

## EDUCATION

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<b>ETH Zurich</b> PhD (in progress), Information Tech. and Electrical Engineering	Zurich, Switzerland 2021–present
<b>University of Waterloo</b> Master of Applied Science (MASC), Electrical and Computer Engineering	Waterloo, ON, Canada 2019–2021
<b>University of Waterloo</b> Bachelor of Applied Science (BASC), Nanotechnology Engineering	Waterloo, ON, Canada 2014–2019

## RESEARCH EXPERIENCE (FULL-TIME)

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<b>PhD Student - ETH Zürich</b> Advisor: Dr. Mathieu Luisier, Professor	Zürich, Switzerland September 2021 - current
– Developing an <i>ab-initio</i> model for resistive switching in oxide-based Valence Change Memory (VCM) cells	
<b>MASC Student (Thesis-based) - University of Waterloo</b> Advisor: Dr. Youngki Yoon, Associate Professor	Waterloo, ON, Canada September 2019 - July 2021
– Engineering the performance of 2D Transition-Metal-Dichalcogenide (TMD) devices through mechanical strain, using <i>ab-initio</i> simulations	
<b>Research Assistant - Waterloo Institute for Nanotechnology (WIN)</b> Supervisor: Dr. Dayan Ban, Professor	Waterloo, ON, Canada January 2018 - August 2018
– Developing a code to model transport through Resonant-Phonon Quantum Cascade Lasers (QCLs), and using it to design new structures	
<b>Research Assistant - National Institute of Materials Science (NIMS)</b> Supervisor: Dr. Genki Yoshikawa, Associate Professor and Group Leader	Tsukuba, Ibaraki, Japan January 2016 - April 2016
– Optimizing the morphology of polymer films on a membrane-type olfactory nanosensor	
<b>Research Assistant - Canadian Nuclear Laboratories (CNL)</b> Supervisor: Dr. Syed Bukhari, Research Associate, Neutron Scattering Branch	Chalk River, Ontario, Canada May 2015 - August 2015
– Optimizing sputtering parameters to minimize the interfacial roughness between stacked metal-alloy thin films	

## WORK EXPERIENCE (FULL-TIME)

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<b>Formulations Engineering Intern - Adaptive Surface Technologies (AST)</b> Supervisor: Dr. Tehila Nahum, Principle Formulations Engineer	Cambridge, MA, USA August 2016 - April 2017
– Developing Slippery Liquid-Infused Porous Surface (SLIPS) nanotextured container coatings	

## TEACHING EXPERIENCE

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### Teaching Assistant Positions

• <b>Quantum Transport in Nanostructures, ETH Zurich</b> Taught one third of the tutorials.	February 2022 - April 2022
• <b>Linear Circuits (NE140), University of Waterloo</b> Prepared and taught all remote (synchronous) tutorials.	January 2021 - April 2021
• <b>Nanoelectronics (NE471), University of Waterloo</b> Held office hours for student questions, prepared assignments, and marked exams.	September 2020 - December 2020

- **Electronic Circuits (NE344), University of Waterloo** May 2020 - August 2020  
Prepared and taught all remote (synchronous) tutorials.
- **Linear Circuits (NE140), University of Waterloo** January 2020 - April 2020  
Prepared and taught all tutorials.

## Project Supervisions

- **Zhouyang Yu, ETH Zurich** September 2022 - January 2023  
Master's student, performing quantum transport simulations on Interband Cascade Lasers (ICLs). Co-supervising with Matheiu Luisier.
- **Patrik Gjini, ETH Zurich** February 2022 - May 2022  
Bachelor's thesis student, implemented a Fast Multipole Method algorithm to accelerate the solution of Poisson's equation in a valence change memory device. Co-supervised with Marko Mladenovic.
- **Patrick Bütler, ETH Zurich** February 2022 - May 2022  
Master's student, investigating phase transition-induced resistive switching in monolayer MoTe<sub>2</sub> towards non-volatile memory applications. Co-supervised with Jonathan Backman.

## OTHER ACTIVITIES

### Technical Director - UW Nano Robotics Group (UWNRG)

Advisor: Dr. Mustafa Yavuz, Associate Professor

Waterloo, ON, Canada

January 2015 - July 2019

- UWNRG designs microbotic actuation systems to compete at the annual IEEE ICRA Microbotics Challenges.
- Competition Record: 3rd place (at ICRA 2015), 1st place (at ICRA 2016), 2nd place (at ICRA 2018).

## JOURNAL ARTICLES

1. **M. Kaniselvan**, M. Sritharan, and Y. Yoon, "Mitigating Tunneling Leakage in Ultrascaled HfS<sub>2</sub> pMOS Devices with Uniaxial Strain," *IEEE Electron Device Letters*, June 2022 doi:10.1109/LED.2022.3179228 **\*Editor's Pick\***
2. **M. Kaniselvan** and Y. Yoon, "Strain-tuning PtSe<sub>2</sub> for high ON-current lateral tunnel field-effect transistors," *Applied Physics Letters*, vol. 119, no. 7, p. 073102, Aug. 2021. doi:10.1063/2F5.0053789
3. G. Han, **M. Kaniselvan**, and Y. Yoon, "Photoresponse of MoSe<sub>2</sub> Transistors: A Fully Numerical Quantum Transport Simulation Study," *ACS Applied Electronic Materials*, vol. 2, no. 11, pp. 3765–3772, Nov. 2020. doi:10.1021/acsaelm.0c00795
4. M. Naqi\*, **M. Kaniselvan\***, S. Choo\*, G. Han, S. Kang, J. Kim, Y. Yoon, and S. Kim, "Ultrasensitive Multilayer MoS<sub>2</sub>-Based Photodetector with Permanently Grounded Gate Effect," *Advanced Electronic Materials*, vol. 6, no. 4, p. 1901256, Feb. 2020. doi: 10.1002/aelm.201901256.

## POSTERS & PRESENTATIONS

1. **Manasa Kaniselvan**, Mathieu Luisier and Marko Mladenovic *An Atomistic Modelling Framework for Valence Change Memory Cells*. International Conference on Simulation of Semiconductor Processes and Devices (SISPAD), Granada, Spain, August 2022
2. **Manasa Kaniselvan**, Marko Mladenovic, Patrik Gjini, and Mathieu Luisier *Modelling transport in valence change memory cells*. Psi-k Conference, Lausanne, Switzerland, August 2022
3. **Manasa Kaniselvan**, Marko Mladenovic, Patrik Gjini, and Mathieu Luisier *Modelling transport in valence change memory cells*. CECAM Workshop on "Quantum transport methods and algorithms: from particles to waves approaches", ETH Zürich, Switzerland, July 2022
4. Marko Mladenovic, **Manasa Kaniselvan**, and Mathieu Luisier *Ab-Initio-Parametrized Kinetic Monte Carlo Model for Vacancy Diffusion in Amorphous Oxides in Valence Change Memory*. First Principles Modelling of Defects in Solids Workshop, ETH Zürich, June 2022
5. **Manasa Kaniselvan**. *Engineering the Performance of 2D Transition Metal Dichalcogenide Nanotransistors through Quantum Transport Simulations*. Nanotechnology Seminar delivered at the University of Waterloo, June 2021

6. Boyu Wen, Chao Xu, Siyi Wang, Sm Shazzad Rassel, **Manasa Kaniselvan**, Chris Deimert, Zbigniew Wasilewski and Dayan Ban *Novel 4-well THz QCL with hybrid injection/extraction channels*. ITQW2019: Infrared Terahertz Quantum Workshop
7. Mary Chen\*, **Manasa Kaniselvan**\*, Corin Seeleman\*, Danielle Smith\*. *A Real-Time Non-Invasive Sensor for Monitoring Laser-Induced Temperature in Medical Applications*. Waterloo Engineering Design Symposium 2019. Waterloo, ON, Canada
8. **UW Nano Robotics Group**. *Solenoid Actuated Microbot (SAM)*. 2018 IEEE IEEE International Conference on Robotics and Automation (ICRA). Brisbane, Australia

## SCHOLARSHIPS & AWARDS (ALL VALUES IN CAD)

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• Top 10% (out of 715) Poster Commendation at the Psi-K Conference	2022
• NSERC PGSD Doctoral Award - <b>\$63,000</b>	2021
• Waterloo Faculty of Engineering Awards (x2) - <b>\$3,000</b>	2020
• Sanford Fleming Foundation (SFF) Teaching Assistant Excellence Award - <b>\$500</b>	2021
• Waterloo Graduate Research Studentship (with MASc offer) - <b>\$35,000</b>	2019–2021
• Waterloo Dean's Entrance Award (Graduate) - <b>\$5,000</b>	2019
• Presentation Award, Waterloo Nanotechnology Symposium - <b>\$1,000</b>	2019
• Waterloo Undergraduate Research Assistantship Awards (x2) - <b>\$1,400</b>	2017–2018
• Waterloo Undergraduate Research Internship Awards (x2) - <b>\$2,800</b>	2017–2018
• NSERC Undergraduate Student Research Awards (USRA) (x2) - <b>\$9,000</b>	2017–2018
• Waterloo International Internship Award - <b>\$1,000</b>	2016
• NIMS (Japan) Internship Program Fellowship - <b>\$5,700</b>	2016
• Waterloo President's (Entrance) Scholarship - <b>\$2,000</b>	2014