Exponent®
Engineering & Scientific Consulting

Boris Spokoyny, Ph.D., FSE, CRE

Senior Managing Scientist | Polymers & Chemistry
Natick
+1-508-652-8593 | bspokoyny@exponent.com

Professional Profile

Dr. Spokoyny's expertise lies in the areas of optics, spectroscopy, microscopy, materials, lighting, and their applications in the consumer electronic, medical device and general industry markets. At Exponent, Dr. Spokoyny assists clients with issues pertaining to optical safety, functional safety of optomechanical systems, optical characterization of materials and understanding of their failure modes, as well as custom optical metrology solutions.

Dr. Spokoyny has worked on safety and design-related aspects of:

- Augmented Reality / Virtual Reality / Mixed Reality headsets (AR/VR/MR)
- Depth sensing technologies including Time-of-Flight (TOF) and Indirect Time-of-Flight (iTOF)
- Eye-tracking technologies
- Automotive and process-related light detection and ranging (LiDAR)
- Wearable consumer electronics
- Laser and LED-based devices in the medical field

Dr. Spokoyny has an extensive background in design and development of optical systems for ultrafast spectroscopy, confocal microscopy, as well as cryogenic characterization of nanomaterial optical properties. At Exponent, Dr. Spokoyny utilizes his experimental background to help clients come up with cutting edge optical metrology solutions for materials analysis, in-line process monitoring, and consumer electronics characterization. These include measurements of spectrally-resolved transmission, reflectance, color, bi-directional reflectance distributions (BRDFs), and photoelasticity, among others.

Dr. Spokoyny utilizes optical simulations using the industry-standard raytracing technologies to assist clients with fast prototyping of their product designs. Dr. Spokoyny has also utilized these computational methods in cases involving simulation of outdoor lighting, camera footage reconstruction, as well as brightness and contrast perception cases.

Academic Credentials & Professional Honors

Ph.D., Chemistry, Northwestern University, 2017

B.A., Physics, University of Chicago, 2011

Licenses and Certifications

ASQ Certified Reliability Engineer (CRE)

Prior Experience

Postdoctoral Researcher, Massachusetts Institute of Technology (MIT), 2017-2019.

Graduate Researcher, Northwestern University, 2011-2017.

Undergraduate Researcher, The University of Chicago, 2006-2011.

Languages

Russian

Publications

Spokoyny B, Utzat H, Moon H, Grosso G, Englund D, Bawendi MG. Effect of spectral diffusion on the coherence properties of single quantum emitters in hexagonal boron nitride. In review, 2019.

Utzat H, Sun W, Kaplan AEK, Krieg F, Ginterseder M, Spokoyny B, Klein ND, Shulenberger KE, Perkinson CF, Kovalenko MV, Bawendi, MG. Coherent single photon emission from colloidal lead halide perovskite quantum dots. Science 2019; 363:1068–1072.

Bertram SN, Spokoyny B, Franke D, Caram JR, Yoo JJ, Murphy RP, Grein ME, Bawendi MG. Single nanocrystal spectroscopy of shortwave infrared emitters. ACS Nano 2019; 13:1042–1049.

Nah S, Spokoyny B, Jiang X, Stoumpos C, Soe CMM, Kanatzidis MG, Harel E. Transient sub-bandgap states in halide perovskite thin films. Nano Letters 2018; 18:827–831.

Nah S, Spokoyny B, Stoumpos C, Soe CMM, Kanatzidis MG, Harel E. Spatially segregated free-carrier and exciton populations in individual lead halide perovskite grains. Nature Photonics 2017; 11:285–288.

Spencer AP, Spokoyny B, Ray S, Sarvari F, Harel E. Mapping multidimensional electronic structure and ultrafast dynamics with single-element detection and compressive sensing. Nature Communications 2016; 7:10434.

Spencer AP, Spokoyny B, Harel E. Enhanced-resolution single-shot 2DFT spectroscopy by spatial spectral interferometry. J Phys Chem Lett 2015; 6:945–950.

Spokoyny B, Koh CJ, Harel E. Stable and high-power few cycle supercontinuum for 2D ultrabroadband electronic spectroscopy. Optics Letters 2015; 40:1014–1017.

Spokoyny B, Harel E. Mapping the vibronic structure of a molecule by few-cycle continuum two-dimensional spectroscopy in a single pulse. J Phys Chem Lett 2014; 5:2808–2814.

Kovalenko MV, Spokoyny B, Lee JS, Scheele M, Weber A, Perera S, Landry D, Talapin DV. Semiconductor nanocrystals functionalized with antimony telluride zintl Ions for nanostructured thermoelectrics. Journal of the American Chemical Society 2010; 132:6686–6695.

Presentations

Spokoyny B, Bertram SN. Poster Presentation. Gordon Research Conference on Colloidal Semiconductor Nanocrystals, Bryant University 2018.

Spokoyny B. Oral Presentation. Tenth International Conference on Quantum Dots, University of Toronto 2018.

Spokoyny B. Poster Presentation. The XVIIth International Conference on Time-Resolved Vibrational Spectroscopy, University of Wisconsin-Madison 2015.