

# MALCOLM C. A. WHITE

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<https://malcolmw.github.io/homepage>

## PERSONAL STATEMENT

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My research interests span the spectrum of computational methods in seismology—from observational problems, like elastic-wave-phase detection; to forward problems, like modeling propagating wavefronts; and inverse problems, like locating earthquakes—and how to synthesize these to investigate structural and mechanical properties of the Earth’s subsurface.

## TECHNICAL STRENGTHS

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<b>Computer Languages</b>	Python, C/C++, Fortran, Mathematica, Bash
<b>Software &amp; Tools</b>	Antelope, GnuCash, L <sup>A</sup> T <sub>E</sub> X, Excel

## EDUCATION

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<b>University of Southern California</b>	<i>August 2016 - Present</i>
PhD in Earth Sciences	Overall GPA: 3.45/4.0
Department of Earth Sciences	

<b>Carleton University</b>	<i>September 2007 - May 2013</i>
BSc in Computational Geophysics	Honours
Department of Earth Sciences	

## EMPLOYMENT

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2013	<b>Scripps Institution of Oceanography</b> — <i>La Jolla, California, USA</i> <i>Seismic Analyst</i>
2011	<b>Pacific Geoscience Center</b> — <i>Sidney, British Columbia, Canada</i> <i>Research Assistant</i>
2010	<b>Geological Survey of Canada</b> — <i>Ottawa, Ontario, Canada</i> <i>Research Assistant</i>

## TEACHING

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2018	<b>The Nature of Scientific Inquiry</b> Examination of the scientific process: what constitutes science; evolution of ideas about the nature of space, time, matter, and complexity; paradigm shifts in the biological and earth sciences. Lecture, 3 hours; laboratory, 2 hours.
	<b>Earthquakes</b>

Causes of earthquakes and nature of large faults; earthquake hazard and risk; world's great earthquakes; understanding the Richter scale. Lecture, 3 hours; laboratory, 2 hours.

2017 | **The Nature of Scientific Inquiry**

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## EDITORIAL REVIEW ACTIVITY

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2020 | **Geophysical Journal International**—*Article reviewer*

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## SOCIETIES

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2020 | **American Geophysical Union  
Seismological Society of America**

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## PUBLICATIONS

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- 2020 | **White, M. C. A.**, Fang, H., Nakata, N., & Ben-Zion, Y. (2020). PyKonal: A Python package for solving the Eikonal equation in spherical and Cartesian coordinates using the Fast Marching Method. *Seismological Research Letters*, in press.
- 2019 | **White, M. C. A.**, Ben-Zion, Y., & Vernon, F. L. (2019). A Detailed Earthquake Catalog for the San Jacinto Fault-Zone Region in Southern California. *Journal of Geophysical Research: Solid Earth*, 124, 6908–6930. doi: 10.1029/2019JB017641
- 2017 | Burdick, S., Vernon, F. L., Martynov, V., Eakins, J., Cox, T., Tytell, J., ... van der Hilst, R. D. (2017). Model Update May 2016: Upper-Mantle Heterogeneity beneath North America from Travel-Time Tomography with Global and USArray Data. *Seismological Research Letters*, 88(2A), 319–325. doi: 10.1785/0220160186
- 2016 | Ross, Z. E., Ben-Zion, Y., **White, M. C.**, & Vernon, F. L. (2016). Analysis of earthquake body wave spectra for potency and magnitude values: implications for magnitude scaling relations. *Geophysical Journal International*, 207(2), 1158–1164. doi: 10.1093/gji/ggw327
- Ross, Z. E., **White, M. C.**, Vernon, F. L., & Ben-Zion, Y. (2016). An Improved Algorithm for Real-Time S -Wave Picking with Application to the (Augmented) ANZA Network in Southern California. *Bulletin of the Seismological Society of America*, 106(5), 2013–2022. doi: 10.1785/0120150230
- 2015 | Ben-Zion, Y., Vernon, F. L., Ozakin, Y., Zigone, D., Ross, Z. E., Meng, H., ... Barklage, M. (2015). Basic data features and results from a spatially dense seismic array on the San Jacinto fault zone. *Geophysical Journal International*, 202(1), 370–380. doi: 10.1093/gji/ggv142

- 2014 | Astiz, L., Eakins, J. A., Martynov, V. G., Cox, T. A., Tytell, J., Reyes, J. C., ... Vernon, F. L. (2014). The Array Network Facility Seismic Bulletin: Products and an Unbiased View of United States Seismicity. *Seismological Research Letters*, 85(3), 576–593. doi: 10.1785/0220130141

## GRADUATE COURSEWORK (SELECTED)

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- 2017 | **Probability for Electrical and Computer Engineers**  
Rigorous coverage of probability, discrete and continuous random variables, functions of multiple random variables, covariance, correlation, random sequences, Markov chains, estimation, and introduction to statistics.
- Methods of Computational Physics**  
Introduction to algorithm development. Integration of ordinary differential equations; chaotic systems; molecular dynamics; Monte Carlo integration and simulations; cellular automata and other complex systems.
- Introduction to Digital Signal Processing**  
Fundamentals of digital signal processing covering: discrete time linear systems, quantization, sampling, Z-transforms, Fourier transforms, FFTs and filter design.
- 2016 | **Methods of Theoretical Physics**  
Vector analysis; infinite, asymptotic Fourier series; complete sets; Dirac delta function; Fourier, Laplace transforms; Legendre functions; spherical harmonics; Sturm-Liouville theory; orthogonal polynomials; gamma-factorial function; complex variables.

## ORAL PRESENTATIONS

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- 2020 | **Hierarchical crustal traveltime tomography in Southern California: Insights and perspectives**  
*University of Southern California—Lithospherics Dynamics Seminar*
- 2019 | **Microseismicity correlates strongly with velocity structure in the San Jacinto fault zoner**  
*American Geophysical Union Annual Meeting*
- Focal mechanisms of microseismicity in the San Jacinto fault-zone region of Southern California**  
*Seismological Society of America Annual Meeting*
- Focal mechanisms of microseismicity in the San Jacinto fault-zone region of Southern California**  
*Lamont-Doherty Earth Observatory—Seismology Student Workshop*
- Illuminating the San Jacinto fault-zone region of Southern California with a new earthquake catalog**

*Massachusetts Institute of Technology—Friday Informal Seminar Hour*

2018 **Illuminating seismogenic structures in the San Jacinto Fault Zone**

*Brown University—Geophysics Seminar*

**Seismicity in the San Jacinto fault zone: automatically deriving a decade-long catalog of earthquake hypocenters from scratch**

*University of Southern California—Lithospheric Dynamics Seminar*