KRZYSZTOF WAWRZYN

Address	Western University Canada Department of Physics and Astronomy Physics and Astronomy Building 1151, Richmond Street, Rm. 134 London, Ontario, Canada, N6A 5K8	**Tel.** **Cel.** **Email**	519-661-2111 (ext. 86044) 226-224-5525 kwawrzyn@gmail.com

EDUCATION

M.Sc. (Medical Biophysics) **2012–2014**
Western University Canada *London, ON*

B.Sc. (Medical Physics) **2007–2012**
Ryerson University *Toronto, ON*

Diploma (Computer Systems Technician) **2003–2006**
Fanshawe College *London, ON*

TECHNICAL SKILLS

Computer Software and Application:

- MATLAB (Object oriented, signal/image processing & analysis).
- Python
- MS Access
- Sim4Life
- EMPro
- HTML/CSS
- Solidworks
- GraphPad Prism

Device Testing and Calibration Equipment:

- RF Exposure Systems for 64MHz & 128MHz (ZMT MITS).
- Gradient Exposure Systems (prototype).
- Single-Point Vibrometry (Polytec OFV-5000).
- RF E-field/B-field Probing (Speag EASY4/TDS).
- Fiber Optic Temperature Monitoring (Neoptix Omniflex/Reflex).

Biomedical Imaging & Therapy Equipment:

- MRI (1.5T, 3.0T, Low field).
- Optical Coherence Tomography (Thorlabs swept source).
- Ultrasound (Ultrasonic RP).
- High-Intensity Focused Ultrasound (prototype).
- Xenon-129 Hyperpolarizer (prototype).

Electronics Engineering/Development:

- Soldering iron.
- Signal waveform generator.
- Oscilloscope.
- Circuit board assembly.
- Cable connection assembly.
- Multi-meter.
- Network analyzer.

Mechanical Engineering and Machine Shop:

- Vertical & horizontal band saw.
- Belt sander.
- Drill press.
- Various manufacturing and shop tools.

RESEARCH EXPERIENCE

Research Associate **2014–Present**
Dept. of Physics & Astronomy, Western University *London, ON*

- Developed, operated and maintained medical device testing equipment. Designed and utilized experimental setups for assessing the safety of various medical devices and implants exposed radio-frequency electromagnetic interactions characteristic of an MRI system. Developed electromagnetic simulations.

Graduate Research Assistant **2012–2014**
Dept. of Medical Biophysics, Robarts Research Institute, Western University *London, ON*

- **Thesis**: Developed a pseudo non-Cartesian imaging pulse sequence for hyperpolarized xenon-129 gas MRI of rodent lungs at low magnetic field strength.
- Operated and maintained a low field MRI scanner and xenon polarizer system for MRI experiments. Performed pulse sequence control, modification, calibration and troubleshooting. Designed *in vitro* and *in vivo* MRI experiments and collected MRI data. Coded MATLAB routines for image processing and analysis of T_1, p_AO_2, T_2*, and ADC maps. Constructed phantoms and performed maintenance on laboratory equipment. Irradiated animals and performed a pilot study of radiation induced lung injury (RILI). Compared results with quantitative histology.
- Presented oral talk and successfully defended dissertation in support of M.Sc. degree.

Research Assistant **2011–2012**
Dept. of Physics, Ryerson University *Toronto, ON*

- Designed and utilized experimental setups for therapeutic techniques involving high-intensity focused ultrasound (HIFU), low intensity therapeutic ultrasound (LITU), *ex vivo* ultrasound imaging, and phantom model preparation.

Research Assistant **2009–2012**
Dept. of Physics, Ryerson University *Toronto, ON*

- Designed and utilized experimental setups for optical measurements or therapeutic techniques involving *ex vivo* OCT imaging high-intensity focused ultrasound (HIFU), low intensity therapeutic ultrasound, *ex vivo* ultrasound imaging, data acquisition for signal analysis and image processing, optical & electric equipment arrangement, and specimen & phantom model preparation.

Undergraduate Thesis Student **2010–2011**
Dept. of Physics, Ryerson University *Toronto, ON*

- **Thesis**: Demonstrated the feasibility of using optical coherence tomography (OCT) to detect and monitor signal change from electric-field induced biological tissue.
- Presented poster and submitted dissertation in support of B.Sc. degree.

Research Student **2009**
Research Operations, Trojan Technologies *London, ON*

- Cultured cells, disinfected waste water samples by irradiating microorganisms using UV collimator beams, and applied chemistry techniques for filtering, testing, and analyzing water contaminants.

WORK & LEADERSHIP EXPERIENCE

Invigilator **2011**
Ryerson University *Toronto, ON*

- Supported the examination process, prepared exam rooms, instructed students, and ensured fair conductivity of exams.

Community Assistant **2011–2012**
Neill-Wycik Student Co-op and Hotel *Toronto, ON*

- In leadership role, gave member orientations, organized committees & workshops, designed posters, coordinated building wide recycling duties, and acted as an information resource.

Computer Laboratory Assistant **2011**
Neill-Wycik Student Co-op and Hotel *Toronto, ON*

- Handled networking operations, user support, updated workstations, and provided member orientations.

Assembler **2001–2010**
Production Department, OES Inc. *London, ON*

- Assembled various types of electronic and mechanical devices and provided service through inspection, troubleshooting, and repair of faulty electronic and mechanical parts and connections.

Assembler **2009**
Manufacturing Operations, Trojan Technologies *London, ON*

- Assembled ultraviolet water disinfection modules and reactors within a multi-disciplinary team, requiring collaboration and cooperation.

PUBLICATIONS

1. (SUBMITTED) Ouriadov A, Perron S, **Wawrzyn K,** Hickling S, Fox M, Serrai H, Santyr G. " Application of a 2D Frequency Encoding Sectoral Approach to Hyperpolarized 129Xe MRI at Low Field", *Journal of Magnetic Resonance (2021).*

2. Attaran A, Handler W, **Wawrzyn K**, Chronik BA. "Electric field probe for time-domain monitoring of radio frequency exposure during development and evaluation of MRI-conditional medical devices at 3 T". *IEEE Trans. Antennas. Propag. IEEE Transactions on Antennas and Propagation 67.3 (2018): 1854-1861.*

3. Ryan K, **Wawrzyn K**, Gati JS, Chronik BA, Wong D, Duggal N, Bartha R. "1H MR spectroscopy of the motor cortex immediately following transcranial direct current stimulation at 7 Tesla". PloS one 13.8 (2018): e0198053.

4. Attaran A, Handler W, **Wawrzyn K**, Menon R, Chronik BA. "Reliable RF B/E-field Probes for Time-Domain Monitoring of EM Exposure During Medical Device Testing". *IEEE Trans. Antennas. Propag. IEEE Transactions on Antennas and Propagation 65.9 (2017): 4815-4823.*

5. **Wawrzyn K**, Demidov V, Vuong B, Harduar MK, Sun C, Yang VXD, Doganay O, Toronov V, and Xu Y. "Imaging the Electro-kinetic Response of Biological Tissues with Optical Coherence Tomography". *Optics Letters* 38, no. 14 (2013): 2572-2574.

CONFERENCE PROCEEDINGS

1. Attaran A, Handler W, **Wawrzyn K**, Chronik BA. "Development of a Transfer-Function Measurement Procedure for the Evaluation's of MRI-Conditional Medical Devices at 3T". *2018 IEEE Canadian Conference on Electrical & Computer Engineering (CCECE)*. IEEE, (2018).

2. **Wawrzyn K**, Vuong B, Harduar MK, Yang VXD, Demidov V, Toronov V, Xu Y. "Monitoring Electric Current in Biological Tissues by Optical Coherence Tomography". *Biomedical Optics* (2012): BW2A.4.

ABSTRACTS AND PRESENTATIONS

1. **Wawrzyn K,** Hendriks J, Gignac D, Handler W, Chronik BA. "Comparison of Robotically Mapped and Simulated RF Fields in 64 and 128 MHz Medical Implant Test Systems". 2019 Imaging Network Ontario Symposium, London, Canada (Poster presentation).

2. **Wawrzyn K,** Hendriks J, Gignac D, Handler W, Chronik BA. "Comparison of Simulated and Robotically Mapped RF Fields in 64 and 128 MHz Medical Implant Test Systems". 2019 International Society for Magnetic Resonance in Medicine (ISMRM), Montréal, QC, Canada. p. 7358. (Poster presentation).

3. **Wawrzyn K,** Hendriks J, Handler W, Chronik BA. "Estimated Measurement Uncertainty (EMU) in Calorimetrically-Determined Whole Body SAR Values for Medical Device Evaluation Using Benchtop Radiofrequency Exposure Systems". 2018 International Society for Magnetic Resonance in Medicine (ISMRM), Paris, France. p. 8264. (Poster presentation).

4. **Wawrzyn K,** Hendriks J, Handler W, Chronik BA. "Measurement Repeatability & Reproducibility in Radiofrequency Implant Heating in Benchtop Exposure Systems". 2017 ISMRM Workshop on Ensuring RF Safety in MRI, Honolulu, USA. p. 20. (Oral and poster presentation).

5. **Wawrzyn K,** Hendriks J, Handler W, Chronik BA. "Uncertainty Assessment of Local SAR Mapping from Radiofrequency-Induced Heating of a Standardized 10.0 cm-Long Titanium Rod in the ASTM Phantom at 64 and 128 MHz". 2017 ISMRM Workshop on Ensuring RF Safety in MRI, Honolulu, USA. p. 19. (Oral and poster presentation).

6. **Wawrzyn K,** Drozd J, Hendriks J, Handler W, Chronik BA. "Resolving Local SAR In Vitro from RF-Field Induced Heating of a 5.0 cm Long Titanium Rod at 64 MHz and 128 MHz". 2017 International Society for Magnetic Resonance in Medicine (ISMRM), Honolulu, USA. p. 2643. (Poster presentation).

7. Ryan K, **Wawrzyn K**, Gati J, Chronik BA, Duggal N, Bartha R. "R 7 Tesla 1H MR Spectroscopy of the Motor Cortex following Transcranial Direct Current Stimulation". 2017 International Society for Magnetic Resonance in Medicine (ISMRM), Honolulu, USA. p. 2980. (Poster presentation).

8. Martire D, **Wawrzyn K**, Handler W, Chronik BA. "Measuring Gradient-Induced Vibration of a Conductive Device using Laser Doppler Vibrometry at 3T". 2016 International Society for Magnetic Resonance in Medicine (ISMRM), Singapore (E-poster presentation).

9. **Wawrzyn K,** Ouriadov A, Hickling S, and Santyr G. **"**Mapping ^{129}Xenon ADC of Radiation-Induced Lung Injury at Low Magnetic Field Strength Using a Sectoral Approach". 2015 International Society for Magnetic Resonance in Medicine (ISMRM), Toronto, Canada (Poster presentation).

10. Doganay O, Wade T, Hegarty E, **Wawrzyn K**, Schulte R F, McKenzie C, and Santyr G.

"Hyperpolarized ^{129}Xe Imaging of the Lung using Spiral IDEAL". 2015 International Society for Magnetic Resonance in Medicine (ISMRM), Toronto, Canada (Poster presentation).

11. **Wawrzyn K. "**Implementation of a Non-Cartesian Pulse Sequence for MRI using hyperpolarized xenon-129". 2014 Medical Biophysics Seminar, Western University, London, Canada (Oral presentation).

12. **Wawrzyn K,** Ouriadov A, Hickling S, and Santyr G. **"**A Pseudo Non-Cartesian Pulse Sequence for Hyperpolarized Xenon-129 Gas MRI of the Lungs at Low Magnetic Field Strength". 2014 Imaging Network Ontario Symposium, Toronto, Canada (Poster presentation).

13. Doganay O, Wade T, Hegarty E, **Wawrzyn K,** McKenzie C, and Santyr G. **"**Hyperpolarized ^{129}Xe Imaging of the Lung using Spiral IDEAL". 2014 Imaging Network Ontario Symposium, Toronto, Canada (Poster presentation).

14. Hegarty E, Engelberts D, Wade T, **Wawrzyn K,** Doganay O, Kavanagh B, and Santyr G. **"**Hyperpolarized Xenon-129 MRI for Evaluation of a Continuous Negatively-Applied Pressure (CNAP) Approach for Recruitment of Atelectasis in a Rat Model". 2014 American Thoracic Society International Conference, San Diego, USA (Poster presentation).

15. **Wawrzyn K. "**Implementation of a Non-Cartesian Pulse Sequence for MRI using hyperpolarized xenon-129". 2013 Medical Biophysics Seminar, Western University, London, Canada (Oral presentation).

16. **Wawrzyn K,** Ouriadov A, Hickling S, Santyr G. **"**Implementation of a Novel Non-Cartesian Pulse Sequence for MRI of the Lungs with Hyperpolarized ^{129}Xe". 2013 London Imaging Discovery, London, Canada (Poster presentation).

17. **Wawrzyn K,** Ouriadov A, Hickling S, Santyr G. **"**Development of a non-Cartesian pulse sequence for MRI of the lungs with hyperpolarized ^{129}Xe". 2013 Imaging Network Ontario Symposium, Toronto, Canada (Oral and poster presentation).

18. **Wawrzyn K**, Yang VXD, Xu Y. "The Effects of Electric Current in Biological Tissues on Optical Coherence Tomography Signals". 2010 Canadian Association of Physicists Congress, Toronto, Canada (Oral presentation).

TRAINING & CERTIFICATES

1.	MS Access Level I and Level II	**2019**
2.	Internal Auditor Training for ISO 17025 / IEC	**2017**
3.	Workplace Hazardous Materials Information System (WHMIS)	**2015**
4.	Standard First Aid/CPR (Level C)	**2012**
5.	Imaging Labs Machine Shop/NC Mill Room Safety	**2012**
6.	Laboratory Environmental Waste Management Safety	**2012**

7. Biosafety Training **2012**
8. Laser Safety Training **2012**
9. Animal Care and Veterinary Services (Advanced rat techniques, gas anesthesia, tail vein catheterization, surgery methodology I & II) **2012**

RELEVANT COURSEWORK

Continuing Education Courses

Access 2016 Level II – Microsoft Access, Western University, 2019.

Access 2016 Level I – Introduction to Microsoft Access, Western University, 2018.

CADD-5016 – Advanced Solidworks, Fanshawe College, 2017, Grade: A+.

PJMG6201-019 – Intro to Project Management, Western University, 2016, Grade: 86%.

Graduate Courses

Medical Biophysics – Nuclear Magnetic Resonance, MRI Physics, Scientific Communications

Undergraduate Courses

Medical Physics – Biophysics, Medical Imaging, Radiation Biology, Radiation Therapy

Computer Modeling – Advanced Programming for Scientists, Image Analysis, Computational Methods, Numerical Analysis

AWARDS

1. Western Graduate Research Scholarship **2012–2014**
2. Trojan Technologies Research Honorarium **2009**

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REFERENCES

Available upon request.