

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

Jaykumar H. Patel, Brenden T. Kadota, **Calder D. Sheagren**, Mark Chiew, and *Graham A. Wright*, "Low-Rank Conjugate Gradient-Net for Accelerated Cardiac MR Imaging". In: O. Camara et al, *Statistical Atlases and Computational Models of the Heart. Workshop, CMRxRecon and MBAS Challenge Papers*. STACOM (2024). *Lecture Notes in Computer Science*, vol 15448. Springer, Cham. https://doi.org/10.1007/978-3-031-87756-8_33

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](https://doi.org/10.1117/12.3006138)

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, TEREZ 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, TEREZ 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, TEREZ 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, TEREZ 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, TEREZ ESCARTIN, PHILIPPA KRAHN, JAYKUMAR PATEL, FUMIN GUO, AND *Graham Wright*

Oral Presentation

International Society of Magnetic Resonance in Medicine Meeting

Fully-Automated LGE Thresholding using Weighted Total Variation Denoising and Persistent Homology

Virtual - 2022

CALDER SHEAGREN, TEREZ 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, TERENCE 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, TERENCE 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

ISMRR 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)