

GIUSEPPE IARIA – ACADEMIC CURRICULUM VITAE

Director and Professor

Department of Psychology, University of Calgary, Calgary, AB, Canada
Email

EDUCATION & QUALIFICATIONS

- 2007 – 2008 University of British Columbia, Vancouver, BC, Canada
Teaching Faculty Certificate: Teaching and Learning in Higher Education
Instructors: Prof. Harry Hubball and Prof. Anne Graham
Date of Graduation: June 16, 2008
- 2007 – 2008 University of British Columbia and the Vancouver Coast Health Research
Institute, Vancouver, BC, Canada. Department of communications & Public
Affairs: **Training in communication and media.**
Date of Graduation: April 10, 2007
- 1999 – 2003 Department of Psychology, University of Rome “La Sapienza”, Rome, Italy, &
Montreal Neurological Institute, McGill University, Montreal, QC, Canada.
Ph.D. in Cognitive Neuroscience
Place learning in human navigation: neural mechanisms and variability.
Supervisors: Prof. Luigi Pizzamiglio and Prof. Michael Petrides
Date of Graduation: April 11, 2003
- 1997 – 1999 IRCCS Santa Lucia Hospital and University of Rome “La sapienza”, Italy.
Training in Neuropsychology
Diagnosis and treatment of cognitive disorders.
Supervisor: Prof. Luigi Pizzamiglio
Date of Graduation: July 25, 1999
- 1992 – 1997 University of Rome “La Sapienza”, Italy.
BA and MSc in Psychology
The facial expressions and perception of emotions in humans.
Supervisor: Prof. Pierluigi Zoccolotti
Date of Graduation: July 10, 1997

ACADEMIC POSITIONS AND AFFILIATIONS

- Jan 2019 – Present Director, Canadian Space Health Research Network, Canada.
- Jul 2009 – Present Professor of Cognitive Neuroscience, Department of Psychology,
Faculty of Arts, University of Calgary, Calgary, AB, Canada.

Jul 2009 – Present	Adjunct Professor, Department of Clinical Neurosciences, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada.
2009 – Present	Member, Hotchkiss Brain Institute, Foothills Medical Centre, Calgary, Alberta, Canada.
2012 – Present	Member, Alberta Children’s Hospital Research Institute for Child and Maternal Health, Calgary, Alberta, Canada.
Jul 2018 – Jun 2021	Director, Psychology Graduate Program, Department of Psychology, Faculty of Arts, University of Calgary, Calgary, AB, Canada.
Sept 2007 – Jul 2012	Adjunct Faculty, Department of Psychology, Simon Fraser University, Burnaby, BC, Canada.
Sept 2006 – Jul 2009	Postdoctoral Fellow, Department of Medicine, Faculty of Medicine, UBC, Vancouver, BC, Canada.
Jan 2006 – Aug 2006	Visiting Scientist, Cognitive Neuroscience Unit, Montreal Neurological Institute, McGill University, Montreal, QC, Canada.
2003 – 2005	Sessional Lecturer, Faculty of Psychology, University of L’Aquila, L’Aquila, Italy.
2003 – 2005	Postdoctoral Fellow, Department of Psychology, University of Rome “La Sapienza”, Rome, Italy.
2002 – 2003	Research Scientist, LPPA, College de France and CNRS, Paris, France.
2000 – 2002	Research Scientist, Cognitive Neuroscience Unit, Montreal Neurological Institute, McGill University, Montreal, QC, Canada.
1994 – 1999	Research Assistant, Department of Psychology, University of Rome “La Sapienza” and Neuropsychology Unit, IRCCS Santa Lucia Hospital, Rome, Italy.

AWARDS AND RECOGNITIONS

- Outstanding Achievement Award – University of Calgary (2023)
- Citizenship Award – University of Calgary (2020)
- Gran Premio Manente – National recognition for Italian Scientists working abroad (2019)
- Royal Society of Canada, The College of Scholar – Nomination (2018)
- Faculty of Arts Research Award - University of Calgary (2017)
- Royal Society of Canada, The College of Scholar – Nomination (2017)
- Killam Award in Undergraduate Mentorship Nomination - University of Calgary (2016)
- Killam Award in Undergraduate Mentorship Nomination - University of Calgary (2015)

- Undergraduate Research Supervision Award - University of Calgary (2011)
- University Research Grant Committee Travel Award - University of Calgary (2011)
- Trainee Award, Michael Smith Foundation for Health Research (2007)
- Trainee Award, Alzheimer Society of Canada (2007)
- Brain Star Award, Canadian Institutes of Health Research (2004)
- *Ennio De Renzi* Award. Italian Society of Neuropsychology (2003)

LEADERSHIP AND SERVICE ACTIVITIES

I am the Director and Founder of the [Canadian Space Health Research Network](#) (CSHRNet), a not-for-profit organization that I founded in 2019. Under my vision and guidance, CSHRNet has grown from a small group of scientists into a community of over 1,300 Canadian researchers, including principal investigators and trainees, from both academic and industry backgrounds. On behalf of CSHRNet, I have raised significant funds from individual donors and organizations to support the networks' activities and sponsors collaborative projects and students' research training. Importantly, I have established partnerships with national and international organizations, such as the Canadian Space Agency, the Canadian Institutes of Health Research (CIHR), NASA, Axiom Space, the Translational Research Institute for Space Health, and the European Space Agency.

In addition to my leadership role at CSHRNet, I have held various academic and administrative positions over the years:

- Interim Director, Psychology Graduate Program, Department of Psychology, University of Calgary (2023 – 2024).
- Member, Faculty of Arts Research and Creativity Committee, Faculty of Arts, University of Calgary (2023 – current).
- Member, Psychology Graduate Program Committee, Department of Psychology, University of Calgary (2010 – current).
- Member, Position Advisory Committee, Department of Psychology, University of Calgary (2017 – current).
- Member, Advisory Board of the Italian Ministry of Education (Universities and Research) (2019 – current).
- Associate Editors and Board Member for *Cortex* (Elsevier), *Cognitive Neuropsychology* (Taylor & Francis), *Canadian Journal of Experimental Psychology* (CPA), and *Frontiers in Neurology* (2015 – 2024).
- Advisory Selection Committee for the Headship Search in Psychology (2023).
- Chair of Health and Life Sciences (HLS) Announcement of Opportunities (AO) grant panel at the Canadian Space Agency (2023).
- Director, Psychology Graduate Program, Department of Psychology, University of Calgary (2018 – 2021).
- Member, Scholarship and Fellowship Committee, Natural Sciences and Engineering Research Council of Canada (NSERC) (2019 – 2022).
- Member, Behavioural Science B and C Committees, Canadian Institutes of Health Research (CIHR) (2017 – 2019).

- Equity, Diversity and Inclusion Committee, Faculty of Arts, University of Calgary (2018 – 2020).
- Faculty of Graduate Studies Scholarship Review Committee, University of Calgary (2017 – 2020).
- Chair, Academic Selection Committee for a Tenure Track Faculty Position in Cognitive Science (Department of psychology, University of Calgary (2018 – 2019).
- Hotchkiss Brain Institute and Department of Clinical Neuroscience Pilot Research Fund Program (PFUN) Committee, University of Calgary (2017)
- Member, Academic Selection Committee for a Tenure Track CRC Faculty Position in Neuropsychology, Department of psychology, University of Calgary (2016 – 2017).
- Member, Academic Selection Committee for Paediatric Neurology Position, Cumming School of Medicine (2013 – 2014).
- Organizer, Department of Psychology Seminar Series, University of Calgary (2012 – 2018).
- Department Representative – The Faculty Association of the University of Calgary (2012 – 2015).
- Performance Review Committee, Department of Psychology, University of Calgary (2013 – 2015).
- Graduate Scholarship Officer, Department of Psychology University of Calgary (2010 – 2013).
- BSc Neuroscience Education Committee, University of Calgary (2009 – 2013).
- Department of Psychology Undergraduate Committee, University of Calgary (2009 – 2010).
- Faculty of Graduate Studies Scholarship Review Committee, University of Calgary (2009 – 2010).
- Acting as a reviewer (an average of once per month) for a variety of scientific journals including *Brain*, *Cerebral Cortex*, *Journal of Cognitive Neuroscience*, *Journal of Neuroscience*, *Nature*, *Neuroimage*, and *Neuron* (2009 – current).

MENTORSHIP, SUPERVISION, AND TEACHING

As supervisor and mentor, I guide students in comprehending new knowledge and foster their development towards becoming self-directed in furthering their understanding of any given research topic in cognitive and clinical neuroscience. To help students to become productive and independent researchers, I meet with them individually, and hold weekly lab meetings. In addition, I provide the space and resources required for their projects, and, importantly, I look for opportunities for them in order to gain additional training (i.e. workshops, conferences, and additional research projects to be undertaken with my collaborators).

Students in my laboratory are enrolled in four different training programs (Psychology, Neuroscience, Clinical Psychology, and Health Sciences) and are trainee members of the Brain and Cognitive Sciences Group in the Department of Psychology, the Hotchkiss Brain Institute, and the Alberta Children Hospital Research Institute. As such, my students are part of a very active cognitive and clinical neuroscience community, and have access to many seminar series, journal clubs, and advanced laboratory and neuroimaging facilities.

Since my first faculty appointment in 2009, I have supervised eight Master students, eight PhD students, 28 honours students, five students in full year research courses equivalent to honours, and 20 summer students (one from Mexico and three from India, recruited through the Mitacs Globalink Program). In addition, I have supervised two visiting international students from the University of Osnabrück (Germany) (visited for 12 months each), two visiting international students from the University of Milan and the University of Padova (visited for eight months each), and 13 volunteers. My students receive competitive local and federal awards including studentships from NSERC and Alberta Innovates Health Solutions. Since my first appointment at the University of Calgary in 2009, my students have contributed to 77 peer-reviewed articles, and presented annually at international conferences in North America and Europe.

I have been teaching undergraduate and graduate courses at the University of Calgary since 2009. The topics of these courses include Cognitive and Clinical Neuroscience, Research in Cognitive Science, Special Topics in the Design of Psychological Research, Advanced Topics in Brain and Cognitive Science, and Neuroimaging Methodologies. With a focus on active learning, I have been nominated for and received teaching awards. Additionally, I have contributed to the Scholarship of Teaching and Learning with a focus on investigating the effects of class sizes on the most effective teaching and learning experiences (Iaria, G., & Hubball, H., 2008. Assessing student engagement in small and large classes. *Transformative Dialogues Teaching and Learning Journal*, 2(1): 1-8). Below is the detailed list of courses taught in the past 16 years:

Graduate Courses

- Functional Neuroanatomy (PSYC 623) Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Winter 2021).
- Research in Cognitive Science (PSYC 712), Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Spring 2024, Summer 2023, Spring 2022, Winter 2022, Spring 2022, Winter 2017, Fall 2016, Winter 2012, Fall 2012, Fall 2011, Winter 2011, Fall 2010).
- Special Topics in the Design of Psychological Research (PSYC 619) – Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Fall 2016, Winter 2017, Spring 2017).
- Research in Behavioural Neuroscience (PSYC 702), Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Spring and Summer 2024, Spring 2017, Winter 2017, Winter 2015, Fall 2014, Fall 2013).
- Advanced Topics Brain & Cognitive Science (PSYC 620), Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Winter 2012, Fall 2010).

Undergraduate Courses

- Cognitive and Clinical Neuroscience (PSYC 521 and NEU 521), Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Winter 2025, Winter 2024, Winter 2023, Winter 2022, Winter 2021, Winter 2020, Winter 2019, Fall 2017, Winter 2017, Winter 2015, Fall 2014, Fall 2013, Fall 2012, Winter 2012, Fall 2011, Winter 2011, Winter 2010, Fall 2009).
- Brain and Behaviour (PSYC 375), Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Winter 2012, Winter 2011, Fall 2010, Winter 2010).
- Research in Psychology (PSYC 504 and PSYC 505), Department of Psychology, University of Calgary, Calgary, Alberta, Canada (Winter 2019, Fall 2018, Winter 2011, Fall 2010).

CURRENT RESEARCH PROGRAM

My research program aims to uncover the fundamental mechanisms underlying human spatial cognition and topographical orientation across the lifespan - from early development to old age – and in the context of neurological conditions or extreme environmental exposure, including those experienced by astronauts during a spaceflight. I also investigate the neurological basis of individual behavioural variability and the brain mechanisms involved in face processing and recognition. My projects integrate neuroimaging, genetic, behavioral, and neuropsychological approaches to examine the contributions of various cognitive functions within my research domain. These studies have benefited from my prior training in psychology, neuropsychology, and imaging techniques at the University of Rome "La Sapienza" (Rome, Italy), the Collège de France (Paris, France), the Montreal Neurological Institute at McGill University (Montreal, Canada), and the University of British Columbia (Vancouver, Canada). Below, I provide a brief description of some of my current projects.

- The behavioural and neurological effects of outer space travel.** The main objective of this research program is to investigate the impact of outer space travel on the human brain. The program includes studies conducted at NASA with astronauts, as well as studies performed with non-astronaut participants and animal models. Importantly, in addition to benefiting the space community, the space health research projects included in this program benefit the general population, as many of the effects of space travel resemble conditions affecting human health on Earth (e.g., inactivity, isolation and confinement, and radiation exposure).

Onboard the International Space Station (ISS), the relative lack of gravitational forces (microgravity) significantly alters an astronaut's proprioceptive and vestibular sensory experience. This change often leads to space motion sickness, perceptual illusions, and spatial disorientation as astronauts adapt to the ISS environment. The primary objective of the "Wayfinding" project, funded by the Canadian Space Agency, is to investigate the behavioral and neurological effects of microgravity following a long-duration spaceflight. Neurological structure and function are assessed in a group of astronauts through Magnetic Resonance Imaging (MRI), and spatial orientation skills are evaluated using tasks in virtual environments. The project aims to provide a comprehensive assessment of the cognitive and neurological changes associated with spaceflight, including post-flight rehabilitation strategies for astronauts who have completed missions on the ISS. This characterization will illuminate unforeseen beneficial neurological and behavioral outcomes that new prophylactic measures could target.

Additional projects within the space health research program explore the impact of simulated microgravity on human cognition, relying on laboratory testing of non-astronaut participants performing tasks in a virtual reality version of the ISS. Similarly, the program investigates the cognitive process of human adaptation to a microgravity environment, potentially leading to the development of selective training programs for long-term spaceflights. Furthermore, the research program includes a study investigating the effects of inactivity (i.e., a bed-rest study) as an analog of exposure to microgravity on human health and cognition. Finally, a newly funded transdisciplinary study utilizes *drosophila* (fruit flies) as an animal model to quantify the behavioral and physiological responses to spaceflight as a stressful life experience. These additional projects receive funding from CIHR, NSERC, the Canadian Space Agency, and the University of Calgary Transdisciplinary Connector Initiative.

- **Developmental Topographical Disorientation (DTD).** This research program aims to investigate the lifelong topographical disorientation experienced by individuals affected by Developmental Topographical Disorientation (DTD), a condition that my colleagues and I have first discovered and termed in 2008 (see publication list). Individuals affected by DTD are unable to orient themselves even in the most familiar surroundings from childhood, despite having no brain damage or cognitive defects.

The research program aims to investigate the cognitive and neurological mechanisms underlying this condition by incorporating the use of behavioral and neuroimaging techniques such as functional Magnetic Resonance Imaging (fMRI), Diffusion Tensor Imaging (DTI), resting-state fMRI, and Susceptibility Weighted Imaging. Additionally, familial and genetic studies are underway to investigate the factors contributing to the lack of development of orientation skills in individuals with DTD.

- **Online assessment of topographical orientation skills.** This project makes use of a comprehensive online assessment of human orientation ability to provide a tool globally for the general population. The battery includes questionnaires and a variety of tests in virtual environments to evaluate the use of different orientation strategies and the range of cognitive skills crucial for orientation in daily life. The testing battery is available online for public use at www.gettinglost.ca, and it has been adopted by many researchers in the world to be implemented in their own research programs. The project has a global impact.
- **Training human spatial orientation.** This research program aims to develop training programs capable of enhancing the spatial orientation skills of both healthy volunteers and individuals affected by topographical disorientation. The program utilizes cognitive, Transcranial Magnetic Stimulation (TMS), and sensory augmentation protocols. The methodological approach involves collecting behavioral and neuroimaging data (including EEG, fMRI, DTI, and resting-state) before and after training to assess the program's efficacy both behaviorally and neurologically. Some of the training programs are provided online in our dedicated platform (www.gettinglost.ca) for benefiting the general population at large and having a global impact on health.
- **Spatial orientation in children.** The ability to orient oneself in the environment relies mainly on the formation and utilization of a mental representation of the surroundings, known as a cognitive map. This project aims to investigate the precise timing of the full development of this complex orientation skill in humans. The project involves behavioral studies with children to evaluate their ability to form and use cognitive maps in both real and virtual environments, and the use of electroencephalography (EEG) to identify the neurological correlates of those skills. Additionally, the research program examines the effects of a variety of clinical conditions, such as perinatal stroke and ADHD, on the development of this ability. To facilitate the assessment of spatial orientation in children, we have developed a video game specifically designed to quantify children's topographical orientation skills.
- **Spatial orientation skills, psychosocial outcomes and quality of life.** The ability to orient oneself in spatial surroundings enables individuals to interact with others and accomplish various tasks essential for daily life functioning. Consequently, topographical orientation skills may significantly correlate with numerous psychosocial outcomes and quality of life indicators. In this project, we are investigating the unexplored relationship between human

spatial orientation abilities and individuals' psychosocial outcomes and quality of life. Our general hypothesis posits that proficiency in orienting and navigating within the environment may exert significant effects on affect, self-concepts, quality of social relationships, psychosocial life outcomes, and measures of quality of life.

- **Human orientation, individual variability, and neural mechanisms.** This project aims to investigate the behavioral and neurological mechanisms related to individual variability in spatial orientation skills within the healthy population. The project utilizes behavioral, fMRI, DTI, and Voxel Brain Morphometry (VBM) methods to focus on examining individual biases in spontaneously adopting different cognitive navigational strategies useful for orientation, and their relationship with functional and structural neural variability.
- **Spatial memory, consolidation, and sleep.** This project focuses on investigating the effects of sleep quality and sleep deprivation on the consolidation of memory for locations and pathways traveled within the environment. The approach includes polygraphic nocturnal sleep recording for the analysis of REM and non-REM phases, as well as behavioral and neuroimaging approaches (fMRI, DTI, Resting State) in young, healthy volunteers.

RESEARCH COLLABORATIONS

My research is inherently interdisciplinary and transdisciplinary, integrating diverse perspectives and methodologies from computer science, neurology, neuroscience, cognitive psychology, and space health. I collaborate with national and international colleagues to tackle complex scientific questions and foster innovative solutions that benefit public health. The collaborative projects listed below (from most recent to oldest) have been instrumental in advancing our understanding of human cognition and its applications in everyday life, underscoring the global impact and relevance of my work.

- **Dr. Matteo Cerri, University of Bologna, Bologna (Italy).** *Sleep, torpor, and health.* This research project combines various methodological approaches in both humans and non-human animals to reproduce the state of torpor and extend its benefits from space travel to clinically relevant situations on Earth.
- **Dr. Savraj Grewal, University of Calgary, Calgary (Canada).** *Astro-fly.* The objective of this project is to adopt a laboratory approach to simulate microgravity and investigate its impact on health. This research benefits the general population globally, as microgravity serves as an analogue for inactivity—a condition common in everyday lifestyles and many clinical situations.
- **Dr. Hugo Spiers, University College London, London, (United Kingdom).** *Spatial orientation, aging, and dementia.* The objective of this collaborative project is to investigate variability in spatial orientation skills – from individuals affected by Developmental Topographical Disorientation (DTD) to expert navigators such as London taxi drivers – in order to identify predictors of neurodegenerative disorders.
- **Dr. Richard Hughson, University of Waterloo, Waterloo (Canada).** *Vascular and neurological aging.* In this project, we combine data from a group of astronauts to

investigate the vascular correlates associated with microbleeds documented in their brains. This unique and innovative approach aims to examine the relationship between vascular and neurological measures in the human aging process.

- **Dr. Pierre-Yves Jonin, CNRS, INSERM, Rennes (France).** *Rehabilitating the human sense of direction.* This project marks the first trial of a collaborative effort between science and technology to develop an indoor Bluetooth system for large buildings – where GPS is unavailable – to assist individuals affected by DTD in orienting and navigating. The system could also benefit anyone who has lost their sense of direction due to an acquired brain damage, a general cognitive decline, or simply a poor innate sense of direction.
- **Dr. Ryan D’Arcy, Simon Fraser University, Burnaby (Canada).** *Brain health.* This project is a collaborative effort between science and technology, utilizing data from private astronauts. Its objective is to test a simple EEG system capable of detecting changes in brain function that may be relevant for high-performance tasks or serve as a measure of brain health in the aging population.
- **Dr. Arne Ekstrom, University of Arizona, Tucson (USA).** *Spatial complexity explained.* The objective of this collaborative project is to develop a theoretical framework that explains the complexity of human spatial orientation and navigation. The approach relies on data collected from MRI and EEG systems, as well as intracranial data from patients affected by epilepsy.
- **Dr. Joern Davidsen, University of Calgary, Calgary (Canada).** *Functional brain networks.* This collaborative effort among experts in physics, computational neuroscience, and neuropsychology offers the first opportunity to illustrate how complex, extended networks in the brain contribute to dysfunctional behaviors that might otherwise remain undetected. By examining the inability to orient – as observed in individuals with Developmental Topographical Disorientation – we gain insights into these underlying neurological mechanisms.
- **Dr. Francesco Ferretti, Roma Tre University, Rome, (Italy).** *Navigating places and stories.* The aim of this project is to investigate the overlapping cognitive and neurological mechanisms involved in navigating spatial environments and processing narratives. This research provides an opportunity to develop a generalized model of cognition that supports diverse domains.
- **Dr. Brad Duchaine, Dartmouth College, Hanover (USA).** *Developmental Topographical Disorientation (DTD) and Developmental Prosopagnosia (DP).* The objective of this project is to investigate, from a cognitive and neurological perspective, the comorbidity of two developmental disorders (i.e. inability to orient and inability to recognise familiar faces) that have been described independently, yet are sometimes reported together by individuals primarily affected by one of them.
- **Dr. Jason Barton, University of British Columbia, Vancouver (Canada).** *Recognizing places and faces.* The main objective of this research project is to investigate the overlap between cognitive deficits observed in brain-damaged patients who have lost the ability to recognize faces and/or places.

- **Dr. Michele Ferrara, University of L'Aquila, L'Aquila (Italy).** *Human sleep and spatial navigation.* This collaborative project investigates the relationship between sleep, memory, and spatial navigation in both healthy individuals and those affected by sleep disorders.
- **Dr. Giorgia Committeri, University Gabriele D'Annunzio, Chieti (Italy).** *Body reference frames and spatial memory.* This long-term collaborative project investigates the relationship between the body reference perspective that individuals take in spatial orientation and their ability to navigate familiar and unfamiliar surroundings.
- **Dr. Concetta Pastorelli, University of Rome 'La Sapienza', Rome, (Italy).** *Individual variability, personality and psychosocial development.* This collaborative project aims to investigate the neurological mechanisms underlying human empathy and certain personality traits (e.g., neuroticism) in relation to variability in spatial cognition.

RESEARCH GRANTS

- Natural Sciences and Engineering Research Council of Canada (NSERC) (2020-2026) (\$165,000) (PI) – “*Measuring behavioural and neurological changes of human spatial orientation*”.
- University of Calgary (2025-2027) (\$17,000) (PI) – “*Astrofly: Harnessing Fruit Fly Genetics to Study Human Space Health*”.
- Canadian Space Agency (CSA) (NASA/ISS project 2016-2026) (\$944,000) (PI) – “*The detrimental effects of long duration spaceflight on human wayfinding: The behavioural and neural mechanisms*”.
- University of Calgary (2023-2025) (\$10,000) (PI) – “*Astro-Drosophila: Studying Spatial Orientation Skills in Spaceflight*”.
- Canadian Space Agency (CSA) (2022-2024) (\$70,000) (Co-applicant) – “*Astronaut Brain Health Data Mining*”.
- Canadian Institutes of Health Research (CIHR) (2020-2022) (\$133,245) (Co-applicant) – “*Ensuring mission success and optimal aging: disentangling the impact of simulated microgravity on brain health*”.
- Natural Sciences and Engineering Research Council of Canada (NSERC) (2015-2020) (\$200,000) (PI) – “*Development and plasticity of human topographical orientation*”.
- Rare Disease Foundation (2017) (\$3,500) (PI) – “*Investigating the genetic basis of Developmental Topographical Disorientation*”.
- Canadian Institute for Military and Veteran Health Research (CIMVHR), Department of National Defence, Canada (2013-2014) (\$90,085) (PI) – “*Measuring spatial abilities using*”.

behavioural (virtual environment) and neuroimaging (magnetic resonance imaging) approaches”.

- Social Sciences and Humanities Research Council of Canada (SSHRC) Insight Development Grant (2012-2014) (\$32,393) (PI) – “*The relationship between psychosocial outcomes and topographical orientation skills*”.
- Natural Sciences and Engineering Research Council of Canada (NSERC) (2010-2015) (\$135,000) (PI) – “*Human topographical orientation: Individual variability and neural mechanisms*”.
- Hotchkiss Brain Institute, University of Calgary (2010-2015) (\$10,000) (PI) – “*The neural mechanisms of spatial orientation in humans*”.
- University Research Grant Committee, University of Calgary (2009-2010) (\$18,000) (PI) – “*Facial expressions and identity recognition: individual differences and neural mechanisms*”.
- Canadian Institutes of Health Research (CIHR) (2007-2009) (\$701,012) (Co-applicant) – “*Functional and structural correlations in prosopagnosia*”.

REFEREED PUBLICATIONS

Please note that trainees under my supervision are underlined. Also, in my discipline, the Principal Investigator and/or senior Author of a manuscript is listed as last Author, unless they have written the manuscript, in which case they are listed as first Author.

Invited essay (2)

1. **Iaria, G., Burles, F.** (2016). Developmental Topographical Disorientation. *Trends in Cognitive Sciences*, 20(10):720-2.
2. **Iaria, G.** (2013). Developmental Topographical Disorientation: Lost every day. *The Lancet Neurology*, 12(8):745.

Journal articles (108) and book chapters (6)

1. Batool, S., Jaswal, T., Burles, F., Iaria, G. (2025). Hippocampal Volumetric Changes in Astronauts Following a Mission in the International Space Station. Under Review.
2. Burles, F., Sallis, E., Kopala-Sibley, D.C., Iaria, G. (2025). Mitigating Head Position Bias in Glymphatic Imaging: LD- ALPS, A Novel Method for DTI-ALPS Calculation. Under Review.
3. Michael McLaren-Gradinaru, M., Burles, F., Ciorac, B., Coetzee, M., Protzner, A.B., Iaria, G. (2025). The behavioural effects of a specialized wayfinding training program in children. Under Review.

4. Kirby, E.D., Burles, B., Frizzell, T.O., D'Arcy, R.C.N., **Iaria, G.** (2025). Monitoring cognitive brain function before and after spaceflight: Feasibility of brain vital signs. Under Review.
5. Jaswal, T., Burles, F., **Iaria G.** (2025). The Rapid Sense of Direction (RSOD) Scale: A brief self-report tool to identify Developmental Topographical Disorientation (DTD). *Brain Sci*, 15, 622.
6. McLaren-Gradinaru, M., Burles, Cnudde, K., Damji, A., Berger, L. Zafar, I., Betts, N., Hanif, H., Protzner, A., **Iaria, G.** (2025). Exploring human spatial orientation and navigation with electroencephalography: A Scoping Review. *Spatial Cognition and Computation*, 1-47.
7. Guadagni, V., Burles, F., Callahan, B., **Iaria G.**, Martino, D. (2025). Functional connectivity of brain areas related to social cognition and anxiety in cervical dystonia. *Dystonia*, 4:14344.
8. **Iaria, G.**, & Burles, F. (2025). Disorders of human spatial navigation: Developmental Topographical Disorientation. In J. Grafman (2nd Edition), *Encyclopedia of Human Brain*. Elsevier.
9. Burles, F., Willson, M., Townes, P., Yang, A., **Iaria, G.** (2024). High Prevalence of Cerebral Microbleeds In Astronauts with Prior Spaceflight Experience. *Frontiers Physiology*, June 13; 15:1360353.
10. Faryadras, M., Burles, F., **Iaria, G.**, Davidsen, J. (2024). Functional brain networks in Developmental Topographical Disorientation. *Cereb Cortex*, 34(4).
11. Berger, L., Burles, F., Jaswal, T., Williams, R., **Iaria, G.** (2024). Evaluating modern magnetic resonance imaging modalities to advance neuroimaging studies in astronauts. *Aerosp Med Hum Perform*, 95(5): 245-253.
12. Fragueiro, A., Cury, C., Santacroce, F., Burles, F., **Iaria, G.**, Committeri, G. (2024). Medial positioning of the hippocampus and increased hippocampal fissure volume in Developmental Topographical Disorientation. *Hippocampus*, 1-13.
13. Zafar, I., Burles, F., Berger, L., McLaren-Gradinaru, M., David, A., Dhillon, I., **Iaria, G.** (2023). The effects of anxiety and depression traits on spatial navigation. *Brain Sciences*, 13(12), 1638.
14. Burles, F., **Iaria, G.** (2023). Neurocognitive adaptations for spatial orientation and navigation in astronauts. *Brain Sciences*, 13(11), 1592.
15. Brown, A., Burles, F., **Iaria, G.**, Einstein, G., Moscovitch, M. (2023). Sex and menstrual cycle influence human navigation strategies and performance. *Scientific Reports*, 13(1):14953.

16. Burles, F., Williams, R., Berger, L., Pike, B., Lebel, C., **Iaria, G.** (2023). The unresolved methodological challenge of detecting neuroplastic changes in astronauts. *Life*, 13(2), 500.
17. McLaren-Gradinaru, M., Burles, Protzner, A., **Iaria, G.** (2023). The cognitive effects of playing video games with a navigational component. *Telematics and Informatics Reports*, Vol 9, 100043.
18. Low-Décarie, E., Puscas, M., Martineau, G., Bhella, G., Bonnen, P., Carr, P., Lim, R., Buckley, N., Mitchell, J., Osmond, M., Urquieta, E., Flamenbaum, J., **Iaria, G.**, Joly, Y., Richer, E., Saary, J., Saint-Jacques, D. (2022). Rare Diseases and Space Health: Optimizing synergies from scientific questions to care. *Npj Microgravity*, 8(1):58.
19. Parmar, J., Burles, F., MacInnis, C., **Iaria, G.** (2022). Investigating the relationship between spatial and social cognitive maps in humans. *Journal of Environmental Psychology*, Volume 81,101827.
20. Barclay, S.F., Potocki, K., Burles, F., Bech-Hansen, T.N., **Iaria, G.** (2021). Evaluation of APOE $\epsilon 2/\epsilon 3/\epsilon 4$ alleles in a cohort of individuals affected by Developmental Topographical Disorientation (DTD). *Journal of Alzheimer's Disease Reports*, Jul 19;5(1):565-570.
21. Callahan, B., McLaren-Gradinaru, M., Burles, F., **Iaria, G.**, (2021). How does dementia begin to manifest in bipolar disorder? A description of prodromal clinical and cognitive changes. *Journal of Alzheimer's Disease*, 82(2):737-748.
22. **Iaria, G.**, Slone, E. (2021). The relationship between mental and physical space and its impact on topographical disorientation. In Alexander Leff and Jason Barton (Eds.), *The Neurology of Vision - Handbook of Clinical Neurology (3rd Series)*. Elsevier.
23. **Iaria, G.**, Burles, F. (2021). Definition: Topographical Disorientation. *Cortex*, Feb 1;S0010-9452(21)00028-9.
24. Burles, F., **Iaria, G.** (2020). Behavioural and cognitive mechanisms of Developmental Topographical Disorientation. *Scientific Reports*, Dec 1;10(1):20932.
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Conference presentations and posters (last ten years)

1. Batool, S., Jaswal, T., Burles, F., **Iaria, G.** (2024). Uncovering hippocampal volume loss in astronauts following a mission to the International Space Station. Canadian Space Health research Symposium, Western University, London, ON, Canada.
2. Jaswal, T., Ma-Phan, J., Burles, F., Grewal, S., **Iaria, G.** (2024). Astro-fly: An Animal Model to Investigate the Impact of Microgravity on Human Health.

- Canadian Space Health research Symposium, Western University, London, ON, Canada.
3. Walsh, M., Banerjee, R., Rastogi, A., Yang, A., Banik, S., Burles, F., McCunn, L.J., Iaria, G. (2024). The virtual International Space Station: A new platform to investigate the effects of simulated microgravity, isolation and confinement on spatial cognition. Canadian Space Health research Symposium, Western University, London, ON, Canada.
 4. Fragueiro, A., Santacroce, F., Burles, F. Cury, C., **Iaria, G.**, Committeri, G. (2023). Shift in hippocampal medial position and increased fissure volumes in individuals affected by Developmental Topographical Disorientation. Federation of the European Societies of Neuropsychology. Thessaloniki, Greece.
 5. Burles, F., Williams, R., Berger, L., Pike, G.B., Lebel, C., **Iaria, G.** (2023). The unresolved methodological challenge of detecting neuroplastic changes in astronauts. NASA Human Research Program Investigators' Workshop. Galveston, USA.
 6. Burles, F., D'Arcy, R., Duchesne, S., **Iaria, G.** (2022). Spaceflight-related neuroplastic adaptations and wayfinding in astronauts. Canadian Space Health Research Symposium. Calgary, Canada.
 7. Faryadras, M., Burles, F., Iaria G., Davidsen, J. (2021). A network neuroscience approach to understanding Developmental Topographical Disorientation. Complex Networks 2021. Madrid, Spain.
 8. McLaren-Gradinaru, M., Burles, F., Dhillon, I., Retsinas, A., Iaria, G. (2019). Improving spatial orientation skills following a two-week training program: A pilot study. Society for Neuroscience. Chicago, IL, USA.
 9. Hannah, J., Jelinkova, K., Kohl, J., Parmar, J., Burles, F., Iaria, G. (2019). Structural properties of the brain in Developmental Topographical Disorientation. Society for Neuroscience. Chicago, IL, USA.
 10. Hannah, J., Jelinkova, K., Kohl, J., Burles, F., Iaria, G. (2019). The structure of the brain in Developmental Topographical Disorientation. Banff Annual Seminar in Cognitive Science. Banff, AB, Canada
 11. McLaren-Gradinaru, M., Burles, F., Dhillon, I., Retsinas, A., Iaria, G. (2019). Training spatial navigation in healthy adults. Banff Annual Seminar in Cognitive Science. Banff, AB, Canada
 12. Tosi, G., Parmar J., Dhillon, I., Maravita, A., Iaria, G. (2019). Daddy-long-leg and enhanced walking speed. The British Neuroscience Association, Dublin, Ireland.
 13. Campanile, M., Lagatta, M., **Iaria, G.**, Sestieri, C., Committeri G. (2018). Evidence for a relationship between egocentric navigation ability and episodic memory. AIP, Madrid, Spain.

14. **Iaria, G.**, Burles, F., Bloomberg, J. (2018). Wayfinding: The Behavioural and Neurological Effects of Spaceflight on Astronauts' Spatial Orientation Skills. Canadian Aeronautics and Space Institute ASTRO18 Conference, Quebec City, QC, Canada.
15. Umiltá, A., Burles, F., McFarlane, L., Potocki, K., **Iaria, G.** (2018). Ventral-dorsal functional specialization of the posterior cingulate cortex in human spatial orientation: A meta-analysis. iNav2018, Mont-Tremblant, QC, Canada.
16. Burles, F., Slone, E., Umiltá, A., McFarlane, L., Potocki, K., **Iaria, G.** (2017). Ventrolateral-Dorsomedial Specialization of Human Posterior Cingulate Cortex in Spatial Processing. Organization for Human Brain Mapping (OHBM), Vancouver, BC, Canada.
17. Guadagni, V., Burles, F., Ferrara, M., **Iaria, G.** (2017). Left anterior insula activity and functional connectivity are modulated by sleep quality in an emotional empathy task. Canadian Sleep Society (CSS), Calgary, AB, Canada.
18. Guadagni, V., Burles, F., Hart, C., Ferrara, M., **Iaria, G.** (2017). Sleep quality modulates activity and connectivity of the left anterior insula in emotional empathy. Organization for Human Brain Mapping (OHBM), Vancouver, BC, Canada.
19. Murias, K., Slone, T., Tariq, S., **Iaria, G.** (2016). Development of Spatial Orientation Skills in Children: a task fMRI. Organization of Human Brain Mapping Annual Meeting, Geneva, Switzerland.
20. Arnold, A.E.G.F., **Iaria, G.**, Ekstrom, A.E. (2016). Mental simulation of routes during navigation involves adaptive temporal compression. Society of Neuroscience Annual Meeting, San Diego, CA, USA.
21. **Iaria, G.**, (2016). Developmental Topographical Disorientation: Some Insights. iNAV2016. Bad Gastein, Austria.
22. Burles, F., Slone, E., **Iaria, G.** (2016). Functional specialization of the posterior cingulate in spatial updating and orienting. iNAV2016. Bad Gastein, Austria.
23. Murias, K., Kirton, A., Tariq, S., Moir, A., **Iaria, G.** (2016). Neuroimaging Markers of Cognitive Outcome in Children with Perinatal Stroke. American Academy of Neurology Annual Meeting. Vancouver, BC, Canada.
24. Guadagni, V., Burles, F., Valera, S., Hardwicke-Brown, E., Ferrara, M., Campbell, T., **Iaria, G.** (2016). The relationship between quality of sleep and emotional empathy. European Sleep Research Society (ESRS) Annual Conference, Bologna, Italy.
25. Arnold, A.E.G.F., Burles, F., Bray, S., Levy, R.M., **Iaria, G.** (2015). Differential neural network configuration during visual path integration in humans. 22nd Annual Cognitive Neuroscience Society Meeting, San Francisco, CA, USA.
26. Arnold, A.E.G.F., Burles, F., Liu, I., Murias, K., Barton, J.J.S., **Iaria, G.** (2015). Museum Explorer: A virtual reality game to help children stay oriented. Entertainment Software and Cognitive Neurotherapeutics Society 2015 Summit, San Francisco, CA, USA.

27. **Iaria, G.** (2015). Developmental topographical disorientation is associated with decreased functional connectivity between the hippocampus and prefrontal cortex. 43th International Neuropsychological Society Annual Meeting, Denver, CO, USA.
28. **Murias, K., Liu, I., Tariq, S., Barton, J., Kirton, A., Iaria, G.** (2015). The effect of perinatal stroke on spatial orientation. 67th American Academy of Neurology Annual Meeting, Washington, DC, USA.

INVITED KEYNOTE SPEAKER (selected)

- *Investigating the effects of spaceflight on the human brain.* McGill University, Montreal, QC, Canada (February 2024).
- *Developmental Topographical Disorientation: Cognitive mechanisms and diagnosis.* Swiss Association of Neuropsychologists, Geneva, Switzerland (August 2023).
- *How we find the way around and get lost.* University of Arizona, Tucson, AZ, USA (April 2023).
- *Space health research in Canada.* University of Alberta, Edmonton, AB, Canada (October 2022).
- *The behavioural and neurological complexity of topographical orientation in humans.* International Symposium on Complexity Science Approaches to Brain Dynamics, Calgary, AB, Canada (October 2018).
- *How microgravity affects the neurological mechanisms underlying Astronauts' spatial orientation skills.* Canadian Aeronautics and Space Institute, Quebec City, QC, Canada (May 2018)
- *Human variability in spatial orientation and navigation.* Banff Annual Seminar in Cognitive Science. Banff, AB, Canada (May 2018).
- *Finding your way around and getting lost: Some behavioural and neurological mechanisms of topographical orientation in humans.* Department of Psychology, MacEwan University, Edmonton, AB, Canada (March 2017).
- *Human topographical orientation: individual variability and disability.* Department of Psychology, University of Alberta, Edmonton, AB, Canada (April 2015).
- *Human topographical orientation: variability and disability.* Attention Deficit Disorder Resources – Seattle, WA, USA (November 2014).

- *Behavioural and neural mechanisms of topographical orientation in humans: insights from Developmental Topographical Disorientation*. The Vespucci Institute, Lisbon, Portugal (September 2014).
- *How we orient and why we get lost: Insights from behaviour, brain and environment*. Accesibilidad cognitiva en edificios públicos, espacios abiertos y transporte, Madrid, Spain (October 2013).
- *Spatial orientation skills: assessment and training*. Defence Personnel Research Symposium, Ottawa, ON, Canada (June 2012).
- *Individual variability and neural mechanisms underlying human topographical orientation*. Defence Research and Development Canada, Toronto, ON, Canada (June 2011).
- *Cognitive maps in human orientation: neural mechanisms, variability and disability*. Canadian Centre for Behavioural Neuroscience. University of Lethbridge, Lethbridge, AB, Canada (May 2011).
- *Developmental Topographical Disorientation: A newly discovered cognitive disorder*. Department of Psychology, University of Rome La Sapienza, Rome, Italy (October 2010).
- *Cognitive maps and orientation in humans: neural mechanisms, individual variability and disability*. Department of Psychology, University of Waterloo, Waterloo, ON, Canada (September 21, 2009).
- *Human topographical orientation: Neural mechanisms, individual variability and disability*. Department of Psychology, University of Victoria, Victoria, BC, Canada (November 2008).
- *Developmental topographical disorientation: A case study*. Vancouver General Hospital, Vancouver, BC, Canada (December 2007).
- *The Cognitive Map Test: Behavioural and neuroimaging data supporting the role of the hippocampus in human topographical orientation*. Cordula and Gunter Paetzold Health Education Centre. Vancouver Coastal Health. Vancouver, BC, Canada (October 2007).
- *The human ability to orient within the environment: neural mechanisms and variability*. Department of Psychology, UBC, Vancouver, BC, Canada (October 2006).
- *The contribution of the hippocampus in forming and using cognitive maps*. Clinic for Alzheimer Disease and related Disorders, UBC Hospital, Vancouver, BC, Canada (September 2006).
- *Never alone: A case of pure topographical orientation disorder*. Montreal Neurological Institute, McGill University, Montreal, QC, Canada (May 2006).

- *The role of the anterior insula in human emotional processing.* Brain Imaging Centre, McGill University, Montreal, QC, Canada (February 2006).
- *The human navigation: cognitive strategies, variability and neural mechanisms.* Department of Psychology, Simon Fraser University, Burnaby, BC, Canada (June 2005).
- *Spatial memory and orientation in humans.* Neurology Department, University of Rome “La Sapienza”, Rome, Italy (March 2005).
- *The neural correlates of human topographical orientation.* Psychology Department, Helmholtz Instituut, Utrecht University, Utrecht, The Netherlands (November 2004).
- *Neural mechanisms of navigation in humans.* LPPA, College de France, Paris, France (June 2004).

KNOWLEDGE DISSIMINATION

I have made numerous contributions to both national and international popular media such as magazines and newspapers, as well as television and radio talk shows and documentaries. The following is a selection of media coverage:

- June 22, 2022 - **Cottage Life** (Magazine) We all get lost sometimes. Here’s why
- June 29, 2018 - **The Wall Street Journal** (Newspaper) Strange stories of extraordinary brains - and what we can learn from them
- February 10, 2018 - **The Guardian** (Magazine) "All of a sudden my world would flip": the woman who is permantely lost
- March 28, 2017 - **BBC Two** (TV, UK) Incredible Medicine: Dr. Weston's Casebook
- January 22, 2017 - **The Washington Post** (Newspaper) I can't follow a map or directions
- October 19, 2016 - **The Globe and Mail** (Newspaper) Canadian Space Agency to conduct health experiment
- January 28, 2016 - **Nautilus** (Magazine) The Woman Who Got Lost at Home
- May 18, 2015 - **The Atlantic** (Magazine) When the Brain Can't Make Its Own Maps
- February 23, 2015 - **CBC Radio - IDEAS Show** (National Radio) You Are Here
- January 23, 2015 - **Swerve Magazine** (Magazine) Land of the Lost
- November 19, 2014 - **New York Magazine** (Magazine) What It's Like to Feel Lost in Your Own Home
- May 21, 2014 - **New Scientist** (Magazine) The Woman Who Gets Lost In Her Own Home
- December 5, 2013 - **CBC - The Nature of Things** (National TV) Where Am I?
- May 13, 2013 - **NBC - Today Show** (National News) Rare Disorder Leaves Woman Lost in Familiar Places
- April 29, 2013 - **The New York Times** (Magazine) Lost Every Day
- May 16, 2012 - **CBC Radio - IDEAS Show** (National Radio) A Question of Optimism
- May 3, 2012 - **CBC Radio - The Homestretch Show** (National Radio) Developmental Topographical Disorientation

- November 20, 2011 - **Glimpse** - Issue 8 Cartography (Magazine) [Losing And Finding Our Way](#)
- January 25, 2011 - **WNYC - RadioLab** (National Public Radio) [Lost & Found](#)
- November 20, 2010 - **CBC Radio - DNTO Show** (National Radio) [What Do You Find When You Get Lost?](#)
- October 21, 2010 - **BBC Focus Magazine** (Magazine) [Get lost. How simple decisions and basic biology can affect your sense of direction](#)
- February 12, 2010 - **ABC40 News** (Television) [Rare Disorder Has People Getting Lost](#)
- November 4, 2009 - **ABC7 News** (Television) [Disorder Causes People To Be Hopelessly Lost](#)
- October 7, 2009 - **The Walrus** (Magazine) [Global Impositioning Systems](#)
- August 25, 2009 - **CJSW** (University of Calgary Radio) [Topographical Disorientation](#)
- August 18, 2009 - **New Scientist** (Magazine) [Why humans can't navigate out of a paper bag](#)
- August 14, 2009 - **The Globe and Mail** (Newspaper) [Calgary researcher helps people who constantly get lost - Calgary Herald](#) (Newspaper) [U of C researching treatment for lost people who can't find way](#) - **CTV** (Television) [Get lost all the time? Researcher may help guide you](#)
- August 13, 2009 - **CBC Radio** (National Radio) [Internet test helps find those with lost disorder](#)
- February 01, 2009 - **Canadian Geographic** (Magazine) [Lost Cause](#)
- January 10, 2009 - **The Scientist** (Magazine) [Lost in Space](#)
- November 03, 2008 - **CTV** (Television) [A Brain Disorder That Cause People To Get Lost - Il Sole 24 Ore](#) (Newspaper) [La Casa Come Un'Isola: E' La "Sindrome Del Sentirsi Perso"](#)
- October 23, 2008 - **CBC Radio** (National Radio) [Topographical Disorientation: Get Lost?](#)
- October 20, 2008 - **USAToday** (Newspaper) [On Road To Recognition](#)
- October 16, 2008 - **Maclean's** (Magazine) [They Get Lost. In Their Own House](#)
- October 09, 2008 - **MSNBC** (Online News) [When You Can't Find Your Way Home](#)
- October 03, 2008 - **The Denver Post** (Newspaper) [Diagnosis Untangles Woman's Whirl](#)
- September 27, 2008 - **Times** (Online News) [Lost Cause](#)
- September 25, 2008 - **The Epoch Times** (Online News) [Getting Lost: A Newly Discovered Developmental Brain Disorder](#)
- September 23, 2008 - **Fox News** (Online News) [Rare Disorder Leaves Woman Lost In Her Own House](#) - **The Vancouver Sun** (Newspaper) [Lost Souls Get Some New Answers](#)

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