

# Curriculum Vitae - Mark Chiew

Physical Sciences Platform  
Sunnybrook Research Institute  
Department of Medical Biophysics  
University of Toronto

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## Work & Education

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### Academic Positions

2022 - 27 **Tier 2 Canada Research Chair in Computational Biomedical Imaging**  
University of Toronto

2022 - **Associate Professor**  
Department of Medical Biophysics, University of Toronto

2022 - **Scientist**  
Physical Sciences Platform, Sunnybrook Research Institute

2021 - **Associate Professor**  
Nuffield Department of Clinical Neurosciences, University of Oxford

2018 - 21 **University Research Lecturer**  
Nuffield Department of Clinical Neurosciences, University of Oxford

2017 - 22 **Royal Academy of Engineering Research Fellow**  
FMRIB Centre, University of Oxford

2012 - 17 **Post-Doctoral Researcher**  
FMRIB Centre, University of Oxford

### Education

2007 - 12 **Ph.D.**, Medical Biophysics, University of Toronto  
Thesis: Development and Application of Methods for Real-Time fMRI Neurofeedback  
Supervisor: Prof. Simon J. Graham

2002 - 07 **B.ASc**, Engineering Physics, University of British Columbia  
Math Honours, Electrical Engineering Option

## Grants & Awards

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*Total Awarded To Date: £964,080*

### Funding

2022 - 27	<b>Tier 2 Canada Research Chair</b> in Computational Biomedical Imaging	<b>\$600,000</b>
2020 - 23	<b>EPSRC Healthcare Technologies New Investigator Award</b> Robust 3D Functional Imaging of the Living, Breathing Brain Principal Investigator (EP/T013133/1)	<b>£352,921</b>
2017 - 22	<b>Royal Academy of Engineering Research Fellowship</b> Characterising the Brain's Spatio-Temporal Dynamics by Integrating EEG and FMRI Principal Investigator (RF201617\16\23)	<b>£499,715</b>

2017 - 19	<b>John Fell Oxford University Press Research Fund</b> A Novel Approach to EEG and FMRI Principal Investigator	<b>£57,800</b>
2019 - 20	<b>WIN Seed Grant</b> Advanced Brain Blood Flow Measurements with 7T MRI Co-Principal Investigator	<b>£9,000</b>

## Awards

2019	WIN Good Citizen Award
2015 - 18	Magnetic Resonance in Medicine Distinguished Reviewer
2015	ISMRM I.I. Rabi Young Investigator Award Finalist
2014,15	University of Oxford Award for Excellence
2015	Guarantors of Brain Travel Grant
2013,14	University of Oxford Lockett Bequest Grant
2014	OHBM Trainee Abstract Award
2011,13,14	ISMRM Trainee Stipend Award
2011	Ontario Graduate Scholarship
2010	University of Toronto Medical Biophysics Excellence Award
2009,10	Jack and Rita Catherall Fund Travel Award
2009 - 10	Ydessa Hendeles Graduate Scholarship
2008 - 10	Ontario Graduate Scholarship in Science and Technology
2006	John Collison Memorial Scholarship in Mathematics
2004,05	UBC Undergraduate Scholars Program Award
2002	British Columbia Provincial Scholarship

## Invited Talks

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1. Computational Methods for Rapid and Robust Neuroimaging, BRAIN-TO Lab, University Health Network, Toronto, Canada; Sept 2022
2. Neuroimaging with Optimized Sampling and Reconstruction, Keilholz Mind Lab, Georgia Tech and Emory University (Virtual); April 2021
3. Fast and Robust MR Imaging with Constrained Reconstruction Methods, Champalimaud Centre for the Unknown, Lisbon, Portugal; Dec 2019
4. Getting more information from fMRI with better sampling and reconstruction, KCL Centre for Neuroimaging Sciences, Neuroimaging Seminar, London, UK; Mar 2019
5. Getting more out of fMRI data using constrained reconstructions and simultaneous EEG, Center for Functional MRI, UC San Diego, USA; Oct 2018
6. Beyond Simultaneous: Integrating EEG Information for Image Reconstruction in FMRI, UCL Centre for Neuroimaging Techniques Seminar, London, UK; Dec 2017
7. Basics, Benefits, and Breakthroughs for Fast Brain Imaging, BC Children's Hospital, Vancouver, Canada; Jun 2017
8. Accelerating FMRI Data Acquisition using Hybrid Radial-Cartesian Sampling and Low-Rank Constraints, Centre for the Developing Brain Seminar Series, Kings College London, London, UK; Oct 2016
9. Using network models of brain activity to inform highly accelerated fMRI data acquisition, MR Seminar, Institute of Biomedical Engineering, ETH Zurich, Zurich, Switzerland; Feb 2016
10. The Utility of Low-Rank Models for Acquisition & Analysis of FMRI Data, Institute of Psychiatry, Psychology & Neuroscience, Kings College London, London, UK; Oct 2015

11. Accelerating fMRI Data Acquisition using Low-Rank Constraints, NeuroImaging Interest Group Rounds, Hospital for Sick Children, Toronto, Canada; Jun 2015
12. Accelerating fMRI Data Acquisition using Rank Constraints, Max Planck Institute for Biological Cybernetics, Tuebingen, Germany; Feb 2014
13. Estimation of Resting State Networks from Undersampled k-t fMRI Data using Matrix Completion, SMIAL Seminar Series, Sunnybrook Research Institute, Toronto, Canada; Jun 2013

## Publications

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### Preprints

1. Millard C, **Chiew M**, Tanner J, Hess AT, Mailhe B. Tuning-free multi-coil compressed sensing MRI with Parallel Variable Density Approximate Message Passing (P-VDAMP), 2022;
2. Millard C, **Chiew M**. A framework for self-supervised MR image reconstruction using sub-sampling via Noisier2Noise, 2022;
3. Schauman SS, Okell TW, **Chiew M**. The Set Increment with Limited Views Encoding Ratio (SILVER) Method for Optimizing Radial Sampling of Dynamic MRI, 2021;
4. Chen X, Wu W, **Chiew M**. Improving robustness of 3D multi-shot EPI by structured low-rank reconstruction of segmented CAIPI sampling for fMRI at 7T, 2021;
5. Xia P, **Chiew M**, Zhou X, Thomas A, Dydak U, Emir UE. Density-Weighted Concentric Ring Trajectory using simultaneous multi-band acceleration: 3D Metabolite-cycled Magnetic Resonance Spectroscopy Imaging at 3 T, 2019;

### Journal Articles

1. Okell TW, **Chiew M**. Optimization of 4D combined angiography and perfusion using radial imaging and arterial spin labeling, *Magnetic Resonance in Medicine* n/a(n/a)
2. Woods JG, Schauman SS, **Chiew M**, Chappell MA, Okell TW. Time-encoded pseudo-continuous arterial spin labeling: Increasing SNR in ASL dynamic angiography, *Magnetic Resonance in Medicine* n/a(n/a)
3. Shen X, Özen AC, Sunjar A, Ilbey S, Sawiak S, Shi R, **Chiew M**, Emir U. Ultra-short T2 components imaging of the whole brain using 3D dual-echo UTE MRI with rosette k-space pattern, *Magnetic Resonance in Medicine* 2023; 89(2):508–521
4. Graedel NN, Miller KL, **Chiew M**. Ultrahigh Resolution fMRI at 7T Using Radial-Cartesian TURBINE Sampling, *Magnetic Resonance in Medicine* 2022; 88(5):2058–2073
5. Lu Y, Wiltshire CEE, Watkins KE, **Chiew M**, Goldstein L. Characteristics of articulatory gestures in stuttered speech: A case study using real-time magnetic resonance imaging, *Journal of Communication Disorders* 2022; 97:106213
6. Shahdloo M, Schüffegen U, Papp D, Miller KL, **Chiew M**. Model-based dynamic off-resonance correction for improved accelerated fMRI in awake behaving nonhuman primates, *Magnetic Resonance in Medicine* 2022; 87(6):2922–2932
7. Clarke WT, **Chiew M**. Uncertainty in denoising of MRSI using low-rank methods, *Magnetic Resonance in Medicine* 2022; 87(2):574–588
8. Mason HT, Graedel NN, Miller KL, **Chiew M**. Subspace-constrained approaches to low-rank fMRI acceleration, *NeuroImage* 2021; 238:118235
9. Hess AT, Dragonu I, **Chiew M**. Accelerated calibrationless parallel transmit mapping using joint transmit and receive low-rank tensor completion, *Magnetic Resonance in Medicine* 2021; 86(5):2454–2467
10. Wiltshire CEE, **Chiew M**, Chesters J, Healy MP, Watkins KE. Speech Movement Variability in People Who Stutter: A Vocal Tract Magnetic Resonance Imaging Study, *Journal of Speech, Language, and Hearing Research* 2021; 64(7):2438–2452
11. Emir UE, Sood J, **Chiew M**, Thomas MA, Lane SP. High-resolution metabolic mapping of the cerebellum using 2D zoom magnetic resonance spectroscopic imaging, *Magnetic Resonance in Medicine* 2021; 85(5):2349–2358
12. Wang C, Foxley S, Ansorge O, Bangerter-Christensen S, **Chiew M**, Leonte A, Menke RA, Mollink J, Pallegage-Gamarallage M, Turner MR, Miller KL, Tendler BC. Methods for quantitative susceptibility and R2\* mapping in

- whole post-mortem brains at 7T applied to amyotrophic lateral sclerosis, *NeuroImage* 2020; 222:117216
13. Schauman SS, **Chiew M**, Okell TW. Highly accelerated vessel-selective arterial spin labeling angiography using sparsity and smoothness constraints, *Magnetic Resonance in Medicine* 2020; 83(3):892–905
  14. **Chiew M**, Miller KL. Improved statistical efficiency of simultaneous multi-slice fMRI by reconstruction with spatially adaptive temporal smoothing, *NeuroImage* 2019; 203:116165
  15. O’Brien C, Okell TW, **Chiew M**, Jezzard P. Volume-localized measurement of oxygen extraction fraction in the brain using MRI, *Magnetic Resonance in Medicine* 2019; 82(4):1412–1423
  16. Steel A, **Chiew M**, Jezzard P, Voets NL, Plaha P, Thomas MA, Stagg CJ, Emir UE. Metabolite-cycled density-weighted concentric rings k-space trajectory (DW-CRT) enables high-resolution 1 H magnetic resonance spectroscopic imaging at 3-Tesla, *Scientific Reports* 2018; 8(1):7792
  17. **Chiew M**, Graedel NN, Miller KL. Recovering task fMRI signals from highly under-sampled data with low-rank and temporal subspace constraints., *NeuroImage* 2018; 174:97–110
  18. **Chiew M**, Jiang W, Burns B, Larson P, Steel A, Jezzard P, Albert Thomas M, Emir UE. Density-weighted concentric rings k-space trajectory for 1H magnetic resonance spectroscopic imaging at 7 T., *NMR in biomedicine* 2018; 31(1):e3838
  19. Weizman L, Miller KL, Eldar YC, **Chiew M**. PEAR: PERiodic And fixed Rank separation for fast fMRI., *Medical physics* 2017; 44(12):6166–6182
  20. Emir UE, Burns B, **Chiew M**, Jezzard P, Thomas MA. Non-water-suppressed short-echo-time magnetic resonance spectroscopic imaging using a concentric ring k-space trajectory, *NMR in Biomedicine* 2017; 30(7):e3714
  21. Graedel NN, Mcnab JA, **Chiew M**, Miller KL. Motion correction for functional MRI with three-dimensional hybrid radial-Cartesian EPI., *Magnetic resonance in medicine* 2017; 78(2):527–540
  22. **Chiew M**, Graedel NN, Mcnab JA, Smith SM, Miller KL. Accelerating functional MRI using fixed-rank approximations and radial-cartesian sampling., *Magnetic resonance in medicine* 2016; 76(6):1825–1836
  23. **Chiew M**, Smith SM, Koopmans PJ, Graedel NN, Blumensath T, Miller KL. K-t FASTER: Acceleration of functional MRI data acquisition using low rank constraints., *Magnetic resonance in medicine* 2015; 74(2):353–364
  24. Olsen RK, **Chiew M**, Buchsbaum BR, Ryan JD. The relationship between delay period eye movements and visuospatial memory, *Journal of Vision* 2014; 14(1):1–11
  25. **Chiew M**, Graham SJ. Constrained source space imaging: Application to fast, region-based functional MRI., *Magnetic resonance in medicine* 2013; 70(4):1058–1069
  26. Rotenberg D, **Chiew M**, Ranieri S, Tam F, Chopra R, Graham SJ. Real-time correction by optical tracking with integrated geometric distortion correction for reducing motion artifacts in functional MRI, *Magnetic Resonance in Medicine* 2013; 69(3):734–748
  27. **Chiew M**, LaConte SM, Graham SJ. Investigation of fMRI neurofeedback of differential primary motor cortex activity using kinesthetic motor imagery, *NeuroImage* 2012; 61(1):21–31
  28. **Chiew M**, Graham SJ. BOLD Contrast and Noise Characteristics of Densely Sampled Multi-Echo fMRI Data., *IEEE transactions on medical imaging* 2011; 30(9):1691–1703
  29. Yancey SE, Rotenberg DJ, Tam F, **Chiew M**, Ranieri S, Biswas L, Anderson KJT, Baker SN, Wright GA, Graham SJ. Spin-history artifact during functional MRI: Potential for adaptive correction., *Medical physics* 2011; 38(8):4634–4646
  30. Kuo AY-C, **Chiew M**, Tam F, Cunningham C, Graham SJ. Multiecho coarse voxel acquisition for neurofeedback fMRI., *Magnetic resonance in medicine* 2011; 65(3):715–724

## Conference Papers

1. Chen X, Wu W, **Chiew M**. Locally Structured Low-Rank MR Image Reconstruction Using Submatrix Constraints, *2022 IEEE International Symposium on Biomedical Imaging (ISBI)* 2022;
2. Weizman L, Miller KL, Eldar YC, Maayan O, **Chiew M**. PEAR: PERiodic and ApeRiodic signal separation for fast FMRI, *2017 39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)* 2017; :505–508

## Conference Abstracts

1. Shen Q, **Chiew M**, Wu W, Okell TW. Efficient 3D cone trajectory for improved combined angiographic and perfusion imaging using arterial spin labeling, *ISMRM Workshop on Data Sampling & Image Reconstruction* 2023;

**(oral presentation)**

2. Chen X, Wu W, **Chiew M**. Improved Structured Low-rank Reconstruction for 3D multi-shot EPI with Joint Motion Modelling, *ISMRM Workshop on Data Sampling & Image Reconstruction 2023*; **(oral presentation)**
3. Lally PJ, **Chiew M**, Matthews PM, Miller KL, Bangerter NK. A motion-robust, short-TR alternative to multi-echo SPGR, *ISMRM Workshop on Data Sampling & Image Reconstruction 2023*; **(oral presentation)**
4. Millard C, **Chiew M**. A framework for self-supervised MR image reconstruction using sub-sampling via Noisier2Noise, *BASP Frontiers Workshop 2023*;
5. Okell TW, Woods JC, **Chiew M**. Combined Angiographic, Structural and Perfusion Radial Imaging using Arterial Spin Labeling, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*; **(oral presentation)**
6. Chen X, Wu W, **Chiew M**. A Locally Structured Low-Rank Tensor Method Using Submatrix Constraints for Joint Multi-echo Image Reconstruction, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
7. Shahdloo M, **Chiew M**. Optimal Singular-Value Shrinkage for fMRI Denoising, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
8. Lally PJ, Statton B, Matthews PM, **Chiew M**, Miller KL, Bangerter NK. SNR-efficient SSFP with k-space aliasing, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*; **(oral presentation)**
9. Bozymiski B, Shen X, Özen A, Ilbey S, Thomas MA, **Chiew M**, Dydak U, Emir UE. Ultra-Short Echo Time 31P 3D MRSI at 3T with Novel Rosette k-space Trajectory, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
10. Karnik A, Shen X, Monsivais H, Sunjar A, Özen A, Ilbey S, **Chiew M**, Cakmak M, Rispoli J, Emir UE. Quantitative Susceptibility Mapping (QSM) Using High-resolution Ultra-Short Echo Time (UTE) MRI with Rosette k-space Pattern, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
11. Ooms N, Shen X, Özen A, Ilbey S, **Chiew M**, Emir UE. Pulmonary imaging Using 3D Dual-Echo FID Ultra-short Echo Time MRI with Rosette k-space Pattern: Introduction and Feasibility., *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
12. Shen X, Özen A, Sunjar A, Ilbey S, Shi R, **Chiew M**, Emir UE. Myelin Imaging Using 3D Dual-echo Ultra-short Echo Time MRI with Rosette k-Space Pattern, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
13. Villarreal C, Shen X, Özen A, Ilbey S, **Chiew M**, Alhulial A, Pogue E, Emir UE, Chan D. Compressed sensing and the use of 3D UTE acquisition for high-resolution accelerated 23Na imaging at 3T, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
14. Monsivais H, Shen X, Sunjar A, Özen A, Ilbey S, **Chiew M**, Karnik A, Emir UE, Dydak U. Iron Imaging with 3D Multi-Gradient Recalled Echo (3D-mGRE) and 3D Ultra-short Echo (3D-UTE) Sequences: A Phantom Comparison Study, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
15. Shen X, Özen A, Monsivais H, Ilbey S, Sunjar A, Karnik A, **Chiew M**, Emir UE. High Resolution 3D Ultra-Short Echo Time MRI with Rosette k-Space Pattern for Brain Iron Content Mapping, *International Society for Magnetic Resonance in Medicine Annual Meeting 2022*;
16. Okell TW, Woods JC, **Chiew M**. Combined Angiographic, Structural and Perfusion Radial Imaging using Arterial Spin Labeling, *ISMRM Workshop on Perfusion MRI 2022*; **(oral presentation)**
17. Lu Y, Wiltshire CEE, Watkins KE, **Chiew M**, Goldstein L. Articulation of metronome-timed speech in people who stutter, *Conference on Motor Speech 2022*;
18. Holmgren J, Prisco L, **Chiew M**, Jbabdi S, Allen M, Sleigh J, Tracey I, Warnaby CE. Auditory and pain processing is severely disrupted at slow wave activity saturation under general anaesthesia, *International Anesthesia Research Society Annual Meeting 2021*;
19. Shen X, **Chiew M**, Emir UE. Development of 3D Rosette K-Space Trajectory in Ultra-Short Echo Time MRI Applications, *American Association of Physicists in Medicine Annual Meeting 2021*;
20. Shahdloo M, Papp D, Schuffelgen U, Miller KL, Rushworth MFS, **Chiew M**. Highly accelerated fMRI of awake behaving non-human primates via model-based dynamic off-resonance correction, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*;
21. **Chiew M**. Variable Density Phase Encoding for High Resolution Single-Shot EPI, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*;

22. Chen X, Wu W, **Chiew M**. Respiratory fluctuations in 3D fMRI from inter-shot phase variations can be reduced by low-rank reconstruction of segmented CAIPI sampling, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*; **(oral presentation)**
23. Clarke WT, **Chiew M**. Characterising the variance and reproducibility of low rank denoising methods for spectroscopic data, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*;
24. Schauman SS, Okell TW, **Chiew M**. Optimizing the fixed angular increment between k-space spokes can lead to improved SNR in radial imaging, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*;
25. Wood TC, Ljungberg E, **Chiew M**. ZTE Infilling From Auto-calibration Neighbourhood Elements, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*;
26. Farley N, Zhou X, **Chiew M**, Thomas MA, Dydak U, Emir UE. Towards a Probabilistic Neurochemical atlas via parcellated approach using ZOOM MRSI, *International Society for Magnetic Resonance in Medicine Annual Meeting 2021*;
27. Xia P, Zhou X, **Chiew M**, Thomas MA, Dydak U, Emir UE. Density-Weighted Concentric Ring Trajectory Using Simultaneous Multi-Slice Acceleration: 3D Magnetic Resonance Imaging at 3T, *Joint AAPM / COMP Virtual Meeting 2020*;
28. Almomen F, Xia P, Zhou X, **Chiew M**, Steel A, Thomas MA, Dydak U, Emir UE. Simultaneous mapping of T2\* and major neurotransmitters using MRSI at 3T, *Organization for Human Brain Mapping Annual Meeting 2020*; **(oral presentation)**
29. Clarke WT, **Chiew M**. Comparison of low-rank denoising methods for accelerating the acquisition of 31P-MRSI, *International Society for Magnetic Resonance in Medicine Annual Meeting 2020*;
30. Chen X, Wu W, **Chiew M**. Reduced Inter-shot Physiological Variability in 3D Multi-Shot fMRI using Structured Low-Rank Matrix Completion, *International Society for Magnetic Resonance in Medicine Annual Meeting 2020*;
31. O'Brien C, Okell TW, **Chiew M**, Jezzard P. Remote Reconstructed Cerebral T2 Maps through Venous Blood Measurement in the Sagittal Sinus using SL-TRUST, *International Society for Magnetic Resonance in Medicine Annual Meeting 2020*;
32. Schauman SS, Woods JC, **Chiew M**, Okell TW. Highly accelerated time-encoded dynamic ASL angiography, *International Society for Magnetic Resonance in Medicine Annual Meeting 2020*;
33. Schauman SS, Okell TW, **Chiew M**. Radial sampling interactions in multi-dimensional sparse encoding problems using a joint decoding-reconstruction framework, *International Society for Magnetic Resonance in Medicine Annual Meeting 2020*;
34. Schauman SS, Okell TW, **Chiew M**. High resolution 4D vessel selective angiography in under 5 minutes using a constrained reconstruction, *International Society for Magnetic Resonance in Medicine Annual Meeting 2020*;
35. Schauman SS, Okell TW, **Chiew M**. The SILVER method – an Improvement upon Radial Golden Ratio Sampling Within a Specified Window Size, *ISMRM Workshop on Data Sampling & Image Reconstruction 2020*;
36. Schauman SS, Okell TW, **Chiew M**. Precision reconstruction for vessel-encoded ASL angiography, *British Chapter ISMRM Annual Meeting 2019*;
37. Holmgren J, Prisco L, **Chiew M**, Jbabdi S, Allen M, Sleight J, Tracey I, Warnaby CE. Auditory and pain processing is severely disrupted at slow wave activity saturation under general anaesthesia, *British Journal of Anaesthesia* 2019; 123:e514
38. Hess AT, Jaeschke S, **Chiew M**. Click and run respiratory resolved, ECG and navigator free cardiac B0 and relative B1 calibration at 7T, *ISMRM Workshop on Ultrahigh Field Magnetic Resonance* 2019;
39. Hess AT, Tanner J, Dragonu I, **Chiew M**. Accelerated 3D relative transmit mapping using structured low-rank matrix completion – evaluated in the body and brain, *ISMRM Workshop on Ultrahigh Field Magnetic Resonance* 2019;
40. Graedel NN, Miller KL, **Chiew M**. Ultra-high spatial resolution TURBINE fMRI at 7T, *International Society for Magnetic Resonance in Medicine Annual Meeting 2019*; **(oral presentation)**
41. Mason HT, Miller KL, Graedel NN, **Chiew M**. Improving k-t PERRI: A low-rank data-driven fMRI k-t acceleration method, *International Society for Magnetic Resonance in Medicine Annual Meeting 2019*; **(oral power-pitch presentation)**
42. Okell TW, **Chiew M**. High Resolution Perfusion Imaging using Golden Angle Radial Arterial Spin Labelling,

- International Society for Magnetic Resonance in Medicine Annual Meeting* 2019; (**oral power-pitch presentation**)
43. Schauman SS, **Chiew M**, Okell TW. 4D Vessel-Encoded pCASL Angiography in a Five-Minute Scan, *University of Michigan International Workshop on Arterial Spin Labeling MRI* 2019;
  44. Woods JC, Schauman SS, **Chiew M**, Chappell MA, Okell TW. Optimization of time-encoded pseudo-continuous ASL angiography with a variable flip-angle scheme, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2019; (**oral presentation**)
  45. Schauman SS, **Chiew M**, Okell TW. Highly Accelerated Dynamic 2D and 3D Vessel-Encoded Arterial Spin Labelling Angiography, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2019; (**oral presentation**)
  46. Emir UE, Xia P, Dydak U, Zhou X, **Chiew M**, Thomas MA, Guo R, Li Y, Zhao Y, Liang ZP. Non-Water suppressed High-Resolution 1H-MRSI of the Brain Using Short-TE SPICE with semi-LASER Concentric Ring Trajectory Acquisition, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2019;
  47. Shen X, Xia P, Dehghani M, Near J, Zhou X, **Chiew M**, Dydak U, Emir UE. Simultaneous Measurement of functional MRI and MRS by Fast Non-water Suppressed MR Spectroscopy Imaging, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2019; (**oral presentation**)
  48. Xia P, Shen X, Zhou X, **Chiew M**, Thomas MA, Dydak U, Emir UE. Density-Weighted Concentric Ring Trajectory using simultaneous multi-slice (SMS) acceleration: 3D Metabolite-cycled Magnetic Resonance Spectroscopy Imaging at 3 T, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2019; (**oral presentation**)
  49. **Chiew M**, Holmgren J, Warnaby CE, Rieger S, Vannesjo SJ, Miller KL. Using Information Derived from Simultaneous EEG Measures to Inform MR Image Reconstruction, *Gordon Research Conference* 2018;
  50. Emir UE, Xia P, Zhou X, **Chiew M**, Thomas MA, Dydak U. Density-weighted concentric ring trajectory using simultaneous multi-slice (SMS) acceleration: 3D metabolite-cycled magnetic resonance spectroscopic imaging at 3 T, *MRS Workshop* 2018;
  51. Wiltshire CEE, Chesters J, **Chiew M**, Watkins KE. Assessing speech movements in people who stutter using real-time MRI of the vocal tract, *Annual meeting of the society for the neurobiology of language* 2018;
  52. Mason HT, Miller KL, **Chiew M**. Acceleration of Golden Angle-Sampled fMRI Data with Data-Driven Priors and Low-Rank Constraints, *Organization for Human Brain Mapping Annual Meeting* 2018; (**oral presentation**)
  53. Steel A, James G, **Chiew M**, Thomas MA, Emir UE, Stagg CJ. Regional GABA Concentrations Assessed by Magnetic Resonance Spectroscopic Imaging Predict Different Aspects of Motor Performance, *Organization for Human Brain Mapping Annual Meeting* 2018;
  54. **Chiew M**, Holmgren J, Fido D, Warnaby CE, Vannesjo SJ. Measuring MRI Gradient Trajectory Dynamics using Simultaneous EEG-fMRI, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2018; (**oral presentation**)
  55. Schauman SS, **Chiew M**, Okell TW. Accelerated Acquisition of Vessel-Encoded Arterial Spin Labelling Angiograms with Compressed Sensing, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2018;
  56. **Chiew M**, Okell TW. Improved Golden Ratio Radial Arterial Spin Labelling Angiography Reconstruction using k-t Sparsity Constraints, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2018;
  57. Emir UE, Xia P, Zhou X, **Chiew M**, Steel A, Thomas MA, Dydak U. Non-Water Suppressed GABA Editing Magnetic Resonance Spectroscopic Imaging using Density Weighted Concentric Rings Trajectory, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2018;
  58. Steel A, **Chiew M**, Jezzard P, Voets NL, Plaha P, Thomas MA, Stagg CJ, Emir UE. Metabolite cycled density-weighted concentric rings k-space trajectory (DW-CRT) enables 1H magnetic resonance spectroscopic imaging at 3 Tesla in a clinically feasible timeframe, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2018;
  59. Mason HT, Miller KL, **Chiew M**. Acceleration of fMRI data with priors and low-rank constraints, *Organization for Human Brain Mapping Annual Meeting* 2017;
  60. Graedel NN, **Chiew M**, Miller KL. Exploring motion navigator choices in the TURBINE motion correction scheme for fMRI, *Organization for Human Brain Mapping Annual Meeting* 2017; (**oral presentation**)
  61. **Chiew M**, Holmgren J, Fido D, Warnaby CE, Miller KL. EEG-Informed Reconstruction of Accelerated fMRI Data Acquisition, *Organization for Human Brain Mapping Annual Meeting* 2017;
  62. **Chiew M**, Miller KL. Improving simultaneous multi-slice and 3D-EPI fMRI using rank-constrained reconstruction,

*Organization for Human Brain Mapping Annual Meeting 2017;*

63. **Chiew M**, Graedel NN, Holmgren J, Fido D, Warnaby CE, Miller KL. Accelerated rank-constrained FMRI data reconstruction informed by external temporal measures, *International Society for Magnetic Resonance in Medicine Annual Meeting 2017*; **(oral presentation)**
64. **Chiew M**, Holmgren J, Graedel NN, Fido D, Warnaby CE, Miller KL. Correction of Gradient Artefacts in Simultaneous EEG-FMRI from Rotating Gradient Trajectories, *International Society for Magnetic Resonance in Medicine Annual Meeting 2017*;
65. **Chiew M**, Jiang W, Larson PEZ, Burns B, Jezzard P, Thomas MA, Emir UE. Density Weighted Concentric Rings K-Space Trajectory for 1H MRSI with gradient offset independent adiabatic pulses at 7T, *International Society for Magnetic Resonance in Medicine Annual Meeting 2017*;
66. Emir UE, Burns B, **Chiew M**, Jezzard P, Thomas MA. Metabolite-Cycling Short-Echo Time Magnetic Resonance Spectroscopic Imaging using a Concentric Ring k-space Trajectory, *International Society for Magnetic Resonance in Medicine Annual Meeting 2017*;
67. **Chiew M**, Holmgren J, Fido D, Warnaby CE, Miller KL. Recovering Brain Network Structure from Highly Under-Sampled FMRI using Electrophysiological Constraints, *BASP Frontiers Workshop 2017*;
68. Weizman L, Miller KL, Eldar YC, **Chiew M**. Acceleration of functional MRI data acquisition by separation of background and dynamic components, *European Society for Magnetic Resonance in Medicine and Biology Annual Meeting 2016*; **(oral presentation)**
69. Guan C, **Chiew M**. Comparison of strict sparsity and low-rank constraints for accelerated FMRI data reconstruction, *International Society for Magnetic Resonance in Medicine Annual Meeting 2016*;
70. Graedel NN, **Chiew M**, Miller KL. Motion correction for functional MRI with hybrid radial-Cartesian 3D EPI, *International Society for Magnetic Resonance in Medicine Annual Meeting 2016*; **(oral presentation)**
71. **Chiew M**, Graedel NN, Miller KL. Promoting incoherence of radial x-f point spread functions using randomly perturbed golden angles, *International Society for Magnetic Resonance in Medicine Annual Meeting 2016*;
72. **Chiew M**, Miller KL. Revisiting adaptive regularization for self-calibrated, dynamic parallel imaging reconstruction, *International Society for Magnetic Resonance in Medicine Annual Meeting 2016*;
73. Guan C, **Chiew M**. Comparison of strict sparsity and low-rank constraints for accelerated FMRI data reconstruction, *ISMRM Workshop on Data Sampling & Image Reconstruction 2016*;
74. **Chiew M**, Graedel NN, Smith SM, Miller KL. Sub-second Whole Brain FMRI using a Hybrid Radial-Cartesian Acquisition and Low-Rank Reconstruction, *Organization for Human Brain Mapping Annual Meeting 2015*;
75. **Chiew M**, Graedel NN, Smith SM, Miller KL. Acceleration of task-based FMRI using k-t FASTER, *International Society for Magnetic Resonance in Medicine Annual Meeting 2015*;
76. **Chiew M**, Graedel NN, McNab JA, Smith SM, Miller KL. 3D Hybrid Radial-Cartesian Sampling for Improved Resting State FMRI using k-t FASTER, *International Society for Magnetic Resonance in Medicine Annual Meeting 2015*;
77. **Chiew M**, Smith SM, Koopmans PJ, Graedel NN, Blumensath T, Miller KL. K-t FASTER: Acceleration of FMRI Data Acquisition using Low Rank Constraints, *International Society for Magnetic Resonance in Medicine Annual Meeting 2015*;
78. Graedel NN, **Chiew M**, McNab JA, Miller KL. FMRI using a 3D radial-Cartesian trajectory: Spatio-temporal tunability and artefact correction, *International Society for Magnetic Resonance in Medicine Annual Meeting 2015*; **(oral presentation)**
79. **Chiew M**, Smith SM, Graedel NN, Blumensath T, Miller KL. Accelerating Resting State FMRI Acquisition using k-t FASTER: In Vivo Validation, *Organization for Human Brain Mapping Annual Meeting 2014*; **(oral presentation)**
80. Graedel NN, **Chiew M**, Clare S, Miller KL. Complex interactions of physiological noise and acceleration on tSNR in 3D EPI, *International Society for Magnetic Resonance in Medicine Annual Meeting 2014*;
81. **Chiew M**, Smith SM, Blumensath T, Miller KL. Joint multi-coil and low-rank constraints for accelerating FMRI data acquisition using k-t FASTER, *International Society for Magnetic Resonance in Medicine Annual Meeting 2014*;
82. **Chiew M**, Smith SM, Graedel NN, Blumensath T, Miller KL. Application of k-t FASTER for rank-constrained acceleration of in vivo FMRI data, *International Society for Magnetic Resonance in Medicine Annual Meeting 2014*;
83. **Chiew M**, Smith SM, Koopmans PJ, Graedel NN, Blumensath T, Miller KL. Low-Rank Acceleration of Resting



FMRI Data Acquisition using k-t FASTER, *Whistler Workshop of Brain Functional Organization, Connectivity and Behavior* 2014;

84. Mansur A, **Chiew M**, Tam F, Schweizer TA, Graham SJ. Analysis of Fmri Neurofeedback of the Primary Motor Cortex as a Function of Time During Kinesthetic Motor Imagery, *Canadian Stroke Congress* 2013;
85. **Chiew M**, Smith SM, Koopmans PJ, Blumensath T, Miller KL. Acceleration of Resting State FMRI Data Acquisition using Matrix Completion, *Organization for Human Brain Mapping Annual Meeting* 2013;
86. Mansur A, **Chiew M**, Tam F, Schweizer TA, Graham SJ. General linear model regression analysis of fMRI neurofeedback of the primary motor cortex using kinesthetic motor imagery, *Organization for Human Brain Mapping Annual Meeting* 2013;
87. **Chiew M**, Smith SM, Koopmans PJ, Blumensath T, Miller KL. K-t FASTER: A New Method for the Acceleration of Resting State FMRI Data Acquisition, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2013;
88. **Chiew M**, Miller KL, Koopmans PJ, Tunnicliffe EM, Smith SM, Blumensath T. Iterative Hard Thresholding and Matrix Shrinkage (IHT+MS) for Low-Rank Recovery of k-t Undersampled MRI Data, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2013;
89. **Chiew M**, Graham SJ. Direct SENSE imaging for fast, multi-echo fMRI over a restricted field of view, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2012;
90. **Chiew M**, LaConte SM, Graham SJ. fMRI Neurofeedback of Kinesthetic Motor Imagery, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2012;
91. Rotenberg DJ, **Chiew M**, Ranieri S, Tam F, Graham SJ. Real-time Motion Correction by Optical Tracking for Reducing Spin-History Artifacts in fMRI, *Organization for Human Brain Mapping Annual Meeting* 2011;
92. **Chiew M**, LaConte SM, Graham SJ. Performance related brain differences in real-time fMRI neurofeedback of imagined hand motor activity, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2011;
93. **Chiew M**, Graham SJ. Effect of physiological noise on densely sampled multi-echo fMRI data, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2011;
94. **Chiew M**, LaConte SM, Graham SJ. Self-Regulation of Imagined Hand Motor Activity using Real-Time fMRI Neurofeedback, *Organization for Human Brain Mapping Annual Meeting* 2010;
95. **Chiew M**, Graham SJ. A novel multi-echo fMRI weighting strategy using principal component analysis for BOLD contrast sensitivity enhancement, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2010;
96. **Chiew M**, Graham SJ. Modulating Brain Activity via Multi-Echo fMRI Neurofeedback, *International Society for Magnetic Resonance in Medicine Annual Meeting* 2009;

## Non Peer-Reviewed Publications

1. O'Donoghue MC, Blane J, Semple J, Rieger S, Aikin N, Campbell J, Pretorius P, Griffanti L, Gillis G, Okell TW, **Chiew M**, Smith SM, Miller KL, & Mackay CE. (2022). WIN MR Protocol: Oxford Brain Health Centre (2019\_102\_BHC). Zenodo. <https://doi.org/10.5281/zenodo.6598036>
2. Magnetic Resonance in Medicine Highlights Magazine, Volume 6 (2021) - Editor
3. Magnetic Resonance in Medicine Highlights Magazine, Volume 5 (2020) - Editor
4. Q&A with Lia Hocke, Yunjie Tong, and Blaise Frederick, Magnetic Resonance in Medicine Highlights (2016 December 16), <http://www.ismrm.org/qa-with-lia-hocke-yunjie-tong-and-blaise-de-frederick/>
5. Q&A with Klaus Scheffler and Philipp Ehse, Magnetic Resonance in Medicine Highlights (2016 July 21), <http://www.ismrm.org/qa-with-klaus-scheffler-and-philipp-ehse>

## Editor Picks

1. Q&A with Aaron T. Hess and Mark Chiew, Magnetic Resonance in Medicine Highlights (2021 December 10), <https://blog.ismrm.org/2021/12/10/qa-with-aaron-t-hess-and-mark-chiew/>

## Patents and Intellectual Property

1. Schauman SS, **Chiew M**, Okell TO “Methods and Systems for Optimizing Sampling Efficiency of Dynamically Sampled Magnetic Resonance Imaging (MRI), US Patent Application 2022/0146615 A1(pending)

2. **Chiew M**, Emir UE “Simultaneous Multi-Slice MRSI using Density Weighted Concentric Ring Acquisition”, US Patent Application 2022/0214414 A1(pending)
3. **Chiew M**, Miller KL, Smith SM, Blumensath T “Acceleration of Low-Rank MRI Data Acquisition”, US Patent (Application 61/808696, Abandoned)

## Teaching and Supervision

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### Teaching & Invited Lectures

2021	Teaching Lecture, “Low Rank and Structured Low Rank Reconstruction Approaches”, Image Reconstruction Weekend Educational Course, ISMRM 2021 Virtual Meeting
2014 - 19	Lecturer, EPSRC-MRC Centre for Doctoral Training in Biomedical Imaging University of Oxford
2013 - 19	Co-Organiser, Head Tutor and Lecturer, FMRIB Graduate Program - MRI Physics Department of Clinical Neurosciences, University of Oxford
2014 - 19	Faculty Lecturer, Physics Lectures FSL Course
2017	Teaching Lecture, “Measuring Connectivity with RS-fMRI”, Connectivity: Structure & Function Weekend Educational Course, ISMRM 2017, Honolulu, Hawaii
2013	Teaching Lecture, “MRI Basics and Diffusion Imaging” Hospital for Sick Children, University of Toronto
2013	Teaching Lecture, “Compressed Sensing”, Teaching Session on Highly Accelerated fMRI ESMRMB 2013 Congress, Toulouse, France
2012 - 13	Tutor and Lecturer, FMRIB Graduate Program Department of Clinical Neurosciences, University of Oxford
2011	Teaching Lecture, “Fast Functional MRI”, Annual MRI Retreat Sunnybrook Research Institute, University of Toronto
2010 - 11	Teaching Assistant, PHY231, Physics for the Life Sciences Department of Physics, University of Toronto
2010	Lab Demonstrator, PHY324 H1S, Practical Physics II Department of Physics, University of Toronto
2010	Invited Lecture, “Conversation with a Scientist”, Summer Research Rounds Rotman Research Institute, University of Toronto

### Post-Doctoral Supervision

2021 - 24	Charles Millard, University of Oxford Project: Self-Supervised Learning Methods in MRI
2020 - 23	Mo Shahdloo, University of Oxford Project: Model-Based Off-Resonance Correction for Accelerated Non-Human Primate Imaging
2015 - 16	Lior Weizman, Visiting Fellow, Technion - Israel Institute of Technology (co-supervisor) Project: Low-Rank + Sparse Decomposition for Accelerated fMRI

### Student Supervision

2022 -	Brenden Kadota, MSc Student, University of Toronto Thesis: TBD
2019 - 23	Xi Chen, DPhil Student, University of Oxford Thesis: Structured Low Rank Methods for Robust 3D Multi-Shot EPI
2017 - 20	S. Sophie Schauman, DPhil Student, University of Oxford Thesis: Improving Acquisition Speed and Efficiency of Advanced Arterial Spin Labelling MRI
2016 - 20	Harry Mason, DPhil Student, University of Oxford Thesis: Exploring subspace-constrained approaches to low-rank fMRI acceleration

2013 - 16	Nadine N. Graedel, DPhil Student, University of Oxford Thesis: Three-Dimensional Hybrid Radial Cartesian Echo Planar Imaging for Functional MRI
2014 - 16	Charles Guan, Electrical Engineering, Stanford University (Undergraduate Thesis) Thesis: Sparsity and Low-Rank Constraints in Functional MRI

## Supervisory Committees

2022 -	Navona Calarco, PhD Supervisory Committee, University of Toronto
2019	Pingyu Xia, PhD Committee, Purdue University

## Examinations

2022 Dec	Qijia Shen, University of Oxford, DPhil Transfer of Status Assessor
2022 Oct	Ying-Qiu Zheng, University of Oxford, DPhil Confirmation of Status Assessor
2021 Dec	Andrew Tyler, University of Oxford, DPhil Viva Voce Examination
2021 Mar	Conor Keogh, University of Oxford, DPhil Transfer of Status Assessor
2021 Jan	Ying-Qiu Zheng, University of Oxford, DPhil Transfer of Status Assessor
2020 Dec	Ryan Timms, University of Oxford, DPhil Confirmation of Status Assessor
2020 Dec	Charles Millard, University of Oxford, DPhil Confirmation of Status Assessor
2020 Nov	Thijs De Buck, University of Oxford, DPhil Transfer of Status Assessor
2020 Oct	Evan Roberts, University of Oxford, DPhil Transfer of Status Assessor
2019 Dec	Ryan Timms, University of Oxford, DPhil Transfer of Status Assessor
2019 Nov	Evan Edmond, University of Oxford, DPhil Transfer of Status Assessor
2019 Oct	Charles Millard, University of Oxford, DPhil Transfer of Status Assessor
2019 Jul	Feng Qi, University of Oxford, DPhil Viva Voce Examination
2018 Dec	Sven Jaeschke, University of Oxford, DPhil Confirmation of Status Assessor
2017 Nov	Jack Allen, University of Oxford, DPhil Confirmation of Status Assessor
2017 Nov	Joseph Woods, University of Oxford, DPhil Confirmation of Status Assessor
2017 Aug	Caitlin O'Brien, University of Oxford, DPhil Transfer of Status Assessor
2016 Aug	Jack Allen, University of Oxford, DPhil Transfer of Status Assessor
2015 Jan	Wenchuan Wu, University of Oxford, DPhil Transfer of Status Assessor

## Professional Activities

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### Ad Hoc Reviewer

BMC Medical Imaging  
 Brain and Behavior  
 Brain Informatics  
 Frontiers in Neuroscience  
 Human Brain Mapping  
 IEEE Transactions on Medical Imaging  
 Journal of Cognitive Neuroscience  
 Journal of Magnetic Resonance Imaging  
 Journal of Medical Imaging  
 Magnetic Resonance in Medicine

Medical Image Analysis  
 Neural Computation  
 Neurocomputing  
 NeuroImage  
 NMR in Biomedicine  
 Philosophical Transactions of the Royal Society B  
 PLoS ONE  
 ISMRM Annual Meeting Abstract Reviewer  
 OHBM Annual Meeting Abstract Reviewer  
 IEEE International Symposium on Biomedical Imaging

## Grant Reviewer

Canadian Institutes of Health Research  
 Israel Science Foundation  
 Royal Academy of Engineering (UK)

## Service

2021 - 22	Co-chair, ISMRM AMPC Image Acquisition Educational Table
2020 - 23	Member, ISMRM Annual Meeting Program Committee
2020 -	Chair, WIN Working Group on Ethnic and Racial Diversity
2020 -	Member, WIN EDI Committee
2019 -	Editor, Magnetic Resonance in Medicine Highlights Magazine
2017 - 20	WIN Methods Seminar Co-Organiser
2013 - 18	MRI Scheduling Co-ordinator, FMRI Physics Group, University of Oxford
2010 - 11	Co-coordinator, Rotman Rounds, Rotman Research Institute

## Professional Affiliations

Royal Academy of Engineering, Research Fellow  
 International Society for Magnetic Resonance in Medicine, Full Member  
 Organization for Human Brain Mapping, Past Member  
 European Society for Magnetic Resonance in Medicine and Biology, Past Member

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