

ELIJAH R. JENSEN  
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## Education

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| 2015 | UNIVERSITY OF LOUISVILLE<br><i>Masters of Science in Physics (Cum Laude)</i>            |
| 2013 | UNIVERSITY OF VERMONT<br><i>Electrical Engineering Masters Program Study</i>            |
| 2012 | AUSTIN PEAY STATE UNIVERSITY<br><i>Bachelor of Science in Physics (Magna Cum Laude)</i> |

## Academic Positions

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| 2013-2015 | Graduate Teaching Assistant, University of Louisville (Physics) |
| 2012-2013 | Graduate Teaching Assistant, University of Vermont (ECE)        |
| 2009-2012 | Tutor, Austin Peay Academic Support Center                      |

## Research Interests

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- Optics
- Electromagnetic Theory, Electronics/Microelectronics
- Mechanical Engineering (Device Construction)
- Computational Science (Modeling of Electrical Properties)
- Materials Science (Thin Films and Graphene)

## Research Projects:

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Current:

- High Dynamic Range Seismic Sensing using custom designed 32bit DAQ.
- Design of custom IR imaging devices.

2015

- High Dynamic Range Instrument Design.

- Optical Detection of Surface Waves.
- High Dynamic Range Seismic Sensing using custom designed 32bit DAQ.

2014

- Design of 24 bit Analog to Digital Capture device.
- “Visualizing” Seismic Waves via Audio Conversion.

2013

- Computational modeling of micro and nano-scale antenna designs (THz and IR sensing applications).
- Computational modeling of EM waves.

2012

- Building better electronic systems for Regenerative braking in electric vehicles.
- Design of efficient, safe, and reliable Transformer-less Power supplies.
- Electric Motor controller design (MOSFET switching).
- PCB manufacturing with desktop CNC milling machines. (new computer code and processes)

2011

- Dynamo design for Regenerative braking in electric vehicles.
- Electric Car Research with FSAE team. (team leader)
- Expanding previous reproach in solar power regulation technology Fall 2011
- Solar Panel Power Regulation circuits. This uses some of the same ideas from the Regenerative systems. These systems use a complex circuit to ensure that the batteries accept charging even under low power conditions.
- Developed firmware for ATMEL microcontroller projects.
- Used microcontroller to drive Robotics hardware with video processing input.

2010

- Computational modeling of Zinc Nano-wire
- Used nwchem and Guassian to model a Zinc nano-wire for possible use in nano photo-voltaics

## Papers/Articles

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### *FRACTIONAL INTENSITY MODULATION OF DIFFUSELY SCATTERED LIGHT*

John Kielkopf, Elijah Jensen, Univ. of Louisville (United States); Frank O. Clark, Bradley Noyes, Wopeco Research (USA)

Published in SPIE Proceedings Volume 9608: Infrared Remote Sensing and Instrumentation XXIII September 2015

## Talks

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- 2012      Lithography, Double Patterning (how to make a nano trace) (UVM)
- 2012      Design of 80v, 19 HP motor controller for EV (TAAPT)
- 2012      Design of Safe and Reliable Transformerless Power Supply (TAAPT)
- 2012      PCB production in small fabrication lab (TAAPT)
- 2011      Computational Analysis of Complex AC Circuits.
- 2011      Computational Analysis of dynamo generator.
- 2011      Solar Power Power Regulator using Switching Technology

## Honors and Awards

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- 2015      Recipient of Iyad Khair Award for Excellence in Physics
- 2013      Dean's List of Distinguished Students (UVM)
- 2011      Inducted into Pi Mu Epsilon Math Society
- 2010      Inducted into Phi Kappa Phi, Honorary Society
- 2008      Dean's List of Distinguished Students, all semesters.
- 2010      Recipient of three Space Grants
- 2011      NSF MaPs Scholarship
- 2010      NSF MaPs Scholarship

## Skills

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Languages: C, C++, FORTRAN, JavaScript, Python, PHP, HTML, BASIC

Programs: MATLAB, Mathematica, Minitab, Igor Pro, National Instruments Lab-View, Pro-tools, Logic, Reason, Arduino IDE, Microsoft Office, Unix/Linux, L<sup>A</sup>T<sub>E</sub>X, NwChem, Gaussian, Octave, Spice, Mac-Spice, xmgrace, HTML/CSS, Qt GUI Programming, AVR Microcontroller C programming, Final Cut Pro, Motion, Avid, Apple Software/Hardware, Eagle CAD, OrCAD, Autodesk Inventor, AutoCAD, Google SketchUp, Pro Engineer, Roland MODELA, G code, M code, RML code. GEDA suite, AppleWorks, iWork, Gimp, MAYA, Adobe Photoshop, Blender, gEDA Suite.

Equipment: Agilent Oscilloscopes, Function Generators, Power Supplies, Multimeters. HP Oscilloscopes, Function Generators, Power Supplies, Multimeters. Breadboarding, SMD soldering, PCB production, CO<sub>2</sub> Laser Equipment, Laser Diodes, AVR microcontrollers, Physics Laboratory Equipment, LABVIEW, Vernier, Lathe (Manual and CNC), 3D printer, Milling (CNC and Manual), Ultrahigh vacuum systems, Repair of any equipment listed above.

## Service

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- Dept. Representative to the Graduate Student Union (University of Louisville) 2015-2016
- Dept. Representative to the Graduate Student Council (University of Louisville) 2015-2016
- Serve on Texas Instruments Expert Advisory Panel from 2015
- Tutored Physics, Math, Biology, and Chemistry from 2009 - 2012
- I play Violin, Piano, and Guitar, and have performed for many concerts and charity events.
- I have taught music both privately and for the Creative School for the Arts at Austin Peay. (The Creative School for the Arts is a Federally funded after school program for young people to experience and learn music)

## Affiliations

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IEEE

American Physical Society

Sigma Pi Sigma