

Exponent®
Engineering & Scientific Consulting

Cameron Chaffey, Ph.D.

Scientist | Electrical Engineering
Menlo Park
+1-650-688-6797 | cchaffey@exponent.com

Professional Profile

Dr. Chaffey is an applied physicist with nearly a decade of expertise in materials characterization using research instruments to measure physical, electrical, and magnetic properties.

He has years of experience in failure analysis and root cause analysis of electrical and mechanical failures in consumer electronics down to the circuit board (PCB) and component level, as well as designing, building and repairing custom electronics.

Prior to joining Exponent, Dr. Chaffey completed his Ph.D. in physics at the University of California, Davis under Professor Nicholas Curro. As a graduate student in experimental condensed matter physics, he used nuclear magnetic resonance (NMR) to characterize materials including high temperature superconductors and magnetic materials. His research focused on quantifying the effect that applying physical strain has on iron-based superconductors and pioneering a new method that improved SNR by several orders of magnitude. This work required mastery of RF signal integrity and impedance matching, high magnetic fields, temperature control, and cryogens.

Academic Credentials & Professional Honors

Ph.D., Physics, University of California, Davis, 2026

M.S., Physics, University of California, Davis, 2021

B.A., Applied Mathematics and Physics, University of California, Berkeley, 2019

Publications

Sherpa P, Hingorani R, Menon A, Vinograd I, Chaffey C, Diogaurdi AP, Yamamoto R, Hirata M, Ronning F, Badger JR, Klavins P, Singh RRP, Taufour V, Curro NJ. "Observation of a pronounced Hebel-Slichter peak in the spin-lattice relaxation rate and implications for gap and pairing symmetry in LaNiGa2." Physical Review Letters 136, 186001 (2026).

Nian Y-H, Chaffey C, Sherpa P, Santillan L, Nagashima K, Klavins P, Taufour V, Curro NJ. "Knight shift measurements probing Fermi surface changes under pressure in CeRhIn5." Physical Rev B 113, 115108 (2026).

Sherpa P, Vinograd I, Shi Y, Sreedhar SA, Chaffey C, Kissikov T, Jung M-C, Botana AS, Dioguardi AP, Yamamoto R, Hirata M, Conti G, Nemsak S, Badger JR, Klavins P, Vishik I, Taufour V, Curro NJ. "Absence of strong magnetic fluctuations or interactions in the normal state of LaNiGa2." Physical Review B 109, 125113 (2024).

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Chaffey C, Williams C, Tanatar MA, Bud'ko SL, Canfield PC, Curro NJ. "Measurements of nematic susceptibility with phase sensitive nuclear magnetic resonance in pulsed strain fields." Review of Scientific Instruments 95, 043903 (2024).

Nian Y-H, Vinograd I, Chaffey C, Li Y, Zic MP, Massat P, Singh RRP, Fisher IR, Curro NJ. "Nuclear magnetic resonance studies in a model transverse field Ising system." Frontiers in Physics 12, 1393229 (2024).

Nian Y-H, Vinograd I, Green T, Chaffey C, Massat P, Singh RRP, Zic MP, Fisher IR, Curro NJ. "Spin Echo, Fidelity, and the Quantum Critical Fan in TmVO4." Physical Review Letters 132, 216502 (2024).

Chaffey C, Wu HC, Jin H, Sherpa P, Klavins P, Avdeev M, Aji S, Shimodate R, Nawa K, Sato TJ, Taufour V, Curro NJ. "Magnetic structure and Kondo lattice behavior in CeVGe3: An NMR and neutron scattering study." Physical Review B 108, 115163 (2023).

Choi H, Vinograd I, Chaffey C, Curro NJ. "Inverse Laplace transformation analysis of stretched exponential relaxation." Journal of Magnetic Resonance 331, 107050 (2021).

Deeg H, Klagyivik P, Armstrong JD, Nespral D, Tal-Or L, Alonso R, Cabatic R, Chaffey C, Gauza B, Hoyer S, Lindsay C, Miles-Páez P, Rojo P, Tingley B. "Maintaining the Ephemeris of 20 CoRoT Planets: Transit Minimum Times and Potential Transit Timing Variations." Journal of the American Association of Variable Star Observers 48, 201 (2020).

Cabrera J, Csizmadia Sz, Montagnier G, Fridlund M, Ammler-von Eiff M, Chaintreui S, Damiani C, Deleuil M, Ferraz-Mello S, Ferrigno A, Gandolfi D, Guillot T, Guenther EW, Hatzes A, Hébrard G, Klagyivik P, Parviainen H, Pasternacki Th, Pätzold M, Sebastian D, Tadeu dos Santos M, Wuchter G, Aigrain S, Alonso R, Almenara J-M, Armstrong JD, Auvergne M, Baglin A, Barge P, Barros SCC, Bonomo AS, Bordé P, Bouchy F, Carpano S, Chaffey C, Deeg HJ, Díaz RF, Dvorak R, Erikson A, Grziwa S, Korth J, Lammer H, Lindsay C, Mazeh T, Moutou C, Ofir A, Ollivier M, Pallé E, Rauer H, Rouan D, Samuel B, Santerne A, Schneider J. "Transiting exoplanets from the CoRoT space mission-XXVII. CoRoT-28b, a planet orbiting an evolved star, and CoRoT-29b, a planet showing an asymmetric transit." Astronomy & Astrophysics 579, A36 (2015).

Presentations

Chaffey C. NMR Study of Single Crystal CaKFe4As4 Under Pulsed Uniaxial Strain. Oral presentation, APS Global Physics Summit, Anaheim, CA, 2025.

Chaffey C. NMR Study of Kondo Lattice Physics and Magnetic Structure in CeVGe3. Poster presentation, Magnetic Resonance of Correlated Electron Materials, Dresden, Germany, 2023.

Chaffey C. NMR Study in Single Crystal CeVGe3. Oral presentation, APS March Meeting, Chicago, IL, 2022.

Peer Reviews

Reviewer for Nature Communications, Physical Review Letters, Physical Review Research