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Session 1: Modeling - I

Tuesday, April 24 / 1:30-3:10
PM / San Carlos IV

Chair: Baruch Levush, *Naval Research Laboratory*

1-1: **Session Keynote: Obtaining Impedance Matrices of RF Structures using the Joining and Subtraction Formulae** (Page 1)
Vadim Jabotinski, *Leidos*
David Chernin, *Leidos*
Thomas M. Antonsen, Jr., *Leidos*
Alexander N. Vlasov, *US Naval Research Laboratory*

1-2: **Session Keynote: Advanced Large-signal Modeling of Multiple-beam Klystrons Using Generalized Impedance Matrix Approach** (Page 3)
Igor A. Chernyavskiy, *Naval Research Laboratory*
John C. Rodgers, *Naval Research Laboratory*
Alexander N. Vlasov, *Naval Research Laboratory*
David K. Abe, *Naval Research Laboratory*
Baruch Levush, *Naval Research Laboratory*
Thomas M. Antonsen, Jr., *Leidos, Inc.*
Khanh T. Nguyen, *Beam-Wave Research, Inc.*
Dean E. Pershing, *Beam-Wave Research, Inc.*

1-3: **Recent Developments on EOS 2D/3D Electron Gun and Collector Modeling Code** (Page 5)
Quan Hu, *University of Electronic Science and Technology of China*
Yulu Hu, *University of Electronic Science and Technology of China*
Xiaofang Zhu, *University of Electronic Science and Technology of China*
Bin Li, *University of Electronic Science and Technology of China*

1-4: **A Novel Technique to Model Ultrafast Electron Microscope** (Page 7)
Thuc Bui, *Calabazas Creek Research, Inc.*
Michael Read, *Calabazas Creek Research, Inc.*
R. Lawrence Ives, *Calabazas Creek Research, Inc.*

1-5: **MICHELLE for High-Level Optimization, Large Scale Problems and HPC Environments** (Page 9)
John Petillo, *Leidos Corporation*
Serguei Ovtchinnikov, *Leidos Corporation*
Aaron Jensen, *Leidos Corporation*
Alex Burke, *Leidos Corporation*
Eric Nelson, *Leidos Corporation*
George Stantchev, *US Naval Research Laboratory*
Simon Cooke, *US Naval Research Laboratory*
Ben Held, *AWR National Instruments*
Alan Nichols, *AWR National Instruments*

Session 2: Space TWTs

Tuesday, April 24 / 1:30-2:50
PM / San Carlos III

Chair: Ernst Bosch, *Thales Electron Devices*

2-1: **Session Keynote: The Flight Operations History of the Cassini X-Band TWTAs** (Page 11)
Wayne Harvey, *California Institute of Technology*
James Shell, *California Institute of Technology (retired)*
Laura L. Burke, *California Institute of Technology*

2-2: **Space Qualified 200-W Q-band Linearized Traveling-Wave Tube Amplifier** (Page 13)
Neal Robbins, *L3 Technologies*
David Eze, *L3 Technologies*
Helen Cohen, *L3 Technologies*
Xiaoling Zhai, *L3 Technologies*
William McGeary, *L3 Technologies*
William Menninger, *L3 Technologies*
Morgan Chen, *L3 Technologies*
Eddie Rodgers, *L3 Technologies*

2-3: **40W Q Wideband Space TWT** (Page 15)
Tiziana Barsotti, *Thales Electrin Devices*
Jean Gastaud, *Thales Electrin Devices*
Julien Pontic, *Thales Electrin Devices*
Mickael Barentin, *Thales Electrin Devices*

2-5: **Medium Power High Efficiency Ka Band** (Page 17)
Christof Dietrich, *Thales Deutschland GmbH*
Wolfgang Dürr, *Thales Deutschland GmbH*
Peter Ehret, *Thales Deutschland GmbH*
Ernst Bosch, *Thales Deutschland GmbH*

Session 3: IOTs/Klystrons I

Chair: David Abe, *Naval Research Laboratory*

Tuesday, April 24 / 1:30-3:10 PM / San Carlos I+II

3-1: **Session Keynote: Manufacturing and Performance Results of a 1.2 MW Peak, 704 MHz Multi-Beam Inductive Output Tube** (Page 19)
Stephan Lenci, *Communications & Power Industries, LLC*
Chris Yates, *Communications & Power Industries, LLC*
Nicholas Halatsis, *Communications & Power Industries, LLC*
Takuji Kimura, *Communications & Power Industries, LLC*
Paul Krzeminski, *Communications & Power Industries, LLC*
Janice Oldahm, *Communications & Power Industries, LLC*
Peter Kolda, *Communications & Power Industries, LLC*
Oliver Sablic, *Communications & Power Industries, LLC*
Armel Beunas, *Thales Electron Devices*
Claude Bel, *Thales Electron Devices*
Christian Robert, *Thales Electron Devices*
Jean Claude Racamier, *Thales Electron Devices*
Denis Bussiere, *Thales Electron Devices*
David Bariou, *Thales Electron Devices*
Karim Haj Khlifa, *Thales Electron Devices*
Virgile Hermann, *Thales Electron Devices*
Philippe Cacheux, *Thales Electron Devices*

3-2: **Scaled Experimental Studies on Radio Frequency Source for Megawatt-Class Ionospheric Heaters** (Page 21)
Brian L. Beaudoin, *University of Maryland*
Antonio Ting, *University of Maryland*
Steven Gold, *University of Maryland*
Amith H. Narayan, *University of Maryland*
Jayakrishnan A. Karakkad, *University of Maryland*
Gregory S. Nusinovich, *University of Maryland*
Thomas M. Antonsen Jr., *University of Maryland*

3-3: **Exploratory Study of X-band Klystron Designs for Maximum Efficiency** (Page 23)
Brandon Weatherford, *SLAC National Accelerator Laboratory*
Richard Kowalczyk, *SLAC National Accelerator Laboratory*
Valery Dolgashev, *SLAC National Accelerator Laboratory*
Jeffrey Neilson, *SLAC National Accelerator Laboratory*
Aaron Jensen, *Leidos, Inc.*
Igor Syratchev, *CERN*
Jinchi Cai, *CERN*

3-4: **A 1.3 GHz 100 kW Ultra-high Efficiency Klystron** (Page 25)
Michael Read, *Calabazas Creek Research Inc.*
R Lawrence Ives, *Calabazas Creek Research Inc.*
Jeff Neilson, *SLAC National Accelerator Laboratory*
Aaron Jensen, *Leidos, Inc.*

Session 4: High Power Microwaves - I

Chair: Eric Nelson, *Los Alamos National Laboratory*

Tuesday, April 24 / 3:30-5:10 PM / San Carlos IV

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Xueying Lu, *Massachusetts Institute of Technology*
Jacob C Stephens, *Massachusetts Institute of Technology*
Ivan Mastovsky, *Massachusetts Institute of Technology*
Michael A Shapiro, *Massachusetts Institute of Technology*
Richard J Temkin, *Massachusetts Institute of Technology*

4-2: **Review of Metamaterial-Inspired Vacuum Electron Devices** (Page 29)
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Michael A. Shapiro, *Massachusetts Institute of Technology*
Yubin Gong, *University of Electronic Science and Technology of China*
Edl Schamiloglu, *University of New Mexico*
Nader Behdad, *University of Wisconsin-Madison*
John H. Booske, *University of Wisconsin-Madison*
B. N. Basu, *Sir J.C. Bose School of Engineering*
Richard J. Temkin, *Massachusetts Institute of Technology*

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Steven C. Exelby, *University of Michigan*
Geoffrey B. Greening, *University of Michigan*
Nicholas M. Jordan, *University of Michigan*
Drew A. Packard, *University of Michigan*
Yue Ying Lau, *University of Michigan*
Ronald M. Gilgenbach, *University of Michigan*
Brad W. Hoff, *Air Force Research Laboratory*
David Simon, *Air Force Research Laboratory*

4-4: **Design of a Cascade High-Power Source with High Efficiency** (Page 33)
Gangxiong Wu, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Qian Li, *University of Electronic Science and Technology of China*
Xia Lei, *University of Electronic Science and Technology of China*
Chong Ding, *University of Electronic Science and Technology of China*
Guo Guo, *University of Electronic Science and Technology of China*
Xianjian Niu, *University of Electronic Science and Technology of China*
Lingna Yue, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*
Dazhi Li, *Institute for Laser Technology*

4-5: **Design Studies of a RF Interaction Cavity for a 4 MW, 170 GHz Triangular Corrugated Coaxial Cavity Gyrotron** (Page 35)
Sukwinder Singh, *Indian Institute of Technology Roorkee*
S Yuvaraj, *Indian Institute of Technology Roorkee*
Gaurav Singh Baghel, *Indian Institute of Technology Roorkee*
M.V. Kartikeyan, *Indian Institute of Technology Roorkee*

Session 5: Thermionic Cathodes

Chair: Daniel Busbaher, *3M*

Tuesday, April 24 / 3:30-5:30 PM / San Carlos III

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Ryan Jacobs, *University of Wisconsin- Madison*
Lin Lin, *University of Wisconsin- Madison*
Tianyu Ma, *University of Wisconsin- Madison*
Otto Lu-Steffes, *L3 Technologies*
Vasilios Vlahos, *L3 Technologies*
Dane Morgan, *University of Wisconsin- Madison*
John Booske, *University of Wisconsin- Madison*

5-3: **Combining Theory and Experiment to Model Electron Emission from Polycrystalline Tungsten Cathode Surfaces** (Page 39)
Dongzheng Chen, *University of Wisconsin- Madison*
Ryan Jacobs, *University of Wisconsin- Madison*
Vasilios Vlahos, *L3 Technologies*
Kevin L. Jensen, *Naval Research Laboratory*
Dane Morgan, *University of Wisconsin- Madison*
John Booske, *University of Wisconsin- Madison*

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Ryan Jacobs, *University of Wisconsin- Madison*
Dane Morgan, *University of Wisconsin- Madison*
John Booske, *University of Wisconsin- Madison*

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Matthew J. Beck, *University of Kentucky*
Qunfei Zhou, *University of Kentucky*
Xiaotao Liu, *University of Kentucky*
Tyler Maxwell, *University of Kentucky*
Bernard Vancil, *e-beam Incorporated*
T. John Balk, *University of Kentucky*

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Xiaoxia Wang, *Chinese Academy of Sciences*
Pengyu Jiang, *Chinese Academy of Sciences*
Bofeng Wang, *Chinese Academy of Sciences*
Qinglan Zhao, *Chinese Academy of Sciences*
Yun Li, *Chinese Academy of Sciences*

Session 6: TWTs I

Chair: David Whaley, *L3 Technologies*

Tuesday, April 24 / 3:30-5:30 PM / San Carlos I+II

6-1: **Design of a Low-Voltage Folded Waveguide Four Beam Mini-TWT** (Page 47)
Alexander N Vlasov, *US Naval Research Laboratory*
John C Rodgers, *US Naval Research Laboratory*
Reginald L Jaynes, *US Naval Research Laboratory*
Colin D Joye, *US Naval Research Laboratory*
John A Pasour, *US Naval Research Laboratory*
Franklin N Wood, *US Naval Research Laboratory*
Igor A Chernyavskiy, *US Naval Research Laboratory*
Simon J Cooke, *US Naval Research Laboratory*
David K Abe, *US Naval Research Laboratory*
Baruch Levush, *US Naval Research Laboratory*
Thomas M Antonsen Jr., *Leidos Inc.*
David P Chernin, *Leidos Inc.*
Vadim J Jabotinski, *Leidos Inc.*
Khanh T Nguyen, *Beam-Wave Research Inc.*

6-2: **550-W Ka-Band Pulsed Helix TWT for Radar Applications** (Page 49)
Chae K. Chong, *L3 Technologies*
Robert M. Baird, *L3 Technologies*
Dennis A. Layman, *L3 Technologies*
Michael L. Ramay, *L3 Technologies*
Hung T. Vu, *L3 Technologies*
Xiaoling Zhai, *L3 Technologies*

6-3: **Development of the DBS Band, 1,250 Watt CW, Air-Cooled Helix TWT** (Page 51)
Merritt Chesnut, *Communication and Power Industries, LLC*
Patrick Casey, *Communication and Power Industries, LLC*
Michael Fernicola, *Communication and Power Industries, LLC*
Kevin Mallon, *Communication and Power Industries, LLC*
Mark Perrin, *Communication and Power Industries, LLC*
Ognian Sabev, *Communication and Power Industries, LLC*

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Reginald L. Jaynes, *U.S. Naval Research Lab*
Alexander N. Vlasov, *U.S. Naval Research Lab*
John C. Rodgers, *U.S. Naval Research Lab*
Frank N. Wood, *U.S. Naval Research Lab*
Colin D. Joye, *U.S. Naval Research Lab*
Dean E. Pershing, *Beam-Wave Research, Inc.*
Alan M. Cook, *U.S. Naval Research Lab*
David K. Abe, *U.S. Naval Research Lab*

6-5: **Design and Development of a 1,250 Watt Extended CW KU-Band Forced Air-Cooled Helix Traveling Wave Tube** (Page 55)
Nileshwar Chaudhary, *Communication and Power Industries, LLC (MPP: Helix TWT)*
Mark Perrin, *Communication and Power Industries, LLC*
Merritt Chesnut, *Communication and Power Industries, LLC*
Tom Grant, *Communication and Power Industries, LLC*

Kevin Mallon, *Communication and Power Industries, LLC*
Patrick Casey, *Communication and Power Industries, LLC*
Ognian Sabev, *Communication and Power Industries, LLC*
Rajni Shah, *Communication and Power Industries, LLC*

6-6: **Development of a Wideband Ka-Band Dielectric-Loaded Traveling-Wave Tube** (Page 57)
Bruce Carlsten, *Los Alamos National Laboratory*
Ryan Fleming, *Los Alamos National Laboratory*
Frank Krawczyk, *Los Alamos National Laboratory*
Quinn Marksteiner, *Los Alamos National Laboratory*
Kimberley Nichols, *Los Alamos National Laboratory*
William Romero, *Los Alamos National Laboratory*
Evgenya Simakov, *Los Alamos National Laboratory*
Samuel Stringfield, *Los Alamos National Laboratory*
Justine Stiftel, *Los Alamos National Laboratory*
Muhammed Zuboraj, *Los Alamos National Laboratory*

Session 7: Modeling - II

Chair: Simon Cooke, *Naval Research Laboratory*

Wednesday, April 25 / 8:30-10:10 AM / San Carlos IV

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David P. Chernin, *Leidos, Inc.*
Thomas M. Antonsen, Jr., *Leidos, Inc. & University of Maryland*

7-2: **Dual-frequency Multipactor Susceptibility on a Dielectric** (Page 61)
Asif Iqbal, *Michigan State University*
Peng Zhang, *Michigan State University*
John Verboncoeur, *Michigan State University*

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Kristinn Torfason, *Reykjavik University*
Hákon Valur Haraldsson, *Reykjavik University*
Ágúst Valfells, *Reykjavik University*
Andrei Manolescu, *Reykjavik University*

7-4: **Vacuum Electronics Optimization Using Galaxy Simulation Builder** (Page 65)
Aaron Jensen, *Leidos, Inc.*
Alex Burke, *Leidos, Inc.*
David Chernin, *Leidos, Inc.*
Serguei Ovtchinnikov, *Leidos, Inc.*
John Petillo, *Leidos, Inc.*

7-5: **The Research of Excitation Source in FDTD Method for Waveguide** (Page 67)
Xiaoliang Gu, *University of Electronic Science and Technology of China*
Xiaolin Jin, *University of Electronic Science and Technology of China*
Bin Li, *University of Electronic Science and Technology of China*

Session 8: Gyrotrons

Chair: Manfred Thumm, *Karlsruhe Institute of Technologym (KIT)*

Wednesday, April 25 / 8:30-10:10 AM / San Carlos III

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Parth C. Kalaria, *Karlsruhe Institute of Technology (KIT)*
Marc George, *Ecole Centrale de Marseille & Aix-Marseille Université*
Stefan Illy, *Karlsruhe Institute of Technology (KIT)*
Konstantinos A. Avramidis, *Karlsruhe Institute of Technology (KIT)*
Gerd Gantenbein, *Karlsruhe Institute of Technology (KIT)*
Sebastian Ruess, *Karlsruhe Institute of Technology (KIT)*
Tomasz Rzesnicki, *Karlsruhe Institute of Technology (KIT)*
Manfred Thumm, *Karlsruhe Institute of Technology (KIT)*
John Jelonnek, *Karlsruhe Institute of Technology (KIT)*

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Ran Yan, *University of Electronic Science and Technology of China*
Yong Luo, *University of Electronic Science and Technology of China*
Qiang Zheng, *University of Electronic Science and Technology of China*
Yafen Shang, *University of Electronic Science and Technology of China*

Xiaoyi Liao, *University of Electronic Science and Technology of China*

8-5: **Comparative Demonstration of Multimode Steady-state Theory for the Gyro-TWT based on a Distributed Loss-loaded Metal Cylindrical Waveguide** (Page 73)
Jirun Luo, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Yanna Tang, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Yu Fan, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Shuyuan Peng, *China Academy of Electronics and Information Technology*
Qianzhong Xue, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

Poster Session 1

Wednesday, April 25 / 8:30 AM-12:30 PM / San Carlos I+II

1: TWT Poster II (SWS / other)

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Chong Ding, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Qian Li, *University of Electronic Science and Technology of China*
Xia Lei, *University of Electronic Science and Technology of China*
Shuangzhu Fang, *University of Electronic Science and Technology of China*
Gangxiong Wu, *University of Electronic Science and Technology of China*
Ruichao Yang, *University of Electronic Science and Technology of China*
Jin Xu, *University of Electronic Science and Technology of China*
Wenxiang Wang, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*
Dazhi Li, *Institute for Laser Technology*

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Tieyang Wang, *China Electronic Product Reliability and Environmental Testing Research Institute*
Fangfang Song, *China Electronic Product Reliability and Environmental Testing Research Institute*
Yunfei En, *China Electronic Product Reliability and Environmental Testing Research Institute*
Feng Zou, *Chinese Academy of Sciences*

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Yu Fan, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Jirun Luo, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Yalin Liu, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Changqing Zhang, *Chinese Academy of Sciences*
Ding Zhao, *Chinese Academy of Sciences*
Fang Zhu, *Chinese Academy of Sciences*

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Zijun Chen, *University of Electronic Science and Technology of China*
Zhanliang Wang, *University of Electronic Science and Technology of China*
Xinyi Li, *University of Electronic Science and Technology of China*
Tenglong He, *University of Electronic Science and Technology of China*
Hexin Wang, *University of Electronic Science and Technology of China*
Lingna Yue, *University of Electronic Science and Technology of China*
Tao Tang, *University of Electronic Science and Technology of China*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*
Jinjun Feng, *University of Electronic Science and Technology of China*

P1-5: **Investigation of Low Voltage Angular Log-periodic Folded Groove Waveguide Slow Wave Structure for G-band TWT** (Page 83)
Hexin Wang, *University of Electronic Science and Technology of China*
Duo Xu, *University of Electronic Science and Technology of China*
Zhanliang Wang, *University of Electronic Science and Technology of China*
Xinyi Li, *University of Electronic Science and Technology of China*
Tenglong He, *University of Electronic Science and Technology of China*
Ruichao Yang, *University of Electronic Science and Technology of China*
Lingna Yue, *University of Electronic Science and Technology of China*
Tao Tang, *University of Electronic Science and Technology of China*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*

2: Klystrons Posters

Richard J Temkin, *Massachusetts Institute of Technology*

P2-3: **High Efficiency Klystron Design and Test Result in TETD** (Page 101)
Kenichiro Suzuki, *Toshiba Electron Tubes & Devices Co., Ltd*
Toshifumi Tanaka, *Toshiba Electron Tubes & Devices Co., Ltd*
Satoshi Fujii, *Toshiba Electron Tubes & Devices Co., Ltd*
Yoshihisa Okubo, *Toshiba Electron Tubes & Devices Co., Ltd*

P2-4: **Increased Efficiency of High-power Multiple-beam Klystrons Based on Optimization of the Output Cavity** (Page 103)
Dmitry A. Komarov, *JSC RPE "Toriy"*
Evgeny P. Yakushkin, *JSC RPE "Toriy"*
Yury N. Paramonov, *JSC RPE "Toriy"*
Sergey E. Sharkov, *JSC RPE "Toriy"*

P2-5: **The Design and Calculation of X-band Broadband CW Klystron** (Page 105)
Yaogen Ding, *Chinese Academy of Sciences*
Ming Xue, *Chinese Academy of Sciences*
Haibing Ding, *Chinese Academy of Sciences*
Zhiqiang Zhang, *Chinese Academy of Sciences*

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Che Xu, *University of Electronic Science and Technology of China*
Bin Wang, *University of Electronic Science and Technology of China*
Yong Yin, *University of Electronic Science and Technology of China*
Liangjie Bi, *University of Electronic Science and Technology of China*
Hailong Li, *University of Electronic Science and Technology of China*
Lin Meng, *University of Electronic Science and Technology of China*

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Deepender Kant, *CSIR-Central Electronics Engineering Research Institute*
Ayan Kumar Bandyopadhyay, *CSIR-Central Electronics Engineering Research Institute*
Lalit Mohan Joshi, *CSIR-Central Electronics Engineering Research Institute*
MV Kartikeyan, *Indian Institute of Technology*
Vijay Janyani, *Malaviya National Institute of Technology*

3: TWT Poster I (Design)

P3-1: **A Magnetic Focused Travelling Wave Tube Based on CNT Cathode** (Page N/A)
Xinghui Li, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Bo Chen, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Yuan Feng, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Jing Feng, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Yanjun Cui, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Jinjun Feng, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Fujiang Liao, *National Key Laboratory of Science and Technology on Vacuum Electronics*

P3-2: **Uniform Permanent Magnetic Field with Hemi-Ladder Structure for Sheet Electron Beam Focusing** (Page 113)
Kaicheng Wang, *University of Electronic Science and Technology of China*
Wei Shao, *University of Electronic Science and Technology of China*
Hanwen Tian, *University of Electronic Science and Technology of China*
Zhanliang Wang, *University of Electronic Science and Technology of China*
Zhigang Lu, *University of Electronic Science and Technology of China*
Huarong Gong, *University of Electronic Science and Technology of China*
Tao Tang, *University of Electronic Science and Technology of China*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

P3-3: **Improvement Design of K-band 2x2 Channels Integrated TWTs** (Page 115)
Yuan Feng, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Pan Pan, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Jinjun Feng, *National Key Laboratory of Science and Technology on Vacuum Electronics*

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Guy Rosenzweig, *Massachusetts Institute of Technology*
Michael A Shapiro, *Massachusetts Institute of Technology*
Richard J Temkin, *Massachusetts Institute of Technology*

Zhigang Lu, *University of Electronic Science and Technology of China*
Huarong Gong, *University of Electronic Science and Technology of China*
Tao Tang, *University of Electronic Science and Technology of China*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

P3-18: **W-band Phase-velocity-taper Traveling Wave Tube Based on Sine Waveguide** (Page 145)
Shuanzhu Fang, *University of Electronic Science and Technology of China*
Xuebing Jiang, *University of Electronic Science and Technology of China*
Xia Lei, *University of Electronic Science and Technology of China*
Pengcheng Yin, *University of Electronic Science and Technology of China*
Jin Xu, *University of Electronic Science and Technology of China*
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Jinjun Feng, *Beijing Vacuum Electronics Research Institute*
Yubin Gong, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*

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Xiaoxiao Li, *University of Electronic Science and Technology of China*
Jianxun Wang, *University of Electronic Science and Technology of China*
Qizhi Tian, *University of Electronic Science and Technology of China*
Hao Li, *University of Electronic Science and Technology of China*
Yafen Shang, *University of Electronic Science and Technology of China*
Qiang Zheng, *University of Electronic Science and Technology of China*

P3-20: **Optimization of Intermodulation Distortion for a Ku-Band Helix TWT** (Page 149)
Hai-jian Qiu, *University of Electronic Science and Technology of China*
Yu-lu Hu, *University of Electronic Science and Technology of China*
Quan Hu, *University of Electronic Science and Technology of China*
Xiao-Fang Zhu, *University of Electronic Science and Technology of China*
Zhong-Hai Yang, *University of Electronic Science and Technology of China*
Bin Li, *University of Electronic Science and Technology of China*

P3-21: **Multi-color Terahertz Smith-Purcell Free-electron Laser Based on Frequency Mixing** (Page 151)
Linbo Liang, *University of Science and Technology of China*
Weihao Liu, *University of Science and Technology of China*
Qika Jia, *University of Science and Technology of China*
Lin Wang, *University of Science and Technology of China*
Yalin Lu, *University of Science and Technology of China*

P3-23: **Optimization of Group Delay Distortion for a Ka-Band Coupled-Cavity TWT** (Page 155)
Xiao-yu Hao, *University of Electronic Science and Technology of China*
Yu-lu Hu, *University of Electronic Science and Technology of China*
Quan Hu, *University of Electronic Science and Technology of China*
Xiao-fang Zhu, *University of Electronic Science and Technology of China*
Bin Li, *University of Electronic Science and Technology of China*

P3-25: **W-band TWT for High Capacity Transmission Hub for Small Cell Backhaul** (Page 157)
Frédéric André, *Thales Electron Devices*
Quang Trung Le, *HF Systems Engineering GmbH*
Giacomo Ulisse, *Goethe University of Frankfurt*
Viktor Krozer, *Goethe University of Frankfurt*
Rosa Letizia, *Lancaster University*
Ralph Zimmerman, *HF Systems Engineering GmbH*
Claudio Paoloni, *Lancaster University*

Session 9: MMW/Sub-mmw Microfabrication I

Chair: Jack Tucek, *Northrop Grumman Corporation*

Wednesday, April 25 / 10:30 AM-12:10 PM / San Carlos IV

9-1: **Session Keynote: Monolithically Integrated 140 GHz TWT Arrays** (Page 159)
Colin D. Joye, *US Naval Reserach Laboratory*
Reginald L. Jaynes, *US Naval Reserach Laboratory*
Jeffrey P. Calame, *US Naval Reserach Laboratory*
John C. Rodgers, *US Naval Reserach Laboratory*
Alan M. Cook, *US Naval Reserach Laboratory*

Scooter D. Johnson, *US Naval Reserach Laboratory*
Alexander T. Burke, *Leidos Inc.*

9-3: **The Enhanced THz Smith-Purcell Radiation from the Grating with Holes** (Page 163)
Ping Zhang, *University of Electronic Science and Technology of China*
Yaxin Zhang, *University of Electronic Science and Technology of China*
Minchun Tang, *Chongqing University*

9-4: **The Sub-THz Clinotron-Multiplier** (Page 165)
Mihail V. Milcho, *Institute for Radiophysics and Electronics of NAS of Ukraine*
Kostyantyn Ilyenko, *Institute for Radiophysics and Electronics of NAS of Ukraine*
Viktor V. Zavertanniy, *Institute for Radiophysics and Electronics of NAS of Ukraine*
Tetyana Yatsenko, *Institute for Radiophysics and Electronics of NAS of Ukraine*
Anatoly S. Tishchenko, *Institute for Radiophysics and Electronics of NAS of Ukraine*

9-5: **Investigation of a THz CW Band-edge Oscillator** (Page 167)
Jun Cai, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Yinghua Du, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Qingmei Xie, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Xiaoqing Zhang, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Xianping Wu, *National Key Laboratory of Science and Technology on Vacuum Electronics*
Jinjun Feng, *National Key Laboratory of Science and Technology on Vacuum Electronics*

Session 10: TWT Design/Modeling

Chair: Claudio Paoloni, *Lancaster University*

Wednesday, April 25 / 10:30 AM-12:30 PM / San Carlos III

10-1: **Back-Off Efficiency Optimization of Traveling-Wave Tubes using Simulated Annealing** (Page 169)
Djamschid Safi, *Technische Universität Hamburg-Harburg*
Philip Birtel, *Thales Electronic Systems GmbH*
Michael Wulff, *Technische Universität Hamburg-Harburg*
Sascha Meyne, *Technische Universität Hamburg-Harburg*
Arne F. Jacob, *Technische Universität Hamburg-Harburg*

10-2: **On Johnson's Backward Wave Oscillation Thresholds in a TWT** (Page 171)
Abhijit Jassem, *University of Michigan*
Patrick Y. Wong, *University of Michigan*
David P. Chernin, *Leidos, Inc.*
Y. Y. Lau, *University of Michigan*
Foivos Antoulinakis, *University of Michigan*
Thomas A. Hargreaves, *L3 Technologies*
Carter M. Armstrong, *L3 Technologies*

10-3: **Prediction and Measurement of Return Loss in Helix Output Circuits** (Page 173)
Mark Perrin, *Communications & Power Industries LLC*
Jeff Li, *Communication & Power Industries LLC*
Benson Sit, *Communication & Power Industries LLC*
Merritt Chesnut, *Communication & Power Industries LLC*
Nileshwar Chaudhary, *Communication & Power Industries LLC*
Ognian Sabev, *Communication & Power Industries LLC*
Alex Plant, *Communication & Power Industries LLC*
Rasheda Begum, *Communications & Power Industries LCC*
Galen Aymar, *Communications & Power Industries LLC*
Kevin Mallon, *Communications & Power Industries LCC*
Tom Grant, *Communications & Power Industries LCC*

10-4: **A Multistage Depressed Collectors Design Tool for Traveling Wave Tubes Based on Non-dominated Sorting Genetic Algorithm II** (Page 175)
Tao Huang, *University of Electronic Science and Technology of China*
Qiufeng Cao, *University of Electronic Science and Technology of China*
Jia Liu, *University of Electronic Science and Technology of China*
Dapeng Gong, *University of Electronic Science and Technology of China*
Shifeng Li, *University of Electronic Science and Technology of China*
Zhonghai Yang, *University of Electronic Science and Technology of China*
Bin Li, *University of Electronic Science and Technology of China*

10-5: **Origin of Second Harmonic Signals in Octave Bandwidth Traveling-Wave Tubes** (Page 177)
Patrick Y. Wong, *University of Michigan*
Y. Y. Lau, *University of Michigan*

Brad W. Hoff, *Air Force Research Laboratory*
Ronald M. Gilgenbach, *University of Michigan*

10-6: **Re-examination of Absolute Instability Near Band Edges in a Traveling Wave Tube** (Page 179)
Foivos Antoulinakis, *University of Michigan*
Patrick Wong, *University of Michigan*
Abhijit Jassem, *University of Michigan*
Y. Y. Lau, *University of Michigan*

Session 11: Klystrons II

Wednesday, April 25 / 1:30-3:10 PM / San Carlos IV

Chair: Yaogen Ding, *Institute of Electronics, Chinese Academy of Sciences*

11-1: **Session Keynote: Miniature Klystron for CubeSats** (Page 181)
Bernard Vancil, *e beam, inc.*
Charles Osborne, *e beam, inc.*
Malcolm Caplan, *Consultant*
Danilo Radovich, *Consultant*

11-2: **Low Voltage Ultra-Compact W-band Klystron** (Page 183)
Ann Sy, *SLAC*
Yuan Zheng, *University of California, Davis*
Brandon Weatherford, *SLAC*
Erik Jongewaard, *SLAC*
Jeff Neilson, *SLAC*
Neville C. Luhmann, Jr., *University of California, Davis*
Diana Gamzina, *SLAC*

11-3: **Improvement of Output Power in G-band EIK with Optimized and Tapering Gap Length** (Page 185)
Renjie Li, *Beihang University*
Cunjun Ruan, *Beihang University*
Huafeng Zhang, *Beihang University*
Yanbin He, *Beihang University*
Shengyu Shan, *Beihang University*

11-4: **Design of a Ka-band CW Extended Interaction Klystron** (Page 187)
Haibing Ding, *Chinese Academy of Sciences*
Liang Tang, *Chinese Academy of Sciences*
Yihao Song, *University of Chinese Academy of Sciences*
Ying Wang, *Chinese Academy of Sciences*
Ke Tang, *Chinese Academy of Sciences*
Yaogen Ding, *Chinese Academy of Sciences*

11-5: **Circuit Design and Simulation of a 220-GHz 100-W Extended Interaction Klystron** (Page 189)
Zhaowei Qu, *Chinese Academy of Sciences*
Zhiqiang Zhang, *Chinese Academy of Sciences*
Yaogen Ding, *Chinese Academy of Sciences*
Shuzhong Wang, *Chinese Academy of Sciences*
Qingsheng Li, *Chinese Academy of Sciences*

Session 12: Cold Cathodes

Wednesday, April 25 / 1:30-3:10 PM / San Carlos III

Chair: Joan Yater, *Institute of Electronics, Naval Research Laboratory*

12-1: **Field Emission from Gated Planar Graphene Edges** (Page 191)
Jonathan L. Shaw, *Naval Research Lab*
J. Brad Boos, *KeyW Corporation*
Byoung-Don Kong, *Pohang University*
Jeremy T. Robinson, *Naval Research Lab*

12-3: **Engineering the Field Enhancement Factor and Work Function toward Ultra-Low Threshold Field Electron Emitter** (Page 193)
Fatemeh Rezaeifar, *University of Southern California*
Rehan Kapadia, *University of Southern California*

12-4: **Integrated Waveguide Assisted Electron Emission Device** (Page 195)
Fatemeh Rezaeifar, *University of Southern California*
Rehan Kapadia, *University of Southern California*

12-5: **Characterization of Field Emission from Carbon Nanotube Fibers in Varying Cathode-Anode Gaps** (Page

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Poster Session 2

Wednesday, April 25 / 01:30-5:30 PM / San Carlos I+II

4: Power Supplies and Tube Sub-Systems Posters

5: Thermionic and Scandate Cathodes Posters

Yafen Shang, *University of Electronic Science and Technology of China*
Yaping Shen, *University of Electronic Science and Technology of China*
Hao Fu, *University of Electronic Science and Technology of China*
Yong Luo, *University of Electronic Science and Technology of China*

P5-10: **Emission Micro-observation of Dispenser Cathode Via DUV-PEEM/TEEM** (Page 241)
Feng Ren, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*
Shengyi Yin, *Chinese Academy of Sciences*
Zhipeng Lu, *Chinese Academy of Sciences & University of Chinese Academy of Sciences*

Session 13: High Power Microwaves - II

Chair: Eunmi Choi, *UNIST*

Wednesday, April 25 / 3:30-5:30 PM / San Carlos III

13-2: **Millimeter Wave Overmoded Relativistic Backward Wave Oscillator** (Page 243)
Ahmed Elfrgani, *University of New Mexico*
Artem Kuskov, *University of New Mexico*
Mikhail I. Fuks, *University of New Mexico*
Edl Schamiloglu, *University of New Mexico*

13-3: **Development of a 2450 MHz, 50 kW CW Klystron** (Page 245)
Claudio Motta, *University of Sao Paulo*
Daniel Lopes, *University of Sao Paulo*
Jiro Takahashi, *University of Sao Paulo*

Session 14: Magnetrons and Gyrotrons

Chair: Stephen Cauffman, *CPI MPPD*

Thursday, April 26 / 8:30-10:10 AM / San Carlos IV

14-1: **A 100 kW 1.3 GHz Phase Locked Magnetron for Accelerators** (Page 249)
Michael Read, *Calabazas Creek Research, Inc.*
R. Lawrence Ives, *Calabazas Creek Research, Inc.*
Thuc Bui, *Calabazas Creek Research, Inc.*
George Collins, *Calabazas Creek Research, Inc.*
Brian Chase, *Fermi National Accelerator Laboratory*
John Reid, *Fermi National Accelerator Laboratory*
Chris Walker, *Communications and Power Industries LLC*
Jeff Conant, *Communications and Power Industries LLC*

14-2: **Experimental Study on Frequency Modulation of an Injection-Locked Magnetron Based on Full Wave Voltage Doubler** (Page 251)
Bo Yang, *Kyoto University*
Tomohiko Mitani, *Kyoto University*
Naoki Shinohara, *Kyoto University*

14-3: **Harmonic-Frequency Locking in Planar Magnetrons** (Page 253)
Drew A. Packard, *University of Michigan*
Geoffrey B. Greening, *University of Michigan*
Nicholas M. Jordan, *University of Michigan*
Steven C. Exelby, *University of Michigan*
Patrick Y. Wong, *University of Michigan*
Y. Y. Lau, *University of Michigan*
Ronald M. Gilgenbach, *University of Michigan*
Brad W. Hoff, *Air Force Research Lab*
Jason F. Hammond, *Air Force Research Lab*

14-4: **Simulating Magnetrons with VSim** (Page 255)
Diana M. Cheatham, *Tech-X Corporation*
David N. Smithe, *Tech-X Corporation*
Nicholas A. Roberds, *Tech-X Corporation*
John R. Cary, *Tech-X Corporation*

Session 15 :G-Band / THz TWTs

Chair: Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

Thursday, April 26 / 8:30-10:10 AM / San Carlos III

15-2: **Narrowband THz Generation by Ultra-Relativistic Beam** (Page 259)
Dan Wang, *Tsinghua University*

Sergey Antipov, *Euclid Techlabs LLC*
Xiaolu Su, *Tsinghua University*
YingChao Du, *Tsinghua University*
Qili Tian, *Tsinghua University*
Yifan Liang, *Tsinghua University*
Lujia Niu, *Tsinghua University*
Wenhui Huang, *Tsinghua University*
Wei Gai, *Tsinghua University*
Chuanxiang Tang, *Tsinghua University*
Lixin Yan, *Tsinghua University*

15-3: **Performance Estimate of a Low-THz Helical Groove-Guide TWT** (Page 261)
Heino Henke, *Technische Universität Berlin*
Markus Jäger, *Technische Universität Berlin*

Poster Session 3

Thursday, April 26 / 8:30 AM-12:30 PM / San Carlos I+II

6: High Power Microwave Posters

P6-1: **Rising Sun Magnetron with Diffraction Output** (Page 263)
Emil Szkop, *KUBARA LAMINA S.A.*
Martyna Wozniak, *KUBARA LAMINA S.A.*
Michal Rychlewski, *KUBARA LAMINA S.A.*
Andrzej Rózycki, *KUBARA LAMINA S.A.*
Dariusz Baczewski, *KUBARA LAMINA S.A.*
Mariusz Blazejewicz, *KUBARA LAMINA S.A.*
Dariusz Laskowski, *Military University of Technology*
Roman Kubacki, *Military University of Technology*

P6-4: **Researching on the Wideband Elliptical-section TE01-TE11 Mode Converter** (Page 269)
Keqiang Wang, *University of Electronic Science and Technology of China*
Hao Li, *University of Electronic Science and Technology of China*
Yong Luo, *University of Electronic Science and Technology of China*
Tianming Li, *University of Electronic Science and Technology of China*
Haiyang Wang, *University of Electronic Science and Technology of China*
Biao Hu, *University of Electronic Science and Technology of China*
Yihong Zhou, *University of Electronic Science and Technology of China*
Jianing Zhao, *University of Electronic Science and Technology of China*

P6-7: **MAGIC Simulation of Microwave Generation Using an Active Metamaterial Powered by an Electron Beam** (Page 273)
Meiqin Liu, *University of New Mexico & Xi'an Jiaotong University*
Chunliang Liu, *Xi'an Jiaotong University*
Mikhail I. Fuks, *University of New Mexico*
Edl Schamiloglu, *University of New Mexico*

P6-9: **Analysis of High-order Mode Self-oscillation in an Oversized Coaxial Relativistic Klystron Amplifier at Ka Band** (Page 277)
Shifeng Li, *University of Electronic Science and Technology of China & China Academy of Engineering Physics*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Hua Huang, *China Academy of Engineering Physics*
Zhenbang Liu, *China Academy of Engineering Physics*
Fei Wang, *University of Electronic Science and Technology of China*
Xin Wang, *University of Electronic Science and Technology of China*
Zhanliang Wang, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*

P6-10: **Regularities and Mechanisms of Development of Instabilities in the System with Intense Relativistic Electron Beam** (Page 279)
Semen Kurkin, *Saratov State University & Yuri Gagarin State Technical University of Saratov*
Artem Badarin, *Saratov State University & Yuri Gagarin State Technical University of Saratov*
Nikita Frolov, *Saratov State University & Yuri Gagarin State Technical University of Saratov*
Alexey Koronovskii, *Saratov State University*
Alexander Hramov, *Saratov State University & Yuri Gagarin State Technical University of Saratov*

7: Magnetrons and Gyrotrons Posters

S. Yuvaraj, *Indian Institute of Technology Roorkee*
Delphine Alphonsa Jose, *Indian Institute of Technology Roorkee*
Madan Singh Chauhan, *Indian Institute of Technology Roorkee*
M. V. Kartikeyan, *Indian Institute of Technology Roorkee*
Stefan Illy, *Karlsruhe Institute of Technology (KIT)*
Manfred K. Thumm, *Karlsruhe Institute of Technology (KIT)*

P7-17: **Design and Simulation of Quasi-optical Mode Generator for a W-band Gyrotron** (Page 309)
ZhiHui Geng, *Chinese Academy of Sciences*

P7-18: **Thermal-hydraulic Design and Analysis for High Power Gyro-TWT Collector** (Page 311)
Yaping Shen, *University of Electronic Science and Technology of China*
Wei Jiang, *University of Electronic Science and Technology of China*
Qiang Zheng, *University of Electronic Science and Technology of China*
Yafen Shang, *University of Electronic Science and Technology of China*
Xiaoyi Liao, *University of Electronic Science and Technology of China*
Hao Fu, *University of Electronic Science and Technology of China*

P7-19: **Study on Radiation Field of Gyrotron Quasi-optical Launcher** (Page 313)
Guo-Hui Zhao, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*
Qian-Zhong Xue, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*
Yong Wang, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*

Session 16: Power Supplies and Tube Sub-Systems

Thursday, April 26 / 10:30 AM-12:10 PM / San Carlos IV

Chair: Yehuda Goren, *Teledyne Electronic Technologies*

16-4: **Daresbury Laboratory Short Pulse Klystron Modulators** (Page 315)
Christopher Chipman, *Diversified Technologies, Inc.*
Marcel Gaudreau, *Diversified Technologies, Inc.*
Luan Jashari, *Diversified Technologies, Inc.*
John Kinross-Wright, *Diversified Technologies, Inc.*
Michael Kempkes, *Diversified Technologies, Inc.*
Rebecca Simpson, *Diversified Technologies, Inc.*
Alan Wheelhouse, *Science & Technology Facilities Council (STFC)*
Stephen Griffiths, *Science & Technology Facilities Council (STFC)*

16-5: **Solid-State Thyratron Replacement** (Page 317)
Ian Roth, *Diversified Technologies, Inc.*
Marcel Gaudreau, *Diversified Technologies, Inc.*
Neal Butler, *Diversified Technologies, Inc.*
Michael Kempkes, *Diversified Technologies, Inc.*
Rebecca Simpson, *Diversified Technologies, Inc.*

Session 17: Scandate Cathodes

Thursday, April 26 / 10:30 AM-12:30 PM / San Carlos III

Chair: Jinshu Wang, *Beijing University of Technology*

17-2: **Improvements in Scandate Powder Synthesis** (Page 321)
Bernard Vancil, *e beam, inc.*
Charles Osborne, *e beam, inc.*
Allen Vancil, *e beam, inc.*
Wayne Ohlinger, *Consultant*
Michael Green, *Consultant*
Ivor Brodie, *Consultant*

17-3: **Analysis of Faceted Tungsten Grains on the Surfaces of Scandate Cathodes Fabricated from L-S and L-L Powders** (Page 323)
Xiaotao Liu, *University of Kentucky*
Qunfei Zhou, *University of Kentucky*
Tyler Maxwell, *University of Kentucky*
T. John Balk, *University of Kentucky*
Bernard Vancil, *e beam Inc.*
Matthew J. Beck, *University of Kentucky*

17-4: **Mapping Conditions for the Formation of High-Performance Scandate Cathodes: New Insights into the Role of Sc** (Page 325)
Qunfei Zhou, *University of Kentucky*
Xiaotao Liu, *University of Kentucky*
Tyler Maxwell, *University of Kentucky*

T. John Balk, *University of Kentucky*
Matthew J. Beck, *University of Kentucky*
Bernard Vancil, *e beam Inc.*

17-5: **Low Energy Electron Microscopy Observation of De-wetting of Scandium on W(100), W(110) and W(111)** (Page 327)
Michael Mroz, *Ohio University*
Samuel Tenney, *Brookhaven National Laboratory*
Martin E. Kordesch, *Ohio University*

17-6: **Materials Characterization of Surface Phases in Scandate Cathodes** (Page 329)
T. John Balk, *University of Kentucky*
Xiaotao Liu, *University of Kentucky*
Qunfei Zhou, *University of Kentucky*
Tyler Maxwell, *University of Kentucky*
Matthew J. Beck, *University of Kentucky*
Bernard Vancil, *e beam, inc*

Session 18: MMW/Sub-mmw Microfabrication II

Chair: Colin Joye, *Naval Research Laboratory*

Thursday, April 26 / 1:30-3:10 PM / San Carlos IV

18-1: **Session Keynote: W-band TWT Circuit Fabricated by 3D-Printed Mold Electroforming** (Page 331)
Alan M. Cook, *U. S. Naval Research Laboratory*
Colin D. Joye, *U. S. Naval Research Laboratory*
Reginald L. Jaynes, *U. S. Naval Research Laboratory*
Jeffrey P. Calame, *U. S. Naval Research Laboratory*

18-4: **Effect of Fabrication Tolerance on 0.346 THz Double Corrugated Waveguide for Backward Wave Oscillators** (Page 335)
Xiang Li, *Lancaster University*
Diana Gamzina, *SLAC National Accelerator Laboratory*
Rosa Letizia, *Lancaster University*
Michelle Gonzales, *University of California, Davis*
Ye Tang, *Beijing Vacuum Electronic Research Institute and Vacuum Electronics National Lab*
Yuan Zheng, *University of California, Davis*
Branko Popovic, *University of California, Davis*
Logan Himes, *University of California, Davis*
Robert Barchfeld, *University of California, Davis*
Hanyan Li, *Beijing Vacuum Electronic Research Institute and Vacuum Electronics National Lab*
Pan Pan, *Beijing Vacuum Electronic Research Institute and Vacuum Electronics National Lab*
Jinjun Feng, *Beijing Vacuum Electronic Research Institute and Vacuum Electronics National Lab*
Claudio Paoloni, *Lancaster University*
Neville C. Luhmann Jr, *University of California, Davis*

18-5: **Simulation and Cold Test of 220GHz Staggered Double Vane Slow Wave Structure** (Page 337)
Hanwen Tian, *University of Electronic Science and Technology of China*
Wei Shao, *University of Electronic Science and Technology of China*
Zhanliang Wang, *University of Electronic Science and Technology of China*
Tao Tang, *University of Electronic Science and Technology of China*
Zhigang Lu, *University of Electronic Science and Technology of China*
Huarong Gong, *University of Electronic Science and Technology of China*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

Session 19: TWTs II

Chair: Philippe Thouvenin, *Thales Electron Devices*

Thursday, April 26 / 1:30-3:10 PM / San Carlos III

19-1: **Fabrication and Cold-test of a Wideband Ka-Band Dielectric-Loaded Traveling-Wave Tube** (Page 339)
Muhammed Zuboraj, *Los Alamos National Laboratory*
William Romero, *Los Alamos National Laboratory*
Frank Fierro, *Los Alamos National Laboratory*
Evgenya Simakov, *Los Alamos National Laboratory*
Bruce Carlsten, *Los Alamos National Laboratory*

19-2: **Impacts of an Embedded FiberInside a Helix TWT on Its Performance** (Page 341)
Jin Zhang, *Southeast University*
Jinyan Wang, *Southeast University*
Xiaohan Sun, *Southeast University*
Baoliang Hao, *Beijing Vacuum Electronics Research Institute*
Lei Zhang, *Beijing Vacuum Electronics Research Institute*
Yanmei Wang, *Beijing Vacuum Electronics Research Institute*
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

19-3: **Transmission Characteristics of Planar Tape-Helix: Simulation and Measurements** (Page 343)
Ajith Kumar M M, *Nanyang Technological University*
Sheel Aditya, *Nanyang Technological University*
Chen Zhao, *Nanyang Technological University*

19-4: **High Frequency Characteristics of a Metamaterial Slow Wave Structure** (Page 345)
Xin Wang, *University of Electronic Science and Technology of China*
Zhaoyun Duan, *University of Electronic Science and Technology of China*
Fei Wang, *University of Electronic Science and Technology of China*
Shifeng Li, *University of Electronic Science and Technology of China*
Shengkun Jiang, *University of Electronic Science and Technology of China*
Leidong Jin, *University of Electronic Science and Technology of China*
Zhanliang Wang, *University of Electronic Science and Technology of China*
Yanyu Wei, *University of Electronic Science and Technology of China*
Yubin Gong, *University of Electronic Science and Technology of China*

19-5: **Folded Waveguide Traveling Wave Tube in a Parallel Configuration with a Single Electron Beam** (Page 347)
Giacomo Ulisse, *Goethe University of Frankfurt*
Viktor Krozer, *Goethe University of Frankfurt*

Poster Session 4

Thursday, April 26 / 1:30-5:30 PM / San Carlos I+II

8: Materials, Guns, Manufacturing Posters

P8-2: **Correlation between Growth Mechanism of Microcrystalline Diamond-Ultrananocrystalline Diamond Composite and Mechanical Properties of Its Thin THz TWT Windows** (Page 349)
Ming Q Ding, *Beijing Vacuum Electronics Research Institute*
Lili Li, *Beijing Vacuum Electronics Research Institute*
Yinghua Du, *Beijing Vacuum Electronics Research Institute*
Lin Chen, *Beijing Vacuum Electronics Research Institute*
Xianping Wu, *Beijing Vacuum Electronics Research Institute*
Jun Cai, *Beijing Vacuum Electronics Research Institute*
Jinjun Feng, *Beijing Vacuum Electronics Research Institute*

P8-5: **Design of the Planar Distributed Three-Beam Gun for W-band Staggered Double Vane TWT** (Page 353)
Zhang Huafeng, *Beihang University*
Ruan Cunjun, *Beihang University*

P8-8: **Energy Distribution of Electrons from cathode in Magnetron Injection Gun** (Page 357)
Alok Mishra, *CSIR-Central Electronics Engineering Research Institute*
M. V. Kartikeyan, *Indian Institute of Technology Roorkee*
A. K. Sinha, *CSIR-Central Electronics Engineering Research Institute*
A. Bera, *CSIR-Central Electronics Engineering Research Institute*

P8-9: **The Phase-space Volume Effect on the Electron Beam Forming in the EOS of Ka-band Devices with a High Aspect Ratio Field-emission Cathode** (Page 359)
Yury N. Paranomov, *JSC RPE "Toriy"*
Sergey P. Morev, *JSC RPE "Toriy"*
Eduard K. Muraviev, *JSC RPE "Toriy"*
Alexander N. Darmaev, *JSC RPE "Toriy"*
Dmitry A. Komarov, *JSC RPE "Toriy"*
Vasily I. Shesterkin, *JSC RPE "Almaz"*
Tatyana N. Sokolova, *JSC RPE "Almaz"*
Dmitry A. Bessonov, *JSC RPE "Almaz"*

P8-14: **Development of Electron-optical System with Convergent Sheet Beam for Terahertz TWT** (Page 367)
Anton A. Burtsev, *Yuri Gagarin State Technical University of Saratov*
Aleksei V. Danilushkin, *Yuri Gagarin State Technical University of Saratov*

Igor A. Navrotsky, *Yuri Gagarin State Technical University of Saratov*
George V. Sakhadzhi, *JSC NPP "Almaz"*
Kirill V. Shumikhin, *JSC NPP "Almaz"*

9: Modeling Posters

10: THz and Microfabrication Posters

P10-4: **A Fabrication Method of High Frequency Structure for THz Travelling Wave Tubes** (Page 397)
Qinglun Liu, *Chinese Academy of Sciences*
Futing Yi, *Chinese Academy of Sciences*
Mingguang Huang, *Chinese Academy of Sciences*
Gang Wang, *Chinese Academy of Sciences*
Liucong Yao, *Chinese Academy of Sciences*
Xiaohua Hu, *Chinese Academy of Sciences*
Yongliang Liu, *Chinese Academy of Sciences*
Yunjin Li, *Chinese Academy of Sciences*
Liaoyu Xue, *Chinese Academy of Sciences*

P10-6: **Effects of Beam Tunnels on 220GHz Rectangular Beam Folded Waveguide Traveling Wave Tubes** (Page 399)
Fengying Lu, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*
Yong Wang, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*
Long Yao, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*
Jie Yang, *University of Chinese Academy of Sciences & Chinese Academy of Sciences*

P10-7: **Study of Double-Beam Folded Waveguide Back Wave Oscillator in Terahertz Band** (Page 401)
Luanfeng Gao, *University of Electronic Science and Technology of China*
Yulu Hu, *University of Electronic Science and Technology of China*
Quan Hu, *University of Electronic Science and Technology of China*
Xiaofang Zhu, *University of Electronic Science and Technology of China*
Bin Li, *University of Electronic Science and Technology of China*

P10-8: **Design of Three-section Traveling Wave Tube with Folded-Waveguide Circuit Shielded by Photonic Crystals** (Page 403)
Hongxia Yi, *Chinese Academy of Scences*
Junting Cui, *Chinese Academy of Scences*
Mingguang Huang, *Chinese Academy of Scences*
Liu Xiao, *Chinese Academy of Scences*

P10-9: **Study of Insertion Loss for a Ka-Band Meander Line Slow-Wave Structure** (Page 405)
Wang Shaomeng, *Nanyang Technological University*
Sheel Aditya, *Nanyang Technological University*

P10-10: **Research of Electrodynamic Characteristics of a Double-gap Klystron Resonator with Quasi-fractal Microstrip Elements** (Page 407)
Alexey Y. Miroshnichenko, *Yuri Gagarin State Technical University of Saratov*
Vladislav A. Tsarev, *Yuri Gagarin State Technical University of Saratov*
Natalia A. Akafyeva, *Yuri Gagarin State Technical University of Saratov*
Yuriy N. Pchelnikov, *Pchelnikov's Consulting*

Session 20: Materials and Manufacturing

Chair: Bernard Vancil, *eBeam, Inc.*

Thursday, April 26 / 3:30-4:30 PM / San Carlos IV

20-1: **Additively Manufactured WR-10 Copper Waveguide** (Page 409)
Timothy Horn, *North Carolina State University*
Ilbey Karakurt, *University of California, Berkeley*
Christopher Ledford, *North Carolina State University*
Michelle Gonzalez, *University of California, Davis*
Diana Gamzina, *SLAC*
Neville C. Luhmann, Jr., *University of California, Davis*
Liwei Lin, *University of California, Berkeley*

20-2: **Dielectric and Thermal Conductivity Characterization of Aluminum Nitride-Based Microwave Absorbing Ceramics for Vacuum Electronics** (Page 411)
Jeffrey P. Calame, *Naval Research Laboratory*
Ender Savrun, *Sienna Technologies, Inc.*

Session 21: W-Band TWTs

Chair: John Booske, *University of Wisconsin-Madison*

Thursday, April 26 / 3:30-5:10 PM / San Carlos III

21-1: **A W-band Efficiency-improved Folded Waveguide Traveling Wave Tube** (Page 415)
Fei Li, *Chinese Academy of Sciences*
Mingguang Huang, *Chinese Academy of Sciences*
Yuhui Sun, *Chinese Academy of Sciences*

Liu Xiao, *Chinese Academy of Sciences*
Jiandong Zhao, *Chinese Academy of Sciences*
Jingtian Wang, *Chinese Academy of Sciences*
Hongxia Yi, *Chinese Academy of Sciences*
Zhuo Wang, *Chinese Academy of Sciences*

21-4: **Toward 100 Gbps Wireless Networks Enabled by Millimeter Wave Traveling Wave Tubes** (Page 417)
Claudio Paoloni, *Lancaster University*
Rosa Letizia, *Lancaster University*
Viktor Krozer, *Goethe University of Frankfurt*
Marc Marilier, *OMMIC S.A.S.*
Sebastian Boppel, *Leibniz-Institut für Höchstfrequenztechnik*
Antonio Ramirez, *Fibernova Systems*
Borja Vidal, *Universitat Politècnica de València*
Ernesto Limiti, *University of Rome, Tor Vergata*
Ralph Zimmerman, *HF Systems Engineering GmbH*

21-5: **Design and Test of a W-band 100-Watts Extended Interaction Oscillator** (Page 419)
Zhaowei Qu, *Chinese Academy of Sciences*
Zhiqiang Zhang, *Chinese Academy of Sciences*
Yaogen Ding, *Chinese Academy of Sciences*
Shuzhong Wang, *Chinese Academy of Sciences*
Qingsheng Li, *Chinese Academy of Sciences*

Additional Papers

P2-6: The Project of a Multibeam Klystron on a Higher Mode for Linear Electron Acceleartors (Page 107)
A. N. Yanakov
V. I. Pugnin
S. V. Evseev
D. S. Moiseyev
A. S. Kotov

P3-8: Effect of Pitch Variation on the Linearity of Helix TWTs (Page 125)
P. Narasimhan
P. Pareek
S. Chakraborty
S. K. Ghosh

P3-11: Preliminary Design of a Three-Slot-Staggered-Ladder Coupled-Cavity Structure for W-band Pulse Power Traveling Wave Tube (Page 131)
Z. Su
Z. Lu
Z. Wang
T. Tang
Y. Gong

P3-12: A Study of Thermal Behavior of Travelling Wave Tube (Page 133)
C. Mistry
S. Chakraborty
S. Arya
A. M. Latha
A. R. Choudhury
S. K. Ghosh

P3-17: Optimization of Resistive Attenuator Coating for TWT Performance Improvement (Page 143)
S. Chakraborty
C. Mistry
P. Pareek
N. Purushottaman
A. R. Choudhury
M. K. Alaria
S. K. Ghosh

P3-22: Particle-in-Cell Simulation of a Novel Rectangular Beam Folded-waveguide Traveling Wave Tube (Page 153)
F. Lu
Y. Wang
B. Xi
X. Wang