

Ultrafast Spectroscopy, Huib Bakker (2017-2022)

Biography



Huib Johan Bakker was born on March 2, 1965 in Haarlem, The Netherlands. He did his PhD studies in the group of Prof. dr. Ad Lagendijk, at AMOLF. From 1991 - 1994 he worked as a post-doc in the group of Prof. dr. Heinz Kurz at the Institute of Semiconductor Electronics at the Technical University of Aachen, Germany. In 1995 he became a group leader at AMOLF, heading the group "Ultrafast Spectroscopy", and in 2003 he became Department Head Molecular Nanophysics. Since 2015 he is leading AMOLF as director of the institute. Since 2001 he is also full professor of Physical Chemistry at the University of Amsterdam. In 2004 he received the Gold Medal of the Royal Netherlands Chemical Society and in 2015 he became elected

member of the Royal Dutch Academy of Sciences (KNAW).

The research work of Huib Bakker is aimed at the understanding of the structural and dynamical properties of dynamical complex aqueous systems, and how these properties are governed by the interactions on the molecular scale, in particular the interactions with water molecules. These systems include proteins in water, hydrogels and membranes, and reactive systems like electrochemical systems and water nanodroplets and water nanochannels containing protons. To this purpose he studies the structural dynamics of water molecules and of molecules interacting with water with femtosecond (two-dimensional) vibrational spectroscopy, surface sum-frequency generation and GHz-THz dielectric relaxation spectroscopy.

Group output

Peer reviewed Publications 2017-2022

2017

1. W.J. Smit and H.J. Bakker, *The surface of ice is like supercooled liquid water*, *Angew. Chem., Int. Ed.* **56**, 15540–15544 (2017).
2. Hongbo Yuan, Jia Liang Xu, E.P. van Dam, Giulia Giubertoni, Y.L.A. Rezus, Roel Hammink, H.J. Bakker, Yong Zhan, A.E. Rowan, Chengfen Xing and P.H.J. Kouwer, *Strategies To Increase the Thermal Stability of Truly Biomimetic Hydrogels: Combining Hydrophobicity and Directed Hydrogen Bonding*, *Macromolecules* **50**, 9058-9065 (2017).
3. K. Meister, A. Paananen, B. Speet, M. Lienemann and H.J. Bakker, *Molecular Structure of Hydrophobins Studied with Site-Directed Mutagenesis and Vibrational Sum-Frequency Generation Spectroscopy*, *J. Phys. Chem. B* **121**, 9398–9402 (2017).
4. S. Strazdaite, J. Versluis, N. Ottosson and H.J. Bakker, *Orientation of Methylguanidinium Ions at the Water-Air Interface*, *J. Phys. Chem. C* **121**, 23398–23405 (2017).
5. W.J. Smit, F. Tang, M.A. Sanchez, E.H.G. Backus, Limei Xu, T. Hasegawa, M. Bonn, H.J. Bakker and Y. Nagata, *Excess Hydrogen Bond at the Ice-Vapor Interface around 200 K*, *Phys. Rev. Lett.* **119**, 133003: 1-5 (2017).
6. W.J. Smit, F. Tang, Y. Nagata, M.A. Sanchez, T. Hasegawa, E.H.G. Backus, M. Bonn and H.J. Bakker, *Observation and Identification of a New OH Stretch Vibrational Band at the Surface of Ice*, *J. Phys. Chem. Lett.* **8**, 3656–3660 (2017).

7. N. Smolentsev, W.J. Smit, H.J. Bakker and S. Roke, *The interfacial structure of water droplets in a hydrophobic liquid*, Nature Commun. **8**, 15548: 1-6 (2017).
8. K. Meister, A. Paananen and H.J. Bakker, *Identification of the response of protein N–H vibrations in vibrational sum-frequency generation spectroscopy of aqueous protein films*, Phys. Chem. Chem. Phys. **19**, 10804–10807 (2017).
9. K. Meister, S.J. Roeters, A. Paananen, S. Woutersen, J. Versluis, G.R. Szilvay and H.J. Bakker, *Observation of pH-Induced Protein Reorientation at the Water Surface*, J. Phys. Chem. Lett. **8**, 1772–1776 (2017). = hybrid OA
10. T.H. van der Loop, N. Ottosson, T. Vad, W.F.C. Sager, H.J. Bakker and S. Woutersen, *Communication: Slow proton-charge diffusion in nanoconfined water*, J. Chem. Phys. **146**, 131101: 1-5 (2017).
11. O. Selig, A. Sadhanala, C. Müller, R. Lovrincic, Z. Chen, Y.L.A. Rezus, J.M. Frost, T.L.C. Jansen and A.A. Bakulin, *Organic Cation Rotation and Immobilization in Pure and Mixed Methylammonium Lead-Halide Perovskites*, J. Am. Chem. Soc. **139**, 4068-4074 (2017).
12. S. Strazdaite, K. Meister and H.J. Bakker, *Reduced Acid Dissociation of Amino-Acids at the Surface of Water*, J. Am. Chem. Soc. **139**, 3716–3720 (2017).
13. M.J. Deuzeman, A.S. Stodolna, E.E.B. Leerssen, A. Antoncicchi, N. Spook, T. Kleijntjens, J. Versluis, S. Witte, K.S.E. Eikema, W. Ubachs, R. Hoekstra and O.O. Versolato, *Ion distribution and ablation depth measurements of a fs-ps laser-irradiated solid tin target*, J. Appl. Phys. **121**, 103301: 1-8 (2017).
14. L. Liu, S. Lotze and H.J. Bakker, *Vibrational and Structural Relaxation of Hydrated Protons in Nafion Membranes*, Chem. Phys. Lett. **670**, 102–108 (2017).
15. M.A. Sanchez, T. Kling, T. Ishiyama, M.-J. van Zadel, P.J. Bisson, M. Mezger, M.N. Jochum, J.D. Cyran, W.J. Smit, H.J. Bakker, M.J. Shultz, A. Morita, D. Donadio, Y. Nagata, M. Bonn and E.H.G. Backus, *Experimental and theoretical evidence for bilayer-by-bilayer surface melting of crystalline ice*, PNAS **114**, 227-232 (2017).

2018

1. C.J. Moll, K. Meister, J. Kirschner and H. J. Bakker, *Surface Structure of Solutions of Polyvinyl Alcohol in Water*, J. Phys. Chem. B **12**, 47: 10722-10727 (2018). Green OA
2. N.P. Gallop, O. Selig, G. Giubertoni, H. J. Bakker, Y. L. A. Rezus, J. M. Frost, T.L.C. Jansen, R. Lovrincic and A. A. Bakulin, *Rotational Cation Dynamics in Metal Halide Perovskites: Effect on Phonons and Material Properties*, J. Phys. Chem. Lett. **9**, 20: 5987-5997 (2018) Green OA
3. O. Sofronov and H. J. Bakker, *Energy Relaxation and Structural Dynamics of Protons in Water/DMSO Mixtures*, J. Phys. Chem. B **122**, 43: 10005-10013 (2018). Gold OA
4. S. Edward, A. Antoncicchi, H. Zhang, H. Sielcken, S. Witte and P. C. M. Planken, *Detection of periodic structures through opaque metal layers by optical measurements of ultrafast electron dynamics*, Opt. Express **26**, 18: 23380-23396 (2018). Gold OA
5. E. P. van Dam and H. J. Bakker, *Structure of micelles and micro-emulsions probed through the molecular reorientation of water*, Chem. Phys. **512**, Advanced Vibrational Spectroscopies: 111-115 (2018). Green OA
6. O. Selig, A.V. Cunha, M.B. van Eldijk, J.C.M. van Hest, T.L.C. Jansen, H. J. Bakker and Y. L. A. Rezus, *Temperature-Induced Collapse of Elastin-Like Peptides Studied by 2DIR Spectroscopy*, J. Phys. Chem. B, (2018). Gold OA
7. K. Meister, A. L. DeVries, H. J. Bakker and R. Drori, *Antifreeze Glycoproteins Bind Irreversibly to Ice*, J. Am. Chem. Soc. **140**, 30: 9365-9368 (2018) . Green OA
8. R. Cota, N. Ottosson, H. J. Bakker and S. Woutersen, *Evidence for Reduced Hydrogen-Bond Cooperativity in Ionic Solvation Shells from Isotope-Dependent Dielectric Relaxation*, Phys.Rev.Lett. **120**, 21: 216001-1-5 (2018). Gold OA

9. B. Weber, Y. Nagata, S. Ketzetzi, F. Tang, W. J. Smit, H. J. Bakker, E.H.G. Backus, M. Bonn and D. Bonn, *Molecular Insight into the Slipperiness of Ice*, J. Phys. Chem. Lett. **9**, 11: 2838-2842 (2018). Gold OA
10. B. Dutta, B. E. Vos, G. H. Koenderink and H. J. Bakker, *Observation of Ultrafast Vibrational Energy Transfer in Fibrinogen and Fibrin Fibers*, J. Phys. Chem. B **122**, 22: 5870-5876 (2018). Gold OA
11. W. J. Smit, J. Versluis, E.H.G. Backus, M. Bonn and H. J. Bakker, *Reduced Near-Resonant Vibrational Coupling at the Surfaces of Liquid Water and Ice*, J. Phys. Chem. Lett. **9**, 1290-1294 (2018). Gold OA
12. Z. F. Brotzakis, Z. Faidon, I. K. Voets, H. J. Bakker and P. G. Bolhuis, *Water structure and dynamics in the hydration layer of a type III anti-freeze protein*, Phys. Chem. Chem. Phys. **20**, 10: 6996-7006 (2018). Green OA
13. H. J. Bakker, S.R. Meech, and E.J. Heilweil, *Time-Resolved Vibrational Spectroscopy*, J. Phys. Chem. A, **122**, (18), 4389–4389, (2018). Green OA

2019

1. G. Giubertoni, G.H. Koenderink and H.J. Bakker, *Direct Observation of Intrachain Hydrogen Bonds in Aqueous Hyaluronan*, J. Phys. Chem. A **123** (38), 8220-8225 (2019). Hybrid OA
2. O.O. Sofronov and H.J. Bakker, *Vibrational Relaxation Dynamics of the Core and Outer Part of Proton-Hydration Clusters*, J. Phys. Chem. B **123** (29), 6222-6228 (2019.) Hybrid OA
3. G. Giubertoni, O.O. Sofronov and H.J. Bakker, *Observation of Distinct Carboxylic Acid Conformers in Aqueous Solution*, J. Phys. Chem. Lett. **10**, (12), 3217-3222 (2019). Hybrid OA
4. K. Meister, C.J. Moll, S. Chakraborty, B. Jana, A.L. DeVries, H. Ramløv and H.J. Bakker, *Molecular structure of a hyperactive antifreeze protein adsorbed to ice*, J. Chem. Phys. **150**, 131101: 1-5 (2019). Green OA
5. G. Huelsz-Prince, A.L. DeVries, H.J. Bakker, J.S. Zon and K. Meister, *Effect of Antifreeze Glycoproteins on Organoid Survival during and after Hypothermic Storage*, Biomolecules **9**, (3), 110: 1-9 (2019). Gold OA
6. G. Giubertoni, F. Burla, C. Martinez-Torres, B. Dutta, G. Pletikapić, E.G. Pelan, Y.L.A. Rezus, G.H. Koenderink and H.J. Bakker, *Molecular Origin of the Elastic State of Aqueous Hyaluronic Acid*, J. Phys. Chem. B **123**, (14), 3043-3049 (2019). Hybrid OA
7. W.J. Smit, E.P. Dam, R. Cota and H.J. Bakker, *Caffeine and taurine slow down water molecules*, J.Phys.Comm. **3** (2), 025010: 1-7 (2019). Gold OA
8. G. Giubertoni, K. Meister, A.L. DeVries and H.J. Bakker, *Determination of the Solution Structure of Antifreeze Glycoproteins Using Two-Dimensional Infrared Spectroscopy*, J. Phys. Chem. Lett. **10** (3), 352-357 (2019). Hybrid OA

2020

1. A.A. Korotkevich and H.J. Bakker, *Confined Water Molecules in Binary Mixtures of Water and 2,6-Lutidine Near Lower Solution Critical Temperature*, J. Phys. Chem. B **125**, (1), 287-296 (2020) Hybrid OA.
2. G. Giubertoni, F. Burla, H.J. Bakker and G.H. Koenderink, *Connecting the Stimuli-Responsive Rheology of Biopolymer Hydrogels to Underlying Hydrogen-Bonding Interactions*, Macromolecules **53**, (23), 10503-10513 (2020) Hybrid OA.
3. H.J. Sielcken and H.J. Bakker, *Probing the ultrafast electron and lattice dynamics of gold using femtosecond mid-infrared pulses*, Phys. Rev. B **102**, (13), 134301: 1-8 (2020) Green OA.
4. O.O. Sofronov and H.J. Bakker, *Nature of hydrated proton vibrations revealed by nonlinear spectroscopy of acid water nanodroplets*, Phys. Chem. Chem. Phys. **22**, (37), 21334-21339 (2020) Green OA.
5. L.A. Muscarella, E.M. Hutter, F. Wittmann, Y.W. Woo, Y.-K. Jung, L. McGovern, J. Versluis, A. Walsh, H.J. Bakker and B. Ehrler, *Lattice Compression Increases the Activation Barrier for Phase Segregation in Mixed-Halide Perovskites*, ACS Energy Lett. **5**, (10), 3152-3158 (2020) Hybrid OA.

6. R.O. Cota, E.P. van Dam, S. Woutersen and H.J. Bakker, *Slowing Down of the Molecular Reorientation of Water in Concentrated Alkaline Solutions*, J. Phys. Chem. B **124**, (38), 8309-8316 (2020) Hybrid OA.
7. R.O. Cota, A. Tiwari, B. Ensing, H.J. Bakker and S. Woutersen, *Hydration interactions beyond the first solvation shell in aqueous phenolate solution*, Phys. Chem. Chem. Phys. **22**, (35), 19940-19947 (2020) Hybrid OA.
8. H.J. Bakker, *Reaction-field model for the dielectric response of mixtures*, J. Chem. Phys. **153**, (5), 054503: 1-9 (2020) Hybrid OA.
9. E.M. Hutter, L.A. Muscarella, F. Wittmann, J. Versluis, L. McGovern, H.J. Bakker, Y.W. Woo, Y.-K. Jung, A. Walsh and B. Ehrler, *Thermodynamic Stabilization of Mixed-Halide Perovskites against Phase Segregation*, Cell Rep. Phys. Sci. **1**, (8), 100120: 1-11 (2020) Gold OA.
10. G. Giubertoni, O.O. Sofronov and H.J. Bakker, *Effect of intramolecular hydrogen-bond formation on the molecular conformation of amino acids*, Commun. Chem **3**, (1), 84: 1-6 (2020) Gold OA.
11. O.O. Sofronov and H.J. Bakker, *Slow Proton Transfer in Nanoconfined Water*, ACS Cent. Sci. **6**, (7), 1150-1158 (2020) Gold OA.
12. C.J. Moll, K. Meister, J. Versluis and H.J. Bakker, *Freezing of Aqueous Carboxylic Acid Solutions on Ice*, J. Phys. Chem. B **124**, (25), 5201-5208 (2020) Hybrid OA.
13. O.O. Sofronov, G. Giubertoni, A. Pérez de Alba Ortíz, B. Ensing and H.J. Bakker, *Peptide Side-COOH Groups Have Two Distinct Conformations under Biorelevant Conditions*, J. Phys. Chem. Lett. **11**, (9), 3466-3472 (2020) Hybrid OA.
14. E.P. van Dam, G. Giubertoni, F. Burla, G.H. Koenderink and H.J. Bakker, *Hyaluronan biopolymers release water upon pH-induced gelation*, Phys. Chem. Chem. Phys. **22**, (16), 8667-8671 (2020) Green OA.
15. L.L.I. Fockaert, D. Ganzinga-Jurg, J. Versluis, B. Boelen, H.J. Bakker, H. Terry and M.C.J. Mol, *Studying Chemisorption at Metal–Polymer Interfaces by Complementary Use of Attenuated Total Reflection–Fourier Transform Infrared Spectroscopy (ATR-FTIR) in the Kretschmann Geometry and Visible–Infrared Sum-Frequency Generation Spectroscopy (SFG)*, J. Phys. Chem. C **124**, (13), 7127-7138 (2020) Hybrid OA.

2021

1. C.J. Moll, J. Versluis and H.J. Bakker, *Bulk Response of Carboxylic Acid Solutions Observed with Surface Sum-Frequency Generation Spectroscopy*, J. Phys. Chem. B **126**, (1), 270-277 (2021) Hybrid OA
2. E.P. van Dam, R. Gouzy, E.G. Pelan, K.P. Velikov and H.J. Bakker, *Water reorientation dynamics in colloidal water–oil emulsions*, Phys. Chem. Chem. Phys. **23**, (47), 27024-27030 (2021) Green OA
3. C.J. Moll, J. Versluis and H.J. Bakker, *Direct Observation of the Orientation of Urea Molecules at Charged Interfaces*, J. Phys. Chem. Lett. **12**, (44), 10823-10828 (2021) Hybrid OA
4. R.O. Cota, S. Woutersen and H.J. Bakker, *Accelerated Vibrational Energy Relaxation of Water in Alkaline Environments*, J. Phys. Chem. B **125**, (43), 11980-11986 (2021) Hybrid OA
5. C.J. Moll, G. Giubertoni, L. van Buren, J. Versluis, G.H. Koenderink and H.J. Bakker, *Molecular Structure and Surface Accumulation Dynamics of Hyaluronan at the Water–Air Interface*, Macromolecules **54**, (18), 8655-8663 (2021) Hybrid OA
6. C.J. Moll, J. Versluis and H.J. Bakker, *Direct Evidence for a Surface and Bulk Specific Response in the Sum-Frequency Generation Spectrum of the Water Bend Vibration*, Phys. Rev. Lett. **127**, (11), 116001: 1-6 (2021) Green OA
7. R. Gera, H.J. Bakker, R. Franklin-Mergarejo, U.N. Morzan, G. Falciani, L. Bergamasco, J. Versluis, I. Sen, S. Dante, E. Chiavazzo and A.A. Hassanali, *Emergence of Electric Fields at the Water–C12E6 Surfactant Interface*, J. Am. Chem. Soc. **143**, (37), 15103-15112 (2021) Green OA
8. E.P. van Dam, Hongbo Yuan, P.H.J. Kouwer and H.J. Bakker, *Structure and Dynamics of a Temperature-Sensitive Hydrogel*, J. Phys. Chem. B **125**, (29), 8219-8224 (2021) Hybrid OA

9. J. Kirschner, A.H.A. Gomes, R.R.T. Marinho, O. Björneholm, H. Ågren, V. Carravetta, N. Ottosson, A.N. de Brito and H.J. Bakker, *The molecular structure of the surface of water–ethanol mixtures*, Phys. Chem. Chem. Phys. **23**, (19), 11568-11578 (2021) Green OA
10. Y. Sun, G. Giubertoni, H.J. Bakker, J. Liu, M. Wagner, D.Y.W. Ng, A.L. DeVries and K. Meister, *Disaccharide Residues are Required for Native Antifreeze Glycoprotein Activity*, Biomacromolecules **22**, (6), 2595-2603 (2021) Hybrid OA
11. L.A. Muscarella, E.M. Hutter, J.M. Frost, G. Grimaldi, J. Versluis, H.J. Bakker and B. Ehrler, *Accelerated Hot-Carrier Cooling in MAPbI₃ Perovskite by Pressure-Induced Lattice Compression*, J. Phys. Chem. Lett. **12**, (17), 4118-4124 (2021) Hybrid OA
12. G. Giubertoni, A. Pérez de Alba Ortíz, F. Bano, X. Zhang, R.J. Linhardt, D.E. Green, P.L. DeAngelis, G.H. Koenderink, R.P. Richter, B. Ensing and H.J. Bakker, *Strong Reduction of the Chain Rigidity of Hyaluronan by Selective Binding of Ca²⁺ Ions*, Macromolecules **54**, (3), 1137-1146 (2021) Hybrid OA
13. A.A. Korotkevich and H.J. Bakker, *Confined Water Molecules in Binary Mixtures of Water and 2,6-Lutidine Near Lower Solution Critical Temperature*, J. Phys. Chem. B **125**, (1), 287-296 (2021) Hybrid OA

2022

1. S. Sengupta, R. Gera, C. Egan, U.N. Morzan, J. Versluis, A.A. Hassanali and H.J. Bakker, *Observation of Strong Synergy in the Interfacial Water Response of Binary Ionic and Nonionic Surfactant Mixtures*, J. Phys. Chem. Lett. **13**, (49), 11391-11397 (2022) Hybrid OA
2. A.A. Korotkevich, O.O. Sofronov, O. Lugier, S. Sengupta, S. Tanase and H.J. Bakker, *Direct Probing of Vibrational Interactions in UiO-66 Polycrystalline Membranes with Femtosecond Two-Dimensional Infrared Spectroscopy*, J. Phys. Chem. Lett. **13**, 9793-9800 (2022) Hybrid OA
3. C.J. Moll, A.A. Korotkevich, J. Versluis and H.J. Bakker, *Molecular orientation of small carboxylates at the water-air interface*, Phys. Chem. Chem. Phys. **24**, (17), 10134-10139 (2022) Green OA
4. A.A. Korotkevich and H.J. Bakker, *Ultrafast vibrational dynamics of aqueous acetate and terephthalate*, J. Chem. Phys. **156**, (9), 094501: 1-9 (2022) Green OA
5. H.E. Parker, S. Sengupta, A.V. Harish, R.G. Soares, H.N. Joensson, W. Margulis, A. Russom and F. Laurell, *A Lab-in-a-Fiber optofluidic device using droplet microfluidics and laser-induced fluorescence for virus detection*, Sci. Rep. **12**, (1), 3539: 1-10 (2022) Gold OA
6. H.E. Parker, S. Sengupta, A.V. Harish, R.R.G. Soares, H.N. Joensson, W. Margulis, A. Russom and F. Laurell, *Erratum: Author Correction: A Lab-in-a-Fiber optofluidic device using droplet microfluidics and laser-induced fluorescence for virus detection (Scientific reports (2022) 12 1 (3539))*, Sci. Rep. **12**, (1) (2022) Gold OA
7. C.J. Moll, J. Versluis and H.J. Bakker, *Bulk Response of Carboxylic Acid Solutions Observed with Surface Sum-Frequency Generation Spectroscopy*, J. Phys. Chem. B **126**, (1), 270-277 (2022) Hybrid OA
8. R. Gera, C.J. Moll, A. Bhattacharjee and H.J. Bakker, *Water-Induced Restructuring of the Surface of a Deep Eutectic Solvent*, J. Phys. Chem. Lett. **13**, 634-641 (2022) Hybrid OA

Contributions to scientific books (chapters or entire book) 2017-2022

N/A

PhD theses 2017-2022

2017

1. C.C.M. Groot, *Dynamics of water interacting with biomolecules*, University of Amsterdam, January 13, 2017 (*cum laude*).

2. O. Selig, *Ultrasensitive Nonlinear Vibrational Spectroscopy of Complex Molecular Systems*, March 30, 2017.

2020

1. G. Giubertoni, *Shape and interactions of the building blocks of biomolecular architectures*, University of Amsterdam, October 16, 2020.
2. R. Cota, *Unraveling the elusive solvation structure of aqueous ions*, University of Amsterdam, October 30, 2020.
3. O.O. Sofronov, *Environmental Issues in the Structure and Ultrafast Kinetics of Acids and Hydrated Protons*, University of Amsterdam, November 11, 2020.
4. E.P. van Dam, *Into the deep waters of emulsions and hydrogels*, University of Amsterdam, November 13, 2020.
5. L. Helmbrecht, *Ion Exchange, Self-Assembly, and Light Emission. A Dance of Ions and Light*, University of Amsterdam, November 20, 2020.

2022

1. C.J. Moll, *Bending and Stretching: A Practical Examination of Molecules at Aqueous Interfaces*, University of Amsterdam, March 24, 2022.

Invited lectures at international conferences and meetings

2017

1. H.J. Bakker, *Structure and dynamics of water at protein surfaces*, APS March Meeting, New Orleans, March 13-17, 2017.
2. H.J. Bakker, *Structure and dynamics of water at protein surfaces*, International Symposium on Molecular Beams XXVII, Nijmegen, June 25-30, 2017.

2018

1. H.J. Bakker, *Probing the Surface of Ice*, Water X, Exotic Properties of Water under Extreme Conditions, La Maddalena, Sardinia, Italy, June 3-8, 2018

2019

1. H.J. Bakker, *At the Interface of Liquid Water and Ice*, Gordon Research Conference (GRC) on Chemistry & Physics of Liquids, Holderness, USA, August 4-9, 2019.
2. H.J. Bakker, *Observation of distinct carboxylic acid conformers in aqueous solution with femtosecond 2D-IR spectroscopy*, Time-Resolved Vibrational Spectroscopy XIX, September 8-13, 2019.

2020

1. H.J. Bakker, *At the Surface of Water and Ice*, International RESOLV Symposium, Bochum, Germany, January 7-9, 2020.

2021

1. H.J. Bakker, *Femtosecond Vibrational Spectroscopy of the Molecular Interactions and the Dynamics of Water in Supramolecular Hydrogels*, Time-Resolved Vibrational Spectroscopy XX, Michigan USA, June 13-18, 2021.

2022

1. H.J. Bakker, *Effect of ions and surfactants on the properties of interfacial water*, Telluride Interfacial and Electronic Structure and Dynamics Workshop, Telluride, USA, June 11-15, 2022.

2. H.J. Bakker, *Surfactants and ions at the surface of water*, SoFiA and PROGENY International Workshop, Leiden, The Netherlands, October 13-14, 2022.
3. H.J. Bakker, *Surfactants and ions interacting at the surface of water*, RESOLV 10th Anniversary Symposium, Essen, Germany, November 3-4, 2022.

Awards & recognitions 2017-2022

2019

1. Carolyn Moll, 2nd Poster Prize at TRVS (Time Resolved Vibrational Spectroscopy) Conference, Auckland, New Zealand, September 8-13, 2019.
2. Eliane van Dam, 2nd Poster Prize at Femtochemistry XIV (FEMTO14), Shanghai, China, July 28-August 2, 2019.

Teaching 2017-2022

N/A

Masters and Bachelors theses 2017-2022

2018

1. Alexandra Tsoukala, *Proteins at Interfaces probe by vibrational sum-frequency generation spectroscopy*, Masters Minor Project Thesis, Hoff Institute of Molecular Science, University of Amsterdam, September 2018.
2. Marloes H. Bistervels, *A study on stearic acid on the water-air interface probed by sum-frequency generation spectroscopy*, Masters Thesis, Hoff Institute of Molecular Science, University of Amsterdam, October 2018.

2021

1. Fabian Vromen, *High Repetition Rate Vibrational Sum Frequency Generation Spectroscopy of Metal Organic Frameworks*, Bachelor Thesis, , University of Twente, January 2021.

Valorization 2017-2022

1. Collaboration in 2018 within an Industrial Partnership Program with **Unilever** on the origin of the putty (elastic) state of hyaluronan, resulting in an article: *Molecular Origin of the Elastic State of Aqueous Hyaluronic Acid*, Giulia Giubertoni, Federica Burla, Christina Martinez-Torres, Biplap Dutta, Galja Pletikapic, Eddie Pelan, Yves L. A. Rezus, Gijsje H. Koenderink, and H.J. Bakker, *J. Phys. Chem. B* **123**, 3043-3049 (2019);
2. Collaboration in 2019 with **TaTa Steel** on the surface properties of coatings using surface sum-frequency generation (Deborah Ganzinga-Jurg (TaTa Steel) and Laura Lyn Fockaert (TU Delft)) resulting in an article: *Studying Chemisorption at Metal-Polymer Interfaces by Complementary Use of Attenuated Total Reflection – Fourier Transform Infrared Spectroscopy (ATR-FTIR) in the Kretschmann Geometry* Laura-Lynn I. Fockaert, Deborah Ganzinga-Jurg, Jan Versluis, Berend Boelen, Huib J. Bakker, Herman Terryn, and Johannes M. C. Mol, *J. Phys. Chem. C*, **124**, 13, 7127–7138 (2020);
3. Collaboration in 2020 within an Industrial Partnership Program with **Unilever** on emulsions using polarization-resolved femtosecond mid-infrared spectroscopy, resulting in an article: *Water reorientation dynamics in colloidal water–oil emulsions*, Eliane P. van Dam, Roland Gouzy, Eddie Pelan, Krassimir P. Velikov, and Huib J. Bakker, *Phys. Chem. Chem. Phys.* **23**, 27024-27030 (2021).