

Kanishka Biswas

Involvement in TE community. Kanishka Biswas is doing research in field of thermoelectrics for past 15 years. He has been provided notable new concept in this field which have been published in Nature, Science, JACS etc. He has popularized the thermoelectric research in India and now, there are nearly 35 groups works in thermoelectrics both in experiments and theory. He has participated board meeting in Asian Thermoelectric Society as Indian representative. He has significant collaborations around the world in thermoelectrics like with USA, China, Europe and Japan. He is serving as Executive Editor in ACS Applied Energy Materials where he has led two special issues on thermoelectrics. Further, he has handled significant number of papers on thermoelectrics. He has been acted as co-guest editor in Applied Physics Letter from thermoelectric special issue. He has co-organized several thermoelectric meetings under IUMRS, ICMAT Singapore, MRSI India and MRS USA. He is also part and Indian leader in the India-UK network of thermoelectric research. He and his group are teaching and doing outreach on thermoelectric cooling and power generation in India and motivated many young minds.

Field of Research: Solid State Inorganic Chemistry, Thermoelectric Energy Conversion, 2D Layered Materials, Topological Quantum Materials, Perovskite Halides, and Clean Water

Education:

Ph.D.	Solid State Chemistry	2009	Indian Institute of Science, Bangalore, India
M.S.	Chemistry	2006	Indian Institute of Science, Bangalore, India
B.Sc.	Chemistry Honors	2003	Jadavpur University, Kolkata, India

Work Experience:

2022-Present	Professor	New Chemistry Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
2018-2022	Associate Professor	New Chemistry Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
2014-2018	Assistant Professor	New Chemistry Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
2012-2014	Faculty (Ramanujan Fellow)	New Chemistry Unit, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
2009-2012	Post-doctoral Fellow	Department of Chemistry, Northwestern University, USA

Fellowships & Awards:

- Elected Fellow of the Indian Academy of Sciences (FASc) (2022)
- Shanti Swarup Bhatnagar Prize in Chemical Science (2021) (Highest honor in Indian Science)
- Merck Young Scientist Award in Chemical Science (2021)
- Silver medal prize of Society for Materials Chemistry (SMC) (2021)
- National Prize for Research in Inorganic and Physical Chemistry, JNCASR (2021)
- Sheikh Saqr Career Award Fellowship, ICMS, JNCASR (2020)
- ICSC-Materials Science Annual Prize, Materials Research Society of India (MRSI) (2020)
- Swarna-Jayanti Fellowship by DST (2019)
- Chemical Research Society of India (CRSI) Bronze Medal, India (2019)
- Emerging investigator in solid-state inorganic chemistry by American Chemical Society based on the publications in JACS, Chem Mater and Inorg. Chem. (2018)
- Young Scientist Wiley Award by International Union of Materials Research Societies in IUMRS-ICAM, Japan (2017)
- Materials Research Society of India (MRSI) Medal, (2017)
- IUMRS–MRS Singapore Young Researcher Merit Award, Singapore (2016)
- Young Affiliate of The World Academy of Sciences (TWAS) (2015-2019)

- Emerging Investigator in Inorganic Chemistry by Inorganic Chemistry Frontiers, Royal Society of Chemistry, UK (2015)
- Young Scientists Medal, Indian National Science Academy (INSA), New Delhi (2016)

Organisation of Scientific Meetings:

- Thermoelectric Theme Symposium, Materials Research Society of India (MRSI), India (2021)
- Virtual International Conference on Thermoelectrics, ITS (2021)
- India-UK Thermoelectric Conference, RSC and British Council, Bangalore, India (2018)

Research Publications Summary:

197 (Papers) + 11 (Book chapters) + 2 (Books); Patents – 6 (2 US + 1 PCT + 3 India)

Citation Analysis:

h-index of 61, with over 18280 citations [Ref. Google Scholar, 14th June 2023]

Other Professional Contributions:

- Editorial Advisory Board Member of Inorganic Chemistry, ACS (2022 onwards)
- Editorial Advisory Board Member of Materials Lab (2022 onwards)
- Editorial Advisory Board Member of Materials Lab, RSC (2021 onwards)
- Executive Editor, ACS Applied Energy Materials, ACS (2021 onward)
- Editorial Advisory Board Member of Material Horizons, RSC (2021 onwards)
- Editorial Advisory Board Member of JACS Au, ACS (2021 onwards)
- Editorial Advisory Board member of Journal of Materiomics, Elsevier (2021 onwards)
- Invited Fellow of Royal Society of Chemistry (FRSC), (2020)
- Editorial Advisory Board Member of Material Advances, RSC (2020 onwards)
- Editorial Advisory Board Member, iScience, Cell Press (2020 onward)
- Editorial Advisory Board Member, Journal of Solid State Chemistry, Elsevier (2020 onward)
- Editorial Advisory Board Member, Journal of Materials Chemistry A, RSC (2020 onward)
- Associate Editor, ACS Applied Energy Materials, ACS (2018 onward)

Most relevant publications

1. Maria, I.; Arora, R.; Dutta, M.; Roychowdhury, S.; Waghmare, U. V.; **Biswas, K.*** Metavalent Bonding Mediated Dual 6s² Lone Pair Expression Leads to Intrinsic Lattice Shearing in n-type TlBiSe₂. *J. Am. Chem. Soc.* 2023, 145, 9292.
2. Sarkar, D.; Samanta, M.; Ghosh, T.; Dolui, K.; Das, S.; Saurabh, K.; Sanyal, D. and **Biswas, K.*** All-scale Hierarchical Nanostructures and Superior Valence Band Convergence Lead to Ultra-high Thermoelectric Performance in Cubic GeTe. *Energy Environ. Sci.* 2022, 15, 4625.
3. Chandra, S.; Bhat, U.; Dutta, P.; Bhardwaj, A.; Datta, R. and **Biswas, K.*** Modular Nanostructures Facilitate Low Thermal Conductivity and Ultra-High Thermoelectric Performance in n-type SnSe. *Adv. Mater.* 2022, 2203725.
4. Acharyya, P.; Ghosh, T.; Pal, K.; Rana, K. S.; Dutta, M.; Swain, D.; Etter, M.; Soni, A.; Waghmare, U. V. and **Biswas, K.*** Glassy Thermal Conductivity in Cs₃Bi₂I₆Cl₃ Single Crystal. *Nat. Commun.* 2022, 13, 5053.
5. Roychowdhury, S.; Ghosh, T.; Arora, R.; Samanta, M.; Xie, L.; Singh, N. K.; Soni, A.; He, J.; Waghmare, U. V. and **Biswas, K.*** Enhanced Atomic Ordering Leads to High Thermoelectric Performance in AgSbTe₂. *Science*, 2021, 371, 722.
6. Dutta, M.; Pal, K.; Etter, M.; Waghmare, U. V. and **Biswas, K.*** Emphasis in Cubic (SnSe)_{0.5}(AgSbSe₂)_{0.5}: Dynamical off-centering of Anion Leads to Low Thermal Conductivity and High thermoelectric Performance. *J. Am. Chem. Soc.* 2021, 143, 16839.
7. Sarkar, D.; Ghosh, T.; Roychowdhury, S.; Arora, R.; Sajjan, S.; Sheet, G.; Waghmare, U. V. and **Biswas, K.***, Ferroelectric Instability Induced Ultralow Thermal Conductivity and High Thermoelectric Performance in Rhombohedral p-type GeSe Crystal. *J. Am. Chem. Soc.*, 2020, 142, 12237.
8. Chandra, S. and **Biswas, K.*** Realization of High Thermoelectric Figure of Merit in Solution Synthesized 2D SnSe Nanoplates via Ge alloying. *J. Am. Chem. Soc.*, 2019, 141, 6141.
9. Samanta, M.; Ghosh, T.; Arora, R.; Waghmare, U. V. and **Biswas, K.***, Realization of both n- and p-type GeTe Thermoelectrics: Electronic Structure Modulation by AgBiSe₂ Alloying. *J. Am. Chem. Soc.*, 2019, 141, 19505.
10. Jana, M. K.; Pal, K.; Warankar, A.; Mandal, P.; Waghmare, U. V. and **Biswas, K.*** Intrinsic rattler-induced low thermal conductivity in zintl type TlInTe₂. *J. Am. Chem. Soc.*, 2017, 139, 43503.