

Navona Calarco

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EDUCATION

Doctor of Philosophy, Medical Biophysics, University of Toronto Supervisor: Dr. Kâmil Uludağ	2022 – present
Master of Science, Institute of Medical Science, University of Toronto Supervisor: Dr. Aristotle Voineskos [thesis]	2018 – 2021
Honours Bachelor of Arts, Cognitive Science, York University Advisors: Drs. Shayna Rosenbaum and Raymond Mar	2012 – 2015

EMPLOYMENT

Course Instructor

2023-winter	Estimation, Testing, and Learning, post-graduate certificate program, Data Science Institute, University of Toronto
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Teaching Assistantships [*all at the University of Toronto*]

2023,22,21,20-fall	Computational Biostatistics in R (MSC1090), graduate, Medical Science
2022-fall	Introduction to Biostatistics (LMP2004), graduate, Laboratory Medicine
2022-summer	Probability, Statistics, and Data Analysis II (STA238), undergraduate, Statistics
2022-summer	Design and Analysis of Experiments (STA305), undergraduate, Statistics

Research Employment

2018/9 - 2022/9	Research Analyst, Neurobiology of Depression & Aging Lab, CAMH (part-time)
2016/8 - 2018/8	Research Analyst II, Imaging-Genetics Lab, Research Imaging Centre, CAMH (full-time)
2015/8 - 2016/8	Research Analyst I, Slight Centre for Youth in Transition, CAMH (full-time)
2014/9 - 2015/8	Lab Manager, Cognitive Neuroscience Lab, York University (part-time)
2013/9 - 2014/8	Research Assistant, Cognitive Neuroscience Lab, York University (part-time)

RESEARCH VISITS

2024, Korea	Visiting Researcher, Centre for Neuroscience Imaging Research, Sungkyunkwan University. Supervised by Dr. Seong-Gi Kim [May 27 - June 28]
2023, Germany	Visiting Researcher, Institute of Science and Medicine, Forschungszentrum Jülich. Supervised by Prof. Dr. med. Katrin Amunts [Oct 16 - Nov 18]

RECOGNITIONS [*graduate studies only*]

2023	Michael Smith Foreign Study Supplement [\$6000]
2023	Helmholtz HIDA Visiting Researcher Grant [\$4060 EUR]
2023-2026	CIHR Vanier Canada Graduate Scholarship [\$150,000]
2023-2026	CIHR Canada Graduate Scholarship - Doctoral (CGS-D) [\$105,000] - <i>declined</i>
2023	Ontario Graduate Scholarship - PhD Program [\$15,000] - <i>declined</i>
2022-2026	Intel ACM SIGHPC Computational & Data Science Fellowship [\$45,000 US]
2022-2023	Massey College Junior Fellow
2022	UofT Department of Medical Biophysics Excellence Award [\$2000]
2022	UofT Medicine Unilever/Lipton Graduate Fellowship in Neurosciences [\$1700]
2022	UHN Research Trainee Conference Participation Award [\$500]

RECOGNITIONS CONT'D

2022	UofT Medicine Dr. Jesse Keshin Graduate Student Award [\$2000]
2022	Ontario Graduate Scholarship - PhD Program [\$15,000]
2020	SOBP Predoctoral Scholars Travel Fellowship Award [\$2000 US]
2019	UofT Graduate Studies Conference Grant [\$940]
2019	UofT Medicine Cleghorn Studentship Award for Schizophrenia Research [\$27,500]
2019	Ontario Graduate Scholarship - Master's Program (CGS-M) [\$15,000]
2018	CIHR Canada Graduate Scholarships - Master's Program [\$17,500]
2018	CAMH Discovery Fund Talent Development Competition [\$32,500]
2018	UofT Medicine Institute of Medical Science Entrance Award [\$5000]

PUBLICATIONS

[→ GoogleScholar](#)

Peer-Reviewed Papers

- 17 [Calarco](#) (2024). *Mapping the claustrum to elucidate consciousness*. Nature Reviews Psychology.
- 16 Amunts et al... [\[one of 100+ authors\]](#) (2024). *The coming decade of digital brain research: A vision for neuroscience at the intersection of technology and computing*. Imaging Neuroscience. Imaging Neuroscience.
- 15 Bingham, [Calarco](#), Dickie, Alexopoulos, Butters, Meyers, Marino, Neufeld, Rothschild, Whyte, Mulsant, Flint, Voineskos (2023). *The relationship of white matter microstructure with psychomotor disturbance and relapse in remitted psychotic depression*. Journal of Affective Disorders.
- 14 [Calarco](#), Oliver, Joseph, Hawco, Dickie, DeRosse, Gold, Foussias, Argyelan, Malhotra, Buchanan, Voineskos (2023). *Multivariate associations among white matter, neurocognition, and social cognition across individuals with schizophrenia spectrum disorders and healthy controls*. Schizophrenia Bulletin.
- 13 Shuster, Miles, Heyland, [Calarco](#), Voineskos, Nikolova, Diniz (2023). *Neuroimaging features of depression-frail phenotype in older adults: A pilot study*. International Psychogeriatrics.
- 12 [Calarco](#), Cassidy, Selby, Hawco, Voineskos, Diniz, Nikolova (2022). *Associations between locus coeruleus integrity and diagnosis, age, and cognitive performance in older adults with and without late-life depression: An exploratory study*. Neurolmage: Clinical.
- 11 Richie-Halford, Cieslak ... [The Fibr Community Science Consortium](#) [one of 150 consortia co-authors], Satterthwaite, Rokem (2022). *An open, analysis-ready, and quality controlled resource for pediatric brain white-matter research*. Scientific Data.
- 10 Schilling ... [\[one of 100+ authors\]](#) ... Descoteaux (2021). *Tractography dissection variability: what happens when 42 groups dissect 14 white matter bundles on the same dataset?* Neurolmage.
- 9 Martin-Chang, Kozak, Levesque, [Calarco](#), Mar (2020). *What's your pleasure? Exploring the predictors of leisure reading for fiction and nonfiction in adults*. Reading and Writing.
- 8 Marečková, Hawco, Bakht, [Calarco](#), Voineskos, Sibille, Hariri, Nikolova (2020). *Novel polygenic risk score as a translational tool linking depression-related changes in the corticolimbic transcriptome with neural face processing and anhedonic symptoms*. Translational Psychiatry.
- 7 Dickie, Anticevic, Smith, Coalson, Manogaran, [Calarco](#), Viviano, Glasser, Van Essen, Voineskos (2019). *ciftify: A framework for surface-based analysis of legacy MR acquisitions*. Neurolmage.
- 6 Shahab, Mulsant, Levesque, [Calarco](#), Nazeri, Wheeler, Foussias, Rajji, Voineskos (2019). *Brain structure, cognition, and brain age in schizophrenia, bipolar disorder, and healthy controls*. Neuropsychopharmacology.
- 5 Hawco, Buchanan, [Calarco](#), Mulsant, Viviano, Dickie, Argyelan, Gold, Iacoboni, DeRosse, Foussias, Malhotra, Voineskos (2019). *Separable and replicable neural strategies during imitation of emotional faces related to social cognitive and neurocognitive performance*. American Journal of Psychiatry.
- 4 Viviano, Buchanan, [Calarco](#), Gold, Foussias, Bhagwat, Stefanik, Hawco, DeRosse, Argyelan, Turner, Chavez, Kochunov, Kingsley, Zhou, Malhotra, Voineskos (2018). *Resting-state connectivity*

PUBLICATIONS CONT'D

- biomarkers of cognitive performance and social function in Schizophrenia Spectrum Disorders and healthy controls. *Biological Psychiatry*.
- 3 Hawco, Viviano, Chavez, Dickie, [Calarco](#), Kochunov, Argyelan, Turner, Malhotra, Buchanan, Voineskos. (2018). A longitudinal human phantom reliability study of multi-center T1-weighted, DTI, and resting state fMRI data. *Psychiatry Research: Neuroimaging*.
 - 2 Dickie, Ameis, Shahab, [Calarco](#), Smith, Miranda, Viviano, Voineskos. (2018). Personalized intrinsic network topography mapping and functional connectivity deficits in Autism Spectrum Disorder. *Biological Psychiatry*.
 - 1 Herdman, [Calarco](#), Moscovitch, Hirshhorn, Rosenbaum. (2015). Impoverished descriptions of familiar routes in three cases of hippocampal/medial temporal lobe amnesia. *Cortex*.

Book Chapters

- 2 Zacks, Mar, [Calarco](#). (2018). The cognitive neuroscience of discourse: Covered ground and new directions. In Schober, Britt, & Rapp (Eds.), *Handbook of Discourse Processes* (269-294). Routledge.
- 1 [Calarco](#), Fong, Rain, Mar. (2017). Absorption in narrative fiction and its possible impact on social abilities. In Hakemulder, Kuijpers, Bálint, Doicaru, & Tan (Eds.), *Narrative Absorption* (293-313). John Benjamins.

PRESENTATIONS [presenting author only, † virtual due to COVID-19 pandemic]

[→ select PDFs](#)

Refereed Conference Presentations

- 2023 The Human Claustrum in BigBrain and in vivo 7T MRI. *Krembil Research Day*, Toronto -- **best presentation award**.
- 2022 Using BigBrain to establish a histologically-informed MRI reference of the human claustrum. BigBrain Workshop: From microstructure to functional connectomics, Zadar Croatia -- **supported by travel award**.
- 2021 † Multivariate associations among white matter microstructure, neurocognition, and social cognition in people with a schizophrenia spectrum disorder, *UofT Institute of Medical Science Scientific Day*, Toronto.
- 2021 † Exploring multivariate patterns of brain and behaviour with Canonical Correlation Analysis: An application in schizophrenia, *Canadian Computational Neuroscience Spotlight (CCNS)*, Toronto.
- 2021 † Exploring multivariate patterns of brain and behaviour with Canonical Correlation Analysis: An application in schizophrenia, *CANSSI-NISS Health Data Science Workshop*, Toronto -- **top 5 paper**.
- 2021 † Multivariate associations among white matter microstructure, neurocognition, and social cognition in people with a schizophrenia spectrum disorder, *Schizophrenia International Research Society (SIRS)*, Toronto.
- 2019 Case-control differences and scanner variability in white matter microstructure in a multi-centre study of schizophrenia spectrum disorder and healthy control participants, *UofT Department of Psychiatry Research Day*, Toronto.
- 2018 Machine learning using brain imaging and neurocognitive data supports accelerated aging in schizophrenia spectrum, but not bipolar spectrum disorders, *UofT Department of Psychiatry Research Day*, Toronto.

Refereed Poster Presentations

- 2024 [UPCOMING] Cytoarchitectonic mapping and probabilistic atlas of the human claustrum. *Organization for Human Brain Mapping (OHBM)*, Seoul, Korea.
- 2024 [UPCOMING] Cytoarchitectonic mapping and probabilistic atlas of the human claustrum, *UofT Medical Biophysics Symposium*, Toronto.
- 2024 Cytoarchitectonic mapping and probabilistic atlas of the human claustrum. *Cognitive Neuroscience*

PRESENTATIONS CONT'D

- Society (CNS), Toronto, Canada.
- 2023 Establishing an anatomical gold standard of the human claustrum, *The International Society for Magnetic Resonance in Medicine (ISMRM) Workshop on Current Issues in Brain Function*, Padua, Italy.
- 2023 Establishing a MRI reference for the human claustrum, *Organization for Human Brain Mapping (OHBM)*, Montreal.
- 2023 Establishing a MRI reference for the human claustrum. *UofT Medical Biophysics Symposium*, Toronto.
- 2022 Neuromelanin in the locus coeruleus is associated with neurocognitive performance in older adults with depression and healthy controls, *Society of Biological Psychiatry (SOBP)*, New Orleans, USA -- **supported by travel award.**
- 2021 † Multivariate associations among white matter microstructure, neurocognition, and social cognition in people with a schizophrenia spectrum disorder and healthy control participants, *UofT Department of Psychiatry Research Day*, Toronto.
- 2021 † Multivariate associations among white matter microstructure, neurocognition, and social cognition in people with a schizophrenia spectrum disorder and healthy control participants, *Society of Biological Psychiatry (SOBP)*, San Diego, USA.
- 2020 † Association among deep white matter tracts and social cognition in schizophrenia and healthy controls, *Society of Biological Psychiatry (SOBP)*, New York, USA -- **supported by travel award.**
- 2020 † Pilot testing of neuromelanin as a biomarker of late-life depression, *Imaging Network Ontario (ImNO)*, Toronto.
- 2019 A graph signal processing analysis of an emotional fMRI task in a large, multi-centre study of schizophrenia and healthy controls, *XSeed Seeding Innovation*, Toronto.
- 2019 Case-control differences and scanner variability in white matter microstructure in a multi-centre study of schizophrenia spectrum disorder and healthy control participants, *UofT Institute of Medical Science Scientific Day*, Toronto.

Guest Lectures, Rounds, Panels, & Outreach Presentations

- 2023/11 Düsseldorf Institute of Neuroscience and Medicine Besprechung | 'Integrating the claustrum into the Jülich Brain Atlas'
- 2023/04 Montreal Feindel Brain Imaging Lecture Series, McConnell Brain Imaging Centre at the MNI (with Kâmil Uludağ) | 'Investigating the claustrum in BigBrain ... and via 7T MRI?'
- 2021/11 † Toronto BrainHack Global Toronto | Panelist, 'Fun and challenges in analyzing MRI data'
- 2021/06 † Toronto CAMH Trainee Seminar Series | 'Multivariate analyses of brain imaging data'
- 2021/03 † Toronto 3 Minute Thesis Competition (3MT), UofT | 'Social cognition is in the connections'
- 2021/02 † Toronto Krembil Neuroimaging Rounds, UHN | 'Multivariate associations with white matter microstructure in schizophrenia'

ADDITIONAL TRAINING

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- 2021 Teaching The Carpentries Instructor Training [virtual]
- 2019 Scientific Diffusion Imaging in Python (DiPy) Workshop [Bloomington]
- 2019 Scientific ABCD Neurocognitive Prediction Challenge, satellite of MICCAI 2019 [virtual]
- 2017 Computational SciNet Compute Ontario Summer School: Data Science [Toronto]
- 2016 Computational SciNet Compute Ontario Summer School: High Performance Computing [Toronto]

SOFTWARE PROFICIENCY

→ [GitHub](#) | [RPods](#)

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- Statistics Strong: R (incl. tidyverse), Python (SciPy, scikit-learn, matplotlib); Familiar: MatLab, SPSS.
- Imaging Strong: FSL, FreeSurfer, AFNI, Slicer; Familiar: DiPy, BIDS, popular pipelines (e.g., fMRIPrep), etc.
- Coding Strong: bash, git; Familiar: Python, containers, compute clusters, etc.

SERVICE

Reviewing[→ ORCID](#)

- Ad hoc:* Psychiatry Research (2); Psychiatry Research: Neuroimaging (6); Schizophrenia Bulletin (2); Schizophrenia Research (2)
- Mentored:* Nature Communications (with Dr. Kâmil Uludag, 1); Nature Neuroscience (with Dr. Kâmil Uludag, 1); Human Brain Mapping (with Dr. Yuliya Nikolova, 2); Biological Psychiatry (with Dr. Aristotle Voineskos, 2)

Student Co-Supervision

- 2024 Shuting Xie, Master of Science in Applied Computing (graduate), University of Toronto [MITACS-funded internship, with Kâmil Uludağ, UHN; 8 months]
- 2024 Jack Pitcher, Master of Science in Applied Computing (graduate), University of Toronto [MITACS-funded internship, with Kâmil Uludağ, UHN; 8 months]
- 2023 Skerdi Proгри, Biomedical Sciences (undergraduate), Toronto Metropolitan University [UHN Summer Research Program and RAship; 12 months]

Student Mentorship

- 2022 Lindsay Heyland, Neuroscience (undergraduate), Mount Saint Vincent University [Amgen Scholar Program, with Yuliya Nikolova, CAMH; 4 months]
- 2018 Priya Patel, Engineering (undergraduate), University of Waterloo [Waterloo-CAMH co-op program, with Yuliya Nikolova, CAMH; 4 months]

Conference Volunteerism

- 2021 Volunteer, The 24th Annual Conference on Artificial Intelligence and Statistics (AISTATS)
- 2020 Reviewer, NeurIPS Workshop: Algorithmic Fairness (AFCI2020)
- 2020 Reviewer, Black in Neuro Conference 2020

COMMUNITY

- 2021/12 - present Carpentries Instructor, Software Carpentry and Data Carpentry [Teach R, Python, and Bash to students and scientists over full-day workshops]
- 2020/9 - 2023/12 Advisory Board, Child Welfare Political Action Committee [Advocacy for former Crown Wards re: post-secondary education support]
- 2018/9 - 2022/12 Programming Instructor, Yonge Street Mission [Teach HTML & CSS and Python to 'at-risk' youth; 2020 Volunteer of the Year]