Andrea Nicole Sajewski
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Education

- **University of Pittsburgh** — Aug 2019 - Dec 2025 (expected)
  Ph.D. candidate in Bioengineering
- **Duquesne University** — Aug 2015 - May 2019
  B.S. in Biomedical Engineering, Mathematics — *GPA: 3.98*

Awards and Fellowships

- **ISMRM Magna Cum Laude Merit Award,** International Soceity for Magnetic Resonance in Medicine, 2023
- **Bioengineering in Psychiatry T32 Fellowship,** National Institutes of Health, 2021
- **Graduate Research Fellowship,** National Science Foundation, 2019
- **ARCS Scholar,** ARCS Foundation Pittsburgh Chapter, 2019
- **Honors Fellow,** Duquesne University, 2019
- **General Excellence in Mathematics Award,** Duquesne University, 2019
- **General Excellence in Biomedical Engineering Award,** Duquesne University, 2019

Research Experience

- **Graduate Research Assistant** — University of Pittsburgh
  Advisor: Dr. Tamer Ibrahim — *Aug 2019 - present*
  - Designed and built novel radiofrequency transmit coils for 7T neuro MRI, including RF simulation and optimization, implementation and validation of the finalized coil, now used for over 1800 in vivo scans
  - Implemented capacitor model in finite-difference time-domain software for accurate simulation of RF coils
  - Developed multi-model, multi-ROI RF shimming strategy for coil optimization, allowing for robust and homogeneous B_1^+ for 7T neuro MRI
  - Investigated the impact of B_1^+ efficiency and homogeneity on MR imaging and spectroscopy using custom and commercial RF coils
  - Contributed to over 30 NIH funded research studies by scanning participants for over 150 hours per year
- **Undergraduate Research Assistant** — Duquesne University
  Advisor: Dr. Stacey Levine — *Jan 2017 - May 2019*
  - Utilized active contour image processing to segment MR images and T2* maps to aid in quantification of hepatic iron content
- **Pediatric Oncology Education Program** — St. Jude Children's Research Hospital
  Advisors: Dr. Claudia Hillenbrand and Dr. Ralf Loeffler — *May 2017 - Aug 2017*
  - Developed simulations and extracted data from phantom scans and clinical studies to optimize scan time and curve fitting techniques for T2* MRI
- **Undergraduate Research Assistant** — Duquesne University
  Advisor: Dr. John Viator — *Oct 2015 - May 2017*
  - Modified photoacoustic flow cytometry system for detection of metastatic melanoma and identification of bacterial infection

Publications

Refereed Journal Articles

- **A. Sajewski,** T. Santini, A. DeFranco, J. Berardinelli, H. Jin, J. Li, C. Chu, J. Berardo, T.S. Ibrahim. "RF shimming strategy for an open 60-channel RF transmit 7T MRI head coil for routine use on the single transmit mode." *Magnetic Resonance in Medicine*, May 2025.
- A. Gildengers, T.S. Ibrahim, X. Zeng, H.J. Aizenstein, S.K. Alkhateeb, S.J. Anderson, C. Chu, J. Diaz, J.E. Emanuel, T.K. Karikari, J. Li, O.L. Lopez, B.J. Lopresti, S.K. Royse, **A. Sajewski**, T. Santini, A.M. Weinstein, M. Wu, M.A. Butters. "The LATTICE Study: Design of a pilot feasibility randomized controlled trial of lithium to delay cognitive decline in mild cognitive impairment." *Alzheimer's & Dementia: Translational Research & Clinical Interventions*, June 2025
- T. Santini, C. Chen, W. Zhu, J. Liou, E. Walker, S. Venkatesh, N. Farhat **A. Sajewski**, S. Alkhateeb, M. Saranathan, Z. Xia, T.S. Ibrahim. "Hippocampal subfields and thalamic nuclei associations with clinical outcomes in multiple sclerosis: an ultrahigh field MRI study." *Multiple Sclerosis and Related Disorders,* Feb 2024.
- J.A. Viator, M. Hazur, **A. Sajewski**, A. Tarhini, M.E. Sanders, R.H. Edgar. "Photoacoustic detection of circulating melanoma cells in late stage patients." *Journal of Innovative Optical Health Sciences,* Aug 2020.

- R. Edgar, J. Cook, C. Noel, A. Minard, **A. Sajewski**, M. Fitzpatrick, R. Fernandez, J.D. Hempel, J.A. Kellum, J.A. Viator. "Bacteriophage Mediated Identification of Bacterial Infection Using Photoacoustic Flow Cytometry." *Journal of Biomedical Optics,* Nov 2019.
- A. Tipirneni-Sajja, R.B. Loeffler, A.J. Krafft, **A. Sajewski**, R.J. Ogg, J.S. Hankins, C.M. Hillenbrand. "Ultrashort Echo Time Imaging for Quantification of Hepatic Iron Overload: Comparison of Acquisition and Fitting Methods via Simulations, Phantoms, and In vivo Data." *Journal of Magnetic Resonance Imaging,* Oct 2018.

Refereed Conference Proceedings

- **A. Sajewski**, J. Li, T. Santini, T. Campos, L. Wang, T.S. Ibrahim. "RF shimming methods for optimizing $B_1{}^+$ homogeneity and SAR reduction for a high channel density transmit array at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2025.*
- **A. Sajewski**, T. Santini, A. DeFranco, W. Salmon, C. Chu, J. Berardo, J. Berardinelli, H. Jin, J. Li, T. Campos, B. de Almeida, T.S. Ibrahim. "Comparison of the 60 Tx/32 Rx Tic-Tac-Toe RF head coil to the Nova 1 Tx/32 Rx RF coil in sTx mode at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2025.*
- H. Jin, T. Santini, **A. Sajewski**, J. Berardinelli, J. Li, C. Chu, B. de Almeida, T. Campos, J. Liou, A. DeFranco, H. Aizenstein, T.S. Ibrahim. "Design and implementation of a 1H/31P dual-tuned head coil at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2025.*
- J. Li, **A. Sajewski**, T. Santini, T.S. Ibrahim. "High Resolution TSE Image Synthesis Using Denoising Diffusion Models Trained on 7T Image Pairs: Application for Hippocampal Subfield Analysis." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2025.*
- T. Santini, J. Li, J. Emanuel, J. Liou, **A. Sajewski**, C. Chu, B. de Almeida, B. Lopresti, H. Aizenstein, M. Wu, A. Gildgengers, T.S. Ibrahim. "Associations of gray matter volume and white matter hyperintensity mean diffusivity and volume with PiB status in mild cognitive impairment." *Proc. Alzheimer's Association International Conference 2024.*
- T. Santini, C. Chen, W. Zhu, J. Liou, E. Walker, S. Venkatesh, N. Farhat, **A. Sajewski**, S. Alkhateeb, M. Saranathan, Z. Xia, T.S. Ibrahim. "Hippocampal subfields and thalamic nuclei associations with clinical outcomes in multiple sclerosis: An ultrahigh field MRI study." *Proc. Alzheimer's Association International Conference 2024.*
- J. Berardinelli, J. Li, N. Farhat, J. Liou, **A. Sajewski**, T. Santini, M. Wu, J. Mettenburg, H. Aizenstein, M. Ikonomovic, J. Kofler, T.S. Ibrahim. "Advancements in High-Resolution MRI Postmortem brain imaging: Histological examination on cells exclusively exhibiting White Matter Hyperintensities made possible using a novel, 3D printed, resuable, imaging container and cutting guide." *Proc. Alzheimer's Association International Conference 2024.*
- T.S. Ibrahim, T. Santini, N. Farhat, S. Alkhateeb, **A. Sajewski**, E. Diniz, J. Berardinelli, J. Li, H. Jin, R. Chu, J. Liou, B. de Almeida, A. DeFranco, W. Salmon, J. Berardo. "7 Tesla Brain MRI: A Paradigm Shifting Technology for Clinical Research in Aging and Dementia Science." *Proc. Alzheimer's Association International Conference 2023.*
- **A. Sajewski,** T. Santini, A. DeFranco, B. Keil, H. Jin, J. Berardinelli, J. Li, C. Chu, T. Martins, T.S. Ibrahim. "An Open 60-channel Tx/32-channel Rx RF Coil System for Routine Use at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2023.*
- **A. Sajewski,** T. Santini, T. Martins, J. Berardinelli, T.S. Ibrahim. "Comparison of the Optimization of a 60-channel Transmit Coil in pTx and sTx mode at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2023.*
- H. Jin, **A. Sajewski,** T. Santini, T. Martins, J.P. Berardinelli, A. DeFranco, H.J. Aizenstein, T.S. Ibrahim. "Investigating the impact of head position on the spatial distribution of B_1^+ field for a 60-ch Tx coil at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2023.*
- J.P. Berardinelli, J. Kofler, J. Li, O. Flaugh, N. Farhat, T. Santini, **A. Sajewski,** N. Schweitzer, J. Mettenburg, M. Ikonomovic, H.J. Aizenstein, T.S. Ibrahim. "Postmortem Imaging with Reusable 3D Printed Ex Vivo Brain Enclosures/Cutting Guide for MRI Registration with Gross Anatomy Photographs at 7T." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2023.*
- **A. Sajewski,** T. Santini, A. DeFranco, T. Martins, J. Berardinelli, H. Aizenstein, T.S. Ibrahim. "Impact of Coupling on the B_1^+ Field Produced by a 15-panel Tic-Tac-Toe RF Array." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2022.*
- **A. Sajewski,** T. Santini, M. Saich, T.S. Ibrahim. "Development of a Microstrip Tx Coil Module for 7T MRI." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2021.*
- T. Santini, A. DeFranco, T. Martins, N. Vinjamuri, **A. Sajewski,** T.S. Ibrahim. "A 28-channel decoupled Tic-Tac-Toe transmit radiofrequency coil for 7T MRI." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2021.*
- N. Farhat, J. Kofler, J. Berardinelli, M. Stauffer, T. Santini, N. Vinjamuri, **A. Sajewski,** S. Alkhateeb, T. Martins, N. Schweitzer, H.J. Aizenstein, T.S. Ibrahim. "Reusable 3D printed enclosure with integrated cutting guides for the alignment of ex-vivo MRI with ex-vivo gross brain photographs." *Proc. International Society for Magnetic Resonance in Medicine Annual Meeting 2021.*
- R.H. Edgar, C. Noel, A. Minard, R. Fernandez, M. Fitzpatrick, **A. Sajewski,** J. Cook, J.D. Hempel, J.A. Kellum, J.A. Viator. "Identification of MRSA infection in blood using photoacoustic flow cytometry." *Proc. SPIE 10878, Photons Plus Ultrasound: Imaging and Sensing 2019*, Feb 2019.

Patents

- H.S. Qin, E. De Leon, F.J.L. Robb, **A. Sajewski,** C.D. Stack, L.J. Vannatta, M. Giancola, V. Taracila. "Systems and methods for an abdominal radio frequency coil for MR imaging." US Patent No. 11,519,979 filed Feb 27, 2019, issued Dec 6, 2022.

Presentations

- International Society for Magnetic Resonance in Medicine Annual Meeting 2025, traditional poster. "RF shimming methods for optimizing B_1^+ homogeneity and SAR reduction for a high channel density transmit array at 7T." May 2025.
- International Society for Magnetic Resonance in Medicine Annual Meeting 2025, digital poster. "Comparison of the 60 Tx/32 Rx Tic-Tac-Toe RF head coil to the Nova 1 Tx/32 Rx RF coil in sTx mode at 7T." May 2025.
- International Society for Magnetic Resonance in Medicine Annual Meeting 2023, oral presentation. "An Open 60-channel Tx/32-channel Rx RF Coil System for Routine Use at 7T." June 2023.
- International Society for Magnetic Resonance in Medicine Annual Meeting 2023, digital poster. "Comparison of the Optimization of a 60-channel Transmit Coil in pTx and sTx mode at 7T." June 2023.
- In Vivo Magnetic Resonance Gordon Research Conference, oral presentation. "Anti-claustrophobic 7T Tic-Tac-Toe RF Coil System with 60/32 Transmit/Receive Channels." July 2022.
- In Vivo Magnetic Resonance Gordon Research Seminar and Gordon Research Conference, poster. "Anti-claustrophobic 7T Tic-Tac-Toe RF Coil System with 60/32 Transmit/Receive Channels." July 2022.
- International Society for Magnetic Resonance in Medicine Annual Meeting 2022, digital poster. "Impact of Coupling on the B1+ Field Produced by a 15-panel Tic-Tac-Toe RF Array." May 2022.
- International Society for Magnetic Resonance in Medicine Annual Meeting 2021, virtual poster. "Development of a Microstrip Tx Coil Module for 7T MRI." May 2021.
- University of Pittsburgh Bioengineering Department Graduate Poster Symposium, digital poster. "Recent Advances in Radiofrequency Coil Designs and Applications for Ultra-high Field Human MRI." Feb 2021, 2022.
- Duquesne University Undergraduate Research Symposium, oral presentation. "Quantifying Iron Overload using MRI, Active Contours, and Convolutional Neural Networks." Apr 2019.
- Society of Women Engineers national conference, Collegiate Poster Competition. "Active Contour Image Segmentation for Automated MRI Quantification of Liver Iron Content." Oct 2018.
- St. Jude Children's Research Hospital Pediatric Oncology Education Program, Lunch and Learn talk. "Optimizing MRI-based Hepatic Iron Quantification via Simulations, Phantoms and Patient Data." Jul 2017.
- Council on Undergraduate Research, Posters on the Hill. "Photoacoustic Flow Cytometry using Bacteriophage for Rapid Identification of Bacterial Infection." Apr 2017.
- Mathematics Association of America section meeting, Student Talk. "Linear Transforms and Sparse Representations for Processing Medical Image Data." Apr 2017.
- Society of Women Engineers local conference, Collegiate Poster Competition. "Photoacoustic Flow Cytometry using Bacteriophage for Rapid Identification of Bacterial Infection." Feb 2017.
- Duquesne University Undergraduate Research Symposium, oral presentation. "Design and Analysis of Multiplexed Photoacoustic Flow Cytometry System for Early Detection of Metastatic Melanoma." Jul 2016.

Professional Experience

- **Teaching Assistant** — University of Pittsburgh
  BIOENG 2170: Clinical Bioengineering — *Spring 2022*
  - Assessed SolidWorks assignments
- **Teaching Assistant** — University of Pittsburgh
  BIOENG 1005/2005: RF Medical Devices — *Fall 2020*
  - Gave a lecture on MRI phantom development
  - Graded homework assignments and projects, held office hours, and led a laboratory session
- **Teaching Assistant** — University of Pittsburgh
  BIOENG 1150: Bioengineering Methods and Applications — *Spring 2020*
  - Led laboratory sessions on RF imaging and graded lab reports
- **Engineering Intern** — GE Healthcare
  Healthcare Imaging MR Coils Division — *May - Aug 2018*
  - Created coil configuration files for all GE legacy coils for Lifecycle testing
  - Programmed infrared camera acquisition and analysis software for automated surface temperature test fixture

Leadership and Involvement

- **International Society for Magnetic Resonance in Medicine,** Member
  - Trainee Representative for the MR Engineering Study Group, 2024
    - Organized Trainee Poster Competition for the 2025 annual meeting
    - Created newsletters for the study group email list
  - Helped organize the Women of ISMRM networking event at the 2025 annual meeting
  - Member of the ISMRM Inclusion Working Group
  - Abstract reviewer for the ISMRM 2024, 2025 Annual Meetings
  - Annual Meeting Educational Stipend recipient, 2021-2023
- **Graduate Women in Engineering Network,** University of Pittsburgh, President
  - Planned and moderated a Graduate Women in STEM panel of invited guests from industry and academia
  - Organized social and professional development events for women graduate students
  - Coordinated Women's Mentoring Lunches with visiting faculty in the School of Engineering
  - Led a peer mentoring group of students from various departments
- **Bioengineering in Psychiatry Training Program,** University of Pittsburgh, Student Leader
  - Facilitated communication between T32 trainees, scholars and Program Directors
  - Helped determine speakers for Bioengineering in Psychiatry Seminar Series and promoted talks
  - Assisted with coordinating BIOENG 2028 Bioengineering in Psychiatry course
  - Organized Meet & Greet event for current trainees, mentors, and prospective students
  - Assisted with paperwork for T32 grant renewal
- **MRI Together,** ESMRMB, Moderator
  - Moderated the session "MRI Hardware for Everyone" for the 2022 workshop
- **Ingenium: Journal of Undergraduate Research,** University of Pittsburgh, Reviewer
  - Reviewed manuscripts submitted by undergraduate students in the Swanson School of Engineering for the 2022 - 2025 issues of *Ingenium*
- **Society of Women Engineers,** Pittsburgh Professional Section, Member
  - Reviewed abstracts for Collegiate Research Competition for the 2024 WE Local conferences
  - Volunteered at outreach events at local schools and in the community
  - Presented a talk on biomedical engineering to a local high school Women in Engineering club
- **Society of Women Engineers,** Duquesne University Collegiate Section, President
  - Initiated a mentorship program to pair freshmen members with an upperclassmen mentor
  - Selected for the SWE Collegiate Leadership Institute at the WE18 annual conference
- **START-Play Hackers,** Duquesne University, Vice President
  - Adapted electronic toys for children with disabilities by modifying circuits
  - Taught a soldering workshop at a campus Build-a-Thon and for outreach events at Pittsburgh area public schools
- **Biomedical Engineering Society,** Duquesne University Student Chapter, Vice President
- **Pi Mu Epsilon Mathematics Honor Society,** Duquesne University Chapter, President
- **Omicron Delta Kappa Honor Society,** Duquesne University Circle, Secretary; ODK Foundation Scholarship Recipient

Technical Skills

- **Programming**: Proficient in MATLAB, familiar with Python, R, C++ **Software**: SolidWorks, Fusion360, Prism, LabVIEW **Skills**: MRI of human subjects, electromagnetic simulation, MRI coil configuration file generation, image processing, 3D printing

Relevant Coursework

- **Undergraduate**: Intro to Biomedical Imaging, Signals and Systems, Biomedical Electronics and Instrumentation I & II, Engineering Computation I & II
- **Graduate**: RF Medical Devices, Biomedical Image Analysis, Artificial Intelligence Applications in Bioengineering, Optimization Methods, Statistical Foundations of Bioinformatics, Cognitive Neuroscience, Pyschopathology, Neurobiology of Disease