Dr. Banani Adhikari (Das)
Associate Professor
Department of Physics (DESH)
Siliguri Institute of Technology

Area of Research: Experimental Soft Condensed Matter (Liquid Crystals)

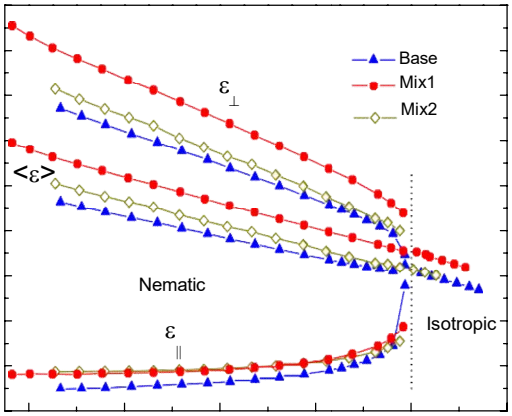
Expertise:

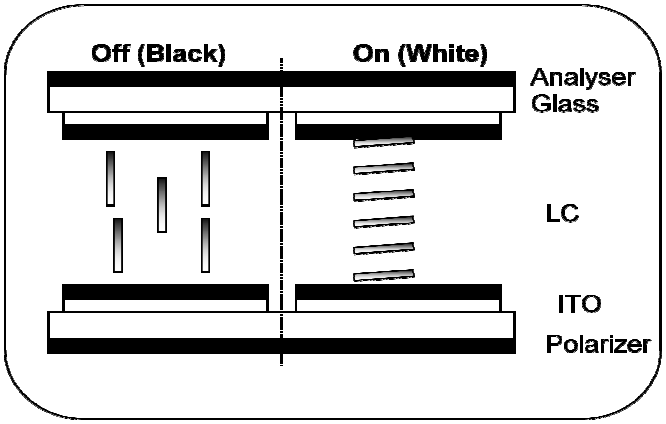
a) Electro optical studies on liquid crystal based smart display devices.
b) Research and Development of materials for Liquid Crystal Displays.
c) X-ray diffraction studies of liquid crystals.
d) Nuclear Magnetic Resonance Measurements of liquid crystals.
e) Physical characterization of Liquid Crystalline materials from optical, elastic constant, dielectric permittivity and magnetic susceptibility measurements.

Ph. D. Guided – 2
Ph. D. Continuing - 3

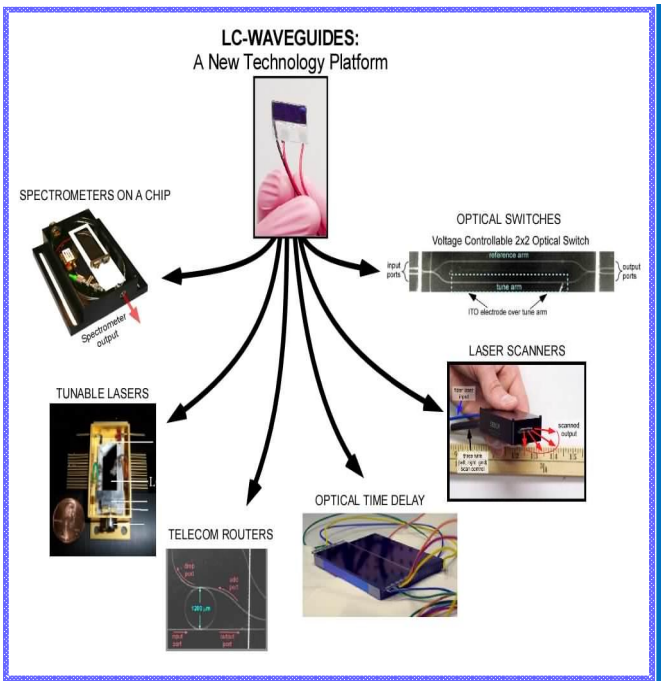
List of Major Research Projects implemented:

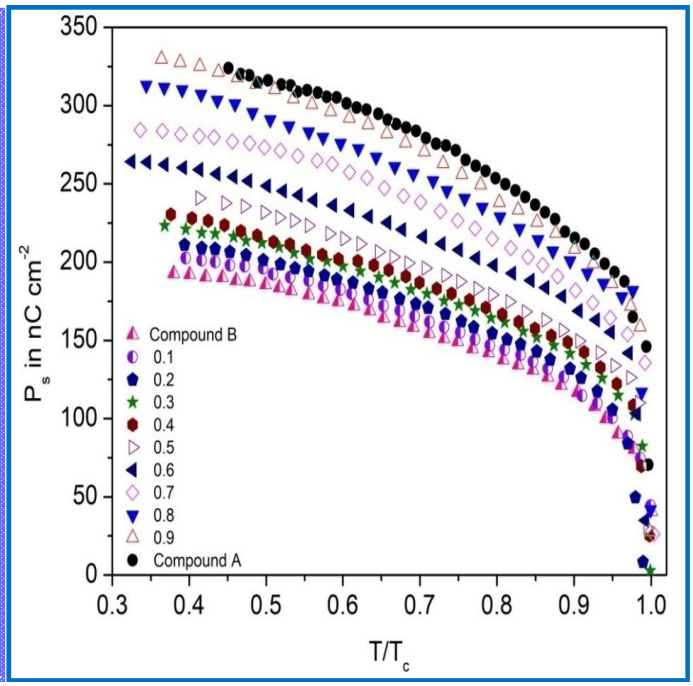
1. **Development of liquid crystalline materials with optimum properties for application in vertically aligned mode liquid crystal displays,** DST, New Delhi, 2007-2011 (SR/S2/CMP-29/2007), Total Cost: **Rs.34,28,000.00**





2. **Development of Antiferroelectric Liquid Crystalline Materials for Application in Optical Modulators with Symmetric Switching Times** DST, New Delhi, 2017-2021 (EMR/2016/005001). Total Cost: **Rs. 38,40,000**





Membership of academic bodies: Life member - Indian Liquid Crystal Society,
Life member - International Liquid Crystal Society
Life member - Nuclear Magnetic Resonance Society.

Key publications:

1. Dielectric Spectroscopy and Electrical Conductivity Measurements of a Series of Orthoconic Antiferroelectric Liquid Crystalline Esters Shantiram Nepal, Banani Das, Malay Kumar Das, Madhumita Das Sarkar and Roman Dabrowski **FERROELECTRICS** Vol 570, Issue – 1, pages 100 – 114, 2021.
2. Dielectric Spectroscopy and Electrical Conductivity Measurements on High-Tilted Antiferroelectric Materials,Shantiram Nepal, Banani Das, Malay Kumar Das, Katarzyna Strójwąs, Magdalena Urbańska, **Phase Transitions**, Vol 93, Issue 9, 2020 https:// doi.org /10.1080/01411594.2020.1813288.
3. Fast Switching Behaviour and Dielectric Parameters of two Chiral Ferroelectric Mesogens, Shantiram Nepal, Sarmistha Mondal, Anindita Sinha, Banani Das, Malay Kumar Das, Ewelina Dmochowska, Jakub Herman & Michal Czerwiński, **Liquid Crystals Published Online:** 04 Mar 2020, March 2020, Pages 1-10 DOI: 10.1080/02678292.2020.1735547
4. Effect of molecular structure on dielectric and electro-optic properties of chiral liquid crystals based on lactic acid derivatives, Barnali Barman, Banani Das, Malay Kumar Das, Věra Hamplová, Alexej Bubnov, **Journal of Molecular Liquids**, 283, 2019, 472-481.
5. Dielectric Properties of Chiral Ferroelectric Liquid Crystalline Compounds with Three Aromatic Rings Connected by Ester Groups, Malay Kumar Das 1, Barnali Barman , Banani Das , V ˇera Hamplová and Alexey Bubnov, **Crystals** 2019, 9, 473; doi:10.3390/cryst9090473 https://www.mdpi.com/2073-4352/9/9/473/pdf.
6. Preparation and study of the electro-optical properties of binary mixtures of orthoconic anti-ferroelectric esters and achiral phenyl pyrimidine liquid crystal, Anamika Pramanik, Malay Kumar Das, **Banani Das** and Roman Dąbrowski, *Soft Materials*, **13**, 201 (2015).
8. Fast switching negative dielectric anisotropic multicomponent mixtures for vertically

aligned liquid crystal displays, Prajnamita Dasgupta, Malay Kumar Das and **Banani Das**, *Materials Research Express*, **2**, 045015 (2015).

9. Self-assembling properties of lactic acid derivative with several ester linkages in the molecular core, Anamika Pramanik, Malay Kumar Das, **Banani Das**, Věra Hamplová, Miroslav Kašpar and Alexej Bubnov, *Phase Transitions*, **88**, 745 (2015).
10. Comparative study of the mesomorphic properties of several laterally fluorinated liquid crystalline materials, Prajnamita Dasgupta, Anamika Pramanik, Malay Kumar Das and **Banani Das**, *Liquid Crystals*, **42**, 1083 (2015).
11. Mesomorphic and structural properties of some liquid crystals possessing a bicyclohexane core, Malay Kumar Das, Prajnamita Dasgupta, **Banani Das** and Sudipta Kumar Sarkar *International Journal of Advanced Research*, **3**, 967 (2015).
12. Electro-optical properties of a new series of fluorinated antiferroelectric orthoconic liquid crystalline esters, Anamika Pramanik, Malay Kumar Das, **Banani Das**, Magdalena Żurowska and Roman Dąbrowski, *Liquid Crystals*, **42**, 412 (2015).
13. Mesomorphic, optical, dielectric, elastic and viscous properties of multi-component isothiocyanato mixtures, A. Pramanik, **B. Das**, M. Das, K. Garbat, S. Urban and R. Dabrowski, *Liquid Crystals,* **40**, 149 (2013).
14. Dielectric Permittivity and Viscoelastic Measurements of Two Tricomponent Mixtures Consisting of Laterally Fluorinated Terphenyl Derivatives, S. Basak, P. Dasgupta, **B. Das,** M.K. Das and R. Dabrowski, *Acta Physica Polonica A*, **123**, 714 (2013).
15. Optical, dielectric and visco-elastic properties of a few hockey stick-shaped liquid crystals with a lateral methyl group, Anish Chakraborty, Malay Kumar Das, **Banani Das**, Ute Baumeister, Wolfgang Weissflog, *Journal of Materials Chemistry C*, **1**, 7418 (2013).
16. Rotational viscosity measurements of bent-core nematogens, Anish Chakraborty, Malay Kumar Das, **Banani Das**, Anne Lehmann and Carsten Tschierske, *Soft Matter*, **9**, 4273 (2013).
17. A comparative study of the mesomorphic properties of fluoro-isothiocyanated and fluorinated terphenyl liquid crystals from birefringence, static dielectric permittivity, splay elastic constant and rotational viscosity measurements, M. K. Das, A. Pramanik, **B. Das**, Ł. Szczuciński and R. Dabrowski, *J. Phys. D: Appl. Phys.,* **45**, 415304 (2012).
18. Mesomorphic and structural properties of liquid crystal possessing a chiral lactate unit, **Banani Das**, Anamika Pramanik, Malay Kumar Das, Alexej Bubnov, Veˇra Hamplova, Miroslav Kašpar, *Journal of Molecular Structure*, **1013**, 119 (2012).
19. Determination of the orientational order parameter of the homologous series of 4-cyanophenyl 4-alkylbenzoate (n.CN) by different methods, Malay Kumar Das, Gautam Sarkar, **Banani Das**, Ratan Rai and Neeraj Sinha, *J. Phys.: Condens. Matter*, **24**, 115101 (2012).
20. New hockey stick compounds with a lateral methyl group showing nematic, synclinic and anticlinic smectic C phases, A. Chakraborty, **B. Das**, M. K. Das, S. Findeisen-Tandel , M.-G. Tamb, U. Baumeister, H. Kresse and W. Weissflog, *Liquid Crystals,* **38**, 1085 (2011).