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## Research interests

Nanophysics, Materials Physics, Biomaterials, Hard-Soft-Matter interfaces

## Employment

### Lecturer

Lecturer  
Physics  
University of York  
United Kingdom  
1 Oct 2007 → 30 Sept 2013

### Reader

Reader  
Physics  
University of York  
United Kingdom  
1 Oct 2013 → 30 Sept 2019

### Professor

Professor  
Physics  
University of York  
United Kingdom  
1 Oct 2019 → present

## Research outputs

### Insights into the response of coral biomineralisation to environmental change from aragonite precipitations in vitro

Castillo Alvarez, C., Penkman, K., Kröger, R., Finch, A. A., Clog, M., Brasier, A., Still, J. & Allison, N., 1 Jan 2024, In: *Geochimica et Cosmochimica Acta*. 364, p. 184-194 11 p.

### An experimental study of wet-cooking in organic vessels: implications for understanding the evolution of cooking technologies

Little, A. P., Needham, A., Langley, A., Lucquin, A. J. A. & Kröger, R., 30 Aug 2023, In: *Archaeological and Anthropological Sciences*. 15, 17 p., 142.

### Using Combination of X-Ray 3D Tomography and FEG-SEM to Perform 3D-FIB Reconstruction in Identified Area to Investigate Effect of Mining Contamination on Scallop Shell Growth

Guichaoua, L., Bessette, S., Stewart, B., Reznikov, N., Kröger, R. & Gauvin, R., 22 Jul 2023, In: *Microscopy and Microanalysis*. 29, Supplement\_1, p. 560-561 2 p.

### Optimising a method for aragonite precipitation in simulated biogenic calcification media

Kellock, C., Alvarez, M. C. C., Finch, A., Penkman, K., Kröger, R., Clog, M. & Allison, N., 2 Dec 2022, In: *PLoS ONE*. 17, 12, 18 p., e0278627.

### **Enhancing strength in mineralized collagen**

Nudelman, F. & Kröger, R., 7 Apr 2022, In: Science (New York, N.Y.). 376, 6589, p. 137-138 2 p.

### **Controls on Sr partitioning in aragonite under simulated biogenic conditions**

Castillo Alvarez, M. C., Penkman, K. E. H., Kröger, R., Finch, A., Clog, M., Hathorne, E. C. & Allison, N., 2022.

### **Hierarchical organization of bone in three dimensions: A twist of twists**

Buss, D. J., Kröger, R., McKee, M. D. & Reznikov, N., 2022, In: JOURNAL OF STRUCTURAL BIOLOGY. 6, 2022, 10 p., 100057.

### **Metal pollution as a potential threat to shell strength and survival in marine bivalves**

Stewart, B. D., Boig, C., Jenkins, S., Sinfield, C., Kennington, K., Lart, W., Brand, A. & Kröger, R., Feb 2021, In: Science of the Total Environment. 755, part 1, 10 p., 143019.

### **The role of aspartic acid in reducing coral calcification under ocean acidification conditions**

Kellock, C., Cole, C., Penkman, K., Evans, D., Kröger, R., Hintz, C., Hintz, K., Finch, A. & Allison, N., 1 Dec 2020, In: Scientific Reports. 10, 1, 12797.

### **Trace and major element incorporation into amorphous calcium carbonate (ACC) precipitated from seawater**

Evans, D., Gray, W. R., Rae, J. W. B., Greenop, R., Webb, P. B., Penkman, K., Kröger, R. & Allison, N., 1 Dec 2020, In: Geochimica et Cosmochimica Acta. 290, p. 293-311 19 p.

### **Metal pollution is leaving scallops helpless against crabs and lobsters**

Stewart, B. D. & Kröger, R., 5 Nov 2020, The Conversation.

### **Nanostructure of Mouse Otoconia**

Athanasiadou, D., Wenge, J., Reznikov, N., Rodriguez-Navarro, A. B., Kröger, R., Bilton, M. W., Gonzalez-Segura, A., Hu, Y. & McKee, M., 3 Mar 2020, (E-pub ahead of print) In: JOURNAL OF STRUCTURAL BIOLOGY. 210, 2, p. 1-11 11 p.

### **Shape-controlled synthesis and in situ characterisation of anisotropic Au nanomaterials using liquid cell transmission electron microscopy**

Wang, S-T., Lin, Y., Nielsen, M. H., Song, C. Y., Thomas, M. R., Spicer, C. D., Kröger, R., Ercius, P., Aloni, S. & Stevens, M. M., 30 Aug 2019, (E-pub ahead of print) In: Nanoscale. 9 p.

### **Time-Resolved in situ Raman Spectroscopic Observations of a Biomineralization Model System**

Wingender, B., Tong, E., Emery, J., Gower, L. & Kröger, R., 5 Aug 2019, In: Microscopy and Microanalysis. p. 826-827

### **The Characteristics and Biological Relevance of Inorganic Amorphous Calcium Carbonate (ACC) Precipitated from Seawater**

Evans, D., Webb, P. B., Penkman, K., Kröger, R. & Allison, N., 3 Jul 2019, In: CRYSTAL GROWTH DESIGN.

### **On Biomineralization: Enzymes Switch on Mesocrystal Assembly**

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### **Medieval women's early involvement in manuscript production suggested by lapis lazuli identification in dental calculus**

Radini, A., Tromp, M., Beach, A., Tong, E., Speller, C. F., McCormick, M., Dudgeon, J., Collins, M. J., Rühli, F., Kröger, R. & Warinner, C., 9 Jan 2019, In: Science Advances. 5, 1, 8 p., eaau7126.

### **Our bones: strength, flexibility and...fractals!**

Kröger, R. & Reznikov, N., Nov 2018, In: TheScienceBreaker.

**Misleading residues on lithics from Star Carr: identification with Raman microspectroscopy**

Croft, S. C. K., Chatzipanagis, K., Kröger, R. & Milner, N., Jun 2018, In: Journal of archaeological science. 19, p. 430-438 9 p.

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**Fractal-like hierarchical organization of bone begins at the nanoscale**

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**Understanding the response of biomineralisation to rising seawater pCO<sub>2</sub>**

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**Glycans modify mesenchymal stem cell differentiation to impact on the function of resulting osteoblasts**

Wilson, K. M., Jagger, A. M., Walker, M., Seinkmane, E., Fox, J. M., Kröger, R., Genever, P. & Ungar, D., 14 Feb 2018, In: Journal of Cell Science. 131, 4, 11 p., jcs209452.

**The application of micro-Raman for the analysis of ochre artefacts from Mesolithic palaeo-lake Flixton**

Croft, S., Kröger, R., Robson, H. K., Rowley, C. C. A., Taylor, B., Jones, A. G., Conneller, C. & Needham, A., 1 Feb 2018, In: Journal of Archaeological Science Reports. 17, p. 650-656 7 p.

**Liquid cell transmission electron microscopy and the impact of confinement on the precipitation from supersaturated solutions**

Kröger, R. & Verch, A., 15 Jan 2018, In: Minerals. 8, 1, 9 p., 21.

**Capacitance-Assisted Sustainable Electrochemical Carbon Dioxide Mineralisation**

Lamb, K. J., Dowsett, M. R., Chatzipanagis, K., Scullion, Z. W., Kröger, R., Lee, J. D., Aguiar, P. M., North, M. & Parkin, A., 10 Jan 2018, In: ChemSusChem. 11, 1, p. 137-148 12 p.

**Biomineralization of a titanium-modified hydroxyapatite semiconductor on conductive wool fibers**

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**Protein sequences bound to mineral surfaces persist into deep time**

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**In situ mechanical and molecular investigations of collagen/apatite biomimetic composites combining Raman spectroscopy and stress-strain analysis**

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**Survival of eggshell peptides over millions of years in Africa is due to mineral binding**

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**Crystallization of citrate-stabilized amorphous calcium phosphate to nanocrystalline apatite: a surface-mediated transformation**

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**Semiconductor-Metal Nano-Floret Hybrid Structures by Self-Processing Synthesis**

Hazut, O., Waichman, S., Subramani, T., Sarkar, D., Dash, S., Roncal-Herrero, T., Kröger, R. & Yerushalmi, R., 30 Mar 2016, In: *Journal of the American Chemical Society*. 138, 12, p. 4079–4086 8 p.

**A Unique Engraved Shale Pendant from the Site of Star Carr: the oldest Mesolithic art in Britain**

Milner, N., Bamforth, M., Beale, G., Carty, J., Chatzipanagis, K., Croft, S. C. K., Conneller, C., Elliott, B. J., Fitton, L. C., Knight, B., Kröger, R., Little, A. P., Needham, A., Robson, H. K., Rowley, C. C. A. & Taylor, B., 26 Feb 2016, University of York.

**Biominerization: Ion binding and nucleation**

Kröger, R., 24 Mar 2015, In: *Nature Materials*. 14, 4, p. 369-370 2 p.

**Control of gas phase nanoparticle shape and its effect on MRI relaxivity**

Aktaş, S., Thornton, S. C., Binns, C., Lari, L., Pratt, A., Kröger, R. & Horsfield, M. A., 17 Feb 2015, In: *Materials Research Express*. 2, 3, 7 p., 035002.

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Demarchi, B., Clements, E., Coltorti, M., Van De Locht, R., Kröger, R., Penkman, K. E. H. & Rose, J., 2015, In: *Quaternary Geochronology*. 25, p. 49-65 17 p.

**An oligomeric C-RING nacre protein influences pre-nucleation events and organizes mineral nanoparticles**

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**The intrinsically disordered C-RING biominerization protein, AP7, creates protein phases that introduce nanopatterning and nanoporosities to mineral crystals**

Chang, E., Russ, J., Verch, A., Kröger, R., Estroff, L. & Evans, J., 15 Jul 2014, In: *Biochemistry*. 53, 27, p. 4317-4319 3 p.

**Ultrastructure and crystallography of nanoscale calcite building blocks in *Rhabdosphaera clavigera* coccolith spines**

Van De Locht, R., Verch, A., Young, J. R., Haigh, S. J., Slater, T. J. A. & Kröger, R., Mar 2014, In: *CRYSTAL GROWTH DESIGN*. 14, 4, p. 1710–1718 8 p.

**Enhanced oxidation of nanoparticles through strain-mediated ionic transport**

Pratt, A., Lari, L., Hovorka, O., Shah, A., Woffinden, C., Tear, S., Binns, C. & Kröger, R., Jan 2014, In: *Nature Materials*. 13, 1, p. 26-30 5 p., n/a.

**Correlation between Anisotropy and Lattice Distortions in Single Crystal Calcite Nanowires Grown in Confinement**

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**Engineering of crystal surfaces and subsurfaces by framework biominerization protein phases**

Chang, E., Russ, J., Verch, A., Kröger, R., Estroff, L. & Evans, J., 2014, In: *CrystEngComm*. 16, 32, p. 7406-7409 4 p.

**Formation and Structure of Calcium Carbonate Thin Films and Nanofibers Precipitated in the Presence of Poly(Allylamine Hydrochloride) and Magnesium Ions**

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#### **Exchange bias in Fe@Cr core-shell nanoparticles**

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#### **Microstructural evolution and nanoscale crystallography in scleractinian coral spherulites**

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#### **Preparation of hydrosol suspensions of elemental and core-shell nanoparticles by co-deposition with water vapour from the gas-phase in ultra-high vacuum conditions**

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#### **Studying carbonate precipitation with and without confinement using electron microscopy**

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#### **Capillarity Creates Single-Crystal Calcite Nanowires from Amorphous Calcium Carbonate**

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#### **An artificial biomineral formed by incorporation of copolymer micelles in calcite crystals**

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#### **Mapping strain gradients in the FIB-structured InGaN/GaN multilayered films with 3D X-ray microbeam**

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#### **Texture and magnetic properties of exchange bias systems**

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**Polar and nonpolar HVPE GaN substrates: impact of doping on the structural, electrical and optical characteristics**

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**Defects and Interfaces in a-plane GaN on r-plane sapphire**

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**The role of anisotropy for defect properties in a-plane GaN**

Kröger, R. & Paskova, T., 21 Apr 2008, *Gallium Nitride Materials and Devices III*. Vol. 6894. 689403

**Structural investigation of growth and dissolution of In<sub>x</sub>Ga<sub>1-x</sub>N nano-islands grown by molecular beam epitaxy**

Pretorius, A., Yamaguchi, T., Kuebel, C., Kroeger, R., Hommel, D. & Rosenauer, A., 15 Feb 2008, In: *Journal of Crystal Growth*. 310, 4, p. 748-756 9 p.

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**Interaction of Stacking Faults in Wurtzite a-Plane GaN on r-Plane Sapphire**

Kroeger, R., Paskova, T. & Rosenauer, A., 2008, *Microscopy of Semiconducting Materials 2007*. Cullis, A. G. M. P. A. (ed.). Vol. 120. p. 49-52 4 p. (*Springer Proceedings in Physics*).

**The role of anisotropy for the defect properties in a-plane GaN - art. no. 689403**

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**Defect distribution in a-plane GaN on Al<sub>2</sub>O<sub>3</sub>**

Tuomisto, F., Paskova, T., Kroger, R., Figge, S., Hommel, D., Monemar, B. & Kersting, R., 19 Mar 2007, In: *Applied Physics Letters*. 90, 12, 3 p., 121915.

**Interfacial structure of a-plane GaN grown on r-plane sapphire**

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**Defect structure of a-plane GaN grown by hydride and metal-organic vapor phase epitaxy on r-plane sapphire**

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**Nonpolar a- and m-plane bulk GaN sliced from boules: structural and optical characteristics**

Paskova, T., Kroeger, R., Hornmell, A., Paskov, P. P., Monemar, B., Preble, E., Hauser, A., Williams, N. M. & Tutor, M., 2007, *Physica Status Solidi C - Current Topics in Solid State Physics, Vol 4 No 7 2007*. Vol. 4. p. 2536-2539 4 p.

**On the mechanism of dislocation and stacking fault formation in a-plane GaN films grown by hydride vapor phase epitaxy**

Kroeger, R., Paskova, T., Rosenauer, A., Hommel, D., Monemar, B., Fini, P., Haskell, B., Speck, J. & Nakamura, S., 2007, *Physics of Semiconductors, Pts A and B*. Jantsch, W. S. F. (ed.). Unknown Publisher, Vol. 893. p. 341-342 2 p. (Aip Conference Proceedings).

**Spatially resolved characterization of plastic deformation induced by focused-ion beam processing in structured InGaN/GaN layers**

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Agrawal, S., Raghuvver, M. S., Kroeger, R. & Ramanath, G., Nov 2006, In: Journal of Applied Physics. 100, 9, 094314.

**Synthesis and Assembly of Monodisperse High-Coercivity Silica-Capped FePt Nanomagnets of Tunable Size, Composition, and Thermal Stability from Microemulsions**

Yan, Q., Purkayastha, A., Kim, T., Kroeger, R., Bose, A. & Ramanath, G., Oct 2006, In: Advanced Materials. 18, 19, p. 2569-2573 5 p.

**High-quality bulk a-plane GaN sliced from boules in comparison to heteroepitaxially grown thick films on r-plane sapphire**

Paskova, T., Kroeger, R., Figge, S., Hommel, D., Darakchieva, V., Monemar, B., Preble, E. A., Hanser, A. D., Williams, N. M. & Tutor, M., 31 Jul 2006, In: Applied Physics Letters. 89, 5, 4 p., 051914.

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**Confined optical modes in monolithic II-VI pillar microcavities**

Lohmeyer, H., Sebald, K., Kruse, C., Kroeger, R., Gutowski, J., Hommel, D., Wiersig, J., Baer, N. & Jahnke, F., 30 Jan 2006, In: Applied Physics Letters. 88, 5, 4 p., 051101.

**Anisotropic spatial correlation of CdSe/Zn(S)Se quantum dot stacks grown by MBE**

Roventa, E., Alexe, G., Schowalter, M., Kroeger, R., Hommel, D. & Rosenauer, A., 2006, *Physica Status Solidi C - Current Topics in Solid State Physics, Vol 3, No 4*. Stutzmann, M. (ed.). Vol. 3. p. 887-890 4 p. (Physica Status Solidi C-Current Topics in Solid State Physics).

**Anti-diffusion barriers for gold-based metallizations to p-GaN**

Piotrowska, A., Kaminska, E., Guziewicz, M., Dynowska, E., Stonert, A., Turos, A., Figge, S., Kroeger, R. & Hommel, D., 2006, *GaN, AlN, InN and Related Materials*. Kuball, M. M. T. H. R. J. M. M. T. (ed.). Vol. 892. p. 351-356 6 p. (Materials

Research Society Symposium Proceedings).

**Crack free monolithic nitride vertical-cavity surface-emitting laser structures and pillar microcavities**

Lohmeyer, H., Sebald, K., Kruse, C., Kroeger, R., Gutowski, J., Hommel, D., Wiersig, J. & Jahnke, F., 2006, In: *Physica status solidi a-Applications and materials science*. 203, 7, p. 1749-1753 5 p.

**Microscopic emission properties of nonpolar a-plane GaN grown by HVPE - art. no. 612106**

Paskova, T., Kroeger, R., Paskov, P. P., Figge, S., Hommel, D., Monemar, B., Haskell, B., Fini, P., Speck, J. S., Nakamura, S., Litton, C. W., Grote, J. G., Morkoc, H. & Madhukar, A., 2006, *Gallium Nitride Materials and Devices*. Vol. 6121 . p. 12106 1 p.

**Relaxation in crack-free AlN/CrN superlattices**

Kroger, R., Kruse, C., Roder, C., Hommel, D. & Rosenauer, A., 2006, In: *Physica status solidi (b) Basic research*. 243, 7, p. 1533-1536 4 p.

**Structural analysis of pyramidal defects in Mg-doped GaN**

Pretorius, A., Schowalter, A., Daneu, N., Kroeger, R., Rechnik, A. & Rosenauer, A., 2006, *Physica Status Solidi C - Current Topics in Solid State Physics, Vol 3, No 6*. Hildebrandt, S. S. M. (ed.). Vol. 3. p. 1803-1806 4 p. (*Physica Status Solidi C-Current Topics in Solid State Physics*).

**Surface segregation of Si and Mg dopants in MOVPE grown GaN films revealed by X-ray photoemission spectro-microscopy**

Schmidt, T., Siebert, M., Flege, J. I., Gangopadhyay, S., Pretorius, A., Kroger, R., Figge, S., Gregoratti, L., Barinov, A., Hommel, D. & Falta, J., 2006, *Physica Status Solidi C - Current Topics in Solid State Physics, Vol 3, No 6*. Hildebrandt, S. S. M. (ed.). Vol. 3. p. 1725-1728 4 p. (*Physica Status Solidi C-Current Topics in Solid State Physics*).

**TEM analyses of wurtzite InGaN islands grown by MOVPE and MBE**

Pretorius, A., Yamaguchi, T., Kuebel, C., Kroeger, R., Hommel, D. & Rosenauer, A., 2006, *Physica Status Solidi C - Current Topics in Solid State Physics, Vol 3, No 6*. Hildebrandt, S. S. M. (ed.). Vol. 3. p. 1679-1682 4 p. (*Physica Status Solidi C-Current Topics in Solid State Physics*).

**The versatility of hot-filament activated chemical vapor deposition**

Schaefer, L., Hofer, M. & Kroeger, R., 2006, In: *THIN SOLID FILMS*. 515, 3, p. 1017-1024 8 p.

**On the microstructure of Al<sub>x</sub>Ga<sub>1-x</sub>N layers grown on 6H-SiC(0001) substrates**

Kröger, R., Einfeldt, S., Chierchia, R., Reitmeier, Z. J., Davis, R. F., Liu, Q. K. K. & Hommel, D., 31 Mar 2005, In: *Journal of Applied Physics*. 97, 8, p. Art. No. 083501

**Surfactant-mediated epitaxy of Ge on Si(111): Beyond the surface**

Schmidt, T., Kroger, R., Clausen, T., Falta, J., Janzen, A., Kammler, M., Kury, P., Zahl, P. & Horn-von Hoegen, M., 14 Mar 2005, In: *Applied Physics Letters*. 86, 11, 4 p., 111910.

**CdSe and InGaN quantum dots for short wavelength light emitters**

Hommel, D., Gust, A., Passow, T., Klude, A., Yamaguchi, T., Roventa, E., Pretorius, A., Kroeger, R., Sebald, K., Gutowski, J. & [No Value], I., 2005, Unknown Publisher. (Idw/Ad '05: Proceedings of the 12th International Display Workshops in Conjunction with Asia Display 2005, Vols 1 and 2)

**Characterization and structuring of nitride-based heterostructures for vertical-cavity surface-emitting lasers**

Kroeger, R., Kruse, C., Dennemarck, J., Hommel, D. & Rosenauer, A., 2005, *Microscopy of Semiconducting Materials*. Cullis, A. G. H. J. L. (ed.). Vol. 107. p. 79-82 4 p. (*Springer Proceedings in Physics*).

**Investigation of In<sub>x</sub>Ga<sub>1-x</sub>N islands with electron microscopy**

Pretorius, A., Yamaguchi, T., Schowalter, M., Kroeger, R., Kuebel, C., Hommel, D. & Rosenauer, A., 2005, *Microscopy of Semiconducting Materials*. Cullis, A. G. H. J. L. (ed.). Vol. 107. p. 17-20 4 p. (*Springer Proceedings in Physics*).

**Microstructure of highly p-type doped GaN sub-contact layers for low-resistivity contacts**

Kroger, R., Dennemarck, J., Bottcher, T., Figge, S. & Hommel, D., 2005, *GaN, AlN, InN and Their Alloys*. Wetzel, C. G. B. K. M. M. M. (ed.). Cambridge University Press, Vol. 831. p. 411-415 5 p. (Materials Research Society Symposium Proceedings).

**Optoelectronic devices on bulk GaN**

Figge, S., Bottcher, T., Dennemarck, J., Kroger, R., Paskova, T., Monemar, B. & Hommel, D., 2005, In: *Journal of Crystal Growth*. 281, 1, p. 101-106 6 p.

**Resonant modes in monolithic nitride pillar microcavities**

Lohmeyer, H., Sebald, K., Gutowski, J., Kroger, R., Kruse, C., Hommel, D., Wiersig, J. & Jahnke, F., 2005, In: *European physical journal b*. 48, 3, p. 291-294 4 p.

**Room-temperature operation of a green monolithic II-VI vertical-cavity surface-emitting laser**

Kruse, C., Sebald, K., Lohmeyer, H., Brendemuhl, B., Kroger, R., Gutowski, J. & Hommel, D., 2005, *Physics of Semiconductors, Pts A and B*. Menendez, J. V. C. G. (ed.). Vol. 772. p. 1521-1522 2 p. (Aip Conference Proceedings).

**Structural investigations of spatial correlation of CdSe/ZnSe quantum dot stacks grown by molecular beam epitaxy**

Roventa, E., Alexe, G., Kroger, R., Hommel, D. & Rosenauer, A., 2005, In: *Journal of Crystal Growth*. 278, 1-4, p. 316-319 4 p.

**ZnSe-based laser diodes: New approaches**

Gust, A., Kruse, C., Klude, M., Roventa, E., Kroger, R., Sebald, K., Lohmeyer, H., Brendemuhl, B., Gutowski, J. & Hommel, D., 2005, *E-MRS 2004 Fall Meeting Symposia C and F*. Stutzmann, M. (ed.). Vol. 2. p. 1098-1105 8 p. (Physica Status Solidi C-Current Topics in Solid State Physics).

**Defect characterization of electrically degraded ZnSe based laser diodes**

Kroger, R., Roventa, E., Gust, A., Ueta, A., Klude, M., Hummel, D. & Ryder, P., 2004, In: *Physica status solidi a-Applied research*. 201, 4, p. R28-R30

**Determination of the anisotropic optical properties for perfluorinated vanadyl phthalocyanine thin films**

Gordan, O. D., Friedrich, M., Michaelis, W., Kroger, R., Kampen, T., Schlettwein, D. & Zahn, D. R. T., 2004, In: *Journal of Materials Research*. 19, 7, p. 2008-2013 6 p.

**Green monolithic II-VI vertical-cavity surface-emitting laser operating at room temperature**

Kruse, C., Ulrich, S. M., Alexe, G., Roventa, E., Kroger, R., Brendemuhl, B., Michler, P., Gutowski, J. & Hommel, D., 2004, In: *Physica status solidi (b)*. 241, 3, p. 731-738 8 p.

**Microstructural study of quantum well degradation in ZnSe-based laser diodes**

Roventa, E., Kroger, R., Klude, M., Ueta, A., Alexe, G., Ryder, P. & Hommel, D., 2004, Wiley-Blackwell. (11th International Conference on II-VI Compounds)

**The role of sub-contact layers in the optimization of low-resistivity contacts to p-type GaN**

Dennemarck, J., Bottcher, T., Figge, S., Einfeldt, S., Kroger, R., Hommel, D., Kaminska, E., Wiatroszak, W. & Piotrowska, A., 2004, Wiley-Blackwell. (5th International Symposium on Blue Laser and Light Emitting Diodes, Proceedings)

**Compositional fluctuations in Al<sub>x</sub>Ga<sub>1-x</sub>N layers grown on 6H-SiC (0001) by metal organic vapor phase epitaxy**

Kroger, R., Einfeldt, S., Reitmeier, Z. J., Chierchia, R., Ryder, P., Hommel, D. & Davis, R. F., 2003, *GaN and Related Alloys-2002*. Wetzel, C. Y. E. T. S. J. S. A. Y. (ed.). Vol. 743. p. 255-260 6 p. (Materials Research Society Symposium Proceedings).

**TEM investigation of defect reduction and etch pit formation in GaN**

Vennemann, A., Dennemarck, J., Kroger, R., Bottcher, T., Hommel, D. & Ryder, P., 2003, *GaN and Related Alloys - 2003*. Ng, H. M. W. M. H. K. G. N. (ed.). Vol. 798. p. 759-764 6 p. (Materials Research Society Symposium Proceedings).

### **The role of the growth temperature for the SiN interlayer deposition in GaN**

Bottcher, T., Dennemarck, J., Kroger, R., Figge, S. & Hommel, D., 2003, *5th International Conference on Nitride Semiconductors*. Stutzmann, M. (ed.). p. 2039-2042 4 p. (Physica Status Solidi C-Current Topics in Solid State Physics).

### **Plasma induced microstructural, compositional, and resistivity changes in ultrathin chemical vapor deposited titanium nitride films**

Kröger, R., Eizenberg, M., Marcadal, C. & Chen, L., Apr 2002, In: *Journal of Applied Physics*. 91, 8, p. 5149-5154 5 p.

### **Investigation of green emitting monolithic II-VI vertical cavity surface emitting laser**

Kruse, C., Alexe, G., Kroger, R., Klude, M., Heinke, H., Hommel, D., Ulrich, S., Michler, P. & Gutowski, J., 2002, *Materials and Devices for Optoelectronics and Microphotonics*. Wehrspohn, R. B. M. R. N. S. S. C. (ed.). Vol. 722. p. 141-146 6 p. (Materials Research Society Symposium Proceedings).

### **Magnesium segregation and the formation of pyramidal defects in p-GaN**

Figge, S., Kroger, R., Bottcher, T., Ryder, P. L. & Hommel, D., 2002, In: *Applied Physics Letters*. 81, 25, p. 4748-4750 3 p.

### **Mg related defect formation during MOVPE growth of GaN based films studied by transmission electron microscopy**

Kroger, R., Figge, S., Bottcher, T., Ryder, P. L. & Hommel, D., 2002, *Gan and Related Alloys-2001*. Northrup, J. E. N. J. L. D. C. C. S. F. R. H. (ed.). Vol. 693. p. 615-619 5 p. (Materials Research Society Symposium Proceedings).

### **On the way to the II-VI quantum dot VCSEL**

Passow, T., Klude, M., Kruse, C., Leonardi, K., Kroger, R., Alexe, G., Sebald, K., Ulrich, S., Michler, P., Gutowski, J., Heinke, H. & Hommel, D., 2002, *Advances in Solid State Physics 42*. Kramer, B. (ed.). Vol. 42. p. 13-25 13 p. (Advances in Solid State Physics).

### **Optical gain of CdSe quantum dot stacks**

Sebald, K., Michler, P., Gutowski, J., Kroger, R., Passow, T., Klude, M. & Hommel, D., 2002, In: *Physica status solidi a-Applied research*. 190, 2, p. 593-597 5 p.

### **Pyramidal defect formation in view of magnesium segregation**

Figge, S., Kroger, R., Bottcher, T., Ryder, P. & Hommel, D., 2002, In: *Physica status solidi a-Applied research*. 192, 2, p. 456-460 5 p.

### **Realization of a GaN laser diode with wet etched facets**

Bottcher, T., Zellweger, C., Figge, S., Kroger, R., Petter, C., Buhlmann, H. J., Ilegems, M., Ryder, P. L. & Hommel, D., 2002, In: *Physica status solidi a-Applied research*. 191, 1, p. R3-R5

### **Electrically pumped lasing from CdSe quantum dots**

Klude, M., Passow, T., Kroger, R. & Hommel, D., 2001, In: *Electronics Letters*. 37, 18, p. 1119-1120 2 p.

### **Influence of diffusion barriers on the nucleation and growth of CVD Cu for interconnect applications**

Kroger, R., Eizenberg, M., Cong, D., Yoshida, N., Chen, L. Y., Ramaswami, S. & Carl, D., 2000, In: *Microelectronic Engineering*. 50, 1-4, p. 375-381 7 p.

### **The role of kinetics in the nucleation and void formation in copper films produced by chemical vapor deposition**

Kroger, R., Eizenberg, M., Rabkin, E., Cong, D. & Chen, L., 2000, In: *Journal of Applied Physics*. 88, 4, p. 1867-1872 6 p.

### **Nucleation and growth of CVD Cu films**

Kroger, R., Eizenberg, M., Cong, D., Yoshida, N., Chen, L. Y. & Chen, L., 1999, *Advanced Interconnects and Contacts*. Edelstein, D. C. K. T. O. M. C. T. K. N. W. E. J. (ed.). Vol. 564. p. 237-241 5 p. (Materials Research Society Symposium Proceedings).

**Properties of copper films prepared by chemical vapor deposition for advanced metallization of microelectronic devices**  
Kroger, R., Eizenberg, M., Cong, D., Yoshida, N., Chen, L. Y., Ramaswami, S. & Carl, D., 1999, In: Journal of the Electrochemical Society. 146, 9, p. 3248-3254 7 p.

**Enhanced diamond film growth by hot-filament CVD using forced convection**

Kroger, R., Schafer, L., Klages, C. P. & Six, R., 1996, In: Physica status solidi a-Applied research. 154, 1, p. 33-42 10 p.

**MASS AND OPTICAL-EMISSION SPECTROSCOPY OF PLASMAS FOR DIAMOND-SYNTHESIS**

Benndorf, C., Joeris, P. & Kroger, R., 1994, In: PURE AND APPLIED CHEMISTRY. 66, 6, p. 1195-1205 11 p.

**INVESTIGATIONS CONCERNING THE ROLE OF HYDROGEN IN THE DEPOSITION OF DIAMOND FILMS**

Joeris, P., Benndorf, C. & Kroger, R., 1993, In: Surface & coatings technology. 59, 1-3, p. 310-315 6 p.

## Activities

**Studying collagen mineralization dynamics using in-situ Raman spectroscopy together with in-situ small and wide-angle X-ray scattering**

Roland Kroeger (Speaker)  
23 Oct 2023 → 25 Oct 2023

**33rd Annual Conference of the European Society for Biomaterials**

Roland Kroger (Keynote/plenary speaker)  
4 Sept 2023

**McGill Summer School 2023 - Electron Microscopy Techniques**

Roland Kroger (Invited speaker)  
5 Jun 2023 → 7 Jun 2023

**Application of microscopy and spectroscopy for the interrogation of biominerals**

Roland Kroger (Invited speaker)  
21 Mar 2023

**Ultrastructure and Composition of the Abdominal Wall**

Roland Kröger (Keynote/plenary speaker)  
1 Feb 2023 → 3 Feb 2023

**Investigating the structure and formation dynamics of biomineralising systems**

Roland Kröger (Invited speaker)  
15 Dec 2022

**Revealing the 3D structure and formation dynamics of biominerals using electrons, X-rays and photons**

Roland Kröger (Invited speaker)  
22 Jul 2022

**University of Connecticut School of Medicine**

Roland Kröger (Advisor)  
27 Jun 2022 → 31 Jul 2027

**Transmission Electron Microscopy using Liquid Cells**

Roland Kröger (Invited speaker)  
21 Jun 2022

**Advanced electron microscopy and X-ray scattering techniques to study bone mineralisation**

Roland Kröger (Invited speaker)

1 May 2022

**McGill University**

Roland Kröger (Advisor)  
25 Apr 2022 → 27 Jul 2022

**3D imaging and in situ studies of hierarchical biominerals**

Roland Kroger (Keynote/plenary speaker)  
26 Aug 2021

**3D Analysis of the Bone Nanostructure**

Roland Kroger (Invited speaker)  
2021 → ...

**Science Foundation of Ireland (SFI)**

Roland Kroger (Reviewer)  
2021

**The Small Scale Matters: Using Electron Microscopy to Interrogate Biogenic Materials**

Roland Kroger (Invited speaker)  
6 Nov 2020

**Nature (Journal)**

Roland Kroger (Reviewer)  
20 Jun 2020

**ACS Nano (Journal)**

Roland Kroger (Reviewer)  
Jun 2020

**ADVANCED FUNCTIONAL MATERIALS (Journal)**

Roland Kroger (Reviewer)  
2020 → ...

**Royal Microscopical Society (External organisation)**

Roland Kroger (Advisor)  
2020 → ...

**Sloan Foundation**

Roland Kroger (Advisor)  
2020

**Understanding and Mimicking Biomineralisation**

Roland Kroger (Invited speaker)  
2020

**International Conferences on the Chemistry and Biology of Mineralized Tissues**

Roland Kroger (Member of programme committee)  
20 Oct 2019 → ...

**Microscience Microscopy 2019**

Roland Kröger (Organiser)  
1 Jul 2019 → 4 Jul 2019

**The 53rd Annual Meeting of the Israel Society for Microscopy**

Roland Kroger (Invited speaker)  
29 May 2019

**Acta Biomaterialia (Journal)**

Roland Kroger (Reviewer)  
2019 → ...

**Nature (Journal)**

Roland Kroger (Reviewer)  
2019

**Proceedings of the National Academy of Sciences of the United States of America (Journal)**

Roland Kroger (Guest editor)  
2019 → ...

**On fractures, fractions and fractals: Insights into bone and collagen/apatite composites**

Roland Kroger (Invited speaker)  
14 Nov 2018

**BPSI Summer Symposium 2018: Business as Usual? – Collaborative Research at the University-Business Interface**

Roland Kroger (Organiser)  
28 Jun 2018

**Microscopy characterisation of organic-inorganic Interfaces**

Roland Kröger (Invited speaker)  
22 Feb 2018

**Angewandte Chemie International Edition (Journal)**

Roland Kroger (Reviewer)  
2018

**CRYSTAL GROWTH DESIGN (Journal)**

Roland Kroger (Reviewer)  
2018 → ...

**CrystEngComm (Journal)**

Roland Kroger (Reviewer)  
2018 → ...

**Crystals (Journal)**

Roland Kröger (Reviewer)  
2018

**In situ microscopy workshop at CIC/Nanogune San Sebastian**

Roland Kroger (Invited speaker)  
2018 → ...

**Journal of the Royal Society Interface (Journal)**

Roland Kroger (Reviewer)  
2018 → ...

**Nano Letters (Journal)**

Roland Kroger (Reviewer)  
2018 → ...

**Nature Communications (Journal)**

Roland Kroger (Reviewer)  
2018

**Nature Materials (Journal)**

Roland Kroger (Reviewer)  
2018 → ...

**PLoS ONE (Journal)**

Roland Kröger (Reviewer)  
2018

**Proceedings of the National Academy of Sciences of the United States of America (Journal)**

Roland Kroger (Reviewer)  
2018 → ...

**Royal Microscopical Society (External organisation)**

Roland Kroger (Trustee)  
2018 → ...

**Scientific Reports (Journal)**

Roland Kroger (Reviewer)  
2018

**Microscopy and Microspectroscopy of Nanomaterials in Liquids**

Roland Kroger (Organiser)  
18 Sept 2017

**Specialized iNANO Lecture: Quantitative Investigation of Nanomaterials using Advanced Transmission Electron Microscopy**

Roland Kroger (Invited speaker)  
9 Aug 2017

**Laurie Gower**

Roland Kroger (Host)  
15 Jun 2017 → 15 Jul 2017

**International Conference on the Chemistry and Biology of Mineralized Tissue**

Roland Kroger (Invited speaker)  
29 May 2017 → 1 Jun 2017

**12th Pacific Rim Conference on Ceramic and Glass Technology - Hawaii, US**

Roland Kroger (Invited speaker)  
21 May 2017 → 26 May 2017

**Studying oxidation pathways and structure of Fe-based NPs with high-resolution TEM**

Roland Kroger (Invited speaker)  
19 Jan 2017

**Acta Biomaterialia (Journal)**

Roland Kröger (Reviewer)

2017

**Chemistry of Materials (Journal)**

Roland Kröger (Reviewer)

2017

**CrystEngComm (Journal)**

Roland Kröger (Reviewer)

2017 → ...

**Journal of biomechanics (Journal)**

Roland Kroger (Reviewer)

2017

**MMC17 -EMAG17 Manchester**

Roland Kröger (Participant)

2017

**McGill University: Anatomy and Cell Biology Departmental Seminar**

Roland Kröger (Invited speaker)

2017

**Nature Communications (Journal)**

Roland Kroger (Reviewer)

2017

**Proceedings of the National Academy of Sciences of the United States of America (Journal)**

Roland Kroger (Reviewer)

2017

**Nanomaterials in Action**

Roland Kroger (Invited speaker)

6 Oct 2016

**In situ studies of biological and bio-inspired materials using electron microscopy in liquids - Presentation at the University of Münster/Germany**

Roland Kroger (Invited speaker)

5 Sept 2016

**Material Research Society Spring Meeting in Phoenix/Arizona**

Roland Kroger (Invited speaker)

28 Mar 2016 → 1 Apr 2016

**Israel Society of Microscopy Golden Jubilee Conference**

Roland Kroger (Invited speaker)

2016 → ...

**PhD Examination**

Roland Kroger (Examiner (external))

2016

**Scientific Reports (Journal)**

Roland Kroger (Reviewer)

2016 → ...

**The International Chemical Congress of the Pacific Basin Societies**

Roland Kroger (Invited speaker)

15 Dec 2015 → 20 Dec 2015

**The International Chemical Congress of the Pacific Basin Societies**

Roland Kroger (Invited speaker)

15 Dec 2015 → 20 Dec 2015

**ACCGE 20 (American Conference on Crystal Growth and Epitaxy) in Big Sky/Montana**

Roland Kroger (Chair)

3 Aug 2015 → 7 Aug 2015

**American Conference on Crystal Growth and Epitaxy (ACCGE-20)**

Roland Kroger (Invited speaker)

3 Aug 2015 → 7 Aug 2015

**International Workshop of the ARISTEIA Project COMANA Complex Magnetic Nanostructures**

Roland Kroger (Invited speaker)

2 Jun 2015 → 5 Jun 2015

**Analytical Chemistry (Journal)**

Roland Kroger (Reviewer)

Mar 2015 → ...

**ADVANCED FUNCTIONAL MATERIALS (Journal)**

Roland Kroger (Reviewer)

1 Jan 2015 → ...

**Royal Microscopy Society (External organisation)**

Roland Kroger (Member)

1 Jan 2015 → ...

**ACS Nano (Journal)**

Roland Kroger (Reviewer)

2015 → ...

**Advanced Materials (Journal)**

Roland Kroger (Reviewer)

2015

**ROYAL MICROSCOPICAL SOCIETY (External organisation)**

Roland Kroger (Member)

2015 → ...

**Nanomaterials Research using Electron Microscopy - University of Florida**

Roland Kroger (Invited speaker)

9 Dec 2014

**Materials Research Society Fall Meeting 2014**

Roland Kroger (Organiser)

1 Dec 2014 → 5 Dec 2014

**Microscience Microscopy Congress 2014**

Roland Kroger (Organiser)

1 Jul 2014 → 3 Jul 2014

**New approaches for the nanoscale study of processes in liquids by electron microscopy - MMC2014**

Roland Kroger (Invited speaker)

1 Jul 2014 → 3 Jul 2014

**E-MRS Spring Meeting 2014**

Roland Kroger (Invited speaker)

26 May 2014 → 30 May 2014

**Langmuir (Journal)**

Roland Kroger (Reviewer)

2014 → ...

**Nature Communications (Journal)**

Roland Kroger (Reviewer)

2014 → ...

**Electron Microscopy and Analysis Group (EMAG) Conference**

Roland Kroger (Invited speaker)

3 Sept 2013 → 6 Sept 2013

**Electron Microscopy and Analysis Group (EMAG) Conference**

Roland Kroger (Invited speaker)

3 Sept 2013 → 6 Sept 2013

**Weizmann Institute of Science, Department of Structural Biology**

Roland Kroger (Researcher)

5 Aug 2013 → 25 Aug 2013

**Leeds EPSRC Nanoscience and Nanotechnology Facility (LENNF) re-launch event**

Roland Kroger (Invited speaker)

25 Jun 2013

**Studying mineral/organic composites with electron microscopy - Materials Science at the Physics/Biology interface**

Roland Kroger (Invited speaker)

25 Jun 2013

**Earth & Environmental Sciences Seminar - University of St. Andrews**

Roland Kroger (Invited speaker)

23 Apr 2013

**JOURNAL OF STRUCTURAL BIOLOGY (Journal)**

Roland Kroger (Reviewer)

2013 → ...

**Journal of Crystal Growth (Journal)**

Roland Kroger (Reviewer)

2013

**Journal of Nanoparticle Research (Journal)**

Roland Kroger (Reviewer)

2013 → ...

**Nanotechnology (Journal)**

Roland Kroger (Reviewer)  
2013

**London Centre for Nanotechnology Seminar - Imperial College**

Roland Kroger (Invited speaker)  
6 Dec 2012

**The 15th European Microscopy Congress**

Roland Kroger (Organiser)  
16 Sept 2012 → 21 Sept 2012

**Microscopy and Microanalysis**

Roland Kroger (Invited speaker)  
29 Jul 2012 → 2 Aug 2012

**Studying carbonate precipitation in-situ using electron microscopy**

Roland Kroger (Invited speaker)  
29 Jul 2012 → 2 Aug 2012

**CECAM Workshop: Structure-Property Relationships in Hierarchical Biocomposites in Lausanne/Switzerland**

Roland Kroger (Organiser)  
16 Jul 2012 → 18 Jul 2012

**CECAM workshop: Grand Challenges in Understanding Interfaces Between Hard and Soft Matter**

Roland Kroger (Invited speaker)  
11 May 2011 → 14 May 2011

**JOURNAL OF STRUCTURAL BIOLOGY (Journal)**

Roland Kroger (Reviewer)  
2011 → ...

**Structural characterization of the mineral phase and organic/mineral interfaces in the coral skeleton**

Roland Kroger (Invited speaker)  
29 Nov 2010 → 2 Dec 2010

**Symposium NN: Biomineralization and Bioinspired Inorganic and Inorganic/Organic Materials - Materials Research Society Fall Meeting**

Roland Kroger (Invited speaker)  
29 Nov 2010 → 2 Dec 2010

**Micron (Journal)**

Roland Kroger (Reviewer)  
2010 → ...

**Symposium on Advanced Oxide Materials: 2nd UK-Taiwan International Networking for Young Scientists**

Roland Kroger (Invited speaker)  
9 Mar 2009 → 12 Mar 2009

**University of Illinois at Urbana-Champaign**

Roland Kroger (Visitor)  
Aug 2007 → Jul 2008

## Awards

### **Revealing the 3D nanoscale structure and composition of healthy and diseased bone and teeth**

Kroger, R.  
EPSRC: £42,298.40  
1/04/22 → 31/07/22

## Projects

### **URP 2019-20 (Strategic Capital) SEM-EDX: New Frontiers in Environmental and Heritage Science at York**

Little, A. P., Kroger, R., White, M. J., Brown, S. E., Craig, O. E., O'Higgins, P., Penkman, K. E. H., Hodson, M. E. & Gehrels, W. R.  
1/08/19 → 31/07/20

### **Aberration-Corrected Scanning Transmission Electron Microscope with atomic resolution spectroscopy under controlled environmental conditions: AC-eSTEM**

Lazarov, V., Boyes, E. D., Gai, P. L., Kroger, R., Tear, S. & Yuan, J.  
EPSRC  
1/11/19 → 31/10/24

### **MIB - Materials in Biology: Hard-Soft Matter Interfaces: From Understanding to Engineering**

Kroger, R.  
EPSRC  
1/09/10 → 3/03/16

### **Mimicking and quantifying bone growth using X-ray spectroscopy and electron microscopy**

Kroger, R. & Parker, J.  
1/01/18 → 30/06/21

### **Nanoparticle interaction with proteins**

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### **Revealing the 3D nanoscale structure and composition of healthy and diseased bone and teeth**

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### **SMILEY: SMILEY: Smart Nano-structured Devices Hierarchically Assembled by Bio-mineralization Processes**

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### **The Control of Coral Biomineralisation**

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### **Understanding trace element and isotope partitioning in aragonites and calcites in biological environments**

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### **OA: WUN-Ocean Acidification**

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