

# GRIFFIN FOSTER, PHD

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## SUMMARY

Experimentalist researcher with 15+ years experience with a background in physics, statistics, computer science, electrical engineering, and leading research teams. Currently developing new radar systems for automotive use. Past work focused on building radio-frequency instruments for astronomy, image processing, and searching for rare signal events. Author of numerous peer-reviewed journal manuscripts and a textbook on observational astronomy.

## EDUCATION

*PhD* 2009-2013 University of Oxford, St. Peter's College  
*Astrophysics*  
Thesis: *Large-N Correlator Systems for Low-Frequency Radio Astronomy*

*Bachelor of Arts* 2003-2007 University of California, Berkeley  
*Physics and Astrophysics* · College of Letters and Science  
Double major, with a minor in Computer Science

## PROFESSIONAL WORK

*Zendar* April 2019–Present Senior Research Engineer  
Currently, I research new techniques for automotive radar. This includes system design, calibration, array geometry design, MIMO processing, range-Doppler processing, and mixed-method back-projection imaging with synthetic aperture radar (SAR).

*University of Oxford / University of California, Berkeley* Nov. 2016–Mar. 2019 Lead Project Scientist  
Led an international team of researchers to develop pipelines and automated triggers for processing multi-TB per day datasets using heterogeneous systems of FPGAs, GPUs, and CPUs. Developed machine learning-based anomaly detection methods for Breakthrough Listen SETI (Search for Extraterrestrial Intelligence) and radio transient surveys.

*Square Kilometre Array South Africa* July 2013–Oct. 2016 Square Kilometre Array Research Fellow  
Used computer vision feature detection techniques to automate source finding and rare event detection pipelines. Radio galaxy classification using basis decomposition (shapelet, wavelet) and wide learning techniques (PCA, SVM, ensemble methods). Advisor to multiple PhD and Masters students. Developed and taught a Masters' level course on observational radio astronomy techniques.

*University of Oxford, Astrophysics* Oct. 2009–June 2013 DPhil Researcher  
Led the design of FPGA-based, streaming cross-correlation instruments (ingesting  $\sim 100$  Gbps data rates and reduced output rates of  $\sim 100$  Mbps) for radio interferometric arrays in the UK and Italy. Built a real-time pipeline to calibrate and produce sky maps from the reduced streaming data using linear algebra and Fourier techniques.

## TECHNICAL SKILLS

*Mathematics* Digital Signal Processing, Linear Algebra, Statistics, Fourier Analysis, Multivariate-Calculus, Basis Set Decomposition, Discrete Mathematics

*Computing Languages* Python, Matlab/Octave, SQL, C,  $\lambda$ ,  $\text{\LaTeX}$ , some experience with C++, CUDA, Verilog

*Analysis Techniques and Tools* Image and signal processing, System Calibration, Fourier and basis transforms, Ensemble learning, PCA/SVD, Embedding and dimensionality reduction, Gaussian Processes, practical experimentation and statistical analysis