

Education and Training

Dates	January 2017 – December 2018
Title of qualification	MSc., Earth and Space Science
Institution	York University, Toronto, ON, Canada
Thesis title	<i>An Imaging Fourier Transform Spectrometer for climate observations</i>
Dates	September 2012 – December 2016
Title of qualification	B.Sc., (specialized Hons.) Earth and Atmospheric Science (Space Science)
Institution	York University, Toronto, ON, Canada

Work Experience

Dates	September 2019 – current
Occupation	Manufacturing Engineering Specialist (Optics Operations)
Activities	Optics, calibration, documentation, auditing, coding, data analysis
Employer	L3Harris Wescam, Burlington, Ontario, Canada
Sector	Research, infrared, production
Involvements	<ul style="list-style-type: none">• Lead and participate in assigned projects related to New Product Introduction (NPI) and Sustaining activities within Operations Engineering (Optics)• Responsible for the development of manufacturing processes and procedures for WESCAM products• Support translation of product specifications from engineering to manufacturing procedures• Contribute and execute the technology and capital roadmap• Leadership and support for continuous improvement initiatives and projects• Utilization of cellular manufacturing, design for manufacturing, SPC, 5S, Point Of Use, etc.• Identification and monitoring of the first-pass yield and rolling yield• Take action on yield issues to develop corrective action and process fixes• Lead tiger teams in quality issues as they pertain to containment and corrective action activities• Identify failure trends & systemic issues, conduct 8D root cause analysis and implement permanent corrective actions• Support documentation changes, including assembly procedures, Work Instructions and Manufacturing Execution System (MES) authoring• Reviewing change requests generated by engineering and production staff, and implement changes as required• Act as a back-up point of contact to the Manufacturing Engineers responsible for frontline support of a Cell Team• Support any other business priorities as required by Operations Engineering leadership

Dates February 2019 – August 2019
Occupation **Systems Designer (Research and Development)**
Activities Optics, calibration, documentation, coding, data analysis
Employer Telops, Quebec City, Canada
Sector Research, infrared, production
Involvements

- Define the technical specifications when developing new products and/or during the submission process by validating the market and customer needs
- Model the key performance of electro-optics instruments in order to make the right design choices
- Make the preliminary and detailed design of the products that meet the specifications
- Pilot technical coordination workshops and problem-solving
- Perform technical coordination and guiding the team towards the development of innovative products
- Manage the technical risks of ongoing projects in collaboration with the project manager
- Act as a technical expert to the customers to present Telops concepts and products
- Contribute to feasibility studies and work planning
- Document the work according to established standards
- Write technical reports in both English and French

Dates November 2018 – January 2019
Occupation **Senior Optical Engineer**
Activities Optics, calibration, documentation, coding, data analysis
Employer Savormetrics, Mississauga, Canada
Sector Research, Production
Involvements

- Design optical systems for the food processing industry
- Document brainstorm and milestones review meetings
- Procure critical parts from vendors

Dates January 2017 – December 2018
Occupation **Teaching Assistant (ESSE, 4360, PHYS 1801, PHYS 1800, NATS 1780, NATS 1840)**
Activities Lab instructor, grading, invigilation
Employer Department of Earth and Space Science and Engineering, Department of Physics and Astronomy, Department of Natural Science, York University, Canada
Sector Academia, Education
Involvements

- Grade science essays
- Invigilate during tests and exams
- Assist students in lab experiments
- Correct lab reports and prepare grade sheets

Dates October 2018 – November 2018
Occupation **Teacher**
Activities Teaching (grade 12 Physics), invigilation, grading
Employer SuOn international academy, Toronto, Canada
Sector Academia, Education
Involvements

- Grade science assignment and tests
- Invigilate during tests and exams
- Prepare grade sheet

Dates January 2016 – December 2016
Occupation **Research Assistant (Tom McElroy)**
Activities Optics, machining, electronics, coding
Employer Lassonde School of Engineering, York University, Canada
Sector Academia, Research
Involvements

- After-flight characterization of the payload after Timmins flight
- Develop an optical bench Michelson interferometer
- Develop simulations for a Michelson interferometer

Dates September 2015 – January 2016
Occupation **Unemployed**

Dates May 2015 – September 2015
Occupation **Research Assistant (Tom McElroy)**
Activities Optics, machining, electronics, coding
Employer Lassonde School of Engineering, York University, Canada
Sector Academia, Research
Involvements

- Characterize diffraction grating spectrometers
- Characterize the image stabilization pointing system
- Develop a payload support system including frame and electronics
- Support stratospheric balloon flight in Timmins. A joint endeavor of the Canadian Space Agency (CSA) and the French Space Agency (CNES)

Dates May 2014 – April 2015
Occupation **Research Assistant (A. Kumarakrishnan)**
Activities Optics, machining, electronics, coding, documentation
Employer Department of Physics and Astronomy, York University, Canada
Sector Academia, Research
Involvements

- Develop an auto-locked diode laser system for high precision metrology
- Design and develop laser and tapered amplifier (TA) control units
- Characterize newly built lasers and phase-lock them to hyperfine lines of Rubidium

Dates May 2013 – July 2013
Occupation **Customer Service Representative**
Activities Documentation, public dealing
Employer Wisdom Immigration Consultancy Services, India
Sector Education, Immigration
Involvements

- Organize orientation for students
- Prepare paperwork for schools and immigration

Volunteer positions

Dates September 2018 – August 2019
Title **Board member**
Activities Documentation, public dealing, finance, social media

Organization Association of Polar Early Scientists (APECS), Canada
Sector Education, Arctic research
Involvements

- Plan events for the public outreach working group
- Manage financial affairs

Dates February 2017 – February 2018
Title **Social media handler**
Activities Public dealing, social media, internet
Organization Association of Polar Early Scientists (APECS), Canada
Sector Education, Arctic research
Involvements

- Post on social media handles: Facebook, Twitter
- Write blogs

Dates July 2013 – December 2016
Title **Peer mentor**
Activities Public dealing, social media, internet
Organization Bethune College, and Lassonde School of Engineering – York University, Canada
Sector Education, management
Involvements

- Guide incoming science and engineering students to available resources
- Help students with enrolling into courses and social clubs

Dates July 2013 – December 2016
Title **Student Ambassador**
Activities Public dealing, social media, internet
Organization Bethune College, and Lassonde School of Engineering – York University, Canada
Sector Education, management
Involvements

- Represent the school at events such as university fairs and open houses
- Help faculty organize events for current and incoming students

Computer Skills and Competencies

Operating Systems Windows (7, 8, 10), Linux (Ubuntu), and Mac OS X
Programming UML, MATLAB, Zemax, Mathematica, STK, C++, Java

Certificates WHMIS II, Laser safety training course, WHMIS I

Driving License Ontario class-G
Indian Union Driving License (MCWG, LMV)

Scholarly addresses

Publications

1. H. C. Beica, A. Carew, A. Vorozcovs, P. Dowling, A. Pouliot, **G. Singh**, and A. Kumarakrishnan, *An Auto-Locked Diode Laser System for Precision Metrology*, High-Power Diode Laser Technology XV, Proc. SPIE 100860W-100860W-6, DOI: 10.1117/12.2250653. (2017, BSc. work)
2. **G. Singh**, *An Imaging Fourier Transform Spectrometer (IFTS) for Climate Observations*, MSc. thesis – faculty of graduate studies, York University. (2018, MSc. work)
3. Nassar, R., C. McLinden, C.E. Sioris, C.T. McElroy, J. Mendonca, J. Tamminen, C.G. MacDonald, C. Adams, C. Boisvenue, A. Bourassa, R. Cooney, D. Degenstein, G. Drolet, L. Garand, R. Girard, M. Johnson, D.B.A. Jones, F. Kolonjari, B. Kuwahara, R.V. Martin, C.E. Miller, N. O’Neill, A. Riihelä, S. Roche, S.P. Sander, W.R. Simpson, **G. Singh**, K. Strong, A.P. Trishchenko, H. van Mierlo, Z. Vaziri Zanjani, K.A. Walker and D. Wunch, *The Atmospheric Imaging Mission for Northern Regions: AIM-North*, The Canadian Journal of Remote Sensing, <https://doi.org/10.1080/07038992.2019.1643707>. (2019, MSc. work)

Talks

1. G. Carlse, A. Pouliot, H. Beica, **G. Singh**, A. Schiff-Kearn, S. Jackson, J. Goobie and A. Kumarakrishnan, *Development of a Home-built Tapered Amplifier Laser System*, CUPC, Peterborough. (October 2015, BSc. work)
2. H. C. Beica, A. Carew, A. Vorozcovs, P. Dowling, A. Pouliot, **G. Singh**, and A. Kumarakrishnan, *Auto-locked laser systems for precision metrology*, SPIE Photonics West LASE, San Francisco. (January 2017, BSc. work).
3. **G. Singh**, C.T. McElroy. *An Imaging Fourier Transform Spectrometer for Nadir Atmospheric Measurement*. Earth and Space Science Colloquium, York University, Toronto, Ontario. (January 2017, MSc. work)
4. **G. Singh**, Z. Vaziri, C.T. McElroy, D. Barton, G. Blair, R. Siddiqui, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS)*. CANDAC/PAHA workshop, Toronto, Ontario. (May 2017, MSc. work)
5. **G. Singh**, C.T. McElroy, Z. Vaziri, and D. Barton. ACE validation campaign – 2017, SPS, MAESTRO, and Brewer” ACE - Post-Campaign Preliminary Data Meeting, University of Toronto, Ontario (May 2017, MSc. work)
6. **G. Singh**, Z. Vaziri, C.T. McElroy, D. Barton, G. Blair, and F.J. Grandmont. *Optical Breadboard of An Imaging Fourier Transform Spectrometer (IFTS)*. Research Evaluation Course Conference, Department of Earth and Space Science, Lassonde School of Engineering, Toronto, Ontario. (May 2017, MSc. work)
7. **G. Singh**, C.T. McElroy, Z. Vaziri, and D. Barton. *ACE science meeting – 2017, SPS, MAESTRO, and Brewer*. ACE Science Meeting, University of Waterloo, Ontario. (May 2017, MSc. work)

8. Z. Vaziri, C.T. McElroy, **G. Singh**, K.-H. Feng, C. Zheng, D. Barton, G. Blair, K.A. Walker, R. Nassar, and F.J. Grandmont. *Balloon demonstrator imaging Fourier transform spectrometer for the measurement of methane and carbon dioxide*. Canadian Meteorological and Oceanographic Society Congress, Toronto, Ontario. (June 2017, MSc. work)
9. **G. Singh**, C.T. McElroy, Z. Vaziri, D. Barton, G. Blair, R. Siddiqui, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS)*. Joint ACE Odin Science Meeting Waterloo, Ontario. (October 2017, MSc. work)
10. **G. Singh**, Z. Vaziri, C.T. McElroy, D. Barton, G. Blair, R. Siddiqui, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS)*. Earth and Space Science Colloquium, York University, Toronto, Ontario. (Nov 2017, MSc. work)
11. **G. Singh**, Z. Vaziri, C.T. McElroy, D. Barton, G. Blair, R. Siddiqui, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS) for Climate Observations*. Research Evaluation Course Conference, Department of Earth and Space Science, Lassonde School of Engineering, Toronto, Ontario. (May 24, 2018, MSc. work)
12. **G. Singh**, Z. Vaziri, C.T. McElroy, D. Barton, G. Blair, R. Siddiqui, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS)*. CANDAC/PAHA workshop, Toronto, Ontario. (May 1, 2018, MSc. work)
13. **G. Singh**, Z. Vaziri, C.T. McElroy, D. Barton, G. Blair, R. Siddiqui, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS)*. ACE Science Meeting Waterloo, Ontario. (May 2018, MSc. work)

Posters

1. **G. Singh**, C.T. McElroy, D.V Barton, Z. Vaziri, and C. Zheng. *Payload for Remote Sounding of Atmosphere Using Balloon Limb Experiments*. Lassonde Undergraduate Research Conference. Lassonde School of Engineering, York University, Toronto, Ontario. (August 2015, BSc. work)
2. **G. Singh**, C.T. McElroy, Z. Vaziri, D. Barton, G. Blair, and F.J. Grandmont. *Optical Bench Breadboard Of An Imaging Fourier Transform Spectrometer (IFTS) For Climate Observations*. 2016 - Lassonde Undergraduate Research Conference. Lassonde School of Engineering, York University, Toronto, Ontario. (August 2016, BSc. work)
3. **G. Singh**, C.T. McElroy, Z. Vaziri, D. Barton, G. Blair, and F.J. Grandmont. *Optical Bench Breadboard of An Imaging Fourier Transform Spectrometer (IFTS) For Climate Observations*. 2017 Connaught Summer Institute in Arctic Science: Atmosphere, Cryosphere, and Climate, Alliston, Ontario. (July 2017, MSc. work)
4. **G. Singh**, C.T. McElroy, Z. Vaziri, D. Barton, G. Blair, and F.J. Grandmont. (2017). *Optical Bench Breadboard of An Imaging Fourier Transform Spectrometer (IFTS) For Climate*

Observations. Final paper number: A33B-2347 2017 Fall Meeting, AGU, New Orleans, LA. (December 2017, MSc. work)

5. **G. Singh**, Z. Vaziri, R. Siddiqui, C.T. McElroy, D. Barton, G. Blair, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS) for Climate Observations*. International Workshop on Greenhouse Gas Measurements from Space, Toronto, Ontario. (May 2018, MSc. work)
6. **G. Singh**, Z. Vaziri, R. Siddiqui, C.T. McElroy, D. Barton, G. Blair, and F.J. Grandmont. *An Imaging Fourier Transform Spectrometer (IFTS) for Climate Observations*. Lassonde Research Day, Toronto, Ontario. (June 2018, MSc. work)