Calder D. **Sheagren**

Ph.D. Candidate - Cardiovascular Magnetic Resonance Imaging

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Education

University of Toronto — *Toronto, ON, Canada*

Ph.D. in Medical Biophysics, Supervisor: Graham Wright — *Sep 2020 - May 2025 (Expected)*

Project: Evaluation of MRI Methods for Ventricular Radio-Frequency Ablation Planning in Patients with Implantable Cardioverter-Defibrillators

University of Chicago — *Chicago, IL, USA*

B.S. in Mathematics with Honors, Supervisor: Erik Shirokoff — *Sep 2016 - Jun 2020*

Project: Atomic Layer Deposition Titanium Nitride and Niobium Nitride for Microwave Kinetic Inductance Detectors

Publications

First-Author Publications

Calder D. Sheagren, Naseem Shadafny, Terenz Escartin, Maria Terricabras, Christopher C. Cheung, Idan Roifman, and *Graham A. Wright*, "Cardiac Function Evaluation in Healthy Volunteers and Patients with Implantable Cardioverter-Defibrillators using High-Bandwidth Spoiled Gradient-Echo Cine". Journal of Cardiovascular Magnetic Resonance (In Press, 2025)

Calder D. Sheagren, Terenz Escartin, Jaykumar H. Patel, Jennifer Barry, and *Graham A. Wright*, "Automated Fibrosis Segmentation from Wideband Post-Contrast T_1^* Mapping in an Animal Model of Ischemic Heart Disease with Implantable Cardioverter-Defibrillators". Magnetic Resonance in Medicine 93:2401-2413 (2025). doi:10.1002/mrm.30468

Calder D. Sheagren, Brenden T. Kadota, Jaykumar H. Patel, Mark Chiew, and *Graham A. Wright*, "Accelerated Cardiac Parametric Mapping using Deep Learning-Refined Subspace Models". In: O. Camara et al, Statistical Atlases and Computational Models of the Heart. Regular and CMRxRecon Challenge Papers. STACOM 2023. Lecture Notes in Computer Science, vol 14507. Springer, Cham. (2024)
`https://doi.org/10.1007/978-3-031-52448-6_35`

Calder D. Sheagren, Tianle Cao, Jaykumar H. Patel, Zihao Chen, Hsu-Lei Lee, Nan Wang, Anthony G. Christodoulou, and *Graham A. Wright*, "Motion-Compensated T_1 Mapping in Cardiovascular Magnetic Resonance Imaging: A Technical Review." Front. Cardiovasc. Med. 10:1160183. (2023) doi:10.3389/fcvm.2023.1160183

Calder Sheagren, Peter Barry, *Erik Shirokoff*, and Qing Yang Tang, "Atomic Layer Deposition Niobium Nitride Films for High-Q Resonators", Journal of Low Temperature Physics 199, 875–882 (2020). `https://doi.org/10.1007/s10909-020-02336-2`

Collaborating-Author Publications

Nikki van Pouderoijen, Luuk H.G.A. Hopman, Terenz Escartin, **Calder Sheagren**, Philippe J. van Rosendael, Cornelis P. Alaart, Mark B.M. Hofman, Graham Wright, and *Marco Götte*, "Visualization of Acute Atrial Injury Post-Ablation Using Contrast-Enhanced T1-Weighted Short Inversion Time MRI". Heart Rhythm (In Press, 2025)

Claudia Prieto, Mahmud Mossa-Basha, Anthony Christodoulou, **Calder D. Sheagren**, Yin Guo, Aleksandra Radjenovic, Xihai Zhao, Jeremy D. Collins, René M. Botnar, and *Oliver Wieben*, "Highlights of the 2024 Society of Magnetic Resonance Angiography Meeting". Journal of Cardiovascular Magnetic Resonance 101878 (2025)

Moujan Saderi, Jaykumar H. Patel, **Calder D. Sheagren**, Judit Csöre, Trisha L. Roy, and *Graham A. Wright* , "3D CT to 2D X-ray image registration for improved visualization of tibial vessels in endovascular procedures", International Journal of Computer Assisted Radiology and Surgery (2025)
`https://doi.org/10.1007/s11548-024-03302-z`

Xinrui Guo, Liwen Li, **Calder Sheagren**, Jaykumar Patel, Graham Wright, and *Fumin Guo*, "Accelerated Reconstruction of Highly Undersampled Cardiac MR Image Navigators", SPIE Medical Imaging (2024).
`https://www.spiedigitallibrary.org/conference-proceedings-of-spie/12926/129260C/Accelerated-reconstruction-of-highly-undersampled-3D-cardiac-MRI-image-navigators/10.1117/12.3006138.full`

Gregor G. Taylor, Dmitry V. Morozov, Ciaran T. Lennon, Peter S. Barry, **Calder Sheagren**, and *Robert H. Hadfield* , "Infrared single-photon sensitivity in atomic layer deposited superconducting nanowires", Applied Physics Letters 118, 191106 (2021) `https://doi.org/10.1063/5.0048799`

Conference Presentations

First-Author Presentations

Sequential CMR Imaging in a Nonischemic Cardiomyopathy Patient with an ICD Before and After Radio-Frequency Ablation — *Washington, DC 2025*

Calder Sheagren, Terenz Escartin, Nasim Shadafny, Maria Terricabras Casas, Stephanie Poon, Idan Roifman, Graham Wright, and *Christopher Cheung* — *Rapid-Fire Case*

Society of Cardiovascular Magnetic Resonance Meeting

Quantitative Fibrosis Analysis using Wideband Post-Gd T1* Mapping in Pigs with CIEDs — *Santiago, Chile 2024*

Calder D. Sheagren, Terenz Escartin, Jaykumar Patel, Melissa Larsen, Jennifer Barry, and *Graham Wright* — *Oral Power Pitch*

Society of Magnetic Resonance Angiography Meeting

Preclinical Validation of Arrhythmia Substrate Characterization with Wideband Motion-Corrected Phase-Sensitive LGE — *Quebec City, Canada 2024*

Calder D. Sheagren, Terenz Escartin, Jaykumar Patel, Melissa Larsen, Jennifer Barry, Kelvin Chow, Xiaoming Bi, and *Graham Wright* — *Poster*

ISMRM Motion Correction Workshop

SyntheticLGE.jl: An Open-Source Toolbox for Retrospective T1 Fitting and Synthetic LGE Image Generation — *Singapore - 2024*

Calder Sheagren, Brandon Tran, Jaykumar Patel, Angus Lau, and *Graham Wright* — *Digital Poster*

International Society of Magnetic Resonance in Medicine Meeting

Quantifying Cardiac Function in the Presence of Implantable Cardioverter Defibrillators with Cardiovascular Magnetic Resonance Imaging: Evaluation in Healthy Volunteers — *San Diego, CA - 2023*

Calder Sheagren, Xiuling Qi, Idan Roifman, and *Graham Wright* — *Rapid Fire Pitch*

Society of Cardiovascular Magnetic Resonance Meeting

A Minimal Cardiac MRI Protocol for Catheter Ablation Planning in Patients with Cardiac Implantable Electronic Devices — *Los Angeles, CA - 2022*

Calder Sheagren, Terenz Escartin, Philippa Krahn, Judi Paulson, Melissa Larsen, Martin Janich, Idan Roifman, and *Graham Wright* — *Oral Power Pitch*

Society of Magnetic Resonance Angiography Meeting

Validation of Automated Topological LGE Thresholding for Peri-Infarct Substrate Characterization — *London, UK - 2022*

Calder Sheagren, Terenz Escartin, Philippa Krahn, Jaykumar Patel, Fumin Guo, and *Graham Wright* — *Oral Presentatation*

International Society of Magnetic Resonance in Medicine Meeting

Fully-Automated LGE Thresholding using Weighted Total Variation Denoising and Persistent Homology — *Virtual - 2022*

Calder Sheagren, Terenz Escartin, Philippa Krahn, and *Graham Wright* — *E-poster*

Society of Cardiovascular Magnetic Resonance Meeting

Open-source Tools for Topological Data Analysis — *Virtual - 2021*

Calder Sheagren and *Graham Wright* — *Lightning Talk*

CANARIE Research Software Conference

Atomic Layer Deposition Niobium Nitride Films for High-Q Resonators — *Milan, Italy - 2019*

Calder Sheagren, Alexander Anferov, Peter Barry, David Schuster, *Erik Shirokoff*, and Qing Yang Tang — *Poster*

Low Temperature Detectors Symposium

Superconducting Thin Film Atomic Layer Deposition Titanium Nitride for Microwave Resonators — *Boston, MA - 2019*

Calder Sheagren, Peter Barry, Ritoban Basu Thakur, Rong Nie, *Erik Shirokoff*, and Qing Yang Tang — *Talk*

American Physical Society March Meeting

Applications of Thin Film Atomic Layer Deposition Superconducting Titanium Nitride to Astronomical Measurements — *Chicago, IL - 2018*

Calder Sheagren, Peter Barry, Ritoban Basu Thakur, Rong Nie, *Erik Shirokoff*, and Qing Yang Tang — *Poster*

American Vacuum Society Prairie Chapter Symposium

Collaborating-Author Presentations

Fast Motion Correction of 3D Cones Imaging for Acute Radiofrequency Ablation Lesion Characterization — *Quebec City, Canada 2024*

Jaykumar Patel, Terenz Escartin, **Calder Sheagren**, Melissa Larsen, Jennifer Barry, Labonny Biswas, Philippa Krahn, and *Graham Wright* — *Poster*

ISMRM Motion Correction Workshop

3D CT to 2D X-Ray Image Registration for Improved Visualization of Tibial Vessels in Endovascular Procedures — *Barcelona, Spain 2024*

Moujan Saderi, Jaykumar H. Patel, **Calder D. Sheagren**, Judit Csöre, Trisha L. Roy, and *Graham A. Wright* — *Lecture Presentation*

Computer Aided Radiology and Surgery Conference

Radiofrequency Ablation (RFA) Lesion Mass Identified from Native T1-weighted MRI Correlates with Average Catheter Contact Force Following Late Gadolinium Enhancement (LGE) MRI-guided Scar Homogenization In A Swine Model of Infarction — *Boston, MA, USA 2024*

Terenz Escartin, Maria Terricabras, Philippa Krahn, **Calder Sheagren**, Christopher Cheung, Jennifer Barry, Melissa Larsen, and *Graham Wright* — *Poster*

Heart Rhythm Society Meeting

Pilot Study: Lesion volume identified from native T1-weighted MRI correlates with microvascular obstruction (MVO) volume identified from late gadolinium enhancement (LGE) MRI in patients with and without ICDs after RFA Therapy — *Boston, MA, USA 2024*

Terenz Escartin, Maria Terricabras, **Calder Sheagren**, Graham Wright, and *Christopher Cheung* — *Poster*

Heart Rhythm Society Meeting

3D Whole-Heart T1-weighted Imaging in a Two-Minute Free-Breathing Scan for Radio-Frequency Ablation Lesion Assessment — *Singapore - 2024*

Jaykumar Patel, Philippa Krahn, Terenz Escartin, **Calder Sheagren**, Labonny Biswas, Jen Barry, Melissa Larsen, and *Graham Wright* — *Oral Presentation*

International Society of Magnetic Resonance in Medicine Meeting

3D High SNR Cardiac MRI via Motion-Corrected Averaging of Multi-Heartbeat Acquisitions — *Singapore - 2024*

Liwen Li, Jaykumar H. Patel, Xinrui Guo, **Calder D. Sheagren**, Graham A. Wright, and *Fumin Guo* — *Digital Poster*

International Society of Magnetic Resonance in Medicine Meeting

Wideband Motion-Corrected T1 Mapping at 3 Tesla: Evaluation in Healthy Volunteers — *London, UK - 2024*

Graham Wright, Rachel Ospalak, **Calder Sheagren**, Jason Rock, Marcus Couch, Kelvin Chow, Xiaoming Bi, Jamie Near, and Idan Roifman — *Rapid Fire Pitch*

Cardiovascular Magnetic Resonance Global Meeting

Native T1-weighted MRI Indicates Acute Thermal Injury Post-RF Ablation in VT Patients — *Montreal, QC - 2023*

Terenz Escartin, **Calder Sheagren**, Maria Terricabras, Idan Roifman, Graham Wright, and *Christopher Cheung* — *Digital Poster*

Canadian Cardiovascular Conference Vascular Meeting

Hierarchical Segmentation of LGE MRI — *Lyon, FR - 2023*

Fumin Guo, **Calder Sheagren**, Jaykumar Patel, and *Graham Wright* — *MYOSAIQ Challenge Submission*

Functional Imaging and Modelling of the Heart

2D/3D Image Registration for Guidance of Endovascular Interventions in Tibial Vessels — *London, ON - 2023*

Moujan Saderi, Jaykumar Patel, **Calder Sheagren**, Trisha Roy, and *Graham Wright* — *Pitch-and-Poster*

Imaging Network Ontario Symposium

3D Multiscale Weighted Total Variation Registration for MR Image-Guided Catheter Interventions — *London, UK - 2022*

Jaykumar Patel, **Calder Sheagren**, Saqeeb Hassan, Fatemeh Rastegar Jooybari, Christopher Macgowan, and *Graham Wright* — *Digital Poster*

International Society of Magnetic Resonance in Medicine Meeting

3D Motion Compensation with Cone Trajectories - in silico Validation Using the MR-XCAT Framework — *Virtual - 2022*

Jaykumar Patel, **Calder Sheagren**, Fatemeh Rastegar Jooybari, Saqeeb Hassan, Okai Addy, Christopher Macgowan, and *Graham Wright* — *E-poster*

Society of Cardiovascular Magnetic Resonance Meeting

Invited Talks

Wideband Motion-Corrected T1 Mapping — *Ann Arbor, MI - 2025*

Michigan Institute of Imaging Technology and Translation

Low-Rank Methods for Generalizable Image Reconstruction — *Washington, DC - 2025*

Society of Cardiovascular Magnetic Resonance Annual Meeting

Multicontrast Cardiac MRI: Historical Perspectives and Modern Applications — *Wuhan, China - 2024*

China Academy of Sciences MRI Group

Careers in Medical (Bio)physics — *Naperville, IL - 2022*

Naperville Central High School

Awards

MBP Excellence Award — *2020-2024*

University of Toronto Fund — *$21k CAD total*

Mary H. Beatty Fellowship Award — *2021-2022*

University of Toronto — *$10k CAD / year*

Teaching

UToronto MBP 1201H: Introduction to Biostatistics — *Aut 2022, Aut 2023*

Teaching Assistant — *2022: 4.17/5, N=26*; *2023: 4.19/5, N=32*

UChicago MATH 131-132: Introductory Calculus — *Aut 2017, Win 2020*

Junior Tutor

UChicago MATH 195-196: Multivariable Calculus and Linear Algebra — *Spr 2018, Win 2020*

Grader

UChicago MATH 151-153: Calculus — *Win/Spr/Aut 2018, Win/Spr 2019*

Course Assistant

Outreach

ISMRM Motion Correction Workshop Organizing Committee — *Member, 2023-2024*

Society of Magnetic Resonance Angiography Early Career Committee — *Co-Chair, 2024-Present*; *Member, 2022-Present*

Medical Biophysics Graduate Student Association — *Intl. Student Rep., 2023-2024*; *Communications Rep., 2022-2023*

Journal and Conference Reviewing

Journals

Journal of Magnetic Resonance Imaging

Quantitative Imaging in Medicine and Surgery

Magnetic Resonance Imaging

Magnetic Resonance in Medicine (Code Reviewer)

Journal of Vacuum Science and Technology

Conferences

Society of Magnetic Resonance Angiography

ISMRM Motion Correction Workshop

ISMRM Annual Meeting

Skills

Linux Computation	Python, LaTeX, vim, bash, git
Image Reconstruction	BART, PyTorch, Sigpy, Julia
Vendor Scanner Programming	GE EPIC, Siemens IDEA
Languages	English (fluent), Mandarin Chinese (conversational)