

XUEYING LU

Assistant Professor of Physics (Joint Position)

Northern Illinois University
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Argonne National Laboratory
Advanced Photon Source & High Energy Physics
9700 S Cass Ave, Bldg. 360, Rm. L108
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EDUCATION

Massachusetts Institute of Technology (MIT), Cambridge, MA Sep 2012 – Nov 2018

Ph.D. in Physics

Doctoral dissertation: “Metamaterial Structures for High Power Microwaves and Accelerator Applications”

Supervisor: Dr. Richard J. Temkin

Tsinghua University, Beijing, China Sep 2008 – Jul 2012

B.S. in Engineering Physics

Bachelor dissertation: “Simulations on mega-electron-volt ultrafast electron diffraction (MeV UED)”

PROFESSIONAL EXPERIENCE

Northern Illinois University, DeKalb, IL & **Argonne National Laboratory**, Lemont, IL Aug 2020 – Present

Assistant Professor of Physics (with guest appointment in Electrical Engineering 2022- present)

- Normal-conducting radiofrequency structures, high-gradient acceleration, advanced accelerator concepts, terahertz structures, physics of beam-wave interaction, coherent synchrotron radiation, applications of compact accelerators

SLAC National Accelerator Laboratory, Menlo Park, CA Jan 2019 – Aug 2020

Postdoctoral Research Associate at Technology Innovation Directorate (TID)

Supervisors: Emilio A. Nanni, Sami G. Tantawi

- Accelerator structures for proton cancer therapy, compact high-efficiency X-band klystrons, Fabry-Perot superconducting resonator for quantum applications

MIT, Plasma Science and Fusion Center, Cambridge, MA Sep 2012 – Dec 2018

Graduate Research Assistant

Supervisors: Richard J. Temkin, Michael A. Shapiro

- Metamaterial structures for high-gradient wakefield acceleration, metamaterial-based high-power microwave sources, theoretical characterization of beam-wave interaction in advanced structures

Tsinghua University, Lab of Particle Accelerators, Beijing, China Sep 2011 – Jun 2012

Undergraduate Research Assistant

Supervisor: Dr. Wenhui Huang

- Beam simulations for a mega-electron-volt ultrafast electron diffraction (MeV UED) beamline

Shanghai Synchrotron Radiation Facility (SSRF), Shanghai, China Jul 2011 – Aug 2011

Undergraduate Summer Intern with Dr. Yongbin Leng

Tsinghua University, Lab of Nuclear Electronics, Beijing, China Oct 2009 – May 2011

Undergraduate Research Assistant to Dr. Cui Meng

HONORS AND AWARDS

Department of Energy, Early Career Award	2021
Featured headline, Department of Energy Office of Science University Research News	2021
Outstanding Self-financed Students Abroad, Chinese Department of Education	2019
CST University Publication Award, Dassault Systèmes	2018
Outstanding Student Poster, 2018 IEEE Advanced Accelerator Concepts Workshop (AAC'18)	2018
Finalist for Best Student Paper, 19 th International Vacuum Electronics Conference (IVEC'18)	2018
MIT Energy Initiative Fellowship	2012 – 2013

RESEARCH GRANTS

1. (PI) DOE Early Career Research Program, “Innovative High-Frequency Structures for High-Gradient Wakefield Acceleration”
08/01/2021 – 07/31/2026, \$750,000
2. (co-PI) DOE Research Opportunities in High Energy Physics, “Enabling High-Gradients Efficient Wakefield Accelerators with High-Quality Shaped Electron Bunches”
06/01/2021 – 05/31/2024, \$330,000 (NIU team), \$180,000 (IIT team)
Team members: Philippe Piot (PI, NIU), and Eric Wisniewski (IIT)
3. (PI) DOE Research Opportunities in High Energy Physics, “Experimental Understanding of Collective Beam Dynamics Guided by Fully Self-Consistent Simulation Models”
08/16/2023 – 08/15/2026, \$480,000 total, \$270,000 for the NIU PI
Team members: Ji Qiang (LBNL), Chengkun Huang (LANL), and John Power (ANL)
4. (co-PI) DOE Traineeship in Accelerator Science & Technology, “Chicagoland Accelerator Science Traineeship”
09/25/2019 – 09/24/2024, \$1.9 million (NIU and IIT combined)
Team members: Yagmur Torun (IIT), Pavel Snopok (IIT), Philippe Piot (NIU)

SUPERVISING

Current Group Members:

Omkar Ramachandran (Nov 2023 – present)	Postdoctoral researcher, NIU/ANL
Brendan Leung (Aug 2021 – present)	PhD candidate, NIU Physics
Dillon Merenich (Aug 2021 – present)	PhD candidate (Master’s thesis, June 2023), NIU Physics
Gaurab Rijal (Mar 2023 – present)	PhD candidate, NIU Physics
Salih Colmekci (Aug 2023 – present)	PhD candidate, NIU Physics
Zara Sheemanto (June 2023 – present)	Master’s student, NIU CAST program

Group Alumni:

Isaac Rodriguez (Jan 2024 – May 2024)	Undergraduate senior research, NIU Physics
Marc Crowell (Aug 2022 – Mar 2024)	Master’s thesis defended March 2024, NIU Physics
Morgan Turner (Spring 2022)	Master’s student, NIU Physics
BreAnna Blazier (Sep 2022 – May 2023)	Undergraduate student, NIU mechanical engineering
Ryan Jimenez (Sep 2022 – May 2023)	Undergraduate student, NIU mechanical engineering

Kunj Kordia (Sep 2022 – May 2023)	Undergraduate student, NIU mechanical engineering
Alex Ramos (Sep 2022 – May 2023)	Undergraduate student, NIU mechanical engineering
Bart Frey (Summer 2021)	Participant in NIU Research Experience for Teachers (RET)

PEER-REVIEWED JOURNAL ARTICLES

1. D. Merenich, Dillon Merenich, Brendan Leung, Gaurab Rijal, Xueying Lu, Scott Doran, Gongxiaohui Chen, Wanming Liu, Chunguang Jing, John Power, Charles Whiteford, Eric Wisniewski, “Breakdown insensitive acceleration regime in a metamaterial accelerating structure”, *Physical Review Accelerators and Beams* **27**, 041301 (2024).
2. S. S. Bulanov, *et al.*, “The science case for an intermediate energy advanced and novel accelerator linear collider facility”, *Journal of Instrumentation* **19**, T01010 (2024).
3. E. Nanni, *et al.*, “Status and future plans for C3 R&D”, *Journal of Instrumentation* **18**, P09040 (2023).
4. B. Freemire, J. Shao, S. Weatherly, M. Peng, E. Wisniewski, S. Doran, W. Liu, C. Whiteford, **X. Lu**, S. Poddar, E. Gomez, J. Power, and C. Jing, “Development of -band single-cell dielectric disk accelerating structures”, *Physical Review Accelerators and Beams* **26**, 071301 (2023).
5. H. Kong, M. Chung, D. S. Doran, G. Ha, S.-H. Kim, J.-H. Kim, W. Liu, **X. Lu**, J. Power, J.M. Seok, S. Shin, J. Shao, C. Whiteford, and E. Wisniewski, “Fabrication of THz corrugated wakefield structure and its high power test”, *Scientific Reports* **13**, 3207 (2023).
6. W. H. Tan, S. Antipov, D. S. Doran, G. Ha, C. Jing, E. Knight, S. Kuzikov, W. Liu, **X. Lu**, P. Piot, J. G. Power, J. Shao, C. Whiteford, and E. E. Wisniewski, “Demonstration of sub-GV/m accelerating field in a photoemission electron gun powered by nanosecond X-band radiofrequency pulses”, *Physical Review Accelerators and Beams* **25**, 083402 (2022).
7. F. Lemery, G. Andonian, S. Doebert, G. Ha, **X. Lu**, J. Power and E. Wisniewski, “Drive beam sources and longitudinal shaping techniques for beam driven accelerators”, *Journal of Instrumentation* **17**, P05036 (2022).
8. J. Picard, I. Mastovsky, M. A. Shapiro, R. J. Temkin, **X. Lu**, M. Conde, D. S. Doran, G. Ha, J. G. Power, J. Shao, E. E. Wisniewski, and C. Jing, “Generation of 565 MW of X -band power using a metamaterial power extractor for structure-based wakefield acceleration”, *Physical Review Accelerators and Beams* **25**, 051301 (2022).
9. **X. Lu**, Z. Li, V. Dolgashev, G. Bowden, A. Sy, S. Tantawi and E. Nanni, “A proton beam energy Modulator for rapid proton therapy”, *Review of Scientific Instruments* **92**, 024705 (2021).
10. **X. Lu**, J. F. Picard, M. A. Shapiro, I. Mastovsky, R. J. Temkin, M. Conde, J. G. Power, J. Shao, E. E. Wisniewski, M. Peng, G. Ha, J. Seok, S. Doran, and C. Jing, “Coherent high-power RF wakefield generation by electron bunch trains in a metamaterial structure”, *Applied Physics Letters* **116**, 264102 (2020).
11. **X. Lu**, M. A. Shapiro, I. Mastovsky, R. J. Temkin, M. Conde, J. G. Power, J. Shao, E. E. Wisniewski, and C. Jing, “Generation of high-power, reversed-Cherenkov wakefield radiation in a metamaterial structure”, *Physical Review Letters* **122**, 014801 (2019).
12. **X. Lu**, M. A. Shapiro, and R. J. Temkin, “Linear theory of instabilities generated by an electron beam in a metamaterial-loaded waveguide”, *Physics of Plasmas* **26**, 033104 (2019).
13. **X. Lu**, J. C. Stephens, I. Mastovsky, M. A. Shapiro, and R. J. Temkin, “High power long pulse microwave generation from a metamaterial structure with reverse symmetry”, *Physics of Plasmas* **25**, 023102 (2018).
14. J. S. Hummelt, **X. Lu**, H. Xu, I. Mastovsky, M. A. Shapiro, and R. J. Temkin, “Coherent Cherenkov-cyclotron

radiation excited by an electron beam in a metamaterial waveguide", *Physical Review Letters* **117**, 237701 (2016).

15. **Xueying Lu**, Michael A. Shapiro, and Richard J. Temkin, "Modeling of the interaction of a volumetric metallic metamaterial structure with a relativistic electron beam", *Physical Review Special Topics-Accelerators and Beams* **18**, 081303 (2015).

NON-PEER-REVIEWED ARTICLES

1. C. Geddes *et al.*, "Report of the Accelerator Frontier Topical Group 6 on Advanced Accelerator Concepts for Snowmass 2021", Snowmass 2021 Report (Community contributor)
2. S. Belomestnykh *et al.*, "RF Accelerator Technology R&D: Report of AF7-rf Topical Group to Snowmass 2021", Snowmass 2021 Report, <https://arxiv.org/abs/2208.12368>
3. X. Lu, *et al.*, "Advanced RF Structures for Wakefield Acceleration and High-Gradient Research", Snowmass 2021 White Paper, <https://arxiv.org/abs/2203.08374>
4. C. Jing, *et al.*, "Continuous and Coordinated Efforts of Structure Wakefield Acceleration (SWFA) Development for an Energy Frontier Machine", Snowmass 2021 White Paper, <https://arxiv.org/abs/2203.08275>
5. E. Nanni, *et al.*, "C³ Demonstration Research and Development Plan", Snowmass 2021 White Paper, <https://arxiv.org/abs/2203.09076>
6. M. Bai, *et al.*, "Strategies in Education, Outreach, and Inclusion to Enhance the US Workforce in Accelerator Science and Engineering", Snowmass 2021 White Paper, <https://arxiv.org/abs/2203.08919>
7. C. Benedetti, *et al.*, "Advanced accelerator linear collider demonstration facility at intermediate energy", Snowmass 2021 White Paper, <https://arxiv.org/abs/2203.08425>
8. John Power, *et al.*, "Research and Educational Opportunities at the Argonne Wakefield Accelerator (AWA) Facility", Letter of Interest, submitted to Snowmass 2021
9. Jiahang Shao, *et al.*, "Short-pulse wakefield structure R&D for high gradient and high efficiency acceleration in future large-scale machines", Letter of Interest, submitted to Snowmass 2021
10. Jiahang Shao, *et al.*, "SWFA demonstrators with integrated technologies for future largescale machines", Letter of Interest, submitted to Snowmass 2021
11. Nathan Cook, *et al.*, "Modeling Needs for Structure Wakefield Accelerators", Letter of Interest, submitted to Snowmass 2021
12. G. C. Blazey, *et al.*, "At Risk: University-based Accelerator Science and Education", Letter of Interest, submitted to Snowmass 2021

BOOK CHAPTERS

1. Michael A. Shapiro, Jason S. Hummelt, **Xueying Lu**, and Richard J. Temkin, "Experimental Hot Test of Beam/Wave Interactions with Metamaterial Slow Wave Structures", Chapter 10, in Book "High Power Microwave Sources and Technologies Using Metamaterials", edited by John W. Luginsland, Jason A. Marshall, Arje Nachman, and Edl Schamiloglu, ISBN: 978-1119384441, Wiley-IEEE Press; 1st edition (November 23, 2021)

CONFERENCE PROCEEDINGS

1. P. Piot, C. Chen, **X. Lu**, J. G. Power, E. E. Wisniewski, C. Jing, S. Kuzikov, and E. Frame, "Development of a Compact Light Source Using a Two-Beam-Acceleration Technique", Proceedings of the 67th ICFA Advanced Beam Dynamics Workshop on Future Light Sources (FLS2023), Lucerne, Switzerland

2. G. Chen, D. Doran, S. Kim, W. Liu, J. Power, C. Whiteford, E. Wisniewski, C. Jing, E. Knight, S. Kuzikov, E. Frame, **X. Lu**, and P. Piot, “Experimental Studies and Simulations for an X-Band Short-Pulse Ultra-High Gradient Photoinjector” , Proceedings of *the International Particle Accelerator Conference 2023 (IPAC 2023)*, Venice, Italy, 2023.
3. B. Leung, C. Phillips, S. Doran, J. Power, P. Piot, and **X. Lu**, “A W-Band Corrugated Waveguide for Wakefield Acceleration at the Awa Emittance Exchange Beamline”, Proceedings of *the International Particle Accelerator Conference 2023 (IPAC 2023)*, Venice, Italy, 2023.
4. D. Merenich, S. Doran, E. Wisniewski, C. Whiteford, J. Power, and **X. Lu**, “Design and test of a metamaterial accelerating structure for Wakefield acceleration”, Proceedings of *the International Particle Accelerator Conference 2023 (IPAC 2023)*, Venice, Italy, 2023.
5. S. Belomestnykh, and **X. Lu**, “Summary of Working Group 3: Laser and High-Gradient Structure-Based Acceleration”, in Proceedings of *AAC 2022*, Long Island, NY, IEEE (2023).
6. B. Leung, **X. Lu**, C. Phillips, P. Piot, D. S. Doran, and J. G. Power , “Design of a W-Band Corrugated Waveguide for Structure Wakefield Acceleration”, Proceedings of *NAPAC2022*, Albuquerque, NM, MOPA74
7. D. C. Merenich, **X. Lu**, J. G. Power, and D. S. Scott, “Design and Fabrication of a Metamaterial Wakefield Accelerating Structure”, Proceedings of *NAPAC2022*, Albuquerque, NM, WEYD4
8. W. Liu, G. Chen, D. S. Doran, S. Y. Kim, **X. Lu**, P. Piot, J. G. Power, C. Whiteford, and E. E. Wisniewski, “Update on the Development of a Low-Cost Button BPM Signal Detector at AWA”, Proceedings of *NAPAC2022*, Albuquerque, NM, TUPA28
9. C. Phillips, B. Leung, **X. Lu**, and P. Piot, “Wakefield Modeling in Sub-Thz Dielectric-Lined Waveguides”, Proceedings of *NAPAC2022*, Albuquerque, NM
10. G. Chen, D. S. Doran, C. Jing, S. Y. Kim, W. Liu, **X. Lu**, P. Piot, J. G. Power, C. Whiteford, E. E. Wisniewski, E.W. Knight, and S.V. Kuzikov, “An X-band Short-Pulse Ultra-High Gradient Photoinjector”, Proceedings of *NAPAC2022*, Albuquerque, NM, MOZE5
11. E. E. Wisniewski ,G. Chen, D.S. Doran, S.Kim, W. Liu, J.G. Power, C.Whiteford, **X. Lu**, D. Merenich, and F. Stulle, “High-Charge Transmission Diagnostics for Beam-Driven RF Structures”, Proceedings of *IPAC2022*, Bangkok, Thailand
12. W. H. Tan, **X. Lu**, P. Piot, S.P. Antipov, C. Jing, E. W. Knight, S. V. Kuzikov, D. S. Doran, G. Ha, C. Jing, W. Liu, J.G. Power, J. Shao, C. Whiteford, E.E. Wisniewski, “Commissioning of a High-Gradient X-Band RF Gun Powered by Short RF Pulses from a Wakefield Accelerator”, Proceedings of *IPAC2022*, Bangkok, Thailand
13. E. A. Frame, P. Piot S. Y. Kim, **X. Lu**, J. G. Power, D. S. Scott, E. E. Wisniewski, “Simulations of the Upgraded Drive-Beam Photoinjector at the Argonne Wakefield Accelerator”, Proceedings of *IPAC2022*, Bangkok, Thailand
14. J. Picard, **X. Lu**, M. Conde, D. S. Doran, G. Ha, C. Jing, I. Mastovsky, J. G. Power, J. Shao, M. A. Shapiro, R. J. Temkin, and E. E. Wisniewski, “Generation of 565 MW of X-Band Power for Structure-Based Wakefield Acceleration Using a Metamaterial-Based Power Extractor”, Proceedings of *2022 IEEE International Vacuum Electronics Conference (IVEC)*.
15. S. Kuzikov, S. Antipov, P. Avrakhov, E. Dosov, C. Jing, E. Knight, G. Ha, W. Liu, P. Piot, J. G. Power, D. Scott, J. Shao, E. Wisniewski, W. H. Tan, and **X. Lu**, “An X-band Ultra-High Gradient Photoinjector”, Proceedings of *IPAC 2021*, online, 2021.
16. E. I. Simakov, R. L. Fleming, D. V. Gorelov, M. Kirshner, J. W. Lewellen, M. E. Middendorf, M. E. Schneider, T. Tajima, **Xueying Lu**, E. A. Nanni, and S. Tantawi, “First C-Band High Gradient Cavity Testing Results

at LANL”, Proceedings of *IPAC 2021*, online, 2021.

17. J. Shao, S. Kuzikov, C. Jing, P. Piot, W.H. Tan, **X. Lu**, S. Doran, W. Liu, J. Power, C. Whiteford, and E. Wisniewski, “High-Power Test of a Highly Over-Coupled X-Band RF Gun Driven by Short RF Pulses”, Proceedings of *IPAC 2021*, online, 2021.
18. J. Shao, R. Agustsson, S. Kutsaev, A. Smirnov, **X. Lu**, and J. Power, “Development of a Pair of 182 GHz Two-Half Power Extractor and Accelerator for Short Pulse RF Breakdown Study”, Proceedings of *IPAC 2021*, online, 2021.
19. J. Picard, I. Mastovsky, M. A. Shapiro, R. J. Temkin, **X. Lu**, M. Conde, D. S. Doran, J. G. Power, J. Shao, E. E. Wisniewski, and C. Jing, “Generating 510 MW of X-Band Power for Structure-Based Wakefield Acceleration Using a Metamaterial-Based Power Extractor”, Proceedings of *IPAC 2021*, online, 2021.
20. B. Weatherford, M. Kemp, **X. Lu**, J. Merrick, E. Nanni, J. Neilson, A. Sy, and S. Tantawi, “Modular High Power RF Sources for Compact Linear Accelerator Systems”, Proceeding in the *2020 IEEE 21st International Conference on Vacuum Electronics (IVEC)*, online, 2021.
21. D. Liu, J. Shao, J. Power, S. Doran, **X. Lu**, H. Garich, S. Snyder, T. Hall, M. Inman and E. J. Taylor, “Precision Electrochemical Fabrication of Corrugated Waveguides”, Electrochemical Society (ECS) Meeting Abstracts, online, 2021
22. **X. Lu**, J. F. Picard, M. A. Shapiro, I. Mastovsky, R. J. Temkin, M. Conde, J. G. Power, J. Shao, E. E. Wisniewski, C. Jing, M. Peng, G. Ha, J. Seok, and S. Doran, “Experiments with Metamaterial-Based Metallic Accelerating Structures”, Proceedings of *North American Particle Accelerator Conf. (NAPAC'19)*, Lansing, MI, USA, 2019.
23. **X. Lu**, E. Nanni, Z. Li, V. Dolgashev, G. Bowden, A. Sy, and S. Tantawi, “Rapid Radio-Frequency Beam Energy Modulator for Proton Therapy”, Proceedings of *North American Particle Accelerator Conf. (NAPAC'19)*, Lansing, MI, USA, 2019.
24. **X. Lu**, M. A. Shapiro, I. Mastovsky, R. J. Temkin, M. Conde, J. G. Power, J. Shao, E. E. Wisniewski, and C. Jing, “A metamaterial wagon wheel structure for wakefield acceleration by reversed Cherenkov radiation”, *Proceedings of IPAC 2018*, Vancouver, BC, Canada, 2018.
25. **X. Lu**, J. C. Stephens, I. Mastovsky, M. A. Shapiro, and R. J. Temkin, “High power microwave generation by Cherenkov-cyclotron instability in a metamaterial structure with negative group velocity”, *2018 IEEE International Vacuum Electronics Conference (IVEC)*, Monterey, CA, 2018.
26. **X. Lu**, J. S. Hummelt, M. A. Shapiro, and R. J. Temkin, “Long pulse operation of a high power microwaves source with a metamaterial loaded waveguide”, *2017 IEEE International Vacuum Electronics Conference (IVEC)*, London, UK, 2017.
27. J. S. Hummelt, **X. Lu**, H. Xu, M. A. Shapiro, and R. J. Temkin, "High power microwave generation from a metamaterial waveguide", *2016 IEEE International Vacuum Electronics Conference (IVEC)*, Monterey, CA, 2016.
28. **X. Lu**, M. A. Shapiro, and R. J. Temkin, “Novel metallic structures for wakefield acceleration”, *North American Particle Accelerator Conf. (NAPAC'16)*, Chicago, IL, USA, 2016. JACOW, Geneva, Switzerland, 2017.
29. **X. Lu**, M. A. Shapiro, and R. J. Temkin, "Interaction of a volumetric metamaterial structure with an electron beam", *Proceedings of IPAC 2015*, Richmond, VA, 2015.

CONFERENCE AND WORKSHOP PRESENTATIONS

1. **Invited oral**, 2023 APS Prairie Section Fall Meeting | Columbia, OH 2023
“High-Gradient Acceleration with Short Pulses”

2. **Oral**, International Workshop on Breakdown Science and High Gradient Technology (HG2023) | Frascati, Italy 2023
“Test of a metamaterial accelerating structure”
3. **Invited oral**, Argonne Wakefield Accelerator Needs and Opportunities Workshop | Lemont, IL 2023
“Metamaterial structures”
4. **Invited oral**, HEP Early Career Network Summer 2023 Workshop | College Station, TX 2023
“HEP Early Career Awards in Accelerator R&D”
5. **Open-session remark**, at P5 (Particle Physics Project Prioritization Panel) Town Hall at Fermilab and Argonne | Lemont, IL 2023
“Advanced Accelerator Concepts for Future Colliders”
6. **Working group co-leader + Invited plenary**, 2022 IEEE Advanced Accelerator Concepts Workshop (AAC’22) | Hauppauge, NY 2022
“Breakdown Insensitive Acceleration Regime in Structure Wakefield Acceleration”
7. **Oral + Poster**, Community Summer Study (Snowmass Summer Meeting 2022) 2022
| Seattle, WA
“Advanced RF Structures for Wakefield Acceleration and High-Gradient Research”
8. **Travel grant**, 2022 PIC Math Interdisciplinary Data Science Workshop | Provo, UT 2022
9. **Invited oral**, International Workshop on Breakdown Science and High Gradient Technology (HG2022) | Online 2022
“Metamaterial Structures for High-Gradient Wakefield Acceleration”
10. **Invited plenary**, 2020 IEEE Advanced Accelerator Concepts Workshop (AAC’20) | Online 2021
“Advanced Structures for Accelerator and Radiation Applications”
11. **Invited plenary**, 2020 APS Prairie Section Fall Meeting | Online 2020
“Metamaterial Structures for High-Gradient Wakefield Acceleration”
12. **Invited oral**, 2019 North America Particle Accelerator Conf. (NAPAC’19) | Lansing, MI 2019
“Experiments with Metamaterial-Based Metallic Accelerating Structures”
13. **Oral**, 2019 North America Particle Accelerator Conf. (NAPAC’19) | Lansing, MI 2019
(Presented by Emilio A. Nanni)
“Rapid Radio-Frequency Beam Energy Modulator for Proton Therapy”
14. **Invited oral**, 2019 APS Division of Particles and Fields Meeting (DPF’19) | Boston, MA 2019
“Experiments with Metallic Metamaterial Structures for Wakefield Acceleration”
15. **Invited oral**, 2019 Advanced Linear Collider Study Group Workshop (ALEGRO’19) | CERN 2019
(Presented by Dr. John G. Power due to travel restrictions)
“Metamaterial Metallic Structure as Power Extractor and Collinear Accelerating structure”
16. **Invited oral**, Compact Linear Collider Workshop 2019 (CLIC’19) | CERN 2019
(Presented by Dr. Manoel Conde due to travel restrictions)
“A Metamaterial Structure for Wakefield Acceleration”
17. **Plenary oral & Poster**, 2018 IEEE Advanced Accelerator Concepts Workshop (AAC’18) 2018
| Breckenridge, CO
“High Microwave Power Extraction from a Metamaterial Structure for Wakefield Acceleration”

18. **Poster**, 9th International Particle Accelerator Conf. (IPAC'18) | Vancouver, BC, Canada 2018
"A Metamaterial Wagon Wheel Structure for Wakefield Acceleration by Reversed Cherenkov Radiation"
19. **Oral**, 19th International Vacuum Electronics Conference (IVEC'18) | Monterey, CA 2018
"High Power Microwave Generation by Cherenkov-Cyclotron Instability in a Metamaterial Structure with Negative Group Velocity"
20. **Poster**, 59th Meeting of APS Division of Plasma Physics (APS DPP'17) | Milwaukee, WI 2017
"Cherenkov-Cyclotron Instability in a Metamaterial Loaded Waveguide for High Power Generation"
21. **Oral**, 44th International Conference on Plasma Science (ICOPS'17) | Atlantic City, NJ 2017
"High Power Long Pulse Microwave Generation from a Metamaterial Based Backward Wave Oscillator"
22. **Keynote oral**, 18th International Vacuum Electronics Conf. (IVEC'17) | London, UK 2017
(Presented by Dr. Richard J. Temkin)
"Long Pulse Operation of a High Power Microwave Source with a Metamaterial Loaded Waveguide"
23. **Poster**, 2016 North American Particle Accelerator Conf. (NAPAC'16) | Chicago, IL 2016
"Novel metallic structures for wakefield acceleration"
24. **Oral**, Breakdown Science and High Gradient Accelerator Technology (HG'16) | Lemont, IL 2016
"Design of Metallic Subwavelength Structures for Wakefield Acceleration"
25. **Oral**, 2015 IEEE Pulsed Power Conference (PPC'15) | Austin, TX 2015
"Modelling of a Volumetric Metallic Metamaterial Structure and Its Interaction with a Relativistic Electron Beam"
26. **Poster**, 6th International Particle Accelerator Conf. (IPAC'15) | Richmond, VA 2015
"Interaction of a Volumetric Metamaterial with an Electron Beam"
27. **Oral**, 2014 Advanced Accelerator Concepts Workshop (AAC'14) | San Jose, CA 2014
"Design of a Metallic Coupled-Cavity Photonic Crystal / Metamaterial Structure with 3D Negative Dispersion"

SEMINAR TALKS

1. **Seminar**, on behalf of Beam Physics faculty, NIU Open House | DeKalb, IL 2024
2. **Seminar**, NIU Physics Colloquium Series | DeKalb, IL 2023
3. **Seminar**, on behalf of Beam Physics faculty, NIU Open House | DeKalb, IL 2023
4. **Seminar**, Los Alamos National Laboratory, Accelerator Division | Virtual 2023
5. **Seminar**, Department of Physics, Illinois Institute of Technology | Chicago, IL 2023
6. **Talk**, DOE management meeting, ANL monthly highlights | Virtual 2022
7. **Seminar**, the University of Chicago, Department of Physics | Virtual 2021
8. **Seminar**, Physics Colloquium at Northern Illinois University | DeKalb, IL 2021
9. **Talk + Poster**, US Department of Energy (DOE) review at ANL | Virtual 2021
10. **Talk**, DOE management meeting, ANL monthly highlights | Virtual 2021
11. **Seminar**, Physics Colloquium at Bard College | Virtual 2021
12. **Seminar**, Physics Colloquium at Northern Illinois University | DeKalb, IL 2020
13. **Seminar**, Argonne National Laboratory (ANL), Advanced Photon Source Seminar | Lemont, IL 2019
14. **Seminar**, Argonne National Laboratory (ANL), HEP Seminar | Lemont, IL 2019
15. **Seminar**, Tsinghua Univ., Department of Engineering Physics | Beijing, China 2018

16. **Seminar**, Peking Univ., School of Electronics Engineering & Computer Science | Beijing, China 2018
17. **Seminar**, Lawrence Berkeley National Laboratory (LBNL), Division of Accelerator Technology & Applied Physics (ATAP) | Berkeley, CA 2018
18. **Seminar**, SLAC National Accelerator Laboratory, Technology Innovation Directorate | Menlo Park, CA 2018
19. **Seminar**, Zhengzhou University, Department of Physics | Zhengzhou, China 2018
20. **Seminar**, Tsinghua University, Department of Engineering Physics | Beijing, China 2017
21. **Seminar**, Peking Univ., School of Electronics Engineering & Computer Science | Beijing, China 2017
22. **Seminar**, Huazhong Univ. Science and Technology, Dep. Electrical Engineering | Wuhan, China 2017
23. **Workshop**, MIT Path of Professorship Workshop | Cambridge, MA 2017
24. **Seminar**, Multidisciplinary University Research Initiatives (MURI) Program Teleseminar 2017
25. **Seminar**, MIT Plasma Science and Fusion Center Student Seminar 2017
26. **Seminar**, Multidisciplinary University Research Initiatives (MURI) Program Teleseminar 2017
27. **Seminar**, Multidisciplinary University Research Initiatives (MURI) Program Teleseminar 2016
28. **Seminar**, MIT Plasma Science and Fusion Center Student Seminar 2016
29. **Seminar**, MIT Plasma Science and Fusion Center Student Seminar 2015

TEACHING

NIU Physics Undergraduate Course “Fundamentals of Physics II: Electromagnetism” PHYS273	Spring 2023, Spring 2024
NIU Physics Graduate Course “Special Problems in Physics” PHYS659	Fall 2021, Spring 2022, Fall 2022
US Particle Accelerator School (USPAS) “Fundamentals of Accelerator Physics and Technology with Simulations and Measurements Lab” Co-instructors: Pavel Snopok (IIT), Diktys Stratakis (Fermilab)	June 2022
NIU Physics Graduate/Undergraduate Course “Introduction to Plasma Physics” PHYS459/790	Spring 2022
Guest Lecture, NIU Electrical Engineering Graduate Seminar (ELE691)	Spring 2022, Spring 2023
Invited Lecture, Chicagoland Accelerator Science Traineeship (CAST) lecture series “Accelerator Cavities”	2021
Blackboard Ultra Transition Academy at NIU	2023
Association of College and University Educators (ACUE) Effective Teaching Practices Program	2020
MIT Kaufman Teaching Certificate	2018

OUTREACH

NIU point of contact as the host for the US Particle Accelerator School (USPAS)	2022 – present
Poster judge, 15 th International Particle Accelerator Conference (IPAC'24)	2024

Co-speaker, NIU STEM Café (public lecture series)	2023
“Fusion Energy: A Clean Energy Source for the Future?”	
APS Career Mentoring Fellow	2023 – 2024
NIU STEM Fest volunteer, physics demonstrations open to the public	2023
Panelist, APS Conference for Undergraduate Women in Physics (CUWiP) at ANL	
“Career in National Labs”	2023
Interview and news article with the ANL Work Planning and Control (WPC)	
“Argonne Wakefield Acceleration Student Becomes the Teacher”	2022
Panelist, NIU Building Engagement in Laboratories, Networking and Peer Groups (BELONG) in STEM	
“The importance of undergraduate research and making connections with faculty”	2021
Mentor, NIU Research Experience for Undergraduates and Teachers (REU/RET)	2021
Panelist, Women in Science and Engineering (WiSE) panel discussion, at 2019 North America Particle Accelerator Conf. (NAPAC’19)	2019

ACADEMIC SERVICES

Editorial Service

IEEE Transactions for Plasma Science
Senior Editor (Apr. 2024 – present), Guest Editor (Dec. 2023–Apr. 2024)
Topical area: Microwave Generation & Microwave Plasma Interaction

Scientific Committees

Scientific Advisory Board, 16 th International Particle Accelerator Conference (IPAC’25)	2024 – 2025
Scientific Advisory Board, 15 th International Particle Accelerator Conference (IPAC’24)	2023 – 2024
Organizing (and Local Organizing) Committees, 21 st Advanced Accelerator Concepts (AAC’24)	2023 – 2024
Co-convenor and proceedings editor, 20 th Advanced Accelerator Concepts Workshop (AAC’22)	2023
Organizing committee, Chicagoland Accelerator Science Traineeship (CAST) review meeting	2022

Journal Referee

IEEE Transactions on Electron Devices
Review of Scientific Instrument
Physics of Plasmas
Journal of Applied Physics
Applied Physics Letters
Matter and Radiation at Extremes
Journal of Instrumentation
Nuclear Instruments and Methods in Physics Research A
IEEE Transactions on Nuclear Science
IEEE Transactions on Plasma Science
Instruments
Photonics
Proceedings of International Particle Accelerator Conference

Proposal Reviewer

Department of Energy SBIR/STTR Program

Department of Energy HEP US-Japan Science and Technology Cooperation Program

Department of Energy GARD University Program

Services at NIU

Faculty Merit Review Committee, NIU Department of Physics	2023 – 2024
Chair Re-Appointment Committee, NIU Department of Physics	2023
Undergraduate Award Committee, NIU Department of Physics	2023 – present
Dean's Designee for the PhD Dissertation Defense of Lingzhe Fang (NIU Chemistry)	2024
Master's Thesis Committee for Kaela Villafania (NIU Physics)	2024
PhD Progress Review Committee for David Tinoco (NIU Physics)	2023 – present
Graduate Admission Committee, NIU Department of Physics	2021, 2022
Chair, NIU Physics Colloquium Committee	2021 – 2023
Search Committee for accelerator faculty at NIU Department of Physics	2021 – 2022
Search Committee for high energy physics faculty at NIU Department of Physics	2022
Organizing Committee for NIU Department of Physics Open House	2021
Master's Thesis Committee for Sarah Choate (NIU Physics)	2023
PhD Thesis Committee for Osama Mohsen (NIU Physics)	2021
PhD Thesis Committee for Wei Hou Tan (NIU Physics)	2022
Master's Thesis Committee for Cassie Philipps (NIU Physics)	2022
PhD Progress Review Committee for Wei Hou Tan (NIU Physics)	2022
PhD Progress Review Committee for Ben Simons (NIU Physics)	2022

Services at ANL

ANL High Energy Physics (HEP) Division Diversity, Equity and Inclusion (DEI) Committee	2024
ANL Postdoctoral Mentor for Osama Mohsen	2024 – present
Argonne Accelerator Institute Steering Committee	2021 – present