

CURRICULUM VITAE

• **Personal Details**

Benjamin Alexander Palmer
12/04/1986, UK
Building 43, Office 105, 0526572435
ORCID ID: 0000-0002-9684-9724

• **Education**

MChem – 2004-2008, 1st Class Honours, Cardiff University, Department of Chemistry

Ph.D. – 2008-2012, Cardiff University, Department of Chemistry

Name of advisor: Prof. Kenneth Harris

Title of thesis: Structural Properties, X-ray Birefringence and Crystal Growth of Solid Organic Inclusion Compounds

• **Employment History**

2019-present

Assistant Professor
Department of Chemistry, Ben-Gurion University of the Negev, Israel.

2018-2019

Senior Postdoctoral Fellow
Weizmann Institute of Science, Israel (Profs. Lia Addadi and Steve Weiner).

2015-2018

Human Frontiers Postdoctoral Fellow and Koshland Scholar
Weizmann Institute of Science, Israel (Profs. Lia Addadi and Steve Weiner).

2014-2015

Dean of Faculty Postdoctoral Fellow and Koshland Scholar, Weizmann Institute of Science, Israel (Profs. Lia Addadi and Steve Weiner).

2012-2013

Postdoctoral Research Assistant
Centre for Nanohealth, Swansea University (Joint project between Swansea (Prof. Steve Wilks) and Texas A&M University (Prof. Kenith Meissner)).

Honors, Citation Awards

2022 Toronto Prize for Research Excellence, Ben-Gurion University.

2019 'Nahum Guzik Presidential Recruit'.

2018 Feinberg Graduate School Prize for Outstanding Achievements in Postdoctoral Research, Weizmann Institute.

2015 IUCR Young Scientist Award.

2014 The Welsh Livery Guild Gold Award.

2014 Koshland Prize, Weizmann Institute of Science

2013 Welsh Livery Guild Travel Scholarship.

2013 Feinberg Graduate School Scholarship, Weizmann Institute of Science.

2010 RSC bursary to attend EuCheMS Chemistry Congress, Nuremberg, August 2010.

2009 Welsh Livery Guild Travel Scholarship.

2008 The Pfizer award for 'Best 4th Year MChem research project' and the GE Healthcare award 'Outstanding 4th year MChem performance'.

2007 Royal Society of Chemistry award for 'Best 3rd Year Performance'.

Research Grants

2022-2026 ISF Grant (ca. \$ 120,000 per year).
2022-2025 HFSP Research Grant (ca. \$ 120,000 per year).
2020-2025 ERC Starting Grant (\$ 2,315,200).
2019-2021 Azrieli Faculty Fellowship (\$210,000).
2020 Lead PI on VATAT Equipment Grant (\$1,080,500 NIS).

Fellowships

2018 Senior Postdoctoral Fellowship, Weizmann Institute of Science.
2015 Human Frontiers Science Program Cross-Disciplinary Fellowship.
2015 Marie Curie Fellowship (Declined in favor of HFSP Fellowship).
2014 Dean of Faculty Fellowship, Weizmann Institute of Science.

Selected Scientific Publications (*corresponding author, ‡BGU affiliation)

1. G. Zhang^{PD}, V. J. Yallapragada^{PD}, T. Halperin^S, A. Wagner^S, M. Shemesh^S, A. Upcher^{PD}, I. Pinkas^{PD}, H. L. O. McClelland^{PD}, D. Hawlena^{PI}, **B. A. Palmer**^{*PI‡}, Ontogenetic Colour Switching in Lizards as a by-Product of Chromatophore Cell Development, *PNAS.*, 2023, 120, e2215193120 .
2. T. Lemcoff^S, L. Alus^S, J. S. Haataja^{PD}, A. Wagner^S, G. Zhang^{PD}, M. J. Pavan^{PD}, V. J. Yallapragada^{PD}, S. Vignolini^{PI}, D. Oron^{PI*}, L. Schertel^{PD*}, **B. A. Palmer**^{*PI‡}, Brilliant Whiteness in Shrimp from Ultra-Thin Layers of Birefringent Nanospheres, *Nature Photonics*, 2023, 17, 485–493.
3. K. Shavit^S, A. Wagner^S, L. Schertel^{PD}, V. Farstey^{PD}, D. Akkaynak, G. Zhang^{PD}, A. Upcher^{PD}, A. Sagi^{PI}, V. J. Yallapragada^{PI}, J. Haatja^{PD*}, **B. A. Palmer**^{*PI‡}, A Tunable Reflector Enabling Crustaceans to See but not be Seen, *Science*, 2023, 379, 695-700.
4. A. Wagner^S, A. Upcher^{PD}, R. Maria^{PD}, T. Magnesen^{PI}, E. Zelinger^{PD}, G. Raposo^{PI}, **B. A. Palmer**^{*PI‡}, Macromolecular Sheets Direct the Morphology and Orientation of Plate-like Biogenic Guanine Crystals, *Nat. Commun.*, 2023, 14, 589.
5. A. Wagner^S, V. Ezersky^{PD}, R. Maria^{PD}, A. Upcher^{PD}, E. D. Aflalo^{PD}, Y. Lubin^{PD}, **B. A. Palmer**^{*PI‡}, The Non-Classical Crystallization Mechanism of a Composite Biogenic Guanine Crystal, *Adv. Mater.*, 2022, 34, 2202242.
6. N. Pinsk^S, A. Wagner^S, L. Cohen^S, C. J. H. Smalley^S, C. E. Hughes^{PD}, G. Zhang^{PD}, M.J. Pavan^{PD}, N. Casati^{PD}, A. Jantschke^{PD}, G. Goobes^{PI}, K. D. M. Harris^{PI}, **B. A. Palmer**^{*PI‡}, Biogenic Guanine Crystals Are Solid Solutions of Guanine and Other Purine Metabolites, *J. Am. Chem. Soc.*, 2022, 144, 5180-5189.
7. A. Wagner^S, Q. Wen^S, N. Pinsk^S, **B. A. Palmer**^{*PI‡}, Functional Molecular Crystals in Animals, *Israel Journal of Chemistry*, 2021, 61, 668-678.
8. L. M. Beck, V. J. Yallapragada, A. Upcher, **B. A. Palmer**, L. Addadi, D. Oron, Measuring the Optical Properties of Nanoscale Biogenic Spherulites, *Opt. Express.*, 29, 20863-20871.
9. S. Bentov^{PD}, **B. A. Palmer**^{‡PI}, B. Bar-On^{PI}, Y. Shelef^S, E. D. Aflalo^{PD}, A. Sagi^{PI}, Reinforcement of bio-apatite by zinc substitution in the incisor tooth of a prawn, *Acta Biomaterialia*, 2021, 120, 116-123.

10. N. Schiffmann^S, E. Merary Wormser^S, V. Brumfeld^{PD}, Y. Addadi^{PI}, I. Pinkas^{PD}, J. V. Yallapragada^{PD}, E. Aflalo^{PD}, A. Sagi^{PI}, **B. A. Palmer**^{*‡PI}, S. Weiner^{PI}, L. Addadi^{PI}, Characterization and Possible Function of an Enigmatic Reflector in the Eye of the Shrimp *Litopenaeus vannamei*, *Faraday Discuss.*, 2020, 223, 278-294.
11. **B. A. Palmer**^{*‡PD}, V. J. Yallapragada^{PD}, N. Schiffmann^S, E. Merary Wormser^S, N. Elad^{PD}, E. D. Aflalo^{PD}, A. Sagi^{PI}, S. Weiner^{PI}, L. Addadi^{PI}, D. Oron^{PI}, A Highly Reflective Biogenic Photonic Material from Core-Shell Birefringent Nanoparticles, *Nature Nanotechnology*, 2020, 15, 138-144.
12. G. Zhang^{PD}, A. Hirsch^S, G. Shmul^{PD}, L. Avram^S, N. Elad^{PD}, V. Brumfeld^{PD}, I. Pinkas^{PD}, Y. Feldman^{PD}, R. Ben Asher^S, **B. A. Palmer**^{PD}, L. Kronik^{PI}, L. Leiserowitz^{PI}, S. Weiner^{PI}, L. Addadi^{PI}, Guanine and 7,8-dihydroxanthopterin reflecting crystals in the zander fish eye: crystal locations, compositions, and structures, *J. Am. Chem. Soc.*, 2019, 141, 19736-19745.
13. V. J. Yallapragada^{PD}, **B. A. Palmer**^{*‡PI}, Animal Eyes: Filtering out the Background, *Curr. Biol.* 2019, 29, R938-R941.
14. K. Christensen^{PD}, P. A. Williams^{PD}, R. Patterson^{PD}, **B. A. Palmer**^{PD}, M. Couzi^{PI}, F. Guillaume^{PI}, K. D. M. Harris^{PI}, Reply to comment on Couzi et al. (2018): a phenomenological model for structural phase transitions in incommensurate alkane/urea inclusion compounds, *R. Soc. Open. Sci.* 2019, 6, 190518.
15. A. Hirsch^S, **B. A. Palmer**^{PD}, A. Ramasubramaniam^{PI}, P. A. Williams^{PD}, K. D. M. Harris^{PI}, B. Pokroy^{PI}, S. Weiner^{PI}, L. Addadi^{PI}, L. Leiserowitz^{PI}, L. Kronik^{PI}, Structure and Morphology of Light-Reflecting Synthetic and Biogenic Polymorphs of Isoxanthopterin: A Comparison, *Chem. Mater.*, 2019, 31, 4479-4489.
16. Y. Zhou^S, R. Patterson^S, **B. A. Palmer**^{PD}, G. R. Edwards-Gau^S, B. M. Kariuki, S. N. Sivaraman^S, D. W. Bruce^{PI}, I. P. Dolbnya^{PI}, S. P. Collins^{PI}, A. Malandain^S, K. D. M. Harris^{PI}, Spatially Resolved Mapping of Phase Transitions in Liquid Crystalline Materials by X-ray Birefringence Imaging, *Chemical Science* 2019, 10, 3005-3011.
17. Y. Tsarfati^S, S. Rosenne^S, H. Weissman^{PD}, L. J. W. Shimon^{PD}, D. Gur^{PD}, **B. A. Palmer**^{PD}, B. Rybtchinski^{PI}, Crystallization of Organic Molecules: Nonclassical Mechanism Revealed by Direct Imaging, *ACS Central Science* 2018, 4, 1031-1036.
18. **B. A. Palmer**^{PD}, D. Gur^{PD}, S. Weiner^{PI}, L. Addadi^{PI}, D. Oron^{PI}, The Organic Crystalline Materials of Vision: Structure-function Considerations from the Nanometer to the Millimeter scale, *Adv. Mater.* 2018, 30, e1800006.
19. **B. A. Palmer**^{*PD}, A. Hirsch^S, V. Brumfeld^{PD}, N. Elad^{PD}, D. Oron^{PI}, L. Kronik^{PI}, L. Leiserowitz^{PI}, S. Weiner^{PI}, L. Addadi^{PI}, Optically Functional Isoxanthopterin Crystals in the Mirrored Eyes of Decapod Crustaceans, *PNAS.*, 2018, 115, 2299-2304.
20. **B. A. Palmer**^{*PD}, G.J. Taylor^{PD}, V. Brumfeld^{PD}, D. Gur^{PD}, M. Shemesh^{PD}, N. Elad^{PD}, A. Oshero^S, D. Oron^{PI}, S. Weiner^{PI}, L. Addadi^{PI}, The Image-Forming Mirror in the Eye of the Scallop, *Science* 2017, 358, 1172-1175.
21. A. Hirsch^{PD}, **B. A. Palmer**^{PD}, D. Gur^{PD}, S. Weiner^{PI}, L. Addadi^{PI}, L. Kronik^{PI}, L. Leiserowitz^{PI}, Biologically Controlled Morphology and Twinning in Guanine Crystals, *Angew. Chem. Int. Ed.* 2017, 56, 9420-9424.

22. N. Funt^S, **B. A. Palmer**^{PD}, S. Weiner^{PI}, L. Addadi^{PI}, Koi Fish Scale Iridophore Cells Orient Guanine Crystals to Maximize Light Reflection, *ChemPlusChem*, 2017, 82, 914-923.
23. D. Gur^S, **B. A. Palmer**^{PD}, S. Weiner^{PI}, L. Addadi^{PI}, Light Manipulation by Guanine Crystals in Organisms: Biogenic Scatterers, Mirrors, Multilayer Reflectors and Photonic Crystals, *Adv. Func. Mater.* 2017, 1603514.
24. M. Couzi^{PI}, F. Guillaume^{PI}, K. D. M. Harris^{PI}, **B. A. Palmer**^{PD}, K. Christensen^{PD}, S. P. Collins^{PI}, The True Structural Periodicities and Superspace Group Descriptions of the Prototypical Incommensurate Composite Materials: Alkane/urea Inclusion Compounds, *Europhys. Lett.* 2016, 116, 56001.
25. **B. A. Palmer**^{PD}, S. P. Collins^{PI}, J. Hulliger^{PI}, K. D. M. Harris^{PI}, Determining Molecular Orientations in Disordered Materials from X-ray Linear Dichroism at the Iodine L1-Edge, *J. Am. Chem. Soc.*, 2016, 138, 16188-16191.
26. D. Gur^S, **B. A. Palmer**^{PD}, B. Leshem^{PD}, D. Oron^{PI}, P. Fratzl^{PI}, S. Weiner^{PI}, L. Addadi^{PI}. The Mechanism of Color Change in the Neon Tetra Fish: a Light-Induced Tunable Photonic Crystal Array, *Angew. Chem. Int. Ed.*, 2015, 54, 12426-124301.
27. J. Sutter^{PI}, I. P. Dolbnya^{PI}, S. P. Collins^{PI}, G. R. E. Edwards-Gau^S, K. D. M. Harris^{PI}, **B. A. Palmer**^S. Theoretical analysis of the background intensity distribution in X-ray Birefringence Imaging using synchrotron bending-magnet radiation, *J. Appl. Phys.*, 2015, 117, 164902.
28. **B. A. Palmer**^S, G. R. E. Edwards-Gau^S, B. M. Kariuki^{PI}, K. D. M. Harris^{PI}, I. P. Dolbnya^{PI}, S. P. Collins^{PI}, J. Sutter^{PI}. X-ray birefringence Imaging of Materials with Anisotropic Molecular Dynamics, *J. Phys. Chem. Lett.*, 2015, 6, 561-657.
29. **B. A. Palmer**^S, G. R. E. Edwards-Gau^S, B. M. Kariuki^{PI}, K. D. M. Harris^{PI}, I. P. Dolbnya^{PI}, S. P. Collins^{PI}. X-ray birefringence Imaging, *Science* 2014, 344, 1013-1016.
30. **B. A. Palmer**^S, A. Le Comte^S, K. D. M. Harris^{PI}, F. Guillaume^{PI}, Controlling Spatial Distributions of Molecules in Multi- Component Organic Crystals, with Quantitative Mapping by Confocal Raman Microspectrometry, *J. Am. Chem. Soc.*, 2013, 135, 14512-14515.
31. **B. A. Palmer**^S, G. R. E. Edwards-Gau^S, A. Morte-Rodenas^S, B. M. Kariuki^{PI}, G. K. Lim^S, K. D. M. Harris^{PI}, I. P. Dolbnya^{PI}, S. P. Collins^{PI}. X-ray Birefringence: A New Strategy for Determining Molecular Orientation in Materials, *J. Phys. Chem. Lett.*, 2012, 2, 3216-3222.
32. **B. A. Palmer**^S, B. M. Kariuki^{PI}, A. Morte-Rodenas^S, K. D. M. Harris^{PI}, Structural Rationalisation of the Phase Transition Behaviour in a Solid Organic Inclusion Compound: Bromocyclohexane/Thiourea, *Cryst. Growth Des.*, 2012, 12, 577- 582.
33. **B. A. Palmer**^S, A. Morte-Rodenas^S, B. M. Kariuki^{PI}, K. D. M. Harris^{PI}, S. P. Collins^{PI}. X-ray Birefringence from a Model Anisotropic Crystal, *J. Phys. Chem. Lett.* 2011, 2, 2346-2351.
34. **B. A. Palmer**^S, B. M. Kariuki^{PI}, V. K. Muppidi, C. E. Hughes, K. D. M. Harris^{PI}. An Incommensurate Thiourea Inclusion Compound, *Chem. Comm.* 2011, 47, 3760-3762.
35. **B. A. Palmer**^S, K. D. M. Harris^{PI}, F. Guillaume^{PI}, A Strategy for Retrospectively Mapping the Growth History of a Crystal, *Angew. Chem. Int. Ed.* 2010, 49, 5096-5100.

36. O. A. Hazzazi^S, S. E. Huxter^S, R. Taylor^S, **B. A. Palmer^S**, L. Gilbert^S, G. A. Attard^{PI}. Electrochemical Studies of Irreversibly Adsorbed Ethyl Pyruvate on Pt{hkl} and Epitaxial Pd/Pt{hkl} Adlayers, *J. Electroanal. Chem.* 2010, 640, 8-16.

Refereed chapters in collective volumes

K. D. M. Harris, **B. A. Palmer**, G. R. Edwards-Gau, Reactions in Solid-State Inclusion Compounds, Supramolecular Chemistry: From Molecules to Nanomaterials, (Ed: J.W. Steed and P.A. Gale), John Wiley & Sons, Chichester, 2012, Volume 4, pp. 1589-1612.

Selected Invited Talks & Conference Organization

2024 Invited Lecture: GRC on Biomineralization, Main, U.S.A.

2024 Invited Lecture: Minerals, Metals & Materials Society Annual Meeting, Florida, U.S.A.

2023 Symposium Organizer: MRS Fall Meeting Symposium, 'Crystal Clear: Recent Advances in Biogenic, and Synthetic, Organic and Inorganic Crystallization'.

2023 Invited Lecture: Science of Surfaces, Interfaces and Nanostructures, Fribourg, Switzerland.

2023 Invited Lecture: ILANIT, Eilat

2022 Departmental Seminar: Department of Chemistry, Bar-Ilan University, Israel.

2022 Invited Lecture: Bioinspired conference, Andermatt, Switzerland.

2022 Invited Lecture: Optica Novel Optical Materials and Applications, Maastricht, Netherlands.

2022 Invited Lecture: Gordon Research Conference on Crystal Engineering, Maine, USA.

2022 Invited Lecture: Israel Chemical Society Annual Meeting, Israel.

2022 Departmental Seminar: Department of Biochemistry, Hebrew University

2021 Invited Lecture: MRS Autumn Meeting, Boston, Symposium on Bioinspired Materials

2021 Departmental Seminar: Department of Biochemistry, Hebrew University

2021 Departmental Seminar: Department of Desert Ecology, Ben-Gurion University of the Negev

2021 Departmental Seminar: Department of Materials Engineering, Ben-Gurion University of the Negev

2021 Departmental Seminar: Department of Electro Optics, Ben-Gurion University of the Negev

2020 Invited Lecture: Israel Society for Microscopy Annual Meeting.

2021 Invited Lecture: Annual Meeting of the Society for Integrative and Comparative Biology (SICB).

2020 Departmental Seminar: Interuniversity Institute for Marine Sciences, Eilat.

2020 Invited Lecture: Biological and Bio-inspired Optics Faraday Discussion, University of Cambridge.

2019 Departmental Seminar: Department of Chemistry, Tel Aviv University.

2019 Departmental Seminar: Department of Biotechnology Engineering, Ben-Gurion University.

2019 Invited Plenary Lecture: Bioinspired Materials (ETH & EPFL), Lago di Maggiore, Switzerland.

2019 Invited Lecture: International Conference on Chemistry of the Solid State (ICCOSS), NYU.

2018 Department Seminar: Faculty of Chemistry, Technion.

2018 Department Seminar: Department of Chemistry, Ben-Gurion University of the Negev.

2018 Department Seminar: Institute of Chemistry, Hebrew University of Jerusalem.

2018 Department Seminar: Department of Neurobiology, Weizmann Institute of Science.

2018 Department Seminar: Department of Ecology, Evolution and Behavior, Hebrew University of Jerusalem.

2018 Department Seminar: Faculty of Chemistry, Weizmann Institute of Science.

2017 Invited Lecture: MPI, Colloids & Interfaces, Potsdam, Germany.

2017 Invited Lecture: User Meeting, BESSY Synchrotron, Berlin, Germany.

2017 Department Seminar: School of Biological Sciences, Bristol University, U.K.

2017 Department Seminar: School of Engineering, EPFL, Lausanne, Switzerland.

2017 Invited Lecture: MRS Fall Meeting, Boston, USA.

2017 Invited Lecture: American Crystallographic Association Meeting, New Orleans, USA.

2017 Departmental Seminar: Department of Structural Biology, Weizmann Institute.