

Jonathan W. Evans, Ph.D.

Assistant Professor of Engineering Physics
Air Force Institute of Technology

2807 Greystoke Dr., Xenia OH 45385
jonathan.evans.6@us.af.mil
P: (937) 656-5776
M: (814) 777-0755
[ORCID](#), [LinkedIn](#), [Google Scholar](#)

Curriculum Vitae

Education:

03/27/2014 **Doctor of Philosophy** in Optical Sciences and Engineering
The Air Force Institute of Technology (Wright-Patterson AFB)

08/09/2010 **Master of Science** in Electro-Optics
The University of Dayton (Dayton, OH)

05/03/2008 **Bachelor of Science** in Electrical Engineering
Minors in Physics, Mathematics, and Bible
Cedarville University (Cedarville, OH)

Professional Experience:

- 05/2021 **Assistant Professor of Engineering Physics (AD-22)**
– Present *Air Force Institute of Technology* (Wright-Patterson AFB)
Tenure-track faculty of the Department of Engineering Physics. Instruction of graduate-level courses in lasers, laser applications, nonlinear optics, and optical materials. Researcher interests include strategies for novel beam steering and manipulation, novel resonator geometries, and narrow-linewidth laser sources.
- 10/2016 **Project Engineer (DR-III, 1310 Physicist)**
– 5/2021 *Air Force Research Laboratory (Systems Technology Office, Wright-Patterson AFB)*
Lead a technology portfolio of seven projects valued in excess of \$25M advancing technology for the warfighter.
- 06/2014 **Laser Physicist (DR-II, 1310 Research Physicist)**
– 10/2016 *Air Force Research Laboratory (Sensors Directorate – RYDH, Wright-Patterson AFB)*
Principal Investigator and case file manager of two in-house research tasks. Research interests include power scaling of continuous wave Fe:ZnSe lasers; energy scaling of Q-switched Fe:ZnSe lasers; advanced rate-equation modeling, numerical modeling of the temperature dependent gain transition metal ions in II–VI materials, and novel materials for lasers and nonlinear optics.
- 09/2010 **Intern (GS-11, 0899 Engineering Trainee)**
– 06/2014 **Pathways Federal Internship Program**
Air Force Research Laboratory (Sensors Directorate – RYMWA, Wright-Patterson AFB)
Performed research on the spectroscopy, lasing efficiency, and optical properties of Fe:ZnSe lasers. Cumulative work contributed substantively to the state-of-the art in solid-state mid-IR lasers.



- 08/2008 **Intern (GS-7/9, 0899 Engineering Trainee)**
 – 09/2010 **Student Career Experience Program**
Air Force Research Laboratory (Sensors Directorate – RYJW, Wright-Patterson AFB)
 Performed research on fast electro-optic beam switching techniques in lithium niobate for switching between periodically poled domains for rapid tuning of mid-IR OPOs.
- 12/2006 **Power Supply Technician and Database Programmer**
 – 08/2008 *Pyrograf Products, Inc. (Cedarville, OH)*
 Repaired high voltage AC power supplies on reactor furnaces. Diagnosed system design flaw; designed and implemented power supply modification, greatly improving the mean-time-between-failures. Upgraded power supplies to modern solid-state relay technology, reducing the cost-per-repair and time-per-repair of power supplies.

Awards & Honors

- 2024 – Distinguished Teaching Professor, *AFIT/EN*
 2023 – Nominee: 75th Annual Arthur S. Flemming Award for Applied Science/Engineering, *AETC*
 2021 – William F. Bahret Technical Excellence Award, *Systems Technology Office, AFRL/STO*
 2019 – AFRL Science and Engineering Early Career Award, *AFRL Headquarters, AFRL/CC*
 2019 – Exemplary Civilian Service Award, *AFRL Headquarters, AFRL/CC, AF-level*
 2019 – Nominee: Richard Neal AFRL Commanders Cup Award, *AFRL/STO*
 2019 – Technical Excellence Award, *Systems Technology Office, AFRL/STO*
 2018 – Brian M. Henderson Memorial Award, *ADIOS Team, Sensors Directorate AFRL/RV*
 2016 – Customer Support/Collaboration Award, *Aerospace Components Division AFRL/RVD*
 2016 – Support Award, *Aerospace Components Division AFRL/RVD*
 2015 – Team Technical Achievement Award, *Aerospace Components Division AFRL/RVD*
 2015 – Member, *AFOSR STAR Team CY12-CY15*
 2012 – Technical Achievement Award, *Multispectral Sensing and Detection Division AFRL/RVM*
 2011 – Brian M. Henderson Memorial Team Award, *EO-IR Novel IRCM Team, AFRL/RV*
 2011 – Member, *AFOSR STAR Team CY09-CY11*
 2009 – Mission Support Award, *EO Sensor Technology Division AFRL/RVJ*
 2008 – Engineering Intern, *Ohio Board of Professional Engineers and Surveyors*
 2007 – Fellow, *National Science Foundation: Research Experience for Undergraduates (NSF:REU)*
 2006 – Fellow, *National Science Foundation: Research Experience for Undergraduates (NSF:REU)*
 2006 – Award for excellent NSF:REU research, *University of Maine (Orono)*
 2003 – Academic Scholarships from: *MENSA Education & Research Foundation, SAE International, and Cedarville University*

Professional Associations:

Optica (Formerly OSA)

- Member since May 2011, Senior Member since June 2020
- Chair: [Fundamental Laser Sciences](#) Technical Group (2018-2021)
- Committee Member of ASSL: Sources Section (2021-2023)
- Program Chair: Advanced Solid-State Lasers (ASSL): Sources Section (2024, 2025)
- General Chair: Advanced Solid-State Lasers (ASSL): Sources Section (2026)
- Editor: *Optics Express Vol 34, Issue 5, Advanced Solid-State Lasers 2025 (2026)*
- Editor: *Optics Materials Express Vol. 16 Issue 5, Advanced Solid-State Lasers 2025 (2026)*
- Reviewer:
 - Optics Letters, Optics Express, Optics Materials Express, Applied Optics, Photonics Research

The International Society for Optics and Photonics (SPIE)

- Member since January 2009, Senior Member since 2024
- Session Chair:
 - Photonics West LASE *Solid State Lasers XXIV: Technology and Devices* (2014)
- Editor:
 - *Optical Engineering* 57 (2), 021201: *Special Section Guest Editorial: Solid-State Lasers* (2017)

Publications (34):

1. Jordan Mindrup, Dillon Nice, Timothy True, Christopher Rice, **Jonathan W. Evans**, Daniel Emmons, David E. Weeks, Glen Perram, Stark broadening of the rubidium 4D-nF spectral lines, *Journal of Quantitative Spectroscopy and Radiative Transfer*, 2026, 110069.
2. Zayne M. Parsons, **Jonathan W. Evans**, Bradley R. Deshano, and Timothy M. True, "Experiment measuring the degree of inhomogeneous broadening in Cr:ZnSe," *Opt. Express* 34, 17480-17490 (2026)
3. Vivian R. Hedberg, Thomas R. Harris, Bradley R. Deshano, and **Jonathan W. Evans**, "Spectroscopic properties of high-concentration Ho³⁺ in YLiF₄ and BaY₂F₈ crystals," *Opt. Mater. Express* 16, 1229-1239 (2026)
4. John Gregg and **Jonathan W. Evans**, "Numerical Study on the Advantages of Different OPO Cavity Schemes in BBO," in *JSAP-Optica Joint Symposia 2025 Abstracts*, (Optica Publishing Group, 2025), paper 7p_N204_4.
5. Vivian R. Hedberg, Thomas R. Harris, Bradley R. DeShano, **Jonathan W. Evans**, "Spectroscopic Investigation of High Concentration Ho³⁺ in Fluoride Crystals," *Proc. of ASSL, AT3A.5*, (Nov 2024)
6. Robert Stegeman, Julia Norris, John Gregg, **Jonathan W. Evans**, "Simple, fast, yet rigorous modeling of a 355 nm pumped, doubly resonant, linear cavity Type I BBO OPO with spatial walk-off compensation and ISO 13694:2018 beam parameters," *Optica Open*. (2023), Preprint. <https://doi.org/10.1364/opticaopen.23729436.v2>
7. **Jonathan W. Evans**, Sean A. McDaniel, Ronald W. Stites, Patrick A. Berry, Gary Cook, Thomas R. Harris, Kenneth L. Schepler, "Crystal host engineering for transition metal lasers," *Opt. Eng.* 62(1) 017101 (11 Jan 2023)

8. **Jonathan W. Evans**, Thomas R. Harris, Eric J. Turner, Martin M. Kimani, J. Matthew Mann, Ronald W. Stites, Gary Cook, Kenneth L. Schepler, "Re-absorption and nonradiative energy transfer in vibronic laser gain media," Opt. Eng. 60(5) 056103 (19 May 2021)
9. **Jonathan W. Evans**, Sean A. McDaniel, Ronald W. Stites, Patrick A. Berry, Gary Cook, Thomas R. Harris, Kenneth L. Schepler, *Crystal host engineering for transition metal lasers*, Proc. SPIE 11259, Solid State Lasers XXIX: Technology and Devices, 112590C (2020).
10. Sean McDaniel, Fiona Thorburn, Carl Leibig, Michael Coco, **Jonathan W. Evans**, Gary Cook, Ajoy Kar, *Mid-IR Ultrafast Laser Inscribed Waveguides and Devices*, IEEE Research and Applications of Photonics in Defense Conference (RAPID), (2019).
11. Eric J. Turner, **Jonathan W. Evans**, Thomas R. Harris, and Sean A. McDaniel, *Double-pass Co: CdTe mid-infrared laser amplifier*, Opt. Mater. Express 8, 2948-2953 (2018)
12. Eric J. Turner, Sean A. McDaniel, **Jonathan W. Evans**, *Performance evaluation of Co²⁺: CdTe as an optical gain medium*, Proc. SPIE 10637, Laser Technology for Defense and Security XIV, 106370W (4 May 2018)
13. **Jonathan W. Evans**, Thomas R. Harris, Eric J. Turner, Martin M. Kimani, J. Matthew Mann, Ronald W. Stites, Gary Cook, *Modeling re-absorption and non-radiative energy transfer in vibronic laser gain media*, Proc. Of SPIE, Solid State Lasers XXVII: Technology and Devices, 10511-16 (February 2018)
14. Eric J. Turner, **Jonathan W. Evans**, Thomas R. Harris, *Optical spectroscopy of cobalt-doped cadmium telluride*, Proc. of SPIE, Solid State Lasers XXVII: Technology and Devices, 10511-60 (February 2018)
15. **Jonathan W. Evans**, Ronald W. Stites, Thomas R. Harris, *Increasing the performance of an Fe: ZnSe laser using a hot isostatic press*, Optical Materials Express, Volume 7, Issue 12, 2017, Pages 4296-4303
16. Tigran Sanamyan, **Jonathan W. Evans**, and Sean A. McDaniel, *Path to doubling the efficiency of mid-IR erbium lasers*, Opt. Express 25, 16452-16457 (2017)
17. **Jonathan W. Evans**, Thomas R. Harris, B. Rami Reddy, Kenneth L. Schepler, Patrick A. Berry, *Optical spectroscopy and modeling of Fe²⁺ ions in zinc selenide*, Journal of Luminescence, Volume 188, 2017, Pages 541-550, ISSN 0022-2313
18. Tigran Sanamyan, and **Jonathan W. Evans**, *Self-amplification of Cascade Er: Y₂O₃ Laser in Cr: ZnSe*, ARL-TR-7957, (February 2017)
19. **Jonathan W. Evans**, Brian D. Dolasinski, Thomas R. Harris, Justin W. Cleary, and Patrick A. Berry, *Demonstration and power scaling of an Fe: CdMnTe laser at 5.2 microns*, Opt. Mat. Express 7, 860-867 (2017)
20. Sean A. McDaniel, Adam Lancaster, **Jonathan W. Evans**, Ajoy K. Kar, and Gary Cook, *Power scaling of ultrafast laser inscribed waveguide lasers in chromium and iron doped zinc selenide*, Opt. Express 24, 3502-3512 (2016)
21. A. Lancaster, G. Cook, S. A. McDaniel, **J. Evans**, P. A. Berry, J. D. Shephard, A. K. Kar, *Mid-infrared laser emission from Fe: ZnSe cladding waveguides*, Appl. Phys. Lett. 107, 031108 (2015)
22. A. Lancaster, G. Cook, S. McDaniel, **J. Evans**, P. Berry, J. Shephard, and A. Kar, *Fe: ZnSe Channel Waveguide Laser Operating at 4122 nm*, in CLEO: 2015, OSA Technical Digest (online) (Optical Society of America, 2015), paper SM2F.5
23. **Jonathan W. Evans**, Brian D. Dolasinski, Thomas R. Harris, *Demonstration and power scaling of an Fe: CdMnTe laser at 5.2 microns*, AFRL-RY-WP-TR-2015-0153, (2015)
24. Reddy, B. Rami, Kenneth Schepler, Elizabeth Moore, John Hoelscher, Shiva Vangala, Bruce Clafin, Narsingh B. Singh, **Jonathan Evans**, and Patrick Berry. *Surface characterization*

- studies of orientation patterned ZnSe doped with Cr²⁺*. In SPIE LASE, pp. 93471M-93471M. International Society for Optics and Photonics, (2015).
25. **Jonathan W. Evans**, Tigran Sanamyan, and Patrick A. Berry. *A continuous wave Fe:ZnSe laser pumped by efficient Er:Y₂O₃ laser*. Solid State Lasers XXIV: Technology and Devices. Vol. 9342. (2015).
 26. **Jonathan W. Evans**, Sean A. McDaniel, Ronald W. Stites, *Experimental Mid-IR Advanced Laser Development (EMIRALD)*, AFRL-RY-WP-TR-2014-0284
 27. **Jonathan W. Evans**, *Iron-doped Zinc Selenide: Spectroscopy and Laser Development*. Air Force Institute of Technology, (2014).
 28. **J. W. Evans**, P. A. Berry and K. L. Schepler, *A Passively Q-Switched, CW-Pumped Fe:ZnSe Laser*, in IEEE Journal of Quantum Electronics, vol. 50, no. 3, pp. 204-209, (March 2014).
 29. **Jonathan W. Evans**, Patrick A. Berry, Kenneth L. Schepler, *A broadly tunable continuous-wave Fe:ZnSe laser*, Proc. SPIE 8599, Solid State Lasers XXII: Technology and Devices, 85990C (26 March 2013);
 30. **Jonathan W. Evans**, Patrick A. Berry, and Kenneth L. Schepler, *840 mW continuous-wave Fe:ZnSe laser operating at 4140 nm*, Opt. Lett. 37, 5021-5023 (2012)
 31. **Jonathan W. Evans**, *Beam Switching of an Nd:YAG Laser using Domain Engineered Prisms in MgO:CLN*, University of Dayton, (2010).
 32. **J. W. Evans**, K. L. Schepler, P. E. Powers, and A. Sarangan, *A Novel Electro-Optic Beam Switch in 5mol% Magnesium-Oxide Doped Congruent Lithium Niobate*, in Frontiers in Optics 2010/Laser Science XXVI, OSA Technical Digest (Optical Society of America, 2010), FThV5.
 33. McCann D.F., Wark M., **Evans J.W.**, Millard P., Vetelino J.F., *A Monolithic Spiral Coil Acoustic Transduction E. coli Sensor*, The 12th International Meeting on Chemical Sensors, Columbus, Ohio, 2008, p. 21.

Academic Committees:

- 2026 – Committee Chair (MS), Marcus X. Cole, *The Air Force Institute of Technology*,
Thesis: TBD
- 2026 – Committee Chair (PhD), Matthew R. Guy, *The Air Force Institute of Technology*,
Dissertation: *Distribution Limited*
- 2026 – Committee Member (MS), 2Lt Gabrielle Dawson, *The Air Force Institute of Technology*,
Thesis: *Cesium Quadrupole-Pumped Alkali Laser (QPAL)*
- 2025 – Committee Chair (MS), Zayne M. Parsons, *The Air Force Institute of Technology*,
Thesis: *Novel Technique for Determining Broadening Inhomogeneity of Solid-State Laser Gain Media: Applied to Chromium Zinc Selenide*
- 2025 – Committee Chair (MS), John R. Norton, *The Air Force Institute of Technology*,
Thesis: *Distribution Limited*
- 2025 – Committee Chair (MS), Jaden Woodward, *The Air Force Institute of Technology*,
Thesis: *Interrogation of CW Cascade Lasing on Mid-IR Transitions in Rubidium Vapor*
- 2025 – Committee Member (MS), Capt Brain C. Morrow, *The Air Force Institute of Technology*,
Thesis: *Assessment of Commercially Available Electromagnetic Pulse Protection Devices for Mobile Systems*

- 2025 – Comm. Member (MS), Maj Carson H. Featherstone, *The Air Force Institute of Technology*,
Thesis: Assessing the Effectiveness of Commercial Electromagnetic Pulse Protection for Contemporary Military Infrastructure
- 2024 – Committee Member (PhD), Zachary Alphonse Marra, *The University Central Florida*
Dissertation: An Ultrafast, Mid-Wave Infrared Source for Driving High-Order Harmonics beyond the Water Window
- 2024 – Committee Chair (MS), 1Lt Samuel Campbell, *The Air Force Institute of Technology*
Thesis: Novel Shadow Mask Fabrication Using Two-Photon Polymerization to Create Micro-Optical Fabry-Perot Sensors
- 2024 – Committee Chair (MS), Capt Vivian Hedberg, *The Air Force Institute of Technology*
Thesis: Spectroscopic Characterization of Trivalent Holmium in LiY_4 and BaY_2F_8 Crystals
- 2024 – Committee Chair (MS), 2d Lt Seth Orson, *The Air Force Institute of Technology*
Thesis: Distribution Limited
- 2023 – Committee Member (PhD), Maj Matthew Cooper, *The University Central Florida*
Dissertation: Multi-Kilowatt Fiber Laser Amplifiers and Hollow-Core Deliver Fibers
- 2023 – Committee Member (MS), Maj Christopher Sutphin, *The Air Force Institute of Technology*
Thesis: Characterizing GeSn Alloys by SEM/EDS and Photoluminescence Spectroscopy
- 2023 – Committee Member (MS), Maj Jeremy Hunter, *The Air Force Institute of Technology*
Thesis: Angle Resolve Photoelectron Spectroscopy Study of Germanium Tin: Experimentally Determined Electronic Band Gap and Surface Analysis.
- 2022 – Committee Member (MS), Capt Laura Pineda, *The Air Force Institute of Technology*
Thesis: Countering Remote Sensing with Airy Gaussian Beams
- 2022 – Committee Member (MS), Capt Peter Norris, *The Air Force Institute of Technology*
Thesis: Determination of Nonlinear Optical Properties for Gallium Arsenide Phosphide Ternary Compounds and for Tin Thiohypodiphosphate
- 2018 – Research Advisor (MS), Eric J. Turner, *The University of Dayton*
Thesis: Study of Cobalt-Doped Cadmium Telluride for Solid-State Laser Applications
- 2017 – Committee Member (PhD), Alán Martinez, *The University of Alabama at Birmingham*
Dissertation: Spectroscopic Characterization of Iron-Doped II-VI Compounds for Laser Applications
- 2015 – Research Advisor (MS), Capt Timothy I. Calver, *The Air Force Institute of Technology*
Thesis: Fe:ZnSe Solid-State Power Amplifier for an Optical Parametric Master Oscillator

Significant Presentations:

2023 – (Invited) Developing Directed Energy Weapons to Operate Across a Range of Atmospheric Conditions, Laser Applications Conference, Tacoma WA
2018 – Crystal host engineering for transition metal lasers, Photonics West, San Francisco CA
2018 – Modeling re-absorption and non-radiative energy transfer in vibronic laser gain media, Photonics West, San Francisco CA
2017 – System Technology Office Portfolio Brief for the Scientific Advisory Board, WPAFB OH
2016 – Novel Fe:II-VI Laser Architectures, Sensors Directorate, WPAFB OH
2015 – A CW Fe:ZnSe laser pumped by efficient Er:Y₂O₃ laser, Photonics West, San Francisco CA
2015 – Novel Fe:ZnSe Laser Architectures, Sensors Directorate, WPAFB OH
2014 – Laboratory Management Review for EMIRALD, Sensors Directorate, WPAFB OH
2014 – Laser Power Scaling via Resonator Analysis Techniques, Sensors Directorate, WPAFB OH
2013 – Iron-doped Zinc Selenide: Spectroscopy and Laser Development, AFIT, WPAFB OH
2013 – Pump Sources for Iron-Doped II-VI Lasers, Sensors Directorate, WPAFB OH
2013 – Continuous-wave Mid-IR Fe-Doped II-VI lasers, Sensors Directorate, WPAFB OH
2013 – Broadly Tunable Continuous Wave Fe:ZnSe Laser, Photonics West, San Francisco CA
2013 – Progress in continuous wave mid-IR Fe-doped lasers, AFIT, WPAFB OH
2012 – Transition Metal doped II-VI Materials, Sensors Directorate, WPAFB OH
2012 – Group Theory of Tetrahedrally coordinated TM ions, Sensors Directorate, WPAFB OH
2010 – A Novel EO Beam Switch in 5mol% MgO:CLN, Frontiers in Optics, Rochester NY
2010 – Laser Beam Switching using domain engineered MgO:CLN, U. of Dayton, Dayton OH
2007 – A High-Harmonic Spiral Coil Transducer for Detecting E. coli, U. of Maine, Orono, ME
2006 – Novel Bio-film for Detecting E. coli with a Quartz Microbalance, U. of Maine, Orono, ME

Courses Taught:

OENG 660 – Introduction to Nonlinear Optical Devices

This course is designed to develop those areas of electromagnetic wave interaction with matter necessary for an understanding of nonlinear optical devices. Plane wave propagation in anisotropic media, commonly called "crystal optics" is stressed. Passive optical devices, such as wave plates, polarizers and compensators, are designed. Parametric processes are introduced and applications such as amplitude and frequency modulation, second harmonic generation, and parametric oscillation are considered.

OENG 651(L) – Optical Diagnostics (Lab)

An advanced laboratory and lecture course in optical diagnostic techniques. The lecture phase of this course treats radiometry, optical sources, spectroscopic techniques, detector physics and performance, error analysis and laser safety. The laboratory experiments emphasize the design of optical systems for the purpose of analyzing physical phenomena. Typical experiments include: diagnostics of CW and pulsed laser systems, spectroscopic analysis of the luminescence from solids and plasmas, interferometric measurements, holography, and calorimetry.

OENG 620 – Laser Devices and Applications

Treats the basic operation and components of the laser with emphasis on the knowledge required to use the laser as an optical system component. Covers laser media, resonator, pump and waste heat removal as well as types of lasers available. Both CW and pulsed lasers will be treated. Stress will be placed on the laser output beam and the device parameters which affect that beam.

OENG 720 – Laser Devices and Applications

Treats specific laser systems of importance to the commercial world and Air Force in particular. The course stresses current laser technology and engineering analysis of specific systems. Topics covered typically include operations characteristics, such as power and energy output, their scalability, spectral and temporal characteristics, and beam quality and the factors limiting the performance. Where appropriate, design issues associated with specific systems are also discussed. In addition to the laser systems commercially available, laser systems appropriate for the Air Force and other military applications, such as laser ranging, target designation, imaging, electro-optic countermeasure, and laser weapons, are discussed.

MATL 672 – Optical Properties of Materials

Study of the various optical phenomena in materials; topics will be selected from absorption, reflection and emission processes, luminescence, dispersion theory, optical materials, polymers, wave propagation in anisotropic media, and nonlinear properties of materials. Application will be made to the material requirements of optical devices such as lasers, detectors, etc.