

Exponent®
Engineering & Scientific Consulting

Kyle Naughton, Ph.D.

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Professional Profile

Dr. Kyle Naughton is a physicist with expertise spanning electronic failure analysis, intellectual property dispute, product liability cases, biomedical device design and testing, electromagnetic modeling, and systems engineering. His background integrates advanced theoretical training with applied industry experience in engineering analysis, standards compliance, and complex dispute resolution.

His technical work includes microchip and integrated circuit (IC) failure analysis, embedded systems evaluation, cryptography, and electronic reliability assessments. He has conducted electromagnetic field (EMF) modeling to analyze EMF exposure from transmissions lines. He has likewise undertaken electromagnetic compatibility (EMC) projects both in the U.S. and E.U. and has studied electromagnetic interference (EMI) in complex systems. His experience also extends to biomedical device testing and evaluation in health care settings, optical device performance testing, and radio frequency (RF) assessments. In addition, Dr. Naughton has also contributed to fire investigations (wildland and commercial/residential), especially as they relate to subrogation. He has experience conducting process manufacturing reviews, managing quality control assurance programs, and leading insurance claims evaluations, and applying rigorous physics-based methods to support product performance and safety.

Beyond technical analysis, Dr. Naughton has experience in systems engineering project management and has supported patent disputes, product liability cases, and class action matters. His work frequently involves the application and review of international engineering standards, including ISO, IEC, and IEEE guidelines, in both U.S. and international contexts. He has participated in intellectual property disputes and international arbitration, providing technical clarity in high-stakes litigation and regulatory matters.

Prior to joining Exponent, he earned his Ph.D. in Physics from the University of Southern California (2021), an M.S. in Physics from UC Irvine (2017), and a B.S. in Physics from UC Santa Barbara (2012).

By combining deep scientific knowledge with practical industry applications, Dr. Naughton delivers comprehensive analyses that bridge theoretical physics, engineering practice, and legal-technical resolution.

Academic Credentials & Professional Honors

Ph.D., Physics, University of Southern California, 2021

M.S., Physics, University of California, Irvine, 2017

B.S., Physics, University of California, Santa Barbara, 2012

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Prior Experience

Graduate Research Assistant, University of Southern California, Los Angeles, CA, 2018-2021

Research Fellow, Complexity Interactive, Santa Fe Institute, Santa Fe New Mexico (2021)

Research Fellow, Phillips Group, California institute of Technology, Pasadena California (2019)

Research Fellow, Physiology, Marine Biology Lab, Woods Hole, Massachusetts (2018)

Graduate Research Assistant, University of California, Irvine, CA 2014-2017

Undergraduate Research Assistant, University of California, Santa Barbara, CA 2008-2012

Chief Process and Manufacturing Engineer, Invenios, Santa Barbara, 2013 – 2014

Publications

Naughton, K. L., Boedicker, J. Q., Simulations to Aid in the Design of Microbes for Synthesis of Metallic Nanomaterials, ACS Synthetic Biology 2021; 10:3475-3488.

Naughton, K.L., Microbial Electron Transfer and Biogenic Nanomaterials: Experiments, Theory, and Simulations at the Bacterial-Inorganic Interface. Ph.D. Dissertation, University of Southern California, Los Angeles, CA, 2021.

Zhao, F., Chavez, M.S., Naughton, K.L., Cole, C.M., Gralnick, J.A., El-Naggar, J.A., Boedicker, J.Q., Light-induced Patterning of Electroactive Bacterial Biofilms, bioRxiv 2021.

Boedicker, J.Q., Gangan, M., Naughton, K.L., Zhao, F., Gralnick, J.A., El-Naggar, M.Y., Engineering Biological Electron Transfer and Redox Pathways for Nanoparticle Synthesis, Bioelectricity 2021; 3:126-135.

Umerani, M.J., Pratakshya,P., Chatterjee,A., Sanchez,J.A.C., Kim,H.S., Ilc,G., Kovačič, M., Magnan, C., Marmiroli, B., Sartori, B., Kwansa, A.L., Orins, H., Bartlett, A.W., Leung, E.M., Feng, Z., Naughton, K.L., Norton-Baker, B., Phan, L., Long, J., Allevato, A., Leal-Cruz, J.E., Lin, Q., Baldi, P., Bernstorff, S., Plavec, J., Yingling, Y.G., Gorodetsky, A.A., Structure, self-assembly, and properties of a truncated reflectin variant. Proceedings of the National Academy of Sciences 2020; 117:32891-32901.

Ostovar, G., Naughton, K.L., Boedicker, J.Q., Computation in bacterial communities. Physical Biology 2020; 17:061002.

Laxhuber, K.S., Morrison, M.J., Chure, G., Belliveau, N.M., Strandkvist, C., Naughton, K.L., Phillips, R., Theoretical investigation of a genetic switch for metabolic adaptation. PLoS ONE 2020: 5:e0226453.

Chellamuthu, P., Naughton, K.L., Pirbadian, S., Silva, K.T.P., Chavez, M.S., El-Naggar, M.Y., Boedicker, J.Q., Biogenic control of manganese doping in zinc sulfide nanomaterial using Shewanella oneidensis MR-1. Frontiers in Microbiology 2019; 10:938.

Leung, E.M., Escobar, M.C., Stiubianu, G.T., Jim, S.R., Vyatskikh, A.L., Feng, Z., Garner, N., Patel, P., Naughton, K.L., Follador, M., Karshalev, E., Trexler, M.D., Gorodetsky, A.A., A dynamic thermoregulatory material inspired by squid skin. Nature Communications 2019; 10:1-10.

Naughto, K.L., Towards Understanding a Dynamic Cephalopod Protein Reflectin. M.S. Dissertation, University of California, Irvine, CA, 2017.

Phan, L., Kautz, R., Leung, E., Naughton, K.L., Van Dyke, Y., Gorodetsky, A.A., Dynamic materials

inspired by cephalopods. Chemistry of Materials 2016; 28:6804-6816.

Naughton, K.L., Phan, L., Leung, E.M., Kautz, R., Lin, Q., Van Dyke, Y., Marmiroli, B., Sartori, B., Arvai, A., Li, S., Pique, M.E., Naeim, M., Kerr, J.P., Aquino, M.J., Roberts, V.A., Getzoff, E.D., Zhu, C., Bernstorff, S., Gorodetsky, A.A., Self-Assembly of the Cephalod Reflectin. Advanced Materials; 28:8405-8412.

Pueyo, N.C., Raub, A.G., Jackson, S., Metz, M.M., Mount, A.C., Naughton, K.L., Eaton, A.L., Thomas, N.M., Hastings, P., Greaves, J., Blumberg, B., Collins, T.J., Sogo, S.G., Oxidation of ethidium bromide using TAML activators: a model for high school research performed in partnership with university scientists. Journal of Chemical Education; 90:326-331.

Presentations

Naughton, K.L., Boedicker, J.Q., Heterodimer Transcription Factors as Novel Gene Regulators, Presentation, APS March Meeting, Boston, MA, 2019.

Naughton, K.L., Boedicker, J.Q., Light Inducible Cell Patterning and Biogenic Lithography, American Society of Cell Biology (ASCB) Annual Meeting, San Diego, Poster Presentation, CA, 2018.

Naughton, K.L., Chellamuthu, P., Boedicker, J.Q., Engineering bacteria to synthesize nanomaterials, Society of Industrial Microbiology and Biotechnology (SIMB) Annual Meeting, Poster Presentation, San Diego, CA, 2018.

Naughton, K.L., Phan, L., Leung, E.M., Kautz, R., Lin, Q., Van Dyke, Y., Marmiroli, B., Sartori, B., Arvai, A., Li, S., Pique, M.E., Naeim, M., Kerr, J.P., Aquino, M.J., Roberts, V.A., Getzoff, E.D., Zhu, C., Bernstorff, S., Gorodetsky, A.A., Self-assembly of the cephalopod structural protein reflectin, American Chemical Society (ACS) Annual Meeting, Presentation, San Diego, CA, 2017.

Naughton, K.L., Phan, L., Leung, E.M., Kautz, R., Lin, Q., Van Dyke, Y., Marmiroli, B., Sartori, B., Arvai, A., Li, S., Pique, M.E., Naeim, M., Kerr, J.P., Aquino, M.J., Roberts, V.A., Getzoff, E.D., Zhu, C., Bernstorff, S., Gorodetsky, A.A., Self-assembly of the cephalopod structural protein reflectin, Materials Research Society (MRL) Annual Meeting, Presentation, Phoenix, AZ, 2017.

Naughton, K.L., Biophysical Characterization of Reflectin Isoforms from Cephalopods” American Association of Crystal Growth and Epitaxy (AACGE) Annual Meeting, Invited Talk, Lake Tahoe, CA, 2016.

Naughton, K.L., Characterization of the cephalopod structural protein reflectin, American Chemical Society (ACS) Annual Meeting, Presentation, San Diego, CA, 2016.

Additional Education & Training

A/B Testing, Udacity, 2021

Fundamentals of Machine Learning; Scaling Theory; Computation in Complex Systems, Santa Fe Institute, 2020

Google Data Analytics, Coursera, 2022

Research Grants

Investigating energy efficiency, information processing and control architectures of microbial community interaction networks, W911NF1910269, United States Army, 2019-2024

Nanoparticle characterization system for analysis of microbial vesicles in relation to biological communication networks and applications in microbial biosynthetic technologies, N000142112931 Office of Naval Research, 2021-2022

Livtronics: Living Electronics for Biologically-Enhanced Sensing, Computing, and Signal Transmission, N000141812632, Office of Naval Research, 2018-2021

Thermocomfort Cloth, ARPA-E, DELTA, 2015-2018

Equipment for Characterization of Nanostructures, N000141712564, Office of Naval Research, 2017

Open Manufacturing: Cephalod-Inspired Reconfigurable Camouflage, HR00111510008, DARPA, 2015-2016

Peer Reviews

eLife

Journal of Chemical Biology