

# Prof. Dr. Dr. h.c Jan-Kristian Krüger

## Research areas and publications

The scientific work of JKK is widely spread and covers more than 180 publications in the field of liquids, soft matter and solid state physics. 11 review articles and invited papers on different topics are amongst his publications. The scientific activities cover fundamental physics as well as applied physics and instrumental development.

## List of publications

### 1975

1. Krüger, J.-K., E. Schollmeyer, and J. Barthel, *The Influence of Higher Order Modes upon the Accuracy of Dielectric Constant Determinations Using Transmission Measurement Cells for Electrolyte Constants in the Giga Hertz Range*. Zeitschrift für Naturforschung A, 1975. **30a**: p. 1476-1480.

### 1977

2. Barthel, J., J. Krüger, and E. Schollmeyer, *Untersuchungen zur Dispersion der komplexen Dielektrizitätskonstante wäßriger und nichtwäßriger Elektrolytlösungen. III. Kritische Untersuchungen zur Meß- und Auswertemethode. Alkalifluoride, -bromide, -iodide und -perchlorate in wässriger Lösung*. Zeitschrift für Physikalische Chemie Neue Folge, 1977. **104**: p. 59-72.
3. Krüger, J.-K. and H.-G. Unruh, *Brillouin spectroscopy of induced phonons in x-cut quartz*. Solid State Communications, 1977. **21**: p. 583-586.
4. Unruh, H.G., J. Krüger, and E. Sailer, *PHASE TRANSITION MECHANISMS REVEALED BY OPTICAL SPECTROSCOPY*. Ferroelectrics, 1977. **20**(1-2): p. 3-10.

## 1978

5. Krüger, J., L. Peetz, and M. Pietralla, *Brillouin scattering of semicrystalline poly(4-methyl-1-pentene): study of surface effects of bulk and film material*. Polymer, 1978. **19**(12): p. 1397-1404.
6. Krüger, J., E. Sailer, R. Spiegel, and H. Unruh, *Investigation of the elastic behaviour of polymer films and bulk material by multipass Brillouin spectroscopy in thermal and microwave-induced phonons*, Progr. Colloid & Polymer Sci., 1978, **64**: p. 208-213.

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7. Krüger, J.K., *Evidence for structures in paraffin-melts by Brillouin-spectroscopy*. Solid State Communications, 1979. **30**(1): p. 43-46.

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8. Krüger, J.K., H. Bastian, G.I. Asbach, and M. Pietralla, *The elastic properties of C<sub>36</sub>H<sub>74</sub> single crystals from Brillouin-spectroscopy*. Polymer Bulletin, 1980. **3**(12): p. 633-640.
9. Krüger, J.K., H.D. Maier, J. Petersson, and H.G. Unruh, *BRILLOUIN-SCATTERING AT THE STRUCTURAL PHASE TRANSITION OF THE TWO DIMENSIONAL ANTIFERROELECTRIC SQUARIC ACID*. Ferroelectrics, 1980. **25**(1 /4): p. 621-624.
10. Krüger, J.K., A. Marx, and L. Peetz, *BRILLOUIN-SCATTERING AT TRANSITIONS OF POLYMER FILMS*. Ferroelectrics, 1980. **26**(1 /4): p. 753-756.
11. Krüger, J.K., L. Peetz, W. Wildner, and M. Pietralla, *Evidence for structural transformations in polymer melts*. Polymer, 1980. **21**(6): p. 620-626.
12. Pietralla, M. and J.K. Krüger, *Are there two temperature regions with different structure of N-alkane melts?* Polymer Bulletin, 1980. **2**(10): p. 663-669.
13. Rehwald, W., A. Vonlanthen, J.K. Krüger, R. Wallerius, and H.G. Unruh, *Study of the elastic properties of K<sub>2</sub>SeO<sub>4</sub> at the phase transition to the incommensurate and the commensurate phase by ultrasonic techniques and Brillouin spectroscopy*. Journal of Physics C: Solid State Physics, 1980. **13**(20): p. 3823-3834.

## 1981

14. Krüger, J.K., J. Albers, M. Möller, and H.J. Cantow, *Micro- and macroconformation of macromolecules - 9. Cyclotetracosane solid and molten state phase transitions by DSC, brillouin scattering, dielectric and 13C-NMR high resolution measurements*. Polymer Bulletin, 1981. **5**(3-4): p. 131-135.
15. Krüger, J.K., R. Kimmich, J. Sandercock, and H.G. Unruh, *The thermal behaviour of n-Tetracosane and low molecular weight Polyethylene studied by NMR and a refined Brillouin scattering technique*. Polymer Bulletin, 1981. **5**(11-12): p. 615-621.
16. Krüger, J.K., L. Peetz, M. Pietralla, and H.G. Unruh, *Brillouin spectroscopy at the melt transition of poly-4-methyl-pentene-1: Discontinuous melting of superstructures?* Polymer Bulletin, 1981. **4**(10): p. 591-596.
17. Krüger, J.K., L. Peetz, M. Pietralla, and H.G. Unruh, *Structure transformation behaviour of polymer melts investigated by Brillouin spectroscopy*. Colloid & Polymer Science, 1981. **259**(2): p. 215-219.
18. Möller, M., H.J. Cantow, J.K. Krüger, and H. Höcker, *Micro- and macroconformation of macromolecules - 8. Magic angle 13C-NMR investigation on linear n-alkanes and highly mobile phase cyclotetracosane as models for solid state polyethylene*. Polymer Bulletin, 1981. **5**(3-4): p. 125-129.

## 1982

19. Krüger, J.K. and M. Pietralla, *Brillouin spectroscopy of oriented PMMA*. Polymer, 1982. **23**(1): p. 3-6.
20. Krüger, J.K., M. Pietralla, and H.G. Unruh, *Elastic properties of hexatriacontane single crystals at their various phase transitions*. Physica Status Solidi (A) Applied Research, 1982. **71**(2): p. 493-504.
21. Pietralla, M., H.P. Grossmann, and J.K. Krüger, *Theoretical Birefringence of Ultraoriented Polyethylene from Model Structure Calculations*. Journal of Polymer Science Polymer Physics Edition, 1982. **20**: p. 1193-1205.

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23. Hotz, R., J.K. Krüger, and R. Siems, *Brillouin scattering in layered structures*. Solid State Communications, 1983. **46**(2): p. 155-158.
24. Krüger, J.K., G.W. Höhne, and M. Pietralla, *About the transition of n-alkanes above the melting point comment to the paper by P. Claudy and J.M. Létoffé*. Polymer Bulletin, 1983. **9**(4-5): p. 252-253.
25. Krüger, J.K., M. Pietralla, and H.G. Unruh, *The elastic properties of hexatriacontane single crystals at their various phase transitions*. Colloid & Polymer Science, 1983. **261**(5): p. 409-411.

#### 1984

26. Krüger, J.K., A. Marx, R. Roberts, H.G. Unruh, and J.H. Wendorff, *Dielectric and brillouin spectroscopic investigations of PVF2 and PVF2/PMMA mixtures*. Ferroelectrics, 1984. **55**(1-4): p. 815-818.
27. Krüger, J.-K., A. Marx, R. Roberts, H.G. Unruh, M.B. Bitar, H. Nguyen-Trong, and H. Seliger, *Segmented block copolymers of uniform chain length and defined structure, 2. Investigation of some physical properties*. Die Makromolekulare Chemie, 1984. **185**(7): p. 1469-1491.
28. Medycki, W., B. Hilczer, J.K. Krüger, and A. Marx, *Dielectric and TSC study of semicompatible PVDF/PMMA blends*. Polymer Bulletin, 1984. **11**(5): p. 429-431.
29. Seliger, H., M.B. Bitar, H. Nguyen-Trong, A. Marx, R. Roberts, J.-K. Krüger, and H.-G. Unruh, *Segmented block copolymer models of uniform chain length and defined structure, 1. Synthesis and characterization*. Die Makromolekulare Chemie, 1984. **185**(7): p. 1335-1360.
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31. Krüger, J., R. Roberts, H. Unruh, K. Frühauf, J. Helwig, and H. Müser, *A reinvestigation of the hypersonic properties and the specific heat of PMMA around the quasi-static glass transition*, in *Frontiers in Polymer Science*. 1985. p. 77-85.
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33. Krüger, J.K., R. Roberts, H.G. Unruh, K.P. Fruehauf, J. Helwig, and H.E. Mueser, *REINVESTIGATION OF THE HYPERSONIC PROPERTIES AND THE*

*SPECIFIC HEAT OF PMMA AROUND THE QUASI-STATIC GLASS TRANSITION. I. HIGH PERFORMANCE BRILLOUIN INVESTIGATIONS.* Progress in Colloid and Polymer Science, 1985. **71**: p. 77-85.

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34. Krüger, J.K., A. Marx, L. Peetz, R. Roberts, and H.G. Unruh, *Simultaneous determination of elastic and optical properties of polymers by high performance Brillouin spectroscopy using different scattering geometries.* Colloid & Polymer Science, 1986. **264**(5): p. 403-414.
35. Krüger, J.K., L. Peetz, R. Zentel, and P. Claudy, *Evidence for a liquid-liquid transition in a liquid crystalline side group polymer obtained by Brillouin spectroscopy and dsc.* Physics Letters A, 1986. **114**(1): p. 51-53.
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#### 1988

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41. Frühauf, K.P., J. Helwig, H.E. Müser, J.K. Krüger, and R. Roberts, *A reinvestigation of the hypersonic properties and the specific heat capacity of PMMA around the quasi-static glass transition II. High performance caloric investigations.* Colloid & Polymer Science, 1988. **266**(9): p. 814-822.

42. Krüger, J.K., L. Peetz, R. Siems, H.G. Unruh, M. Eich, O. Herrmann-Schönherr, and J.H. Wendorff, *Hypersonic properties of nematic and smectic polymer liquid crystals*. Physical Review A, 1988. **37**(7): p. 2637-2643.
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44. Marx, A., J.K. Krüger, and H.G. Unruh, *Brillouin spectroscopy on monodomains of thin polycrystalline layers of molecular crystals*. Applied Physics A Solids and Surfaces, 1988. **47**(4): p. 367-371.
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51. Marx, A., J.K. Krüger, and H.G. Unruh, *Elastic properties of the premelting phases of the perfluoroalkanes C<sub>16</sub>F<sub>34</sub> and C<sub>20</sub>F<sub>42</sub>*. Zeitschrift für Physik B Condensed Matter, 1989. **75**(1): p. 101-107.

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55. Marx, A., J.K. Krüger, A. Kirfel, and H.G. Unruh, *Unconventional structures and related physical properties of the semifluorinated triblock alkane C<sub>6</sub>F<sub>13</sub>-C<sub>4</sub>H<sub>8</sub>-C<sub>6</sub>F<sub>13</sub>*. Physical Review B, 1990. **42**(10): p. 6642-6650.

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57. Nakagawa, O.S., S. Ashok, and J.K. Kruger, *A Schottky barrier study of HBr magnetron enhanced reactive ion etching damage in silicon*. Journal of Applied Physics, 1991. **69**(4): p. 2057-2061.

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71. Krüger, J.K., K.P. Bohn, and J. Schreiber, *Anomalous behavior of the longitudinal mode Grüneisen parameter around the glass transition as revealed by Brillouin spectroscopy: Polyvinylacetate*. Physical Review B - Condensed Matter and Materials Physics, 1996. **54**(22): p. 15767-15772.
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