Dr. Anil K. Patnaik, Ph. D.
Professor of Physics
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PROFESSIONAL EXPERIENCE

Air Force Institute of Technology | WPAFB, OH | Jun 2019-present
Professor of Physics (2025-present); Associate Professor of Physics (2019-2025)

- Graduated a total of 27 students – 13 direct advisees (4 PhD, 9 Masters), advised 14 other MS and PhD as research committee member; advised 10 undergraduate interns; mentored 2 postdocs and 7 summer faculties
- 14 current students (9 direct advisee, and in research committee for 5 students)
- Developed four new courses: Quantum Sensing (PHYS745), Quantum Information Teaching Laboratory (PHYS699 – now OENG655), Quantum Optics & Quantum Information – QOQI (PHYS845), ultrashort pulse laser-matter interactions (PHYS699, SP23)
- Established new research laboratories on quantum information, quantum network and THz generation
- Co-developed Quantum Information short course and delivered lecture
- 26 journal articles, 3 book chapters and 22 conference papers published, 1 patent submitted, 4 manuscripts in review and 10 manuscripts in preparation; delivered 2 plenary and 29 invited talks, more than 37 seminars/ contributed papers.
- PI/co-PI in four research areas: (i) quantum information and sensing, (ii) nuclear plasma diagnostics, (iii) THz/microwave generation and (iv) extreme light interaction with liquid target for table-top particle acceleration
- Funding received from AFOSR, AFRL, NSF, DOE, DTRA, Army, AFTAC, JDETO and undisclosed source (PI/co-PI portion: $4.4M; total: $12M)
- Through the research programs supported a total of 18 other student, postdocs, researcher and lab technician
- Supported 13 SFFPs, scientists, graduate assistants, summer interns
- Curriculum Chair of the Applied Physics program at AFIT/ENP
- AFIT/EN Faculty Council President (FY25), President-Elect (FY24)
- 2022-24 ENP representative in AFIT/EN's Doctoral Committee and helped streamlining program outcome evaluations
- Guest Editor for Applied Optics, organized LACSEA and AIAA conferences, refereed papers and proposals, contributed to MOU with AFRL

Air Force Research Laboratory | RQTC, WPAFB, OH | Apr 2007 – May 2019
Onsite Contractor/Senior Research Scientist (Spectral Energies LLC and Innovative Scientific Solutions Inc)

- Led theoretical research activity on ultrafast light-matter interactions to develop diagnostics for Air-Force relevant applications
- Led SBIR/STTR projects from various funding agencies, such as DoD, NASA, DOE, NSF
- Co-authored proposals for LRIR and CRDF
- Published 25 refereed journal papers and 35 conference papers
- Contributed to the AF program review meetings both as a presenter and reviewer
- Mentored and collaborated with visiting students and faculties
- Refereed journal (PRL, PRA, OL, OptExp, AO) papers, chaired conference sessions, memberships in APS, OSA, AIAA

Wright State University | Dayton, OH | Aug 2007 – Jul 2017
Research Faculty

- Taught graduate courses on Quantum Mechanics
- Presented seminars
- Worked on research papers and presentations
- Participated as a liaison between AFRL and Wright State for AFRL funded projects

Texas A&M University | College Station, TX | Sep 2003 – Mar 2007
Post-Doctoral Research Associate and Visiting Assistant Professor

- Worked with Scully group at Institute for Quantum Studies on theory and experiments
- Taught undergraduate "Mechanics and Optics," and guest lecturer in grad courses
- Mentored two Ph.D. students and many M.S. students
- Collaborated with visiting faculties at Harvard, Princeton and Max-Planck etc
- Published 7 papers, presented at numerous conferences (both invited and contributed) and seminars
- Organized multiple symposiums, meetings at Princeton and Texas A&M; refereed journal (PRL, PRA, OL, Opt. Commun) papers, chaired conference sessions; memberships in APS, OSA
- Administrator of group's computational resources

University of Electro-Communication | Tokyo, Japan | Mar 2001 – Aug 2003
JSPS Post-Doctoral Research Associate

- Conducted research on slow light and storage of light with the experimental group; JSPS fellow with grant-in-aid fund
- Research on fiber-based slow light earned international attention
- Mentored graduate students of the group
- Published 4 papers in international journals and multiple conference papers (both invited and contributed)

Other Visiting Positions

- Air Force Research Laboratory, Albuquerque (NM, USA), Sep 2021
- University of North Texas, Denton (TX, USA), Sep. 2021
- Purdue University, West Lafayette (IN, USA), Nov. 2006, Jan. 2018
- Princeton University, Princeton (NJ, USA), Oct-Dec. 2003, Feb. 2007
- Louisiana State University, Baton Rouge (LA, USA), Mar. 2005
- Max-Planck Inst. for Quantum Optics, Garching (Germany), Jul-Aug 2004

EDUCATION

1995-2001 | Ph.D. | Physical Research Laboratory, Department of Space, India
Thesis: "Novel optical phenomena induced by external fields"

1993-1995 | MS (Physics) | Utkal University, India
Specialization in "Solid State Physics"

1990-1993 | BS (Physics Honors) | Stewart Science College, Utkal University, India
Honors in Physics

SELECTED AWARDS AND HONORS

- Extreme Light Lab (ELL) awarded Best Team of Quarter 2 of 2026 at the AFIT/EN School and AFIT level.
- ELL awarded Best Team of Q2 of 2026 at the EN School and AFIT unit.

- Paper on kHz-rate D-D Fusion was chosen was Editor's pick, cover page and Editor-in-Chief Award in the year 2024 for the Cambridge University journal "High Power Laser Science and Engineering"
- QuOTe laboratory's work was awarded for "Videos in Science" competition in Dayton-Cincinnati Aerospace Science Symposium 2024.
- Received Dean's Distinguished Teaching Professor Award 2021
- Research work on slow light in fibers in international news [Physics World, 2015]
- Review article received distinction of "Top 1% cited article in the engineering field" as identified by Web of Science.
- Worked with Nobel Laureate Prof. Glauber; article published in "100-year celebration of Einstein's Miraculous Year"
- Selected to be listed in "Marquis Who's Who of America" in 2005
- Japanese Society for Promotion of Science (JSPS) fellowship for the period 2001-2003 with a research grant of 3 million yen
- Selected by National Research Council (USA) in 2003 work at NASA's Jet Propulsion Laboratory, Caltech, CA but could not join due to administrative reason
- Selected as finalists for Indian National Science Academy Young Scientist Award 2005-06
- Selected as a junior visitor in the "Theoretical Physics Seminar Circuit (TPSC)" program during the period 2000-2001 and was invited by S. N. Bose Institute, Calcutta
- "Best Student Seminar Award" in 1995 at Dept. of Physics, Utkal University, Bhubaneswar
- Merit and national scholarships from 1983-1993 (primary school through BS degree) and India's "National Rural Talent Search" Scholarship from 1985-1988

TEACHING EXPERIENCE

Air Force Institute of Technology | WPAFB, OH | Jun 2019-present
Professor of Physics

Course	Title	Term
PHYS 781	Laser Spectroscopy	SU 26
PHYS 745A	Quantum Sensing	WI 26
PHYS 755	Quantum Mechanics II	FA 25
PHYS 781	Laser Spectroscopy	SU 25
PHYS 745A	Quantum Sensing	WI 25
PHYS 755	Quantum Mechanics II	FA 24
PHYS 781	Laser Spectroscopy	SU 24
PHYS 798	Department Colloquium	SP 24
PHYS 611	Atomic and Molecular Spectroscopy	WI 24
PHYS 798	Department Seminar	WI24
PHYS 755	Quantum Mechanics II	FA 23
PHYS 899	Advanced Ultrashort Pulse Light-Matter Interactions	SP 23
PHYS 699	Ultrashort Pulse Light-Matter Interactions	SP 23
PHYS 845	Quantum Optics and Information	SP 23
PHYS 611	Atomic and Molecular Spectroscopy	WI 22
PHYS 755	Quantum Mechanics II	FA 22
PHYS 845	Quantum Optics and Information	SP 22
PHYS 611	Atomic and Molecular Spectroscopy	WI 22
PHYS 845	Quantum Optics and Information	SP 21
PHYS 899	Special study: Quantum Information (Laboratory)	SP 21

PHYS 611	Atomic and Molecular Spectroscopy	WI 21
PHYS 755	Quantum Mechanics II	FA 20
PHYS 845	Quantum Optics and Information	SP 20
QI-Short	Quantum Information Short Course (co-taught)	WI 20
PHYS 611	Atomic and Molecular Spectroscopy	WI 20
PHYS 755	Quantum Mechanics II	FA 19

Wright State University | Dayton, OH | Aug 2007 – Jul 2017

Research Faculty

Course	Title	Term
PHYS 712	Quantum Mechanics III	SP 12
PHYS 711	Quantum Mechanics II	WI 12
PHYS 710	Quantum Mechanics I	FA 11
PHYS 712	Quantum Mechanics III	SP 11
PHYS 711	Quantum Mechanics II	WI 11

Texas A&M University | College Station, TX | Sep 2003 – Mar 2007

Post-Doctoral Research Associate and Visiting Assistant Professor

Course	Title	Term
PHYS 800	Laser Physics – graduate course	FA 06
PHYS 202	Undergraduate Electromagnetism (co-taught)	SP 06
PHYS 800	Light-Matter Interactions (co-taught) – graduate course	FA 05
PHYS 201	Undergraduate Mechanics	WI 05

RESEARCH INTERESTS

Broad field of theory and experiments on

- Quantum information, qubit propagation in atmosphere, quantum networks (fiber and free space), non-linear dispersion control, slow and fast light, quantum sensors, distributed sensing
- Foundations of quantum mechanics, quantum optics and applications
- High-intensity ultrafast laser-plasma interaction in a liquid target, laboratory scale mixed radiation (neutron, proton, electron, x-ray) sources from relativistic interactions, applications
- Nonlinear optics, laser-induced plasmas, laser-induced breakdown spectroscopy (LIBS) and diagnostics applications in gas-phase and nuclear materials

PROFESSIONAL SERVICES AND ACTIVITIES

- Technical Planning Committee for AFRL Discover 2026 event
- Faculty Mentor for AFIT's SPIE Student Chapter 2023 to now
- General Chair of Optica (OSA)'s 2024 conference on Laser Application to Chemical, Security, and Environmental Analysis (LACSEA) to held at Toulouse, France.
- Executive Chair, 49th AIAA-Dayton-Cincinnati Aerospace Science Symposium (2024); and Deputy Chair in 2023.
- Guest Editor for Applied Optics 2025 and 2023 special issue on LACSEA
- Plenary Speaker at International Network in Space Quantum Technologies, Workshop 4: Space Quantum Technologies held at Ahmedabad, India (march, 2024).
- As a Plenary Speaker at 51st Winter Colloquium on Physics of Quantum Electronics 2022, organized a session on Ultrafast light –matter interactions
- Reviewed multiple AFOSR BAA, NSF and ACS proposals
- Volunteered to be panelist in FY2020 National Defense Science & Engineering Graduate

(NDSEG) Fellowship program, reviewed 6 applications
- Chair of Applied Physics program at AFIT/ENP
- Hosted 3 summer faculty fellows and 5 summer students over last two years
- Coordinated AFIT's Quantum Information Group visit to ORNL
- Served as co-Director for the short course on quantum information
- Served as official POC for IBM delegate's trip
- Teaching Astronomy to youth students at a local Sunday school
- Worked on getting the MOU with RQ for the Extreme Light Lab
- Provided input for Applied Physics program justification along AF S&T strategy
- Took lead in providing ENP input for AFIT white paper in response to RFI from Office of Undersecretary of Defense and for Phase II AFIT response to Texas A&M Alliance for Office of Undersecretary of Defense
- Member, American Physical Society (APS), Optica (formerly OSA)
- Life Member of SPIE (The International Society for Optics and Photonics)
- Senior Member, American Institute of Aerospace and Aeronautics (AIAA)
- Fellow, Optical Society of India
- Member, American JSPS Alumni Association
- Referee for following peer-review journals: Nature Light, Physical Review Letter, Physical Review A, Physics Review B, Sensors, Optics Letter, Physics Letter A, Optics Express, Optics Communications, Journal of Modern Optics, Combustion and Flames, and European Physical Journal D

PATENTS

1. Patent filed: Billie DeLuca and Anil Patnaik, The Coherent Atomic Transfer Function as a Deconvolving Function, Jan. 2024 (Invention Disclosure); 2026 (provisional patent filed).

PEER REVIEWED JOURNALS

Google Scholar:
2026 Total citations – 2155, h-index – 24, i10-index – 40 (as of Sep 2026)

Published Articles

1. Michael Dexter, Stephen J. Hageman, Gregory K. Ngirmang, Kyle D. Frische, Joseph Snyder, Enam A. Chowdhury, and Anil K. Patnaik, Generation of kHz-rate complex-structured liquid targets for relativistic laser-plasma interactions, *Applied Physics Letters* **128**, 251108 (2026). https://doi.org/10.1063/5.0328950
2. Keith A. Wyman, Noah S. Everett and Anil K. Patnaik, Matching Two Long Interferometric Pathlengths using Low Temporal Coherence Light for Finding Hong-Ou-Mandel Dip, *The European Physical Journal Special Topics* **235**, 2903-2912 (2026). https://doi.org/10.1140/epjs/s11734-026-02397-6
3. Joseph D. Fasone, Keith A. Wyman, and Anil K. Patnaik, Effect of atmospheric turbulence on classical ghost imaging with random light versus sequenced selective mode structures, *Optical Engineering* **65(8)**, 081821 (2026). https://doi.org/10.1117/1.OE.65.8.081821
4. Yuri Rostovtsev; Jacob Emerick; Anil K. Patnaik, Correlated quantum photon states generated by vacuum fields, *The European Physical Journal Special Topics* **235**, 2917-2923 (2026). https://doi.org/10.1140/epjs/s11734-026-02252-8
5. John J. Felice, Ronak Desai, Nathaniel Tamminga, Joseph R. Smith, Alona Kryshchenko, Chris Orban, Michael L. Dexter, and Anil K. Patnaik, Applying Machine Learning Methods to Laser

Acceleration of Protons: Synthetic Data for Exploring the High Repetition Rate Regime, *Contributions to Plasma Physics* **66**, e70049 (2026).
https://doi.org/10.1002/ctpp.70049

6. Jacob Emerick, Trever Harborth, Anil K. Patnaik, Yuri Rostovtsev, The Refractive Index of a Single Three-level Atom: Quantum state separator, *The European Physical Journal Special Topics* **235**, 2939-2945 (2026).
https://doi.org/10.1140/epjs/s11734-025-02018-8
7. Nathaniel Tamminga, Scott Feister, Kyle D. Frische, Ronak Desai, Joseph Snyder, John J. Felice1, Joseph R. Smith, Chris Orban, Enam A. Chowdhury, Michael L. Dexter, and Anil K. Patnaik, Towards Intelligent Control of MeV Energy Electrons and Protons from kHz Repetition Rate Ultra-Intense Laser Interactions, *APL Machine Learning 3,* 026115 (2025)
https://doi.org/10.1063/5.0253529
8. Anil K. Patnaik, Michael L. Dexter, Kyle D. Frische, Benjamin M. Knight, Nathaniel Tamminga, Ronak Desai, Joseph Snyder, Chris M. Orban and Enam A. Chowdhury, Progress in Development of a Versatile Table-top kHz-Rate Laser-Plasma Accelerator for Mixed Radiation Source, *Applied Optics* **64**(18), E152-E163 (2025).
https://doi.org/10.1364/AO.558553
9. Keith A. Wyman, Noah S. Everett, Milo W. Hyde, Michael R. Grimaila, Robert N. Lanning, and Anil K. Patnaik, Characterization of Turbulent Atmosphere Simulator for Qubits (TASQ) Testbed, *Applied Optics* **64**(18), E140-E151 (2025)
https://doi.org/10.1364/AO.555977
10. Madison Moran,* Ashwin Rao and Anil Patnaik, Machine Learning for Enhancement of LIBRIS Fidelity to Determine Li Isotope Ratio, *Applied Optics* **64**(18), E119-E128 (2025).
https://doi.org/10.1364/AO.555986
11. Jacob Emerick, Anil K. Patnaik, and Yuri Rostovtsev, The Refractive Index of a Single Three-level Atom Experienced by a Single Photon, *Frontiers in Quantum Science and Technology* **4**, 1546480 (2025).
https://doi.org/10.3389/frqst.2025.1546480
12. Caroline Winters, Aamir Farooq, Naibo Jiang, Christoph Arndt, Anna-Lena Sahlberg, and Anil Patnaik, Laser applications to chemical, security, and environmental analysis: introduction to the feature issue, *Applied Optics* **64**, LAC1-LAC3 (2025)
https://doi.org/10.1364/AO.567776
13. Ashwin P. Rao and Anil K. Patnaik, Principal component-generalized spectrum-machine learning (PC-GS-ML) enables high sensitivity chemical analysis of plutonium surrogate material, *Applied Optics* **64**, D77 (2025).
https://doi.org/10.1364/AO.554537
14. Ronak Desai, Thomas Zhang, John J. Felice, Ricky Oropeza, Joseph R. Smith, Alona Kryshchenko, Chris Orban, Michael L. Dexter and Anil K. Patnaik, Applying machine learning methods to laser acceleration of protons: lessons learned from synthetic data, *Contributions to Plasma Physics* **65**, e202400080 (2024).
https://doi.org/10.1002/ctpp.202400080
15. James T. Stofel, Ashwin P. Rao, Anil K. Patnaik, Andrew V. Giminaro, and Michael B. Shattan, Analysis of lithium aging using machine learning-enhanced spectroscopy techniques, *Journal of Applied Spectroscopy* **78 (8)**, 874-884 (2024).
https://doi.org/10.1177/00037028241235679
16. Benjamin M. Knight, Connor M. Gautam, Colton R. Stoner, Bryan V. Egner, Joseph R. Smith, Chris M. Orban, Juan J. Manfredi, Kyle D. Frische, Michael L. Dexter, Enam A. Chowdhury, and Anil K. Patnaik, Characterization of kHz-rate, mJ-Class Laser-Driven Fusion Source with a Neutron Detection Suite, *High Power Laser Science and Engineering* **12**, e2 (2024).
https://doi.org/10.1017/hpl.2023.84
17. Thomas J. Bullard, Kyle Frische, Charlie Ebbing, Stephen Hageman, John Morrison, John Bulmer, Enam A. Chowdhury, Michael L. Dexter, Timothy J. Haugan, Anil K. Patnaik, Directional Microwave Emission from Femtosecond-Laser Illuminated Linear Arrays of Superconducting Rings, *Scientific Reports (Nature)* **13**, 18043 (2023).
https://doi.org/10.1038/s41598-023-44751-x

18. Yuri Rostovtsev, Jacob Emerick, and Anil K. Patnaik, The Refractive Index of a Single Atom Experienced by a Single Photon, *Results in Optics* **13**, 100568 (2023). https://doi.org/10.1016/j.rio.2023.100568
19. Billie DeLuca and Anil Patnaik, Fourier Transfer Function for Generic Light Pulse Storage and Retrieval using EIT, *European Physical Journal – Special Topics* **232**, 3369 (2023). https://doi.org/10.1140/epjs/s11734-023-00985-4
20. Ashwin P. Rao, Phillip R. Jenkins, Ryan E. Pinson, John D. Auxier, Michael B. Shattan, and Anil K. Patnaik, Machine Learning in Analytical Spectroscopy for Nuclear Diagnostics: A Review, *Applied Optics* **62(6)**, A82-A109 (2023). https://doi.org/10.1364/AO.482533
21. Ryan E. Pinson, Andrew V. Giminaro, Christina L. Dugan, Phillip R. Jenkins, and Anil K. Patnaik, LIBS and Raman Spectroscopy in Tandem with Machine Learning for Interrogating Weatherization of Lithium Hydride, *Applied Optics* **62(6)**, A118-A126 (2023). https://doi.org/10.1364/AO.482304
22. Christoph Arndt, Anna-Lena Sahlberg, Anil Patnaik, Frank Beyrau, Joakim Bood, Paul Hsu, and Thomas Seeger, Laser Applications to Chemical, Security, and Environmental Analysis: introduction to the feature issue, *Applied Optics* **62(6)**, LAC1-LAC3 (2023). https://doi.org/10.1364/AO.487814
23. Ashwin P. Rao, Phillip R. Jenkins, John D. Auxier II, Michael B. Shattan, Anil K. Patnaik, Enabling orders of magnitude sensitivity improvement for quantification of Ga in a Ce matrix with a compact Echelle spectrometer, *Journal of Analytical Atomic Spectroscopy* **37**, 1975 – 1980 (2022). https://doi.org/10.1039/D2JA00179A
24. Ashwin P. Rao, Phillip R. Jenkins, John D. Auxier II, Michael B. Shattan, Anil K. Patnaik, Analytical comparisons of handheld LIBS and XRF devices for rapid quantification of gallium in a plutonium surrogate matrix, *Journal of Analytical Atomic Spectroscopy* **37**, 1090–1098 (2022). https://doi.org/10.1039/D1JA00404B
25. Ashwin P. Rao, Phillip R. Jenkins, John D. Auxier II, Michael B. Shattan, Anil K. Patnaik, Development of advanced machine learning models for analysis of plutonium surrogate optical emission spectra, *Applied Optics* **61(7)**, D30-38 (2022). https://doi.org/10.1364/AO.444093
26. Ashwin P. Rao, Phillip R. Jenkins, Dung M. Vu, John D. Auxier II, Anil K. Patnaik, Michael B. Shattan**,** Rapid quantitative analysis of trace elements in plutonium alloys using a handheld laser-induced breakdown spectroscopy (LIBS) device coupled with chemometrics and machine learning, *Analytical Methods* **13**, 3368-78 (2021). https://doi.org/10.1039/D1AY00826A
27. M. Gragston, P. S. Hsu, A. K. Patnaik, Z. Zhang, and S. Roy, Time-Gated Single-Shot Picosecond LIBS for Equivalence Ratio Measurement, *Applied Spectroscopy*, **74**, 340 (2020). https://doi.org/10.1177/0003702819885647
28. Puja Singh, Anil K. Patnaik, Sukesh Roy, James R. Gord, and Yuri V. Rostovtsev, Influence of Coherent Population Trapping on Raman Scattering, *Phys. Rev. A* **100**, 023808 (2019). https://doi.org/10.1103/physreva.100.023808
29. Ashwin P. Rao, Mark Gragston, Anil K. Patnaik, Paul S. Hsu, and Michael B. Shattan, Measurement of Electron Density and Temperature from Laser-Induced Nitrogen Plasma at Elevated Pressure (1–6 bar), *Optics Express*, **27**, 33779 (2019). https://doi.org/10.1364/oe.27.033779
30. A. K. Patnaik, Y. Wu, P. S Hsu, M. Gragston, Z. Zhang, J. R. Gord, and S. Roy, Simultaneous LIBS and Plasma Density Measurement for Quantitative Insight into LIBS Signal Instability at Elevated Pressures, *Optics Express* **26(10)**, 25750-25760 (2018). https://doi.org/10.1364/oe.26.025750
31. P. S. Hsu, A. K. Patnaik, A. J. Stolt, J. Estevadeordal, S. Roy, and J. R. Gord, Femtosecond-Laser-Induced Plasmas (FLIPs) for High-Pressure Gas Sensing: Enhanced Stability of Spectroscopic Signal, *Applied Physics Letters* **113**, 214103 (2018).

https://doi.org/10.1364/oe.26.025750

32. Y. Wu, M. Gragston, Z. Zhang, P. S. Hsu, N. Jiang, A. K. Patnaik, S. Roy, and J. R. Gord, High-Pressure 1D Fuel/Air-Ratio Measurements with LIBS, *Combustion and Flame* **198**, 120-129 (2018).
https://doi.org/10.1016/j.combustflame.2018.09.009
33. Paul S. Hsu, Naibo Jiang, Anil K. Patnaik, Vish Katta, Sukesh Roy, and James R. Gord, All Fiber-Coupled OH Planar Laser-Induced-Fluorescence (OH-PLIF)-Based Two-Dimensional Thermometry, *Applied Spectroscopy* **72 (4)**, 604-610 (2018).
https://doi.org/10.1177/0003702817744519
34. N. DeLuca, R. B. Miles, N. Jaing, W. D. Kulatilaka, A. K. Patnaik, and J. R. Gord, FLEET Velocimetry for Combustion and Flow Diagnostics, *Appl. Opt.* **56**, 8632-8638 (2017).
https://doi.org/10.1364/ao.56.008632
35. Anil K. Patnaik, Igor Adamovich, James R. Gord, and Sukesh Roy, Recent advances in ultrafast-laser-based spectroscopy and imaging for reacting plasmas and flames, *Plasma Sources Science and Technology* **26**, 103001 (2017).
https://doi.org/10.1088/1361-6595/aa8578
36. Paul S. Hsu, Mark Gragston, Yue Wu, Anil K. Patnaik, Zhili Zang, Johannes Kiefer, Sukesh Roy, and James R. Gord, Sensitivity, Stability, and Precision of Quantitative Ns-LIBS-Based Fuel-Air Ratio Measurement for Methane-Air Flame at 1-11 bar, *Applied Optics* **55**, 8042-8048 (2016).
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37. Anil K. Patnaik, Sukesh Roy and James R. Gord, Ultrafast Saturation of Electronic-Resonance-Enhanced Coherent anti-Stokes Raman scattering and comparison from Nanosecond to Femtosecond Regime, *Phys. Rev.* **A 93**, 023812 (2016).
https://doi.org/10.1103/physreva.93.023812
38. Anil K. Patnaik, James R. Gord, and Sukesh Roy, Lineshape dependence of ultrafast saturation of absorption and fluorescence, *Physica Scripta* **T165**, 014031 (2015).
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39. Anil K. Patnaik, Sukesh Roy and James R. Gord, Ultrafast saturation of resonant optical processes, *Phys. Rev.* **A 90**, 063813 (2014).
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41. Anil K. Patnaik, Sukesh Roy, and James R. Gord, All-optically controlled concurrent slow-fast light, *Optics Letters* **36**, 3272-3274 (2011).
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42. Paul S. Hsu, George R. Welch, James R. Gord and Anil K. Patnaik, Propagation dynamics of controlled cross-talk in double ladder system, *Physical Review* **A 83**, 053819 (2011).
https://doi.org/10.1103/physreva.83.053819
43. Paul S. Hsu, Anil K. Patnaik, James R. Gord, Terrence R. Meyer, Waruna D. Kulatilaka, and Sukesh Roy, Investigation of Optical Fibers for Coherent Anti-Stokes Raman Scattering (CARS) Spectroscopy in Reacting Flows, *Experiments in Fluids* **49**, 969-984 (2010).
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44. Paul S. Hsu, Sukesh Roy, James R. Gord, and Anil K. Patnaik, Magneto-optical control of the group velocity of light in an inhomogeneously broadened medium, *Journal of Modern Optics* **57**, 1388-1396 (2010).
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45. Luqi Yuan, Gombojav O. Ariunbold, Robert K. Murawski, Dmitry Pestov, Xi Wang, Anil K. Patnaik, Vladimir A. Sautenkov, Alexei V. Sokolov, Yuri V.Rostovtsev and Marlan O. Scully, Femtosecond wave-packet dynamics in cesium dimers studied through controlled stimulated emission, *Physical Review* **A 81**, 053405 (2010).
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https://doi.org/10.1016/j.pecs.2009.11.001

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https://doi.org/10.1063/1.3137106

48. Ling Zhou, Guo Hui Yang and Anil K. Patnaik, Spontaneously generated atomic entanglement in free space reinforced by incoherent pumping, *Phys. Rev.* **A 79**, 062102 (2009).
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INVITED, PLENARY and KEYNOTE TALKS

127. Anil K. Patnaik,# Classical ghost imaging through turbulence: Toward real-time imaging with genetic algorithm, SPIE Unconventional Imaging, Sensing, and Adaptive Optics, San Diego (Aug 24-27, 2026). [Invited Talk]
128. Anil K. Patnaik,# Relativistic Laser-Plasma Interactions with Liquid Targets at High Repetition Rate, AFOSR: Ultrashort Pulse Laser-Matter Interactions Program Review, Washington DC (20-24 July 2026). [Invited Talk]
129. Anil K. Patnaik,# Quantum Programs at AFIT, AFRL Quantum Workshop (May 2026). [Invited Talk]
130. Joseph D. Fasone,#^ Keith A. Wyman, Anil K. Patnaik, Classical ghost imaging with nondiffracting, self-healing light structures in simulated atmospheric turbulence, Proc. SPIE 13921, Complex Light and Optical Forces XX, 1392105 (5 March 2026). [Invited Talk]
131. Benjamin M. Knight,#^ Kyle D. Frische, Enam A. Chowdhury, Michael L. Dexter, and Anil K Patnaik, *Laser-driven fusion and accelerator facility to generate kHz-rate mixed radiation*, SPIE High-Power Laser Ablation, Santa Fe (Mar 16-18, 2026). [Invited Talk]
132. Anil K. Patnaik,# Quantum Programs at AFIT, ANT Center Seminar (Feb 2026). [Invited Talk]
133. Anil K Patnaik,# Integrated Quantum Network: Photonic Qubit Transport Through Turbulence and Terrestrial Fibers, AS&T Kick-off Meeting, AFIT (Dec 5, 2025). [Invited Talk]
134. Anil K. Patnaik,# Integrated Quantum Network: Photonic Qubit Transport Through Turbulence and Terrestrial Fibers, CDE Offsite Meeting (Dec, 2025). [Invited Talk]
135. Anil K Patnaik,# Quantum Imaging through Turbulence, College of Science, Cedarville (Oct 2025). [Invited Talk]
136. Anil K. Patnaik,# Quantum Imaging through Turbulence, Quantum Matters at OSU (Sep, 2025). [Invited Talk]
137. Anil K Patnaik,# Extreme Light Laboratory: kHz-Rate Ultrashort-Laser Based Table-Top Accelerator, AFRL-AFIT Summit, AFIT (Aug 14, 2025). [Invited Talk]
138. Anil K Patnaik,# Imaging with "Spooky" Photons that Can't See the Target: Implications for Turbulent Flow Diagnostics, Gordon Research Conference on Laser Diagnostics in Energy and Reacting Flows, Les Diablerets, Switzerland (Jun 15-20, 2025). [Invited Talk]
139. Anil K Patnaik,# Optics at AFIT: From One Photon to Extreme Light, Ohio Optical Frontier Showcase at Ohio State University, Columbus (May 2, 2025). [Invited Talk]
140. Anil Patnaik,# Future of Computing and Networking – Delving into the Quantum Weirdness, Marshall University (Sep 23, 2024). [Invited Colloquium of Math-Phys-Eng Dept]
141. Noah Everett, Keith Wyman and Anil Patnaik,# Reconstructing the Quantum State of Photon Propagating through Atmospheric Turbulence Simulator, Frontiers of Quantum and Mesoscopic Thermodynamics held at Prague, Czech Republic (Jul 21 – 25, 2024). [Invited Talk]
142. Anil Patnaik,# Tabletop Laser Driven kHz-Rate Fusion at AFIT: Development of Mixed Radiation Source, Extreme Light Workshop, Ohio State University (Jul 9-10, 2024). [Invited Talk]
143. Keith A. Wyman,# Noah S. Everett, Robert J. Von-Holle, Viswanathan I. Ramesh, Milo W. Hyde, Anil K. Patnaik, Atmospheric turbulence effects on quantum statistics and interference of photons, Proc SPIE Photonics West, Quantum Computing, Communication, and Simulation IV, PC1291108 (2024). [Invited Talk]
144. Anil Patnaik,# Challenges in Free-Space Qubit Propagation and Quantum Network, INSQT Workshop, India (Mar, 2024). [Plenary Talk]
145. Anil K. Patnaik,# "Building Free-Space Quantum Network with Flying Qubits," Department of Physics, Miami University, Oxford, OH (Mar 6, 2024). [Invited Seminar]
146. Anil K. Patnaik,# "Challenges for Building a Resilient Free-Space Quantum Network," Department of Physics, Ohio State University (Oct 3, 2023). [Invited Colloquium]

147. Anil K. Patnaik,# Benjamin Knight,* Connor Gautam,^ Kyle Frische, Juan Manfredi, Michael Dexter, and Enam Chowdhury, “Table-Top Ultrashort-Pulse-Laser Driven Fusion at kHz Rate,” IEEE Rapids, Miramar Beach, FL (Sep 10-13, 2023). [Invited Talk]
148. Anil K. Patnaik, “Laser-induced plumes in solids and LIBS to follow the plume evolution,” DTRA-MSEE RA4 Meeting on Zoom (Mar 19, 2023). [Invited Talk]
149. Anil K. Patnaik, "Light–Matter Interactions at Millionth-of-Billionth of a Second and Applications," Department of Physics, Marietta College, Marietta, OH (Mar 19, 2023). [Colloquium]
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152. A. K. Patnaik and Tom Bullard, AFOSR GHz-THz Program Review Meeting (2022) [Invited Talk].
153. Anil Patnaik, Tabletop mixed radiation source from liquid target via extreme light interactions, Frontiers of Quantum and Mesoscopic Thermodynamics, Prague, Czech Republic, Aug 1 - 5 (2022) [Invited Talk]
154. Anil K. Patnaik, Free Space Quantum Information Propagation: Prospects and Challenges, Optical and Quantum Sensing and Precision Metrology II, PC1201638, Photonic West 2022, San Francisco, USA (Jan 22-27). [Invited Talk]
155. Anil K. Patnaik, Femtosecond Laser Induced Plasma and Applications, 51st Colloquium on Physics of Quantum Electronics, Snowbird, USA (Jan 9-14, 2022). [Plenary Talk]
156. Anil Patnaik, “Physics of ultrafast laser-matter interactions and applications,” at Department of Physics, University of North Texas, Sep 14, 2021. [Invited Colloquium]
157. A. P. Rao, R. E. Pinson, P. R. Jenkins, A. K. Patnaik, M. B. Shattan, Applications of laser-induced breakdown spectroscopy for chemical analysis of nuclear materials, SciX 2021, Rhode Island, Sep 26 - Oct 1, 2021. [Invited Talk]
158. Anil K. Patnaik, State-of-the-art Quantum Communications: Entanglement, Cryptography, Teleportation and Future Outlook, IEEE NAECON, Aug 16 - 19 (2021). [Invited Talk]
159. Yuri Rostovtsev, Billie DeLuca, Colin Roy, and Anil Patnaik, Dispersion of a Single Atom Experienced by Single Photon, FQMT, Jul 18 - 24 (2021) [Invited Talk]
160. Anil K. Patnaik, Laser-induced plasmas for spatio-temporal characterization, DTRA-MSEE Jul 13 (2021) [Invited Talk].
161. Anil K. Patnaik, Laser-Induced Plasmas –From Probing Physio-Chemical Processes to Table-Top Mixed Radiation Source, Seminar at Office of Defense Coordination, Lawrence Livermore National Lab (May 20, 2021). [Invited Talk]
162. Anil K. Patnaik, Ultrafast Laser Based Light–Matter Interactions: Sensing and Beyond, Webinar at for Silver Jubilee Celebration of International School of Photonics (India), Apr. 22. [Invited Talk]
163. A. K. Patnaik, State-of-the-art Quantum Communications: Entanglement, Cryptography, Teleportation and Future Outlook, Quantum Information Short Course, AFIT (2020). [Invited Talk]
164. A. K. Patnaik, H. U. Stauffer, P. S. Hsu, N. Jiang, P. J. Wrzesinski, J. R. Gord, and S. Roy, Ultrafast Diagnostics of Reacting Flows and Plasmas, International Conference on Thermal Engineering, BUET (Dhaka, Bangladesh, 2018). [Plenary Talk]
165. A. K. Patnaik, P. S. Hsu, A. J. Stolt, J. Estevadeordal, J. R. Gord, and S. Roy, Advantages of Ultrafast LIBS for High-Pressure Diagnostics, *LACSEA,* OSA Imaging and Applied Optic*s* (Orlando, FL, 2018), pp. LW5C.4. [Invited Talk]
166. A. K. Patnaik, P. S. Hsu, S. Roy, Y. Wu, M. Gragston, Z. Zhang, and J. R. Gord, Ultrafast Laser-Induced-Breakdown Spectroscopy (LIBS) for F/A-Ratio Measurement of Hydrocarbon Flames, *AIAA SciTech* (Kissimmee, FL, 2018), pp. AIAA 2018-1776. [Invited Talk]
167. Ultrafast non-equilibrium saturation of resonant emission process, A.K. Patnaik, S. Roy, J.R. Gord, PQE, Snowbird, UT, 2014. [Invited Talk]

168. Ultrafast Saturation of Raman Coherence, Anil K. Patnaik, Sukesh Roy, and James R. Gord, FQMT, Prague, Czech Republic, 2013. [Invited Talk]
169. Ultrafast non-equilibrium saturation of resonant emission process, Anil K. Patnaik, S. Roy, and J. R. Gord, 43rd Winter Colloquium on Physics of Quantum Electronics, Snowbird, UT Jan 5-9 (2013). [Invited Talk]
170. Non-equilibrium and ultrafast saturation of highly under-damped resonant processes, Anil K. Patnaik, Sukesh Roy, and James R. Gord, *8th Conference on Nonlinear Systems and Dynamics,* Indian Institute of Technology, Indore, India, Dec. 11-14 (2013). [Invited Talk]
171. Realization of opposite dispersion slopes for two probes: Concurrent slow-fast light, Anil K. Patnaik, S. Roy, and J. R. Gord, 43rd Winter Colloquium on Physics of Quantum Electronics, Snowbird, UT Jan 6-11 (2013) [Invited Talk]
172. Ultrafast saturation of Raman coherence, Anil K. Patnaik, S. Roy, and J. R. Gord, Frontiers of Quantum and Mesoscopic Thermodynamics, held at Prague (Czech Republic), 29 July-3 Aug (2013). [Invited Talk]
173. Ultra-fast thermometry using quantum coherence, Anil K. Patnaik, S. Roy, and J. R. Gord, Frontiers of Quantum and Mesoscopic Thermodynamics, held at Prague (Czech Republic), 25-30 July (2011). [Invited Talk]
174. Simultaneous dual- or multi-channel slow light in a single delay element, Anil K. Patnaik, Paul S. Hsu, Sukesh Roy and James R. Gord, Electro-optics Program/Physics Seminar held at University of Dayton, Dayton, OH (USA), Sep 17 (2010). [Invited Talk]
175. Two-Channel Control of Slow Light and Potential Diagnostic Applications, Anil K. Patnaik, Paul S. Hsu, Sukesh Roy and James R. Gord, Augmenter Design Systems Conference held at Jacksonville, FL (USA), March 17-19 (2010). [Invited Talk]
176. Fiber Coupling Laser Beams for Practical Applications of CARS Spectroscopy, Paul S. Hsu, Waruna D. Kulatilaka, Anil K. Patnaik, Terrence R. Meyer, Sukesh Roy and James R. Gord, Augmenter Design Systems Conference, held at Jacksonville, FL (USA), March 17-19 (2010). [Invited Talk]
177. Fiber-Coupled Picosecond Coherent Anti-Stokes Raman Scattering (CARS) Spectroscopy, Paul S. Hsu, Anil K. Patnaik, James R. Gord, Sukesh Roy, Waruna D. Kulatilaka and Terrence R. Meyer, Laser Applications to Chemical, Security and Environmental Analysis (LACSEA), held at San Diego, CA (USA), 31 Jan-3 Feb (2010). [Invited Talk]
178. Non-linear optical techniques for detection of minor species, Anil K. Patnaik Physics Colloquium, National Institute of Science Education and Research, Bhubaneswar (India), 13 Jan. (2010). [Invited Talk]
179. Controlling Speed of Light by Light: Slow and Stopped Light, Anil K. Patnaik, Paul S. Hsu, Sukesh Roy, and James R. Gord, Physics Seminar, Wright State University, Dayton, 25 April 2008. [Invited Talk]
180. Coherent-repumping-assisted immunity of Raman coherence to rapid collisional decays, Anil K. Patnaik, Sukesh Roy, Robert P. Lucht, and James R. Gord, XXXVIII Winter Colloquium on Physics of Quantum Electronics, held at Snowbird, Utah (USA), 6-10 January 2008. [Invited Talk]
181. Nonlinear magneto-optical polarization rotation with intense laser fields, George W. Welch, Paul S. Hsu, Anil K. Patnaik, SPIE Fluctuations and Noise, pg. 6603-45, held at Florence (Italy), 20-24 May 2007. [Invited Talk]
182. Preserving Coherence, Anil K. Patnaik, Princeton-TAMU Symposium on Quantum Coherence and Laser Spectroscopy, held at Priceton, NJ (USA), 16-17 March 2007. [Invited Talk]
183. Single photon Dicke super and sub-radiance, Anil K. Patnaik, Anatoly Svizdzinsky, Juntao Chang, and Marlan O. Scully, Fundamental Aspects of Quantum Mechanics Symposium, held at Priceton, NJ (USA), 16-17 February 2007. [Invited Talk]
184. Ground state dephasing measurement via interruption of coherent population trapping, Anil K. Patnaik, TAMU Molecular Physics and Quantum Optics Symposium held at Texas A&M University, College Station, TX (USA), 9-10 Jan 2007. [Invited Talk]
185. Controllable quantum correlated in Raman System and applications, Anil K. Patnaik, Department Seminar, Indian Institute of Technology, Bombay, 28 July 2006. [Invited Talk]

186. Controllable quantum correlation between Raman photon pair and applications, Anil K. Patnaik, International Symposium on Quantum Optics, held at Physics Research Laboratory, Ahmedabad (India), 24-27 July 2006. [Invited Talk]
187. Coherence effects on the Raman two-photon correlation and applications, Anil K. Patnaik, XXXVI Winter Colloquium on Physics of Quantum Electronics, held at Snowbird, Utah (USA), 2-6 January 2006. [Invited Talk]
188. Quantum Microscopy, Anil K. Patnaik, JSPS-PRISM-TAMU Symposium on Quantum Material Science, held at Princeton University, NJ (USA) 21-22 February 2005. [Invited Talk]
189. Raman Photon Pair Correlations Via the Onsager Regression Theorem, Anil K. Patnaik, G. S. Agarwal, R. Ooi and M. O. Scully, XXXV Winter Colloquium on Physics of Quantum Electronics, held at Snowbird, Utah (USA), 4-8 January 2005. [Invited Talk]
190. Quantum Correlation between Raman Pair and Applications to Quantum Microscopy, Anil K. Patnaik, Physics Department Seminar, Oklahoma State University, Still Water, OK, Sep. 29 (2004). [Invited Talk]
191. Manipulating the retrieval of stored light pulses, Anil K. Patnaik, Fam Le Kien, and K. Hakuta, XXXIV Winter Colloquium on Physics of Quantum Electronics, held at Snowbird, Utah (USA), 4-8 January 2004. [Invited Talk]
192. Coherent Control of Group Velocity of Light in an Optical Fibre, Anil K. Patnaik, Physics Department Seminar, Indian Institute of Technology, Bombay (India), 25 September 2002. [Invited Talk]
193. Slow Light Propagation in a Thin Optical Fiber via Electromagnetically Induced Transparency, Anil K. Patnaik, J. Q. Liang, and K. Hakuta, XXXIII Winter Colloquium on Physics of Quantum Electronics, held at Snowbird, Utah (USA), 5-9 January 2003. [Invited Talk]

SEMINARS AND CONTRIBUTED CONFERENCE PAPERS

194. Anil K. Patnaik# and Keith Syman, Free-space qubit transport through a lab-scale turbulence testbed, Southeastern Quantum Conference, Chattanooga (Aug 2-5, 2026). [Talk]
195. T. Morris and A. K. Patnaik, "*Trace Lithium Isotope Analysis of the 2s-2p Doublets via Surface-Enhanced Nanosecond LIBS*" Dayton-Cincinnati Aerospace Science Symposium, Mar 9, Dayton (2026). [Talk]
196. Roscoe Schumann, Travis Morris and Anil Patnaik, "*Differentiating ^{6}Li and ^{7}Li Isotope Contents Using Seven Spectral Lines from Laser Induced Breakdown Spectroscopy*," Dayton-Cincinnati Aerospace Science Symposium, Mar 9, Dayton (2026). [Talk]
197. Nathaniel Tamminga, Scott Feister, Kyle Frische, Ronak Desai, Joseph C. Snyder, Joseph R. Smith, Chris Orban, Enam A. Chowdhury, Michael L. Dexter, and Anil K. Patnaik. "Towards Intelligent Control of MeV Electrons and Protons from kHz Rep-Rate Ultra-Intense Laser-Plasma Interactions." In APS *Division of Plasma Physics, Nov* (2025). [Poster]
198. Scott Feister,# Kyle Frische, Ronak Desai,^ Joseph Snyder, Joseph Smith, Chris Orban, Enam Chowdhury, Michael Dexter, Anil Patnaik, Towards Intelligent Control of MeV Electrons and Protons from kHz Rep-Rate Ultra-Intense Laser-Plasma Interactions, 67th Annual Meeting of the APS Division of Plasma Physics, Long Beach, California November 17-21 (2025). [Talk]
199. Nathaniel Tamminga, Scott Feister, Kyle Frische, Ronak Desai, Joseph Snyder, Joseph R. Smith, Chris Orban, Enam Chowdhury, Michael Dexter, and Anil Patnaik, Towards Intelligent Control of MeV Energy Electrons and Protons from kHz Repetition Rate Ultra-Intense Laser-Plasma Interactions, LaserNetUS Meeting, Phoenix, AZ, July 8-10, 2025. [Poster] (https://events.bizzabo.com/lasernetus2025/).
200. Ben Knight, Michael Dexter, Enam Chowdhury, Anil Patnaik, Laser-driven fusion and accelerator facility to generate kHz-rate mixed radiation, IEEE plasma conference, Berlin, Jun 15-20 (2025). [Talk]
201. Benjamin Knight, Nathaniel Tamminga, Scott Feister, Ronak Desai, Chris Orban, Kyle Frische, Enam Chowdhury, Michael Dexter, and Anil Patnaik, Optimization and Implementation of Mixed Radiation from a KHZ-Rate Laser Accelerator Facility at AFIT, HEART Conference, Monterey, CA on April 7, 2025. [Talk]

202. Madison Moran,*# Ashwin Rao and Anil Patnaik, Isotopic Analysis of Lithium Hydroxide Monohydrate Using Laser-Induced Breakdown Self-Reversal Isotopic Spectrometry (LIBRIS) and Machine Learning, 50DCASS-058, Dayton-Cincinnati Aerospace Science Symposium, Dayton, Mar 4 (2025). [Talk]
203. Joseph R Smith, Nicholas S Haught,* Ronak Desai,^ Chris Orban, Michael L Dexter, and Anil K Patnaik, Parametric Study of Ultrashort Pulse Laser-Driven Neutron Production with Particle-In-Cell Simulations, 66th Annual Meeting of the APS Division of Plasma Physics, Atlanta, Georgia, Oct 7-11 (2024).
204. Joseph D. Fasone, Mikaela R. Morris, Keith A. Wyman, and Anil K. Patnaik, Atmospheric Turbulence in Quantum Illumination, SPIE Photonic West, San Francisco (25-30 Jan, 2025).
205. Billie V DeLuca, Milo Hyde, and Anil Patnaik, "Quantum Coherent Transfer Function for Generic Pulse Storage and Retrieval" Frontiers of Quantum and Mesoscopic Thermodynamics held at Prague, Czech Republic (Jul 21 – 25, 2024).
206. Keith Wyman Noah Everett, Anil Patnaik, Interference of photons and polarization-based quantum state tomography through emulated atmospheric turbulence, SPIE Photonics for Quantum, Waterloo, Ontario, Canada, 17-21 June (2024).
207. Keith A. Wyman,# Noah S. Everett, Robert J. Von-Holle, Viswanathan I. Ramesh, Milo W. Hyde, Anil K. Patnaik, Atmospheric turbulence effects on quantum statistics and interference of photons, Photonics West (2024).
208. Keith A. Wyman, Noah S. Everett, Robert J. Von-Holle, Viswanathan I. Ramesh, Milo W. Hyde, Anil K. Patnaik, Interference of photons and polarization-based quantum state tomography through emulated atmospheric turbulence, SPIE Photonics for Quantum (Waterloo), 13106-69 (Jun, 2024).
209. Billie DeLuca and Anil Patnaik, Reconstruction of Generic Light Pulses Stored via EIT Using the Coherent Atomic Transfer Function, Quantum 2.0 Conference and Exhibition (Netherlands), QTh3A.6 (Jun, 2024).
210. Nicholas Haught, Ronak Desai, Chris Orban, Joseph Smith, Michael Dexter, Anil Patnaik, PIC Simulations to Investigate the Influence of Initial Target Conditions on Short-Pulse Laser Neutron Production, Bulletin of the American Physical Society, E01.00009, Spring Meeting of the APS Eastern Great Lakes Section, Kettering University, Flint, Michigan, April 12–13, 2024.
211. Benjamin Knight,*# Kyle Frische, Enam Chowdhury, Michael Dexter, and Anil K Patnaik, Laser-Driven Table-Top Accelerator Facility to Generate kHz-rate Mixed Radiation, APS Eastern Great Lakes Section (EGLS) Fall 2023 Meeting, Cleveland State University, Cleveland, Ohio, Oct 20-21 (2023).
212. Nathaniel Tamminga,* Scott Fiester, Chris Orban, Joseph Snyder, Kyle Frische, Benjamin Knight,* Michel Dexter, Anil Patnaik, High Rep-Rate Data Acquisition for Extreme Light Laser, NIF User Group Meeting, May 2023 [Poster]
213. Thomas Bullard, Steve Hageman, Charles Ebbing, Kyle Frische, John Bulmer, Enam Chowdhury, Michael Dexter, Anil Patnaik, Timothy Haugan, Ultrafast Optically Triggered Microwave/Terahertz Emission from an Array of Inductively Charged Superconducting Rings, Applied Superconductivity Conference, Honolulu Oct 23 -28, 2022 [Poster]
214. Joseph C Snyder, Stephen J Hageman, Gregory Ngirmang, Kyle Frische, Michael Dexter, Enam Chowdhury, and Anil Patnaik, Structured targets at high-repetition rates for high-intensity laser-plasma interactions, 64th Annual Meeting of the APS Division of Plasma Physics, Volume 67, Number 15 at Spokane, Washington (October 17–21, 2022). [Talk]
215. Keith Wyman, Alex Ressue, Robert V Holle, Vishwa Ramesh, Robert Deluca, Billie Deluca, Anil Patnaik, AFIT Quantum Optical Technologies Laboratory, OSU Quantum Center Inauguration, Columbus (Sep 9, 2022) [Poster].
216. R. E. Pinson, P. R. Jenkin, A. V. Giminaro, and A. K. Patnaik, "Evaluating Spectroscopic Data Fusion for Environmental Conditioning of Lithium Hydride Using Machine Learning," in Optical Sensors and Sensing Congress 2022 (AIS, LACSEA, Sensors, ES), Technical Digest Series (Optica Publishing Group, 2022), paper LF1C.4.
217. Keith Wyman^# and Anil K. Patnaik, Qubit propagation through simulated atmoshperic turbulences, SPIE Photonics for Quantum Conference 2022, Rochester, USA (June 6-9).
218. A K Patnaik, B DeLuca,^# N Guerrero,^ A Scheppe,^ M Pak, D Weeks, Multiphoton approximation error of parametric down conversion source detection, Optical and Quantum

Sensing and Precision Metrology II, PC1201639, Photonic West 2022, San Fransisco, USA (Jan 22-27); Proceedings Volume PC12016, Optical and Quantum Sensing and Precision Metrology II; PC1201639 (2022) https://doi.org/10.1117/12.2617247

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220. Colin Roy,^ Pooja Singh,# Anil K Patnaik, Yuri Rostovtsev, Chirped pulse propagation influenced by coherent population trapping, Photonic West 2022, San Fransisco, USA (Jan 22-27, 2022); Proc. SPIE PC12016, Optical and Quantum Sensing and Precision Metrology II, PC120162L (9 March 2022). https://doi.org/10.1117/12.2617249
221. A Scheppe,^# B DeLuca,^ N Guerrero,^ D Weeks, A Patnaik, M Pak, Multiphoton approximation error of parametric down conversion source detection, Bulletin of the American Physical Society (2022).
222. A. P. Rao,^# P. R. Jenkin, J. D. Auxier II, M. B. Shattan, and A. K. Patnaik, Decision tree-based methods for chemical analysis of Pu surrogate spectra, ACS 2021 [Talk].
223. Ashwin P. Rao,^# Phillip R. Jenkin, John Auxier, II, Michael B. Shattan, and Anil Patnaik, Development of Tree-Based Machine Learning Methods for Quantification of Gallium in a Plutonium Surrogate Matrix via Laser-Induced Breakdown Spectroscopy, SciX 2021, Rhode Island, Sep 26 - Oct 1, 2021. [Poster]
224. Ryan Pinson,^# Christina Dugan and Anil Patnaik, Characterization of Environmental Conditioning of Lithium Compounds Using Spectroscopy, SciX 2021, Rhode Island, Sep 26 - Oct 1, 2021. [Poster]
225. Ashwin P. Rao,^# Phillip R. Jenkins, John D. Auxier II, Michael B. Shattan, Anil K. Patnaik, Decision tree-based methods for chemical analysis of Pu surrogate spectra, ACS Fall 2021 [Talk]
226. Billie DeLuca and Anil Patnaik, An Analytical Framework for the Storage and Retrieval of Arbitrary Light Pulses, American Physical Society March Meeting, 2021. [Poster]
227. Anil K Patnaik, J. R. Smith, C. Orban, J. T. Morrison, K. M. George, G. K. Ngirmang, E. A. Chowdhury, M. L. Dexter, Evolutionary Algorithms for Optimization of Ion Acceleration in Extreme Laser-Plasma Interactions, Directed Energy Professional Society Meeting, March 2021. [Talk]
228. Enam Chowdhury, John Morrison, Kyle Frische, Wes Erbsen, Michael Dexter, and Anil Patnaik, Development of an ultra-short pulse mid-infrared laser system for propagation and material damage studies, Directed Energy Professional Society Meeting, March 2021. [Talk]
229. Y. Rostovtsev, B. DeLuca, C. Roy, and A. K. Patnaik, Refractive index of a single atom experienced by a single photon, Optical and Quantum Sensing and Precision Metrology, SPIE Photonic West, 2021. [Talk]
230. S. Cranford and A. K. Patnaik, Plasma Actuation for Hypersonic Electromagnetic Blackout Mitigation, Directed Energy Professional Society Meeting, Match 2021. [Poster]
231. M. Rynders, M. Gragston, A. K. Patnaik, M. Shattan, Time-resolved Plasma Characterization during DP-LIBS of Cerium Oxides, SCIX 2020. [Poster]
232. A. K. Patnaik, "Quantum Storage: Present and Future," AFIT Friday QuanTech Seminar Series, July (2020). [Seminar]
233. A. K. Patnaik, "Photon Correlation and Entanglement: The Quantum Weirdness," AFIT Friday QuanTech Seminar Series (2 lecture), Jun (2020). [Seminar]
234. Y. Wu, M. Gragston, Z. Zhang, P. S. Hsu, N. Jiang, A. K. Patnaik, S. Roy, and J. R. Gord, 1D Nanosecond-LIBS Measurements of Fuel/Air Ratios, *AIAA SciTech* (Kissimmee, FL, 2018). [Talk]
235. Comparison of Ns, Ps and Fs LIBS for F/A Ratio Measurement, A. K. Patnaik, P. S. Hsu, Y. Wu, M. Gragston, Z. Zhang, J. R. Gord, and S. Roy, *Gordon Research Conference on Laser Diagnostics in Combustion* (Mount Snow, West Dover, Vermont, 2017). [Poster]
236. Measurement-Stability Analysis of Fuel-Air Ratio using Correlation between Laser-Induced-Breakdown Signal and Electron Generation, A. K. Patnaik, P. S. Hsu, Y. Wu, M. Gragston, Z. Zhang, J. R. Gord, and S. Roy, *DCASS* (Dayton, 2017). [Talk]
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Electron Number Density: Application to High-Pressure Hydrocarbon Flames, A.K. Patnaik, P. S. Hsu, Y. Wu, M. Gragston, Z. Zhang, J. R. Gord, and S. Roy, Frontiers in Ultrafast Optics: Biomedical, Scientific, and Industrial Applications XVII (SPIE LASE, Photonics West) San Francisco, p. 10094-52 (2017). [Talk]

238. Sensitivity, Stability, and Precision of Quantitative ns-LIBS-Based Fuel-Air Ratio Measurements for High-Pressure Methane-Air Flames, M. Gragston, Y. Wu, Z. Zhang, P. S. Hsu, A. K. Patnaik, S. Roy, J. R. Gord, 55th AIAA Aerospace Sciences Meeting. Grapevine, Texas: AIAA; p. AIAA 2017-0384 (2017). [Talk]
239. Pulse-Duration-Dependent Saturation of Raman coherence and Electronic-Resonance-Enhanced CARS, Anil K. Patnaik, Sukesh Roy, James R. Gord, LACSEA, Heidelberg, Germany, 2016. [Talk]
240. Saturation of Electronic-Resonance-Enhanced-CARS with ns to fs excitation, Anil K. Patnaik, Sukesh Roy, James R. Gord, DCASS, Dayton, OH, 2016.
241. Saturation Criterion for ERE-CARS: Nanosecond to Femtosecond Regime, Anil K. Patnaik, Sukesh Roy, James R. Gord, Gordon Research Conference, Watersville Valley, NH, 2015.
242. Electronic-Resonance-Enhanced CARS Saturation from Nanosecond to Femtosecond Excitation Regime, Anil K. Patnaik, Sukesh Roy, James R. Gord, DESS, Wright State University, Dayton, OH, 2015.
243. Saturation Limits for Ultrafast Resonant Optical Processes, Anil K. Patnaik, Sukesh Roy, James R. Gord, DCASS, Dayton, OH, 2015.
244. Ultrafast Saturation of Resonant Absorption, Emission, and Raman Processes, Anil K. Patnaik, Sukesh Roy, James R. Gord, DESS, Wright State University, Dayton, OH, 2014.
245. Analysis of ultrafast-saturation criterion of electronic-resonance enhanced CARS, Anil K. Patnaik, Sukesh Roy, James R. Gord, LACSEA, Seattle, WA, 2014.
246. Criterion for saturation of electronic-resonance-enhanced coherent anti-Stokes Raman scattering, Anil K. Patnaik, Sukesh Roy, and James R. Gord, 9th Annual Dayton Engineering Science Symposium, Wright State University, Dayton, OH, Oct. 29 (2013).
247. Ultrafast saturation of Raman coherence and coherent anti-Stokes Raman scattering, Anil K. Patnaik, S. Roy, and J. R. Gord, Gordon Research Gordon Research Conference on Laser Diagnostics in Combustion, Waterville Valley, NH, Aug 8-16 (2013).
248. Role of saturation of rotational Raman transition on femtosecond vibrational CARS, Anil K. Patnaik, Sukesh Roy, and James R. Gord, CLEO/QELS, San Jose, CA, June 9-14 (2013).
249. Advances in fiber-coupled pulsed-laser diagnostics for simultaneous species-concentration and velocity measurements in practical combustors, Pual S. Hsu, Sukesh Roy, Naibo Jiang, Anil K. Patnaik, James R. Gord, CLEO/QELS, CTu2H.7, San Jose, CA, June 9-14 (2013).
250. Saturation threshold of femtosecond CARS, Anil K. Patnaik, Sukesh Roy, and James R. Gord, 38th DCASS, Dayton, OH, Mar 6 (2013).
251. Saturation of Vibrational Femtosecond CARS via Saturation of Rotational Raman Transition, Anil K. Patnaik, S. Roy, and J. R. Gord, 43rd Winter Colloquium on Physics of Quantum Electronics, Snowbird, UT Jan 6-11 (2013)
252. Saturation of Vibrational Coherent Anti-Stokes Raman Scattering via Saturation of Rotational Coherence, Anil K. Patnaik, Sukesh Roy, and James R. Gord, ICORS 23rd International Conference on Raman Spectroscopy, Bangalore (India), 12-17 August 2012.
253. Fiber-Coupled High-Speed OH-PLIF Imaging in Turbulent Flames, Paul S. Hsu, Waruna D. Kulatilaka, Naibo Jiang, Stan Kotska, Sukesh Roy, Anil K. Patnaik, and James R. Gord, 28th Aerodynamic Measurement Technology,Ground Testing, and Flight Testing Conference, held at New Orleans, LA (USA), June 25-28 (2012).
254. Concurrent Slow-Fast Light Pair with Controllable X-Type Dispersion, Anil K. Patnaik, S. Roy, and J. R. Gord, QELS/CLEO, held at San Jose, CA May 6-11 (2012).
255. Interplay of $\chi^{(1)}$ and $\chi^{(3)}$ Processes in Double-Ladder System, Paul S. Hsu, George R. Welch, James R. Gord, and Anil K. Patnaik, QELS/CLEO held at San Jose, CA May 6-11 (2012)

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257. Simultaneous Two Beams of Slow-Fast and Slow-Slow Light: Diagnostics Perspectives, Anil K. Patnaik, S. Roy, and J. R. Gord, Central State Section Spring Technical Meeting of The Combustion Institute held at Dayton, OH, Apr 22-24 (2012).
258. Fiber-Coupled Laser Diagnostics for Gas-Phase Measurements in Practical Turbine Engine Hardware, Paul S. Hsu, Waruna D. Kulatilaka, Anil K. Patnaik, Sukesh Roy, and James R. Gord, Central State Section Spring Technical Meeting of The Combustion Institute held at Dayton, OH, Apr 22-24 (2012) [Talk]
259. Fiber-Coupled Laser Diagnostics for Practical Combustion Application, Paul S. Hsu, Waruna D. Kulatilaka, Anil K. Patnaik, Sukesh Roy, and James R. Gord, American Chemical Society, Dayton Section Meeting, held at Central State University, Wilberforce, OH (USA), Apr 3 (2012). [Poster]
260. Simultaneous Slow and Fast Light: Diagnostic Aspects, Anil K. Patnaik, Sukesh Roy, and James R. Gord, American Chemical Society, Dayton Section Meeting, held at Central State University, Wilberforce, OH (USA), Apr 3 (2012). [Poster]
261. Diagnostic Implications of Simultaneous Slow and Fast Light, Anil K. Patnaik, S. Roy, and J. R. Gord, 37th DCASS, held at Dayton, OH, Mar 6 (2012) [Talk]
262. Advances in Fiber-Coupled Laser Diagnostics for Practical Combustion Measurements, Paul S. Hsu, Waruna D. Kulatilaka, Anil K. Patnaik, Sukesh Roy, and James R. Gord, LACSEA, held at San Diego, CA, Jan 29-Feb 1 (2012). [Talk]
263. Development of an All-Fiber-Coupled, Pulsed, Ultraviolet Laser-Induced-Fluorescence (UV-LIF) Detection System for OH Radicals in Practical Combustion Devices, Paul S. Hsu, Waruna D. Kulatilaka, Anil K. Patnaik, Sukesh Roy, and James R. Gord, 50th AIAA Aerospace Sciences Meeting including the New Horizons Forum and Aerospace Exposition, Nashville, TN, Jan 9 (2012). [Talk]
264. Simultaneous Slow and Fast Light: Spectroscopic Implications, Anil K. Patnaik, S. Roy, and J. R. Gord, 7th Annual Dayton Engineering Sciences Symposium, held at Wright State University, Dayton, OH, Oct. 24 (2011) [Talk]
265. Fiber-Coupled Laser Diagnostics for Temperature and Species-Concentration Measurements in Practical Combustion Devices, Paul S. Hsu, Waruna D. Kulatilaka, Anil K. Patnaik, Sukesh Roy, and James R. Gord, 7th Annual Dayton Engineering Sciences Symposium, held at Wright State University, Dayton, OH, Oct. 24 (2011) [Talk]
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273. Continuing Development of Slow Light for Diagnostic Applications, Anil K. Patnaik, Paul S. Hsu, Sukesh Roy, and James R. Gord, 35th AIAA Dayton-Cincinnati Aerospace Science Symposium, held at Dayton, Ohio (USA), 9 March (2010). [Talk]
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275. Two-Channel Magneto-Optical Control of Slow Light for Diagnostic Applications, Anil K. Patnaik, Paul S. Hsu, Sukesh Roy, and James R. Gord, American Chemical Society, Dayton Section Meeting, held at Dayton, Ohio (USA), 8 March (2010). [Poster]
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