Stanford

Matthias Kling

Director, PULSE Institute, Professor of Photon Science and, by courtesy, of Applied Physics

Photon Science Directorate

Bio

BIO

Matthias Kling is an expert in ultrafast science, serving as Professor of Photon Science and Applied Physics (by courtesy) at Stanford University and Director of the Stanford PULSE Institute at SLAC National Accelerator Laboratory. With a background spanning physics, laser physics, and physical chemistry, he earned degrees from the Universities of Göttingen and Jena before completing postdoctoral research at UC Berkeley and AMOLF in Amsterdam. From 2007 to 2021, he led a research group within the Laboratory of Attosecond Physics at the Max Planck Institute of Quantum Optics and held faculty positions at Kansas State University and the University of Munich. Matthias joined SLAC and Stanford in 2021. He has been serving as Director of the Science and R&D Division at the Linac Coherent Light Source (LCLS) until 2026, when he became the third Director of the Stanford PULSE Institute. Matthias' research interests include ultrafast x-ray science, petahertz electronics, nanophotonics, and laser physics.

ACADEMIC APPOINTMENTS

- Professor, Photon Science Directorate
- Member, Bio-X
- Principal Investigator, Stanford PULSE Institute

ADMINISTRATIVE APPOINTMENTS

- Director, Stanford PULSE Institute, (2026- present)
- Professor of Photon Science & Applied Physics (by courtesy), Stanford University, (2021- present)
- Director, Science and R&D Division, LCLS, SLAC, (2021-2026)
- Max Planck Fellow, Max Planck Institute of Quantum Optics, Germany, (2019-2023)
- Professor of Physics, LMU Munich, Germany, (2013-2021)
- Assistant Professor of Physics, Kansas-State University, (2009-2013)
- Max Planck Group Leader, Max Planck Institute of Quantum Optics, Germany, (2007-2013)

HONORS AND AWARDS

- Oppenheimer Fellow, DOE National Laboratories (2025)
- OPTICA Fellow, OPTICA (2024)
- APS Fellow, American Physical Society (2019)
- Max Planck Fellow, Max Planck Society (2019)
- ERC Starting Grant, European Research Council (2013)
- Early Career Award, Department of Energy (2012)

- Heisenberg Fellow, German Research Foundation (2012)
- Nernst-Haber Bodenstein Prize, German Bunsen Society (2012)
- Roentgen Prize, Giessen University (2011)
- Emmy-Noether Fellow, German Research Foundation (2007)
- Marie-Curie Fellow, European Research Council (2004)
- Feodor-Lynen Fellow, Alexander von Humboldt foundation (2003)

PROFESSIONAL EDUCATION

- Ph.D., University of Goettingen, Germany , Physical Chemistry (2002)
- Certificate, Jena University, Germany , Laser Physics (2000)
- Diploma, University of Goettingen, Germany , Physics (1998)

LINKS

- Ultrafast Electronics and Nanophotonics Group: https://uen.stanford.edu
- LCLS/SLAC: https://lcls.slac.stanford.edu/
- Stanford PULSE Institute: https://ultrafast.stanford.edu/
- SLAC National Laboratory: https://www6.slac.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The fastest timescale of electron motion within nanostructures is attoseconds (1 attosecond = 10-18 seconds). We have pioneered the field attosecond nanophotonics and are currently conducting research to extend the state-of-the-art to multi-dimensional spectroscopies, x-ray emission and scattering using intense attosecond XFEL pulses. We aim to explore the dynamics of many-electron effects, including correlation-driven and collective effects. A particularly important open question is the transition from many-body quantum physics to classical dynamics. This will largely impact applications of nanosystems in optoelectronic devices used in ultrafast electronics and computing. As an example, ultrafast plasmonic circuitry can overcome current limitations in resistive electronics and might open an avenue towards quantum computing at ambient temperature.

We also address the question, how aerosolized particles can enable and catalyze light-induced chemical processes. Reaction nanoscopy is a powerful method that is developed in our group for analyzing the surface chemistry on aerosols with nanometer spatial and femtosecond temporal resolution. We aim to advance this technique to solve fundamental questions in astro- and atmospheric chemistry. Among these are the mechanisms of chemical transformations under extreme conditions, where such particles are exposed to high-intensity or high-energy radiation.

We aim to develop, expand, and exploit field-resolved spectroscopies towards higher frequencies in the THz and PHz domains. Opening up these frequency ranges will enable sensitivity to a manyfold of vibrational and electronic transitions in organic electronics and 2D-materials. Field-resolved spectroscopy is a powerful technique that permits addressing the sub-cycle response of a solid to a lightfield. Exploring and controlling many-body excitations and scattering dynamics opens a path for optimized energy conversion in optoelectronic devices. The sub-cycle control of a device builds the basis for lightwave electronics, which may push the speed of computing to its ultimate limit.

We engage in the development of high-average and high-peak power ultrashort light sources. These include optical-parametric chirped pulse amplifiers (OPCPAs) driven by high-power fiber, thin-disk and Innoslab amplifiers. We focus on ultrashort few-cycle pulse generation in the visible and mid-infared spectral region with stable and controllable electric field waveforms. The R&D efforts also include nonlinear tools for pulse characterization. Such

capabilities are instrumental in addition to the facility-based light sources in our research on ultrafast nanophotonics, lightwave electronics, and ultrafast x-ray science.

Teaching

COURSES

2024-25

- Electrons and Photons: APPPHYS 201, PHOTON 201 (Spr)

2023-24

- Synchrotron Radiation and Free Electron Lasers: Principles and Applications.: APPPHYS 325 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Aaron Ghrist

Postdoctoral Faculty Sponsor

Jonah Adelman, Chance Ornelas-Skarin

Doctoral Dissertation Advisor (AC)

Harrison Pasquinilli, Samuel Sahel-Schackis, Selene She, Kazuki Tayama, Shao Ci Wu

Doctoral (Program)

Sean O'Tool

Publications

PUBLICATIONS

- **Trihydrogen Formation on Gold Nanoparticles in Strong Laser Fields.** *Nano letters*
  Dagar, R., Zhang, W., Rosenberger, P., Neuhaus, M., Bergues, B., Costa Vera, C., Kling, M. F.
  2026

- **Imaging Valence Electron Rearrangement in a Chemical Reaction Using Hard X-Ray Scattering.** *Physical review letters*
  Gabalski, I., Green, A., Lenzen, P., Allum, F., Bain, M., Bhattacharyya, S., Britton, M. A., Champenois, E. G., Cheng, X., Cryan, J. P., Driver, T., Forbes, R., Garratt, et al
  2025; 135 (8): 083001

- **Imaging Valence Electron Rearrangement in a Chemical Reaction Using Hard X-Ray Scattering** *PHYSICAL REVIEW LETTERS*
  Gabalski, I., Green, A., Lenzen, P., Allum, F., Bain, M., Bhattacharyya, S., Britton, M. A., Champenois, E. G., Cheng, X., Cryan, J. P., Driver, T., Forbes, R., Garratt, et al
  2025; 135 (8)

- **Characterizing few-cycle UV resonant dispersive waves through direct field sampling** *OPTICS LETTERS*
  Larsen, K. A., Lantigua, C., Kincaid, C., Allum, F., Britton, M., Castellanos, J., Kaufman, B., Neuhaus, M., Sylla, F., Kim, K., Bradforth, S. E., Kling, M. F., Robinson, et al
  2025; 50 (16): 4962-4965

- **Multi-millijoule hollow-core fiber compression of short-wave infrared pulses to a single cycle** *OPTICS EXPRESS*
  Bloechl, J., Kuthe, M. F., Schroeder, H., Azzeer, A. M., Nubbemeyer, T., Kling, M. F.
  2025; 33 (13): 28071-28080

- **Light field-controlled PHz currents in intrinsic metals.** *Science advances*
  Fehér, B., Hanus, V., Li, W., Pápa, Z., Budai, J., Paul, P., Szeghalmi, A., Wang, Z., Kling, M. F., Dombi, P.
  2025; 11 (26): eadv5406

- **Attosecond inner-shell lasing at ångström wavelengths.** *Nature*
  Linker, T. M., Halavanau, A., Kroll, T., Benediktovitch, A., Zhang, Y., Michine, Y., Chuchurka, S., Abhari, Z., Ronchetti, D., Fransson, T., Weninger, C., Fuller, F. D., Aquila, et al
  2025

- **Stable high-energy proton acceleration with water-leaf targets driven by intense laser pulses** *PHYSICAL REVIEW RESEARCH*
  He, L. R., Bachhammer, M., Balling, F., Biswas, S., Doyle, L., Gerlach, S., Hofrichter, I., Kharbedia, M., Liese, J., De Marco, M., Pohle, T., Prasselsperger, A., Schmidt, et al
  2025; 7 (2)

- **Imaging the photochemistry of cyclobutanone using ultrafast electron diffraction: Experimental results.** *The Journal of chemical physics*
  Green, A. E., Liu, Y., Allum, F., Graßl, M., Lenzen, P., Ashfold, M. N., Bhattacharyya, S., Cheng, X., Centurion, M., Crane, S. W., Forbes, R., Goff, N. A., Huang, et al
  2025; 162 (18)

- **Burn parameters affect PAH emissions at conditions relevant for prescribed fires** *ATMOSPHERIC POLLUTION RESEARCH*
  Topperwien, K., Vignat, G., Feinberg, A. J., Daube, C., Alton, M. W., Fortner, E. C., Canagaratna, M. R., Kling, M. F., Johnson, M., Nadeau, K., Herndon, S., Jayne, J. T., Ihme, et al
  2025; 16 (5)

- **Attosecond XUV laser triggers smallest, shortest dance of electrons ever recorded** *LASER FOCUS WORLD*
  Biswas, S., Kling, M.
  2025; 61 (4): 14-17

- **Generation of fast photoelectrons in strong-field emission from metal nanoparticles** *NANOPHOTONICS*
  Saydanzad, E., Powell, J., Renner, T., Summers, A., Rolles, D., Trallero-Herrero, C., Kling, M. F., Rudenko, A., Thumm, U.
  2025

- **Generation of fast photoelectrons in strong-field emission from metal nanoparticles.** *Nanophotonics (Berlin, Germany)*
  Saydanzad, E., Powell, J., Renner, T., Summers, A., Rolles, D., Trallero-Herrero, C., Kling, M. F., Rudenko, A., Thumm, U.
  2025; 14 (9): 1355-1364

- **Ionization effects in single-shot carrier-envelope phase detection with gas-gap devices** *APPLIED PHYSICS LETTERS*
  Bloechl, J., Seeger, M. F., Schroeder, H., Zhan, M., Guggenmos, A., Nubbemeyer, T., Kling, M. F., Bergues, B.
  2025; 126 (13)

- **Correlation-driven attosecond photoemission delay in the plasmonic excitation of C60 fullerene.** *Science advances*
  Biswas, S., Trabattoni, A., Rupp, P., Magrakvelidze, M., Madjet, M. E., De Giovannini, U., Castrovilli, M. C., Galli, M., Liu, Q., Månsson, E. P., Schötz, J., Wanie, V., Wnuk, et al
  2025; 11 (7): eads0494

- **Probing Electronic Coherence between Core-Level Vacancies at Different Atomic Sites** *PHYSICAL REVIEW X*
  Wang, J., Driver, T.
  2025; 15: 011008

- **Roadmap on basic research needs for laser technology** *JOURNAL OF OPTICS*
  Kling, M. F., Menoni, C. S., Geddes, C., Galvanauskas, A., Albert, F., Kiani, L., Chini, M., Baker, L., Nelson, K. A., Young, L., Moses, J., Carbajo, S., Demos, et al
  2025; 27 (1)

- **Petahertz electronics** *NATURE REVIEWS PHYSICS*
  Heide, C., Keathley, P. D., Kling, M. F.
  2024

- **Catalysis in Extreme Field Environments: A Case Study of Strongly Ionized SiO2Nanoparticle Surfaces.** *Journal of the American Chemical Society*
  Linker, T. M., Dagar, R., Feinberg, A., Sahel-Schackis, S., Nomura, K., Nakano, A., Shimojo, F., Vashishta, P., Bergmann, U., Kling, M. F., Summers, A. M.
  2024

- **Tracking surface charge dynamics on single nanoparticles.** *Science advances*

Dagar, R., Zhang, W., Rosenberger, P., Linker, T. M., Sousa-Castillo, A., Neuhaus, M., Mitra, S., Biswas, S., Feinberg, A., Summers, A. M., Nakano, A., Vashishta, P., Shimojo, et al
2024; 10 (32): eadp1890

- **Attosecond delays in X-ray molecular ionization.** *Nature*
  Driver, T., Mountney, M., Wang, J., Ortmann, L., Al-Haddad, A., Berrah, N., Bostedt, C., Champenois, E. G., DiMauro, L. F., Duris, J., Garratt, D., Glownia, J. M., Guo, et al
  2024; 632 (8026): 762-767

- **Waveform retrieval for ultrafast applications based on convolutional neural networks** *APL MACHINE LEARNING*
  Altwaijry, N., Coffee, R., Kling, M. F.
  2024; 2 (2)

- **Terawatt-scale attosecond X-ray pulses from a cascaded superradiant free-electron laser** *NATURE PHOTONICS*
  Franz, P., Li, S., Driver, T., Robles, R. R., Cesar, D., Isele, E., Guo, Z., Wang, J., Duris, J. P., Larsen, K., Glownia, J. M., Cheng, X., Hoffmann, et al
  2024

- **Light-wave-controlled Haldane model in monolayer hexagonal boron nitride.** *Nature*
  Mitra, S., Jiménez-Galán, Á., Aulich, M., Neuhaus, M., Silva, R. E., Pervak, V., Kling, M. F., Biswas, S.
  2024

- **Experimental demonstration of attosecond pump-probe spectroscopy with an X-ray free-electron laser** *NATURE PHOTONICS*
  Guo, Z., Driver, T., Beauvarlet, S., Cesar, D., Duris, J., Franz, P. L., Alexander, O., Bohler, D., Bostedt, C., Averbukh, V., Cheng, X., Dimauro, L. F., Doumy, et al
  2024

- **Far-Field Petahertz Sampling of Plasmonic Fields.** *Nano letters*
  Wong, K. F., Li, W., Wang, Z., Wanie, V., Månsson, E., Hoeing, D., Blöchl, J., Nubbemeyer, T., Azzeer, A., Trabattoni, A., Lange, H., Calegari, F., Kling, et al
  2024

- **Sensitivity Enhancement in Photoconductive Light Field Sampling** *ADVANCED OPTICAL MATERIALS*
  Altwaijry, N., Qasim, M., Zimin, D., Karpowicz, N., Kling, M. F.
  2024

- **Propagation effects in polarization-gated attosecond soft-X-ray pulse generation.** *Optics express*
  Mitra, S., Schotz, J., Zhang, C., Hyuk Ko, D., Chang, Z., Corkum, P. B., Staudte, A., Kling, M. F.
  2024; 32 (2): 1151-1160

- **From Ultrafast Light-Induced Currents to Spatially-Resolved Field Sampling**
  Bloechl, J., Schoetz, J., Bergues, B., Kling, M. F.
  edited by Chini, M., Argenti, L., Fang, L.
  SPRINGER INTERNATIONAL PUBLISHING AG.2024: 177-186

- **49 W carrier-envelope-phase-stable few-cycle 2.1 & mu;m OPCPA at 10 kHz** *OPTICS EXPRESS*
  Seeger, M. F., Kammerer, D., Bloechl, J., Neuhaus, M., Pervak, V., Nubbemeyer, T., Kling, M. F.
  2023; 31 (15): 24821-24834

- **Resonance Effect in Brunel Harmonic Generation in Thin Film Organic Semiconductors** *ADVANCED OPTICAL MATERIALS*
  Li, W., Saleh, A., Sharma, M., Huenecke, C., Sierka, M., Neuhaus, M., Hedewig, L., Bergues, B., Alharbi, M., ALQahtani, H., Azzeer, A. M., Graefe, S., Kling, et al
  2023

- **Enhanced cutoff energies for direct and rescattered strong-field photoelectron emission of plasmonic nanoparticles.** *Nanophotonics (Berlin, Germany)*
  Saydanzad, E., Powell, J., Summers, A., Robatjazi, S. J., Trallero-Herrero, C., Kling, M. F., Rudenko, A., Thumm, U.
  2023; 12 (10): 1931-1942

- **Reaction nanoscopy of ion emission from sub-wavelength propanediol droplets.** *Nanophotonics (Berlin, Germany)*
  Rosenberger, P., Dagar, R., Zhang, W., Majumdar, A., Neuhaus, M., Ihme, M., Bergues, B., Kling, M. F.
  2023; 12 (10): 1823-1831

- **Enhanced cutoff energies for direct and rescattered strong-field photoelectron emission of plasmonic nanoparticles** *NANOPHOTONICS*
  Saydanzad, E., Powell, J., Summers, A., Robatjazi, S., Trallero-Herrero, C., Kling, M. F., Rudenko, A., Thumm, U.
  2023
- **Reaction nanoscopy of ion emission from sub-wavelength propanediol droplets** *NANOPHOTONICS*
  Rosenberger, P., Dagar, R., Zhang, W., Majumdar, A., Neuhaus, M., Ihme, M., Bergues, B., Kling, M. F.
  2023
- **Linear and Nonlinear Optical Properties of Iridium Nanoparticles Grown via Atomic Layer Deposition** *COATINGS*
  Schmitt, P., Paul, P., Li, W., Wang, Z., David, C., Daryakar, N., Hanemann, K., Felde, N., Munser, A., Kling, M. F., Schroeder, S., Tuennermann, A., Szeghalmi, et al
  2023; 13 (4)
- **Light-Induced Subnanometric Modulation of a Single-Molecule Electron Source.** *Physical review letters*
  Yanagisawa, H., Bohn, M., Kitoh-Nishioka, H., Goschin, F., Kling, M. F.
  2023; 130 (10): 106204
- **Ion microscopy with evolutionary-algorithm-based autofocusing** *ENGINEERING RESEARCH EXPRESS*
  Haniel, F. E., Hedewig, L., Schroeder, H., Kling, M. F., Bergues, B.
  2023; 5 (1)
- **Broadband Photoconductive Sampling in Gallium Phosphide** *ADVANCED OPTICAL MATERIALS*
  Altwaijry, N., Qasim, M., Mamaikin, M., Schoetz, J., Golyari, K., Heynck, M., Ridente, E., Yakovlev, V. S., Karpowicz, N., Kling, M. F.
  2023
- **Ultrafast quantum dynamics driven by the strong space-charge field of a relativistic electron beam** *OPTICA*
  Cesar, D., Acharya, A., Cryan, J. P., Kartsev, A., Kling, M. F., Lindenberg, A. M., Pemmaraju, C. D., Poletayev, A. D., Yakovlev, V. S., Marinelli, A.
  2023; 10 (1): 1-10
- **Strong-field physics with nanospheres** *ADVANCES IN PHYSICS-X*
  Seiffert, L., Zherebtsov, S., Kling, M. F., Fennel, T.
  2022; 7 (1)
- **Relaxation dynamics in excited helium nanodroplets probed with high resolution, time-resolved photoelectron spectroscopy** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*
  LaForge, A. C., Asmussen, J. D., Bastian, B., Bonanomi, M., Callegari, C., De, S., Di Fraia, M., Gorman, L., Hartweg, S., Krishnan, S. R., Kling, M. F., Mishra, D., Mandal, et al
  2022: 28844-28852
- **Strong-Field Control of Plasmonic Properties in Core-Shell Nanoparticles** *ACS PHOTONICS*
  Powell, J. A., Li, J., Summers, A., Robatjazi, S., Davino, M., Rupp, P., Saydanzad, E., Sorensen, C. M., Rolles, D., Kling, M. F., Trallero, C., Thumm, U., Rudenko, et al
  2022
- **Complementary dispersive mirror pair produced in one coating run based on desired non-uniformity** *OPTICS EXPRESS*
  Chen, Y., Li, W., Wang, Z., Hahner, D., Kling, M. F., Pervak, V.
  2022; 30 (18): 32074-32083
- **Spatiotemporal sampling of near-petahertz vortex fields** *OPTICA*
  Bloechl, J., Schoetz, J., Maliakkal, A., Sreibere, N., Wang, Z., Rosenberger, P., Hommelhoff, P., Staudte, A., Corkum, P. B., Bergues, B., Kling, M. F.
  2022; 9 (7): 755-761
- **Imaging elliptically polarized infrared near-fields on nanoparticles by strong-field dissociation of functional surface groups** *EUROPEAN PHYSICAL JOURNAL D*
  Rosenberger, P., Dagar, R., Zhang, W., Sousa-Castillo, A., Neuhaus, M., Cortes, E., Maier, S. A., Costa-Vera, C., Kling, M. F., Bergues, B.
  2022; 76 (6)
- **All-optical nanoscopic spatial control of molecular reaction yields on nanoparticles** *OPTICA*
  Zhang, W., Dagar, R., Rosenberger, P., Sousa-Castillo, A., Neuhaus, M., Li, W., Khan, S. A., Alnaser, A. S., Cortes, E., Maier, S. A., Costa-Vera, C., Kling, M. F., Bergues, et al

2022; 9 (5): 551-560

- **Fifth-order nonlinear optical response of Alq(3) thin films** *RESULTS IN PHYSICS*
  Saleh, A., Li, W., ALQahtani, H., Neuhaus, M., Alshehri, A., Bergues, B., Alharbi, M., Kling, M. F., Azzeer, A. M., Wang, Z., Alharbi, A. F.
  2022; 37
- **Few-femtosecond resolved imaging of laser-driven nanoplasma expansion** *NEW JOURNAL OF PHYSICS*
  Peltz, C., Powell, J. A., Rupp, P., Summers, A., Gorkhover, T., Gallei, M., Halfpap, Antonsson, E., Langer, B., Trallero-Herrero, C., Graf, C., Ray, D., Liu, Q., et al
  2022; 24 (4)
- **Electro-optic characterization of synthesized infrared-visible light fields** *NATURE COMMUNICATIONS*
  Ridente, E., Mamaikin, M., Altwaijry, N., Zimin, D., Kling, M. F., Pervak, V., Weidman, M., Krausz, F., Karpowicz, N.
  2022; 13 (1): 1111
- **The emergence of macroscopic currents in photoconductive sampling of optical fields.** *Nature communications*
  Schotz, J., Maliakkal, A., Blochl, J., Zimin, D., Wang, Z., Rosenberger, P., Alharbi, M., Azzeer, A. M., Weidman, M., Yakovlev, V. S., Bergues, B., Kling, M. F.
  2022; 13 (1): 962
- **Attosecond coherent electron motion in Auger-Meitner decay.** *Science (New York, N.Y.)*
  Li, S., Driver, T., Rosenberger, P., Champenois, E. G., Duris, J., Al-Haddad, A., Averbukh, V., Barnard, J. C., Berrah, N., Bostedt, C., Bucksbaum, P. H., Coffee, R. N., DiMauro, et al
  1800: eabj2096
- **Efficient nonlinear compression of a thin-disk oscillator to 8.5 fs at 55 W average power** *OPTICS LETTERS*
  Barbiero, G., Wang, H., Grassl, M., Groebmeyer, S., Kimbaras, D., Neuhaus, M., Pervak, V., Nubbemeyer, T., Fattahi, H., Kling, M. F.
  2021; 46 (21): 5304-5307
- **Onset of charge interaction in strong-field photoemission from nanometric needle tips** *NANOPHOTONICS*
  Schoetz, J., Seiffert, L., Maliakkal, A., Bloechl, J., Zimin, D., Rosenberger, P., Bergues, B., Hommelhoff, P., Krausz, F., Fennel, T., Kling, M. F.
  2021; 10 (14): 3769-3775
- **Petahertz-scale nonlinear photoconductive sampling in air** *OPTICA*
  Zimin, D., Weidman, M., Schoetz, J., Kling, M. F., Yakovlev, V. S., Krausz, F., Karpowicz, N.
  2021; 8 (5): 586-590
- **Saturating multiple ionization in intense mid-infrared laser fields** *NEW JOURNAL OF PHYSICS*
  Haniel, F. E., Schroeder, H., Kahaly, S., Nayak, A., Dumergue, M., Mondal, S., Zoltan, F., Flender, R., Kurucz, M., Haizer, L., Kiss, B., Charalambidis, D., Kling, et al
  2021; 23 (5)
- **Observation of the quantum shift of a backward rescattering caustic by carrier-envelope phase mapping** *PHYSICAL REVIEW A*
  Mizuno, T., Ishii, N., Kanai, T., Rosenberger, P., Zietlow, D., Kling, M. F., Tolstikhin, O., Morishita, T., Itatani, J.
  2021; 103 (4)
- **Single-shot dispersion sampling for optical pulse reconstruction** *OPTICS EXPRESS*
  Korobenko, A., Rosenberger, P., Schoetz, J., Naumov, A., Villeneuve, D. M., Kling, M. F., Staudte, A., Corkum, P. B., Bergues, B.
  2021; 29 (8): 11845-11853
- **Mark Stockman: Evangelist for Plasmonics** *ACS PHOTONICS*
  Aizpurua, J., Atwater, H. A., Baumberg, J. J., Bozhevolnyi, S. I., Brongersma, M. L., Dionne, J. A., Giessen, H., Halas, N., Kivshar, Y., Kling, M. F., Krausz, F., Maier, S., Makarov, et al
  2021; 8 (3): 683-698
- **Femtosecond Laser Induced Resonant Tunneling in an Individual Quantum Dot Attached to a Nanotip** *ACS PHOTONICS*
  Duchet, M., Perisanu, S., Purcell, S. T., Constant, E., Loriot, V., Yanagisawa, H., Kling, M. F., Lepine, F., Ayari, A.
  2021; 8 (2): 505-511
- **Ionization-Induced Subcycle Metallization of Nanoparticles in Few-Cycle Pulses** *ACS PHOTONICS*

Liu, Q., Seiffert, L., Suessmann, F., Zherebtsov, S., Passig, J., Kessel, A., Trushin, S. A., Kling, N. G., Ben-Itzhak, I., Mondes, V., Graf, C., Ruehl, E., Veisz, et al

2020; 7 (11): 3207-3215

- **Femtosecond streaking in ambient air** *OPTICA*

  Korobenko, A., Johnston, K., Kubullek, M., Arissian, L., Dube, Z., Wang, T., Kubel, M., Naumov, A., Villeneuve, D. M., Kling, M. F., Corkum, P. B., Staudte, A., Bergues, et al

  2020; 7 (10): 1372-1376

- **Near-Field Induced Reaction Yields from Nanoparticle Clusters** *ACS PHOTONICS*

  Rosenberger, P., Rupp, P., Ali, R., Alghabra, M., Sun, S., Mitra, S., Khan, S. A., Dagar, R., Kim, V., Iqbal, M., Schotz, J., Liu, Q., Sundaram, et al

  2020; 7 (7): 1885-1892

- **Suppression of individual peaks in two-colour high harmonic generation** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*

  Mitra, S., Biswas, S., Schoetz, J., Pisanty, E., Foerg, B., Kavuri, G. A., Burger, C., Okell, W., Hoegner, M., Pupeza, Pervak, Lewenstein, M., Wnuk, P., Kling, et al

  2020; 53 (13)

- **Photoelectron spectroscopy of large water clusters ionized by an XUV comb** *JOURNAL OF PHYSICS-PHOTONICS*

  Trabattoni, A., Colaizzi, L., Ban, L., Wanie, V., Saraswathula, K., Mansson, E. P., Rupp, P., Liu, Q., Seiffert, L., Herzig, E. A., Cartella, A., Yoder, B. L., Legare, et al

  2020; 2 (3)

- **High-contrast, intense single-cycle pulses from an all thin-solid-plate setup** *OPTICS LETTERS*

  Seo, M., Tsendsuren, K., Mitra, S., Kling, M., Kim, D.

  2020; 45 (2): 367-370

- **Tunable isolated attosecond X-ray pulses with gigawatt peak power from a free-electron laser** *NATURE PHOTONICS*

  Duris, J., Li, S., Driver, T., Champenois, E. G., MacArthur, J. P., Lutman, A. A., Zhang, Z., Rosenberger, P., Aldrich, J. W., Coffee, R., Coslovich, G., Decker, F., Glownia, et al

  2020; 14 (1): 30-+

- **Carrier-envelope-phase-controlled molecular dissociation by ultrashort chirped laser pulses** *PHYSICAL REVIEW A*

  Bozpolat, S. A., Rosenberger, P., Ciappina, M. F., Kling, M. F., Yavuz, I.

  2019; 100 (6)

- **Attosecond transient absorption spooktroscopy: a ghost imaging approach to ultrafast absorption spectroscopy.** *Physical chemistry chemical physics : PCCP*

  Driver, T., Li, S., Champenois, E. G., Duris, J., Ratner, D., Lane, T. J., Rosenberger, P., Al-Haddad, A., Averbukh, V., Barnard, T., Berrah, N., Bostedt, C., Bucksbaum, et al

  2019

- **Interplay of pulse duration, peak intensity, and particle size in laser-driven electron emission from silica nanospheres** *OPTICS EXPRESS*

  Powell, J. A., Summers, A. M., Liu, Q., Robatjazi, S., Rupp, P., Stierle, J., Trallero-Herrero, C., Kling, M. F., Rudenko, A.

  2019; 27 (19): 27124-27135

- **All-optical spatio-temporal control of electron emission from SiO₂ nanospheres with femtosecond two-color laser fields** *NEW JOURNAL OF PHYSICS*

  Liu, Q., Zherebtsov, S., Seiffert, L., Skruszewicz, S., Zietlow, D., Ahn, S., Rupp, P., Wnuk, P., Sun, S., Kessel, A., Trushin, S., Schlander, A., Kim, et al

  2019; 21

- **Sub-cycle dynamics in relativistic nanoplasma acceleration** *SCIENTIFIC REPORTS*

  Cardenas, D. E., Ostermayr, T. M., Di Lucchio, L., Hofmann, L., Kling, M. F., Gibbon, P., Schreiber, J., Veisz, L.

  2019; 9: 7321

- **Generation and Characterization of Attosecond Pulses from an X-ray Free-electron Laser**

  Li, S., Rosenberger, P., Champenois, E. G., Driver, T., Bucksbaum, P. H., Coffee, R., Gatton, A., Hartmann, G., Helml, W., Huang, Z., Knurr, J., Kling, M. F., Lin, et al

  IEEE.2019

- **Phase- and intensity-resolved measurements of above threshold ionization by few-cycle pulses** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*
  Kuebel, M., Arbeiter, M., Burger, C., Kling, N. G., Pischke, T., Moshammer, R., Fennel, T., Kling, M. F., Bergues, B.
  2018; 51 (13)
- **Roadmap on plasmonics** *JOURNAL OF OPTICS*
  Stockman, M. I., Kneipp, K., Bozhevolnyi, S. I., Saha, S., Dutta, A., Ndukaife, J., Kinsey, N., Reddy, H., Guler, U., Shalaev, V. M., Boltasseva, A., Gholipour, B., Krishnamoorthy, et al
  2018; 20 (4)
- **Attosecond streaking metrology with isolated nanotargets** *JOURNAL OF OPTICS*
  Liu, Q., Seiffert, L., Trabattoni, A., Castrovilli, C., Galli, M., Rupp, P., Frassetto, F., Poletto, L., Nisoli, M., Ruehl, E., Krausz, F., Fennel, T., Zherebtsov, et al
  2018; 20 (2)
- **Single-shot carrier-envelope-phase tagging using an f-2f interferometer and a phase meter: a comparison** *JOURNAL OF OPTICS*
  Ren, X., Summers, A. M., Raju, K. P., Vajdi, A., Makhija, V., Fehrenbach, C. W., Kling, N. G., Betsch, K. J., Wang, Z., Kling, M. F., Carnes, K. D., Ben-Itzhak, I., Trallero-Herrero, et al
  2017; 19 (12)
- **Signatures and mechanisms of plasmon-enhanced electron emission from clusters in few-cycle laser fields** *JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS*
  Seiffert, L., Koehn, J., Peltz, C., Kling, M. F., Fennel, T.
  2017; 50 (22)
- **Optical Control of Young's Type Double-slit Interferometer for Laser-induced Electron Emission from a Nano-tip** *SCIENTIFIC REPORTS*
  Yanagisawa, H., Ciappina, M., Hafner, C., Schoetz, J., Osterwalder, J., Kling, M. F.
  2017; 7: 12661
- **Non-sequential double ionization with near-single cycle laser pulses** *SCIENTIFIC REPORTS*
  Chen, A., Kuebel, M., Bergues, B., Kling, M. F., Emmanouilidou, A.
  2017; 7: 7488
- **Attosecond physics at the nanoscale** *REPORTS ON PROGRESS IN PHYSICS*
  Ciappina, M. F., Perez-Hernandez, J. A., Landsman, A. S., Okell, W. A., Zherebtsov, S., Foerg, B., Schoetz, J., Seiffert, L., Fennel, T., Shaaran, T., Zimmermann, T., Chacon, A., Guichard, et al
  2017; 80 (5): 054401
- **Phase- and intensity-dependence of ultrafast dynamics in hydrocarbon molecules in few-cycle laser fields** *MOLECULAR PHYSICS*
  Kuebel, M., Burger, C., Siemering, R., Kling, N. G., Bergues, B., Alnaser, A. S., Ben-Itzhak, I., Moshammer, R., de Vivie-Riedle, R., Kling, M. F.
  2017; 115 (15-16): 1835-1845
- **Delayed electron emission in strong-field driven tunnelling from a metallic nanotip in the multi-electron regime** *SCIENTIFIC REPORTS*
  Yanagisawa, H., Schnepp, S., Hafner, C., Hengsberger, M., Kim, D., Kling, M. F., Landsman, A., Gallmann, L., Osterwalder, J.
  2016; 6: 35877
- **Carrier-envelope phase dependence of the directional fragmentation and hydrogen migration in toluene in few-cycle laser fields**
  Li, H., Kling, N. G., Foerg, B., Stierle, J., Kessel, A., Trushin, S. A., Kling, M. F., Kaziannis, S.
  AMER INST PHYSICS.2016: 043206
- **Alignment-assisted field-free orientation of rotationally cold CO molecules (vol 90, 013419, 2014)** *PHYSICAL REVIEW A*
  Ren, X., Makhija, V., Li, H., Kling, M. F., Kumarappan, V.
  2016; 93 (3)
- **Visualization of bond rearrangements in acetylene using near single-cycle laser pulses** *FARADAY DISCUSSIONS*
  Burger, C., Kling, N. G., Siemering, R., Alnaser, A. S., Bergues, B., Azzeer, A. M., Moshammer, R., de Vivie-Riedle, R., Kuebel, M., Kling, M. F.
  2016; 194: 495-508
- **Single-Cycle Non-Sequential Double Ionization** *IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS*
  Bergues, B., Kuebel, M., Kling, N. G., Burger, C., Kling, M. F.

2015; 21 (5)

- **Alignment-assisted field-free orientation of rotationally cold CO molecules** *PHYSICAL REVIEW A*
  Ren, X., Makhija, V., Li, H., Kling, M. F., Kumarappan, V.
  2014; 90 (1)
- **The Interplay of Nuclear and Electron Wavepacket Motion in the Control of Molecular Processes: A Theoretical Perspective** *MOLECULAR QUANTUM DYNAMICS: FROM THEORY TO APPLICATIONS*
  Thallmair, S., Siemering, R., Koelle, P., Kling, M., Wollenhaupt, M., Baumert, T., de Vivie-Riedle, R.
  edited by Gatti, F.
  2014: 213-248
- **Plasmon-Enhanced-Attosecond-Extreme Ultraviolet Source** *PHYSICAL REVIEW LETTERS*
  Lupetti, M., Kling, M. F., Scrinzi, A.
  2013; 110 (22): 223903
- **Nanoplasmonic near-field synthesis** *PHYSICAL REVIEW A*
  Feist, J., Reid, M., Kling, M. F.
  2013; 87 (3)
- **Ultrafast phenomena on the nanoscale** *ANNALEN DER PHYSIK*
  Hommelhoff, P., Kling, M. F., Stockman, M. I.
  2013; 525 (1-2): A13-A14
- **(Sub-)femtosecond control of molecular reactions via tailoring the electric field of light** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*
  Kling, M. F., von den Hoff, P., Znakovskaya, I., de Vivie-Riedle, R.
  2013; 15 (24): 9448-9467
- **Attosecond tracing of correlated electron-emission in non-sequential double ionization** *NATURE COMMUNICATIONS*
  Bergues, B., Kuebel, M., Johnson, N. G., Fischer, B., Camus, N., Betsch, K. J., Herrwerth, O., Senftleben, A., Sayler, A., Rathje, T., Pfeifer, T., Ben-Itzhak, I., Jones, et al
  2012; 3: 813
- **Attosecond nanoplasmonic streaking of localized fields near metal nanospheres (vol 84, 121406, 2011)** *PHYSICAL REVIEW B*
  Sussmann, F., Kling, M. F.
  2011; 84 (11)
- **Attosecond nanoplasmonic streaking of localized fields near metal nanospheres** *PHYSICAL REVIEW B*
  Suessmann, F., Kling, M. F.
  2011; 84 (12)
- **Predicted Ultrafast Dynamic Metallization of Dielectric Nanofilms by Strong Single-Cycle Optical Fields** *PHYSICAL REVIEW LETTERS*
  Durach, M., Rusina, A., Kling, M. F., Stockman, M. I.
  2011; 107 (8): 086602
- **Attosecond measurement of petahertz plasmonic near-fields**
  Suessmann, F., Kling, M. F.
  edited by Stockman, M. I.
  SPIE-INT SOC OPTICAL ENGINEERING.2011
- **Metallization of Nanofilms in Strong Adiabatic Electric Fields** *PHYSICAL REVIEW LETTERS*
  Durach, M., Rusina, A., Kling, M. F., Stockman, M. I.
  2010; 105 (8): 086803
- **Time of flight-photoemission electron microscope for ultrahigh spatiotemporal probing of nanoplasmonic optical fields**
  Lin, J., Weber, N., Wirth, A., Chew, S., Escher, M., Merkel, M., Kling, M. F., Stockman, M. I., Krausz, F., Kleineberg, U.
  IOP PUBLISHING LTD.2009: 314005
- **Attoscience: An attosecond stopwatch** *NATURE PHYSICS*
  Kling, M., Krausz, F.

2008; 4 (7): 515-516

- **Attosecond electron dynamics** *ANNUAL REVIEW OF PHYSICAL CHEMISTRY*
  Kling, M. F., Vrakking, M. J. J.
  2008; 59: 463-492

- **Attosecond nanoplasmonic-field microscope** *NATURE PHOTONICS*
  Stockman, M. I., Kling, M. F., Kleineberg, U., Krausz, F.
  2007; 1 (9): 539-544

- **Nature and role of bridged carbonyl intermediates in the ultrafast photoinduced rearrangement of Ru₃(CO)₁₂** *ORGANOMETALLICS*
  Glascoe, E. A., Kling, M. F., Shanoski, J. E., Harris, C. B.
  2006; 25 (3): 775-784

- **Ultrafast infrared mechanistic studies of the interaction of 1-Hexyne with group 6 hexacarbonyl complexes** *ORGANOMETALLICS*
  Shanoski, J. E., Payne, C. K., Kling, M. F., Glascoe, E. A., Harris, C. B.
  2005; 24 (8): 1852-1859

- **Decomposition of tertiary alkoxy radicals** *ZEITSCHRIFT FUR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY & CHEMICAL PHYSICS*
  Buback, M., Kling, M., Schmatz, S.
  2005; 219 (9): 1205-1222

- **Photo-induced decomposition of organic peroxides: Ultrafast formation and decarboxylation of carbonyloxy radicals** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*
  Buback, M., Kling, M., Schmatz, S., Schroeder, J.
  2004; 6 (24): 5441-5455

- **Decarboxylation of carbonyloxy radicals: a density functional study** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*
  Kling, M., Schmatz, S.
  2003; 5 (18): 3891-3896

- **Watching photoinduced chemistry and molecular energy flow in solution in real time** *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION*
  Assmann, J., Kling, M., Abel, B.
  2003; 42 (20): 2226-2246