

PUBLICATIONS

OVERVIEW

59 papers (15 as first author, 7 as corresponding author) in peer reviewed journals, including 1 in *Reviews of Modern Physics*, 2 in *Science*, 3 in *PNAS*, 2 in *PRL* and 1 in *JACS* + 2 book chapter

PEER-REVIEWED ARTICLES

- [59] *Melting domain size and recrystallization dynamics of ice revealed by time-resolved x-ray scattering*
C. Yang, M. Ladd Parada, K. Nam, S. Jeong, S. You, A. Späh, H. Pathak, T. Eklund, T. J Lane, J. Hyuk Lee, I. Eom, M. Kim, **K. Amann-Winkel**, F. Perakis, A. Nilsson, K. H. Kim
Nature Communications 14, 3313 (2023)
- [58] *Nanocrystallites Modulate Intermolecular Interactions in Cryoprotected Protein Solutions.*
M. Filianina, M. Bin, S. Berkowicz, M. Reiser, H. Li, S. Timmermann, M. Blankenburg, **K. Amann-Winkel**, C. Gutt, F. Perakis
Journal of Physical Chemistry B 127 (27), 6197 - 6204 (2023)
- [57] *Coherent X-ray Scattering Reveals Nanoscale Fluctuations in Hydrated Proteins*
M. Bin, M. Reiser, M. Filianina, S. Berkowicz, S. Das, S. Timmermann, W. Roseker, R. Bauer, J. Oström, A. Karina, **K. Amann-Winkel**, M. Ladd-Parada, F. Westermeier, M. Sprung, J. Möller, F. Lehmkuhler, C. Gutt, F. Perakis
Journal of Physical Chemistry B 127 (21), S. 4922 - 4930 (2023)
- [56] *Liquid-liquid phase separation in supercooled water from ultrafast heating of low-density amorphous ice*
K. Amann-Winkel*, K. H. Kim*, N. Giovambattista, M. Ladd Parada, A. Späh, F. Perakis, H. Pathak, C. Yang, T. Eklund, T. J Lane, S. You, S. Jeong, J. Hyuk Lee, I. Eom, M. Kim, J. Park, S. H. Chun, P.H. Poole, A. Nilsson
Nature Communications 14, 442 (2023)
- [55] *Infrared Spectroscopy on Equilibrated High-Density Amorphous Ice*
A. Karina, T. Eklund, C.M. Tonauer, H. Li, T. Loerting, **K. Amann-Winkel#**
The Journal of Physical Chemistry Letters 13 (34), 7965-7971 (2022)
- [54] *Chemical Strain Engineering of MAPbI₃ Perovskite Films*
Y. Yalcinkaya, I. M. Hermes, T. Seewald, **K. Amann-Winkel**, L. Veith, L. Schmidt-Mende, S. AL Weber
Advanced Energy Materials 12 (37), 2202442 (2022)
- [53] *Pressure-annealed high-density amorphous ice made from vitrified water droplets: A systematic calorimetry study on water's second glass transition*
J. Bachler, J. Giebelmann, **K. Amann-Winkel**, T. Loerting
The Journal of Chemical Physics 157 (6), 064502 (2022)
- [52] *Using coherent X-rays to follow dynamics in amorphous ices*
M. Ladd-Parada, H. Li, A. Karina, K. H. Kim, F. Perakis, M. Reiser, F. Dallari, N. Striker, M. Sprung, F. Westermeier, G. Grübel, A. Nilsson, F. Lehmkuhler, **K. Amann-Winkel#**
Environmental Science: Atmospheres 2, 1314 (2022)
- [51] *Metal-ligand complexation and clustering in mussel-inspired side-chain functionalized supramolecular hydrogels*
A. Jangizehi, M. Ahmadi, S. Pschierer, P. Nicoletta, H. Li, **K. Amann-Winkel**, S. Seiffert
Soft Matter 18, 36, 6836 (2022)

- [50] *Following the Crystalization of Amorphous Ice after Ultrafast Laser Heating*
M. Ladd Parada, **K. Amann-Winkel**, K. H. Kim, A. Späh, F. Perakis, H. Pathak, C. Yang, D. Mariedahl, T. Eklund, T. J. Lane, S. You, S. Jeong, M. Weston, J. Hyuk Lee, I. Eom, M. Kim, J. Park, S. H. Chun, A. Nilsson
Journal of Physical Chemistry B, 126, 11 (2022)
- [49] *Long range structures of amorphous solid water*
H. Li, A. Karina, M. Ladd-Parada, A. Späh, F. Perakis, C. Benmore, **K. Amann-Winkel**[#]
Journal of Physical Chemistry B 125 (48), 13320 (2021) [#] Corresponding author
- [48] *Anomalous temperature dependence of the experimental x-ray structure factor of supercooled water*
N. Esmaeildoost, H. Pathak, A. Späh, T. J. Lane, K. H. Kim, C. Yang, **K. Amann-Winkel**, M. Ladd-Parada, F. Perakis, J. Koliyadu, A. R. Oggenfuss, P. JM Johnson, Y. Deng, S. Zerdane, R. Mankowsky, P. Beaud, H. T. Lemke, A. Nilsson, J. A. Sellberg
Journal of Chemical Physics 155 (21), 214501 (2021)
- [47] *Enhancement and maximum in the isobaric specific-heat capacity measurements of deeply supercooled water using ultrafast calorimetry*
H. Pathak, A. Späh, N. Esmaeildoost, J. A. Sellberg, K. H. Kim, F. Perakis, **K. Amann-Winkel**, M. Ladd-Parada, J. Koliyadu, T. J. Lane, C. Yang, H. T. Lemke, A. R. Oggenfuss, P. J. M. Johnson, Y. Deng, S. Zerdane, R. Mankowsky, P. Beaud, A. Nilsson
Proceedings of the National Academy of Sciences U.S.A. (PNAS), 118, 6, (2021)
- [46] *Experimental observation of the liquid-liquid transition in bulk supercooled water under pressure*
K. H. Kim*, **K. Amann-Winkel***, N. Giovambattista, A. Späh, F. Perakis, H. Pathak, M. Ladd Parada, C. Yang, D. Mariedahl, T. Eklund, T. J. Lane, S. You, S. Jeong, M. Weston, J. Hyuk Lee, I. Eom, M. Kim, J. Park, S. H. Chun, P.H. Poole, A. Nilsson
**equally contributing to this work*
SCIENCE 370, 6519, 978 (2020)
- [45] *Electron beam induced transformation in high-density amorphous ices*
H. Xu, J. Ångström, T. Eklund, **K. Amann-Winkel**[#]
Journal of Physical Chemistry B 124 (41), 9283 (2020); [#] Corresponding author
- [44] *Anisotropic X-Ray Scattering of Transiently Oriented water*
K. H. Kim, A. Späh, H. Pathak, C. Yang, S. Bonetti, **K. Amann-Winkel**, D. Mariedahl, D. Schlesinger, J. A. Sellberg, D. Mendez, G. van der Schot, H. Y. Hwang, J. Clark, O. Shigeki, T. Tadashi, Y. Harada, H. Ogasawara, T. Katayama, A. Nilsson, F. Perakis
Phys. Rev. Lett. 125, 076002 (2020)
- [43] *Structural differences between unannealed and expanded high-density amorphous ice based on isotope substitution neutron diffraction*
K. Amann-Winkel, D. Bowron, T. Loerting
J. Mol. Phys. 117, 3207 (2019)
- [42] *Temperature Dependent Anomalous Fluctuations in Water: Shift of 1 kbar Between Experiment and Classical Force Field Simulations*
H. Pathak, A. Späh, **K. Amann-Winkel**, F. Perakis, K. H. Kim and A. Nilsson
J. Mol. Phys. 117, 3232 (2019)
- [41] *X-ray Studies of the Transformation from High-to Low-density Amorphous Water*
D. Mariedahl, F. Perakis, A. Späh, H. Pathak, K. Hwan Kim, C. Benmore, A. Nilsson, **K. Amann-Winkel**[#] [#] Corresponding author
Philos. Trans. Royal Soc. A, 377, 20180164 (2019)
- [40] *Apparent Power-law behavior of water's isothermal compressibility and correlation length upon supercooling*
A. Späh, H. Pathak, K. H. Kim, F. Perakis, D. Mariedahl, **K. Amann-Winkel**, J. A. Sellberg, J. H. Lee, S. Kim, J. Park, K. H. Nam, T. Katayama, and A. Nilsson
Phys. Chem. Chem. Phys, 21, 26-31 (2019)

- [39] *X-ray Scattering and O-O Pair-Distribution Functions of Amorphous Ices*
D. Mariedahl, F. Perakis, A. Späh, H. Pathak, K. H. Kim, G. Camisasca, D. Schlesinger, C. Benmore, L. G. M. Pettersson, A. Nilsson and **K. Amann-Winkel**[#]
[#] Corresponding author
Journal of Physical Chemistry B 122, 7616 (2018)
- [38] *Response to comment on "Maxima in the Thermodynamic Response and Correlation Functions of Deeply Supercooled Water"*
K.H. Kim, A. Späh, H. Pathak, F. Perakis, D. Mariedahl, **K. Amann-Winkel**,
J.A. Sellberg, J.H. Lee, S. Kim, J. Park, K.H. Nam, T. Katayama and A. Nilsson
SCIENCE 360, (2018)
- [37] *Coherent x-rays reveal the influence of cage effects on ultrafast water dynamics*
F. Perakis, G. Camisasca, T. Lane, A. Späh, K. Wikfeldt, J. Sellberg, F. Lehmkuhler, H. Pathak, K. H. Kim, **K. Amann-Winkel**, S. Schreck, S. Song, T. Sato, M. Sikorski, A. Eilert, T. McQueen, H. Ogasawara, D. Nordlund, W. Roseker, J. Koralek, S. Nelson, P. Hart, R. Alonso-Mori, Y. Feng, D. Zhu, A. Robert, G. Grübel, L. Pettersson, A. Nilsson
Nature Communications 9:1917 (2018)
- [36] *Calorimetric study of water's two glass transitions in the presence of LiCl.*
G. N. Ruiz, **K. Amann-Winkel**, L. E. Bove, H. R. Corti, T. Loerting
Physical Chemistry Chemical Physics 20, 6401 (2018)
- [35] *Maxima in the Thermodynamic Response and Correlation Functions of Deeply Supercooled Water*
K.H. Kim, A. Späh, H. Pathak, F. Perakis, D. Mariedahl, **K. Amann-Winkel**,
J.A. Sellberg, J.H. Lee, S. Kim, J. Park, K.H. Nam, T. Katayama and A. Nilsson
SCIENCE 358, 1589 (2017)
- [34] *Relaxation dynamics and transformation kinetics of deeply supercooled water: Temperature, pressure, doping, and proton/deuteron isotope effects*
S. Lemke, P.H. Handle, L.J. Plaga, J.N. Stern, M. Seidl, V. Fuentes-Landete, **K. Amann-Winkel**, K.W. Köster, C. Gainaru, T. Loerting, and R. Böhmer
Journal of Chemical Physics 147, 034506, (2017)
- [33] *Diffusive dynamics during the high-to-low density transition in amorphous ice*
F. Perakis^{*}, **K. Amann-Winkel**^{*}, F. Lehmkuhler, M. Sprung, D. Mariedahl, J.A. Sellberg, H. Pathak, A. Späh, F. Cavalca, D. Schlesinger, A. Ricci, A. Jain, B. Massani, F. Aubree, C. J. Benmore, T. Loerting, G. Grübel, L. G. M. Pettersson and Anders Nilsson
^{*}equally contributing to this work
Proceedings of the National Academy of Sciences U.S.A. (PNAS), 114, 8193, (2017)
- [32] *X-ray and Neutron Scattering of Water*
K. Amann-Winkel, M.-C. Bellissent-Funel, L.E. Bove, T. Loerting, A. Nilsson,
A. Paciaroni, D. Schlesinger, L. Skinner
Chemical Reviews 116, 13, 7570–7589, (2016)
- [31] *Water: a Tale of Two Liquids.*
P. Gallo, **K. Amann-Winkel**, C.A. Angell, M. Anisimov, F. Chaupin, C. Chakravarty,
E. Lascaris, T. Loerting, A. Panagiotopoulos, J. Russo, J.A. Sellberg, H. Stanley,
H. Tanaka, C. Vega De Las Heras, L. Xu, L. Pettersson
Chemical Reviews 116, 13, 7463–7500, (2016)
- [30] *Colloquium: water's controversial glass transitions*
K. Amann-Winkel, R. Böhmer, F. Fujara, C. Gainaru, B. Geil, T. Loerting
Reviews of Modern Physics 88, 011002 (2016)
- [29] *Experimental evidence for two distinct deeply supercooled liquid states of water. Response to „Comment on ‚Water's second glass transition‘“, by G. P. Johari, Thermochim. Acta 617, 200 (2015)*
J. Stern, M. Seidl, C. Gainaru, V. Fuentes-Landete, **K. Amann-Winkel**, P. Handle,
K.W. Köster, H. Nelson, R. Böhmer, T. Loerting
Thermochim. Acta (2015)

- [28] *Anomalous behavior of the homogeneous ice nucleation rate in "no-man's land"*.
H. Laksmono, T.A. McQueen, J.A. Sellberg, N. Duane Loh, C. Huang, D. Schlesinger, R.G. Sierra, C.Y. Hampton, D. Nordlund, M. Beye, A.V. Martin, A. Barty, M.M. Seibert, M. Messerschmidt, G.J. Williams, S. Boutet, **K. Amann-Winkel**, T. Loerting,
L. G. M. Pettersson, M.J. Bogan, A. Nilsson
Journal of Physical Chemistry Letters 6, 2826 (2015)
- [27] *The glass transition in high-density amorphous ice*
T. Loerting, V. Fuentes-Landete, P.H. Handle, M. Seidl,
K. Amann-Winkel, C. Gainaru, R. Böhmer
Journal of Non-Crystalline Solids 407, 423 (2015)
- [26] *Anomalously large isotope effect in the glass transition of water.*
C. Gainaru, A.L. Agapov, V. Fuentes-Landete, **K. Amann-Winkel**, H. Nelson, K.W. Köster, A.I. Kolesnikov, V.N. Novikov, R. Richert, R. Böhmer, T. Loerting, A.P. Sokolov
Proceedings of the National Academy of Sciences U.S.A. (PNAS) 111, 17402 (2014)
- [25] *Water's second glass transition*
K. Amann-Winkel, C. Gainaru, P. H. Handle, M. Seidl, H. Nelson, R. Böhmer, T. Loerting
Proceedings of the National Academy of Sciences U.S.A. (PNAS) 110, 17720 (2013)
- [24] *From parallel to single crystallization kinetics in high-density amorphous ice*
M. Seidl, **K. Amann-Winkel**, P. H. Handle, G. Zifferer, T. Loerting
Physical Review B 88, 174105 (2013)
- [23] *Ultra-slow Dynamics in Low Density Amorphous Ice Revealed by Deuteron NMR: Indications for a Glass Transition*
F. Löw, **K. Amann-Winkel**, T. Loerting, F. Fujara, B. Geil
Physical Chemistry Chemical Physics 15, 9308 (2013)
- [22] *Limits of metastability in amorphous ices: ²H-NMR relaxation*
F. Löw, **K. Amann-Winkel**, B. Geil, T. Loerting, C. Wittich, F. Fujara
Physical Chemistry Chemical Physics 15, 576 (2013)
- [21] *Limits of metastability in amorphous ices: the neutron scattering Debye Waller factor*
K. Amann-Winkel, F. Löw, P.H. Handle, W. Knoll, J. Peters, B. Geil, F. Fujara,
T. Loerting
Physical Chemistry Chemical Physics 14, 16386 (2012)
- [20] *Local structural order in carbonic acid polymorphs: Raman and FT-IR spectroscopy*
C. Mitterdorfer, J. Bernard, F. Klauser, **K. Winkel**, I. Kohl, K.R. Liedl, H. Grothe,
E. Mayer, T. Loerting
Journal of Raman Spectroscopy 43, 108 (2012)
- [19] *Cryoflotation: densities of amorphous and crystalline ices*
T. Loerting, M. Bauer, I. Kohl, K. Watschinger, **K. Winkel**, E. Mayer
Journal of Physical Chemistry B 115, 14167 (2011)
Special Issue: H. Eugene Stanley Festschrift
- [18] *How many amorphous ices are there?*
T. Loerting, **K. Winkel**, M. Seidl, M. Bauer, Ch. Mitterdorfer, P. H. Handle,
Ch.G. Salzmann, E. Mayer, J.L. Finney, D. Bowron
Physical Chemistry Chemical Physics 13, 8783 (2011)
- [17] *Equilibrated high-density amorphous ice and its first-order transition to the low-density form*
K. Winkel[#], E. Mayer, T. Loerting
[#] Corresponding authorship
Journal of Physical Chemistry B 115, 14141 (2011)
Special Issue: H. Eugene Stanley Festschrift
- [16] *Volumetric study consistent with a glass-to-liquid transition in amorphous ices under pressure*
M. Seidl, M.S. Elsaesser, **K. Winkel**, G. Zifferer, E. Mayer, T. Loerting;

- Physical Review B 83, 100201 (2011)
- [15] *Structural study of low concentration LiCl aqueous solutions in the liquid, supercooled, and hyperquenched glassy states*
K. Winkel, M. Seidl, T. Loerting, L.E. Bove, S. Imberti, V. Molinero, F. Bruni, R. Mancinelli, M.A. Ricci;
Journal of Chemical Physics 134, 024515 (2011)
- [14] *Reversibility and isotope effect of the calorimetric glass→liquid transition of low-density amorphous ice*
M. S. Elsaesser, **K. Winkel**, E. Mayer, T. Loerting
Physical Chemistry Chemical Physics 12, 708 (2010)
- [13] *Hexagonal ice transforms at high pressures and compression rates directly into "doubly metastable" ice phases*
M. Bauer, **K. Winkel**, D. Toebbens, E. Mayer, T. Loerting
Journal of Chemical Physics **131**, 224514 (2009)
- [12] *Relaxation effects in low density amorphous ice: Two distinct structural states observed by neutron diffraction*
K. Winkel, D.T. Bowron, T. Loerting, E. Mayer, J.L. Finney
Journal of Chemical Physics **130**, 204502 (2009)
Research Highlight at JCP online
- [11] *Raman spectroscopic study of the phase transition of amorphous to crystalline β-carbonic acid*
I. Kohl, **K. Winkel**, M. Bauer, K.R. Liedl, T. Loerting, E. Mayer
Angewandte Chemie Int. Ed. **48**, 2690 (2009)
- [10] *Compression-rate dependence of the phase transition from hexagonal ice to ice II and/or ice III*
M. Bauer, M.S. Elsaesser, **K. Winkel**, E. Mayer, T. Loerting
Physical Review B **77**, 220105 (2008)
- [9] *Structural transitions in amorphous H₂O and D₂O: The effect of temperature*
K. Winkel, M. Bauer, E. Mayer, M. Seidl, M.S. Elsaesser, T. Loerting
Journal of Physics: Condensed Matter **20**, 494212 (2008)
- [8] *Water polyamorphism: Reversibility and (dis)continuity*
K. Winkel, M.S. Elsaesser, E. Mayer, T. Loerting
Journal of Chemical Physics **128**, 044510 (2008)
- [7] *Carbonic acid: From polyamorphism to polymorphism*
K. Winkel, W. Hage, T. Loerting, S.L. Price, E. Mayer
Journal of American Chemical Society **129**, 13863 (2007)
- [6] *Isothermal amorphous- amorphous- amorphous transitions in water*
K. Winkel, W. Schustereder, I. Kohl, C.G. Salzmann, E. Mayer, T. Loerting
Proc. 11th Intl. Conf. on the Physics and Chemistry of Ice, 641 (2007)
- [5] *High density amorphous ice from cubic ice*
T. Loerting, I. Kohl, W. Schustereder, **K. Winkel**, E. Mayer
Chem. Phys. Chem. **7**, 1203 (2006)
- [4] *The relation between high-density and very-high-density amorphous ice*
T. Loerting, C.G. Salzmann, **K. Winkel**, E. Mayer
Physical Chemistry Chemical Physics **8**, 2810 (2006)
- [3] *Amorphous ice: Stepwise formation of very-high-density amorphous ice from low-density amorphous ice at 125 K*
T. Loerting, W. Schustereder, **K. Winkel**, C.G. Salzmann, I. Kohl, E. Mayer
Physical Review Letters **96**, 025702 (2006)

- [2] *Deuteron spin lattice relaxation in amorphous ices*
M. Scheuermann, B. Geil, **K. Winkel**, F. Fujara
Journal of Chemical Physics **124**, 224503 (2006)
- [1] *Nature of amorphous polymorphism of water*
M.M. Koza, B. Geil, **K. Winkel**, C. Köhler, F. Czeschka, M. Scheuermann, H. Schober, T. Hansen; Physical Review Letters **94**, 125506 (2005)

BOOK CHAPTER

Crystalline and amorphous ices

V. Fuentes-Landete, C. Mitterdorfer, P.H. Handle, G.N. Ruiz, J. Bernard, A. Bogdan, M. Seidl, **K. Amann-Winkel**, J. Stern, S. Fuhrmann, T. Loerting
In: P. G. Debenedetti, M. A. Ricci and F. Bruni (Eds.), *Proceedings of the International School of Physics "Enrico Fermi", Volume 187: Water: Fundamentals as the Basis for Understanding the Environment and Promoting Technology*. Amsterdam: IOS and Bologna: SIF 2015, 173–208.

Amorphous ices

Nicolas Giovambattista, **Katrin Amann-Winkel**, Thomas Loerting
Advances in Chemical Physics, 152: Liquid Polymorphism; John Wiley & Sons 2013, 139–173

INVITED TALKS AND CONFERENCE CONTRIBUTIONS

Since 2005 I have contributed in giving more than 50 talks and several more poster presentations at national and international conferences, including **23 invited talks**, which are listed as follows (**keynote lectures** are highlighted):

- 2024 **Water under extreme conditions / Italy (to be held in 2024, invited keynote lecture)**
2023 International conference on High Pressure Science (AIRAPT) / Edinburgh / UK (08/2023)
2023 NSLS-II user meeting / Brookhaven / USA (April 2023)
2023 Colloquiums talk to open public within CMWS water days at DESY / Hamburg (02/2023)
2022 Colloquiums talks at TU Darmstadt / Darmstadt / Germany (December 2022)
2022 Colloquiums talks at University Mainz / Mainz / Germany (November 2022)
2022 Annual meeting of German Physical Society DPG / Regensburg / Germany (September 2022)
2022 Gordon Research Conference: Research at High Pressure / Holderness / USA (July 2022)
2022 QENS/WINS 2021 conference / San Sebastian / Spain
2021 Pacificchem 2021 / Hawaii / USA (Hybrid-conference)
2021 Petra IV workshop "Soft matter health and life science" / Hamburg / Germany (online-conference)
2021 **CMWS Water Days 2021 / DESY / Hamburg (online, due to the pandemic)**
2019 Colloquiums talk at the Institute for Inorganic Chemistry / University Hamburg / Germany
2019 ACS Fall meeting "Chemistry & Water" / San Diego / USA
2019 Satellite to StatPhys 27: Structure and Dynamics of Glassy, Supercooled and Nanoconfined Fluids / Buenos Aires / Argentina
2019 *invited as speaker to the international WaterX conference, but had to cancel due to overlapping XFEL-beamtime at PAL in Korea.*
2018 **14th International Conference on the Physics and Chemistry of Ice** / Zürich / Switzerland
2017 2017 Colloquiums talk at GSI-FAIR „X-rays reveal water’s mystery“ / Darmstadt / Germany
2017 8th International Discussion Meeting on Relaxations in Complex Systems / Wisla / Poland
2017 Water under Extreme Conditions / Rome / Italy
2016 "Physics days", annual meeting of the Swedish Physical society / Göteborg / Sweden
2015 AGU Fall Meeting (American Geophysical Union) / San Francisco / USA
2012 Statistical Mechanics Meeting / Berkeley / USA
2011 **8th Liquid Matter Conference** / Wien / Austria
2010 10th International Workshop on Non Crystalline Solids (IWNCS) / Barcelona / Spain