

1 Research Associate Professor (2000-2020) Dr. habil. Werner Kaminsky



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2 Biographical Sketch

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Birthdate: October 22, 1959

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2.1 Professional Preparation

1986, M.S.; Inst. for Crystallography, Univ. Cologne, *Farady effect in cubic crystals*, Research Advisor: Prof. Siegfried Haussuehl

1990, PhD., Inst. for Crystallography, Univ. Cologne, *Variation des Farady-Effekts bei Phasenumwandlungen und photochromatischen Prozessen*, Graduate Research Advisor: Prof. Siegfried Haussuehl

1999, Habilate (2nd PhD) Inst. for Crystallography, Univ. Cologne, *Beitraege zur Untersuchung chiraler Eigenschaften von Kristallen*, Advisor Prof. Ladislav Bohaty

2.2 Honors

DFG-Scholar, Deutsche Forschungsgemeinschaft, 1994-1996

2004, Top 10 most innovative scientists of the University of Washington

2.3 Prizes

Poster prize DGKK-meeting Stuttgart, Germany, 1994

British Philips Physical Crystallography Prize, April Cardiff, UK, 1995

Poster prize Annual National Meeting of the ACA, Chicago, USA, 2004

Poster prize Annual Meeting of the FACSS, Portland, USA, 2004

2.4 Appointments (Primary Professional Positions)

Research Associate Professor of Chemistry, University of Washington (2000-2020)

Departmental Crystallographer, University of Washington (1999-)

Privat Dozent, University of Cologne (2000-2011)

Expert Witness for the High Court of Singapore, (2018-2023)

2.5 Representative Recent Advisory and Review Panel Service

Univ. Washington, Chair, FCET: Faculty Council on Educational Technology, 2004-2009

Univ. Washington, UTAC: University Technology Advisory Committee, 2005-2008

Univ. Washington, Faculty Senate 2005-2009

Univ. Washington, Senate Executive Committee 2005-2009

Reviewer, Veterans Affairs Merit Review Subcommittee for Neurobiology-D 2004-2009

Reviewer, The National Center of Science and Technology Evaluation (NCSTE) of Kazakhstan 2017-2018
Secretary, German Language School for Children, 2003-2006
Session chair, 'Symmetry 2006' in Budapest, Hungary
Session chair, IUCr meeting Osaka, Japan 2008
Board member of the COD (Crystallographic open Database) 2017-

2.6 Past Primary Professional Positions

Private Docent, University of Cologne, 2000-2011
Dep. Lecturer, Clarendon Laboratory, Univ. of Oxford, UK 1997-1999
Research Fellow, University of Cologne, 1990-1996

2.7 Subjects of investigation

The research is aiming at the correlation between atomic structure and observed optical properties.

A new light mode was recently discovered along directions of optical isotropy in the presence of anomalous birefringence.

New chiral substances are synthesized as models for structure-feature studies, for example from adding chiral ligands to isothiocyanates. These new substances crystallize well and allow a multitude of variations of their chemistry while being strongly structurally related.

Similarly, structural phase-transitions cause variations in structures which are the cause of sometimes strong changes of the optical properties.

New optical measurement techniques are developed to collect data on chiroptical properties like optical rotation, Faraday Effect, circular dichroism, the electro-optic effect, and electrogyration. Such new methods are:

- 1) the 'tilter - method' that allows to measure optical rotation in any transparent crystal
- 2) an imaging polarized microscope which allows simultaneous precision measurement of linear dichroism, retardation and extinction angles of heterogeneous samples (Metripol, Rotopol)
- 3) a microscope which is designed to image circular extinction in solids (U-pol)
- 4) millipol, a microscope to measure time-dependent changes of the optical indicatrix in solids on a millisecond timescale.

Semi-empirical models are developed to be applied to the visible spectral range of light which allow calculating electrogyration, the electro-optic effect, and the d-coefficients for frequency doubling, using the atomic structure and empirical polarizability volumes for the individual atoms.

Crystal growth from aqueous or other solutions and their crystallographic characterization (forms, structure, and basic physical properties) assist the research. The aim is to provide large samples of interesting chemical composition in the size-range of cube-centimeters.

X-ray structure determination and chemical analysis as part of the duties for the Department of Chemistry in Seattle complement these studies.

I devote some of my time to the development of software packages to aid the teaching of physical crystallography. This resulted in one program for the presentation of tensorial features in form of representation surfaces (WinTensor for Windows) another program for the presentation of crystal morphology as virtual reality models (WinXMorph for Windows) and a remote presentation / remote PC application, 'REMSEM', to allow teaching from a distance. More recently I devoted some time on export routines for preparing 3D-printable file formats for WinXMorph and

Wintensor and completed this program series with a crystal structure rendering package, Cif2VRML, which produces images and 3D printable models directly from structural data.

2.8 Special Achievements (in chronological order)

1. *Periodic table of Verdet constants of Ions*. The Faraday rotation of over 250 cubic crystals was studied, and the first and so far only comprehensive compilation (almost complete periodic table) of specific Verdet constants of elements in different valence states was derived, including temperature dependence. Publication No. 1.
2. The first to measure *complete Verdet tensors* in non-cubic crystals, including triclinic symmetry. Publications No.1, 5-8.
3. *The tilter method*. A method was developed to measure the optical rotation of birefringent solids ca. 1000 times faster than competing methods. Publication No. 11, 22, 23, 24, 26, 29, 31, 37, 39, 40, 44, 49, 50, 60.
4. *Algorithm* to invert numerically a sinusoidally varying signal with smoothly changing amplitude. Publications No. 15, 16.
5. The first to measure *optical rotation topographs* in birefringent solids. Publications No.12, 15, 18.
6. *The DES-model*. A theory and software was developed to calculate the electro-optic tensor, the d-coefficients, and the electro-gyration tensors in crystals of any symmetry from the x-ray structure and empirical polarizability volumes of the atoms. Publication No. 18
7. Solving the over *100-years old problem* of Pasteur's findings of optical rotation in solutions versus crystals of Tartaric Acid. Publication No. 16.
8. Developing an *imaging system* to unfold images of birefringence, eigenrays and transmittance. Publication No. 13.
9. Solution to the problem of *ambiguity* of birefringence measurements. Publication No 21.
10. Discovery of *anomalous azimuthal rotation* in dyed crystals (AAR). Publication No. 38.
11. First to measure *circular dichroism images* with a new device, U-pol, (US patent 7292389). Publications No. 30, 33, 38, 39, 47, 48, 51, 57, 62.
12. Discovery of AAR related anomalous circular extinction in dyed crystals (*ACE-effect*). Publication No. 38.
13. Development of a system to unfold images of birefringence, eigen rays and transmittance on a *millisecond timescale*. (US Patent 7522278), invention licensed to Emerald Biosystems: DeCode Genetics, Publications No. 48, 56.
14. Two educational software packages, *WinTensor* to study tensorial properties and *WinXMorph* to study crystal morphologies are licensed through the University of Washington. Disclosures UW TechTr. 7045D, UW TechTr. 7038D; abstracts 22, 31; Publication No. 45, 52.
15. Peer-to-peer remote-PC software (REMSEM) to give remote lectures licensed through the University, UW TechTransfer Ref. UW TEchTr. 4109 Reg 0001.
16. Prism technology for Millipol approach UW TechTr. 7619D, Publication No. 48.
17. The crystal structure of Herapathite (SCIENCE), Publication No. 58.
18. Discovery of a novel light mode along optic axis in presence of anomalous birefringence, Publication No. 60.
19. Correction and exact determination of the absolute structures of humulone and its derivatives, Publication No. 67.
20. Software to transform structure information collected in cif-files into 3-D printer formats Publications No. 72, 78, 79, 80, 81, 85, 91, 94, 96.
21. Structure of quantum dots, Publication No. 368.

3 Publication List

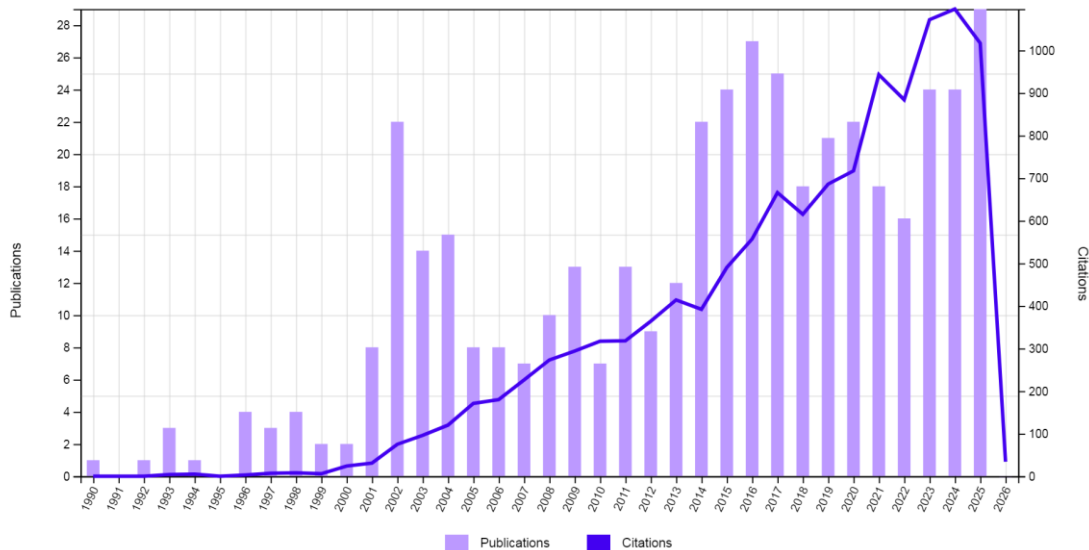
3.1 Overview

438 refereed publications, *of which*, 2 US Patents, 1 book report, 5 book chapters.

h-index 56 (60 according to Google Scholar) i10-index 273

91 poster abstracts

60 invited Talks

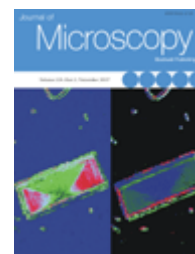


3.2 Publications not related to X-ray service for the Department

1. S. Haussühl, W. Effgen: Faraday effect in cubic crystals. Z. Kristallogr. 183 (1988) 153-174.
2. W. Kaminsky, S. Haussühl: Faraday effect and birefringence in orthorhombic $\text{Li}_2\text{Ge}_7\text{O}_{15}$ near the ferroelectric phase transition. Ferroelectrics letters 11 (1990) 63-67.
3. E. Gomez, H.W. Schrötter, E. Claus, S. Haussühl, W. Effgen: Dispersion angular fononica de un cristal triclinico. Superficies y Vacio 3 (1991) 6-11.
4. W. Kaminsky, A. Fahrenstich, S. Haussühl: Magneto-electrogyration in cubic $\text{Sr}(\text{NO}_3)_2$, $\text{Ba}(\text{NO}_3)_2$, and $\text{Pb}(\text{NO}_3)_2$. Ann.Physik 1 (1992) 92-97.
5. W. Kaminsky, S. Haussühl: Anisotropy of the Faraday effect in non-cubic crystals. Z. Kristallogr. 203 (1993) 79-91.
6. W. Kaminsky, E. Hartmann: Anisotropy of optical activity and Faraday effect in TeO_2 . Z. Phys.B 90 (1993) 47-50.
7. W. Kaminsky, U. Bismayer: The Faraday effect near the ferroelastic phase transition of lead phosphate, $\text{Pb}_3(\text{PO}_4)_2$. Phase Transitions 46 (1993) 41-46.
8. W. Kaminsky, S. Haussühl, A. Brandstaedter, C. Balarew: Physical properties and phase transition in tetragonal $\text{X}_2\text{CuT}_4.2\text{Q}_2\text{O}$, $\text{X}=\text{K}, \text{Rb}, \text{NH}_4, \text{ND}_4$, $\text{T}=\text{Cl}, \text{Br}, \text{Q}=\text{H}, \text{D}$. Z. Kristallogr. 209 (1994) 395-399.
9. G. Witt-Eickschen, W. Kaminsky, B. Harte, H. Seck: Trace element concentrations in amphibole and/or clinopyroxene from composite mantle xenoliths of the West Eifel (Germany): an ion-microprobe study. Mineralogical Magazine 58A (1994) 981-982.
10. W. Kaminsky: Reinvestigation of electrogyration in triglycine sulphate. Phase Transitions 52 (1994) 235-259.
11. W. Kaminsky, A. M. Glazer: Measurement of optical rotation in crystals. Ferroelectrics 183 (1996) 133-141.
12. W. Kaminsky: Reinvestigation of optical activity in the course of the ferroelastic phase transition in cadmium-langbeinite, $\text{K}_2\text{Cd}_2(\text{SO}_4)_3$. Phase Transitions 59 (1996) 121-133.
13. A. M. Glazer, J. G. Lewis & W. Kaminsky: A new optical imaging system for birefringent media. J. Royal Soc.London A452 (1996) 2751-2765.

14. W. Kaminsky, A. M. Glazer: Crystal optics of Mannitol, $C_6H_{14}O_6$: Crystal growth, structure, basic physical properties, birefringence, optical activity, Faraday effect, electro-optic related effect and model calculations. *Z. Kristallogr.* 212 (1997) 283-296.
15. W. Kaminsky: Topographies of linear and chiral optical properties in $FeBO_3$, using a novel polarimeter, the 'tilter'. *Ferroelectrics* 204 (1997) 233-246.
16. D. Mucha K. Stadnicka, W. Kaminsky and A. M. Glazer: Determination of optical activity in monoclinic tartaric acid, (2R, 3R)-(+)- $C_4H_6O_6$, using the 'tilter'-method. *J. Phys.C: Condens. Matter* 9 (1997) 10829-10842.
17. W. Kaminsky, A. J. Fitzmaurice & A. M. Glazer: Measurement and calculation of second-harmonic generation in single-crystal spheres: Application to d-coefficients of D-mannitol, $C_6H_{14}O_6$. *J. Physics D* 31 (1998) 767-775.
18. W. Kaminsky, A. M. Glazer: Comparison of experimental optical properties of TGS with calculations using the DES model. *Phase Transitions* 66 (1998) 1-21.
19. G. Witt-Eickschen, W. Kaminsky, U. Kramm and B. Harte: The nature of young metasomatism in the lithosphere of the West Eifel, Germany: geochemical and isotopic constraints from amphibole and clinopyroxene in composite mantle xenoliths from the Meerfelder Maar (Germany). *J. Petrology* 39 (1998) 155-185.
20. D. L. Corker, A. M. Glazer, W. Kaminsky, R. W. Whatmore, J. Dec, K. Roleder: Investigation into the crystal structure of the perovskite lead hafnate, $PbHfO_3$. *Acta Crystallogr. B* 54 (1998) 18-28.
21. M. A. Geday, W. Kaminsky, J. G. Lewis, A.M. Glazer: Images of absolute retardance $L \times D_n$, using the rotating polariser method. *J. of Microscopy* 198 (2000) 1-9.
22. W. Kaminsky: Experimental and phenomenological aspects of circular birefringence and related properties in transparent crystals. **REVIEW** *Rep. Prog. Phys.* 63 (2000) 1575-1640.
23. M. Kurimoto, L. D. Bastin, D. Fredrickson, P. N. Gustafson, S.-H Jang, W. Kaminsky, S. Lovell, C. A. Mitchell, J. Chmielewski, B. Kahr. Intrasectoral zoning of proteins and nucleotides in simple crystalline hosts, in: *Morphology and dynamics of crystal surfaces in complex molecular systems*, eds. J.J. De Yoreo, W.H. Casey, A.J. Malkin, E. Vlieg, and M.D. Ward. Materials Research Society, Pittsburgh 2001, 620, M9.8.1-M9.8.10.
24. D.Y. Kim, W. Kaminsky and A.M. Glazer. A low-temperature tilter system and its application to the measurement of the anisotropy of optical rotation in K_2ZnCl_4 in the vicinity of the phase transition at 145K. *Phase Transitions* 73 (2001) 533-563.
25. W. Kaminsky and B. Kahr: Crystal Optics and the Symmetry Principle: An Update. *Symmetry* 2000, I. Hargittai and L. Torvard, eds. Portland Press, Lond. Part 1 2002, 307-316.
26. W. Kaminsky, E. Haussuehl, L. Bastin, J.A. Subramony, S. Lovell, B. Kahr. Correlation of Chiral KH_2PO_4 Growth Hillocks with the Absolute Configuration of the Crystallographic Faces. *J. Crystal Growth* 234 (2002) 523-528.
27. M. Kurimoto, B. Mueller, L.-W. Jin, W. Kaminsky, B. Kahr: Dyeing Crystals to Dyeing Tissues: Congo Red in anisotropic media. in: *Molecular Crystals and Liquid Crystals Mol. Cryst. Liq. Cryst.* 389 (2002) 1-9.
28. K. Claborn, B. Kahr, W. Kaminsky: Calculation of optical properties of the tetraphenyl-X family of isomorphous crystals (X=C, Si, Ge, Sn, Pb). *Cryst. Eng. Comm.* 4 (2002) 252-256.
29. W. Kaminsky, P.A. Thomas, A.M. Glazer: Optical rotation in $RbTiOAsO_4$ (PG mm2). *Z. Kristallogr.* 217 (2002) 1-7.
30. Kacey Claborn, Eileen Faucher, Werner Kaminsky, Bart Kahr: Circular Dichroism Imaging Microscopy: Application to enantiomorphous twinning in biaxial crystals of 1,8-dihydroxyanthraquinone. *J Am Chem Soc.* 125 (2003): 14825-14831
31. Kaminsky, W, Geday, A.M, Herreros-Cedres, J., Kahr, B: Optical rotatory and Circular dichroic scattering. *J. Phys. Chem. A* 107 (2003) 2800-2807.
32. Carlson, Brenden; Phelan, Gregory D.; Jiang, Xuezhong; Kaminsky, Werner; Jen, Alex K. Y.; Dalton, Larry R.: Organic light emitting devices based upon divalent osmium complexes: Part 1: design, synthesis, and characterization of osmium complexes. *Proceedings of the SPIE, Volume 4800*, p. 93-104 (2003).
33. Werner Kaminsky, Bart Kahr: A chirality microscope?. *Symmetry: Culture and Science* 2003-2004, 14-15, 271-280.
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35. Bart Kahr, Miki Kurimoto, Werner Kaminsky, Sei-Hum Jang, Jason Benedict: Optical Consequences of Chemistry at Growing Crystal interfaces. In: 'From Solid-Fluid Interface to Nanostructural Engineering' J. De Yoreo, X. Y. Liu, eds. Plenum/Kluwer Academic Publisher (2004) 83-107
36. Jason B. Benedict, Werner Kaminsky, Christopher J. Tonzola: 2,2'-bis(4-phenylquinoline)-3,3'-didecyl-2,2'-bithienylene. *Acta Crystallogr. E* 60 (2004) o530-o531.
37. Bart Kahr, Werner Kaminsky, Kacey Claborn; Why biphenyl configuration still matters. *J. Phys. Org. Chem.* 17 (2004) 735-739.
38. Werner Kaminsky, Javier Herreros-Cedres, Morten A. Geday, Bart Kahr.: Dispersion of anomalous optical rotatory and circular dichroic signals in dyed K_2SO_4 crystals. *Chirality* 15 (2004) 855-S61.

39. Werner Kaminsky, Kacey Claborn, Bart Kahr: Polarimetric Imaging of Crystals. *Chem. Rev. Soc.* 33 (2004) 514-525.
40. J. Anand Subramony, Scott Lovell, Werner Kaminsky, Bart Kahr: Structure of a High Temperature Phase of Potassium Dideuteriophosphate (KDDP). *Solid State Commun.* 132 (2004) 827-830
41. Jason B. Benedict, Theresa Bullard, Werner Kaminsky and Bart Kahr: Potassium salt of phthalic acid hydrate dimer, monobasic: New structure and correction to literature. *Acta Crystallogr. C* 60 (2004) m551-m553.
42. Bart Kahr, Werner Kaminsky, Kacey Claborn, Miki Kurimoto, Lee-Way Jin: Status of congo red stained amyloid in polarized light. *Amyloid and Amyloidosis*, G Grateau, RA Kyle, M Skinner, eds CRC Press, Boca Raton (2005) pp 12-14.
43. Kacey Claborn, An-Shyang Chu, Sei-Hum Jang, Fengyu Su, Werner Kaminsky, Bart Kahr: Circular extinction imaging: Determination of the absolute orientation of embedded chromophores in enantiomorphously twinned s LiKSO₄ crystal. *J Cryst. Growth and Design* 5 (2005) 2117-2123
44. Javier Herreros Cedres, Cecilio Hernandez-Rodriguez and Werner Kaminsky: Absolute optical rotation of CsLiB₆O₁₀. *J. Appl. Crystallogr.* 38 (2005) 544-554.
45. W. Kaminsky: WinXMorph: a computer program to draw crystal morphology, growth sectors and cross-sections with export files in VRML V2.0 utf8-virtual reality format. *J. Appl. Crystallogr.* 38 (2005) 566-567.
46. Maliha Asma, Werner Kaminsky, Amin Badsha: Trans-Dichloro(orthochloroaniline) (triphenylphosphine)palladium(II) dichloromethane solvate. *Acta Crystallogr. E* 61 (2005) m1797-1798.
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49. Kacey Claborn, Werner Kaminsky, Javier Herreros-Cedres, Ekhart Weckert, Bart Kahr: Optical rotation of Achiral Pentaerythritol. *JACS* 128 (2006) 14746-14747.
50. W. Kaminsky, E. Weckert, H. Kutzke, M. A. Glazer, H. Klapper. Non-linear optical properties and absolute structure of metastable 4-methylbenzophenone. *Z. Kristallogr.* 221 (2006) 294-299.
51. W. Kaminsky, B. Kahr: Circular extinction contrast imaging microscope. Nov. 2007: **US Patent 7292389**
52. W. Kaminsky: From *.cif to virtual morphology: new aspects of predicting crystal shapes as part of the WinXMorph program. *J. Appl. Cryst.*, 40 (2007) 382-385.
53. W. Kaminsky, E. Gunn, R. Sours, B. Kahr: Simultaneous false-color imaging of birefringence, extinction, and transmittance at camera speed. *J Microscopy*. 228 (2007) 153-164. **(Journal Cover)**
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58. Bart Kahr, John Freudenthal, Shane Phillips, Werner Kaminsky: Herapathite. **SCIENCE** 324 (2009) 1407.
59. Singh, K. S., Kaminsky, W., Rodrigues, C., Naik, C. G.: Structural studies and antimicrobial properties of norcembrane diterpenoid from an Indian soft coral *Sinularia inelegrans* Tixier-Durivault. *J Chem. Sciences* 121 (2009) 1041-1046.
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61. W. Kaminsky, Donald Responde, Dan Darancioglu, Jose B Gallegos, Bao-Chau NgocTran, Tram-Anh Pham: Structure, morphology and optical properties of chiral N-(4-X-phenyl)-N-[1(S)-1-phenylethyl]thiourea, X= Cl, Br, and NO₂ *Molecules* 2010, 15, 554-569
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63. Keisham Sarjit Singh, Werner Kaminsky: Synthesis, spectral and structural studies of water soluble arene ruthenium (II) complexes containing 2,2'-dipyridyl-N-alkyl imine ligand: *Inorganic Chimica Acta* 365 (2011) 487-491.



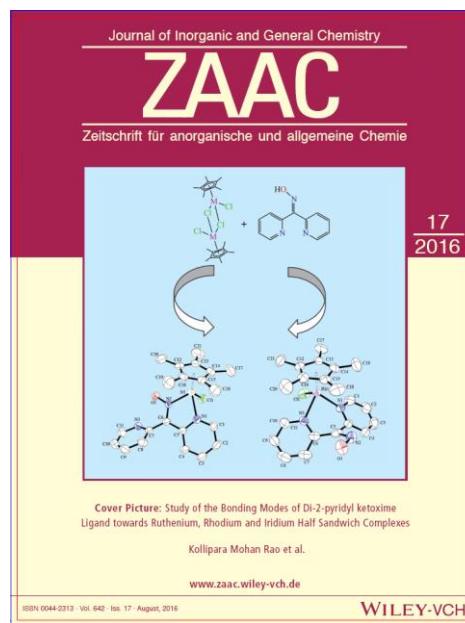
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65. Keisham S. Singh and Werner Kaminsky: Isolation and X-ray structure of deoxycholic acid from the sponge *Iricinia* sp. *Nat. Prod. Comm.* 6 (2011) 1237-1238.
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67. Thammavongsy, Zachary; Seda, Takele; Zakharov, Lev; Kaminsky, Werner; Gilbertson, John: Ligand-based reduction of CO₂ and release of CO on iron(II). *Inorganic Chemistry* 51 (2012) 9168-9170.
68. Jan Urban, Clinton Dahlberg, Brian Carroll, Werner Kaminsky: Absolute configuration of beer's bitter compounds. *Angewandte Chemie* 52 (2013) 1553-1555. 
69. Ewa M. Spiesz, Andreas G. Reisinger, Werner Kaminsky, Paul Roschger, Dieter H Pahr, Philippe K. Zysset: Computational and experimental methodology for site-matched investigations of the influence of mineral mass fraction and collagen orientation on the axial indentation modulus of lamellar bone. *Journal of the mechanical behavior of biomedical materials* 28C (2013) 195-205.
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72. Moeck, P., Kaminsky, W., and Snyder, T. J., "Presentation and answers to a few questions about 3D printing of crystallographic models", *IUCr Newsletter* 22 (2014) 7-9.
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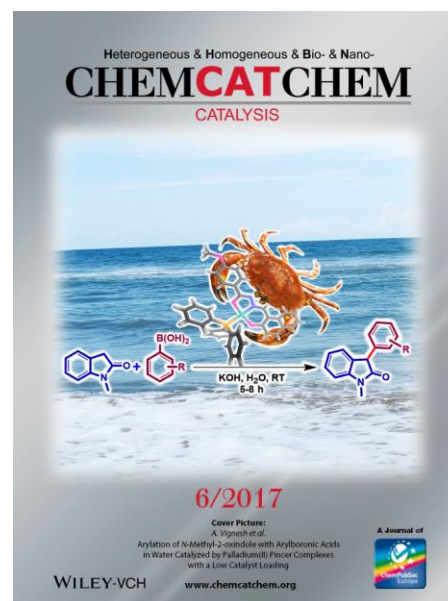
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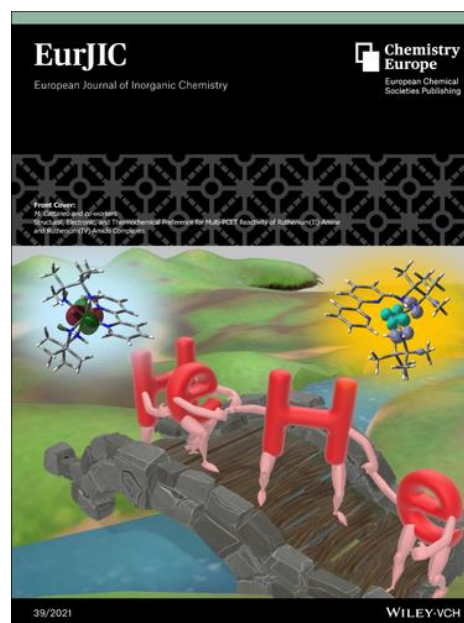
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414. Ashlyn A Kamin, Ian P Moseley, Jeewhan Oh, EJ Brannan, Paige M Gannon, Werner Kaminsky, Joseph M Zadrozny, Dianne J Xiao: Geometry-dependent valence tautomerism, magnetism, and electrical conductivity in 1D iron–tetraoxolene chains. *Chem. Sci.* 14 (2023) 4083–4090.
415. BS Mitchell, A Chirila, KJ Anderton, W Kaminsky, A Velian: Probing Edge/Support Electronic Cooperativity in Single Edge Fe/Co₆Se₈ Clusters. *Inorganic Chemistry* 62 (2023) 10497–10503.
416. Ashlyn A Kamin, Tara D Clayton, Claire E Otteson, Paige M Gannon, Sebastian Krajewski, Werner Kaminsky, Ramesh Jasti, Dianne J Xiao: Synthesis and metalation of polycatechol nanohoops derived from fluorocycloparaphenylenes. *Chem. Sci.* 14 (2023) 9724–9732.
417. Robert D Robinson Jr, Werner Kaminsky, Jeremiah J Scepianiak: Cyclopentadienyl Complexes of IrIII for Attempted C–D Bond Activation. *Eur. J. of Inorg. Chem.* 26 (2023) e202300369.
418. Baobing Fan, Wei Gao, Rui Zhang, Werner Kaminsky, Lingxiao Tang, Francis R Lin, Yiwen Wang, Qunping Fan, Wei Ma, Feng Gao, Alex K-Y Jen: Correlation of Broad Absorption Band with Small Singlet-Triplet Energy Gap in Organic Photovoltaics. *Angew. Chem.* 62 (2023) e202311559.
419. Alexie W Clover, Adam P Jones, Robert F Berger, Werner Kaminsky, Gregory W O’Neil: Regioselective Fluorohydrin Synthesis from Allylsilanes and Evidence for a Silicon–Fluorine Gauche Effect. *J of Org. Chem.* 89 (2024) 4309–4318.
420. Jonathan A Kephart, Daniel Y Zhou, Jason Sandwisch, Nathalia Cajiao, Sebastian M Krajewski, Paul Malinowski, Jiun-Haw Chu, Michael L Neidig, Werner Kaminsky, Alexandra Velian: Caught in the Act of Substitution: Interadsorbate Effects on an Atomically Precise Fe/Co/Se Nanocluster. *ACS Cent. Sci.* (2024) 1276–1282.
421. SF Sandeno, SM Krajewski, RA Beck, W Kaminsky, X Li, BM Cossairt: Synthesis and Single Crystal X-ray Diffraction Structure of an Indium Arsenide Nanocluster. *ACS Central Science* 10 (2024) 744–751.
422. Soren F Sandeno, Kyle J Schnitzenbaumer, Sebastian M Krajewski, Ryan A Beck, Dylan M Ladd, Kelsey R Levine, Damara Dayton, Michael F Toney, Werner Kaminsky, Xiaosong Li, Brandi M Cossairt: Ligand Steric Profile Tunes the Reactivity of Indium Phosphide Clusters. *JACS* 146 (2024) 3102–3113.
423. Maike Lundahl, Maria B Greiner, Marc C Piquette, Paige M Gannon, Werner Kaminsky, Julie A Kovacs: Exploring the Influence of H-Bonding and Ligand Constraints on Thiolate Ligated Non-Heme Iron Mediated Dioxygen Activation. *Chemical Science* 15 (32), 12710–12720.
424. Sarah M. West, Duyen K. Tran, Werner Kaminsky, Samson A. Jenekhe: Conjugated Ladder Poly(thienobenzothiazine): Synthesis, Electronic Structure, Optical Properties, and Electrical Conductivity of a Narrow Bandgap p-Type Semiconducting Polymer. *Macromolecules* 57 (2024) 8176–8186.
425. Connor W Dalton, Paige M Gannon, Werner Kaminsky, Douglas A Reed: Leveraging ordered voids in microporous perovskites for intercalation and post-synthetic modification. *Chemical Science* (2024).
426. Ashlyn A Kamin, EJ Brannan, Kathleen M Snook, Sebastian Krajewski, Paige M Gannon, Werner Kaminsky, Dianne J Xiao: Solvation and oxidation effects on the crystal structure and morphology of tetraoxolene-based materials. *CrystEngComm* (2024).
427. Sebastian M Krajewski, Robert J Love Jr, Jonathan A Kephart, Andrew C Boggiano, Henry S La Pierre, Werner Kaminsky, Alexandra Velian: Exploring Charge Redistribution at the Cu/Co₆Se₈ Interface. *Inorg. Chem.* 63 (2024) 20388–20397.
428. Daniel Y Zhou, Kelsey S Zimmerman, Paige M Gannon, Sebastian M Krajewski, Werner Kaminsky, Benjamin S Mitchell, Alexandra Velian: Synthesis and Reactivity of Iron and Cobalt Bis (amidophosphine selenide) Complexes. *Organometall.* 44, (2025) 335–339.
429. Xiaofeng Huang, Dongdong Xia, Qian Xie, Deng Wang, Qian Li, Chaowei Zhao, Jun Yin, Fang Cao, Zhenhuang Su, Zixin Zeng, Wenlin Jiang, Werner Kaminsky, Kaikai Liu, Francis R Lin, Qifan Feng, Binghui Wu, Sai-Wing Tsang, Danyuan Lei, Weiwei Li, Alex K-Y Jen: Supramolecular force-driven non-fullerene acceptors as an electron-transporting layer for efficient inverted perovskite solar cells. **Nature Communications** 16 (2025) 1626.
430. Ashlyn A Kamin, Phuong H Le, EJ Brannan, Paige M Gannon, Sebastian Krajewski, Werner Kaminsky, Dianne J Xiao: Synthesis and crystal structures of a family of bimetallic complexes with phenyl-substituted bridging tetraoxolene ligands. *Acta Cryst C* 81 (2025) 299–309.

431. Connor W Dalton, Paige M Gannon, Werner Kaminsky, Douglas A Reed: Leveraging ordered voids in microporous perovskites for intercalation and post-synthetic modification. *Chemical Science* 16 (2025) 1147-1154.
432. Duyen K Tran, Sarah M West, Anna E Stewart, Werner Kaminsky, Samson A Jenekhe: Mixed Ionic-Electronic Transport in A Series of New Cyano-Functionalized N-Type Conjugated Ladder Copolymers. *Advanced Functional Materials* 36(4) (2025) e10945.
433. Robert JE Westbrook, Andrew J Levin, Wei Gao, Urvashi Bothra, Saied Md Pratik, Baobing Fan, Francis R Lin, Qian-Qian Zhang, Khoa Ngo, Werner Kaminsky, Jean-Luc Brédas, Veaceslav Coropceanu, Alex K-Y Jen, Michael F Toney, David S Ginger: Solid-State Packing Controls Exciton Delocalization and Photophysics in Nonfullerene Acceptors. *JACS* 147 (2025) 30199-30209.
434. Meredith Pomfret, Lucy Miller, Nicholas Serck, Ángel Rentería-Gómez, Bob Li, Sarah Zeitler, Sebastian Krajewski, Werner Kaminsky, Osvaldo Gutierrez, Matthew Golder: Macrocyclic Ruthenium Ring Expansion Metathesis Polymerization Initiators Exhibit Tether Length-Dependent Behavior. *Organomet. Chem.* 44 (2025) 2083-2091.
435. Deesha D Malik, Shilpa Bhatia, Maike N Lundahl, Haley N Bautel, Dylan M Rogers, Werner Kaminsky, Julie A Kovacs: Intramolecular Oxo Atom Migration to the cis Thiolate Sulfur of an Fe-Oxo Intermediate. *JACS* (2025) 25337-25349.
436. Ashlyn A Kamin, Nathaniel J Schuster, Haomiao Xie, Phuong H Le, Kathleen M Snook, Sebastian Krajewski, Werner Kaminsky, Omar K Farha, Ramesh Jasti, Dianne J Xiao: Permanently porous cycloparaphenylene nanohoops via supramolecular engineering. *Chemical Science* 17 (2026) 1167-1175.
437. Feng Qi, Qian Li, Hao Lu, Rui Zhang, Shuzhe Liu, Werner Kaminsky, Yaoyao Wei, Qunping Fan, Hongna Zhang, Danyuan Lei, Francis R Lin, Zhishan Bo, Alex K-Y Jen: Alleviating non-radiative losses in organic solar cells through side-chain regulation of low-bandgap non-fullerene acceptors. **Nature Communications** 17 (2026) 712.
438. Lars Forberger, Jacob T Baillie, Zhaojie Feng, Rachel E Gariepy, Sankhya Hirani, Daniel R Gamelin, Shuai Zhang, Werner Kaminsky, Peter J Pauzauskie: Hydrothermal Synthesis of Ultra-high Aspect Ratio -NaYF Disks via Methyliminodiacetic Acid (MIDA) (submitted)

3.4 Seminars, Talks, and international Lectures

1. 5.6.1992, invited by Prof L. Bohatý (Inst. f. Krist. & Min. of Univ.Munich, *Germany*): Der Faraday-Effekt in kubischen Kristallen.
2. 7.7.1992, invited by Prof. U. Bismayer (Inst.f.Min. of Univ.Hannover, *Germany* and SFB 173): Faraday-Effekt in Kristallen mit Phasenumwandlungen.
3. 8.10.1992, invited by Prof.Haussühl (Inst.Krist of Univ.Cologne, *Germany*): Beobachtung von Phasenumwandlungen mit Hilfe des Faraday-Effekts.
4. 21.1.1993, invited by Prof.M.Schenk (Inst.f.Krist. & Materialforschung, Humboldt-Univ. Berlin, *Germany*): Faraday-Effekt in Kristallen mit Phasenumwandlungen.
5. 28.1.1993, invited by S.Bauer (ISI II, KFA-Juelich, *Germany*): Faraday-Effekt in Kristallen mit Phasenumwandlungen.
6. 4.2.1993, invited by Prof.J.Chr.Buhl (Inst.f.Min.of Univ.Münster, *Germany*): Faraday-Effekt in Kristallen mit Phasenumwandlungen.
7. 14.5.1993, invited by Prof.H.J.Weber (Fachbereich Phys.EII of Univ.Dortmund, *Germany*): Faraday-Effekt in Kristallen mit Phasenumwandlungen.
8. 10.11.1994, invited by Dr.A.M. Glazer (Clarendon Laboratory Oxford, *United Kingdom*): Gyro-optical investigations of phase transitions.
9. 29.3.1995, invited by P. F. Fewster (Philips, BCA-BACG spring meeting (1995) Cardiff, *United Kingdom*): Presentation of **Philips Physical Crystallography Award**.
10. 28.4.1995, invited by Marylise Lecointe (Groupe Matière Condensée Et Matériaux, Rennes, *France*): Correlations of gyro-optical properties and fluctuating symmetry in TGS.

11. 20.12.1995, invited by Dr. Malcolm McMahon (IOP-meeting (1995) Liverpool, United Kingdom): To tilt or not to tilt: Gyro-optics.
12. 9.2.1996, invited by Prof. W. Depmeier (Institut für Mineralogie der Univ. Kiel, Germany): Gyro-optische Untersuchungen an azentrischen Kristallphasen.
13. 8.3.1996, invited by Prof. H. Schmid (Dep. de Chimie Mineral, Analytique et Appliquée, Université Genève, Switzerland): Measurement of gyro-optical effects with the 'tilter'.
14. W. Kaminsky: Topographies of linear and chiral optical properties in FeBO₃, derived by a novel polarimeter, the 'tilter'. 3rd international conference on magnetoelectric interaction phenomena in crystals (1996) Novgorod, Russia.
15. 2.6.1997, invited by Prof. H. Klapper (Mineralogisch-Petrographisches Institut Der Universität Bonn, Germany): Kristalloptisches Kaleidoskop (Abriß über optische Phänomene mit Vorführungen).
16. W. Kaminsky, G. Witt-Eickschen: Programm zur Berechnung diffusionskontrollierter Spurenelement-Verteilungen in Gesteinen im Kontakt zu Gängen nach dem Modell von Bodinier. Meeting of the German Min. Soc. (1997) Cologne, Germany. Beih. z. Eur. J. Mineral 9 (1997) 178.
17. 5.5.1998, invited by Prof. G. Heger (Institut für Kristallographie der RWTH Aachen, Germany): Chirale optische Eigenschaften von Kristallen.
18. 22.5.1998, invited by Dr. J. Schreuer (Laboratorium F. Kristallographie, ETH Zürich, Switzerland): The calculation of optical properties in crystals.
19. 21.9.1998, invited by Prof. B. Kahr (Department of Chemistry, Univ. of Washington, USA): The measurement of chiral optical and associated properties.
20. 5.11.1998, invited by Prof. L. Bohaty (Institut für Kristallographie der Universität Köln, Germany): Chirale optische Eigenschaften.
21. W. Kaminsky, A.M. Glazer: Experiences with the low-temperature tilter to measure optical properties. DGK-meeting (1999) Leipzig, Germany. Z. Kristallogr. Suppl. 16 (1999) 107.
22. 14.5.1999, invited by Prof. B. Kahr (Department of Chemistry, Univ. of Washington, USA): The calculation of chiral optical and associated properties.
23. 21.10.1999, invited by the Math. Naturwiss. Faculty of the University Cologne, Germany (Habilitation examination talk): Flüssigkristallanzeigen.
24. 29.11.2000, invited by the Math. Naturwiss. Faculty of the University Cologne, Germany (Antrittsvorlesung): Gefärbte Kristalle.
25. 13.8.2001-24.8.2001 (Institut für Kristallographie der Universität Köln, Germany): 10 lectures on "Gyrooptische Eigenschaften in Kristallen".
26. 5.4.2002, invited by Cecilio Hernandez-Rodriguez (Departamento de Física Básica, Universidad de La Laguna, Tenerife, Spain): 3 lectures (1h each) on "Non-linear optical tensors", "NLO in mannitol", and "Optical rotation imaging".
27. 1.7.2002-5.7.2002 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "Kristallographische Aspekte von Phasenumwandlungen".
28. W. Kaminsky: A fast microscope for unfolded images of birefringence, extinction, and transmission. 4 - 7 November 2002 CPAC Fall 2002 Sponsor Meeting, Seattle, USA
29. W. Kaminsky, B. Kahr: A chirality microscope?. 16 - 21 August 2003 international Symmetry 2003 festival Budapest, Hungary.
30. W. Kaminsky: A fast microscope to measure birefringence and eigenray directions. 4 - 8 May 2003 CPAC Spring 2003 Sponsor Meeting, Seattle, USA
31. 15.12.2003 - 20.12.2003 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "3-D Darstellung und 'virtual reality' Programmierung kristallographischer Objekte".
32. 17.12.2003, invited by Prof. L. Bohaty (Institut für Kristallographie der Universität Köln, Germany): Forschen unter Amerikanischen Bedingungen
33. W. Kaminsky: Search for applications for 'Millipol', a fast quantitative polarimetric imaging technique. 2 - 6 May 2004 CPAC Spring 2004 Sponsor Meeting, Seattle, USA
34. 6.1.2004, invited by Prof. L. Keller (Institut für Chemie, Univ. Dortmund, Germany): Forschen unter Amerikanischen Bedingungen.
35. 22.10.2004, invited by Alvin Kwiram, Univ. Washington., Seattle: "New developments in optical microscopy".
36. 27.10.2004, invited by Alex Jen, Univ. Washington, Seattle: "New microscopic tools to study linear and nonlinear optical properties of materials: new ways to measure EO activity of materials "
37. 15.11.2004 - 19.11.2004 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "3-D Darstellung und 'virtual reality' Programmierung kristallographischer Objekte".

38. 16.11.2004: invited by Dr. Gerhild Beneke (Institut für Kristallographie der RWTH Aachen, *Germany*): "Abbildung kristalliner Eigenschaften".
39. "Electro-optic imaging". STC Retreat, Feb. 2005, Georgia Tech, Atlanta.
40. 24.8.2005, 20th Congress of the IUCr, Florence, invited by Reiko Kuroda, (Univ. of Tokyo, Japan): "Optical topographies of chiral structures". *Acta Cryst. A* 61 (2005) C11.
41. 29.11.2005, invited by Ana de Bettencourt-Diaz, (Chemistry Department, Syracuse University, New York): "Optical topographies of chiral structures".
42. W. Kaminsky: From *.cif to virtual morphology: new aspects of predicting crystal shapes as part of the free WinXMorph program. 12 - 18 August 2006 international Symmetry 2006 festival Budapest, *Hungary*.
43. 13.8.2006: invited by Peter Nollert (Emerald Biosystems, Bainbridge Island, Washington, USA) W. Kaminsky: Search for applications for 'Millipol', a fast quantitative polarimetric imaging technique.
44. 29.11.2006, invited by Dr. Morten Geday (Universidad Polytechnica Madrid, Spain): "Optical topographies of chiral structures".
45. 26.7.2007: Werner Kaminsky. "Virtual Reality in PowerPoint Presentations with Objects Created with WinXMorph and WinTensor". Annual meeting of the ACA, Salt Lake City, Utah.
46. Feb. 11th, 2008, invited by Peter Moek (Department of Physics, Portland State University) "New optical microscopies".
47. June 4th, 2008: Werner Kaminsky, D. Responde, D. Daranciang, J. Gallegos. "Synthesis, Structures, Morphologies and Optical properties of some new chiral thiocarbamates and thioureas." Annual meeting of the ACA, Knoxville, Tennessee.
48. January 26th, 2009 on invitation by Kenneth Carlin (Dep. Chemistry, Johns Hopkins University, Baltimore) "Chiro-optics of crystals and molecules".
49. March 31st, 2009: (invited by Antonello DeMartino) "Real-time Birefringence Measurements and other Optical Properties", 1st European Workshop "Polarization-based optical techniques applied to biology and medicine 2009", Massy (Paris) France.
50. April 30th, 2010: (Invited by Steve Jaques (Oregon Health Sciences University, Portland) "real-time Microscopic Imaging of Birefringence in Biological tissue".
51. May 22nd, 2010: Cichy E, Kaminsky, W and Zysset, PK Bone collagen fibers orientation assessment using birefringence measurements. Northwest Biomechanics Symposium, Seattle.
52. September 23rd 2010 on invitation by Mark Hollingsworth (Dep. Chemistry, Kansas State University, Manhattan, Kansas): "Real-time birefringence imaging".
53. April 13th, 2011, on invitation by Philippe Zysset (Institute of Lightweight Design and Structural Biomechanics (ILSB) Vienna University of Technology, Austria): "Real-time birefringence imaging".
54. April 8th, 2013, on invitation of KCTS/Seattle Science Center, Kirkland, Washington, USA: "Beer, Hops, Humulone, & Health".
55. May 21st, 2014, on Invitation of Deok-Ho Kim, Bio Engineering, Univ. Washington, USA: "Real-time imaging of Birefringence".
56. October 13th, 2014, on invitation by Peter Pauzauskie (Material Science and Engineering, Univ. Washington, USA: "Beer, Hops, Humulone, & Health".
57. May 7th, 2015, on invitation of the MolES department, Univ. Washington, USA: "Beer, Hops, Humulone, & Health".
58. October 3rd, 2016, on invitation of Zuo-Guang Ye, 13th International Symposium on Ferroic Domains & Micro- to Nano-scopic Structures (ISFD-13), Vancouver, BC, Canada: "Automated Microscope add-ons to quantify birefringence images".
59. March 5th, 2018, on invitation by Peter Moek (Department of Physics, Portland State University, Portland, Oregon): "Great X (-ray) expectations".
60. March 8th, 2018, on invitation by Paul Neubert (Molecular Engineering & Sciences Institute, UW, Seattle, Washington): "Great X (-ray) expectations".
61. June 17th, 2021, on invitation by Kraig Wheeler (Whitworth University, Gonzaga, Spokane, Washington): "From Beer to Quantum dot, cancer to malaria, sea-urchins to barnacles, dog wee to MOF, catalyst to chromophore: service crystallography".

3.5 Poster abstracts

1. S.Haussühl, W.Effgen: Beobachtung von Phasenumwandlungen mit Hilfe des Faraday-Effekts. 26.AGKR-meeting (1987) Berlin, Germany. *Z.Krist* 178 (1987) 86-88.

2. W.Kaminsky, S.Haussühl: Verlauf des Faraday-Effekts und der Brechwerte bei der ferroelastischen Phasenumwandlung in $\text{Li}_2\text{Ge}_7\text{O}_{14}$. 28.AGKR-meeting (1989) Hannover, Germany. Z.Krist 186 (1989) 155-157.
3. W.Kaminsky, Th.Woike, W.Kirchner, S.Haussühl: Einwirkung des Magnetfeldes auf die metastabilen Zustände in $\text{Na}_2[\text{Fe}(\text{CN})_5\text{NO}]\cdot 2\text{H}_2\text{O}$. DPG-meeting (1990) Regensburg, Germany. Verhandlungen der Deutschen Physikalischen Gesellschaft (VI) 25 (1990) (1042).
4. W.Kaminsky, A.Fahnenstich, S.Haussühl: Magneto-Elektrogyration in kubischem $\text{Pb}(\text{NO}_3)_2$. 29.AGKR-meeting (1991) Munich, Germany. Z. Krist.Supplement 3 (1991) 146.
5. W. Kaminsky, A. Brandstaedter, C. Balarew, S. Haussühl: Physikalische Eigenschaften von $\text{A}_2\text{CuB}_4\cdot 2\text{H}_2\text{O}$; $\text{A}=\text{K}, \text{Rb}, \text{NH}_4, \text{ND}_4$; $\text{B}=\text{Cl}, \text{Br}$. 1.DGK-meeting (1992) Mainz, Germany. Z. Kristallogr. Suppl. 6 (1992) 125.
6. W.Kaminsky, E.Hartmann: Richtungsabhängigkeit der optischen Aktivität in TeO_2 . 1.DGK-meeting (1992) Mainz, Germany. Z. Kristallogr. Suppl. 6 (1992) 126.
7. W.Kaminsky, U.Bismayer: Faraday-Effekt und Indikatrix bei der ferroelastischen Phasenumwandlung in $\text{Pb}_3(\text{PO}_4)_2$. 2.DGK-meeting (1993) Bochum, Germany. Z. Kristallogr. Suppl. 7 (1993) 95.
8. R.Schwesig, P.Dvoran, W.Kaminsky, S.Haussühl: Cotton-Mouton-Effekt in Alkalihalogeniden. 2.DGK-meeting (1993) Bochum, Germany. Z. Kristallogr. Suppl. 7 (1993) 185.
9. E.Günther, W.Kaminsky, S.Haussühl: Magneto-Elektrogyration in Alkalihalogeniden. 2.DGK-meeting (1993) Bochum, Germany. Z. Kristallogr. Suppl. 7 (1993) 65.
10. W.Kaminsky: Kristallzüchtung und optische Eigenschaften von D-Mannitol, $\text{C}_6\text{H}_{14}\text{O}_6$. DGKK-meeting (1994) Stuttgart, Germany. **(Awarded with poster prize)**.
11. W.Kaminsky: Separation of birefringence, gyration and electro-optic effects near the phase transition in triglycine sulfate by polarimetry. ECM-15 (1994) Dresden, Germany. Z. Kristallogr. Suppl. 8 (1994) 541.
12. G. Witt-Eickschen, W. Kaminsky, B.Harte, H.A.Seck: Trace element concentrations in amphibole and/or clinopyroxene from composite mantle xenoliths of the West Eifel (Germany): an ion-microprobe study. (1994) Edinburgh, UK.
13. G.Witt-Eickschen, W.Kaminsky: Spurenelementkonzentrationen in Amphibolen und/oder Klinopyroxenen von 'composite' Mantelxenolithen der Westeifel. (1994), Germany.
14. Werner Kaminsky, Gudrun Witt-Eickschen: Programm zur Berechnung diffusionskontrollierter Spurenelement-Verteilungen in Gesteinen im Kontakt zu Gangen nach dem Modell von Bodinier. Tagung der Deutschen Min. Ges., Koeln, Deutschland, 15.9.-19.9.1999 in Koeln.
15. A.J. Fitzmaurice, W. Kaminsky: Phase matchability of second harmonic generation in orthorhombic D-Mannitol, $\text{C}_6\text{H}_{14}\text{O}_6$. DGK-meeting (1995) Darmstadt, Germany. Z. Kristallogr. Suppl. 9 (1995) 264.
16. W. Kaminsky: Gyro-optical properties and structural relations of large D-Mannitol single crystals. BCA-BACG-meeting (1995) Cardiff, UK.
17. J. G. Lewis, W. Kaminsky, A.M. Glazer: Topographic studies of optical properties in crystals. BCA Spring Meeting (1996) Cambridge, UK.
18. W. Kaminsky: The calculation of high-rank optical tensor-properties and the aspects of science fiction. BCA Spring Meeting (1996) Cambridge, UK.
19. A.M. Glazer, W. Kaminsky: The 'Tilter': A novel polarimeter for fast optical activity measurements in birefringent crystal sections. IUCr XVII Congress and General Assembly Seattle (1996) Washington, USA. Acta Crystallogr. A52 (1996) C-39.
20. W. Kaminsky, U. Bismayer: Optical activity and ferroelastic phase transition in Cd-langbeinite. DGK-meeting (1997) Hamburg, Germany. Z. Kristallogr. Suppl. 12 (1997) 69.
21. W.Kaminsky: Berechnung höherer optischer Tensoren mit dem DES-Modell. DGK-meeting (1997) Hamburg, Germany. Z. Kristallogr. Suppl. 12 (1997) 182.
22. W.Kaminsky: Graphische Darstellung von Tensoren: unverzichtbar in der Kristallphysik. DGK-meeting (1997) Hamburg, Germany. Z. Kristallogr. Suppl. 12 (1997) 183.
23. W. Kaminsky: Topographies of linear and chiral optical properties in FeBO_3 , using the 'tilter'. DGK-meeting (1997) Hamburg, Germany. Z. Kristallogr. Suppl. 12 (1997) 191.
24. W. Kaminsky, D. Corker, E.L. Belokoneva, A.M. Glazer: Absolute structure and optical rotation in LaBGeO_5 . BCA-BACG-meeting (1997) Leeds, UK.
25. W. Kaminsky, P.A. Thomas, A.M. Glazer: Measurement of optical rotation in RbTiOAsO_4 (PG mm2), using the tilter. DGK-meeting (1998) Karlsruhe, Germany. Z. Kristallogr. Suppl. 15 (1998) .
26. M. A. Geday, W. Kaminsky and A.M Glazer "Measurements of birefringence in nonhomogenous samples" XVIIIth IUCr. Congress & General Assembly (1999) Glasgow, UK Collected abstracts p 541.
27. W. Kaminsky, M.A. Geday, A.M. Glazer: Images of absolute retardation $L \times D_n$, using the rotating polarizer method. DGK-meeting (1999) Leipzig, Germany. Z. Kristallogr. Suppl. 16 (1999) 106.

28. W. Kaminsky, A. M. Glazer: Experiments with the low-temperature tilter to measure optical properties. DGK-meeting (1999) Leipzig, Germany. Z. Kristallogr. Suppl. 16 (1999) 107.
29. Kim, D.Y. and Kaminsky, W. (1999). Optical rotation in the low temperature phase of K_2ZnCl_4 . Acta Cryst. A, P05.10.003.
30. W. Kaminsky, A. Sodt, B. Kahr: The old problem of optical rotation in $Na(Cl,Br)O_3$ - mixed crystals. DGK-meeting (2000) Aachen, Germany. Z. Kristallogr. Suppl. 17
31. W.Kaminsky: Wintensor: ein WIN95/98/NT Programm zum darstellen tensorieller Eigenschaften. DGK-meeting (2000) Aachen, Germany. Z. Kristallogr. Suppl. 17 (2000) 51
32. U. Fekl, W. Kaminsky, K. Goldberg: The first stable five-coordinate platinum (IV) alkyl complex. Gordon Research Conference on Inorganic Reaction Mechanisms. (2001) Ventura, CA, USA.
33. K. Claborn, W. Kaminsky, B. Kahr: Predicting optical rotation in organic compounds. 4th annual University of Washington Undergraduate Research Symposium. (2001) Seattle, WA, USA.
34. Bart Kahr, Werner Kaminsky, Miki Kurimoto, Sei-Hum Jang, and Kacey Claborn: Dyeing Crystals and Tissues: New Methods of the Optical Analysis of Heterogeneous Substances. 2001 Northwest Regional Meeting of the American Chemical Society (2001) Seattle, WA, USA
35. B Kahr, W Kaminsky, M Geday, A Sodt, K Claborn and M Kurimoto Washington University, USA: Optical Rotation in Engineering Crystals.CrystEngComm Discussion 1 Innovation in Crystal Engineering 29 June - 1 July 2002 University of Bristol, UK
36. Shearer J, Jackson HL, Schweitzer D, Leary TM, Kaminsky W, Scarrow R, Kovacs JA: Modeling the reactivity properties of cysteine-ligated non-heme iron enzymes. Abstr. of Papers J Am. Chem Soc. 223 (2002) 227-INOR Part 2.
37. Carlson B, Kim JH, Kaminsky W, Jen AKY, Dalton LR: Novel divalent osmium complexes: Design, synthesis, and use in organic light-emitting diodes. Abstr. Pap. OF J. Am. Chem. Soc. 225: 613-INOR Part 2 MAR 2003
38. Phelan GD, Carlson B, Purvis L, Kaminsky W, Dalton LR.: Synthesis and characterization of novel lanthanide metal complexes. Abstr. Pap. OF J. Am. Chem. Soc. 225: 616-INOR Part 2 MAR 2003.
39. Saad Akbar, Vassar College '05, and Werner Kaminsky, Bart E. Kahr, Department of Chemistry, University of Washington. Construction of the Circular Dichroism Tensor of Horse Oxyhemoglobin. Undergraduate Research Summer Institute Symposium. Vassar College, September 17, 2003
40. Kacey Claborn, Werner Kaminsky, Bart Kahr: In search of the Structural Determinants of Optical Activity. Annual National Meeting of the American Crystallographic Association, ACA Chicago (USA) 7/17 - 7/22/2004 (**Awarded with poster prize**).
41. **Carlson B, Phelan** GD, Kaminsky W, Benedict JB, Dalton LR: Crystallographic results of several novel 4,7-bis(aryl)-1,10-phenanthroline containing divalent osmium complexes. Abstr. Pap. OF J. Am. Chem. Soc. 227: U1546-U1546 901-INOR Part 1, MAR 28th, 2004
42. Carlson B, Phelan GD, Benedict JB, Kaminsky W, Dalton LR: Crystallography and luminescence of divalent osmium complexes. Abstr. Pap. OF J. Am. Chem. Soc. 228: U801-U801 157-INOR Part 1, AUG 22nd, 2004
43. Phelan GD, Carlson B, Benedict JB, Kaminsky W, Dalton LR: Possible structural evidence for participation of phosphine (3D) and osmium (5D) orbital backbonding. Abstr. Pap. OF J. Am. Chem. Soc. 228: U821-U821 279-INOR Part 1, AUG 22nd, 2004
44. Kovacs JA, Theisen R, Kitagawa T, Lugo-Mas P, Shearer J, Kaminsky W, Scarrow R: Understanding the mechanism of superoxide reduction by the cysteine-ligated non-heme iron enzyme superoxide reductase (SOR). Abstr. Pap. OF J. Am. Chem. Soc. 227: U1432-U1432 421-INOR Part 1, MAR 28th, 2004
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58. Werner Kaminsky, Sandy Moy, David Masuda, Efthimis Efthimiadis, Linda Martin-Morris: Plagiarism-avoidance tools for writers. Annual Symposium on Teaching and Learning, May 6th, 2008, Univ. Washington.
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63. Peter Nollert, Werner Kaminsky, Timothy Vincent, Chad Warren, Mark Mixon, Lance Stewart: Protein Crystal Imaging With The Detect-X Microscope. ACA 2009 Toronto, Canada.
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68. Heather Dillon, Nick Stelzenmuller, Jaeger Dill, Ann Mescher, Ashley Emery, Werner Kaminsky: thermal effects during aspect ratio hollow polymer fiber drawing. 20th international conference on plastic optical fibers 2011, Bilbao, Spain.
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75. Peter Moeck, Trevor J. Snyder, Werner Kaminsky, Daniel Chateigner, Xiaolong Chen, Marco Ciriotti, Robert T. Downs, Saulius Grazulis, Armel Le Bail, Luca Lutterotti, Yoshitaka Matsushita, Miguel Quiros Olozabal, Hareesh Rajan, Alexandre F.T. Yokochi: Crystallography Open Database: educational subsets and their usage in

- interdisciplinary college education at Portland State University. Proc. 2013 National Educators Workshop, Materials in Enabling Technologies: Defining the FutureTulsa Oklahoma 11/3-5/2013
76. International Advisory Board of the Crystallography Open Database and Trevor J. Snyder: Putting 3D print files of crystallographic models into open access. Grand Opening Ceremony of the International UNESCO/IUCr Year of Crystallography, January 20-21, 2014, UNESCO Building, Place de Fontenoy, Paris / France
 77. P. Moeck, T. Snyder, and W. Kaminsky: Educational offsprings of the Crystallography Open Database and their usage in interdisciplinary college education. Proc. Spring 2014 Meeting of the Materials Research Society, April 21-25, 2014, San Francisco, CA
 78. Meghana Rawal, Kerry Garrett, Werner Kaminsky, Evgheni V Jucov, David P Shelton, Tatiana V Timofeeva, Bruce E Eichinger, Bruce Robinson, Larry R Dalton: Cross-Conjugation as a Novel Motif for Non-Linear Optical Molecules. Proc. Spring 2014 Meeting of the Materials Research Society, April 21-25, 2014, San Francisco, CA
 79. J. Stone-Sundberg, G. Gledhill, T. J. Snyder, W. Kaminsky, and P. Moeck, On demand 3D printing of crystallographic models leveraging the Open Access Crystallography project infrastructure. Proc. Advances in Structural and Chemical Imaging, May 27-28, 2014, Seattle, WA
 80. A. Recidoro, W. Kaminsky, R. Kwon: Bone mineralization in the regenerating zebrafish fin. 11th Intern. Conf. on Zebrafish Development and Genetics. June 24th – 28th, 2014, Madison, Wisconsin
 81. S. Bhakat, R. Acharyya, S. P. Subhashree, S. Pasayat, W. Kaminsky, M. R. Hardikar, B. N. Joshi, R. Dinda: Synthesis, characterization and study of cytotoxic activity of oxidovanadium and oxidomolybdenum complexes of thiosemicarbazone: potential antitumor agents. ICC-41, International Conference on Coordination Chemistry, Singapore, July 21st -25th, 2014.
 82. P. Moeck, T. Snyder, W. Kaminsky, and all members of the International Advisory Board of the Crystallography Open Database: 3D printing of crystallographic models from STL files at open access databases, Proc. 2014 Biennial Conference on Chemical Education, August 3-4, 2014, Grand Valley State University, MI
 83. Werner Kaminsky, Trevor Snyder, Peter Moeck: 3D printing of crystallographic models and educational offsprings of the Crystallography Open Database, 23rd Congress and General Assembly of the International Union of Crystallography, 5-12th August 2014, Montreal, Canada
 84. P. Moeck, W. Kaminsky, and T. Snyder, Open access to 3D printing files of crystallographic models in support of interdisciplinary college education, 23rd Congress and General Assembly of the International Union of Crystallography, August 5-12, 2014, Montreal, Canada; Acta Cryst. A70, C1379
 85. Recidoro AM, Roof AC, Schmitt M, Worton LE, Petrie T, Strand N, Ausk BJ, Srinivasan S, Moon RT, Gardiner EM, Kaminsky W, Bain SD, Allan CH, Gross TS, Kwon RY: Neuromuscular Regulation of Bone Regeneration in Zebrafish. 12th In. Bone Fluid Flow Workshop, 10-11th September 2015, Houston, Texas.
 86. Peter Moeck, Andrew Maas, Jennifer Stone-Sundberg, Bryant York, Trevor Snyder, Werner Kaminsky, and Nigel Browning: Applications of Bicrystallography: Revealing Generic Similarities in Coincidence Site Lattice Boundaries of all Holohedral Cubic Materials and Facilitating the Design of 3D Printed Models of such Grain Boundaries. Advances in Combining Simulation and Experiment for Materials Design (M&M 2015), August 2-6, 2015, Portland, Oregon.
 87. Claire Watson, Edith Gardiner, Werner Kaminsky, Ronald Kwon: High-content in vivo imaging of zebrafish bone regeneration reveals dynamic NADH events during osteoblast dedifferentiation. ASBMR 2016 Annual Meeting, September 16-19, 2016, Atlanta, Georgia, USA.
 88. Kailasam Saravana Mani, Werner Kaminsky, Subramanian Parameswaran Rajendran: A facile synthesis of Quinoline grafted spiro-indenoquininoxaline pyrrolizines through [3+2]-cycloaddition reactions and its biological evaluation. International Conference on Organic Synthesis (ICOS-21), December 11th - 16th, 2016, Indian Institute of Technology- Mumbai, India
 89. P. DeStefano, P. Moeck, W. Kaminsky, T. Snyder: Straightforward Routes from CIFs to 3D Printed Crystallography Models. IUCr 2017, August 21 – 28, Hyderabad, India. · Acta Cryst. A: Foundations and Advances 73(a2) (2017) C1132
 90. Maike Blakely, Gloria Villar-Acevedo, Maksym Dedushko, Werner Kaminsky, Julie Kovacs: Metal-Assisted oxygen addition to an Fe (III)-thiolate. Abstr. Oof Papers Am. Chem. Soc. 253 (2017).
 91. Hannah Zeitler, Werner Kaminsky, Karen Goldberg: Reactions of palladium and platinum methyl complexes with molecular oxygen. Abstr. Oof Papers Am. Chem. Soc. 254 (2017).

3.6 Video Publications

Inside Science TV (W. Kaminsky et al.): Cheers to your Health, Copyright 2013 American Institute of Physics (<https://youtu.be/-VK2MWLBuwo>).

3.7 Periodic Reviewer

Advanced Materials, American Mineralogist, Angewandte Chemie, Applied Physics, Arabian Journal of Chemistry, Chemical Data Collections, Chemical Communications, Chemistry, Chirality, Crystal Growth & Design, Crystals, Journal of the American Chemical Society, Journal of Applied Crystallography, Journal of Agricultural and Food Chemistry, Journal of Coordination Chemistry, Journal of Inorganic Biochemistry, Journal of Molecules, Journal of Molecular Structure, Journal of Optics A Pure and Applied Optics, Journal Organometallic Chemistry, Journal of Physics A General Physics, Journal of Physics B Atomic and Molecular Physics, Journal of Physics Condensed Matter, Green Chemistry, Holzforschung - International Journal of the biology, chemistry, physics, and technology of wood, Inorganic Chemistry Communications, New Journal of Physics, Physical Chemistry Chemical Physics, Physics Letters A, Physical Review, Optics Communications, Pure and Applied Chemistry, Synthetic Communications, Talanta, Zeitschrift für Kristallographie,

4 Grant Activities

C.1 Proposals Awarded

Agency	title	PI and Co-PI's	amount	period
DFG (Germany)	Chiro-optical properties	W. Kaminsky	\$60,000 direct	1994 – 1996
EPSRC (UK)	Novel Experiments on Optical Crystals	A.M.Glazer, W. Kaminsky	\$40,000 direct	1997 – 1998
PRF	Interpretation of Gyration Tensors	W. Kaminsky, Bart Kahr	\$60,000 direct	2000 – 2002
RRF	Novel Microscope	W. Kaminsky	\$28,000 direct	2003 – 2004
UW, OT&T	U-pol patent application	W. Kaminsky, B. Kahr	\$12,000	2004
WRF (Gift)	Millipol Prism	W. Kaminsky	\$22,000 direct	2005
NSF (GOLI)	Stochastic Behavior in Polymer Optical Fiber Drawing	A. Emery A. Mescher, P. Nollert, Kaminsky	\$440,451 total (4%)	2007-2013
Emerald Biosystems	License of Millipol Technology	W. Kaminsky	\$100,000 direct (ca.)	2006 – 2010
RRF	Patent application and consultancy			
RRF	HAUP-Microscope	W. Kaminsky	\$26,000 direct	2007 – 2009
PRF	Beyond specific rotations	B. Kahr, W. Kaminsky	\$100,000 direct	2008 - 2009
Private (Gift)	Milliview for milli-second imaging	W Kaminsky	\$10,000 direct	2012
Kindex (Gift)	Beer's Bitter structural chirality	W Kaminsky	\$ 3,000 direct	2012-2013
NIH (Benaroya Res.Institute)	Birefringence Detection in Biological Samples	W Kaminsky	\$10,330 direct	2013

C.2 Proposal applications pending

Agency	title	PI and Co-PI's

C.3 Proposals Applied for

Agency	title	PI and Co-PI's
DOD	A Nanopatterned 3D Cell Sheet Engineering Approach to Enhance Tendon Repair	Deok-Ho et al.
NIH	Multiscale Biomimetic 3D Tendon Tissue Engineering	Deok-Ho, W. Kaminsky et al.
AFOSR	Simultaneous, Global & Real-Time Measurements of Shear Stress and Pressure on a Two-Dimensional Surface.	D.Dabiri, J. West, W. Kaminsky
NSF	Dynamic Effects on Molecular Ordering and Refractive Index in Polymer Optical Fibers	A. Emery, A. Mescher, W Kaminsky
RRF	Optical properties from X-ray structures	W Kaminsky
NSF-Instrumentation	Instrumentation for structural fingerprinting of nanocrystals and electron crystallography for the Pacific Northwest Region	Peter Moeck et al. Temporary Proposal 6929248
NIH	Circular Dichroism Imaging of Neuropathologies	B. Kahr, W. Kaminsky, Lee-Way Jin
Packard Foundation	Imaging chirality in complex diseased tissues	B. Kahr, W. Kaminsky, Lee-Way Jin
NASA	The SETH cigar (polarimeter for Mars-mission)	A. MacDermott, W. Kaminsky
RRF	Investigation into low-temperature structures	W. Kaminsky
CPAC	A fast microscope to measure birefringence and eigenray directions	W. Kaminsky
PRF	Imaging of optical rotatory properties	W. Kaminsky
NASA	SEXSOH: the Search for EXtra-Solar Homochirality	A.J.MacDermott, W. Kaminsky
CPAC	Search for applications for 'millipol', a fast quantitative polarimetric imaging technique	W. Kaminsky

TGIF	Commercialization of 'Millipol', a fast automated imaging technique for birefringence.	W. Kaminsky
NASA (Director's discretionary fund proposal)	Shear Sensitive Paint and Methods of Measurement	J. Bell, J. Callis, M. Gouterman, W. Kaminsky, G. Khalil, G. Phelan
NASA	SEXSOH: the Search for EXtra-Solar Homochirality	A.J. MacDermott, W. Kaminsky
NSF	Full-field real time shear stress sensor	James B Callis, Dana Dabiri, Werner Kaminsky, Gamal Khalil, James Riley
PRF	Dyeing Spherulites	Bart Kahr, W. Kaminsky
Philip Morris Award	Abbilden komplexer Stoffe	W. Kaminsky

5 Visitors

Dr. Eiken Haussuehl From Technische Universitaet Vienna, Austria

Dr. Morton Geday From Clarendon Laboratory, Oxford, England

Prof. Hans-Lothar Keller From Institute for Physics, Dortmund, Germany

Prof. Hans-Josef Weber From Institute for Physics, Dortmund, Germany

Dr. Ewa Cichy From Technische Universitaet Vienna, Austria

Greg Spyridis From Northwest University, Kirkland, Washington

6 Teaching

6.1 Teaching (Seattle)

CHEM 190 Early Fall 2011, 5-credits: "Diving Deep" - X-ray Crystallography and the inside of crystals

BSTR 519 WINTER 2002/2003; 2003/2004; 2004/2005; 2005/2006; 2006/2007, 2007/2008, 2008/2009, 1-credit, extension to BSTR 515: "Computer Laboratory Experience in the Chemistry X-ray Laboratory"

GEN ST 197 V # 9678 AUTUMN 2002, 1-credit, Freshman Seminar: " Diving Deep: X-ray structure determination"

GEN ST 391 Spring 2001, 3-credits, "Crystal structure determination"

GEN ST 391 Summer 2001, 3-credits, "Mathematical tools and crystallographic computing"

GEN ST 391 Fall 2001, 3-credits, "Physical properties of crystals"

Supervised Undergraduates

Thao Tan Tran, 2004

Ken Anderson, 2004-2005

Donald Responde, 2004-2005

Dan Daranciang, 2005 (REU)

Crystal Chang, 2005

Bao-Chau Ngoc Tran, 2005-2006

Tram-Anh Pham, 2005-2006

Andrea Joseph, 2006 (REU)

Joey B. Gallegos, 2007 (REU)

Steven Steininger, 2009 (REU)

Joel Zazueta 2010 (REU)

Max Kaganyuk 2011 (REU)

Viktoria Pakhnyuk 2012 (REU)

Michael Thompson (with Ann Mescher) 2012/13

Supervised High School Students

Kevin M. Kim, 2013, 2014

Doctoral supervisory committee / Supervisor

Lloyd Bastian

Kahr

Eileen Puklin-Faucher

Kahr

Kacey Claborn

Kahr

Fletcher Kimura

Danibi

John Freudentahl

Kahr

Elizabeth Thompson

Dabiri

Satabdi Roy

Dinda (NIT Rourkela, India)

Hyok Yoo

Pollak

Zheng Li

Pollak

Shalini C.

Kaveri (Bharatahiar Univ. Combatore, India)

6.2 Teaching (Cologne, Germany, before joining the Department)

TA in experimental physics (1983-1984), TA for geometrical crystallography, microscopy with polarized light, physical crystallography (1985-1995).

6.3 Teaching (Oxford, UK, before joining the Department)

Tutor of Jesus College in Mechanics (freshmen), Solid State Physics (4th Year Undergrad) (1996-1997).

6.4 Teaching (Cologne, after joining the Chemistry Department)

13.8.2001-24.8.2001 (Institut für Kristallographie der Universität Köln, Germany): 10 lectures on "Gyrooptische Eigenschaften in Kristallen".

1.7.2002-5.7.2002 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "Kristallographische Aspekte von Phasenumwandlungen".

15.12.2003 - 19.12.2003 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "3-D Darstellung und 'virtual reality' Programmierung kristallographischer Objekte".

15.11.2004 - 19.11.2004 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "3-D Darstellung und 'virtual reality' Programmierung kristallographischer Objekte".

29.8.2005-2.9.2005 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "Chirale optische Eigenschaften".

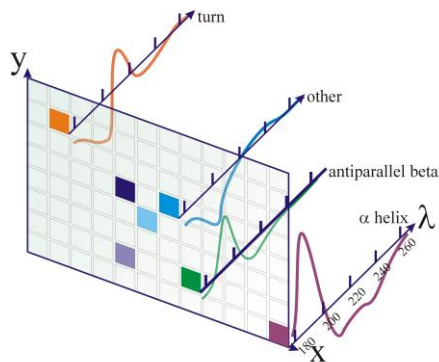
Winter 2006/7 (Institut für Kristallographie der Universität Köln, Germany): 5 * 2-hours - lectures on "3-D Darstellung und 'virtual reality' Programmierung kristallographischer Objekte" (remote lectures).

7 Invention Disclosures and Patents

7.1 U-pol (OTL Ref: 3091-3878DL) , US patent 7292389 (Werner Kaminsky, Bart Kahr).

‘U-pol’ stands for the development of a technology that measures images with circular extinction as contrast. Potential application of this prototype, which right now works in the visible spectral range, is mainly within biological research. However, if extended into the infrared, this method can be a valuable device for the drug industry to determine the absolute hand or polymorph of solid drugs (crystals or amorphous aggregates).

If extended down to a wavelength of 180nm, the contrast would enable the user to distinguish between different tissue components. Circular dichroism is the differential absorption (circular extinction) of left- and right-circularly polarized light traversing a sample and reveals the dissymmetry of a molecule’s chromophores. Despite its widespread use in structure determination circular dichroism spectroscopy is woefully under-utilized, especially in the analysis of organized media that exhibit linear anisotropies.



Distinguishing components of organic tissue from images where each pixel of a bitmap contains the spectral dependence allowing the separation into typical spectra characteristic for specific compositions.

This invention was developed under NSF Grant # CHE-0092617, "Optical Probes of Crystal Growth Mechanisms". And through support of the Center for Nanotechnology.

7.2 Millipol (Werner Kaminsky) (UW TechTransfer Ref. 7011D) US patent 7522278

Transparent solids and liquid crystals can be characterized by the anisotropy of the refractive index. Sample size as well as composition, internal and external pressure, electric fields, and wavelength impact the degree of anisotropy and the directions of eigenrays. A device was constructed that produces simultaneously microscopic images of birefringence, extinction angle (eigenrays), and absorption on a sub-second timescale. Such polarimetric features can be used to study fiber quality, tension in transparent solids, orientation of micro fibrils, thickness of birefringent objects, speed of crystal nucleation, texture of textiles, chemical processes in biological cells – alive or dead, and many more.

Commercial evaluation:

The software was licensed to Emerald Biosystems 2006-2010.

More information can be obtained from Laura Dorsey:

Laura Dorsey
Software Technology Manager
UW TechTransfer Digital Ventures
4311 Eleventh Ave NE, Ste. 500
Seattle, WA 98105-4608
VM: 206-616-3451 Fax: 206-616-3322
<http://depts.washington.edu/ventures/>

US patent 7522278 obtained: Real-time linear-birefringence-detection polarizing microscope
Febr. 2006. PI: W. Kaminsky

7.3 Rotopol (UW TechTr. Ref. 46502)

A technology is presented that extends the range of application of any existing optical microscope to measure quantitatively and simultaneously Birefringence, Extinction, and Transmission images. It consists of two parts:

- a) The camera-rotating polarizer unit
- b) a circular polarizer

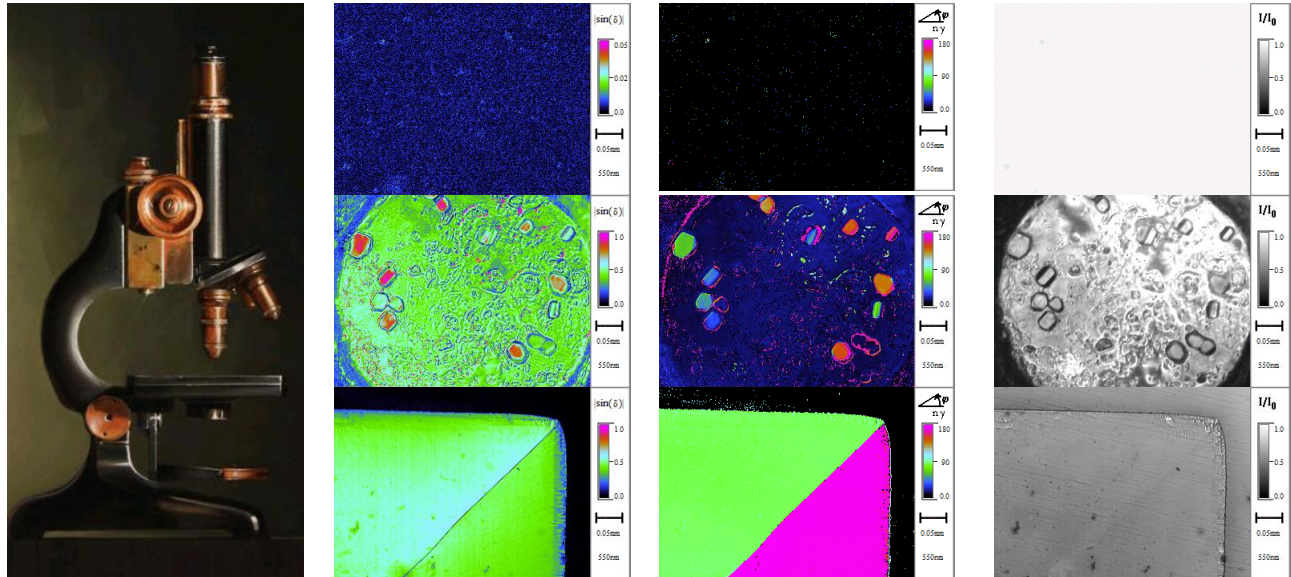
Description of unit a)

A rotating polarizer is placed in front of a camera with integrated optical components. The unit can be placed on any microscope replacing a standard ocular or on a C-mount that allows insertion of an ocular. The polarizer is computer controlled through the USB connection and the images of the digital camera are received also via a standard USB port on a Microsoft Windows operating computer.



Below is an examples of measurements performed with a 1915 vintage Bausch & Lomb optical microscope. The ROTOPOL device replaced the brass ocular piece on the top. A simple green-filter polarizer plus two quarter wave compensators (one with its slow axis aligned with the polarizer, the other at 45 degrees, which allows calibration to exact quarter wavelength retardation) was fastened underneath the sample table.

The first row of images shows next to the microscope the background which removes all dust and other imperfections on all following images. The second row shows a 'well' from a crystallization plate with crystals. The third row exhibits the birefringence of a thin birefringent crystal plate.



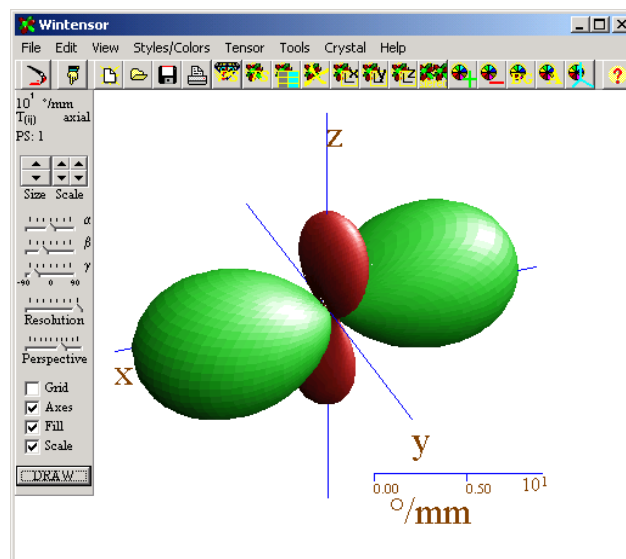
Old microscope used for ROTOPOL measurements with a crystal growth well as sample (see text).

7.4 Optical measurement of flow-strain (UW TechTr. Ref. 7027D)

In cooperation with the Research team around Jim Callis we worked out an application of millipol that led to another disclosure on how a liquid crystal film changes birefringence in proportion to the air-flow over its surface. Furthering the subject with Dana Dabiri and Gamal Khalil led to a provisional patent application **US 61/843/786**.

7.5 WinTensor (UW TechTr. 7045D)

Tensorial properties like the electro-optic effect as an example depend on the symmetry of the material they are connected with. The tensorial symmetry is at least that of the material. With the degree of complexity, the tensorial effects are difficult to visualize. A closed surface, drawn so that the distance of a point on the surface to the origin is scaled by the strength of the effect, can help to understand the processes leading to a technical device. A program was written and distributed through UW TechTransfer Digital Ventures that makes such representation surfaces. Below, the screen-dump of the program.



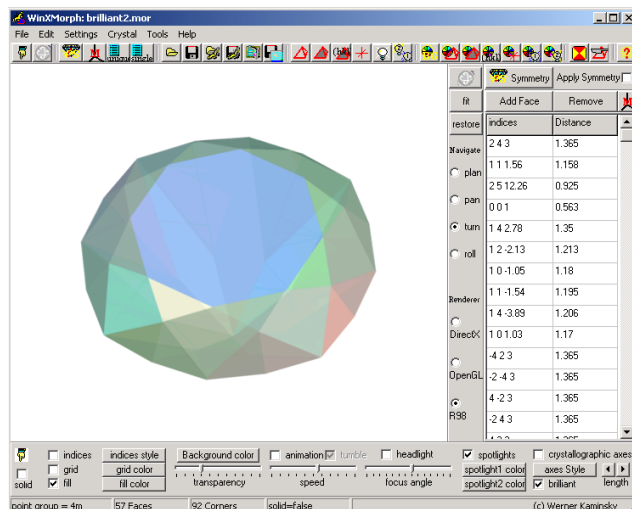
7.6 WinXMorph (UW TechTr. 7038D)

This Program was started during my vacation over the holidays in Cologne, Germany, winter 2003/2004. As such, it did not waste salary or other funding while working on this program and I

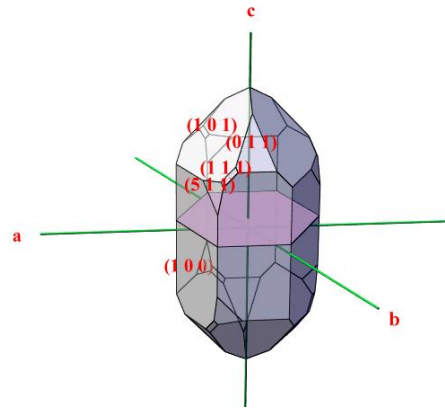
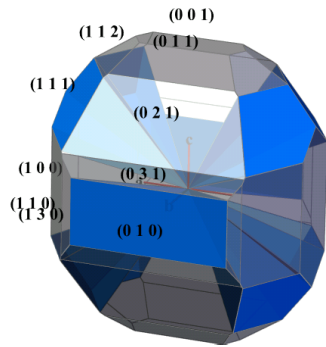
want to share my pleasure of writing and using WinXMorph with members of educational institutions and friends of crystal in generals.

My reason of writing a program to generate *.wrl files of crystal morphologies is simple: there are almost no such files on the internet (August.2004). This will most likely change soon, and the beauty of crystal shapes will, so I hope, attract many.

WinXMorph is licensed through UW TechTransfer Digital Ventures. Below the screendump.



Other than visualizing crystal morphologies it allows to investigate growth sectors and sample preparation in simulating cut-sections and morphology predictions.



7.7 Osmium-based oxygen sensor and pressure-sensitive paint

Larry Dalton, Greg Phelan, Brenden Carlson, Werner Kaminsky, Jason Benedict --

Provisional Patent Application Filed 2/16/2005

"Osmium-based oxygen sensor and pressure-sensitive paint"

This disclosure is related to work on several crystal structures done for Brenden Carlson and Greg Phelan.

7.8 REMSEM: Software for giving remote Seminars (UW TEchTr. 4109 Reg 0001)

Giving talks remotely with available software was unsatisfactory. A new program was designed to allow to give a presentation remotely with the presentation running on the side of the audience, giving remote access to the speaker, and having bilateral sound and video access.

The program can also be used as a remote PC application or as video converencing software.

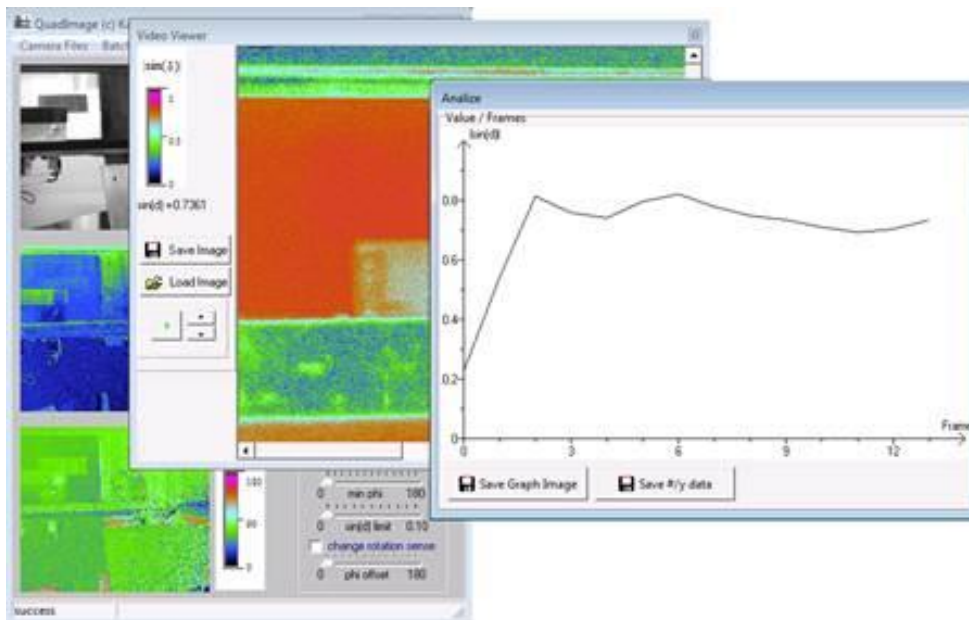
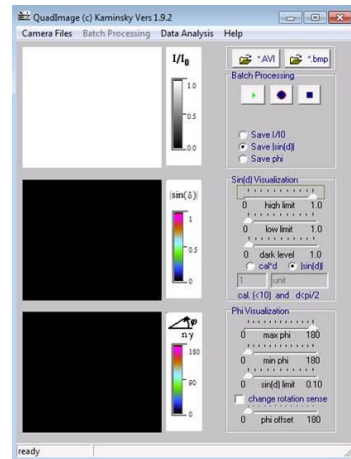
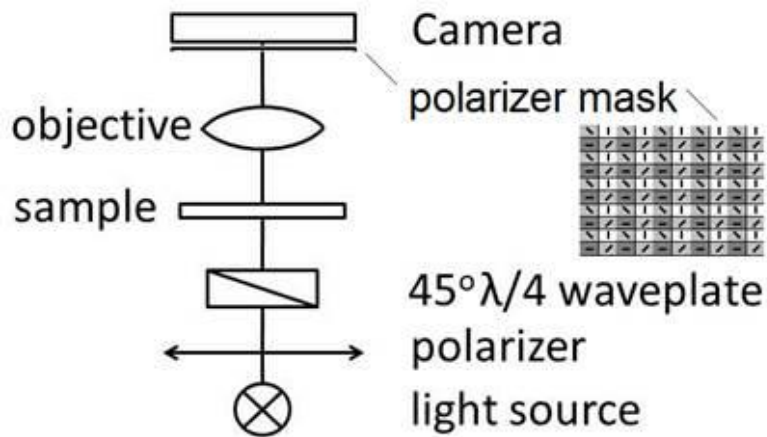
<http://cad4.cpac.washington.edu/REMSEMhome/REMSEM.htm>

7.9 Prism for Millipol (UW TEchTr. 7619D)

A problem with a commercial image multiplexer used in the millipol device is its price. An alternative device was developed replacing the image multiplexer and expensive camera at 5 % of the involved costs still creating a usable device.

7.10 Quadimage

Similar set-up as for Rotopol or Milliview, but with a static multipolarizer masked camera and no moving parts, intended for time resolved measurements at camera speed.



8 X-ray Website

An internet-database has been created which has been well accepted by the department. Original data is easily accessed and users of the lab are invited to compare their results with other research groups inside the department.

Data backup accessibly through http:

URL: <http://cad4.cpac.washington.edu/structures>

A structure can be studied interactively through the internet. The model can be turned and bond-distances as well as angles can be measured directly on this page. All data is accessed through this portal allowing paper free dissemination of structural reports.

When a structure is running, the laboratory, server screens, current samples, and the crystallographer's office can be seen through the internet. This helps to monitor a data collection and is instructional for students who are interested in crystallography.

UNIVERSITY OF WASHINGTON **Chemistry Department X-ray Laboratory**

Chemistry Library Building 125 - tel. (206) 543 0210 / (206) 543 7585

Res. Assoc. Prof. Werner Kaminsky

We try to do structures on a 60 hours basis (2 1/2 days), that is the time it takes from receiving a sample to returning a final, publishable report and all documentary information. We accept applications from outside campus and offer confidentiality or can arrange for a non-disclosure agreement.

X-ray LabCam public since 1.1.2005 APEXII Screen

Office refresh in 3 seconds CCD

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