John Garrett

University Group
Experimental Radio/mm Cosmology
Astrophysics
Department of Physics
University of Oxford

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Profile

- Fourth year DPhil student in Astrophysics (final year)
- Strong research background in:
  - Electrical engineering including RF design, simulation and testing
  - Numerical computation/simulation using Python & NumPy
  - Superconducting detectors with theory and hands-on experience
- Distinguished academic record:
  - Recipient of the Clarendon Scholarship, an international award from IEEE, the ALIS Sir James Lougheed Award of Distinction, and the Alberta Innovates Technology Futures Scholarship
  - Master's degree GPA of 4.0 / 4.0
- Demonstrated research productivity:
  - 12 refereed research contributions including 3 first author journal papers

Education

Doctorate of Philosophy

Astrophysics, University of Oxford — 2014 – present

- Supervisor: Prof. Ghassan Yassin
- Thesis: *A 230 GHz Focal Plane Array using Wide IF Bandwidth SIS Receivers*
  - Increasing the sensitivity of terahertz receivers by increasing the instantaneous bandwidth and the number of receivers in the focal plane
  - This work will help to increase the mapping speed of ultra-sensitive receivers looking at the ultra-cold universe

Master of Science

Electrical Engineering, University of Calgary — 2012 – 2014

- Supervisor: Dr. Elise Fear
- Thesis: *Average Dielectric Property Analysis of Non-Uniform Structures*
  - A new technique to estimate the average dielectric properties of complex and non-uniform structures from transmission measurements
  - This work can be applied to improve microwave breast imaging results for non-invasive cancer detection
- Courses including letter grade:
  - Antenna Design (A+), RFIC Design (A+), Analog IC Design (A), RF Microwave Passive Circuits (A+) [GPA: 4.0 / 4.0]

Bachelor of Science

Electrical Engineering, University of Alberta — 2008 – 2012

- Capstone project: Nanowire Metamaterials for Biosensing Applications
- Graduated with distinction

Publications

Journal Papers

I. Cortzen, J. Garrett, *et al.*, "Mid-IR Spectroscopy as a Tracer of the Molecular Gas in Star Forming Galaxies," *in preparation.*

J. Garrett, and E. Fear, "A New Breast Phantom with a Durable Skin Layer for Microwave Breast Imaging," *IEEE Transactions on Antennas and Propagation,* vol. 63, no. 4, pp. 1693–1700, Apr. 2015.

J. Garrett, and E. Fear, "Average Dielectric Property Analysis of Complex Breast Tissue with Microwave Transmission Measurements,"*Sensors (MDPI),* vol. 15, no. 1, pp. 1199–1216, 2015.

J. Garrett, and E. Fear, "Stable and Flexible Materials to Mimic the Dielectric Properties of Human Soft Tissues," *IEEE Antennas and Wireless Propagation Letters,* vol. 13, pp. 599–602, 2014.

J. Bourqui, J. Garrett, and E. Fear, "Measurement and Analysis of Microwave Frequency Signals Transmitted Through the Breast," *International Journal of Biomedical Imaging,* vol. 2012, Article ID 562563, 11 pages, 2012.

Selected Conference Proceedings

J. Garrett, J. Leech, B. Ellison, and G. Yassin, "A 1×4 Focal Plane Array Using 230 GHz SIS Mixers," accepted to present at *The 29th International Symposium on Space Terahertz Technology (ISSTT)*, Los Angeles, CA, Mar. 2018.

J. Garrett, H. Rashid, V. Desmaris, V. Belitsky, and G. Yassin, "Spectral Domain Simulation of SIS Frequency Multiplication," in *The 28th International Symposium on Space Terahertz Technology (ISSTT)*, Cologne, Germany, Mar. 2017.

J. Garrett, F. Boussaha, C. Chaumont, B.K. Tan, and G. Yassin, "A 230 GHz Finline SIS Receiver with Width IF Bandwidth," in *The 27th International Symposium on Space Terahertz Technology (ISSTT)*, Nanjing, China, Apr. 2016.

J. Garrett, B.K. Tan, F. Boussaha, C. Chaumont, and G. Yassin, "A 220 GHz Finline Mixer with Ultra-Wide Instantaneous Bandwidth," in *The 26th International Symposium on Space Terahertz Technology (ISSTT)*, Cambridge, MA, Mar. 2015.

J. Leech, G. Yassin, B.K. Tan, Y. Zhou, J. Garrett, and P. Grimes, "An SIS Mixer Based Focal-Plane Array at 230 GHz," in *The 26th International Symposium on Space Terahertz Technology (ISSTT)*, Cambridge, MA, Mar. 2015.

J. Garrett, and E. Fear, "Average Property Estimation Validation with Realistic Breast Models," in *The 8th European Conference on Antennas and Propagation (EuCAP)*, The Hague, Netherlands, Apr. 2014, pp. 1279–1280.

J. Garrett, and E. Fear, "A Time- and Temperature-Stable Complex Breast Phantom for Microwave Breast Imaging," in *The 2013 USNC-URSI Radio Science Meeting (Joint with IEEE AP-S Symposium)*, Lake Buena Vista, FL, Jul. 2013, pp. 32.

J. Garrett, J. Bourqui, and E. Fear, "Average Property Estimation of Breast Tissue: the Use of Time-Gating and Antenna Compensation Techniques," presented at *The 2012 IEEE Antennas and Propagation Symposium*, Chicago, IL, Jul. 2012.

Awards and Honours

Major Scholarships	Clarendon Fund Scholarship	2014 – 2018
	New College Graduate Scholarship	2014 – 2017
	Alberta Innovates Technology Futures (AITF) Scholarship	2012 – 2014
	NSERC Undergraduate Student Research Award (USRA)	2011
Selected Awards	ALIS Sir James Lougheed Award of Distinction (Doctoral)	2015
	IEEE Antennas and Propagation Pre-Doctoral Research Award	2013

Teaching

Demonstrator/ Teaching Assistant	First Year Electromagnetics, University of Oxford	2016 – present
	Electromagnetic Waves and Applications, University of Calgary	2013 – 2014
	Electromagnetic Fields and Applications, University of Calgary	2013

Extra-Curricular

Community Involvement and Service	Stargazing at Oxford	2014 – present
	– An outreach program to teach the general public about astronomy	
	Canadian Association for Disabled Skiing	2012 – 2013
	– Taught a disabled woman how to ski through 1-on-1 lessons (4 hrs/week)	
Competitive Athletics	Rugby	
	– New College Rugby Football Club	2014 – present
	– Rams Senior Men Rugby Club	2013 – 2014
	Rowing	
	– New College VIII's	2014 – 2015
	Triathlon	
	– University of Calgary Triathlon Club	2013
Leadership	Sports Representative, New College MCR Committee	2015
	VP Operations, ECE Graduate Student Assn., UofC	2012 – 2013
Professional Memberships	Institute of Electrical and Electronics Engineers (IEEE)	
	– Student member	
Other Interests	Backcountry skiing, backpacking, reading and brewing beer	