

Scott A. Diddams – Curriculum Vitae

Current Position

Robert H. Davis Discovery Learning Endowed Chair
Professor of Electrical Computer and Energy Engineering
Professor of Physics
University of Colorado Boulder
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Education & Training

JILA, University of Colorado, Postdoc 1996-2000, Optical Physics (T. Clement and J.L. Hall, advisors)
University of New Mexico, Department of Physics & Astronomy, Albuquerque, NM, 1996. Ph.D., Optical Science (J.-C. Diels, advisor)
Bethel College, St. Paul, MN, 1989. B.A., Physics (Summa Cum Laude).

Appointments

2023-present: Professor of Physics, University of Colorado Boulder (courtesy appointment)
2022-present: Robert H. Davis Discovery Learning Endowed Chair in the College of Engineering and Applied Science at the University of Colorado Boulder
2022-present: Professor of Electrical, Computer & Energy Engineering, University of Colorado Boulder
2022-present: Faculty Director, Quantum Engineering Initiative, University of Colorado Boulder
2013-2022: Professor Adjoint, Dept. of Physics, University of Colorado Boulder
2021-2022: Visiting Professor, Electrical, Computer, and Energy Engineering, Univ. of Colorado Boulder
2014-2022: Fellow, National Institute of Standards and Technology
2012-2013: Moore Distinguished Scholar, Caltech
2008-2013: Lecturer, Dept. of Physics, Univ. of Colorado Boulder
2007: Visiting Scientist, Max Planck Institute for Quantum Optics (group of Theodor W. Hänsch)
2000-2014: Physicist, National Institute of Standards and Technology
1998-2000: National Research Council Postdoctoral Fellow, National Institute of Standards and Technology, Quantum Physics Division, JILA, University of Colorado (John L. Hall, advisor)
1996-1998: Postdoctoral Research Associate, JILA, University of Colorado (Tracy Clement, advisor)
1990-1996: Teaching and Research Assistant, Univ. of New Mexico, Dept. of Physics and Astronomy
1988-1989: Technical aide, Fiber Optics Lab, 3-M Corporation, St. Paul, MN
1986-1989: Research & Teaching Assistant, Bethel College, St. Paul, MN

Awards & Honors

Fellow of IEEE (2024)
Holland Award for Outstanding Faculty Researcher—University of Colorado ECEE Department (2023)
Optica C.E.K Mees Medal for original use of optics across multiple fields (2023)
Department of Commerce Gold Medal for development of a chip-scale 2-photon optical clock (2021)
Distinguished Presidential Rank Award (2021)
Edward Uhler Condon Award for distinguished written exposition in science or technology (2021)
IEEE Photonics Society Laser Instrumentation Award (2021)
Department of Commerce Bronze Medal for quantum control of molecular ions (2021)
NASA Group Achievement Award for the NEID radial velocity spectrograph (2020)
OSA Paul F. Forman Team Engineering Excellence Award (2020)
IEEE I. I. Rabi Award (2017)
Fellow of NIST (2014)
Jacob Rabinow Award for Innovation (2014)
IEEE Trans. on Ultrasonics, Ferroelectrics and Frequency Control: Outstanding paper of the year (2013)
Moore Distinguished Scholar in Engineering and Applied Science, Caltech (2012-13)
Department of Commerce Silver Medal Award for novel applications of optical frequency combs (2011)
Arthur S. Flemming Award (2010)

Finalist, Berthold Leibinger Innovationspreis (2010)
Fellow of Optical Society of America (2009)
Fellow of American Physical Society (2009)
Lecturer at Wilhelm and Else Heraeus Summer School, Wittenberg, Germany (2007)
European Frequency and Time Forum Young Scientist Award (2007)
Presidential Early Career Award for Scientists and Engineers (2003)
Department of Commerce Gold Medal Award for revolutionizing the measurement of frequency (2001)
National Research Council Postdoctoral Fellow (1998-2000)
JILA Scientific Award (2000)
Univ. of New Mexico Dept. of Physics and Astronomy Durward D. Young, Jr. dissertation award (1996)
Univ. of New Mexico Center for Advanced Studies Graduate Fellowship (1994-95)

Research Activities

Precision measurements with optical frequency combs, optical clocks, astronomical spectroscopy, laser physics, ultrafast and nonlinear optics, nonlinear nano-photonics, microwave photonics, precision spectroscopy from the UV to THz.

Major Research Accomplishments:

- Invented and developed the first carrier-envelope stabilized femtosecond laser system. This technology has revolutionized the measurement of optical frequencies, is key to the development of optical clocks, and was part of the 2005 Nobel Prize in Physics. Frequency-stabilized mode-locked lasers have also been crucial for the generation of isolated attosecond laser pulses. [The first paper](#) on the topic was denoted a “[Milestone Letter](#)” at the 50th anniversary of Physical Review Letters. It and a [companion paper in Science](#) and have been cited more than a combined 4800 times.
- Built the femtosecond laser frequency comb technology and demonstrated the [first optical clock](#) based on a single Hg⁺ ion. The techniques described in [Science](#) and [PRL](#) have been cited over 1400 times and have been adopted by all laboratories pursuing research into advanced optical clocks.
- Demonstrated optical and microwave frequency synthesis at the 1×10^{-19} level with femtosecond laser frequency combs. Following four years of work, the key paper was [published in Science](#). It proved that the frequency comb was a perfect optical synthesizer and would not be a limitation in future optical clocks or spectroscopy. This paper has been cited over 400 times.
- Developed and employed novel femtosecond lasers with [sub-Hz linewidths](#) to make measurements of absolute atomic frequencies and frequency ratios with 18+ digits of precision. These are now the most precise measurements of any physical quantities. This infrastructure is critical to the comparison of atomic standards for tests of the constancy of fundamental constants and local position invariance. Among many papers co-authored in this area, two of the key ones were published in [PRL](#) and [Science](#) and have more than 2100 combined citations.
- Established new approaches to broadband spectroscopy in which the femtosecond laser frequency comb is itself used as a [probe for precision spectroscopy](#). Introduced a novel 2-dimensional diagnostic for rapid [spectral fingerprinting](#), and extended such techniques into the [mid-infrared](#) spectral region. The original paper in [Nature](#) has been cited over 800 times. Simple and robust [broad bandwidth infrared frequency combs](#) in the lab now rival the brightness and bandwidth of an infrared synchrotron beamline. These tools are being applied to infrared molecular spectroscopy and hyperspectral imaging.
- Introduced the technique of optical frequency division and used optically-stabilized frequency combs to generate ultra-low noise microwave signals—possessing phase noise and timing jitter significantly lower than what is achievable with the best conventional electronic sources. Here, a key discovery was the [limitations introduced](#) by high-speed photodetection, as well as ways to [circumvent and understand the quantum limitations](#). Key publications in [Nature Photonics](#), [Optics Letters](#) and [IEEE Photonics Journal](#) have combined citations exceeding 1000.
- Introduced gigahertz repetition-rate laser combs that are now critical to the most precise astronomical spectroscopy. Technology platforms include [10 GHz solid state lasers](#), in addition to [electro-optic combs](#) and [microresonator combs](#). This technology was employed at the Hobby-Eberly telescope where it yielded the [first comb-calibrated stellar spectra](#), and it has also been evaluated at the [IRTF](#) and [Keck](#) telescopes on Mauna Kea. Since 2018, a [30 GHz electro-optic frequency comb](#) runs continuously at the McDonald

Observatory. This frequency comb is used nightly for high-precision radial velocity exoplanet searches, and it has enabled more than 20 scientific discoveries by astronomer collaborators.

- Development and application of micro-resonator frequency combs, which enable frequency combs to be fabricated on a silicon chip. This work resulted in the [first self-referenced microcomb](#) and the application of these chip-scale devices to [optical frequency synthesis](#), a [microcomb optical clock](#), and [chip-scale optical clocks](#). An [early review paper in Science](#) motivated development in the field and has received over 2000 citations. This work is part of the NIST on a Chip Program and has motivated significant external research efforts across multiple funding agencies.

Professional Affiliations & Service

Fellow of American Physical Society, Fellow of OPTICA (formerly Optical Society of America) and Fellow of IEEE

Associate Editor, *Optica*, Optical Society of America (2015-2021)

Reviewer for NSF, NIST, AFOSR, ERC, Nature, Nature Communications, Nature Photonics, Nature Physics, Nature Scientific Reports, Science, Science Advances, Physical Review Letters, Physical Review A, Physical Review Applied, Applied Physics Letters, Optica, Optics Letters, Optics Express, Applied Optics, JOSA B, IEEE Journal of Lightwave Technology, IEEE Journal of Selected Topics in Quantum Electronics, European Journal of Physics D, Journal of Optics B, IEEE Journal of Quantum Electronics, Photonics Technology Letters, Optics Communications, Applied Physics B.

Guest editor of IEEE Journal of Selected Topics in Quantum Electronics (August 2003)

Program committee for Conference on Precision Electromagnetic Measurement (2002, 2004, 2006)

Co-organizer of John Hall Symposium (2004)

Program committee for IEEE/LEOS Summer Topicals (2005)

Program committee for ESA International Workshop on Optical Clocks (2005)

Program committee for IEEE Frequency Control Symposium (2006-2012)

Program chair for IEEE/LEOS Summer Topical—OFTMAG (2007)

Program topical chair “Frequency Combs and their Applications” CLEO-Europe/IQEC (2007)

Guest editor European J. Phys. D (2007)

Program committee for IEEE Microwave Photonics (2015)

Co-chair of Caltech Keck Institute for Space Studies (KISS) Workshop on Optical Frequency Combs for Space Applications (2015-16)

Program committee for OSA Mid-infrared Coherent Sources (2016)

Program committee for “Precision Metrology and Frequency Combs” CLEO-Europe/EQEC (2017)

Program committee for “Nonlinear Optics and Novel Phenomena” CLEO (2018-2019)

IEEE Frequency Control Symposium Awards Committee (2020-2022)

International Steering Committee for the 9th Symposium on Frequency Standards and Metrology (2023)

Conference Organizing Committee for International Conference on Laser Spectroscopy, ICOLS (2023)

Publications and Presentations

305 Peer-reviewed papers, books and proceedings, including papers in *Science* (14), *Phys. Rev. Lett.* (21), *Phys. Rev. X* (2), *Nature* (4), *Nature Photonics* (10), *Nature Communications* (5), and *Optica* (14).

183 Invited talks and colloquia

13 Patents granted or submitted

269 Contributed conference papers

[Web of Science](#): >23,300 citations, h-index of 78

[Google Scholar](#): >40,000 citations, h-index of 98

Journal Articles, Books, and Proceedings

315. T-H.Wu, L. Ledezma, C. Fredrick, P. Sekhar, R. Sekine, Q. Guo, R. M. Briggs, A. Marandi & S. A. Diddams C. “Visible-to-ultraviolet frequency comb generation in lithium niobate nanophotonic waveguides,” *Nat. Photon.* (2024). <https://doi.org/10.1038/s41566-023-01364-0>

314. G. Stefánsson, S. Mahadevan, Y. Miguel, P. Robertson, M. Delamer, S. Kanodia, C. I. Cañas, J. N. Winn, J. P. Ninan, R. C. Terrien, R. Holcomb, E. B. Ford, B. Zawadzki, B. P. Bowler, C. F. Bender, W. D. Cochran, S. Diddams, M. Endl, C. Fredrick, S. Halverson, F. Hearty, G. J. Hill, A. S. J. Lin, A. J. Metcalf, A. Monson, L. Ramsey, A. Roy, C. Schwab, J. T. Wright, and G. Zeimann, "A Neptune-mass exoplanet in close orbit around a very low-mass star challenges formation models," *Science* (1979) 382, 1031–1035 (2023).
313. J. E. Libby-Roberts, M. Schutte, L. Hebb, S. Kanodia, C. I. Cañas, G. Stefánsson, A. S. J. Lin, S. Mahadevan, W. Parts(they/them), L. Powers, J. Wisniewski, C. F. Bender, W. D. Cochran, S. A. Diddams, M. E. Everett, A. F. Gupta, S. Halverson, H. A. Kobulnicky, A. F. Kowalski, A. Larsen, A. Monson, J. P. Ninan, B. A. Parker, L. W. Ramsey, P. Robertson, C. Schwab, T. N. Swaby, and R. C. Terrien, "An In-depth Look at TOI-3884b: A Super-Neptune Transiting an M4Dwarf with Persistent Starspot Crossings," *Astron J* 165, 249 (2023).
312. C. I. Cañas, S. Kanodia, J. Libby-Roberts, A. S. J. Lin, M. Schutte, L. Powers, S. Jones, A. Monson, S. Wang, G. Stefánsson, W. D. Cochran, P. Robertson, S. Mahadevan, A. F. Kowalski, J. Wisniewski, B. A. Parker, A. Larsen, F. A. L. Chapman, H. A. Kobulnicky, A. F. Gupta, M. E. Everett, B. E. Penprase, G. Zeimann, C. Beard, C. F. Bender, K. D. Colón, S. A. Diddams, C. Fredrick, S. Halverson, J. P. Ninan, L. W. Ramsey, A. Roy, and C. Schwab, "TOI-3984 A b and TOI-5293 A b: Two Temperate Gas Giants Transiting Mid-M Dwarfs in Wide Binary Systems," *Astron J* 166, 30 (2023).
311. A. S. J. Lin, J. E. Libby-Roberts, J. A. Alvarado-Montes, C. I. Cañas, S. Kanodia, T. Han, L. Hebb, E. L. N. Jensen, S. Mahadevan, L. C. Powers, T. N. Swaby, J. Wisniewski, C. Beard, C. F. Bender, C. H. Blake, W. D. Cochran, S. A. Diddams, R. C. Frazier, C. Fredrick, M. Gully-Santiago, S. Halverson, S. E. Logsdon, M. W. McElwain, C. Morley, J. P. Ninan, J. Rajagopal, L. W. Ramsey, P. Robertson, A. Roy, C. Schwab, G. Stefánsson, D. J. Stevens, R. C. Terrien, and J. T. Wright, "The Unusual M-dwarf Warm Jupiter TOI-1899 b: Refinement of Orbital and Planetary Parameters," *Astron J* 166, 90 (2023).
310. S. Kanodia, A. S. J. Lin, E. Lubar, S. Halverson, S. Mahadevan, C. F. Bender, S. E. Logsdon, L. W. Ramsey, J. P. Ninan, G. Stefánsson, A. Monson, C. Schwab, A. Roy, L. A. Paredes, E. Golub, J. Higuera, J. Klumeyer, W. McBride, C. Blake, S. A. Diddams, F. Grisé, A. F. Gupta, F. Hearty, M. W. McElwain, J. Rajagopal, P. Robertson, and R. C. Terrien, "Stable Fiber-illumination for Extremely Precise Radial Velocities with NEID," *Astron J* 166, 105 (2023).
309. G. Stefansson, S. Mahadevan, Y. Miguel, P. Robertson, M. Delamer, S. Kanodia, C. Cañas, J. Winn, J. Ninan, R. Terrien, R. Holcomb, E. Ford, B. Zawadzki, B. P. Bowler, C. Bender, W. Cochran, S. Diddams, M. Endl, C. Fredrick, S. Halverson, F. Hearty, G. J. Hill, A. Lin, A. Metcalf, A. Monson, L. Ramsey, A. Roy, C. Schwab, J. Wright, and G. Zeimann, "An extreme test case for planet formation: a close-in Neptune orbiting an ultracool star," (2023).
308. S. E. Jones, G. Stefansson, K. Masuda, J. E. Libby-Roberts, C. N. Gardner, R. Holcomb, C. Beard, P. Robertson, C. I. Cañas, S. Mahadevan, S. Kanodia, A. S. J. Lin, H. A. Kobulnicky, B. A. Parker, C. F. Bender, W. D. Cochran, S. A. Diddams, R. B. Fernandes, A. F. Gupta, S. Halverson, S. L. Hawley, F. R. Hearty, L. Hebb, A. Kowalski, J. Lubin, A. Monson, J. P. Ninan, L. Ramsey, A. Roy, C. Schwab, R. C. Terrien, and J. Wisniewski, "TOI-2015b: A Warm Neptune with Transit Timing Variations Orbiting an Active mid M Dwarf," (2023).
307. S. Kanodia, S. Mahadevan, J. Libby-Roberts, G. Stefansson, C. I. Cañas, A. A. A. Piette, A. Boss, J. Teske, J. Chambers, G. Zeimann, A. Monson, P. Robertson, J. P. Ninan, A. S. J. Lin, C. F. Bender, W. D. Cochran, S. A. Diddams, A. F. Gupta, S. Halverson, S. Hawley, H. A. Kobulnicky, A. J. Metcalf, B. A. Parker, L. Powers, L. W. Ramsey, A. Roy, C. Schwab, T. N. Swaby, R. C. Terrien, and J. Wisniewski, "TOI-5205b: A Short-period Jovian Planet Transiting a Mid-M Dwarf," *Astron J* 165, 120 (2023).
306. J. E. Libby-Roberts, M. Schutte, L. Hebb, S. Kanodia, C. Canas, G. Stefansson, A. S. J. Lin, S. Mahadevan, W. Parts, L. Powers, J. Wisniewski, C. F. Bender, W. D. Cochran, S. A. Diddams, M. E. Everett, A. F. Gupta, S. Halverson, H. A. Kobulnicky, A. F. Kowalski, A. Larsen, A. Monson, J. P. Ninan, B. A. Parker, L. W. Ramsey, P. Robertson, C. Schwab, T. N. Swaby, and R. C. Terrien, "An In-Depth Look at TOI-3884b: a Super-Neptune Transiting a M4 Dwarf with Persistent Star Spot Crossings," (2023).
305. N. Hoghooghi, S. Xing, P. Chang, D. Lesko, A. Lind, G. Rieker, S. Diddams "1-GHz mid-infrared frequency comb spanning 3 to 13 μm ," *Light Sci Appl* 11, 264 (2022). <https://doi.org/10.1038/s41377-022-00947-w>

304. C. A McLemore, N. Jin, M. Kelleher, J. Hendrie, D. Mason, Y. Luo, D. Lee, P. Rakich, S. A. Diddams, F. Quinlan, "Thermal noise-limited laser stabilization to an 8 mL volume Fabry-Perot reference cavity with microfabricated mirrors," arXiv:2203.15915 (2022). <https://doi.org/10.48550/arXiv.2203.15915>
303. N. Jin, C. A. McLemore, D. Mason, J. P. Hendrie, Y. Luo, M. L. Kelleher, P. Kharel, F. Quinlan, S. A. Diddams, P. T. Rakich, "Micro-fabricated mirrors with finesse exceeding one million," *Optica* **9**, 965-970 (2022). <https://doi.org/10.1364/OPTICA.467440>
302. D. Lesko, K.F. Chang, S.A. Diddams, "High-sensitivity Frequency Comb Carrier-Envelope Phase Metrology in Solid State High Harmonic Generation," to appear in *Optica*, arXiv:2205.07330, (2022). <https://doi.org/10.48550/arXiv.2205.07330>
301. J. Guo, C. A McLemore, C. Xiang, D. Lee, L. Wu, W. Jin, M. Kelleher, N. Jin, D. Mason, L. Chang, A. Feshali, M. Paniccia, P. T Rakich, K. J Vahala, S. A. Diddams, F. Quinlan, J. E. Bowers, "Chip-Based Laser with 1 Hertz Integrated Linewidth" *Science Advances*, **8** (43), eabp9006 (2022) <https://doi.org/10.1126/sciadv.abp9006>
300. R. C. Terrien et al, "Rotational Modulation of Spectroscopic Zeeman Signatures in Low-mass Stars," *Astrophys. J. Lett.* **927**, L11 (2022). <https://doi.org/10.3847/2041-8213/ac4fc8>
299. C. Fredrick, F. Olsen, R. Terrien, S. Mahadevan, F. Quinlan, and S. A. Diddams, "Thermal-light heterodyne spectroscopy with frequency comb calibration," *Optica* **9**, 221-230 (2022). <https://doi.org/10.1364/OPTICA.440389>
298. Corey Beard et al "TOI-1696 and TOI-2136: Constraining the Masses of Two Mini-Neptunes with the Habitable-Zone Planet Finder," *Astronomical J.* **163**, 286 (2022). <https://doi.org/10.3847/1538-3881/ac69ec>
297. G. Stefánsson et al "The Warm Neptune GJ 3470b Has a Polar Orbit," *Astrophys. J. Lett.* **931**, L15 (2022). <https://doi.org/10.3847/2041-8213/ac6e3c>
296. Caleb I. Cañas et al, "TOI-3714 b and TOI-3629 b: Two Gas Giants Transiting M Dwarfs Confirmed with the Habitable-zone Planet Finder and NEID," *Astronomical J.* **164**, 50 (2022). <https://doi.org/10.3847/1538-3881/ac7804>
295. Shubham Kanodia et al. "High-resolution Near-infrared Spectroscopy of a Flare around the Ultracool Dwarf vB 10," *Astrophys. J.* **925**, 155 (2022). <https://doi.org/10.3847/1538-4357/ac3e61>
294. Caleb I. Cañas et al "A Hot Mars-sized Exoplanet Transiting an M Dwarf," *Astronom. J.* **163**, 3 (2022). <https://doi.org/10.3847/1538-3881/ac3088>
293. Suvrath Mahadevan et al. "The Habitable-zone Planet Finder detects a terrestrial-mass planet candidate closely orbiting Gliese 1151: The likely source of coherent low-frequency radio emission from an inactive star," *Astrophys. J. Lett.* **919** L9 (2021). <https://doi.org/10.3847/2041-8213/abe2b2>
292. S. Xing, D.M.B. Lesko, T. Umeki, A. J. Lind, N. Hoghooghi, T.-H. Wu, S. A. Diddams, "Single-cycle all-fiber frequency comb," *APL Photon.* **6**, 086110 (2021). <https://doi.org/10.1063/5.0055534>
291. V. Krishnamurthy et al, "Nondetection of Helium in the Upper Atmospheres of TRAPPIST-1b, e, and f," *Astronomical J.* **162**, 82 (2021). <https://doi.org/10.3847/1538-3881/ac0d57>
290. J Crass, BS Gaudi, S Leifer, C Beichman, C Bender, et al. "Extreme precision radial velocity working group final report," arXiv:2107.14291, (2021) <https://doi.org/10.48550/arXiv.2107.14291>
298. S. Kanodia et al, "A Harsh Test of Far-field Scrambling with the Habitable-zone Planet Finder and the Hobby–Eberly Telescope," *Astrophys. J.* **912**, 15 (2021). <https://doi.org/10.3847/1538-4357/abec83>
288. Jack Lubin et al, "Stellar Activity Manifesting at a One-year Alias Explains Barnard b as a False Positive" *Astronomical J.* **162**, 61 (2021). <https://doi.org/10.3847/1538-3881/ac0057>
287. D. Lee, T. Nakamura, J. Zang, J. C. Campbell, S. A. Diddams, and F. Quinlan, "Reduction of Flicker Phase Noise in High-Speed Photodetectors under Ultrashort Pulse Illumination," *IEEE Photonics Journal* **13**, 5500213 (2021). <https://doi.org/10.1109/JPHOT.2021.3075381>
286. Z. L. Newman, V. Maurice, T. Fortier, C. Frederick, S. A. Diddams, J. Kitching, and M. T. Hummon, "High-performance, compact optical standard," *Opt. Lett.* **46**, 4702 (2021). <https://doi.org/10.1364/OL.435603>

285. J. Rutledge, A. Catanese, D.D. Hickstein, S.A. Diddams, T. Allison, A. Kowligy, “Broadband ultraviolet-visible frequency combs from cascaded high-harmonic generation in quasi-phase-matched waveguide,” *JOSA B* **38**, 2252-2260 (2021). <https://doi.org/10.1364/JOSAB.427086>
284. R. C. Terrien, J. P. Ninan, S. A. Diddams, S. Mahadevan, S. Halverson, C. Bender, C. Fredrick, F. Hearty, J. Jennings, A. J. Metcalf, A. Monson, A. Roy, C. Schwab, G. Stefánsson, “Broadband stability of the Habitable Zone Planet Finder Fabry-Pérot etalon calibration system:evidence for chromatic variation,” to appear in *Astronomical Journal* **161**, 252 (2020). <https://doi.org/10.3847/1538-3881/abef68>
283. G. Stefánsson, et al., “A Mini-Neptune and a Venus-Zone Planet in the Radius Valley Orbiting the Nearby M2-dwarf TOI-1266: Validation with the Habitable-zone Planet Finder,” *Astronomical Journal*, **160**, 259 (2020) <https://doi.org/10.3847/1538-3881/abbe19>
282. G. Stefansson, et al., “The Habitable-zone Planet Finder reveals a High Mass and a Low Obliquity for the Young Neptune K2-25B,” *Astronomical Journal*, 160:192 (28pp), (2020) <https://doi.org/10.3847/1538-3881/abb13a>
281. S. Kanodia, et al., “TOI-1728b: The Habitable-zone Planet Finder Confirms a Warm Super-Neptune Orbiting an M-dwarf Host,” *Astrophysical Journal* **899**, 29 (2020) <https://doi.org/10.3847/1538-4357/aba0a2>
280. C. Cañas, et al., “A Warm Jupiter Transiting an M Dwarf: A TESS Single-transit Event Confirmed with the Habitable-zone Planet Finder,” *Astronomical Journal* **160**, 147 (2020) <https://doi.org/10.3847/1538-3881/abac67>
279. F. Lecocq, F. Quinlan, K. Cicak, J. Aumentado, S. A. Diddams, J. D. Teufel, “Control and readout of a superconducting qubit using a photonic link,” *Nature* **591**, 575-579 (2021). <https://doi.org/10.1038/s41586-021-03268-x>
278. M. I. Bodine, J.-D.Deschênes, I. H. Khader, W. C. Swann, H. Leopardi, K. Beloy, T. Bothwell, S.M. Brewer, S. L. Bromley, J.-S. Chen, S. A. Diddams, R.J. Fasano, T. M. Fortier, Y. S. Hassan, D. B. Hume, D. Kedar, C. J. Kennedy, A. Koepke, D. R. Leibrandt, A. D. Ludlow, W. F. McGrew, W. R. Milner, D. Nicolodi, E. Oelker, T. E. Parker, J. M. Robinson, S. Romish, S. A. Schäffer, J. A. Sherman, L. Sonderhouse, J. Yao, J. Ye, Xi. Zhang, N. R. Newbury and L. C. Sinclair, “Optical Atomic Clock Comparison through Turbulent Air,” *Phys. Rev. Research* **2**, 033395 (2020). <https://doi.org/10.1103/PhysRevResearch.2.033395>
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1. S. A. Diddams and J.-C. Diels, "White light interferometry and Fourier spectroscopy," in Proceedings of Lab Focus '93, R. W. Peterson, ed. (American Association of Physics Teachers, Boise, 1993).

Patents

13. F. Quinlan, J. Tüefel, S. Diddams, J. Aumentado, J. Davila-Rodriguez, F. LeCoq, "Delivering Signals To Cryogenic Environments Via Photonic Links," US-2023-0059433A1
12. S. Diddams, H. Timmers, A. Kowligy, A. Lind, S. Papp, "Method and apparatus for generating mid-infrared frequency combs," US Patent 11,226,534B2.
11. Franklyn Quinlan, Scott Diddams, Andrew Ludlow, Frederick Baynes, Josue Davila-Rodriguez, "Optical Reference Cavity," US Patent # 10,931,077B2
10. Scott Papp, David Carlson, Dan Hickstein, Scott Diddams, "Ultrafast electro-optic laser" US Patent US11,011,882B2
9. Scott Papp, Scott Diddams, Kartik Srinivasan, John Kitching, Matt Hummon, Kerry Vahala, David Johnson, Cort Johnson, Leo Hollberg, "Rb two-photon chip-scale optical clock" provisional patent 2019.
8. Kerry Vahala, John E. Bowers, Kartik A. Srinivasan, Scott B. Papp, Scott A. Diddams, "Optical frequency measurement and control using dual optical frequency combs" US Patent # US10,067,031B2.
8. Kerry Vahala, Jiang Li, Scott Diddams, Xu Yi, Hansuek Lee, "Dual-frequency optical source," European Patent 3 097 614 B1
7. S. Papp, S. Diddams, D. Cole, K. Beha, "Electronic light synthesizer and process for electronically synthesizing light," US Patent #10,048,567 B2.
6. K. Vahala, S. Diddams, J. Li, X Yi, H. Lee, "Stabilized Microwave Frequency Source," US Patent #10,009,103 B2.
5. F. Quinlan, T. Fortier, A. Rolland, and S. Diddams, "Signal generator, process for and using same," US Patent #10,050,722.
4. S. A. Diddams, P. Del'Haye and S. Papp, "Laser Machining and Mechanical Control of Optical MicroResonators," US Patent # 9,341,781.
3. S.T. Cundiff, S.A. Diddams, J.L. Hall and D.J. Jones, "Mode-locked pulsed laser system and method," US Patent #6,850,543.
2. J. Hall, J. Ye, S. A. Diddams, and L.-S. Ma, "Comb-generating optical cavity that includes an optical amplifier and optical modulator," US Patent #6,201,638.
1. S. A. Diddams, S. Prein, and J.-C. Diels, "Broadband ultrashort pulse measuring device using non-linear electronics," US Patent #6,025,911.

Invited Presentation, Talks and Colloquia

183. S. Diddams, "Frequency Combs and Quantum Metrology," Department of Physics Colloquium at Colorado School of Mines (2022)
182. S. Diddams, "Frequency Combs and Quantum Metrology," Department of Physics Colloquium at Colorado School of Mines (2022)
181. S. Diddams, "Frequency Combs and Quantum Metrology," Applied Physics Seminar at Stanford University (2022)
180. S. Diddams, "An Optical Sampling Oscilloscope," plenary talk at OPTICA Mid-Infrared Coherent Sources (2022).
179. S. Diddams, "Counting the Cycles of Light," presented to Colorado Photonics Industry Association (2022).

178. S. Diddams, "Synthesizing Light," invited talk at AusIMPACT21, Australian workshop on Integrated Microcavities for Photonic Applications of Comb Technology (2021).
177. S. Diddams, "Synthesizing Light," Physics department colloquium at UCLA (2021).
176. S. Diddams, "Optical Frequency Combs: Synthesizers of Light," colloquium at Univ. California, Davis (2021).
175. S. Diddams, "Synthesizing Light," colloquium at the University of Richmond (2021).
174. S. Diddams, "Infrared Frequency Comb Synthesis and Sampling," invited talk presented at OSA Optical Sensors meeting (2021).
173. S. Diddams, "Optical frequency combs for broad bandwidth, high-speed, hyperspectral analysis," presented at NIST-AstraZeneca workshop (2021).
172. S. Diddams, "Towards a Quantum Optical Sampling Oscilloscope," invited talk at IS-NTT, Atsugi, Japan (2021).
171. S. Diddams, "Single-Cycle Optical Frequency Combs," invited talk at EOSAM, Rome (2021).
170. S. Diddams, "Optical Frequency Combs 2.0," University of Colorado CU-Bit colloquium (2021).
169. S. Diddams, "Can you count to one quadrillion in a second?" public lecture given at the University of Colorado (2021).
168. S. Diddams, "Synthesizing Light," colloquium at Electrical Engineering, University of Colorado (2021).
167. S. Diddams, "Synthesizing Light," colloquium at Aston University (2021).
166. S. Diddams, "Twenty years of optical frequency combs," invited talk at IEEE Photonics Conference, Vancouver (2020).
165. S. Diddams, "Synthesizing Light," colloquium at Texas A&M, College Station (2020).
164. S. Diddams, "20 Years of Optical Frequency Combs: Science, Technology and Applications, tutorial talk at CLEO, San Jose (2020)
163. S. Diddams, "Precision Astronomical Spectroscopy with Laser Frequency Combs," invited talk at APS April Meeting, Washington DC (2020).
162. S. Diddams, "Synthesizing Light," colloquium at Carnegie Mellon University, Pittsburgh (2019).
161. S. Diddams, "Infrared electric-field sampled frequency comb spectroscopy," invited talk at CLEO Europe, Munich (2019).
160. S. Diddams, "Laser Frequency Combs: Optical Frequency Synthesizers for Quantum Metrology," keynote talk at Workshop on Quantum Technologies, Queretaro, Mexico (2019).
159. S. Diddams, "Infrared Optical Frequency Comb Generation with Nonlinear Ultrafast Photonics," invited talk at OSA Advanced Photonics, Burlingame (2019).
158. S. Diddams, "Optical Clocks and Synthesizing Light with Microcombs," invited talk at the OSA Frontiers in Optics meeting, Washington DC (2019).
157. S. Diddams, "Optical Frequency Combs: From Lab Scale to Chip Scale," invited talk Photonics North, Quebec City (2019).
156. S. Diddams, "Broad bandwidth laser frequency combs for terrestrial and astronomical spectroscopy," invited talk at the annual meeting of the American Chemical Society, Boston (2018).
155. S. Diddams, "Optical Frequency Combs: From Lab Scale to Chip Scale," invited talk at ALPS, Yokohama (2018).
154. S. Diddams, "Synthesizing Light," colloquium at University of Arizona Optical Sciences Center, Tucson (2018).
153. S. Diddams, "The History and Presence of High-resolution Laser Spectroscopy and its Applications," keynote talk at the SPIE Boulder Damage Symposium, Boulder (2018).
152. S. Diddams, "Infrared laser frequency combs: generation and spectroscopic applications," invited talk at DAMOP, Ft. Lauderdale (2018).
151. S. Diddams, "Precision Optical Timing: An Opportunity for Integrated Photonics," invited talk at DARPA ERI Summit, San Francisco (2018).

150. S. Diddams, “Synthesizing Light: New Tools, Wavelengths and Opportunities,” colloquium at Max Planck Institute for Quantum Optics, Garching (2018).
149. S. Diddams, “Infrared Astronomical Spectroscopy and Radial Velocity Measurements with 10 cm/s Precision,” Seminar at NSF Headquarters, Alexandria VA (2018).
148. S. Diddams, “Synthesizing Light,” colloquium at NTT Basic Research Labs, Atsugi (2018).
147. S. Diddams, “Dual-Comb Electric Field Sampled Infrared Spectroscopy,” invited talk at OSA Fourier Transform Spectroscopy, Singapore (2018).
146. S. Diddams, “Kerr-microresonator combs for low-noise frequency synthesis,” invited talk at SPIE Photonics West, San Francisco (2018).
145. S. Diddams, “Infrared laser frequency combs: generation and spectroscopic applications,” seminar at ThorLabs, Newton, NJ (2018).
144. S. Diddams, “Synthesizing Light,” colloquium at University of Electro Communications, Tokyo (2018).
143. S. Diddams, “Synthesizing Light,” colloquium at University of New Mexico (2018).
142. S. Diddams, “Optical Frequency Combs: From Lab Scale to Chip Scale,” colloquium at Boston University (2017).
141. S. Diddams, “Integrated Photonics for Mid-infrared Frequency Comb Generation and Spectroscopy,” presented by Nima Nader in my absence at the IEEE Summer Topicals, San Juan, Puerto Rico (2017).
140. S. Diddams, “Photonic Frequency Synthesis from RF to THz,” presented at the IEEE Photonics Conference, Orlando (2017).
139. S. Diddams, “Optical Frequency Combs for Clocks, Spectroscopy and Astronomy,” invited talk at OSA IONS meeting, Balvanyos (2017).
138. S. Diddams, “Integrated nonlinear optics for spectroscopy and precision frequency metrology,” invited talk at the group retreat of Philip Russel, Max Planck Institute for the Science of Light, Ringberg (2017).
137. S. Diddams, “Optical Frequency Combs: From Lab Scale to Chip Scale” colloquium at the Stony Brook University (2017).
136. S. Diddams, “Advances in optical frequency combs and their applications” colloquium at the Princeton University (2016).
135. S. Diddams, “Advances in optical frequency combs and their applications” colloquium at the Max Planck Institute for the Science of Light, Erlangen (2016).
134. S. Diddams and S. Papp, “Frequency Synthesis with Chip-Scale Microresonators,” presented at OSA Optical Fiber Communications Conference, Anaheim (2016).
133. S. Diddams and S. Papp, “Self-referenced frequency stabilization of a microresonator frequency comb,” presented at the NASA Fundamental Physics Workshop, Dana Point (2016).
132. S. Diddams, “Advances in Optical Frequency Combs and their Applications,” keynote talk presented at Europhoton 2016, Vienna (2016).
131. S. Diddams, “Laser and Parametric Optical Frequency Combs,” presented at the Optical Society of America’s Siegman Summer School on Lasers and Nonlinear Optics, Barcelona (2016).
130. S. Diddams, “Optical Frequency Combs: Nonlinear Optics and the Meeting of the Ultrafast and Ultrastable,” short course presented at the São Paulo School of Advanced Science on Nanophotonics and XV Jorge Andre Swieca School on Nonlinear and Quantum Optics, Campinas Brazil (2016).
129. S. Diddams, “Fundamentals of frequency combs: What they are and how they work,” presented at the Keck Institute for Space Sciences, Pasadena (2015)
128. S. Diddams, S. Papp & K. Vahala, “Precision frequency metrology with parametric microresonator combs,” presented at OSA Integrated Photonics Research, Silicon and Nanophotonics, Boston (2015).
127. S. Diddams, “Optical Frequency Combs for Astronomical Spectrograph Calibration,” presented at workshop on Pathways Towards Habitable Planets, Bern (2015)
126. S. Diddams, “Optical Frequency Combs for Astronomical Spectrograph Calibration,” presented at the Extreme Precision Radial Velocity Workshop, Yale (2015)

125. S. Diddams, S. Papp & K. Vahala, "Precision frequency metrology with microresonator combs," presented at SPIE Photonics West, San Francisco (2015).
124. S. Diddams, "Optical Frequency Combs: From Lab Scale to Chip Scale," colloquium at the Laboratoire Kastler Brossel, Paris (2015).
123. S. Diddams, "Optical Frequency Combs: From Lab Scale to Chip Scale," presented at the 8th Symposium on Frequency Standards and Metrology, Potsdam (2015).
122. S. Diddams, S. Papp & K. Vahala, "Frequency metrology and optical clocks with microresonator combs," presented at NASA Fundamental Physics Workshop, Pasadena (2014).
121. S. Diddams, "Optical Frequency Combs: Moving from Lab Scale to Chip Scale," colloquium presented at ICFO, Barcelona (2014).
120. S. Diddams, "The long and short of optical time keeping," University of Colorado Physics Colloquium, Boulder (2014)
119. S. Diddams, "Photonic generation of ultrastable microwave signals," presented at Caltech Applied Physics Seminar, Pasadena (2014)
118. S. Diddams, "Photonic generation of ultrastable microwave signals," presented at PQE Snowbird (2014).
117. S. B. Papp, P. Del'Haye, D. C. Cole, K. Beha, S. A. Diddams, H. Lee, J. Li, K. J. Vahala, "An Optical Microcomb Supporting Fundamental Physics Research on the International Space Station," presented at NASA ASSGR, Orlando (2013).
116. S. Diddams, "Optical Frequency Combs from A to Z," presented at OSA Frontiers in Optics (2013).
115. S. Diddams, T. Fortier, S. Papp & F. Quinlan, "Frequency combs for optical clocks and low-noise oscillators," presented at APS Four-Corners Meeting, Denver (2013).
114. S. Diddams, "Optical Frequency Combs: Moving from Lab Scale to Chip Scale," presented at UC Santa Barbara (2013).
113. Scott A. Diddams, Florian Adler, Tyler Neely, Kevin Knabe, Daniel Maser & Lora Nugent-Glandorf, "Frequency comb sources and techniques for mid-infrared spectroscopy and sensing," presented at CLEO, San Jose (2013).
112. S. Diddams, "Optical Frequency Combs: Moving from Lab Scale to Chip Scale," presented at ICOLS, Berkeley (2013).
111. S. Diddams & Chris Oates, "A guide to building an optical clock," short course presented at CLEO, San Jose (2014).
110. S. Diddams, "The evolving optical frequency comb," presented at Univ. of New Mexico Optics Colloquium, Albuquerque (2013).
109. Lora Nugent-Glandorf, Tyler Neely, Florian Adler, Kevin Knabe and Scott A. Diddams, "Mid-infrared Frequency Comb Sources for Rapid and Broadband Trace-Gas Detection," presented at Ultrafast Optics, Davos (2013).
108. S. Diddams, "Optical frequency comb sources and applications," presented at Europhoton, Stockholm (2012)
107. T. Fortier, S. Diddams, "Optical frequency combs: looking toward optical frequency measurements at the 10^{-18} level," presented at SPIE, San Diego (2010).
106. F. Quinlan, T. M. Fortier, M. S. Kirchner, J. A. Taylor, J. C. Bergquist, T. Rosenband, N. Lemke, A. Ludlow, Y. Jiang, C. W. Oates, S. A. Diddams, "Optical frequency combs for low phase noise microwave generation," presented at URSI GASS, Istanbul (2011).
105. S. Diddams & Chris Oates, "A guide to building an optical clock," short course presented at CLEO, San Jose (2012).
104. S. A. Diddams, "Synthesis of low jitter optical and microwave waveforms with optical frequency combs," Worldwide Great Scholars Workshop, Yonsei Univ. Seoul, Korea (2012).
103. S. Papp and S. A. Diddams, "Characterization of picosecond pulse trains from a microresonator optical frequency comb," SPIE Photonics West, San Francisco (2012).
102. S. A. Diddams, "Development and Application of Optical Frequency Combs," Laser Applications to Chemical, Security and Environmental Analysis, San Diego (2012).

101. S. A. Diddams, "Generation of microwaves with ultra-low phase noise using optical frequency combs," presented at Johns Hopkins Applied Physics Lab, Baltimore (2011).
100. S. A. Diddams, "Combing through earth and space: Broad bandwidth approaches to optical and infrared spectroscopy," U. of Virginia AMO Colloquium (2011).
99. S. Papp and S. A. Diddams, "Control and characterization of picosecond pulse trains from a microresonator frequency comb," Nonlinear Optics, Kauai (2011).
98. S. A. Diddams, "Synthesis of low jitter optical and microwave waveforms with optical frequency combs," Univ. of Colorado Optics Seminar (2011).
97. S. A. Diddams, "Combing through earth and space: Broad bandwidth approaches to optical and infrared spectroscopy," Symposium on A Revolution in Spectroscopy by the Optical Frequency Comb, Tsukuba, Japan (2011).
96. S. A. Diddams, T. Neely, L. Nugent-Glandorf, F. Adler, K. Knabe, P. Williams, F. Giorgetta, E. Baumann, I. Coddington, A. Zolot and N. Newbury, "Broad Bandwidth Trace Gas and Standoff Detection with Infrared Frequency Comb Sources," FACSS, Reno (2011).
95. S. A. Diddams, F. Adler, T. Fortier, M. Kirchner, S. Meyer, T. Neely, L. Nugent-Glandorf, S. Papp, F. Quinlan, J. Taylor, G. Ycas, "The evolving optical frequency comb: Expanding applications for a precision optical frequency synthesizer," IEEE FCS and EFTF Joint meeting, San Francisco (2011).
94. S. A. Diddams, "Science and Technology with Optical Frequency Combs," CLEO invited tutorial, Baltimore (2011).
93. S. A. Diddams and C. Oates, "A Guide to Building an Optical Clock," CLEO Short Course, San Jose (2010).
92. S. A. Diddams, "Low jitter optical and microwave waveform synthesis with frequency combs," Microwave Photonics Arbitrary Waveform Generation Workshop, Montreal (2010).
91. S. A. Diddams, "Use of Lasers in Time and Frequency Applications," OSA Frontiers in Optics, Rochester (2010).
90. S. A. Diddams, "Optical Combs with Large Mode Spacing: Sources and Applications," SPIE Photonics West, San Francisco (2010).
89. S. A. Diddams, "Mid-infrared frequency comb spectroscopy: sources and detection techniques," Stanford Photonics Research Center Annual Symposium, Palo Alto (2010).
88. S. A. Diddams, T. Johnson, and L. Nugent-Glandorf, "Mid-infrared frequency comb up-conversion spectroscopy", American Chemical Society Annual meeting, Boston (2010).
87. S. A. Diddams, "Coming through earth and space: Broad bandwidth approaches to optical and infrared spectroscopy, JILA Chemical Physics Colloquium, Boulder (2009)
86. S. A. Diddams, "Coming through earth and space: Broad bandwidth approaches to optical and infrared spectroscopy, Optical Sciences Colloquium, Univ. of Arizona, Tucson (2009)
85. S. A. Diddams, "Femtosecond optical frequency combs and their applications in precision time and frequency metrology," presented at AIST, Tsukuba (2009).
84. S. A. Diddams, "Femtosecond optical frequency combs and their applications in precision time and frequency metrology," presented at the 4th International Symposium on Ultrafast Photonic Technologies, Sendai (2009).
83. S. A. Diddams, "Optical Frequency Combs: Introduction, Sources and Applications," tutorial presented at EFTF IEEE FCS Joint Meeting, Besancon (2009).
82. S. Diddams & Chris Oates, "A guide to building an optical clock," short course presented at CLEO, Baltimore (2009).
81. S. A. Diddams, "Tick tock: counting by femtoseconds with an optical clock," Workshop on Synchronization in Telecommunication Systems (WSTS '09), Broomfield (2009).

80. W.M. Itano, T. Rosenband, D.B. Hume, P.O. Schmidt, C.W. Chou, A. Brusch, L. Lorini, W.H. Oskay, R.E. Drullinger, S. Bickman, T.M. Fortier, J.E. Stalnaker, S.A. Diddams, W.C. Swann, N.R. Newbury, D.J. Wineland, and J.C. Bergquist, "Ratio of the Al⁺ and Hg⁺ Optical Clock Frequencies to 17 Decimal Places," presented at ISQM, Tokyo (2008).
79. L. Hollberg, Q. Quraishi, D. A. Braje, T. Fortier, M. Kirchner, Shijun Xiao, C. W. Oates and S. A. Diddams, "High stability optical and microwave signals from femtosecond laser optical frequency combs," presented at LEOS Annual Meeting, Newport Beach (2008).
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46. A. Bartels, C. W. Oates, L. Hollberg, S.A. Diddams, "Sub-hertz stabilization of femtosecond laser frequency combs," presented at the Conference on Lasers and Electro-optics, 2004, paper CMW7.
45. S. Diddams, "High Precision Optical Frequency Synthesis with Femtosecond Optical Frequency Combs," presented at NASA Fundamental Physics Workshop, Solvang, CA, April 20-22, 2004.
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43. B.R. Washburn, J.W. Nicholson, S.A. Diddams, M.F. Yan, C.G. Jørgensen, and N.R. Newbury, "A phase locked frequency comb from an all-fibre supercontinuum source," European Conference on Communications 2003, paper TH4.1.3, Rimini, Italy, 2003.

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41. A. Bartels, T.M. Ramond, S.A. Diddams, L. Hollberg, "Synthesis of optical frequencies and ultrastable femtosecond pulse trains from an optical reference oscillator," presented at Ultrafast Optics, Vienna (2003).
40. S. Bize, S. A. Diddams, U. Tanaka, C. E. Tanner, W. H. Oskay, R. E. Drullinger, T. E. Parker, T. P. Heavner, S. R. Jefferts, L. Hollberg, W. M. Itano, D. J. Wineland, J. C. Bergquist, "Testing the stability of the fine structure constant with the $^{199}\text{Hg}^+$ single-ion optical clock," presented at Quantum Electronics and Laser Science, 2003, p. 682.
39. K. L. Corwin, N.R. Newbury, B.R. Washburn, S.A. Diddams, J.M. Dudley, S. Coen, R. S. Windeler, "Experimental and numerical investigation of fundamental noise on supercontinuum generated in microstructure fiber," presented at Quantum Electronics and Laser Science, 2003, p. 119-121.
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37. I. Thomann, A. Bartels, K. L. Corwin, N. R. Newbury, L. Hollberg, Scott A. Diddams, J. W. Nicholson, M. F. Yan, "A 420 MHz Cr:forsterite femtosecond ring laser and its use for continuum generation in the 1-2 micron range," to be presented at the Conference on Lasers and Electro-optics, 2003.
36. T. M. Ramond, S. A. Diddams, L. Hollberg, A. Bartels, H. Kurz, "Phase coherent link from optical to microwave frequencies via a 1 GHz octave-spanning Ti:sapphire femtosecond oscillator," postdeadline presentation at the Conference on Lasers and Electro-optics, 2002
35. D.J. Jones, S.A. Diddams, T.M. Fortier, J. Ye, J.L. Hall, S.T. Cundiff, "Absolute control over the carrier envelope phase of a sub-10 fs pulses," presented at OSA Annual Meeting, 2000.
34. K. Vogel, S.A. Diddams, C. Oates, A. Curtis, R. Rafac, Th. Udem, J.S. Wells, B. Freech, W.D. Lee, R. W. Fox, J.C. Bergquist, L. Hollberg, "Clockwork for the measurement and comparison of optical frequency standards," presented at OSA Annual Meeting, 2000.
33. S. A. Diddams, D. J. Jones, Jun Ye, S. T. Cundiff, J. L. Hall, J. K. Ranka, R. S. Windeler, "Direct rf to optical frequency measurements with a femtosecond laser comb," presented at CPEM 2000.
32. D. J. Jones, S. A. Diddams, S. T. Cundiff and J. L. Hall, "Long-term locking of the carrier-envelope phase in a 15-fs Ti:sapphire laser using frequency domain techniques," post-deadline presentation at Conference on Lasers and Electro-Optics, 2000.
31. D. J. Jones, S. A. Diddams, M. Taubman, S. T. Cundiff, L.-S. Ma, and J. L. Hall, "Using cross phase modulation in optical fiber to transfer optical frequency combs to arbitrary center frequencies," presented at Quantum Electronics and Laser Science Conference, 2000.
30. S. A. Diddams, D. J. Jones, L.-S. Ma, S. T. Cundiff and J. L. Hall, "A phase and frequency controlled femtosecond laser for metrology and single-cycle nonlinear optics," presented at Advanced Solid-State Lasers Topical Meeting, 2000.
29. D. J. Jones, S. A. Diddams, L.-S. Ma, S. T. Cundiff and J. L. Hall, "Measuring optical frequency gaps greater than 100 THz with a femtosecond laser frequency comb," postdeadline paper presented at OSA Annual Meeting, 1999.
28. M. S. Taubman, S. A. Diddams, and J. L. Hall, "Accurate diode laser stabilization via injection locking with dither-canceled HeNe Iodine-stabilized reference," presented at OSA Annual Meeting, 1999.
27. S. A. Diddams, L.-S. Ma, J. Hall, and J. Ye, "A broadband optical comb generator with parametric gain," presented at Conference on Lasers and Electro-Optics, 1999.
26. S. A. Diddams, "Unraveling the mysteries of intense femtosecond pulse propagation," presented at JILA Chemical Physics After Dark Seminar, Boulder, 1998.
25. H. Eaton, S. A. Diddams, and T. S. Clement, "Nonlinear femtosecond pulse propagation in solids and liquids," DAMOP '98 in Bulletin of the Am. Phys. Soc., Vol. 43, No. 3, 1998, p. 1287.
24. S. A. Diddams, A. Zozulya, and T. S. Clement, "Numerical investigations of nonlinear femtosecond pulse propagation with the inclusion of Raman, shock, and third-order phase effects," DAMOP '98 in Bulletin of the Am. Phys. Soc., Vol. 43, No. 3, 1998, p. 1287.

23. S. A. Diddams, H. Eaton, A. Zozulya, and T. S. Clement, "Full-field characterization of femtosecond pulses after nonlinear propagation," in Conference on Lasers and Electro-Optics, Vol. 6, 1998 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1998), p. 519.
22. A. Zozulya, S. A. Diddams, and T. S. Clement, "Theoretical investigation of the propagation of ultrashort pulses in nonlinear, dispersive bulk media," in International Quantum Electronics Conference, Vol. 7, 1998 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1998), pp. 245-246.
21. A. VanEngen, S. A. Diddams, and T. S. Clement, "Dispersion measurements of water using white light interferometry," in Conference on Lasers and Electro-Optics, Vol. 6, 1998 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1998), pp. 211.
20. S. A. Diddams, H. Eaton, and T. S. Clement, "Measuring and predicting ultrafast nonlinear propagation in bulk media," presented at Interdisciplinary Laser Science XIII, 1997.
19. S. A. Diddams, B. Peterson, and T. S. Clement, "Amplitude and phase characterization of a femtosecond OPA," presented at Interdisciplinary Laser Science XIII, 1997.
18. S. A. Diddams, "Generation and Measurement of Femtosecond Laser Pulses," presented at JILA Ultrafast Science Seminar, Boulder, 1997.
17. S. A. Diddams, H. Eaton, and T. S. Clement, "Characterizing the propagation of intense femtosecond pulses in bulk media," presented at Ultrafast Optics, Monterey, 1997.
16. S. A. Diddams, "Phase Measurements Inside Mode-locked Ring Lasers," presented at JILA Chemical Physics After Dark Seminar, Boulder, 1996.
15. S. A. Diddams, B. Atherton, and J.-C. Diels, "Intracavity characterization of a three-level system in atomic samarium," in Quantum Electronics and Laser Science Conference, Vol. 10, 1996 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1996), pp. 200-201.
14. S. Prein, S. A. Diddams and J.-C. Diels, "Complete characterization of femtosecond pulses with all-electronic detection," in Conference on Lasers and Electro-Optics, Vol. 9, 1996 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1996).
13. B. Atherton, S. A. Diddams, and J.-C. Diels, "Stabilization of a mode-locked ring laser gyroscope," in Conference on Lasers and Electro-Optics, Vol. 9, 1996 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1996), p. 201-2.
12. S. A. Diddams and J.-C. Diels, "Dispersion measurements with white light interferometry," presented at the International Conference on Lasers '95, Charleston, 1995.
11. B. Atherton, S. A. Diddams, and J.-C. Diels, "Ultrasensitive phase measurements with femtosecond ring lasers," presented at NATO Advanced Study Institute 47th SUSSP Summer School, St. Andrews, 1995
10. S. A. Diddams, B. Atherton, and J.-C. Diels, "Intracavity phase spectroscopy of samarium," in Quantum Electronics Conference, Vol. 16, 1995 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1995), pp. 171-172.
9. B. Atherton, S. A. Diddams, and J.-C. Diels, "Stabilization of a mode-locked ring laser," in Quantum Electronics Conference, Vol. 16, 1995 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1995), pp 8-9.
8. S. A. Diddams, B. Atherton, and J.-C. Diels, "Ultrafast phase sensitive spectroscopy," in International Quantum Electronics Conference, Vol. 9, 1994 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1994), pp. 133-134.
7. S. A. Diddams, "Measurement of ultrashort optical pulses," presented at CHTM Student Seminar Series, Albuquerque, 1994.
6. B. W. Atherton, S. A. Diddams, and J.-C. Diels, "Intracavity ring-laser, femtosecond, phase sensitive spectroscopy," presented at OSA Annual Meeting, Toronto, 1993, paper ThLL5.
5. X. M. Zhao, S. A. Diddams, and J.-C. Diels, "Pure linear method to determine the amplitude and phase of a femtosecond pulse," in Conference on Lasers and Electro-Optics, Vol. 11, 1993 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1993), pp. 568-571.
4. S. A. Diddams, J.-C. Diels, and B. Atherton, "Femtosecond laser gyroscope," in Conference on Lasers and Electro-Optics, Vol. 11, 1993 OSA Technical Digest Series (Optical Society of America, Washington, D.C., 1993), pp. 192-193.

3. S. A. Diddams, J.-C. Diels, and X. Long, “Sagnac spectroscopy,” presented at OSA Annual Meeting, Albuquerque, 1992.
2. S. A. Diddams and J.-C. Diels, “Dispersion characterization of optical materials with white light interferometry,” presented at OSA Annual Meeting, Albuquerque, 1992.
1. S. A. Diddams, and R.W. Peterson, “Reflection holograms for lecture demonstrations,” presented at AAPT Apparatus Competition, Ithaca, 1988, first prize award—college and university category.

Collaborators, Visiting Scientists, PostDocs & Students

Collaborators & Visiting Scientists

Thomas Udem, *Max Planck Institute for Quantum Optics* (2000, 2007, 2019)
 T. W. Haensch, *Max Planck Institute for Quantum Optics* (2007)
 Jeff Nicholson, Robert Windeler, Paul Westbrook, *OFS Optics* (2000-present)
 Alex Zozulya, *JILA and Worcester Polytechnic Institute* (1996-1999)
 Carol Tanner, *Univ of Notre Dame* (2003-2008)
 John Dudley, *Univ of Franche-Comté* (2002-3)
 Justin Torgerson, Fio Omenetto, *Los Alamos National Lab* (2004-2008)
 Lennart Robertsson, *BIPM* (2001-2004)
 Ma Long-Sheng, *BIPM and East China Normal University* (1998-present)
 Bi Zhiyi, *East China Normal University* (2003)
 Feng-Lei Hong, *AIST* (2002-04); now at *Yokohama University*
 Yohei Kobayashi, *AIST* (2004-present); now at *Tokyo University*.
 Albrecht Bartels, *GigaOptics and Univ. Of Konstanz* (2005-present)
 Eugene Ivanov, *Univ. of Western Australia* (2001-06)
 Andy Weiner, *Purdue Univ.* (2006-07, 2014)
 Danielle Braje, *NIST* (2007-08)
 Lora Nugent-Glandorf, *NIST-CU* (2009-2014)
 Kerry Vahala, *Caltech* (2010-present)
 Joe Campbell, *University of Virginia* (2010-present)
 Flavio Cruz, *UNICAMP, Brazil* (2008-present)
 Suvrath Mahadevan, *Penn State Univ.* (2010-present)
 John Bowers, *UC Santa Barbara* (2014-present)
 Kartik Srinivasan, *NIST Gaithersburg* (2014-present)
 Tobias Kippenberg, *EPFL* (2007, 2014-present)
 John Kitching, *NIST* (2015-present)
 Hong Tang, *Yale University* (2015-present)
 Thomas Schibli, *Univ. of Colorado* (2012-present)
 Markus Raschke, *Univ. of Colorado* (2018-present)
 Greg Rieker, *Univ. of Colorado* (2019-present)
 Takeshi Umeki, *NTT Basic Research Labs* (2020-present)

Postdocs supervised or co-supervised

Albrecht Bartels, *NIST* (2001-2004); now at Novanta, Konstanz
 Tanya Ramond, *NIST-NRC postdoc* (2002-04); now at Ball Aerospace, Boulder
 Kristan Corwin, *NIST-NRC postdoc* (2002-04); now at NIST, Boulder
 Tara Fortier, *Los Alamos National Lab postdoc* (2004-08); now at NIST, Boulder
 John McFerran, *NIST* (2004); now at Univ. of Western Australia
 Kyoungsik Kim, *NIST-CU postdoc* (2004-05); now Professor at Yonsei University, Seoul.
 Jason Stalnaker, *NIST-NRC postdoc* (2005-07); now Professor at Oberlin College.
 Shijun Xiao, *NIST* (2007-09); now at CoAdna Photonics
 Todd Johnson, *NIST-NRC posdoc* (2008-10); now Professor at College of St. Benedict and St. John’s University
 Franklyn Quinlan, *NIST-NRC postdoc* (2009-13); now Group Leader at NIST, Boulder
 Scott Papp, *NIST-NRC postdoc* (2010-13); now Group Leader at NIST, Boulder

Tyler Neely, NIST-CU postdoc (2010-12); now Senior Lecturer in Physics at The University of Queensland, Australia
Florian Adler, NIST-CU (2010-12); now at Tiger Optics
Kevin Knabe, NIST-CU (2012); now at Vescent Photonics
Haifeng Jiang, NIST (2011-2012); now at National Time Service Center, Chinese Academy of Sciences
Pascal Del'Haye, NIST-CU (2011-2015); now at Max Planck Institute for the Science of Light
Fred Baynes, NIST-CU (2013-2015); now at Univ. Adelaide
Katja Beha, NIST-CU (2013-2015); now at MenloSystems, Munich, Germany
William Loh, NIST-NRC postdoc (2013-2015); now staff at Lincoln Labs
Andrew Klose, NIST-NRC postdoc (2013-2015); now professor at Augustana College
Antoine Rolland, NIST (2014-2015) now at IMRA America
Aurelien Coillet, NIST-CU (2014-2015); now professor at Université de Bourgogne-Franche-Comté
Erin Lamb, NIST-CU (2015-2017) now at OFS
Andrew Metcalf, NIST-CU (2015-2018); now staff at AFRL, Albuquerque
Josue Davila-Rodriguez, NIST-CU (2015-2018); now at Stable Laser Systems
Wei Zhang, NIST-CU (2016-2018); now at JPL
Daniel Hickstein, NIST-NRC (2016-2018); now staff at KM Labs
Tara Drake, NIST-NRC (2015-2019); now professor at UNM, Albuquerque
Travis Briles, NIST-CU (2015-2019); now at NIST
Daryl Spencer, NIST-NRC (2016-2018)
Ryan Terrien, NIST-NRC (2016-present); now professor at Carleton College
David Carlson, NIST-NRC (2016-2018); now at Octave Photonics
Abijith Kowligy, NIST-CU (2016-2020); now at Vector Atomic
Henry Timmers, NIST-CU (2017-2019); now at Vescent Photonics
Sida Xing, NIST-CU (2019-2021); now at Shanghai Institute of Optics and Fine Mechanics
Stephanie Swartz, NIST-NRC (2021-2022); now at NASA
Ryan Cole, NIST-NRC (2021-2023); now professor at Bates College
Tsung-Han Wu, NIST-CU (2020-present)
Kristina Chang, NIST-NRC (2021-present)
Alexander Lind, NIST-CU (2021-present)
Connor Fredrick, NIST-CU (2022-present)
Igor Kudelin, NIST-CU (2022-present)
Daniel Herman, CU (2023-present)

PhD Students supervised as primary advisor

Qudsia Quraishi, Ph.D. Univ of Colorado (2005-2008); now at Army Research Lab
Stephanie Meyer, Ph.D. Univ of Colorado (2006-2011); now at CU Denver
Matt Kirchner, Ph.D, Univ. of Colorado (2006-2011); now at Thorlabs
Jennifer Taylor, Ph.D, Univ. of Colorado (2009-2012); now at US Naval Observatory
Gabe Ycas, Ph.D, Univ. of Colorado (2009-2013); now at Honeywell
Daniel Maser, Ph.D, Univ. of Colorado (2012-2017); now professor at Connecticut College
Daniel Cole, Ph.D, Univ. of Colorado (2012-2018); now NRC postdoc at NIST Boulder
Holly Leopardi, Ph.D, Univ. of Colorado (2015-2019); now postdoc at AFRL Albuquerque
Connor Fredrick, Ph.D, Univ. of Colorado (2015-2021); now postdoc at NIST
Alexander Lind, Ph.D, Univ. of Colorado (2015-2021); now postdoc at NIST
Daniel Lesko, Ph.D, Univ. of Colorado (2019-2023); now at University Erlangen
Pooja Sekhar, Univ. of Colorado (2020-present)
Eugene Tsao, Univ. of Colorado (2020-present)
Peter Chang, Univ. of Colorado (2020-present)
William Groman, Univ. of Colorado (2022-present)
Matthew Heyrich, Univ. of Colorado (2022-present)
Lauren Kennedy, Univ. of Colorado (2022-present)
Sichong Ma, Univ. of Colorado (2023-present)

Molly Kate Kreider, Univ. of Colorado (2023-present)
Dylan Meyer, Univ. of Colorado (2023-present)
Jordan Wind, Univ. of Colorado (2024-present)

Other Graduate Students Supervised/Advised

Isabell Thomann, Univ of Colorado (2001-02)
Karl Weber, Univ. of Melbourne (2002)
Giovanna Nogueira, UNICAMP Brasil (2005)
Michael Thiel, Univ of Karlsruhe (2005)
Ole Mussman, Univ. of Konstanz (2006)
Vela Mbele, CSIR-NML and Univ of Witwatersrand (2005-2008)
Dirk Heinecke, Univ. of Konstanz (2008-2010)
Antoine Rolland, Univ. of Rennes (2012)
Adam Green, Univ. of Colorado (2013-14)
Daniel Hackett, Univ. of Colorado (2014-15)
Francisco Viera Senna, *UNICAMP Brazil* (2015)
Jordan Stone, Univ. of Colorado (2015-18)
William Depetri, *UNICAMP Brazil* (2019)
William Schenken, Univ. of Colorado (2022)

Undergrad Students

Matt Kirchner, Colorado School of Mines (2005); now at Thorlabs
Kyle Johnson, Colorado School of Mines (2005)
Paul Blanchard, Colorado School of Mines (2005); now at NIST Boulder
Brett Kachel, Colorado School of Mines (2006-07)
Anne Baldwin (2008)
Max Diddams, Carleton College (2010); now MD at University of North Carolina
Jessica Doehrmann, Bethel College (2011); PhD UofA; now at Honeywell
Robert Kealhofer, Harvey Mudd College (2012); now postdoc at UCSB
Isaac Shelby, *Carneige-Mellon* (2014)
Jeff Jennings, *Univ. of Colorado* (2015); now at University Cambridge
Bella Ferranti, *Southwestern University* (2016)
Jordan Deitsch, *Univ. of Colorado* (2017)
Jonah Shaw, *Carleton College* (2018-19); now at University of Colorado
Freja Olsen, *Carleton College* (2019)
Kyle Kelly, *Univ. of Colorado* (2020)
Molly Kate Kreider, *Univ. of Richmond* (2021, 2022)
Aria Mundy, *Univ. of Colorado* (2022)

High School Students

Abigail Newbury, Fairview High School (2017-2018); now at University of Virginia
Aria Mundy, Fairview High School (2018-2019); now at University of Colorado