

# MAXWELL W. TERBAN

Johannesstr. 23, 70176 Stuttgart, Germany

+49 711 6891506 ◊ m.terban@fkf.mpg.de

## EDUCATION

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Ph.D. Materials Science & Engineering, Columbia University, New York, NY	02/2018
M.Sc. Materials Science & Engineering, Columbia University, New York, NY	06/2013
B.S. Chemical Engineering, University of Massachusetts, Amherst, MA	06/2012

## POSITIONS

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**X-ray Diffraction, Max Planck Institute for Solid State Research** 10/2017–present  
*Post-doctoral scientist with Robert E. Dinnebier* Stuttgart, Germany

- Developing structure characterization methods to improve synthetic understanding and quality control of polymers, small molecules, and microporous materials for academic and industrial applications
- Applying in situ x-ray diffraction methods toward understanding formation mechanisms and functional properties in novel materials

**Applied Physics & Applied Mathematics, Columbia University** 02/2013–09/2017  
*Graduate Research Assistant with Simon J. L. Billinge* New York, NY, USA

- Used high energy, synchrotron x-ray characterization to develop insights into food and pharmaceutical formulations, polymers, ion-exchangers, catalysts, photovoltaics, and quantum dot nanoparticles
- Worked as part of interdisciplinary team toward testing of novel software tools, data collection interfaces, and hardware setups for synchrotron measurements and analysis

### Visiting researcher/internships

- Chemistry, University of Glasgow, Scotland (9–10/2015)
- Pharmacy and Biomedical Sciences, University of Strathclyde, Scotland (03/2013)
- High Performance Materials Institute, Florida State University, US (05–07/2011)
- Chemical and Biological Engineering, Iowa State University, US (06–08/2010)

## WORKSHOP TEACHING AND ORGANIZATION

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8. **Analysis of diffraction data in real space (ADD2022)**, speaker and tutorial instructor, ESRF, Grenoble, France, October 17–21 (2022)
7. **Joint international school on the basics and applications of the Rietveld method & pair distribution function analysis in materials science (ISBARM-22)**, speaker and tutorial instructor, Islamabad, Pakistan, July 27–29 (2022)
6. **TOPAS Intensive Course**, speaker and tutorial instructor, EPDIC17, Šibenik, Croatia, May 29–31 (2022)
5. **To.Sca.Lake 3.0**, tutorial instructor, Como, Italy May 27–31 (2019)
4. **Pair distribution function (PDF) analysis workshop**, primary organizer/instructor, DMG/DGK Ph.D. student course, Max-Planck-Institute FKF, Stuttgart, Germany, Oct. 11–12 (2018)
3. **To.Sca.Lake 2.0**, speaker and tutorial instructor, Como, Italy, May 29–June 2 (2017)

2. **Joint Undertaking for an African Materials Institute (JUAMI)**, assisted with program organization, Arusha, Tanzania, May 29–June 10 (2016)
1. **Scientific Software Innovation Institute for Advanced Analysis of X-ray and Neutron Scattering Data (SIXNS)**, assisted with program organization, Upton, NY, USA, Aug. 14–15 (2013)

## TEACHING ASSISTANTSHIPS

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- Introduction to applied mathematics, Columbia University (Spring 2015)
- Partial differential equations, Columbia University (Fall 2014)
- Laboratory in materials science, Columbia University (Spring 2013)
- Physics of fluids, Columbia University (Fall 2012)

## SKILLS:

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X-ray scattering/diffraction (synchrotron and laboratory techniques, liquid flow cells, cryocooling/heating, gas loading), pair distribution function analysis (Fit2D, pyFAI, XPDtools, PDFgetX(N)3, xPDF-suite, PDFgui, Diffpy-CMI), Rietveld refinement and crystal structure solution from powder diffraction (TOPAS), small angle scattering (SasView), thermal, gravimetric, and volumetric analyses (DSC, TG-DTA, gas pycnometry), spectroscopic analyses (FTIR, Raman, basic assessment of SSNMR), scripting, data analysis and representation (Python), image analysis (ImageJ), communication/presentation (LaTeX, Microsoft Suite), Linux and Windows OS

## HONORS:

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- Julian Baumert PhD Thesis Award, NSLS-II/CFN User Meeting, 2018
- Herman R. Branson Pauling Poster Prize, ACA, 2015
- EGSC professional development scholarship, 2015
- Columbia University/University of Glasgow Research Exchange Award, 2015
- magna cum laude, UMass, 2012
- Commonwealth Honors College Scholar with Great Distinction, 2012
- Boy Scouts of America, Eagle Scout, 2007

## SCIENTIFIC ARTICLES:

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Google Scholar: <https://scholar.google.com/citations?user=OrvYI2MAAAAJ&hl=en&oi=ao>

44. C. Koschnick, M. W. Terban, S. Canossa, M. Etter, R. E. Dinnebier, B. V. Lotsch. **Influence of water content on speciation and phase formation in Zr-porphyrin-based MOFs**, *Advanced Materials*, Special Issue on Hygroscopic Materials (accepted) (2023).
43. C. Copeman, H. A. Bicalho, M. W. Terban, D. Troya, M. Etter, P. L. Frattini, D. M. Wellse, A. J. Howarth. **Adsorptive removal of iodate oxyanions from water using a Zr-based metal–organic framework**, *Chemical Communications*, DOI:10.1039/D2CC06558D (2023).
42. C. Koschnick, S. Canossa, M. W. Terban, R. Frison, M. Etter, F. A. Böhm, D. M. Proserpio, S. Krause, R. E. Dinnebier, B. V. Lotsch. **Unlocking new topologies in Zr-based metal–organic frameworks by combining linker flexibility and building block disorder**, *ChemRxiv*, DOI:10.26434/chemrxiv-2022-d58j3 (2022).
41. N. Gantzler, M.-B. Kim, A. Robinson, M. W. Terban, S. Ghose, R. E. Dinnebier, A. H. York, D. Tiana, C. M. Simon, P. K. Thallapally. **Computation-informed optimization of Ni(PyC)<sub>2</sub> functionalization for noble gas separations**, *Cell Reports Physical Science*, 3(9) 101025 (2022).

40. M. Joos, M. Conrad, I. Moudrakovski, M. W. Terban, A. Rad, P. Kaghazchi, R. Merkle, R. E. Dinnebier, T. Schleid, J. Maier. **Ion transport mechanism in anhydrous lithium thiocyanate LiSCN part II: frequency dependence and slow jump relaxation**, *Physical Chemistry Chemical Physics*, 24, 20198–20209 (2022).
39. H. L. B. Boström, S. Bette, S. T. Emmerling, M. W. Terban, B. V. Lotsch. **Guest-responsive thermal expansion in the Zr-porphyrin metal-organic framework PCN-222**, *APL Materials*, 10, 071106 (2022).
38. C. Stähler, L. Grunenberg, M. W. Terban, W. R. Browne, D. Doellerer, M. Kathan, M. Etter, B. V. Lotsch, B. L. Feringa, S. Krause. **Light-driven molecular motors embedded in covalent organic frameworks**, *Chemical Science*, 13, 8253–8264 (2022).
37. M. W. Terban, L. Madhau, A. J. Cruz-Cabeza, P. O. Okeyo, M. Etter, A. Schulz, J. Rantanen, R. E. Dinnebier, S. J. L. Billinge, M. Moneghini, D. Hasa. **Controlling desolvation through polymer-assisted grinding**, *CrystEngComm*, 24, 2305–2313 (2022).
36. T. Scholz, C. Schneider, M. W. Terban, Z. Deng, R. Eger, M. Etter, R. E. Dinnebier, P. Canepa, B. V. Lotsch. **Superionic conduction in the plastic crystal polymorph of Na<sub>4</sub>P<sub>2</sub>S<sub>6</sub>**, *ACS Energy Letters* 7, 1403–1411 (2022).
35. T. E. Kibona, S. Frisco, M. W. Terban. **Pair distribution function analysis and electrochemical performance of mesoporous carbon nanomaterials synthesized through KOH and ZnCl<sub>2</sub> activation**, *Tanzania Journal of Science* 47 (4), 1362–1375 (2021).
34. J. Kröger, F. Podjaski, G. Savasci, I. Moudrakovski, A. Jimenez-Solano, M. W. Terban, S. Bette, V. Duppel, M. Joos, A. Senocrate, R. E. Dinnebier, C. Ochsenfeld, B. V. Lotsch. **Conductivity mechanism in ionic 2D carbon nitrides: from hydrated ion motion to enhanced photocatalysis**, *Advanced Materials*, 34 (7), 2107061 (2021).
33. G. Gallo, M. W. Terban, I. Moudrakovski, T. Huber, M. Etter, M. Ernst, B. Hinrichsen, R. E. Dinnebier. **A previously unknown cyclic alkanolamine and molecular ranking using the pair distribution function**, *Acta Crystallographica Section B* 77, 986–995 (2021).
32. A.-K. Hatz, I. Moudrakovski, S. Bette, M. W. Terban, M. Etter, M. Joos, N. M. Vargas-Barbosa, R. E. Dinnebier, B. V. Lotsch. **Fast water-assisted lithium ion conduction in restacked lithium tin sulfide nanosheets**, *Chemistry of Materials* 33 (18), 7337–7349 (2021).
31. C. Koschnick and R. Stäglich and T. Scholz and M. W. Terban, A. Mankowski, G. Savasci, F. Binder, A. Schökel, M. Etter, J. Nuss, R. Siegel, L. S. Germann, C. Ochsenfeld, R. E. Dinnebier, J. Senkar, B. V. Lotsch. **Disorder and linker deficiency in porphyrinic Zr-MOFs: resolving the Zr<sub>8</sub> cluster conundrum in PCN-221**, *Nature Communications* 12 (1), 1–9 (2021).
30. M. W. Terban, S. K. Ghose, A. M. Plonka, D. Troya, P. Juhás, R. E. Dinnebier, A. I. Frenkel. **Atomic resolution tracking of nerve-agent simulant decomposition and host metal-organic framework response in real space**, *Communications Chemistry*, 4, 2 (2021).
29. L. Grunenberg, G. Savasci, M. W. Terban, V. Duppel, I. Moudrakovski, M. Etter, R. E. Dinnebier, C. Ochsenfeld, B. V. Lotsch. **Amine-linked covalent organic frameworks as a powerful platform for post-synthetic modification: structure interconversion and combined linkage- and pore-wall-modification**, *Journal of the American Chemical Society* 143 (9), 3430–3438 (2021).
28. M. W. Terban, K. Seidel, E. Pöselt, M. Malfois, R.-P. Baumann, R. Sander, D. Paulus, B. Hinrichsen, R. E. Dinnebier. **Cross-examining polyurethane nanodomain formation and internal structure**, *Macromolecules*, 53 (20), 9065–9073 (2020).
27. M. W. Terban, L. Russo, T. N. Pham, D. H. Barich, Y. T. Sun, M. Burke, J. Brum, S. J. L.

- Billinge. **Local structural effects due to micronization and amorphization on an HIV treatment active pharmaceutical ingredient**, *Molecular Pharmaceutics*, 17 (7), 2370–2389 (2020).
26. L. Yang, P. Juhás, M. W. Terban, S. J. L. Billinge. **Structure-mining: screening structure models by automated fitting to the atomic pair distribution function over large numbers of models**, *Acta Crystallographica Section A: Foundations and Advances* 76 (3), 395–409 (2020).
  25. A. Pütz, M. W. Terban, S. Bette, F. Haase, R. E. Dinnebier, B. V. Lotsch. **Total scattering reveals the hidden stacking disorder in a 2D covalent organic framework** *Chemical Science*, 11, 12647–12654 (2020).
  24. M. W. Terban, A. Pütz, G. Savasci, U. Heinemeyer, B. Hinrichsen, P. Desbois, R. E. Dinnebier. **Improving the picture of atomic structure in nonoriented polymer domains using the pair distribution function: a study of  $\alpha$  nylon 6**, *Journal of Polymer Science*, 58 (13), 1843–1866 (2020).
  23. H. Schlomberg, J. Kröger, G. Savasci, M. W. Terban, S. Bette, F. Podjaski, I. Moudrakovski, V. Duppel, R. E. Dinnebier, C. Ochsenfeld, B. V. Lotsch. **Structural insights into poly-(heptazine) imide (PHI): light storing carbon nitride material for dark photocatalysis**, *Chemistry of Materials*, 31 (18), 7478–7486 (2019).
  22. E. A. Morrow, M. W. Terban, L. C. Thomas, S. J. L. Billinge, S. J. Schmidt. **Investigation of thermal decomposition as a critical factor inhibiting cold crystallization in amorphous sucrose prepared by melt-quenching**, *Journal of Food Engineering*, 243, 125–141 (2019).
  21. A. I. Nguyen, K. M. Van Allsburg, M. W. Terban, M. Bajdich, J. Oktawiec, M. S. Ziegler, J. P. Dombrowski, K. V. Lakshmi, W. S. Drisdell, J. Yano, S. J. L. Billinge, T. D. Tilley. **Tunable, site-isolated  $\text{Co}_4\text{O}_4$  oxygen-evolution catalysts uniformly dispersed within porous frameworks**, *PNAS*, 116 (24), 11630–11639 (2019).
  20. T. E. Gorelik, R. B. Neder, M. W. Terban, Z. Li, X. Mu, C. Jung, T. Jacob, U. Kaiser. **Towards quantitative treatment of electron pair distribution function**, *Acta Crystallographica*, B75, 532–549 (2019).
  19. E. A. Morrow, M. W. Terban, L. C. Thomas, D. L. Gray, M. J. Bowman, S. J. L. Billinge, S. J. Schmidt. **Effect of amorphization method on the physicochemical properties of amorphous sucrose**, *Journal of Food Engineering* 243, 125–141 (2019).
  18. W. J. Transue, M. Nava, M. W. Terban, J. Yang, M. W. Greenberg, G. Wu, E. S. Foreman, C. L. Mustoe, P. Kennepohl, J. S. Owen, S. J. L. Billinge, H. J. Kulik, C. C. Cummins. **Anthracene as a launchpad for a phosphinidene sulfide and for generation of a phosphorus–sulfur material having the composition  $\text{P}_2\text{S}$ , a vulcanized red phosphorus that is yellow**, *Journal of the American Chemical Society* 141 (1), 431–440 (2018).
  17. B. Zhang, R. H. Sánchez, Y. Zhong, M. Ball, M. W. Terban, D. Paley, S. J. L. Billinge, F. Ng, M. L. Steigerwald, C. Nuckolls. **Hollow organic capsules assemble into cellular semiconductors**, *Nature Communications* 9 (1), 1957 (2018).
  16. M. W. Terban, D. Banerjee, S. Ghose, B. Bharat, A. Shukla, B. A. Legg, Z. Zhu, Y. Zhou, M. L. Sushko, J. L. De Yoreo, J. Liu, P. Thallapally, S. J. L. Billinge. **Early stage structural development of prototypical zeolitic imidazolate framework (ZIF) in solution**, *Nanoscale* 10 (9), 4291–4300 (2018).
  15. C. S. Lewis, D. Moronta, M. W. Terban, L. Wang, S. Yue, C. Zhang, Q. Li, A. Corrao, S. J. L. Billinge, S. S. Wong. **Synthesis, characterization, and growth mechanism of motifs of ultrathin cobalt doped  $\text{NaFeSi}_2\text{O}_6$  nanowires**, *CrystEngComm* 20 (2), 223–236 (2018).

14. M. W. Terban. **Characterizing the atomic structure in low concentrations of weakly ordered, weakly scattering materials using the pair distribution function**, Columbia University – *Ph.D. Thesis* (2018).
13. N. Nakamura, M. W. Terban, S. J. L. Billinge, B. Reeja Jayan. **Unlocking the structure of mixed amorphous-crystalline ceramic oxide films synthesized under low temperature electromagnetic excitation**, *Journal of Materials Chemistry A* 5 (35), 18434–18441 (2017).
12. J. L. Stein, M. I. Steimle, M. W. Terban, A. Petrone, S. J. L. Billinge, X. Li, B. M. Cossairt. **Cation exchange induced transformation of InP magic-sized clusters**, *Chemistry of Materials* 29 (18), 7984–7992 (2017).
11. M. W. Terban and C. Shi, R. Silbernagel, A. Clearfield, S. J. L. Billinge. **Local environment of terbium(III) ions in layered nanocrystalline zirconium(IV) phosphonate–phosphate ion exchange materials**, *Inorganic Chemistry* 56 (15), 8837–8846 (2017).
10. F. Bertolotti, L. Protesescu, M. V. Kovalenko, S. Yakunin, A. Cervellino, S. J. L. Billinge, M. W. Terban, J. S. Pedersen, N. Masciocchi, A. Guagliardi. **Coherent nanotwins and dynamic disorder in cesium lead halide perovskite nanocrystals**, *ACS Nano* 11 (4), 3819–3831 (2017).
9. L. Gámez–Mendoza and M. W. Terban, S. J. L. Billinge, M. Martínez–Iñesta. **Modelling and validation of particle size distributions of supported nanoparticles using the pair distribution function technique**, *Journal of Applied Crystallography*, 50 (2017).
8. A. N. Beecher and O. E. Semonin, J. M. Skelton, J. M. Frost, M. W. Terban, H. Zhai, A. Alatas, J. S. Owen, A. Walsh, S. J. L. Billinge. **Direct observation of dynamic symmetry breaking above room temperature in methylammonium lead iodide perovskite**, *ACS Energy Letters*, 1 (4), 880–887 (2016).
7. M. W. Terban, R. Dabbous, A. Debellis, E. Pösel, S. J. L. Billinge. **On the structures of hard phases in thermoplastic polyurethanes**, *Macromolecules*, 49 (19), 7350–7358 (2016).
6. B. A. Frandsen, Z. Gong, M. W. Terban, S. Banerjee, B. Chen, C. Jin, M. Feygenson, Y. J. Uemura, S. J. L. Billinge **Local atomic and magnetic structure of dilute magnetic semiconductor (Ba,K)(Zn,Mn)<sub>2</sub>As<sub>2</sub>**, *Physical Review B*, 94 (9), 094102 (2016).
5. J. Aríñez--Soriano, J. Albalad, A. Carné--Sánchez, C. S. Bonnet, F. Busqué, J. Lorenzo, J. Juanhuix, M. W. Terban, I. Imaz, É. Tóth, D Maspoeh. **pH--responsive relaxometric behaviour of coordination polymer nanoparticles made of a stable macrocyclic gadolinium chelate**, *Chemistry–A European Journal* 22, 1–1 (2016).
4. M. W. Terban, E. Y. Cheung, P. Krolikowski, S. J. L. Billinge. **Recrystallization, phase composition, and local structure of amorphous lactose from the total scattering pair distribution function**, *Crystal Growth & Design* 16 (1), 210–220 (2016).
3. M. W. Terban, M. Johnson, M. Di Michiel, S. J. L. Billinge. **Detection and characterization of nanoparticles in suspension at low concentrations using the X-ray total scattering pair distribution function technique**, *Nanoscale* 7 (12), 5480–5487 (2015).
2. D. C. Gary, M. W. Terban, S. J. L. Billinge, B. M. Cossairt. **Two-step nucleation and growth of InP quantum dots via magic-sized cluster intermediates**, *Chemistry of Materials*, 27 (4), 1432–1441 (2015).
1. S. Lendínez, R. Zarzuela, J. Tejada, M. W. Terban, S. J. L. Billinge, J. Espin, I. Imaz, D. Maspoeh, E. M. Chudnovsky. **Resonant spin tunneling in randomly oriented nanospheres of Mn<sub>12</sub> acetate**, *Physical Review B*, 91 (2), 024404 (2015).

## BOOK CHAPTERS AND REVIEWS:

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3. S. J. L. Billinge, S. H. Skjaerve, M. W. Terban, S. Tao, L. Yang, Y. Rakita, B. A. Frandsen. **10.09 – Local structure determination using total scattering data**, Comprehensive Inorganic Chemistry III (Third Edition), 222–247 (2023).
2. M. W. Terban, S. J. L. Billinge. **Structural analysis of molecular materials using the pair distribution function**, Chemical Reviews 122 (1), 1208–1272 (2022).
1. S. Thakral, M. W. Terban, N. K. Thakral, R. Suryanarayanan. **Recent advances in the characterization of amorphous pharmaceuticals by X-ray diffractometry**, Advanced Drug Delivery Reviews 100, 183–193 (2016).

## INVITED/CONTRIBUTED TALKS:

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25. **An intro to total scattering and PDF for polymers**, XRD-PDF (Pair Distribution Function) Workshop, EMPA, Dübendorf, Switzerland, November 16 (2022)
24. **Local and extended structuring in not-so-crystalline molecular materials**, ADD2022, Grenoble, France, October 19 (2022)
23. **Insights into organic materials using the pair distribution function**, Neutron and X-ray methods for structural analysis of organic materials - ICCOSS XXV, Ohrid, North Macedonia, July 2 (2022)
22. **Characterizing structural effects due to micronization and amorphization on an active pharmaceutical ingredient for HIV treatment**, 17<sup>th</sup> EPDIC, Šibenik, Croatia, June 1 (2022)
21. **Structural characterization and mechanism for crystal desolvation induced by polymer-assisted grinding**, 30th DGK, Munich, DE, March 16 (2022)
20. **Characterizing the structure in disordered functional materials with x-ray scattering**, Meeting of the Directors' Board, Max Planck Institute, Stuttgart, DE, December 10 (2021)
19. **Developing more precise structural descriptions of layered covalent organic frameworks using total scattering data**, 25th IUCr, Prague, CZ, August 20 (2021)
18. **Atomic-scale insights into guest interactions within microporous and catalytic materials**, BASF, Heidleberg, DE, June 23 (2021)
17. **Cluster species and binding signals in disordered (metal-)organic frameworks**, BAM-UBFC Materials Science Symposium, (online) May 12 (2021)
16. **Tracking nerve-agent simulant decomposition in UiO-67 using in situ total scattering pair distribution function analysis**, 29th DGK, Hamburg, DE, March 18 (2021)
15. **Insights into molecular materials using the pair distribution function**, CMPC Meeting, DESY, Hamburg, DE, March 9 (2021)
14. **Local structure and local functionality in metal-organic frameworks: overcoming difficulties of crystallographic averaging with total scattering**, Functional Materials Seminar, Max Planck Institute, Stuttgart, DE, January 13 (2021)
13. **Multi-Mythen detector for fast, high-resolution, lab-based pair distribution function characterization of nanostructures**, 16<sup>th</sup> EPDIC, Edinburgh, Scotland, July 2 (2018)
12. **Solution of polymer structures from the pair distribution function using TOPAS**, 14<sup>th</sup> TOPAS User Meeting, Edinburgh, Scotland, June 29 (2018)

11. **Characterizing the atomic structure in low concentrations of weakly ordered, weakly scattering materials using the pair distribution function**, Julian Baumert PhD Thesis Award, NSLS/NSLS-II and CFN Users' Meeting, Upton, New York, USA, May 23 (2018)
10. **Pair distribution function for characterization of non-oriented polymer structures**, BASF, Heidelberg, DE, April 12 (2018)
9. **Total scattering and pair distribution function characterization of disordered polymer structures**, Lightning Talk, 26<sup>th</sup> Annual Meeting of the German Crystallographic Society (DGK), Essen, DE, March 6–8 (2018)
8. **Local structure of disordered metal organic frameworks and in situ characterization methods**, University of Bayreuth, Bayreuth, DE, January 22 (2018)
7. **Generating partnerships for collaborative research: synchrotron light source data for African materials science**, African MRS, Gaborone, Botswana, December 14 (2017)
6. **In situ characterization of particle formation at the nanoscale**, BASF, Heidelberg, DE, November 6 (2017)
5. **Applications of x-ray pair distribution function analysis to amorphous and mixed crystalline/amorphous samples**, GlaxoSmithKline, Stevenage, UK, September 8 (2017)
4. **Characterizing synthesis and processing effects in nanostructured molecular materials**, To.Sca.Lake Summer School, Como Lake, Italy, June 1 (2017)
3. **Total scattering characterization of thin films grown using low temperature, microwave-assisted synthesis**, APAM Research Conference, Columbia University, New York, NY, USA, February 24 (2017)
2. **X-ray total scattering study of the local structure of disordered, zirconium based exchange materials**, NSLS-II Lunchtime Seminar Series, Brookhaven National Laboratory, Upton, NY, USA, March 4 (2016)
1. **Probing the local structure of disordered pharmaceutical formulations**, APAM Research Conference, Columbia University, New York, NY, USA, May 1 (2015)

## POSTERS:

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9. **Local structural effects due to micronization and amorphization on an HIV treatment active pharmaceutical ingredient**, 28<sup>th</sup> Annual Meeting of the German Crystallographic Society (DGK), Wrocław, Poland, February 24–27 (2020)
8. **Local structure, dynamics, and expansivity of  $\alpha$  polyamide 6 through the glass transition**, 28<sup>th</sup> Annual Meeting of the German Crystallographic Society (DGK), Wrocław, Poland, February 24–27 (2020)
7. **Total scattering and pair distribution function characterization of disordered polymer structures**, 27<sup>th</sup> Annual Meeting of the German Crystallographic Society (DGK), Leipzig, Germany, March 24–27 (2019)
- 5,6. **Toward solution of locally ordered polymer domain structures using pair distribution function analysis**, 16<sup>th</sup> European Powder Diffraction Conference, Edinburgh, Scotland, July 1–4 (2018) —and— 26<sup>th</sup> Annual Meeting of the German Crystallographic Society (DGK), Essen, Germany, March 5–8 (2018)
4. **Formation of ZIF-8: early stage structural development from in situ pair distribution function analysis**, Gordon Research Conference: Nanoporous Materials and their Applications, Andover, NH, USA, August 6–11 (2017)

- 2,3. **Total scattering pair distribution function for probing local structure and recrystallization of amorphous molecules: a study of lactose**, American Crystallographic Association Annual Meeting, Philadelphia, PA, USA, July 25–29 (2015) —and— Gordon Research Conference: Preclinical Formulation for Drug Discovery, Waterville Valley, NH, USA, June 7–12 (2015)
1. **Structural characteristics of amorphous pharmaceuticals using the pair distribution function (PDF)**, NSLS/NSLS-II and CFN Users' Meeting, Upton, NY, USA, May 19–21 (2014)

**PEER REVIEW FOR:**

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Acta Crystallographica A, Acta Crystallographica C, APL Machine Learning, Chemical Communications, Chemical Society Reviews, Crystal Growth & Design, International Journal of Pharmaceutics, Jordanian Journal of Physics, J. Molecular Graphics and Modeling, J. of the American Chemical Society, J. Pharmaceutical Sciences, J. Physical Chemistry, J. of Synchrotron Radiation, Macromolecular Materials and Engineering, Materials Today Communications, Molecular Pharmaceutics, Nature Communications, Physical Chemistry Chemical Physics, and regular internal reviews for Max-Planck-Institute FKF

**INTERESTS:**

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skiing, rock climbing, piano, guitar, weightlifting/nutrition