MAGNITUDE INSTRUMENTS™

Founder's CV

Eric R. Kennehan

Co-founder, Chief Executive/Chief Technology Officer
Magnitude Instruments
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Education

PhD Chemistry – Advisor: John B. Asbury
Penn State University, Department of Chemistry
2014 – 2019

BS Chemistry – Advisor: Josef B. Simeonsson
Youngstown State University
2010 – 2014

Research and Experience

- Designed, manufactured and brought to market state-of-the-art, nanosecond, transient absorption spectrometers that are more sensitive, faster, smaller, and more affordable than current instruments.
- Lead a team of researchers through the startup process and prepared Magnitude Instruments for the launch of our first and second product lines.
- Developed and executed key business strategies to advance Magnitude Instruments towards its first sales.
- Acted as technical lead in the design and fabrication of Magnitude Instruments' products, as well as worked to form key partnerships with other companies across the country.
- Headed photo- and electrocatalysis research projects at Penn State to measure time-resolved spectroscopy of transient intermediate species that form during catalytic reactions.
- Developed an ultrafast, electro-optical technique known as pump-push-photocurrent probe spectroscopy to measure charge transport in working PbS quantum dot solar cells under operating conditions.
- Lead a research team at Penn State that built the most sensitive nanosecond, time-resolved, mid-infrared detected, transient absorption spectrometer to date.
- Rebuilt an ultrafast regenerative and multi-pass amplifier (Quantronix, Integra-C) along with visible and mid-infrared optical parametric amplifiers (Light Conversion, TOPAS). Redesigned the optical path for the ultrafast visible pump, visible and mid-infrared probe transient absorption instruments at Penn State.
- Developed a laser-induced fluorescence technique at Youngstown State capable of detecting ultra-trace amounts of bismuth in environmental and fuel samples with a limit of detection of ten parts per trillion.
- Developed protocols to analyze fuel samples using a mass spectrometry and chromatography methods.

Honors and Awards

Troxell Continuing Graduate Research Award (2018)
14th Annual College of Engineering Symposium, 2nd Place Award for Best Oral Presentation (2017)
Dalalian Fellowship for Excellence in Graduate Research (2015)
Nellie H. and Oscar L Roberts Scholarship (2014)
ACS Undergraduate Awards in Inorganic and Analytical Chemistry (2014)
ACS Undergraduate Awards in Analytical and Organic Chemistry (2013)
Analytical Chemists of Pittsburgh Award (2013)
Leslie H. Cochran, Full Academic Scholarship (2010)

Publications

Web of Science H-Index = 8, 12 Peer Reviewed Publications, >160 Total Citations (as of May 2020)

Publications – E. Kennehan

12) Eric R. Kennehan, Kyle T. Munson, Grayson S. Doucette, Ashley R. Marshall, Mathew C. Beard, and John B. Asbury, "Dynamic Ligand Surface Chemistry of Excited PbS Quantum Dots", *JPC Lett*. (2020) 11, 2291-2297. **DOI**: 10.1021/acs.jpclett.0c00539

11) Muhsin Ezer, Ramesh Gondi, Eric R. Kennehan, and Josef B. Simeonsson, "Trace Determination of Germanium by Continuous Flow Hydride Generation Laser-Induced Fluorescence Spectrometry", *Analytical Lett*. (2019) 52, 1125-1137. **DOI**: 10.1080/00032719.2018.1521827

10) Kyle T. Munson, Eric R. Kennehan, and John B. Asbury, "Structural Origins of the Electronic Properties of Materials via Time-Resolved Infrared Spectroscopy", *J. Mater. Chem. C* (2019) 7, 5889-5909. **DOI**: 10.1039/C9TC01348B

9) Kyle T. Munson, Grayson S. Doucette, Eric R. Kennehan, John R. Swartzfager, and John B. Asbury, "Vibrational Probe of the Structural Origins of Slow Recombination in Halide Perovskites", *J. Phys. Chem. C*. (2019) 123, 7061-7073. **DOI**: 10.1021/acs.jpcc.9b00555

8) Kyle T. Munson, Eric R. Kennehan, Grayson S. Doucette, and John B. Asbury, "Dynamic Disorder Dominates Delocalization, Transport, and Recombination in Halide Perovskites", *Chem*. (2018) 4, 2826-2843. **DOI**: 10.1016/j.chempr.2018.09.001

7) Eric R. Kennehan, Grayson S. Doucette, Ashley R. Marshall, Christopher Grieco, Kyle T. Munson. Matthew C. Beard, and John B. Asbury, "Electron-Phonon Coupling and Resonant Relaxation from 1D and 1P States in PbS Quantum Dots", *ACS Nano* (2018) 12, 6263-6272. **DOI**: 10.1021/acsnano.8b03216

6) Christopher Grieco, Eric R. Kennehan, Hwon Kim, Ryan D. Pensack, Alyssa N. Brigeman, Adam Rimshaw, Marcia M. Payne, John E. Anthony, Noel C. Giebink, Gregory D. Scholes, and John B. Asbury, "Direct Observation of Correlated Triplet Pair Dynamics during Singlet Fission Using Ultrafast Mid-IR Spectroscopy", J. Phys. Chem. C, 122, 2012-2022. **DOI**: 10.1021/acs.jpcc.7b11228

5) Chiao-Yu Cheng, Rijul Dhankar, Christopher L. Gray, Sukrit Mukhopadhyay, Eric R. Kennehan, John B. Asbury, Anatoliy Sokolov, and Noel C. Giebink, "Charged Polaron Polaritons in an Organic Semiconductor Microcavity", *Phys. Rev. Lett*. (2018) 120, 017402. **DOI**: 10.1103/PhysRevLett.120.017402

4) Christopher Grieco, Eric R. Kennehan, Adam Rimshaw, Marcia M. Payne, John E. Anthony, and John B. Asbury, "Harnessing Molecular Vibrations to Probe Triplet Dynamics during Singlet Fission", *J. Phys. Chem. Lett*. (2017) 8, 5700-5706. **DOI**: 10.1021/acs.jpclett.7b02434

3) Christopher Grieco, Grayson S. Doucette, Jason M. Munro, Eric R. Kennehan, Youngmin Lee, Adam Rimshaw, Marcia M. Payne, Nichole Wonderling, John E. Anthony, Ismaila Dabo, Enrique D. Gomez and John B. Asbury, "Triplet Transfer Mediates Triplet Pair Separation During Singlet Fission in TIPS-Pentacene", *Adv. Funct. Mater*. (2017) 27, 1703929. **DOI**: 10.1002/adfm.201703929

2) Eric R. Kennehan, Christopher Grieco, Alyssa N. Brigeman, Grayson S. Doucette, Adam Rimshaw, Kayla Bisgaier, Noel C. Giebink, and John B. Asbury, "Using Molecular Vibrations to Probe Exciton Delocalization in Films of Perylene Diimides with Ultrafast Mid-IR Spectroscopy", *Phys. Chem. Chem. Phys*., (2017) 19, 24829-24839. **DOI**: 10.1039/C7CP04819J

1) Kyle T. Munson, Christopher Grieco, Eric R. Kennehan, Robert J. Stewart, and John B. Asbury, "Time-Resolved Infrared Spectroscopy Directly Probes Free and Trapped Carriers in Organo-Halide Perovskites", *ACS Energy Lett*., (2017) 2, 651-658. **DOI**: 10.1021/acsenergylett.7b00033