

Calder D. Sheagren, PhD

POSTDOCTORAL RESEARCH FELLOW - CARDIOVASCULAR MAGNETIC RESONANCE IMAGING

1300 Catherine St., Ann Arbor MI, 48109

1-760-685-7245 | caldersheagren+inquiries@gmail.com | caldersheagren.com | [calderds](https://calderds.com) | Citizenship: USA

Education and Training

University of Michigan

POSTDOCTORAL RESEARCH FELLOW, DEPARTMENT OF RADIOLOGY, SUPERVISOR: JESSE HAMILTON, PHD

Project: Artifact-Robust Cardiac Magnetic Resonance Fingerprinting

Ann Arbor, MI, USA

June 2025 - Present

University of Toronto

PH.D. IN MEDICAL BIOPHYSICS, SUPERVISOR: GRAHAM WRIGHT, PHD

Project: MRI Methods for Pre-Ablation Imaging in Patients with Implantable Cardioverter-Defibrillators

Toronto, ON, Canada

Sep 2020 - May 2025

University of Chicago

B.S. IN MATHEMATICS WITH HONORS, SUPERVISOR: ERIK SHIROKOFF, PHD

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

Chicago, IL, USA

Sep 2016 - Jun 2020

Publications

FIRST-AUTHOR PUBLICATIONS

Calder D. Sheagren, Terenz Escartin, Jaykumar H. Patel, Jennifer Barry, Kelvin Chow, Xiaoming Bi, Maria Terricabras, and *Graham A. Wright*, “Arrhythmia Substrate Identification using Wideband Motion-Corrected Late Gadolinium Enhancement Magnetic Resonance Imaging in a Swine Model of Myocardial Infarction with Taped Implantable Cardioverter-Defibrillators”. *Heart Rhythm* O2 6:9 (2025) <https://doi.org/10.1016/j.hroo.2025.06.008>

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* 27:1 (2025) <https://doi.org/10.1016/j.jcmr.2025.101893>

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

Aaron D. Curtis, **Calder D. Sheagren**, Alexander J. Mertens, Graham A. Wright, and *Hai-Ling Margaret Cheng*, “Predictive Signal Modeling and Multi-rate Filtering in Accelerated Cardiac MRI”. *Magnetic Resonance in Medicine* 95:585-600 (2026) doi:10.1002/mrm.70058

Terenz Escartin, Maria Terricabras, **Calder Sheagren**, Philippa Krahm, Graham Wright, and *Christopher C. Cheung*, “Feasibility Study: Characterizing Acute Lesion Dimensions in Patients With and Without Devices Using Non-Contrast (Native T1-weighted) MRI After VT/PVC Radiofrequency Ablation”. *Heart Rhythm* 22:12 P3180-3188 (2025)

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 22:12 P3208-3209 (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 27:1 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

A Single-TR-Resolved Deep Image Prior Reconstruction for Cardiac MR Fingerprinting

Rio de Janeiro, Brazil - 2026

CALDER SHEAGREN, ZHONGNAN LIU, ZEXUAN LIU, GASTAO CRUZ, AND Jesse Hamilton

Rapid-Fire Pitch

Society of Cardiovascular Magnetic Resonance Meeting

Low-Rank Motion-Corrected Deep Image Prior Reconstruction for Cardiac Magnetic Resonance Fingerprinting

Sedona, AZ - 2026

CALDER D. SHEAGREN, ZHONGNAN LIU, ZEXUAN LIU, GASTAO CRUZ, AND Jesse Hamilton

Traditional Poster

ISMRM Workshop on Data Sampling and Reconstruction

Wideband Magnetic Resonance Fingerprinting for T1 and T2 Mapping Near Cardiac Implantable Electronic Devices

Sedona, AZ - 2026

CALDER D. SHEAGREN, TOM GRIESLER, MAXIMILIAN GRAM, NICOLE SEIBERLICH, GASTAO CRUZ, AND Jesse Hamilton

Traditional Poster

ISMRM Workshop on Data Sampling and Image Reconstruction

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

OpenMRF: A Pulse-based Magnetic Resonance Fingerprinting Framework for simultaneous T_1 , T_2 , and $T_{1\rho}$ Quantification

Rio de Janeiro, Brazil - 2026

Maximilian Gram, TOM GRIESLER, PETRA ALBERTOVA, SYDNEY KAPLAN, CALDER D. SHEAGREN, MARTIN BLAIMER, PETER JAKOB, NICOLE SEIBERLICH, AND PETER NORDBECK

CMR Open-Source Software

Society of Cardiovascular Magnetic Resonance Meeting

Improving the Precision and Repeatability of 0.55T Lung MRF Using a Deep Image Prior with Ensemble Averaging

Sedona, AZ 2026

ZEXUAN LIU, ZHONGNAN LIU, CALDER D. SHEAGREN, GASTAO CRUZ, NICOLE SEIBERLICH, AND Jesse Hamilton

Traditional Poster

ISMRM Workshop on Data Sampling and Image Reconstruction

An Accelerated Deep Image Prior Reconstruction for Cardiac MR Fingerprinting Using Meta-Learning

Sedona, AZ 2026

ZHONGNAN LIU, CALDER D. SHEAGREN, ZEXUAN LIU, NICOLE SEIBERLICH, LIYUE SHEN, AND Jesse Hamilton

Conference Oral Presentation

ISMRM Workshop on Data Sampling and Image Reconstruction

Improved-Contrast Accelerated 3D Cones LGE using Cardiac Binning and Keyhole-Filtered View Sharing

Honolulu, Hawaii - 2025

JAYKUMAR H. PATEL, CALDER D. SHEAGREN, TERENZ ESCARTIN, LABONNY BISWAS, JENNIFER BARRY, AND Graham Wright

Poster

International Society of Magnetic Resonance in Medicine Meeting

Unsupervised Reconstruction of Highly Undersampled 3D cones Cardiac Image Navigators using a Dual-Branch Joint Training Framework

XINRUI GUO, CALDER D. SHEAGREN, JAYKUMAR H. PATEL, LIWEN LI, GRAHAM A. WRIGHT, AND Fumin Guo

Honolulu, Hawaii - 2025

International Society of Magnetic Resonance in Medicine Meeting

Poster

Fast Motion Correction of 3D Cones Imaging for Acute Radiofrequency Ablation Lesion Characterization

JAYKUMAR PATEL, TERENZ ESCARTIN, CALDER SHEAGREN, MELISSA LARSEN, JENNIFER BARRY, LABONNY BISWAS, PHILIPPA KRAHN, AND Graham Wright

ISMRM Motion Correction Workshop

Poster

3D CT to 2D X-Ray Image Registration for Improved Visualization of Tibial Vessels in Endovascular Procedures

MOUJAN SADERI, JAYKUMAR H. PATEL, CALDER D. SHEAGREN, JUDIT CSÖRE, TRISHA L. ROY, AND Graham A. Wright
Computer Aided Radiology and Surgery Conference

Barcelona, Spain - 2024

Lecture Presentation

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

TERENZ ESCARTIN, MARIA TERRICABRAS, PHILIPPA KRAHN, CALDER SHEAGREN, CHRISTOPHER CHEUNG, JENNIFER BARRY, MELISSA LARSEN, AND Graham Wright

Heart Rhythm Society Meeting

Poster

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

TERENZ ESCARTIN, MARIA TERRICABRAS, CALDER SHEAGREN, GRAHAM WRIGHT, AND Christopher Cheung
Heart Rhythm Society Meeting

Boston, MA - 2024

Poster

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

JAYKUMAR PATEL, PHILIPPA KRAHN, TERENZ ESCARTIN, CALDER SHEAGREN, LABONNY BISWAS, JEN BARRY, MELISSA LARSEN, AND Graham Wright

International Society of Magnetic Resonance in Medicine Meeting

Singapore - 2024

Oral Presentation

3D High SNR Cardiac MRI via Motion-Corrected Averaging of Multi-Heartbeat Acquisitions

LIWEN LI, JAYKUMAR H. PATEL, XINRUI GUO, CALDER D. SHEAGREN, GRAHAM A. WRIGHT, AND Fumin Guo
International Society of Magnetic Resonance in Medicine Meeting

Singapore - 2024

Digital Poster

Wideband Motion-Corrected T1 Mapping at 3 Tesla: Evaluation in Healthy Volunteers

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

London, UK - 2024

Native T1-weighted MRI Indicates Acute Thermal Injury Post-RF Ablation in VT Patients

TERENZ ESCARTIN, CALDER SHEAGREN, MARIA TERRICABRAS, IDAN ROIFMAN, GRAHAM WRIGHT, AND Christopher Cheung
Canadian Cardiovascular Conference Vascular Meeting

Montreal, QC - 2023

Digital Poster

Hierarchical Segmentation of LGE MRI

FUMIN GUO, CALDER SHEAGREN, JAYKUMAR PATEL, AND Graham Wright
Functional Imaging and Modelling of the Heart

Lyon, FR - 2023

MYOSAIQ Challenge Submission

2D/3D Image Registration for Guidance of Endovascular Interventions in Tibial Vessels

MOUJAN SADERI, JAYKUMAR PATEL, CALDER SHEAGREN, TRISHA ROY, AND Graham Wright
Imaging Network Ontario Symposium

London, ON - 2023

Pitch-and-Poster

3D Multiscale Weighted Total Variation Registration for MR Image-Guided Catheter Interventions

JAYKUMAR PATEL, CALDER SHEAGREN, SAQEEB HASSAN, FATEMEH RASTEGAR JOOYBARI, CHRISTOPHER MACGOWAN, AND Graham Wright

Digital Poster

International Society of Magnetic Resonance in Medicine Meeting

London, UK - 2022

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

Grants and Funding

MIDAS Postdoctoral Affiliate

2025-2026

MICHIGAN INSTITUTE OF DATA AND AI IN SOCIETY

\$5k USD

MBP Excellence Award

2020-2024

UNIVERSITY OF TORONTO FUND

\$21k CAD total

Mary H. Beatty Fellowship Award

2021-2022

UNIVERSITY OF TORONTO

\$10k CAD

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

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, 2024-2025

Member, 2022-2025

Medical Biophysics Graduate Student Association

Intl. Student Rep., 2023-2024

Communications Rep., 2022-2023

Journal and Conference Reviewing

JOURNALS

Journal of Cardiovascular Magnetic Resonance

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, L^AT_EX, vim, bash, git

Image Reconstruction BART, PyTorch, Sigpy, Julia

Vendor Scanner Programming GE EPIC, Siemens IDEA

Languages English (fluent), Mandarin Chinese (conversational)