

David Feng

Office

700 East Ave.
L-498
Livermore, CA 94550

[Personal](#)
[Google Scholar](#)
[ORCID](#)

EDUCATION

Princeton University 2021
Doctor of Philosophy, Mechanical & Aerospace Engineering

University of California, Irvine 2015
Bachelor of Science, Mechanical Engineering

RESEARCH

Laser diagnostics of high-speed flows, gases, and plasmas. Molecular spectroscopy via absorption, emission, ionization, and scattering. Physics of solid-state and fiber-based lasers. Aerospace measurement technologies.

PRIMARY EXPERIENCE

Lawrence Livermore National Laboratory 2022 – Present
National Ignition Facility & Photon Sciences
Postdoctorate Fellow
Nonlinear pre-pulse cleaning methods for high-peak power fiber lasers. Fiber laser development for hyperfine spectroscopy. Raman gain and open cavity development. Plenoptic camera modeling and analysis for lightfield imaging.

Metrolaser, Inc. 2020 – 2022
Research Scientist
Laser Rayleigh scattering of density in a tightly confined space. Filtered Rayleigh scattering for the volumetric measurement of density and three-dimensional velocity of supersonic flows. Development of Rayleigh scattering lineshape model for signal prediction and post-processing.

University of Tokyo 2019 – 2020
Kobayashi Lab, Institute of Solid State Physics
Visiting Researcher
Mid-infrared absorption spectroscopy of complex molecules using mid-infrared fiber lasers. Long-wave infrared fiber laser development and pulse characterization.

Princeton University 2015 – 2020
Department of Mechanical & Aerospace Engineering
PhD Candidate
Laser diagnostics for pressure, temperature, and velocity measurements: scattering, absorption, fluorescence, schlieren, molecular tagging, nonlinear optics. Pulse-burst high-energy laser development.
Thesis: Advancements in light scattering diagnostics for selected gas properties

University of California, Irvine 2012 – 2015
Department of Mechanical & Aerospace Engineering; Department of Chemistry
Undergraduate Researcher
Laser diagnostics of combustion products. Methane hydrate formation & characterization. Fourier transform spectroscopy of acetaldehyde-water clusters. Absorption spectroscopy of Criegee intermediates.

REFEREED PUBLICATIONS

- A.1 D. Feng, T. P. Jenkins, and J. George, “Investigation of the wake region behind a hemispherical turret via laser Rayleigh scattering,” *Appl. Opt.*, vol. 62, no. 30, Oct. 2023.
- A.2 S. Tani, K. Sugiyama, T. Sukegawa, T. Sato, D. Feng et al., “Real-time high-spectral-resolution mid-infrared spectroscopy with a signal-to-noise ratio of ten thousand,” *Opt. Express*, vol. 30, no. 20, Sep. 2022.
- A.3 D. Feng, Ahmed Diallo, and M. N. Shneider, “Two-color scattering for the measurement of neutrals at the edge of nuclear fusion devices,” *Review of Scientific Instruments*, vol. 92, no. 6, June 2021.
- A.4 L. Hansen, B. M. Goldberg, D. Feng et al., “Energy transfer in interaction of a cold atmospheric pressure plasma jet with substrates,” *Plasma Sources Science and Technology*, vol. 30, no. 4, Aug. 2020.
- A.5 D. Feng, B. M. Goldberg, M. N. Shneider, and R. B. Miles, “Optimization of filtered Rayleigh scattering for the measurement of pressure and temperature,” *Combustion Science and Technology*, pp. 1-19, Sept. 2020.
- A.6 D. Feng, B. M. Goldberg, M. N. Shneider, and R. B. Miles, “Filtered Rayleigh Scattering for Pressure Measurement Applications,” *AIAA Journal*, vol. 57, no. 12, Aug. 2019.
- A.7 E. S. Foreman, K. Kapnas, Y. Jou, D. Feng et al., “High resolution absolute absorption cross sections of the B₁A - X₁A transition of the CH₂OO biradical,” *Physical Chemistry Chemical Physics*, vol. 17, no. 48, Nov. 2015.

CONFERENCE PROCEEDINGS (PAPER REQUIRED)

- B.1 D. Feng, T. Jenkins, J. George, “Towards Simultaneous Density and Flow Velocity Measurements of High-speed Flows Using Filtered Rayleigh Scattering” in AIAA Aviation 2021 Forum, *American Institute of Aeronautics and Astronautics*, 2021.
- B.2 A. Rekhly, A. Gerakis, D. Feng, M. N. Shneider, A. Dogariu, and R. B. Miles, “Temperature Profiling of the Atmosphere from an Airborne Lidar by Dispersed Filtered Rayleigh Scattering in Atomic and Molecular Vapors,” in AIAA Aviation 2019 Forum, *American Institute of Aeronautics and Astronautics*, 2019.
- B.3 D. Feng, B. M. Goldberg, M. N. Shneider, and R. B. Miles, “Progress of Pressure-Sensitive Measurements Via Filtered Rayleigh Scattering,” in AIAA Scitech 2019 Forum, *American Institute of Aeronautics and Astronautics*, 2019.
- B.4 T. P. Jenkins, J. George, D. Feng, and R. B. Miles, “Filtered Rayleigh Scattering for Instantaneous Measurements of Pressure and Temperature in Gaseous Flows,” in AIAA Scitech 2019 Forum, *American Institute of Aeronautics and Astronautics*, 2019.
- B.5 D. Feng, B. M. Goldberg, M. Naphade, M. N. Shneider, and R. B. Miles, “A Model Study of Filtered Rayleigh Scattering Sensitivity to Pressure and Temperature,” in 2018 AIAA Aerospace Sciences Meeting, *American Institute of Aeronautics and Astronautics*, 2018.

CONFERENCE PROCEEDINGS (ABSTRACT ONLY)

- C.1 D. Feng, L. Kiani, P. Pax, M. Messerly, “Towards a Pre-Pulse Cleaning Method In Ultrafast Fiber Lasers,” *Advanced Accelerator Concepts*, 2022.
- C.2 T. Sato, D. Feng, S. Tani, O. Komeda, H. Suto, Y. Umetani, S. Mori, A. Yasuda, H. Otsuki, and Y. Kobayashi, “Development of a high sensitivity mid-IR spectrometer for the detection of mixed gases,” Japan Society of Applied Physics (JSAP) Spring Meeting, *JSAP*, 2020. (Cancelled due to CO-VID19 pandemic.)
- C.3 D. Feng, B. M. Goldberg, M. N. Shneider, and R. B. Miles, “Pressure Field Measurements Using Light Scattering Diagnostics,” in 2019 Laser Diagnostics in Energy and Combustion Science, *Gordon Research Conferences*, 2019.

- C.4 L. Hansen, S. Reuter, K. Reck, B. M. Goldberg, D. Feng et al., “Energy transfer in interaction of non-equilibrium atmospheric pressure plasmas with substrates,” in XXXIV International Conference on Phenomena in Ionized Gases & 10th International Conference on Reactive Plasmas, 2019.
- C.5 D. Feng, B. M. Goldberg, M. N. Shneider, and R. B. Miles, “Towards Pressure Measurements Using Filtered Rayleigh Scattering,” in 71st Annual Meeting of the APS Division of Fluid Dynamics, *American Physical Society*, vol. Volume 63, Number 13, 2018.
- C.6 D. Feng, M. N. Shneider, and R. B. Miles, “Sensitivity Model of Pressure, Temperature, and Velocity Using Filtered Rayleigh Scattering” in International OSA Network of Students (IONS) Paris Conference, *Optical Society of America*, 2017.
- C.7 D. Feng, E. Foreman, and C. Murray, “Spectroscopic Study of the Simplest Criegee Intermediate” in 249th ACS National Meeting, *American Chemical Society*, 2015.
- C.8 D. Feng, I. Finneran, and G. Blake, “Analysis of CH₃CHO–(H₂O) Using Chirped Pulse Fourier Transform Microwave Spectroscopy” in Southern California Conferences for Undergraduate Research, 2014.
- C.9 D. Feng, J. Kar, V. Mojica, and D. Dunn-Rankin, “Methane Hydrate Formation and Generation” in University of California, Irvine (UCI) Undergraduate Research Symposium, 2014.
- C.10 D. Feng, D. Escorfet-Martin, and D. Dunn-Rankin, “2D-OH Planar Laser Induced Fluorescence” in UCI Undergraduate Research Symposium, 2013.

FUNDED PROPOSALS (CO-AUTHOR)

- D.1 DOE Phase IV: A Novel Coherent Combining Approach Towards High Peak and High Average Power Ultrafast Lasers (2023 – Present)
- D.2 SBIR Phase II: Three-Dimensional Density Imaging by Rayleigh Scattering (2019 – 2021)
- D.3 SBIR Phase II: Laser Diagnostic for Multiple Properties in Unseeded High-Speed Flows (2018 – 2021)

PATENTS

- E.1 T. P. Jenkins, David Feng et al. (2023) “A system and a method for measuring spatially resolved velocity and density simultaneously,” *U.S. Patent and Trademark Office, U.S. Department of Commerce*.

TEACHING EXPERIENCE

SAGE Camp, Lawrence Livermore National Laboratory 2022 – Present
Teaching Instructor

- Teach professional growth and development to a class of high school students.
- Develop the class outline with program organizers.
- Assist in SAGE Camp activities such as lunch, tours, & seminars.

National Association of Rocketry 2022 – Present
Rocketry Mentor

- Mentor to local school teams for the American Rocketry Challenge.
- Advice and consultation on how to model and optimize model rockets based on competition guidelines.
- Instruct student groups on the fundamentals of rocketry and the competition.

Lumiere Mentoring 2021 – 2023
Research Mentor

- Guide students into diverse research topics, such as rocket propulsion and biomechanical flight.
- Mentorship on research topic to write report and submit for appropriate publication.
- Instruct students on the fundamentals of basic physics required for their research.

Princeton University 2017 – 2019
Teaching Assistant (Mechanical & Aerospace Engineering)

Courses: Engineering Thermodynamics (lecture); Fluid Dynamics (lecture); Fluid Mechanics (laboratory)

- Lead weekly discussion classes to better understand course material.
- Assist students on homework course sets.
- Hold office hours and prepare students for quizzes, projects, and upcoming exams.

University of California, UC Irvine 2013 – 2015
Academic Peer Tutor

Courses: Single-variable Calculus; Introduction to Physics; Classical Physics

- Lead weekly discussion classes separate from main course to better understand course material.
- Develop curriculum for discussion; assist students on main course homework sets.
- Prepare students for quizzes, projects, and upcoming exams.

ORGANIZATION EXPERIENCE

Asian Pacific American Committee 2022 – Present
Lawrence Livermore National Laboratory
T-shirt & Media Committee Chair

Department of Mechanical & Aerospace Engineering 2018 – 2019
Princeton University
Environmental Sustainability Chair

Metrolaser, Inc. 2018
Laguna Hills, CA
Consultant

Princeton University Graduate Student Government 2017 – 2019
Princeton University
Photographer

Hyperloop Pod Design Competition 2016 – 2017
OpenLoop, Princeton University
Pod Analysis Member

Princeton American Chemical Society 2016
Princeton University
Mentor

COSMOS Summer School For Math & Science 2012-2014
University of California, Irvine
Student Volunteer

PROFESSIONAL ORGANIZATIONS

American Institute of Aeronautics & Astronautics (AIAA)

- Session Chair for AIAA SciTech 2024 Conference
- Peer reviewer for AIAA Journal

Gordon Research Conference

- Session Chair for Laser Diagnostics for Energy & Combustion 2019

Optica (Optical Society of America)

- Peer reviewer for Applied Optics Journal

AWARDS & HONORS

Japan Student Services Organization Scholarship	2019 – 2020
National Defense Science Engineering Graduate (NDSEG) Fellowship	2017 – 2021
Science, Mathematics, & Research For Transformation (SMART) Fellowship	2017
American Society of Mechanical Engineers (ASME) Scholarship	2015
Howard Hughes Medical Institute Grant Fellowship	2014
Great Lakes National STEM Scholarship	2014 – 2015
Society of American Military Engineers (SAME) Scholarship	2013 – 2015
Undergraduate Research Opportunity Program Grant	2012 – 2015
Asian Pacific Islander American Scholarship Foundation Scholarship	2011 – 2015