

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 - Mar 2025 (Expected)

Project: Evaluation of Emerging Cardiac Magnetic Resonance Methods in the presence of Cardiac Implantable Electronic Devices

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, 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

COLLABORATING-AUTHOR PUBLICATIONS

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>

Peer-Reviewed Conference Proceedings

FIRST-AUTHOR PROCEEDINGS

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 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 PROCEEDINGS

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/](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)

[Accelerated-reconstruction-of-highly-undersampled-3D-cardiac-MRI-image-navigators/10.1117/12.3006138.full](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)

Conference Presentations

FIRST-AUTHOR PRESENTATIONS

Quantitative Fibrosis Analysis using Wideband Post-Gd T1* Mapping in Pigs with CIEDs

CALDER D. SHEAGREN, TERENCE ESCARTIN, JAYKUMAR PATEL, MELISSA LARSEN, JENNIFER BARRY, AND *Graham Wright*
Society of Magnetic Resonance Angiography Meeting

Santiago, Chile 2024

Oral Power Pitch

Preclinical Validation of Arrhythmia Substrate Characterization with Wideband Motion-Corrected Phase-Sensitive LGE

CALDER D. SHEAGREN, TERENCE ESCARTIN, JAYKUMAR PATEL, MELISSA LARSEN, JENNIFER BARRY, KELVIN CHOW, XIAOMING BI, AND *Graham Wright*
ISMRM Motion Correction Workshop

Quebec City, Canada 2024

Poster

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

CALDER SHEAGREN, BRANDON TRAN, JAYKUMAR PATEL, ANGUS LAU, AND *Graham Wright*
International Society of Magnetic Resonance in Medicine Meeting

Singapore - 2024

Digital Poster

Quantifying Cardiac Function in the Presence of Implantable Cardioverter Defibrillators with Cardiovascular Magnetic Resonance Imaging: Evaluation in Healthy Volunteers

CALDER SHEAGREN, XIULING QI, IDAN ROIFMAN, AND *Graham Wright*
Society of Cardiovascular Magnetic Resonance Meeting

San Diego, CA - 2023

Rapid Fire Pitch

A Minimal Cardiac MRI Protocol for Catheter Ablation Planning in Patients with Cardiac Implantable Electronic Devices

CALDER SHEAGREN, TERENCE ESCARTIN, PHILIPPA KRAHN, JUDI PAULSON, MELISSA LARSEN, MARTIN JANICH, IDAN ROIFMAN, AND *Graham Wright*
Society of Magnetic Resonance Angiography Meeting

Los Angeles, CA - 2022

Oral Power Pitch

Validation of Automated Topological LGE Thresholding for Peri-Infarct Substrate Characterization

CALDER SHEAGREN, TERENCE ESCARTIN, PHILIPPA KRAHN, JAYKUMAR PATEL, FUMIN GUO, AND *Graham Wright*
International Society of Magnetic Resonance in Medicine Meeting

London, UK - 2022

Oral Presentation

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

CALDER SHEAGREN, TERENCE ESCARTIN, PHILIPPA KRAHN, AND *Graham Wright*
Society of Cardiovascular Magnetic Resonance Meeting

Virtual - 2022

E-poster

Open-source Tools for Topological Data Analysis

CALDER SHEAGREN AND *Graham Wright*
CANARIE Research Software Conference

Virtual - 2021

Lightning Talk

Atomic Layer Deposition Niobium Nitride Films for High-Q Resonators

CALDER SHEAGREN, ALEXANDER ANFEROV, PETER BARRY, DAVID SCHUSTER, *Erik Shirokoff*, AND QING YANG TANG
Low Temperature Detectors Symposium

Milan, Italy - 2019

Poster

Superconducting Thin Film Atomic Layer Deposition Titanium Nitride for Microwave Resonators

CALDER SHEAGREN, PETER BARRY, RITOBAN BASU THAKUR, RONG NIE, *Erik Shirokoff*, AND QING YANG TANG
American Physical Society March Meeting

Boston, MA - 2019

Talk

Applications of Thin Film Atomic Layer Deposition Superconducting Titanium Nitride to Astronomical Measurements

CALDER SHEAGREN, PETER BARRY, RITOBAN BASU THAKUR, RONG NIE, *Erik Shirokoff*, AND QING YANG TANG
American Vacuum Society Prairie Chapter Symposium

Chicago, IL - 2018

Poster

COLLABORATING-AUTHOR PRESENTATIONS

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

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

ISMRM Motion Correction Workshop

Quebec City, Canada 2024

Poster

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

MOUJAN SADARI, 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

Boston, MA, USA 2024

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, USA 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, TEREZ 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

Cardiovascular Magnetic Resonance Global Meeting

London, UK - 2024

Rapid Fire Pitch

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 SADARI, 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*

International Society of Magnetic Resonance in Medicine Meeting

London, UK - 2022

Digital Poster

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*
Society of Cardiovascular Magnetic Resonance Meeting

E-poster

Invited Talks

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)