Michigan, Ann Arbor, MI

COMPACT SURFACE WAVE LAUNCHERS AND THEIR MATCHING NETWORK  
FOR SUSTAINING PLASMA COLUMNS AT RADIO FREQUENCIES

R. Grenier, M. Moisan, and Z. Zakrzewski, Universite de  
Montreal, Montreal, Canada

- 3P24 INVESTIGATION OF GAS-PUFFED DISCHARGES OF THE PLASMA-FOCUS  
TYPE  
M. Sadowski, J. Baranowski, L. Jakubowski,  
E. Skladnik-Sadowska, and A. Szydlowski, Soltan Institute for  
Nuclear Studies, Swierk, Poland
- 3P25 Z-PINCH CHARACTERISTICS OF THE TANDEM PUFF  
J. Thompson, P. Davis, N. Loter, J. Rauch, and K. Ware,  
Maxwell Laboratories, Inc., San Diego, CA
- 3P26 NEUTRON PRODUCTION IN DEUTERIUM-NOBEL GAS MIXTURES IN A  
PLASMA FOCUS  
C. Deeney, Physics International Company, San Leandro, CA;  
P. Choi, Imperial College, London, UK; and  
H. Herold, Univeritaet Stuttgart, Stuttgart, FRG
- 3P27 CURVE-FITTING ANALYSIS OF TIME-RESOLVED THOMSON SPECTROGRAMS  
FROM A PLASMA FOCUS  
D.J. Weidman, Advanced Technology and Research, Laurel, MD;  
and M.J. Rhee, U. of Maryland, College Park, MD
- 3P28 MICROSOURCES OF INTENSE FUSION IN FOCUSED DISCHARGES OF  
PLASMA FOCUS  
A. Bortolotti, A. Fuschini, V. Nardi, Universita di  
Ferrara, Ferrara, Italy; and  
J.S. Brzosko, C. Powell, Stevens Institute of Technology,  
Hoboken, NJ
- 3P29 PRELIMINARY PLASMA FOCUS DRIVEN DT MICROBALLOON EXPERIMENTS  
B.L. Freeman and D.G. Rickel, Los Alamos National Lab, Los  
Alamos, NM
- 3P30 GAS-PUFF Z-PINCH ON PULSED POWER GENERATOR WITH SELF-CROWBAR  
SWITCH  
H. Akiyama, N. Shimomura, Kumamoto University, Kumamoto,  
Japan;  
K. Takasugi, T. Miyamoto, Nihon University, Chiyoda-ku,  
Japan;  
M. Sato, Himeji Institute of Technology, Himeji, Japan; and  
T. Tazima, Nagoya University, Nagoya, Japan
- 3P31 EXPERIMENTAL STUDY OF A GAS-PUFF Z-PINCH PLASMA  
C.R. Li, T.C. Yang, M. Han, and C.M. Luo, Tsinghua  
University, Beijing, PRC
- 3P32 LINER IMPLOSIONS BY PULSED POWER TRANSFORMER AT ILE OSAKA  
N. Yugami, S. Umehara, A. Zakou, S. Miyamoto, K. Imasaki,  
S. Nakai, and C. Yamanaka, Osaka University, Osaka, Japan
- 3P33 PLASMA DYNAMICS FROM A TWO-GUN PLASMA FOCUS DEVICE  
T.R. Yeh, D.J. Shang, C.C. Tzeng, M. Wen, C.K. Yeh,  
Y.Y. Kuo, and W.S. Hou, Institute of Nuclear Energy Research,  
Lung-tan, Taiwan, Republic of China

Tuesday Morning, 23 May 1989

Poster Session 3P19-33: PLASMA FOCUS AND ULTRAFAST Z-PINCHES

- 2-D MAGNETOHYDRODYNAMIC MODEL FOR A DENSE HELIUM PLASMA FOCUS  
F. Begay and I. Lindemuth, Los Alamos National Lab, Los  
Alamos, NM
- THE EFFECT OF TRANSMISSION LINES AND SWITCHING ACTION ON THE  
ELECTRICAL SIGNALS IN PLASMA FOCUS DEVICES  
H. Bruzzone, H. Kelly, and C. Moreno, Ciudad Universitaria,  
Buenos Aires, Argentina
- ON THE DIFFERENT STAGES IN THE BREAKDOWN PHASE IN PLASMA  
FOCUS DEVICES  
H. Bruzzone and R. Vieytes, Ciudad Universitaria, Buenos  
Aires, Argentina
- KINEMATICS AND STRUCTURE OF THE COLLAPSING CURRENT SHEATH  
CORRELATED WITH NEUTRON AND BEAM PRODUCTION IN A PLASMA  
FOCUS DEVICE  
H. Bruzzone, H. Kelly, G. Giudice, D. Grondona,  
and A. Marquez, Ciudad Universitaria, Buenos Aires, Argentina
- MEASUREMENT OF ACCELERATED PLASMA IN PLASMA FOCUS BY LASER  
DIFFERENTIAL INTERFEROMETRY METHODS  
S.J. Huang, X.X. Wang, and T.C. Yang, Tsinghua University,  
Beijing, PRC

Tuesday Afternoon, 23 May 1989  
2:00 P.M. - Grand Ballroom A

PLASMA SCIENCE HISTORY 4H

THE HISTORY OF THE REVERSED-FIELD PINCH

H.A. Bodin  
Culham Laboratory, U.K.

Chairperson: J. N. Benford

Tuesday Afternoon, 23 May 1989  
2:50 P.M. - Grand Ballroom E

Oral Session 4A: PLASMA DIAGNOSTICS - I  
Chairperson: K.A. Connor

- 4A1 MEASUREMENTS OF THE PLASMA TEMPERATURE ASSOCIATED WITH THE INTERACTIONS OF HIGH POWER PULSE LASERS WITH THE MATERIALS  
H.Y. Chang, Korea Institute of Technology, Korea
- 4A2 INFRARED ATMOSPHERIC OXYGEN PLASMA EMISSION SPECTRA AS A DIAGNOSTIC TOOL  
S. Alexiou, Brown U., Providence, RI
- 4A3 IN-FLIGHT DIAGNOSTICS OF THERMAL TREATMENT OF POWDERS IN INDUCTION PLASMAS  
H. Takikawa, Nagoya University, Japan;  
T. Sakuta, Kanazawa University, Japan; and  
M.I. Boulos, Universite de Sherbrooke, Sherbrooke, Canada
- 4A4 CHARACTERIZATION OF A MULTIPOLAR ELECTRON CYCLOTRON RESONANCE MICROWAVE PLASMA SOURCE  
J. Hopwood, R. Wagner, D.K. Reinhard, and J. Asmussen, Michigan State U., East Lansing, MI
- 4A5 ENERGY-RESOLVED IMAGING OF THE PBFA-II ION BEAM  
W.A. Stygar, L.P. Mix, R.J. Leeper, T.A. Mehlhorn,  
J.E. Maenchen, E.R. Brock, D.E. Hebron, D.J. Johnson,  
T.R. Lockner, Sandia National Labs, Albuquerque, NM;  
W.E. Nelson, SEA, Albuquerque, NM; and  
P. Reyes, Ktech Corporation, Albuquerque, NM
- 4A6 ION BEAM EFFECTS ON K-SHELL EMISSION FROM HIGH TEMPERATURE PLASMAS ON PBFA II  
R.J. Dukart, Sandia National Labs, Albuquerque, NM
- 4A7 HIGH-ENERGY PHOTON SPECTRA FROM A TUNGSTEN PLASMA FLOW SWITCH EXPERIMENT  
J.F. Davis, S.K. Coffey, R&D Associates, Alexandria, VA;  
and J.H. Degnan, D.W. Price, Air Force Weapons Lab,  
Kirtland AFB, NM

Tuesday Afternoon, 23 May 1989  
2:50 P.M. - Grand Ballroom F

Oral Session 4B: FAST-WAVE DEVICES - II  
Chairperson: A. K. Ganguly

- 4B1-2 Invited Paper  
CYCLOTRON AUTORESONANCE MASER AMPLIFIER EXPERIMENTS AT M.I.T.  
G. Bekefi, B.G. Danly, J.A. Davies, A. DiRienzo,  
C. Leibovitch, K.D. Pendergast, R.J. Temkin, and  
J.S. Wurtele, Massachusetts Institute of Technology,  
Cambridge, MA
- 4B3-4 Invited Paper  
NONLINEAR MODE COMPETITION AND COHERENCE IN LOW GAIN FEL OSCILLATORS  
T.M. Antonsen, Jr. and B. Levush, U. of Maryland, College Park, MD
- 4B5 THE INTENSE ELECTRON-BEAM-DRIVEN ELEMENTARY MONOTRON  
J.E. Walsh, L. Dong, Dartmouth College, Hanover, NH; and  
M. Arman, B. Godfrey, M. Mostrom, D. Sullivan, Mission Research Corporation, Albuquerque, NM
- 4B6 OPTIMIZATION OF THE EFFICIENCY IN GYROTRON BACKWARD WAVE OSCILLATOR MODEL VIA TAPERED AXIAL MAGNETIC FIELD  
S. Ahn and A.K. Ganguly, Naval Research Lab, Washington, DC
- 4B7 NONLINEAR STUDIES OF AXIS-ENCIRCLING ELECTRON BEAM WITH OFF-CENTERING AND FIELD TAPERING EFFECTS  
V. Ayres, J.Y. Choe, K. Boulais, and H.S. Uhm, Naval Surface Warfare Center, Silver Spring, MD
- 4B8 A SIXTEENTH HARMONIC CUSPTRON OSCILLATOR  
K.K. Tiong, S.P. Kuo, and P.E. Miller, Polytechnic U., Farmingdale, NY
- 4C1-2 Invited Paper  
CONFINED DISCHARGE PLASMA SOURCES FOR Z-PINCH EXPERIMENTS  
D.D. Hinshelwood, P.J. Goodrich, JAYCOR, Vienna, VA;  
G. Mehlman, Sachs/Freeman Assoc., Landover, MD;  
V.E. Scherrer, S.J. Stephanakis, F.C. Young, Naval Research Lab, Washington, DC; and  
B.L. Welch, U. of Maryland, College Park, MD
- 4C3 MAGNETIC COMPRESSION OF AN ALUMINUM VAPOR CYLINDER  
P. Audebert, E. Figura, C. Rouille, B. Etlicher, Ecole Polytechnique, Palaiseau, France; and  
A. Folkierski, S. Niffikeer, Imperial College, London, UK
- 4C4 SOFT X-RAY EMISSIONS BY HIGH CURRENT VACUUM DISCHARGES  
H. Arita, K. Suzuki, Y. Kurosawa, and K. Hirasawa, Hitachi Research Laboratory, Hitachi Ltd., Japan
- 4C5-6 Invited Paper  
HOLOGRAPHIC INTERFEROMETRY OF GAS-PUFF Z-PINCHES  
W.W. Hsing and J.L. Porter, Sandia National Labs, Albuquerque, NM
- 4C7 TWO-DIMENSIONAL SIMULATIONS OF IMPLoding GAS PUFF PLASMAS  
N.F. Roderick, U. of New Mexico, Albuquerque, NM; and  
T.W. Hussey, Sandia National Labs, Albuquerque, NM

Tuesday Afternoon, 23 May 1989  
2:50 P.M. - Grand Ballroom G

Oral Session 4C: ULTRAFast Z-PINCHES  
Chairperson: T. W. Hussey

**Tuesday Afternoon, 23 May 1989**  
**2:50 P.M. - Grand Ballroom C**

**Oral Session 4D; PLASMA PROCESSING - I;**  
**THERMAL AND NONEQUILIBRIUM**

**Chairperson: K. Etemadi**

- 4D1 CHARACTERISTICS OF DIAMOND-LIKE CARBON THIN FILMS PRODUCED BY DC HOLLOW CATHODE (DCHC) GLOW DISCHARGE IN AR/CH<sub>4</sub> PLASMAS  
L. Seto, J. Parent, J.S. Chang, and A.A. Berezin, McMaster University, Hamilton, Canada
- 4D2 A NUMERICAL SIMULATION OF THE PRODUCTION OF ULTRAFINE PARTICLES IN A THERMAL PLASMA REACTOR  
P. Proulx and J.F. Bilodeau, Universite de Sherbrooke, Sherbrooke, Canada
- 4D3 THERMAL PLASMA CRYSTAL GROWTH  
K. Etemadi, State University of New York at Buffalo, Buffalo, NY
- 4D4 PLASMA PROCESSING OF HIGH TC SUPERCONDUCTING FILMS  
D.T. Shaw, S. Witanachchi, S. Patel, and H.S. Kwok, State University of New York at Buffalo, Buffalo, NY
- 4D5 LASER-PRODUCED PLASMAS IN MEDICINE  
S.J. Gitomer, R.D. Jones, Los Alamos National Lab, Los Alamos, NM; and  
C. Howsare, Uniform Services University of the Health Sciences, Bethesda, MD
- 4D6 THERMAL CHARACTERISTICS OF NON-TRANSFERRED DC PLASMA TORCHES UNDER VARIOUS COMBINATIONS OF PURE AND MIXTURE GASES  
T.G. Beuthe, J.S. Chang, McMaster University, Hamilton, Canada;  
N. Hayashi, University of Tokushima, Japan;  
S. Ono, Musashi Inst. of Tech., Tokyo, Japan; and  
A. Kalinski, D. Galicki, K. Brodowicz, Warsaw Technical University, Warsaw, Poland
- 4D7 SELECTIVE HARDENING OF HIGH CARBON STEEL USING AN ARGON THERMAL PLASMA FLAME  
F.W. Giacobbe, American Air Liquide, Inc., Countryside, IL
- 4D8 A COMPUTATIONAL ANALYSIS OF ENERGY AND MASS TRANSPORT IN PLASMA SKULL MELTING PROCESSES  
A.D. Brent and K.J. Reid, U. of Minnesota, Minneapolis, MN

**Tuesday Afternoon, 23 May 1989**

**Poster Session 4P34-40: COMPACT TOROIDS AND ALTERNATE FUSION CONCEPTS**

- 4P34 RADIAL ION DIFFUSION INDUCED BY CYCLOTRON RESONANCE HEATING AT THE THERMAL BARRIER REGION IN THE PHAEDRUS-B TANDEM MIRROR  
Y.J. Wen, South-western Institute of Physics, Leshan, PRC;  
D. Brouchous, R.A. Breun, N. Hershkowitz, P. Probert, R. Majeski, T. Intrator, D. Roberts, D. Keil, U. of Wisconsin-Madison, Madison, WI; and  
M. Ichimura, University of Tsukuba, Japan
- 4P35 THE DENSE Z-PINCH AS A FUSION POWER SOURCE  
J.D. Sethian, A.E. Robson, K.A. Gerber, and  
A.W. DeSilva, Naval Research Lab, Washington, DC
- 4P36 HIGH ENERGY DENSITY FUSION USING THE COMPACT TORUS  
J.L. Eddleman, J.H. Hammer, C.W. Hartman, B.G. Logan, and R. Moir, Lawrence Livermore National Lab, Livermore, CA

- 4P37 COMPUTATIONAL MODELLING OF COMPACT TOROIDAL PLASMAS  
C.J. Clouse, W.L. Baker, J.D. Beason, J.H. Degnan, D. Dietz, J.E. Rowley, C.R. Sovinec, Air Force Weapons Lab, Kirtland AFB, NM; and  
J.S. Buff, M.H. Frese, R.E. Peterkin, Jr., N.F. Roderick, Mission Research Corporation, Albuquerque, NM
- 4P38 THE POTENTIAL OF D-T AND D-3HE FUEL CYCLES IN FIELD-REVERSED CONFIGURATIONS  
W. Kernbichler and G.H. Miley, U. of Illinois, Urbana, IL
- 4P39 EFFECTS OF THE VELOCITY-SPACE PARTICLE LOSS ON THE BEHAVIOR OF FIELD-REVERSED CONFIGURATIONS  
M.Y. Hsiao and P.R. Chiang, Pennsylvania State U., University Park, PA
- 4P40 PARTICLE CONFINEMENT TIME SCALING OF FIELD-REVERSED CONFIGURATIONS DUE TO COLLISIONAL VELOCITY-SPACE PARTICLE LOSS  
P.R. Chiang and M.Y. Hsiao, Pennsylvania State U., University Park, PA

**Tuesday Afternoon, 23 May 1989**

**Post Session 4P41-48: INTENSE BEAM**

**MICROWAVE SOURCES - II**

- 4P41 EXPERIMENTAL INVESTIGATION OF PLASMA- NEUTRALIZED OPERATION OF A GYROTRON  
D.A. Kirkpatrick, S.H. Gold, W.M. Manheimer, C. Sullivan, Naval Research Lab, Washington, DC; and  
B. Levush, T.M. Antonsen, Jr., U. of Maryland, College Park, MD
- 4P42 A REPETITIVELY- PULSED, MOBILE, HPM SYSTEM  
S.T. Spang, D.E. Anderson, K.D. Claborne, R.A. Hill, S.P. Manning, J.A. Pasour, D.M. Rexroad, E.P. Scannell, R.J. Williams, and D.A. Woodyard, AAI Corporation, Hunt Valley, MD
- 4P43 REALIZATION OF CAVITY AND DRIFT SPACE DESIGNS FOR A 30 MW, 10 GHZ GYROKLYSTRON  
J. Calame, W. Lawson, P.E. Latham, S. Miller, D. Welsh, M. Skopec, B. Hogan, M. Naiman, Y. Carmel, V.L. Granatstein, C.D. Striffler, U. of Maryland, College Park, MD; and  
M.E. Read, PSI, Alexandria, VA
- 4P44 ELECTRON DIODE OSCILLATORS FOR HIGH-POWER RF GENERATION  
S. Humphries, Jr., Acceleration Consultants, Albuquerque, NM
- 4P45 THEORETICAL STUDY OF STABILITY ANALYSIS FOR RELATIVISTIC PLANAR MAGNETRON  
H.C. Chen and H.S. Uhm, Naval Surface Warfare Center, Silver Spring, MD
- 4P46 PHASE-LOCKING OF MULTIPLE RELATIVISTIC MAGNETRONS  
J.S. Levine, J. Benford, N. Cooksey, B. Harteneck, R.R. Smith, and H. Sze, Physics International Company, San Leandro, CA
- 4P47 SIMULATION OF A 41 CAVITY MILO  
B.M. Marder, Sandia National Labs, Albuquerque, NM
- 4P48 SMALL-SIGNAL THEORY OF THE HIGH-POWER MAGNETRON WITH INTENSE ELECTRON FLOW  
R.A. Stark and H.S. Uhm, Naval Surface Warfare Center, Silver Spring, MD

Tuesday Afternoon, 23 May 1989

Poster Session 4P49-56: FAST OPENING SWITCHES - II

- 4P49 A HALL-CURRENT MODEL OF ELECTRON LOSS AFTER POS OPENING INTO HIGH-IMPEDANCE LOADS  
J.B. Greenly, Cornell U., Ithaca, NY
- 4P50 NEUTRAL ACCUMULATION FROM PLASMA-WALL INTERACTIONS IN PLASMA OPENING SWITCHES  
L.L. Chen and J.L. Geary, Berkeley Research Associates, Springfield, VA
- 4P51 TIME RESOLVED PLASMA CHARACTERIZATION IN A LONG CONDUCTION TIME PLANAR PLASMA OPENING SWITCH  
L.K. Adler, J.B. Greenly, N. Qi, and D.A. Hammer, Cornell U., Ithaca, NY
- 4P52 COMPUTER SIMULATION OF THE PLASMA-FILLED DIODE  
J.L. Geary, Berkeley Research Associates, Springfield, VA
- 4P53 COMPUTER SIMULATIONS OF A REFLEX TRIODE  
J. Ambrosiano, Lawrence Livermore National Lab, Livermore, CA; and  
J.L. Geary, Berkeley Research Associates, Springfield, VA
- 4P54 FOIL IMPLOSION STUDIES WITH A PLASMA FLOW SWITCH  
R.R. Bartsch, J.C. Cochrane, F. Begay, H.W. Kruse, H. Oona, J.V. Parker, Los Alamos National Lab, Los Alamos, NM; and  
P.J. Turchi, R&D Associates, Alexandria, VA
- 4P55 CIRCUIT DESCRIPTION OF INDUCTIVE ENERGY STORAGE PULSED POWER SYSTEMS  
C.C. Kung and M.J. Rhee, U. of Maryland, College Park, MD
- 4P56 PERFORMANCE OF LASER ACTIVATED SEMICONDUCTOR OPENING SWITCHES  
E.A. Chauchard, C.C. Kung, C.H. Lee, and M.J. Rhee, U. of Maryland, College Park, MD

Tuesday Afternoon, 23 May 1989

Poster Session 4P57-60: MULTIGAP

ACCELERATORS AND INERTIAL FUSION - II

- 4P57 NUMERICAL INVESTIGATION OF THE PLASMA-GRID INTERACTION OF THE LBL HIF SOURCE  
D.W. Hewett, D.J. Larson, Lawrence Livermore National Lab, Livermore, CA;  
H.L. Rutkowski, Lawrence Berkeley Lab, Berkeley, CA; and  
S. Humphries, Jr., U. of New Mexico, Albuquerque, NM
- 4P58 PROGRESS IN 3D PARTICLE-IN-CELL MODELING OF HEAVY ION BEAM TRANSPORT IN QUADRUPOLE FOCUSING CHANNELS  
A. Friedman, J.W-K. Mark, D.E. Nielsen, Lawrence Livermore National Lab, Livermore, CA; and  
C.L. Chang, A.T. Drobot, A. Mankofsky, Science Applications International Corporation
- 4P59 PLASMA LENSES  
K.A. Brueckner, U. of California, San Diego, CA; and  
J.W-K. Mark, Lawrence Livermore National Lab, Livermore, CA
- 4P60 A SELF-SIMILAR MODELING AND TRANSPORT ANALYSIS OF LASER-PRODUCED CORONAS  
K. Kim and W.H. Choe, U. of Illinois, Urbana, IL

Wednesday Morning, 24 May 1989

8:30 A.M. - Grand Ballroom A

REVIEW 5R

MATERIALS PROCESSING IN NONEQUILIBRIUM PLASMAS

H.H. Sawin  
Massachusetts Institute of Technology, Cambridge, MA

Chairperson: G.S. Selwyn

Wednesday Morning, 24 May 1989

9:40 A.M. - Grand Ballroom E

Oral Session 5A: GASEOUS ELECTRONICS - II

Chairperson: J. J. Rocca

- 5A1-2 Invited Paper  
DYNAMICS OF SHEATHS IN LOW PRESSURE R.F. DISCHARGES  
M.A. Lieberman, U. of California, Berkeley, CA
- 5A3 ELECTRON SWARMS IN TWO PHASE PLASMAS  
M.J. McCaughey and M.J. Kushner, U. of Illinois, Champaign, IL
- 5A4 INCLUDING ELECTRON-ELECTRON COLLISIONS IN MONTE CARLO SIMULATIONS OF SWARMS IN PARTIALLY IONIZED PLASMAS  
Y. Weng and M.J. Kushner, U. of Illinois, Champaign, IL
- 5A5 THERMODYNAMIC AND TRANSPORT PROPERTIES OF AN ALUMINUM-NITROGEN PLASMA  
M. Dassanayake and K. Etemadi, State University of New York at Buffalo, Buffalo, NY
- 5A6 THERMAL INSTABILITY IN CURRENT-CARRYING PLASMAS  
S.C. Kuo and S.P. Kuo, Polytechnic U., Farmingdale, NY
- 5A7 RESOLUTION REQUIREMENTS FOR MODELING STREAMER FORMATION IN A SPARK GAP  
A.E. Rodriguez, K.J. Touryan, and W.M. Moeny, Tetra Corporation, Albuquerque, NM
- 5A8 A TRANSMISSION LINE THEORY OF SURFACE FLASHOVER ARCS  
A. Kadish, W.B. Maier, II, Los Alamos National Lab, Los Alamos, NM; and  
R.T. Robiscoe, Montana State U., Bozeman, MT
- 5A9 NUCLEAR-INDUCED UV FLOURESCENCE  
W.H. Williams and G.H. Miley, U. of Illinois, Urbana, IL

Wednesday Morning, 24 May 1989  
9:40 A.M. - Grand Ballroom F

Oral Session 5B: MULTIGAP ACCELERATORS

AND INERTIAL FUSION - III

Chairperson: J. W-K. Mark

INTRODUCTION TO SPECIAL SENSORS ON MULTI-GAP ACCELERATORS  
AND INERTIAL FUSION ACCELERATORS  
J.W-K. Mark, Lawrence Livermore National Lab, Livermore,  
CA

Invited Paper

PARTICLE ACCELERATOR DEVELOPMENTS AND THEIR APPLICABILITY TO  
IGNITION DEVICES FOR INERTIAL FUSION  
C. Rubbia, European Organization of Nuclear Research,  
Geneva, Switzerland

Invited Paper

PRESENT AND FUTURE EXPERIMENTS ON HEAVY ION BEAM PLASMA  
INTERACTION AND ON BEAM DYNAMICS  
R. Bock, GSI, Darmstadt, FRG

Invited Paper

RESEARCH ON MULTIPLE-BEAM INDUCTION LINACS FOR HEAVY ION  
INERTIAL FUSION  
T.J. Fessenden, U. of California, Berkeley, CA

BEAM STUDIES IN THE L.B.L. MBE-4 DEVICE

S. Eylon, H. Meuth, R. Johnson, and K. Hahn, Lawrence  
Berkeley Lab, Berkeley, CA

Invited Paper

COOLING OF ACCELERATOR BEAMS TO IMPROVE FOCAL PROPERTIES  
T. Katayama, University of Tokyo, Tokyo, Japan

Wednesday Morning, 24 May 1989  
9:40 A.M. - Grand Ballroom G

Oral Session 5C: X-RAY LASERS - I

Chairperson: F. C. Young

- 5C1 RECENT DEVELOPMENTS IN X-RAY LASER RESEARCH AT LLE  
T. Boehly, B. Yaakobi, R.S. Craxton, R. Epstein,  
M.C. Richardson, M. Russotto, D. Shvarts, J.M. Soares,  
and J. Wang, U. of Rochester, Rochester, NY
- 5C2 ANALYSIS OF MULTIPLE-FOIL XRL TARGETS USING X-RAY  
SPECTROSCOPY  
J. Wang, T. Boehly, B. Yaakobi, D. Shvarts, R. Epstein,  
D. Meyerhofer, M.C. Richardson, M. Russotto, and  
J.M. Soares, U. of Rochester, Rochester, NY
- 5C3 APPLICATION OF ESCAPE PROBABILITY TO LINE TRANSFER IN  
LASER-PRODUCED PLASMAS  
Y.T. Lee, R.A. London, G.B. Zimmerman, and  
P.L. Hagelstein, Lawrence Livermore National Lab,  
Livermore, CA
- 5C4 IMPROVED C-R MODEL CALCULATIONS FOR X-UV LASERS BY LI-LIKE  
IONS  
A. Sureau, A. Klisnick, H. Guennou, C. Moller, Universite  
Paris-Sud, Orsay, France; and  
J. Virmont, Ecole Polytechnique, Palaiseau, France
- 5C5 PROSPECT OF MULTIPHOTON INDUCED INNER SHELL EXCITATIONS FOR  
X-RAY LASER PUMPING  
D.E. Casperson, P.H.Y. Lee, and G.T. Schappert, Los Alamos  
National Lab, Los Alamos, NM
- 5C6 GAIN CALCULATIONS FOR L-SHELL X-RAY LASERS  
G.A. Kyrala, Los Alamos National Lab, Los Alamos, NM
- 5C7 X-RAY LASER CAVITY BASED ON MULTIPLE PULSE LASER EXCITATION  
OF CAPILLARY DISCHARGE  
A. Zigler, Soreq Nuclear Research Centre, Yavne, Israel
- 5C8-9 Invited Paper  
X-RAY LASER BASED ON CHANNEL RADIATION  
N. Rostoker and M. Strauss, U. of California, Irvine, CA

Wednesday Morning, 24 May 1989

Poster Session 5P1-14: PLASMA DIAGNOSTICS - II

- 5P1 THE DESIGN OF A 400 KV PARALLEL PLATE ELECTROSTATIC ANALYZER FOR USE WITH THE 2 MEV HEAVY ION BEAM PROBE  
J. Resnick, K.A. Connor, T.P. Crowley, R.L. Hickok, and J.F. Lewis, Rensselaer Polytechnic Institute, Troy, NY
- 5P2 DESIGN STUDIES OF THE 2 MEV HEAVY ION BEAM PROBE FOR TEXT UPGRADE  
J. Schwelberger, P.M. Schoch, R.L. Hickok, T.P. Crowley, K.A. Connor, and J.F. Lewis, Rensselaer Polytechnic Institute, Troy, NY
- 5P3 IMPROVEMENTS IN MICROCHANNEL PLATE OPERATING CHARACTERISTICS  
A.L. Roquemore and S.S. Medley, Princeton U., Princeton, NJ
- 5P4 MAGNETIC FIELD EFFECTS IN ELECTROSTATIC ANALYZERS USED FOR HEAVY ION BEAM PROBE MEASUREMENTS  
J.J. Zielinski and G.A. Hallock, U. of Texas at Austin, Austin, TX
- 5P5 COLLECTIVE THOMSON SCATTERING IN TOKAMAKS HAVING ENERGETIC IONS  
R.C. Myer, P.P. Woskov, J.S. Machuzak, D.J. Sigmar, D.R. Cohn, Massachusetts Institute of Technology, Cambridge, MA;  
N.L. Bretz, P.C. Efthimion, Princeton Plasma Physics Lab, Princeton, NJ; and  
P.L. Colestock, Princeton Plasma Physics, Princeton, NJ
- 5P6 EXPERIMENTAL DESIGN OF SPECTROSCOPIC MEASUREMENTS OF MICROWAVE ELECTRIC FIELD IN MTX TOKAMAK PLASMA  
K. Mizuno, U. of California, Davis/Livermore, Davis, CA;  
T. Oda, K. Takiyama, Hiroshima University, Hiroshima, Japan;  
E.B. Hooper, Y. Matsuda, Lawrence Livermore National Lab, Livermore, CA; and  
K. Kawasaki, Okayama University, Okayama, Japan
- 5P7 EMISSION SPECTROSCOPY OF ECRH NON-AXISYMMETRIC HELIUM MIRROR PLASMAS  
K.L. Junck, M.L. Brake, and W.D. Getty, U. of Michigan, Ann Arbor, MI
- 5P8 PLASMA EMISSION AND ABSORPTION SPECTROSCOPY WITH AN OPTICAL FIBER PROBE  
Z.J. Jin and C. Chan, Northeastern U., Boston, MA
- 5P9 PROBE TECHNIQUE FOR DIRECT MEASUREMENT OF TEMPORAL VARIATION OF ELECTRON TEMPERATURE  
A. Wendt and N. Hershkowitz, U. of Wisconsin-Madison, Madison, WI
- 5P10 THE PITCH ANGLE DETECTOR : PADE  
E. Leal-Quiros and M.A. Prelas, U. of Missouri, Columbia, MO
- 5P11 DEVELOPMENT OF A LASER DIAGNOSTIC SYSTEM AT PBFA II FOR LIGHT-ION-BEAM RESEARCH  
F.C. Perry, Sandia National Labs, Albuquerque, NM
- 5P12 HIGH REPETITION RATE, WIDE BANDPASS, DATA ACQUISITION SYSTEM FOR HIGH POWER MICROWAVE APPLICATIONS  
L.M. Miner, Air Force Weapons Lab, Kirtland AFB, NM;  
D.E. Voss, Voss Scientific, Albuquerque, NM; and  
P.R. Perea, Rockwell Power Syst., Kirtland AFB, NM
- 5P13 STUDY OF THE LUMINESCENCE FROM INFRARED WINDOW MATERIALS UNDERGOING PULSED NUCLEAR IRRADIATION  
O. Barnouin, H. Chung, and G.H. Miley, U. of Illinois, Urbana, IL
- 5P14 MEASUREMENT OF THE MASS ABLATION RATE FOR 0.53 UM RANDOM PHASED LASER IRRADIATION OF SPHERICAL TARGETS  
P.A. Norreys, N. Miyanaga, H. Nishimura, K. Kondo, H. Azechi, O. Maegawa, A. Nishiguchi, M. Yamanaka, K. Mima, S. Nakai, Osaka University, Osaka, Japan; and  
C. Yamanaka, Institute of Laser Technology, Osaka, Japan

Wednesday Morning, 24 May 1989

Poster Session 5P15-22: MICROWAVE-PLASMA INTERACTIONS - I

- 5P15 INTERACTION OF AN INTENSE RELATIVISTIC ELECTRON BEAM WITH A PLASMA-FILLED WAVEGUIDE IN A MAGNETIC FIELD  
B.R. Poole, B. Chang, and J.F. Camacho, Lawrence Livermore National Lab, Livermore, CA
- 5P16 THEORY FOR BEAM-PLASMA MILLIMETER-WAVE RADIATION SOURCE EXPERIMENTS  
M. Rosenberg, Rosenberg Consultants, San Diego, CA; and  
N.A. Krall, Krall Associates, Del Mar, CA
- 5P17 MILLIMETER-WAVE RADIATION GENERATED VIA PLASMA THREE-WAVE MIXING USING HIGH-CURRENT DENSITY COUNTER-STREAMING ELECTRON BEAMS  
J. Santoru and R.W. Schumacher, Hughes Research Labs, Malibu, CA.
- 5P18 SIMPLE REFLECTION IN AN IONIZING GAS CLOUD  
H.L. Rappaport, P.E. Latham, and C.D. Striffler, U. of Maryland, College Park, MD
- 5P19 AIR BREAKDOWN IN THE RELATIVISTIC LIMIT  
G. Graham, EG&G Energy Measurements, Inc. Los Alamos, NM; and  
R. Roussel-Dupre, Los Alamos National Lab, Los Alamos, NM
- 5P20 MICROWAVE REFLECTIVITIES OF A FINITE-LENGTH PLASMA WITH A PERIODIC DENSITY VARIATION  
H. Figueroa, M.A. Gundersen, U. of Southern California, Los Angeles, CA; and  
C. Joshi, U. of California, Los Angeles, CA
- 5P21 REAL PLASMA EFFECTS OF MICROWAVE RADIATION PROPAGATING PERPENDICULAR TO A MAGNETIZED PLASMA  
L. Jiang and J.R. Roth, U. of Tennessee, Knoxville, TN
- 5P22 OPERATION OF A DOUBLE CAVITY, MICROWAVE PULSE COMPRESSION SYSTEM WITH PHASE CONTROLLED OUTPUT  
P.R. Bolton and R.A. Alvarez, Lawrence Livermore National Lab, Livermore, CA

Wednesday Morning, 24 May 1989

Poster Session 5P23-32: PLASMA PROCESSING - II;  
THERMAL AND NONEQUILIBRIUM

- P23 FOURIER TRANSFORM MASS SPECTROMETRY IN AN ECR PLASMA  
J.L. Shohet, J. Friedmann, and A. Wendt, U. of  
Wisconsin-Madison, Madison, WI
- P24 NUMERICAL SIMULATION OF ERC MICROWAVE PLASMA STREAM  
M. Hussein and G.A. Emmert, U. of Wisconsin-Madison,  
Madison, WI
- P25 PULSE MODULATED MICROWAVE PLASMA ETCHING  
C. Grabowski and J. Gahl, U. of New Mexico, Albuquerque, NM
- P26 MEASUREMENT OF THE REACTION RATE CONSTANT OF THE SiH  
RADIACAL IN SILANE PLASMA USING AN INFRARED DIOD LASER  
ABSORPTION METHOD  
T. Goto, K. Kato, N. Itabashi, N. Nashiwaki, Nagoya  
University, Nagoya, Japan; and  
C. Yamada, E. Hirota, Institute for Molecular Science,  
Okazaki, Japan
- P27 NON-EQUILIBRIUM BEHAVIOR OF LOW-PRESSURE PLASMA JETS  
C.H. Chang and E. Pfender, U. of Minnesota, Minneapolis, MN
- P28 CONICAL THETA PINCH PLASMA FOR DEPOSITION OF THIN POLYMER  
FILMS  
P.D. Pedrow, A.M. Nasiruddin, R. Mahalingam, and  
V.M. Desai, Washington State U., Pullman, WA
- P29 A HIGH-VOLTAGE SWITCHING CIRCUIT FOR RAPID PLASMA ION  
IMPLANTATION  
P.F. Keebler, J.E. Crowley, and J.R. Roth, U. of Tennessee,  
Knoxville, TN
- P30 CORROSION-RELATED CHARACTERISTICS OF PLASMA ION IMPLANTED  
SAMPLES EXPOSED IN A STEADY-STATE PENNING DISCHARGE  
J.R. Roth, P.F. Keebler, M. Wu, R.A. Buchanan, and  
I.S. Lee, U. of Tennessee, Knoxville, TN
- P31 EMISSION SPECTROSCOPIC STUDIES OF COPPER CONTAMINATION IN A  
FREE-BURNING ARGON ARC  
M. Roberts and K. Etemadi, State University of New York at  
Buffalo, Buffalo, NY
- P32 DIELECTRIC-BARRIER DISCHARGE FOR THE REMOVAL OF SO<sub>2</sub> FROM  
FLUE GAS  
S.K. Dhali and I. Sardja, Southern Illinois U., Carbondale,  
IL

Wednesday Afternoon, 24 May 1989

1:30 P.M. - Grand Ballroom E

Oral Session 6A: MICROWAVE - PLASMA INTERACTIONS - II  
Chairperson: R. W. Schumacher

- 6A1-2 Invited Paper  
DEMONSTRATION OF EFFICIENCY ENHANCEMENT IN A HIGH POWER  
BACKWARD WAVE OSCILLATOR BY PLASMA INJECTION  
Y. Carmel, W.W. Destler, V.L. Granatstein, K. Minami,  
D. Abe, W.R. Lou, U. of Maryland, College Park, MD; and  
R.A. Kehs, Harry Diamond Labs, Adelphi, MD
- 6A3 BRAGG SCATTERING OF EM WAVES BY MICROWAVE PRODUCED PERIODIC  
PLASMA LAYERS  
Y.S. Zhang and S.P. Kuo, Polytechnic U., Farmingdale, NY
- 6A4 PROPAGATION OF HIGH POWER MICROWAVE PULSES IN THE AIR  
S.P. Kuo and Y.S. Zhang, Polytechnic U., Farmingdale, NY
- 6A5 TWO-DIMENSIONAL LONG PULSE CALCULATIONS OF ELECTRON LAYER  
FORMATION IN CROSSED MICROWAVE BEAMS IN LOW PRESSURE AIR  
D.J. Mayhall, J.H. Yee, G.E. Sieger, and R.A. Alvarez,  
Lawrence Livermore National Lab, Livermore, CA
- 6A6 SIMULATION OF RF REFLECTION FROM SLIGHTLY IRREGULAR PLASMA  
SHEETS  
T. Wallace, R. Short, ARCO Power Technologies, Inc.,  
Washington, DC; and  
K. Papadopoulos, U. of Maryland, College Park, MD
- 6A7 SIMULATION OF PLASMA GENERATION BY MICROWAVE POWER BEAMING  
P. Koert and P. Lallement, ARCO Power Technologies, Inc.,  
Washington, DC
- 6A8 HIGH-EFFICIENCY PERFORMANCE CHARACTERISTICS OF A NEW  
MICROWAVE DISCHARGE-PUMPED EXCIMER LAMP  
H. Kumagai and M. Obara, Keio University, Yokohama, Japan

Wednesday Afternoon, 24 May 1989

1:30 P.M. - Grand Ballroom F

Oral Session 6B: COMPUTER APPLICATIONS IN PLASMA SCIENCE - II  
Chairperson: A. T. Drobot

- 6B1 IMPLEMENTATION OF A PARALLEL 3-D VACUUM ELECTRONICS  
SIMULATION CODE  
E. Zaidman, Naval Research Lab, Washington, DC
- 6B2 DEVELOPMENT OF 2-D HYDRODYNAMIC CODE FOR SPHERICAL PLASMA  
SHELL  
S. Kawata, U. of California, Davis, CA, and Lawrence  
Livermore National Lab, Livermore, CA; and  
Y. Masubuchi, Nagaoka University of Technology, Nagaoka,  
Japan
- 6B3-4 Invited Paper  
BASIS: SETTING THE SCIENTIST FREE  
P.F. Dubois, Lawrence Livermore National Lab, Livermore,  
CA
- 6B5 USER-FRIENDLY, PORTABLE INPUT INTERFACE FOR USE WITH  
EVOLVING SIMULATION COMPUTER CODES  
W.S. Bigelow, Electro Magnetic Applications, Inc.,  
Albuquerque, NM
- 6B6 NUMERICAL MODE AND BOUNDARY ANALYSIS OF BIFURCATION  
PHENOMENA IN PLASMAS WITH STATIONARY STRIATIONS  
P. Papavaritis and W.B. Pardo, U. of Miami, Miami, FL

Wednesday Afternoon, 24 May 1989

1:30 P.M. - Grand Ballroom G

Oral Session 6C: PLASMA PROCESSING - III; NONEQUILIBRIUM

Chairperson: R. N. Carlile

- 6C1-2 Invited Paper  
LASER DIAGNOSTIC STUDIES OF PARTICULATE CONTAMINATION  
GENERATED BY ETCHING PLASMAS  
G.S. Selwyn, IBM T.J. Watson Research Center, Yorktown  
Heights, NY
- 6C3 ETCHING OF VIAS IN SiO<sub>2</sub> WITH CONTROLLABLE SIDEWALL ANGLES  
R.N. Carlile, U. of Arizona, Tucson, AZ; and  
J.L. Houghten, Motorola, Inc., Phoenix, AZ
- 6C4 DOWN STREAM OXIDATION OF SILICON USING AN ECR MICROWAVE  
PLASMA DISK REACTOR  
G.T. Salbert, D.K. Reinhard, and J. Asmussen, Michigan State  
U., East Lansing, MI
- 6C5 IR LASER ABSORPTION STUDIES OF RADICAL CONCENTRATIONS IN CF<sub>4</sub>  
RF PLASMAS  
J. Wormhoudt, Aerodyne Research, Inc., Billerica, MA
- 6C6 INFLUENCE OF THE WAFER BIASING FREQUENCY UPON ETCHING OF  
POLYIMIDE  
G. Sauve, R. Grenier, M. Moisan, Universite de Montreal,  
Montreal, Canada; and  
Y. Arnal, CNET/CNRS, Grenoble, France
- 6C7 FEEDBACK CONTROL OF A POLYMER PRODUCING GLOW DISCHARGE PLASMA  
N. Hershkowitz, M.H. Cho, J. Pruski, J. Dekock,  
and P. Anderson, U. of Wisconsin-Madison, Madison, WI

Wednesday Afternoon, 24 May 1989

Poster Session 6P33-49: TOKAMAKS, STELLARATORS, AND  
FUSION DEVICE DESIGN - II

- 6P33 OHMIC AND ALPHA HEATING IN THE HIGH-FIELD IGNITEX TOKAMAK  
G. Fu, R. Bickerton, R. Carrera, J. Dong, J. Helton,  
C.A. Ordonez, M.N. Rosenbluth, J. Van Dam, U. of Texas at  
Austin, Austin, TX;  
L. Hively, GA Technologies, Inc., San Diego, CA;  
E. Montalvo, Oak Ridge National Lab, Oak Ridge, TN; and  
S. Tamor, U. of California, San Diego, CA
- 6P34 HOMOPOLAR GENERATOR POWER SUPPLIES FOR THE IGNITEX EXPERIMENT  
W.A. Walls, J.H. Gully, W.F. Weldon, and H.H. Woodson, U. of  
Texas at Austin, Austin, TX
- 6P35 FIRST WALL SYSTEM IN THE IGNITEX EXPERIMENT  
C.A. Ordonez, R. Carrera, Y. Chen, J. Howell,  
and P. Varghese, U. of Texas at Austin, Austin, TX
- 6P36 IN-VESSEL MAINTENANCE ON THE IGNITEX EXPERIMENT  
J. Ling, M. Barrington, R. Carrera, and D. Tesar, U. of  
Texas at Austin, Austin, TX
- 6P37 PLASMA DIAGNOSIS IN THE IGNITEX EXPERIMENT  
W.D. Booth, R. Bickerton, R. Carrera, and G.A. Hallock, U.  
of Texas at Austin, Austin, TX
- 6P38 VACUUM AND FUELING SYSTEMS FOR THE IGNITEX EXPERIMENT  
G.A. Hallock, W.D. Booth, and R. Carrera, U. of Texas at  
Austin, Austin, TX

- 6P39 OPERATION OF THE IGNITEX TOKAMAK  
S. Eways, R. Carrera, J. Dong, G.A. Hallock,  
and E. Montalvo, U. of Texas at Austin, Austin, TX
- 6P40 SMALL AND LARGE VERSIONS OF THE IGNITEX EXPERIMENT  
E. Montalvo, R. Carrera, and M.N. Rosenbluth, U. of Texas at  
Austin, Austin, TX
- 6P41 EXPERIMENTAL PROGRAM FOR THE FUSION IGNITION EXPERIMENT  
IGNITEX  
R. Bickerton, W.D. Booth, R. Carrera, G. Fu, G.A. Hallock,  
E. Montalvo, J. Van Dam, U. of Texas at Austin, Austin, TX;  
and M.N. Rosenbluth, U. of California at San Diego, San  
Diego, CA
- 6P42 DENSITY, POTENTIAL, AND MAGNETIC FIELD FLUCTUATION  
MEASUREMENTS DURING MHD ACTIVITY IN THE TEXT TOKAMAK  
T.P. Crowley, V. Simcic, P.M. Schoch, K.A. Connor,  
R.L. Hickok, Rensselaer Polytechnic Institute, Troy, NY;  
and X.Z. Yang, Academia Sinica, Beijing, PRC
- 6P43 KO ANALYSIS AND PROPAGATION DIRECTION SENSITIVITY OF HIBP  
DATA FROM TEXT  
J.W. Heard, T.P. Crowley, P.M. Schoch, K.A. Connor,  
R.L. Hickok, Rensselaer Polytechnic Institute, Troy, NY;  
and X.Z. Yang, Academia Sinica, Beijing, PRC
- 6P44 MHD INSTABILITIES IN TEXT DISCHARGES WITH HIGH MAGNETIC  
PERTURBATION LEVELS AND ERGODIC MAGNETIC LIMITER EFFECTS  
J.Y. Chen, Institute of Plasma Physics, Hefei, PRC;  
M.S. Foster, S.C. McCool, A.J. Wootton, U. of Texas at  
Austin, Austin, TX;  
D.L. Brower, U. of California, Los Angeles, CA;  
P.M. Schoch, Rensselaer Polytechnic Institute, Troy, NY;  
K. Wenzel, Massachusetts Institute of Technology,  
Cambridge, MA; and  
X.Z. Yang, X.H. Yu, Academia Sinica, Beijing, PRC
- 6P45 MEASUREMENTS OF FLUX SURFACES IN THE ATF TORSATRON  
A.C. England, R.J. Colchin, J.H. Harris, D.L. Hillis,  
T.C. Jernigan, M. Murakami, G.H. Neilson, J.A. Rome,  
M.J. Saltmarsh, Oak Ridge National Lab, Oak Ridge, TN;  
F.S.B. Anderson, U. of Wisconsin-Madison, Madison, WI;  
R.F. Gandy, J.D. Hanson, M.A. Henderson, Auburn U.,  
Auburn, AL;  
D.K. Lee, V.E. Lynch, D.L. Million, Martin Marietta Energy  
Systems, Inc.; and  
C.M. Simpson, U. of Maryland, College Park, MD
- 6P46 MICROWAVE TOKAMAK EXPERIMENT (MTX) STATUS AND PLANS  
E.B. Hooper, S.L. Allen, M.D. Brown, J.A. Byers,  
T.A. Casper, M.E. Fenstermacher, J.H. Foote, A.H. Futch,  
D. Hwang, C. Lasnier, S. Meassick, W.H. Meyer,  
J.M. Moller, D.E. Perkins, B.L. Rice, T.D. Rognlien,  
G.R. Smith, B.W. Stallard, K.I. Thomassen, Lawrence  
Livermore National Lab, Livermore, CA; and  
K. Ohasa, Japan Atomic Energy Research Institute, Japan
- 6P47 MICROWAVE ABSORPTION DIAGNOSTICS ON THE MTX TOKAMAK  
S. Meassick, E.B. Hooper, B.L. Rice, B.W. Stallard,  
C. Brooksby, Lawrence Livermore National Lab, Livermore, CA;  
J. Verboncouer, M. Marinak, Lawrence Berkeley Labs,  
Berkeley, CA; and  
J. Lorbeck, U. of Wisconsin-Madison, Madison, WI
- 6P48 POLOIDAL FIELD ELECTROMAGNETIC ENGINEERING DESIGN FOR THE  
TEXT UPGRADE  
G. Li, W. Zhu, Institute of Plasma Physics, Hefei, PRC;  
and P.H. Edmonds, E.R. Solano, U. of Texas at Austin,  
Austin, TX
- 6P49 SRX-PRECURSOR TO LARGE SCALE HIGH BETA PLASMA DEVICES  
S. Mendelsohn, A.M.M. Todd, H. Wexler, Grumman Corporate  
Research Center, Princeton, NJ; and  
G.A. Navratil, Columbia U., New York, NY



**Wednesday Afternoon, 24 May 1989**

**Post Session 6P50-54: GASEOUS ELECTRONICS - III**

- 6P50 FIRING CHARACTERISTICS OF A MINIATURE LASER-TRIGGERED  
HIGH-VOLTAGE VACUUM SWITCH  
L.M. Earley, G.L. Scott, and G.E. Boettcher, Sandia National  
Labs, Albuquerque, NM
- 6P51 COLLISION CROSS SECTIONS AND DEPOSITION EFFICIENCIES FOR  
ARGON ION EXCITATION BY RELATIVISTIC ELECTRONS  
D.B. McCarrah and M.L. Brake, U. of Michigan, Ann Arbor, MI
- 6P52 MODELING OF THE DISCHARGE PLASMA IN A BACK LIGHTED THYRATRON  
H. Bauer, G. Kirkman, and M.A. Gundersen, U. of Southern  
California, Los Angeles, CA
- 6P53 CHARGE TRANSPORT DYNAMICS IN SURFACE FLASHOVER ARCS  
A. Kadish, W.B. Maier, II, Los Alamos National Lab, Los  
Alamos, NM; and  
R.T. Robiscoe, Montana State U., Bozeman, MT
- 6P54 THEORY AND MEASUREMENTS OF ELECTROPHORETIC EFFECTS IN  
MONOLITH, FIXED-BED, AND FLUIDIZED-BED PLASMA REACTORS  
T.J. Morin, U. of Idaho, Moscow, ID

**Wednesday Afternoon, 24 May 1989**

**Poster Session 6P55-59: X-RAY LASERS - II**

- 6P55 X-RAY LASER RESEARCH AT PHYSICS INTERNATIONAL  
T. Nash, C. Deeney, J.S. Levine, P.D. LePell,  
and M. Krishnan, Physics International Company, San Leandro,  
CA
- 6P56 VACUUM ULTRAVIOLET RADIATION FROM NEON IMPLOSIONS  
B.L. Welch, H.R. Griem, U. of Maryland, College Park, MD;  
and F.C. Young, S.J. Stephanakis, Naval Research Lab,  
Washington, DC
- 6P57 CHARACTERIZATION OF ALUMINUM X-PINCH PLASMAS DRIVEN BY THE  
0.5 TW LION ACCELERATOR  
N. Qi, D.A. Hammer, D.H. Kalantar, W.A. Noonan,  
G.D. Rondeau, J.B. Workman, Cornell U., Ithaca, NY; and  
M.C. Richardson, U. of Rochester, Rochester, NY
- 6P58 TIME RESOLVED XUV SPECTROSCOPY FROM HIGHLY IONIZED CAPILLARY  
DISCHARGES  
J.J. Rocca, M.C. Marconi, M. Villagran Muniz, D.C. Beebe,  
and J.F. Schmerge, Colorado State U., Fort Collins, CO
- 6P59 SOFT X-RAY SPECTRA OF LOW-Z GASSES PRODUCED BY LASER  
IRRADIATION OF A HIGH-PRESSURE SUPERSONIC GAS JET  
P.C. Filbert, D.A. Kohler, R.A. Walton, Lockheed Research  
& Development Division, Palo Alto, CA; and  
G.H. Dahlbacka, Plasma Research Corporation, Alameda, CA