



**Exponent**<sup>®</sup>  
Engineering & Scientific Consulting

## Felix Schmitt, Ph.D.

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### Professional Profile

Dr. Schmitt helps clients accelerate product development and solve complex engineering challenges by integrating expertise across electrical, software, and mechanical systems. With more than a decade of experience, he supports clients from concept to realization by designing, analyzing, and optimizing innovative products and test systems. His work spans electronic design and failure analysis, software design from firmware to data modeling, design for manufacturing and assembly, and modeling complex physical systems.

Prior to joining Exponent, Dr. Schmitt served as Chief Technology Officer of an alternative energy startup, where he led the design and deployment of custom hardware, software, and manufacturing infrastructure. He guided product strategy by combining advanced physical modeling with hands-on system development.

Dr. Schmitt has deep experience in digital signal and image processing, optimization algorithms, embedded systems, and cybersecurity. He is proficient in C/C++, Java, Matlab, LabVIEW, and Python, and has designed one-of-a-kind systems for measurement, control, and analysis.

At Stanford University, Dr. Schmitt earned his Ph.D. in condensed matter physics and completed postdoctoral research on high-temperature superconductors, charge-density wave materials, and topological insulators. He has authored over 25 peer-reviewed publications and holds nine patents.

### Academic Credentials & Professional Honors

Ph.D., Applied Physics, Stanford University, 2011

Diplom, Physics, Julius-Maximilians-Universität Würzburg, 2005

M.S., Physics, University at Albany, 2003

### Prior Experience

Advisor, Spark Thermionics Inc., 2024-2025

CTO, Spark Thermionics Inc., 2016-2024

Senior Staff Researcher, Synaptics Inc., 2015-2016

Staff Systems Architect, Synaptics Inc., 2013-2015

Post-doctoral researcher, Stanford University, 2011-2013

## Patents

WO2016018530A: Improved stackup for touch and force sensing, February 2016 (Felix Schmitt, Richard R. Schediwy)

US-20170090670-A1: Mitigating interference in capacitance sensing, March 2017 (Matthew Stevenson, Felix Schmitt)

US-9904412-B2: Display noise subtraction via substantially orthogonal noise templates, February 2018 (Matthew Stevenson, Felix Schmitt)

US-20170285773-A1: Active pen signal detection, August 2018 (Oscar Ayzenberg, Felix Schmitt)

US-10275080-B2: Method and apparatus for constant response from shape memory alloy, April 2019 (Felix Schmitt)

US-10699886-B2: System and method for thermionic energy conversion, June 2020 (Felix Schmitt, Jared William Schwede, Adam Lorimer)

US-10642428-B2: Engineering displacement response through electrode shape, May 2020 (Mihai Bulea, Felix Schmitt)

US-11264144-B2: System and method for thermionic energy conversion, March 2022 (Kyana van Houten, Lucas Heinrich Hess, Jared William Schwede, Felix Schmitt)

WO2023122177A1: Burner system and method of operation, June 2023 (Felix Schmitt, Jared William Schwede, David Rich, Tyler Sandberg)

## Publications

Progress Toward High Power Output in Thermionic Energy Converters, M. F. Campbell, T. J. Celenza, F. Schmitt, J. W. Schwede, I. Bargatin, *Adv. Sci.* 2021, 8, 2003812 (2021)

Nanostructured Spacers for Thermionic and Thermophotovoltaic Energy Converters, M. F. Campbell, M. Azadi, Z. Lu, A. G. Eskenazi, A. Jain, J. W. Bang, P. G. Sieg, G. A. Popov, S. M. Nicaise, K. Van Houten, F. Schmitt, J. W. Schwede, I. Bargatin, *Journal of Microelectromechanical Systems*, vol. 29, no. 5, 637-644, (2020)

Persistent order due to transiently enhanced nesting in an electronically excited charge density wave, L. Rettig, R. Cortés, J.-H. Chu, I. R. Fisher, F. Schmitt, R. G. Moore, Z.-X. Shen, P. S. Kirchmann, M. Wolf & U. Bovensiepen, *Nature Communications* volume 7, Article number: 10459 (2016)

Observation of universal strong orbital-dependent correlation effects in iron chalcogenides, M. Yi, Z.K. Liu, Y. Zhang, R. Yu, J.X. Zhu, J.J. Lee, R.G. Moore, F.T. Schmitt, W. Li, S.C. Riggs, J.H. Chu, B. Lv, J. Hu, M. Hashimoto, S.K. Mo, Z. Hussain, Z.Q. Mao, C.W. Chu, I.R. Fisher, Q. Si, Z.X. Shen, D.H. Lu, *Nature Communications* 6, 7777 (2015)

Thickness-Dependent Coherent Phonon Frequency in Ultrathin FeSe/SrTiO<sub>3</sub> Films, S. Yang, J. A. Sobota, D. Leuenberger, A. F. Kemper, J. J. Lee, F. T. Schmitt, W. Li, R. G. Moore, P. S. Kirchmann, and Z.-X. Shen, *Nano Lett.* 15, 4150 (2015)

Observation of universal strong orbital-dependent correlation effects in iron chalcogenides, M. Yi, Z.K. Liu, Y. Zhang, R. Yu, J.X. Zhu, J.J. Lee, R.G. Moore, F.T. Schmitt, W. Li, S.C. Riggs, J.H. Chu, B. Lv, J.

Hu, M. Hashimoto, S.K. Mo, Z. Hussain, Z.Q. Mao, C.W. Chu, I.R. Fisher, Q. Si, Z.X. Shen, D.H. Lu, Nature Communications 6, 7777 (2015)

Thickness-Dependent Coherent Phonon Frequency in Ultrathin FeSe/SrTiO<sub>3</sub> Films, S. Yang, J. A. Sobota, D. Leuenberger, A. F. Kemper, J. J. Lee, F. T. Schmitt, W. Li, R. G. Moore, P. S. Kirchmann, and Z.-X. Shen, Nano Lett. 15, 4150 (2015)

Interface Ferroelectric Transition near the Gap-Opening Temperature in a Single-Unit-Cell FeSe Film Grown on Nb-doped SrTiO<sub>3</sub> Substrate, Y.-T. Cui, R. G. Moore, A.-M. Zhang, Y. Tian, J. J. Lee, F. T. Schmitt, W.-H. Zhang, W. Li, M. Yi, Z.-K. Liu, M. Hashimoto, Y. Zhang, D.-H. Lu, T. P. Devereaux, L.-L. Wang, X.-C. Ma, Q.-M. Zhang, Q.-K. Xue, D.-H. Lee, and Z.-X. Shen, Phys. Rev. Lett. 114, 037002 (2015)

Interfacial mode coupling as the origin of the enhancement of T<sub>c</sub> in FeSe films on SrTiO<sub>3</sub>, J. J. Lee, F. T. Schmitt, R. G. Moore, S. Johnston, Y.-T. Cui, W. Li, M. Yi, Z. K. Liu, M. Hashimoto, Y. Zhang, D. H. Lu, T. P. Devereaux, D.-H. Lee, Z.-X. Shen, Nature 515, 245 (2014)

Direct observation of the transition from indirect to direct bandgap in atomically thin epitaxial MoSe<sub>2</sub>, Y. Zhang, T. R. Chang, B. Zhou, Y. T. Cui, H. Yan, Z. K. Liu, F. Schmitt, J. J. Lee, R. G. Moore, Y. L. Chen, H. Lin, H. T. Jeng, S.-K. Mo, Z. Hussain, A. Bansil, Z.-X. Shen, Nature NanoTechnology 9, 111 (2014)

Charge-orbital-lattice coupling effects in the dd excitation profile of one-dimensional cuprates, J. J. Lee, B. Moritz, W. S. Lee, M. Yi, C. J. Jia, A. P. Sorini, K. Kudo, Y. Koike, K. J. Zhou, C. Monney, V. Strocov, L. Patthey, T. Schmitt, T. P. Devereaux, Z.-X. Shen, Physical Review B 89, 041104(R) (2014)

Direct Optical Coupling to an Unoccupied Dirac Surface State in the Topological Insulator Bi<sub>2</sub>Se<sub>3</sub>, J. A. Sobota, S.-L. Yang, A. F. Kemper, J. J. Lee, F. T. Schmitt, W. Li, R. G. Moore, J. G. Analytis, I. R. Fisher, P. S. Kirchmann, T. P. Devereaux, Z.-X. Shen, Physical Review Letters 111, 136802 (September 24, 2013)

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Photon-Enhanced Thermionic Emission from Heterostructures with Low Interface Recombination, J. W. Schwede, T. Sarmiento, V. K. Narasimhan, S. J. Rosenthal, D. C. Riley, F. Schmitt, I. Bargatin, K. Sahasrabudde, R. T. Howe, J. S. Harris, N. A. Melosh, Z.-X. Shen, Nature Communications 4, 1576 (March 12, 2013)

Time-resolved Fermi surface mapping of the charge density wave material DyTe<sub>3</sub>, L. Rettig, R. Cortés, J.-H. Chu, I.R. Fisher, F. Schmitt, P.S. Kirchmann, R.G. Moore, Z.-X. Shen, M. Wolf and U. Bovensiepen, EPJ Web of Conferences 41, 03025 (2013)

Phase competition in trisected superconducting dome, I. M. Vishik, M. Hashimoto, R.-H. He, W. S. Lee, F. Schmitt, D.-H. Lu, R. G. Moore, C. Zhang, W. Meevasana, T. Sasagawa, S. Uchida, K. Fujita, S. Ishida, M. Ishikado, Y. Yoshida, H. Eisaki, Z. Hussain, T. P. Devereaux, Z.-X. Shen, Proceedings of the National Academy of Sciences USA, 109, 18332-18337 (Nov. 6, 2012)

Superconductivity distorted by the coexisting pseudogap in the antinodal region of Bi<sub>1.5</sub>Pb<sub>0.55</sub>Sr<sub>1.6</sub>La<sub>0.4</sub>CuO<sub>6+δ</sub>: A photon-energy-dependent angle-resolved photoemission study, M. Hashimoto, R.-H. He, I. M. Vishik, F. Schmitt, R. G. Moore, D.-H. Lu, Y. Yoshida, H. Eisaki, Z. Hussain, T. P. Devereaux, Z.-X. Shen, Physical Review B 86, 094504 (Sept. 4, 2012)

Intrinsic ultrathin topological insulators grown via molecular beam epitaxy characterized by in-situ angle resolved photoemission spectroscopy, J. J. Lee, F. T. Schmitt, R. G. Moore, I. M. Vishik, Y. Ma, Z.-X. Shen, Applied Physics Letters 101, 013118 (July 2, 2012)

Emerging coherence with unified energy, temperature and lifetime scale in heavy fermion  $\text{YbRh}_2\text{Si}_2$ , S.-K. Mo, W. S. Lee, F. Schmitt, Y. L. Chen, D.-H. Lu, C. Capan, D. J. Kim, Z. Fisk, Z. Hussain, Z.-X. Shen, *Physical Review B* 85, 241103 (June 22, 2012)

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High-energy anomaly in  $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_4$  investigated by angle-resolved photoemission spectroscopy and quantum Monte Carlo simulations, F. Schmitt, B. Moritz, S. Johnston, S.-K. Mo, M. Hashimoto, R. G. Moore, D.-H. Lu, E. Motoyama, M. Greven, T. P. Devereaux, Z.-X. Shen, *Physical Review B* 83, 195123 (2011)

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Doping-dependent Nodal Fermi Velocity of the High-Temperature Superconductor  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$  Revealed Using High-Resolution Angle-Resolved Photoemission Spectroscopy, I. M. Vishik, W. S. Lee, F. Schmitt, B. Moritz, T. Sasagawa, S. Uchida, T. P. Devereaux, Z.-X. Shen, *Physical Review Letters* 104, 207002 (2010)

Effect of Strong Correlations on the high energy anomaly in hole- and electron-doped high- $T_c$  Superconductors, B. Moritz, F. Schmitt, W. Meevasana, S. Johnston, E. M. Motoyama, M. Greven, D.-H. Lu, C. Kim, R. T. Scalettar, Z.-X. Shen, T. P. Devereaux, *New Journal of Physics* 11, 093020 (2009)

Transient electronic structure and melting of a charge density wave  $\text{TbTe}_3$ , F. Schmitt, P. S. Kirchmann, U. Bovensiepen, R. G. Moore, L. Rettig, M. Krenz, J.-H. Chu, N. Ru, L. Perfetti, D.-H. Lu, M. Wolf, I. R. Fisher, Z.-X. Shen, *Science* 321, 1649 (2008)

Analysis of the spectral function of  $\text{Nd}_{1.85}\text{Ce}_{0.15}\text{CuO}_4$ , obtained by angle-resolved photoemission spectroscopy, F. Schmitt, W. S. Lee, D.-H. Lu, W. Meevasana, E. Motoyama, M. Greven, Z.-X. Shen, *Physical Review B* 78, 100505 (2008)

Extracting the Spectral Function of the Cuprates by a Full 2D Analysis, W. Meevasana, F. Baumberger, K. Tanaka, F. Schmitt, W. R. Dunkel, D.-H. Lu, S.-K. Mo, H. Eisaki, Z.-X. Shen, *Physical Review B* 77, 104506 (2008)