

PERSONAL INFORMATION

Philipp Kukura FRSC
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• EDUCATION

- 2006 *PhD in Chemistry (19.05.2006)*
Ultrafast Spectroscopy
Department of Chemistry, UC Berkeley, USA
Supervisor: Prof Richard A. Mathies
- 2002 *MChem*
Department of Chemistry, St Hugh's College, University of Oxford, UK

• CURRENT POSITIONS

- 2018 – *Founder and non-executive Director*
Refeyn (formerly: Arago Biosciences), Oxford UK
- 2016 – *Professor of Chemistry*
Physical and Theoretical Chemistry Laboratory, University of Oxford, UK
- 2011 – *Official Fellow for Physical Chemistry*
Exeter College, Oxford, UK

• PREVIOUS POSITIONS

- 2014 – 2016 *Associate Professor of Chemistry*
Physical and Theoretical Chemistry Laboratory, University of Oxford, UK
- 2011 – 2014 *University Lecturer*
Physical and Theoretical Chemistry Laboratory, University of Oxford, UK
- 2010 – 2015 *EPSRC Career Acceleration Fellow*
Physical and Theoretical Chemistry Laboratory, University of Oxford, UK

• FELLOWSHIPS

- 2010 – 2011 *Research Fellow*
St Hugh's College, University of Oxford, UK
- 2006 – 2010 *Postdoctoral Fellow*
ETH Zurich, Zurich, Switzerland
Supervisor: Prof Vahid Sandoghdar

• DISTINCTIONS (Past 10 years)

- 2019 Blavatnik Award for Young Scientists UK, Chemistry Laureate
- 2019 Member, Slovak Academy of Sciences
- 2018 Klung-Wilhelmy Science Award (Chemistry)
- 2018 Blavatnik Award for Young Scientists UK, Chemistry Finalist
- 2018 Royal Society Wolfson Research Merit Award
- 2017 EBSA Young Investigator Award and Medal
- 2015 Royal Society of Chemistry Marlow Award
- 2015 Visiting Professor Sapienza University of Rome
- 2014 ERC Starting Investigator Grant
- 2014 Visiting Professor University of Erlangen
- 2011 Royal Society of Chemistry Harrison-Meldola Award

2011 Elected Fellow of the Royal Society of Chemistry

2010 EPSRC Career Acceleration Fellowship

• **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

2010 – 2019 10 postdocs, 7 doctoral students and 16 Masters students

• **TEACHING ACTIVITIES (Past 10 years)**

2020 Examiner Part1A

2019 Examiner of MChem PartII Thesis and Vivas

2017 Examiner of MChem 3rd Year Final Examination in Physical Chemistry

2016 Examiner of MChem 2nd Year Examination in Physical Chemistry

2014 – 2015 Examiner of MChem Preliminary Examination in Physical Chemistry

2011 – Official Fellow for Physical Chemistry, Exeter College, Oxford, UK
3 groups of 6 students/year (144 hrs p.a.)

2010 – Examiner of 6 PhD theses

2010 – Organiser and lecturer of core MChem course *Photochemistry and Photophysics and Symmetry I*

• **ORGANISATION OF SCIENTIFIC MEETINGS**

2020 Member of the organising committee Interferometric Scattering
Microscopy Conference, Erlangen

2018 Chair: New Methods for Studying Structural Dynamics of Macromolecules
Molecular Biophysics Subgroup of the Biophysical Society

2013 Session Chair CLEO

2011 Member of the organising committee COMET 2011

• **INSTITUTIONAL RESPONSIBILITIES**

2019- Investment Committee, Exeter College, Oxford

2015 – 2016 Co-organiser Physical Chemistry Seminar Series

2014 – 2017 Steering Committee of the Conference of Colleges

2013 – 2014 Finance & Estates Committee, Exeter College, Oxford

2011 – 2013 Development Committee, Exeter College, Oxford

2011 – 2012 Buildings Committee, Exeter College, Oxford

2011 – Governing Body, Exeter College, Oxford

• **COMMISSIONS OF TRUST**

2019 Panel: ERC Starting Grant 2019 (chair-elect from 2021)

2019 International Advisory Board, J. Heyrovsky Institute of Physical
Chemistry

2019 – Chair to access panel at CLF, Harwell

2019 Editor: Current Opinion in Chemical Biology, Elsevier

2018 Panel: Engineering and Physical Sciences Research Council

2018 Guest editor: Current Opinions in Chemical Biology – Molecular Imaging

2017 Reviewer: NSERC Discovery Grant

2016 Panel: Engineering and Physical Sciences Research Council

2015 Member, Faraday Division Awards Committee, Royal Society of
Chemistry

2014 Panel: Engineering and Physical Sciences Research Council

2011 Referee: DOE Young Investigator Award

2011 Panel: Engineering and Physical Sciences Research Council

2010 – Reviewer for a broad range of scientific journals including: *Nature*,
Science, *Nature Photonics*, *Nature Chemistry*, *Nature Methods*, *PNAS*,
JACS, *PRL*, *Chemical Reviews*, *Nano Letters*, *JPC*, *JCPA/B*, *Nanoscale*, *ACS*
Nano, *ACS Photonics*, *Optics Letters*, and *Optics Express*

SELECTED PREVIOUS FUNDING

As PI grants valued at about €3.4M since 2010, €1.5M as CoI and €0.8M for visitors

- 2019- Emerson Grant (PI, £250k)
- 2019- Oxford Berlin Award (PI, £15k)
- 2019-2024 ERC Consolidator Grant, " Photomass", (PI, €2M)
- 2018 – 2020 ERC Proof of Concept Grant (PI, Single Molecule Imaging Mass Spectrometry, €142k)
- 2017 – 2019 EPSRC Impact Accelerator Award (PI, Interferometric Scattering Mass Spectrometry €104k)
- 2015 – 2018 EPSRC, "Direct observation and characterisation of physical autocatalysis by interferometric scattering microscopy", (CoI, €689k)
- 2014 – 2018 ERC Starting Investigator Grant, "Optical Imaging of Nanoscopic Potentials and Dynamics", (PI, €1.499M)
- 2013 – 2016 EPSRC, "Do you need a protein for efficient photochemistry?", (CoI, €785k)
- 2010 – 2014 EPSRC Career Acceleration Fellowship, "Following molecular structure and dynamics in real time using femtosecond stimulated Raman spectroscopy", (PI, €1.633M)

• MAJOR COLLABORATIONS

Prof JUSTIN BENESCH, Department of Chemistry, University of Oxford

Prof STEPHEN FLETCHER, Department of Chemistry, University of Oxford

Prof ROLAND RIEK, Department of Chemistry, ETH Zurich

Prof HELGE EWERS, Department of Biochemistry, FU Berlin

Prof ALEX PERSAT, EPFL, Lausanne

Prof JONATHAN HEDDLE, Jagielloian University, Kraków

Dr TIM CLAUSEN, Research Institute of Molecular Pharmacology, Vienna

Dr AKSHAY RAO, Department of Physics, University of Cambridge

Dr JAMES SELLERS, National Institutes of Health, Bethesda

Dr SANLI FAEZ, University of Utrecht

Dr DAVID HASELBACH, IMP, Vienna

- **INVITED TALKS**

More than 70 in national and international institutions and conferences:

Major international meetings

- 2019: Nanometa (plenary), Seefeld; Single Molecule and NanoSystems (plenary), Munich; Biophysical Society, Baltimore;
- 2018: QBI Göttingen, Klosters Winterseminar; Gordon Research Conference Biointerfaces, Il Ciocco;
- 2017: European Biophysical Society, Edinburgh; Gordon Conference Coherent Control; ECSBM Amsterdam; RACI Centenary Congress, Melbourne; ACS Spring Meeting, San Francisco.
- 2016: Gordon Conference Vibrational Spectroscopy, New England; Biophysical Society 60th Annual Meeting, Los Angeles; International Conference on Retinal Proteins, Potsdam.
- 2015: European Biophysical Congress EBSA, Dresden.
- 2014: International Conference on Retinal Proteins, Nagahama.
- 2013: Deutsche Physikalische Gesellschaft, Spring Meeting, Hannover.
- 2012: International Conference on Raman Spectroscopy, Bangalore.

Smaller international meetings, national meetings and workshops

- 2020: SMB2020, Les Houches; MPI Heidelberg Departmental Retreat, Ringberg; EPFL Symposium, Lausanne
- 2019: AspenCentre of Physics, SMB2019, Aspen; Modern Concepts in Structural Biology IMP, Vienna; Bunsentagung, Jena; NH Eindhoven; TSCR Workshop, Telluride; Molecular Foundry, Berkley; VIB Gent, Biomembrane Meeting, Berlin, Young Scientists, Cambridge
- 2018: Cardiff NanoBio Symposium, Hong Kong postgraduate symposium (keynote).
- 2017: Graduate School Meeting, International Max Planck Research School for Molecular Medicine; DPG Summer School Advanced Microscopy; MMC 2017 Manchester.
- 2016: International Conference on Retinal Proteins, Potsdam; German Biophysical Society, Erlangen; Picoquant Single Molecule Workshop, Berlin; Future Leaders in Physical Chemistry, Oxford; OWLS, Mumbai.
- 2015: Good Vibrations Lorentz Conference Leiden; PhoQuS workshop, Warsaw; Microscience Microscopy Congress, Manchester.
- 2014: British Biophysical Society, Warwick.
- 2013: Institute of Molecular Science Workshop Okazaki; Center for NanoScience (CeNS) workshop, Venice; Quantum Effects in Biological Systems, Vienna.
- 2012: International Conference on Raman Spectroscopy, Bangalore.
- 2011: International Conference on Molecular Energy Transfer, Oxford.

- **PATENTS**

- 2001 Bradbury JE, Smith DR, Grant ER, Kukura P. Identification of material inclusions in pulp and paper using Raman spectroscopy. US6744500B2.
- 2016 Kukura P, Weigel A, Benesch J. Interferometric Scattering Microscopy. GB2552195A, patent pending.

• PUBLICATIONS

73 since 2003 including Science (2), Nature (2), Nature Photonics (3), Nature Chemistry (2), Nature Methods, Nature Physics (3), PNAS (3), PRL (3), eLife. >6300 citations, h-index 39, 17 papers with more than 100 citations, currently >800 citations/year (Google scholar).

Preprints

78. Olerinyova, A, Sonn-Segev, A, Gault, J, Eichmann, C, Schimpf, J, Kopf AH, Rudden, LSP, Ashkinadze, D, Bomba, R, Greenwald J, Degiacomi, MT, Kilian, JA, Friedrich, T, Riek, R, Struwe, WB, Kukura, P. Mass Photometry of Membrane Proteins. *Pre-print* **2020** bioRxiv 969287
77. Soltermann F, Foley EDB, Pagnoni V, Galpin MR, Benesch JLP, Kukura P, Struwe WB. Quantifying protein-protein interactions by molecular counting with mass photometry. *Pre-print* **2020** bioRxiv 925456
76. Li, Y, Struwe, WB, Kukura, P. Single molecule mass photometry of nucleic acids. *Pre-print* **2020** bioRxiv 904755
75. Sonn-Segev A, Belacic A, Bodrug T, Young G, VanDerLinden RT, Schulman A, Schimpf J, Friedrich T, Dip PV, Schwartz T, Bauer B, Peters JM, Struwe WB, Benesch JLP, Brown NG, Haselbach D, Kukura P. Quantifying the heterogeneity of macromolecular machines by mass photometry. *Pre-print* **2019** biorxiv 864553

Publications

74. Fumero, G, Schnedermann, C, Batignani, G, Wende, T, Bassolino, G, Ferrante, C, Mukamel, S, Kukura, P, Scopigno, T. Two-dimensional impulsively resonant raman spectroscopy of molecular excited states. *Physical Review X* **2020** 10(1)
73. Sung J, Schnedermann C, Ni L, Sadhanala A, Chen RYS, Cho C, Priest L, Lim JM, Kim HK, Monserrat B, Kukura P, Rao A. Long-range ballistic propagation of carriers in methylammonium lead iodide perovskite thin films. *Nat. Phys.* **2019** 10.1038/s41567-019-0730-2
72. Schnedermann C, Sung J, Pandya R, Verma SD, Chen RYS, Guariot N, Bretscher H, Kukura P, Rao A. Ultrafast Tracking of Exciton and Charge Carrier Transport in Optoelectronic Materials on the Nanometer Scale. *J. Phys. Chem. Lett.* **2019** 10:6727-6733
71. Schnedermann C, Antonios MA, Wende T, Lukman S, Feng J, Schröder FAYN, Turban DHP, Wu J, Hine NDM, Greenham NC, Chin AW, Rao A, Kukura P, Musser AJ. A molecular movie of ultrafast singlet fission. *Nature communications* **2019** 10:4207
70. Pandya R, Chen RYS, Gu Q, Sung J, Schnedermann C, Ojambati OS, Chikkaraddy R, Gorman J, Jacucci G, Onelli OD, Willhammar T, Johnstone DN, Collins SM, Midgley PA, Auras F, Baikie T, Jayaprakash R, Mathevet F, Soucek R, Du M, Vignolini S, Lidzey DG, Baumberg JJ, Friend RH, Barisien T, Legrand L, Chin AW, Musser AJ, Yuen-Zhou J, Saikin SK, Kukura P, Rao A. Ultrafast long-range energy transport via light-matter coupling in organic semiconductor films. *Pre-print* [arXiv:1909.03220](https://arxiv.org/abs/1909.03220)

69. Young G and Kukura P. Interferometric Scattering Microscopy *Annual Review of Physical Chemistry* **2019** 70: 301-322
68. Malay AD, Naoyuki M, Biela A, Chakroborti S, Maisterkiewicz K, Stupka I, Kaplan CS, Kowalczyk A, Piette BMAG, Hochberg GKA, Wu D, Wrobel TP, Fineberg A, Kushwah MS, Kelemen M, Vaypetic P, Pelicon P, Kukura P, Benesch JLPB, Iwasaki K, Heddle JG. An ultra-stable gold-coordinated protein cage displaying reversible assembly *Nature* **2019** 569: 438-442
67. Christoph Schnedermann, Akshay Rao and Philipp Kukura. Shaky lattices for light-matter interactions. *Nature Materials* **2019** 18: 300-308
66. Haeussermann K, Young G, Kukura P, Dietz H. Dissecting FOXP2 oligomerization and DNA binding. *Angewandte Chemie Internationale Edition* **2019** 58: 7662-7667
65. Tala L, Fineberg A, Kukura P, Persat A. *Pseudomonas aeruginosa* orchestrates twitching motility by sequential control of type IV pili movements. *Nature Microbiology* **2019** 4: 774-780
64. de Wit G, Albrecht D, Ewers H, Kukura P. Revealing compartmentalized diffusion in living cells with interferometric scattering microscopy. *Biophysical Journal* **2018** 114: 2945 – 2950
63. Reina F, Galiani S, Shrestha D, Sezgin E, de Wit G, Cole D, Lagerholm BC, Kukura P, Eggeling C. Complementary studies of lipid membrane dynamics using iSCAT and super-resolved fluorescence correlation spectroscopy. *Journal of Physics D: Applied Physics* **2018** 51: 235401
62. Young G, Hundt N, Cole D, Fineberg A, Andrecka J, Tyler A, Olerinyova A, Ansari A, Marklund EG, Collier MP, Chandler SA, Tkachenko O, Allen J, Crispin M, Billington N, Takagi Y, Sellers JR, Eichmann C, Selenko P, Frey L, Riek R, Galpin MR, Struwe WB, Benesch JLP*, Kukura P*. Quantitative mass imaging of single biological macromolecules. *Science* **2018** 360: 423-327
(Featured in: *Science News & Views*, *Nature Methods*, *C&E News*, *Science Translational Medicine Blog*, *Phys.org*, *Chemistry & Industry*)
61. Schnedermann C, Yang X, Liebel M, Spillane KM, Lugtenburg J, Fernández I, Valentini A, Schapiro I, Olivucci M, Kukura P, Mathies RA. Evidence for a vibrational phase-dependent isotope effect on the photochemistry of vision. *Nature Chemistry* **2018** 10: 449-455
60. Cole D, Young G, Weigel A, Kukura P. Label-free single molecule imaging with numerical aperture-shaped interferometric scattering microscopy. *ACS Photonics* **2017** 4: 211-216
59. Liebel M, Kukura P. Lack of evidence for phase-only control of retinal photoisomerization in the strict one-photon limit.

- Nature Chemistry* **2017** 9: 45-49
58. Nayak PK, Moore DT, Wenger B, Nayak S, Haghighirad AA, Fineberg A, Noel NK, Reid OG, Rumbles G, Kukura P, Vincent KA, Snaith HJ. Mechanism for rapid growth of organic–inorganic halide perovskite crystals.
Nature Communications **2016** 7: 13303
57. Schnedermann C, Lim JM, Wende T, Duarte AS, Ni L, Gu O, Sadhanala A, Rao A, Kukura P. Sub-10 femtosecond time-resolved vibronic microscopy.
Journal of Physical Chemistry Letters **2016** 7: 4854–4859
56. Duarte AS, Schnedermann C, Kukura P. Wide-field detected Fourier transform CARS microscopy.
Scientific Reports **2016** 6: 37516
55. Andrecka J, Takagi Y, Mickolajczyk KJ, Lippert LG, Sellers JR, Hancock WO, Goldman YE, Kukura P. Interferometric scattering microscopy for the study of molecular motors.
Methods in Enzymology **2016** 581: 517-539
54. Ortega-Arroyo JO, Bisette AJ, Kukura P*, Fletcher SP*. Visualization of the spontaneous emergence of a complex, dynamic, and autocatalytic system.
Proceedings of the National Academy of Sciences USA **2016** 113: 11122-11126
53. Schnedermann C, Muders M, Ehrenberg D, Schlesinger R, Kukura P, Heberle, J. Vibronic dynamics of the ultrafast all-trans to 13-cis photoisomerization of retinal in channelrhodopsin-1.
Journal of the American Chemical Society **2016** 138: 4757-4762
52. Ortega-Arroyo JO, Cole D, Kukura P. Interferometric scattering microscopy and its combination with single molecule fluorescence imaging.
Nature Protocols **2016** 11: 617-633
51. Ortega-Arroyo JO, Kukura P. Non-fluorescent schemes for single-molecule detection, imaging and spectroscopy.
Nature Photonics **2016** 12: 11-17
50. Andrecka J, Ortega-Arroyo J, Lewis K, Cross RA, Kukura P Label-free imaging of microtubules with sub-nanometer precision using interferometric scattering microscopy.
Biophysical Journal **2016** 110: 214-217
49. Mickolajczyk K, Ortega-Arroyo JO, Andrecka J, Kukura P and Hancock WO Kinetics of nucleotide-dependent structural transitions in the kinesin-1 hydrolysis cycle.
Proceedings of the National Academy of Sciences USA **2015** 112: E7186-7193
48. de Wit G, Danial J, Kukura P, Wallace M. Dynamic label-free imaging of lipid nanodomains.
Proceedings of the National Academy of Sciences USA **2015** 112: 12299-12303

47. Bassolino G, Sovdat T, Duarte AS, Lim JM, Schnedermann C, Liebel M, Odell B, Claridge TD, Fletcher SP, Kukura P. Barrierless photoisomerisation of 11-cis retinal protonated Schiff base in solution.
Journal of the American Chemical Society **2015** 137: 12434-12437
46. Weigel A, Sebesta A, Kukura P. Shaped and feedback controlled excitation of a single molecule in the weak-field limit.
Journal of Physical Chemistry Letters **2015** 6: 4031-4037
45. Liebel M, Schnedermann C, Wende T, Kukura P. Principles and applications of broadband impulsive vibrational spectroscopy.
Journal of Physical Chemistry A **2015** 119: 9506-9517
44. Musser AJ, Liebel M, Schnedermann C, Wende T, Kehoe TB, Rao A, Kukura P. Evidence for conical intersection dynamics mediating ultrafast singlet exciton fission.
Nature Physics **2015** 11: 352–357
(Featured in: *Nature Physics News & Views*)
43. Andrecka J, Ortega-Arroyo JO, Takagi Y, de Wit G, Fineberg A, MacKinnon L, Young G, Sellers JR, Kukura P. Structural dynamics of myosin 5 during processive motion revealed by interferometric scattering microscopy.
eLife **2015** 4: e05413
42. Schnedermann C, Liebel M, Kukura P. Mode-Specificity of Vibrationally Coherent Internal Conversion in Rhodopsin during the Primary Visual Event.
Journal of the American Chemical Society **2015** 137: 2886–2891
41. Weigel A, Kukura P. Raman extraordinaire.
Nature Photonics **2015** 9: 11–12. (News & Views)
40. Wende T, Liebel M, Schnedermann C, Pethick RJ, Kukura P. Population-Controlled Impulsive Vibrational Spectroscopy: Background- and Baseline-Free Raman Spectroscopy of Excited Electronic States.
Journal of Physical Chemistry A **2014** 118: 9976–9984
39. Spillane KM, Ortega-Arroyo J, de Wit G, Eggeling C, Ewers H, Wallace MI, Kukura P. High-Speed Single-Particle Tracking of GM1 in Model Membranes Reveals Anomalous Diffusion due to Interleaflet Coupling and Molecular Pinning.
Nano Letters **2014** 14: 5390–5397
38. Weigel A, Sebesta A, Kukura P. Dark Field Microspectroscopy with Single Molecule Fluorescence Sensitivity.
ACS Photonics **2014** 1: 848–856
(Selected as *Editor's choice*)
37. Arroyo JO, Andrecka J, Spillane KM, Billington N, Takagi Y, Sellers JR, Kukura

- P. Label-Free, All-Optical Detection, Imaging, and Tracking of a Single Protein. *Nano Letters* **2014** 14: 2065–2070
36. Liebel M, Schnedermann C, Bassolino G, Taylor G, Watts A, Kukura P. Direct Observation of the Coherent Nuclear Response after the Absorption of a Photon. *Physical Review Letters* **2014** 112: 238301
35. Parker AW, Bisby RH, Greetham GM, Kukura P, Scherer KM, Towrie M. Ultrafast Vibrational Spectroscopic Studies on the Photoionization of the alpha-Tocopherol Analogue Trolox C. *Journal of Physical Chemistry B* **2014** 118: 12087–12097
34. Liebel M, Schnedermann C, Kukura P. Sub-10-fs pulses tunable from 480 to 980 nm from a NOPA pumped by an Yb:KGW source. *Optics Letters* **2014** 39: 4112–4115
33. Bassolino G, Sovdat T, Liebel M, Schnedermann C, Odell B, Claridge TDW, Kukura P, Fetcher SP. Synthetic Control of Retinal Photochemistry and Photophysics in Solution. *Journal of the American Chemical Society* **2014** 136: 2650–2658
32. Liebel M, Schnedermann C, Kukura P. Vibrationally Coherent Crossing and Coupling of Electronic States during Internal Conversion in beta-Carotene. *Physical Review Letters* **2014** 112: 198302
31. Polli D, Weingart O, Brida D, Poli E, Maiuri M, Spillane KM, Bottoni A, Kukura P, Mathies RA, Cerullo G, Garavelli M. Wavepacket Splitting and Two-Pathway Deactivation in the Photoexcited Visual Pigment Isorhodopsin. *Angewandte Chemie-International Edition* **2014** 53: 2504–2507
(Selected as *VIP paper*)
30. Wende T, Liebel M, Schnedermann C, Pethick RJ, Kukura P. Population-Controlled Impulsive Vibrational Spectroscopy: Background- and Baseline-Free Raman Spectroscopy of Excited Electronic States. *Journal of Physical Chemistry A* **2014** 118: 9976–9984
29. Andrecka J, Spillane KM, Ortega-Arroyo J, Kukura P. Direct Observation and Control of Supported Lipid Bilayer Formation with Interferometric Scattering Microscopy. *ACS Nano* **2013** 7: 10662–10670
28. Szklarczyk OM, Gonzalez-Segredo N, Kukura P, Oppenheim A, Choquet D, Sandoghdar V, Helenius A, Sbalzarini IF, Ewers H. Receptor Concentration and Diffusivity Control Multivalent Binding of Sv40 to Membrane Bilayers. *PLoS Computational Biology* **2013** 9: e1003310
27. Liebel M, Kukura P. Broad-Band Impulsive Vibrational Spectroscopy of Excited Electronic States in the Time Domain.

- Journal of Physical Chemistry Letters* **2013** 4: 1358–1364
26. Kumar V, Casella M, Molotokaite E, Gatti D, Kukura P, Manzoni C, Polli D, Marangoni M, Cerullo G. Balanced-detection Raman-induced Kerr-effect spectroscopy.
Physical Review A **2012** 86: 053810
25. Sovdat T, Bassolino G, Liebel M, Schnedermann C, Fletcher SP, Kukura P. Backbone Modification of Retinal Induces Protein-like Excited State Dynamics in Solution.
Journal of the American Chemical Society **2012** 134: 8318–8320.
24. Ortega-Arroyo J, Kukura P. Interferometric scattering microscopy (iSCAT): new frontiers in ultrafast and ultrasensitive optical microscopy.
Physical Chemistry Chemical Physics **2012** 14: 15625–15636
(Cover article)
23. Lee KG, Chen XW, Eghlidi H, Kukura P, Lettow R, Renn A, Sandoghdar V, Goetzinger S. A planar dielectric antenna for directional single-photon emission and near-unity collection efficiency.
Nature Photonics **2011** 5: 166–169
22. Celebrano M, Kukura P, Renn A, Sandoghdar V. Single-molecule imaging by optical absorption.
Nature Photonics **2011** 5: 95–98
(Featured in: *Nature Photonics News & Views*)
21. Celebrano M, Lettow R, Kukura P, Agio M, Renn A, Goetzinger S, Sandoghdar V. Efficient coupling of single photons to single plasmons.
Optics Express **2010** 18: 13829–13835
20. Kukura P, Celebrano M, Renn A, Sandoghdar V. Single-molecular Absorption Sensitivity at Room Temperature.
Journal of Physical Chemistry Letters **2010** 1: 3323–3327
(Featured in: *Physics Today, C&EN News, Nature Methods Highlights*)
19. Polli D, Altoe P, Weingart O, Spillane KM, Manzoni C, Brida D, Tomasello G, Orlandi G, Kukura P, Mathies RA, Garavelli M, Cerullo G. Conical intersection dynamics of the primary photoisomerization event in vision.
Nature **2010** 467:440–443
(Featured in: *Nature News & Views, Nature Chemistry Highlights, C&EN News*)
18. Krishnan M, Mojarad N, Kukura P, Sandoghdar V. Geometry-induced electrostatic trapping of nanometric objects in a fluid.
Nature **2010** 467: 692–695
(Featured in: *Physics World, Nature News&Views*)
17. Kukura P, Ewers H, Mueller C, Renn A, Helenius A, Sandoghdar V. High-speed nanoscopic tracking of the position and orientation of a single virus. *Nature*

- Methods* **2009** 6: 923–935
16. Kukura P, Celebrano M, Renn A, Sandoghdar V. Imaging a Single Quantum Dot When It Is Dark.
Nano Letters **2009** 9: 926–929
(Cover article, *Nature Photonics Highlights*, *Nature Physics Highlights*)
 15. Rodgers CT, Wedge CJ, Norman SA, Kukura P, Nelson K, Baker N, Maeda K, Henbest KB, Hore PJ, Timmel CR. Radiofrequency polarization effects in zero-field electron paramagnetic resonance.
Physical Chemistry Chemical Physics **2009** 11: 6569–6572
 15. Kukura P, McCamant DW, Mathies RA. Femtosecond stimulated Raman spectroscopy.
Annual Review of Physical Chemistry **2007** 58: 461–488
 14. Kukura P, Yoon S, Mathies RA. 2006. Femtosecond stimulated Raman spectroscopy.
Analytical Chemistry. 78: 5952–5959
 13. Yoon S, Kukura P, Stuart CM, Mathies RA. Direct observation of the ultrafast intersystem crossing in tris(2,2'-bipyridine) ruthenium(II) using femtosecond stimulated Raman spectroscopy.
Molecular Physics **2006** 104: 1275–1282
 12. Kukura P, Frontiera R, Mathies RA. Direct observation of anharmonic coupling in the time domain with femtosecond stimulated Raman scattering.
Physical Review Letters **2006** 96: 238303
 11. Kukura P, McCamant DW, Yoon S, Wandschneider DB, Mathies RA. Structural observation of the primary isomerization in vision with femtosecond-stimulated Raman.
Science **2005** 310:1006–1009
(*Science News & Views*, *Science Perspectives*, *C&EN news top ten chemistry highlights of 2005*)
 10. Rodgers CT, Henbest KB, Kukura P, Timmel CR, Hore PJ. Low-field optically detected EPR spectroscopy of transient photoinduced radical pairs.
Journal of Physical Chemistry A **2005** 109: 5035–5041
 9. McCamant DW, Kukura P, Mathies RA. Femtosecond stimulated Raman study of excited-state evolution in bacteriorhodopsin.
Journal of Physical Chemistry B **2005** 109: 10449–10457
 8. Yoon S, McCamant DW, Kukura P, Mathies RA, Zhang DH, Lee SY. Dependence of line shapes in femtosecond broadband stimulated Raman spectroscopy on pump-probe time delay.
Journal of Chemical Physics **2005** 122: 024505

7. McCamant DW, Kukura P, Yoon S, Mathies RA. Femtosecond broadband stimulated Raman spectroscopy: Apparatus and methods. *Review of Scientific Instruments* **2004** 75: 4971–4980
6. Henbest KB, Kukura P, Rodgers CT, Hore PJ, Timmel CR. Radio frequency magnetic field effects on a radical recombination reaction: A diagnostic test for the radical pair mechanism. *Journal of the American Chemical Society* **2004** 126:8102–8103
5. Lee SY, Zhang DH, McCamant DW, Kukura P, Mathies RA. Theory of femtosecond stimulated Raman spectroscopy. *Journal of Chemical Physics* **2004** 121: 3632–3642
4. Kukura P, McCamant DW, Mathies RA. 2004. Femtosecond time-resolved stimulated Raman spectroscopy of the S-2 (1B(u)(+)) excited state of beta-carotene. *Journal of Physical Chemistry A* **2004** 108: 5921–5925
(Cover article)
3. McCamant DW, Kukura P, Mathies RA. Femtosecond broadband stimulated Raman: A new approach for high-performance vibrational spectroscopy. *Applied Spectroscopy* **2003** 57: 1317–1323
2. McCamant DW, Kukura P, Mathies RA. Femtosecond time-resolved stimulated Raman spectroscopy: Application to the ultrafast internal conversion in beta-carotene. *Journal of Physical Chemistry A* **2003** 107: 8208–8214
1. Kukura P, McCamant DW, Davis PH, Mathies RA. Vibrational structure of the S-2 (1B(u)) excited state of diphenyloctatetraene observed by femtosecond stimulated Raman spectroscopy. *Chemical Physics Letters* **2003** 382: 81–86