Stanford

Diana Gamzina

Casual - Nonexempt, SLAC National Accelerator Laboratory

Bio

BIO

Dr. Gamzina joined SLAC in January of 2017; she was at the UC Davis millimeter-wave research group for over 8 years prior to that leading research and development programs in millimeter wave and terahertz vacuum electronics. At SLAC, she has focused on development of advanced materials for vacuum electron devices. Her expertise includes mechanics of materials' interaction with electromagnetic waves, micro to nano scale as well as additive material synthesis techniques, high current density nano-composite cathodes, and multiscale thermo-mechanical design and analysis. Enabling design driven material microstructure for the next generation of RF vacuum electronic devices is her personal career goal.

CURRENT ROLE AT STANFORD

Staff Scientist

HONORS AND AWARDS

- DOE Early Career Research Program Award, High Energy Physics, Department of Energy (2019)
- The SLAC Director’s Award for modeling excellence, creativity, and collaboration., SLAC National Accelerator Laboratory (2019)
- Zuhair A. Munir Best Doctoral Dissertation Award, College of Engineering, UC Davis (2017)
- A Medal of Recognition for Development of W-band Sheet Beam Klystron, U.S. Marine Corps, NSWC, Dahlgren (2012)
- Tau Beta Pi, Engineering Honors Society (2006)

EDUCATION AND CERTIFICATIONS

- Ph.D., UC Davis , Mechanical and Aerospace Engineering (2016)
- M.S., UC Davis , Mechanical Engineering (2012)
- B.S., UC Davis , Double: Materials Science, Mechanical Engineering (2008)

SERVICE, VOLUNTEER, AND COMMUNITY WORK

- Founder of SAGE-S (Science Accelerating Girls' Engagement in STEM) (12/15/2017)
- Adjunct Assistant Professor
- Instructor (1/1/2020 - 3/31/2020)

Professional

WORK EXPERIENCE

- Development Engineer - UC Davis (8/15/2008 - 1/10/2017)

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- Committee Member, International Vacuum Electronics Conference: 2017 and 2018: “Best Student Paper Award,” 2019: “Best Poster Award” (2017 - present)
- Member, IEEE (2010 - present)
- Peer Reviewer, Physics of Plasmas Journal, Transactions on Electron Devices, An International Journal of Engineering Science and Technology, Journal of Materials Processing and Technology. (2012 - present)
- Graduate, International Research Training Group (IRTG2057): "Physical Modeling for Virtual Manufacturing Systems and Processes" (2012 - 2016)

Publications

PUBLICATIONS

- **Multioutput Circuit for Low Voltage Ultracompact W-Band Klystron** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Zheng, Y., Sy, A., Weatherford, B., Luhmann, N. C., Gamzina, D.
  2020; 67 (9): 3821–27
- **Design and Analysis of the Staggered Double Grating Slow Wave Circuit for 263 GHz Sheet Beam TWT** *IEEE TRANSACTIONS ON TERAHERTZ SCIENCE AND TECHNOLOGY*
  Zheng, Y., Gamzina, D., Himes, L., Gonzalez, M., Luhmann, N. C.
  2020; 10 (4): 411–18
- **Characteristics and Processing of Hydrogen-Treated Copper Powders for EB-PBF Additive Manufacturing** *APPLIED SCIENCES-BASEL*
  Ledford, C., Rock, C., Carriere, P., Frigola, P., Gamzina, D., Horn, T.
  2019; 9 (19)
- **Copper Reconsidered: Material Innovations to Transform Vacuum Electronics (Keynote)** *2019 International Vacuum Electronics Conference (IVEC)*
  Gamzina, D., Kozina, M., Mehta, A., Nanni, E., Tantawi, S., Welander, P., Horn, T., Ledford, C.
  2019
- **Copper Reconsidered: Material Innovations to Transform Vacuum Electronics**
  Gamzina, D., Kozina, M., Mehta, A., Nanni, E. A., Tantawi, S., Welander, P. B., Horn, T., Ledford, C., IEEE
  IEEE.2019
- **A Periodic Cusped Magnetic - Quad Magnetic Focusing System for Low Voltage Ultra-Compact W-Band Klystron**
  Zheng, Y., Luhmann, N. C., Gamzina, D., Olszewski, J., Sy, A., Weatherford, B. R., IEEE
  IEEE.2019
- **Quality and Performance of Commercial Nanocomposite Scandate Tungsten Material**
  Gonzalez, M., Luhmann, N. C., Gamzina, D., McElroy, C., Schalansky, C., IEEE
  IEEE.2019
- **Double Multi-Gap Output Cavity for Low Voltage Ultra-Compact W-Band Klystron**
  Zheng, Y., Luhmann, N. C., Gamzina, D., Sy, A., Weatherford, B. R., IEEE
  IEEE.2019
- **Fabrication of a 0.346-THz BWO for Plasma Diagnostics** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Feng, J., Tang, Y., Gamzina, D., Li, X., Popovic, B., Gonzalez, M., Himes, L., Barchfeld, R., Li, H., Pan, P., Letizia, R., Paoloni, C., Luhmann, et al
  2018; 65 (6): 2156–63
- **Development of a 100-W 200-GHz High Bandwidth mm-Wave Amplifier** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Field, M., Kimura, T., Atkinson, J., Gamzina, D., Luhmann, N. C., Stockwell, B., Grant, T. J., Griffith, Z., Borwick, R., Hillman, C., Brar, B., Reed, T., Rodwell, et al
  2018; 65 (6): 2122–28
- **Low Voltage Ultra-Compact W-band Klystron**
  Sy, A., Zheng, Y., Weatherford, B., Jongewaard, E., Neilson, J., Luhmann, N. C., Gamzina, D., IEEE
  IEEE.2018: 183–84

- **Additively Manufactured WR-10 Copper Waveguide**
  Horn, T., Karakurt, I., Ledford, C., Gonzalez, M., Gamzina, D., Luhmann, N. C., Lin, L., IEEE
  IEEE.2018: 409–10
- **Effect of Fabrication tolerance on 0.346 THz Double Corrugated Waveguide for Backward Wave Oscillators**
  Li, X., Gamzina, D., Letizia, R., Gonzales, M., Tang, Y., Zheng, Y., Popovic, B., Himes, L., Barchfeld, R., Li, H., Pan, P., Feng, J., Paoloni, et al
  IEEE.2018: 335–36
- **Mechanical Design and Manufacturing of W-Band Sheet Beam Klystron** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Gamzina, D., Barnett, L. R., Ravani, B., Luhmann, N. C.
  2017; 64 (6): 2675–82
- **Performance of a Nano-CNC Machined 220-GHz Traveling Wave Tube Amplifier** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Baig, A., Gamzina, D., Kimura, T., Atkinson, J., Domier, C., Popovic, B., Himes, L., Barchfeld, R., Field, M., Luhmann, N. C.
  2017; 64 (5): 2390–97
- **0.2-THz Dual Mode Sheet Beam Traveling Wave Tube** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Zheng, Y., Gamzina, D., Luhmann, N. C.
  2017; 64 (4): 1767–73
- **Large scale production of advanced high current density thermionic cathodes** *2017 Eighteenth International Vacuum Electronics Conference (IVEC)*
  Gamzina, D., Gonzalez, M., Soekland, G., Luhmann, N., McElroy, C., Wood, B., Irani, B., Schalansky, C.
  2017
- **Thermo-Mechanical Stress in High-Frequency Vacuum Electron Devices** *JOURNAL OF INFRARED MILLIMETER AND TERAHERTZ WAVES*
  Gamzina, D., Luhmann, N. C., Ravani, B.
  2017; 38 (1): 47–61
- **Backward wave oscillator for high power generation at THz frequencies**
  Gamzina, D., Li, X., Hurd, C., Tang, Y., Huang, X., Zheng, Y., Himes, L., Gonzalez, M., Li, H., Pan, P., Letizia, R., Feng, J., Luhmann, et al
  edited by Razeghi, M., Baranov, A. N., Pavlidis, D., Zavada, J. M.
  SPIE-INT SOC OPTICAL ENGINEERING.2017
- **Thermomechanical Fatigue in Sub-THz Vacuum Electron Devices** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Gamzina, D., Ravani, B.
  2016; 63 (12): 4948–54
- **Electron Beam Transport System for 263-GHz Sheet Beam TWT** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Zheng, Y., Gamzina, D., Popovic, B., Luhmann, N. C.
  2016; 63 (11): 4466–72
- **Nano-CNC Machining of Sub-THz Vacuum Electron Devices** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Gamzina, D., Himes, L. G., Barchfeld, R., Zheng, Y., Popovic, B. K., Paoloni, C., Choi, E., Luhmann, N. C.
  2016; 63 (10): 4067–73
- **Study on the compositions of emission active materials and the emission properties of dispenser cathodes made from Scandia-doped powders** *ADVANCED POWDER TECHNOLOGY*
  Li, N., Luhmann, N. C., Gamzina, D., Soekland, G., Banducci, M., Gonzalez, M.
  2016; 27 (5): 1933–40
- **THz Backward-Wave Oscillators for Plasma Diagnostic in Nuclear Fusion**
  Paoloni, C., Gamzina, D., Himes, L., Popovic, B., Barchfeld, R., Yue, L., Zheng, Y., Tang, X., Tang, Y., Pan, P., Li, H., Letizia, R., Mineo, et al
  IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2016: 369–76
- **Nanoscale Surface Roughness Effects on THz Vacuum Electron Device Performance** *IEEE TRANSACTIONS ON NANOTECHNOLOGY*
  Gamzina, D., Li, H., Himes, L., Barchfeld, R., Popovic, B., Pan, P., Letizia, R., Mineo, M., Feng, J., Paoloni, C., Luhmann, N. C.
  2016; 15 (1): 85–93
- **Development of Nano Machining Techniques to Bridge the Terahertz Gap**

Himes, L., Gamzina, D., Popovic, B., Barchfeld, R., Luhmann, N. C., IEEE
IEEE.2016

- **Comparison of Couplers for 0.346 THz DCW-BWO**
  Waring, R., Paoloni, C., Gamzina, D., Popovic, B., Himes, L., Letizia, R., Tang, Y., Li, H., Pan, P., Feng, J., Luhmann, N. C.
  edited by Yu, J., Chen
  IEEE.2016: 208–9

- **3-D Simulations and Design of Multistage Depressed Collectors for Sheet Beam Millimeter Wave Vacuum Electron Devices** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Shi, Z., Gamzina, D., Barnett, L. R., Baig, A., Luhmann, N. C.
  2013; 60 (9): 2912–17

- **MEMS COMPATIBLE SEVER FOR 220 GHZ ULTRA WIDE BAND TWTA: DESIGN AND PARTICLE-IN-CELL ANALYSIS** *PROGRESS IN ELECTROMAGNETICS RESEARCH LETTERS*
  Baig, A., Barnett, L. R., Gamzina, D., Luhmann, N. C.
  2013; 41: 135–48

- **0.22 THz wideband sheet electron beam traveling wave tube amplifier: Cold test measurements and beam wave interaction analysis** *PHYSICS OF PLASMAS*
  Baig, A., Gamzina, D., Barchfeld, R., Domier, C., Barnett, L. R., Luhmann, N. C.
  2012; 19 (9)

- **Scandate Dispenser Cathode Fabrication for A High-Aspect-Ratio High-Current-Density Sheet Beam Electron Gun** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Zhao, J., Gamzina, D., Li, N., Li, J., Spear, A. G., Barnett, L., Banducci, M., Risbud, S., Luhmann, N. C.
  2012; 59 (6): 1792–98

- **Experimental study of multichromatic terahertz wave propagation through planar micro-channels** *APPLIED PHYSICS LETTERS*
  Shin, Y., Baig, A., Barchfeld, R., Gamzina, D., Barnett, L. R., Luhmann, N. C.
  2012; 100 (15)

- **High Current Density and Long-Life Nanocomposite Scandate Dispenser Cathode Fabrication** *IEEE TRANSACTIONS ON ELECTRON DEVICES*
  Zhao, J., Li, N., Li, J., Barnett, L. R., Banducci, M., Gamzina, D., Munir, Z. A., Luhmann, N. C.
  2011; 58 (4): 1221–28

- **Design, Fabrication and RF Testing of Near-THz Sheet Beam TWTA** *Terahertz Science and Technology*
  Baig, A., Shin, Y., Barnett, L., Gamzina, D., Barchfeld, R., Domier, C., Wang, J., Luhmann, N. C.
  2011; 4 (4)

- **Scandia-added Tungsten Dispenser Cathode Fabrication for THz Vacuum Integrated Power Amplifiers** *Terahertz Science and Technology*
  Zhao, J., Li, N., Li, J., Gamzina, D., Baig, A., Barchfeld, R., Risbud, S., Luhmann, N. C.
  2011; 4 (4)

- **UV Lithography and Molding Fabrication of Ultrathick Micrometallic Structures Using a KMPR Photoresist** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*
  Shin, Y., Gamzina, D., Barnett, L. R., Yaghmaie, F., Baig, A., Luhmann, N. C.
  2010; 19 (3): 683–89

- **Micro-Fabricable Terahertz Sheet Beam Amplifier Integrated with Broadband Metamaterial Circuit**
  Shin, Y., Zhao, J., Baig, A., Gamzina, D., Barnett, L. R., Luhmann, N. C., IEEE
  IEEE.2010: 373–78

- **Terahertz vacuum electronic circuits fabricated by UV lithographic molding and deep reactive ion etching** *APPLIED PHYSICS LETTERS*
  Shin, Y., Barnett, L. R., Gamzina, D., Luhmann, N. C., Field, M., Borwick, R.
  2009; 95 (18)