

Akira Ozawa

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• CURRENT POSITION

Feb. 2014 – today Researcher
Laser spectroscopy division (Prof. T.W. Hänsch)
Max-Planck-Institute of Quantum Optics, Germany

• PREVIOUS POSITION

Jan. 2010 – Feb. 2014 Research Associate (“Jokyo”)
Laser and Synchrotron Research Center (Prof. Y.Kobayashi)
The Institute for Solid State Physics,
The University of Tokyo, Japan

• EDUCATION

Feb. 2006 – Dec. 2009 “Frequency combs in the extreme ultraviolet”
Dr. rer. nat. (summa cum laude)
Ludwig-Maximilians-Universität München,
Max-Planck-Institute of Quantum Optics, Germany
Supervisor: Prof. T.W. Hänsch

Apr. 2004 – Mar. 2006 Master of Science in Physics
Department of Physics, Graduate School of Science,
The University of Tokyo, Japan
Supervisor: Prof. T. Kobayashi

Apr. 2000 – Mar. 2004 Bachelor of Science in Physics
Department of Physics
The University of Tokyo, Japan

• TEACHING ACTIVITIES

2022 – 2023 Lecture “Laser Physics”
(planned) Ludwig-Maximilians-Universität München

2021 – 2022 Lecture “Atomic Spectroscopy”
Ludwig-Maximilians-Universität München

2020 – 2021 Lecture “Quantum Optics”
Ludwig-Maximilians-Universität München
Technische Universität München

- **AWARDS**

The Japan Society of Applied Physics, The 33rd Autumn Meeting, 2012
Young scientist presentation award
High precision spectroscopy using vacuum ultraviolet frequency combs
Akira Ozawa, Yohei Kobayashi

CLEO-PR&OECC/PS 2013 Best Paper Awards
Intracavity High Harmonic Generation At 80 and 10 MHz Repetition Rates
Akira Ozawa, Makoto Kuwata-Gonokami and Yohei Kobayashi

- **GRANT**

German Research Foundation
MCQST Start-up grant, EXC-2111
"Experimental and numerical investigations on low-noise XUV frequency comb generation"
50k € (2021)

- **PATENTS**

Generating laser pulses and spectroscopy using the temporal talbot effect
US patent US20180233877
Th. Udem and A. Ozawa

Spectral apparatus, detection apparatus, light source apparatus, reaction apparatus, and measurement apparatus
US patent US9594253B2
Takashi Sukegawa, Yohei Kobayashi, Akira Ozawa, Mamoru Endo, Makoto Gonokami

- **CITATION STATISTICS**

40 publications in peer-reviewed international journals and 3 monographs
Among them, I am the first or the last author in 19 publications.
Google Scholar citation profile (as of May 2022): h-index: 20, i10-index: 28, 1868 citations.

- **REFEREE ACTIVITIES**

Applied Physics B, Applied Physics Letters, Optics Express, Optics Letters, Optics Communications, Applied Physics Express, Japanese Journal of Applied Physics, The European Physical Journal Plus, Nature Communications, Nature Physics, Nature Photonics, Physics Letters A, and others.

- **MISCELLANEOUS**

Languages: English, Japanese
Programming skills: C++, Python, Mathematica
Hobbies: Skiing, Hiking, Taking aerial photography using drones, Electronics

Publication list

43. Very large bandwidth lasers

[Akira Ozawa](#) and Thomas Udem
Nature Photonics 15, 247 (2021)

42. Higher-order logarithmic corrections and the two-loop self-energy of a 1s electron in hydrogen

Savely G. Karshenboim, [Akira Ozawa](#), and Vladimir G. Ivanov
Phys. Rev. A 100, 032515 (2019)

41. The Lamb shift of the 1s state in hydrogen: Two-loop and three-loop contributions

Savely G. Karshenboim, [Akira Ozawa](#), Valery A. Shelyuto, Robert Szafron, Vladimir G. Ivanov
Phys. Lett. B, 795, 432 (2019)

40. Simple phase noise measurement scheme for cavity-stabilized laser systems

Fabian Schmid, Johannes Weitenberg, Theodor W. Hänsch, Thomas Udem, and [Akira Ozawa](#)
Opt. Lett. 44, 2709 (2019)

39. Motional resonances of three-dimensional dual-species Coulomb crystals

Byoung-moo Ann, Fabian Schmid, Jonas Krause, Theodor W. Hänsch, Thomas Udem and [Akira Ozawa](#)
J. Phys. B: At. Mol. Opt. Phys. 52, 035002 (2019)

38. Quantum Zeno Effect assisted Spectroscopy of a single trapped ion

[Akira Ozawa](#), Josue Davila-Rodriguez, Theodor W. Hänsch and Thomas Udem
Scientific Reports, 8, 10643 (2018)

37. Efficient high harmonics generation by enhancement cavity driven with a post-compressed FCPA laser at 10 MHz

Zhigang Zhao, [Akira Ozawa](#), Makoto Kuwata-Gonokami and Yohei Kobayashi
High Power Laser Science and Engineering, 6, E19 (2018)

36. Multi-pass-cell-based nonlinear pulse compression to 115 fs at 7.5 μ J pulse energy and 300 W average power

Johannes Weitenberg, Andreas Vernaleken, Jan Schulte, [Akira Ozawa](#), Thomas Sartorius, Vladimir Pervak, Hans-Dieter Hoffmann, Thomas Udem, Peter Russbüldt, and Theodor W. Hänsch
Opt. Express, 25, 20502 (2017)

35. Single ion fluorescence excited with a single mode of an UV frequency comb

[Akira Ozawa](#), Josue Davila-Rodriguez, James R. Bounds, Hans A. Schuessler, Theodor W. Hänsch, and Thomas Udem
Nature Communications, 8, 44 (2017)

34. Mode locking based on the temporal Talbot effect

Thomas Udem and [Akira Ozawa](#)
Appl. Phys. B 123: 100 (2017)

33. High repetition pump-and-probe photoemission spectroscopy based on a compact fiber laser system

[Y. Ishida](#), [T. Otsu](#), [A. Ozawa](#), [K. Yaji](#), [S. Tani](#), [S. Shin](#) and [Y. Kobayashi](#)
Rev. Sci. Instrum. 87, 123902 (2016)

32. Doppler Cooling Trapped Ions with a UV Frequency Comb

Josue Davila-Rodriguez, [Akira Ozawa](#), Theodor W. Hänsch, and Thomas Udem
Physical Review Letters, 116, 043002 (2016)

31. High average power coherent vuv generation at 10 MHz repetition frequency by intracavity high harmonic generation

(Selected as Spotlight on Optics, Highlighted Articles from OSA Journals)
[Akira Ozawa](#), Zhigang Zhao, Makoto Kuwata-Gonokami, and Yohei Kobayashi
Optics Express, Vol. 23, Issue 12, pp. 15107-15118 (2015)

30. Dual comb spectroscopy (in Japanese)

Naoya Kuse, [Akira Ozawa](#), Yohei Kobayashi
Journal of the Physical Society of Japan, 69, 1 (2014)

29. 6-GHz, Kerr-lens mode-locked Yb:Lu₂O₃ ceramic laser for comb-resolved broadband spectroscopy

Mamoru Endo, [Akira Ozawa](#) and Yohei Kobayashi
Optics Letters, Vol. 38 Issue 21, pp. 4502 (2013)

- 28. VUV frequency comb generation and its application to high precision spectroscopy (in Japanese)**
Akira Ozawa and Yohei Kobayashi
OplusE Oct. (2013)
- 27. 10-MHz, Yb-fiber chirped-pulse amplifier system with large-scale transmission gratings**
Yohei Kobayashi, Nozomi Hirayama, Akira Ozawa, Takashi Sukegawa, Takashi Seki, Yoshiyuki Kuramoto, and Shuntaro Watanabe,
Optics Express Vol. 21, Issue 10, pp. 12865–12873 (2013).
- 26. Static FBG strain sensor with high resolution and large dynamic range by dual-comb spectroscopy**
Kuse, Naoya; Ozawa, Akira; Kobayashi, Yohei,
Optics Express, Vol. 21 Issue 9, pp.11141-11149 (2013).
- 25. Vuv frequency-comb spectroscopy of atomic xenon**
Akira Ozawa and Yohei Kobayashi
Phys. Rev. A 87, 022507 (2013)
- 24. Vacuum ultraviolet frequency comb generation and applications (in Japanese)**
Akira Ozawa and Yohei Kobayashi
Japanese journal of optics, 41,9 (2012)
- 23. Comb-Resolved Dual-Comb Spectroscopy Stabilized by Free-Running Continuous-Wave Lasers**
Naoya Kuse, Akira Ozawa Yohei Kobayashi,
Appl. Phys. Exp 5, 112402 (2012)
- 22. Chirped-pulse direct frequency-comb spectroscopy of two-photon transitions**
Akira Ozawa and Yohei Kobayashi
Phys. Rev. A 86, 022514 (2012)
- 21. Kerr-lens mode-locked Yb:KYW laser at 4.6-GHz repetition rate**
M. Endo, A. Ozawa and Y. Kobayashi
Optics Express 20 12191-12197 (2012)
- 20. Injection locking of Yb-fiber based optical frequency comb**
Naoya Kuse, Akira Ozawa, Yutaka Nomura, Isao Ito, Yohei Kobayashi
Optics Express 20 10509-10518 (2012)
- 19. Vacuum ultraviolet frequency combs generated by a femtosecond enhancement cavity in the visible**
Birgitta Bernhardt, Akira Ozawa, Andreas Vernaleken, Ioachim Pupeza, Jan Kaster, Yohei Kobayashi, Ronald Holzwarth, Ernst Fill, Ferenc Krausz, Theodor W. Hänsch, and Thomas Udem
OPTICS LETTERS 37 503-505 (2012)
- 18. Coherent quasi-cw 153 nm light source at 33 MHz repetition rate**
Yutaka Nomura, Yoshiaki Ito, Akira Ozawa, Xiaoyang Wang, Chuangtian Chen, Shik Shin, Shuntaro Watanabe, and Yohei Kobayashi
Optics Letters 36 1758-1760 (2011)
- 17. Interferometric autocorrelation in the ultraviolet utilizing spontaneous parametric down-conversion inside an enhancement cavity**
P. Michelberger, R. Krischek, W. Wiczorek, A. Ozawa, and H. Weinfurter
Optics Letters 37 1223-1225 (2012)
- 16. Power scaling of femtosecond enhancement cavities and high-power applications**
I. Pupeza, T. Eidam, J. M. Kaster, B. Bernhardt, J. Rauschenberger, A. Ozawa, E. Fill, Th. Udem, M. F. Kling, J. Limpert, Z. Alahmed, A. M. Azzeer, A. Tünnermann, Th. W. Hänsch, and F. Krausz
SPIE professional 7914, 79141I-1 (2011)
- 15. Carrier-envelope phase-locked pump-probe experiment for independent phase/delay manipulation**
Shunsuke Adachi, Akira Ozawa, Takayoshi Kobayashi
Chemical Physics Letters 489 130–133 (2010)
- 14. Self-compensation of third-order dispersion for ultrashort pulse generation demonstrated in an Yb fiber oscillator**
Naoya Kuse, Yutaka Nomura, Akira Ozawa, Makoto Kuwata-Gonokami, Shuntaro Watanabe, and Yohei Kobayashi
Optics Letters, 35 3868-3870 (2010)
- 13. Modeling and optimization of single-pass laser amplifiers for high-repetition-rate laser pulses**
Akira Ozawa, Thomas Udem, Uwe D. Zeitner, Theodor W. Hänsch, Peter Hommelhoff
PHYSICAL REVIEW A 82 033815 (2010)

12. **Power scaling of a high-repetition-rate enhancement cavity**
Ioachim Pupeza, Tino Eidam, Jens Rauschenberger, Birgitta Bernhardt, [Akira Ozawa](#), Ernst Fill, Alexander Apolonski, Thomas Udem, Jens Limpert, Zeyad A. Alahmed, Abdallah M. Azzeer, Andreas Tünnermann, Theodor W. Hänsch, and Ferenc Krausz
Optics Letters, Vol. 35, Issue 12, pp. 2052-2054 (2010)
11. **A Peltier Cooled Single Pass Amplifier for Titanium: Sapphire Laser Pulses**
[A. Ozawa](#), W. Schneider, F. Najafi, T.W. Hänsch, Th. Udem, P. Hommelhoff
LASER PHYSICS 20 967 (2010)
10. **Ultraviolet enhancement cavity for ultrafast nonlinear optics and high-rate multiphoton entanglement experiments**
Roland Krischek, Witlief Wieczorek, [Akira Ozawa](#), Nikolai Kiesel, Patrick Michelberger, Thomas Udem, Harald Weinfurter
Nature Photonics 4, 170 - 173 (2010)
9. **Cavity-enhanced dual-comb spectroscopy**
Birgitta Bernhardt, [Akira Ozawa](#), Patrick Jacquet, Marion Jacquy, Yohei Kobayashi, Thomas Udem, Ronald Holzwarth, Guy Guelachvili, Theodor W. Hänsch, Nathalie Picqué
Nature Photonics 4, 55 - 57 (2010)
8. **Efficient 494 mW sum-frequency generation of sodium resonance radiation at 589 nm by using a periodically poled Zn:LiNbO3 ridge waveguide**
T. Nishikawa, [A. Ozawa](#), Y. Nishida, M. Asobe, F.L. Hong, T.W. Hänsch
Opt. Express 17 17792 (2009)
7. **Phase-stable single-pass cryogenic amplifier for high repetition rate few-cycle laser pulses**
[A. Ozawa](#), W. Schneider, T.W. Hänsch, Th. Udem, P. Hommelhoff
New J. Phys. 11 083029 (2009)
6. **Puzzling spectral structures of molecular vibration observed in ultrafast pump-probe experiment of transparent material**
[Akira Ozawa](#) and Takayoshi Kobayashi
Chem. Phys. Lett. 477 281 (2009)
5. **Feasibility of coherent xuv spectroscopy on the 1S-2S transition in singly ionized helium**
M. Herrmann, M. Haas, U.D. Jentschura, F. Kottmann, D. Leibfried, G. Saathoff, C. Gohle, [A. Ozawa](#), V. Batteiger, S. Knünz, N. Kolachevsky, H.A. Schüssler, T.W. Hänsch, Th. Udem
Phys. Rev. A 79 052505 (2009)
4. **Non-collinear high harmonic generation:
A promising outcoupling method for cavity-assisted XUV generation**
[A. Ozawa](#), A. Vernaleken, W. Schneider, I. Gotlibovych, Th. Udem, T.W. Hänsch
Opt. Express 16 6233 (2008)
3. **High harmonic frequency combs for high resolution spectroscopy**
[A. Ozawa](#), J. Rauschenberger, Ch. Gohle, M. Herrmann, D.R. Walker, V. Pervak, A. Fernandez, R. Graf, A. Apolonski, R. Holzwarth, F. Krausz, T.W. Hänsch, Th. Udem
Phys. Rev. Lett. **100** 253901 (2008)
Selected for Virtual Journal of Ultrafast Science, Volume 7, Issue 7
2. **Time resolution of chirped lattice vibrations in a mixed-valence metal-halogen complex system**
F. Araoka, [A. Ozawa](#), D. Kawakami, S. Takaishi, M. Yamashita, T. Kobayashi
Phys. Rev. B 75 224304 (2007)
1. **Sub-5 fs time-resolved dynamic Franck-Condon overlaps associated with the S1 → S0 stimulated transition in oligothiophene 13-mer**
[A. Ozawa](#), K. Takimiya, T. Otsubo, T. Kobayashi
Chem. Phys. Lett. 409 224 (2005)

Selected conference contributions

Towards High-Precision Spectroscopy of the 1S–2S Transition in He⁺ (invited)

Akira Ozawa

Proton Radius European Network Workshop (PREN2022), Paris, France (2022. June)

Towards High-Precision Spectroscopy of the 1S–2S Transition in He⁺ (invited)

Akira Ozawa, Fabian Schmid, Jorge Moreno, Johannes Weitenberg, Theodor W. Hänsch, Thomas Udem
International Conference on Precision Physics of Simple Atomic Systems (PSAS), Warsaw, Poland (2022)

Towards high-precision spectroscopy of He⁺ using extreme-ultraviolet frequency combs (invited)

Akira Ozawa

2nd International Symposium on Precision Measurement Physics (ISPMP), Wuhan, China (2022)

Direct comb spectroscopy by quantum-Zeno-effect assisted detection

A. Ozawa, J. Davila-Rodriguez, T. W. Hänsch, and Th. Udem

Postdeadline Session, PD-1.1, CLEO Europe, Munich, Germany (2017.6)

VUV Frequency Comb Generation and its Applications (invited)

Akira Ozawa, Zhao Zhigang, Makoto Kuwata-Gonokami and Yohei Kobayashi

HTu3C.1, High-Intensity Lasers and High-Field Phenomena (HILAS) (2014.3.18)

Intracavity High Harmonic Generation At 80 and 10 MHz Repetition Rates (Selected as "Best Paper Awards")

Akira Ozawa, Makoto Kuwata-Gonokami and Yohei Kobayashi

TuF1-5, CLEO-PR 2013, Kyoto, JAPAN (2013.6)

Cavity-enhanced high harmonic generation with high power Yb-fiber laser at 10MHz repetition rate

Akira Ozawa, Makoto Kuwata-Gonokami and Yohei Kobayashi

CM3N.2. CLEO 2013, San Jose, USA (2013.6)

VUV frequency comb generation based on Yb-doped fiber lasers and its application for comb spectroscopy (invited)

Akira Ozawa and Yohei Kobayashi

Ultrafast Optics 2013, Davos, Switzerland Mar. 2013

Single comb mode excitation of ground state xenon in VUV

Akira Ozawa and Yohei Kobayashi

Postdeadline Session II CTh5D.9 CLEO 2012, San Jose, USA (2012.5)

Intracavity high harmonic generation driven by Yb-fiber based MOPA system at 80MHz repetition rate

Akira Ozawa, Yohei Kobayashi

CThB4, CLEO 2012, Baltimore, USA (2011.5)

XUV frequency combs (Invited)

Akira Ozawa, Andreas Vernaleken, Igor Gotlibovych, Peter Hommelhoff, Thomas Udem and Theodor W. Hänsch

SPIE International Symposium, Photonics Europe (2010.4)

Current Progress in XUV frequency combs (invited)

2nd International Conference on Attosecond Physics, Manhattan, KS, USA (2009)

Amplification of ultrashort pulses with a single-pass cryogenic Ti:sapphire Amplifier at 80MHz Repetition Rate

CLEO Europe, Munich, Germany (2009)

High Harmonic Frequency Combs for High Resolution Spectroscopy

16th International Conference on Ultrafast Phenomena, Stresa, Italy (2008)

Dynamics of one-dimensional exciton in porphyrin J aggregates by sub-5fs transient absorption experiment (poster)

15th International Conference on Ultrafast Phenomena, Pacific Grove, CA, USA (2006)