

Rajesh Bisht, Ph.D.

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Profile

Dr. Rajesh Bisht is an Assistant Professor of Chemistry at the College of Technology, Sardar Vallabhbhai Patel University of Agriculture and Technology, Meerut, Uttar Pradesh, India. Originally from Shyampur, a quaint town near the picturesque city of Rishikesh, Dr. Bisht has demonstrated exceptional academic achievements. He has successfully qualified the CSIR-NET JRF and GATE examinations and was awarded the prestigious CSIR Junior Research Fellowship. With a Ph.D. specializing in the development of optically responsive materials, Dr. Bisht's academic journey spans over a decade of extensive research and postdoctoral experience across India, Israel, and France. His research expertise includes the synthesis and characterization of advanced materials for diverse applications, including solar energy, electronic devices, and optical technologies. Alongside publishing in high-impact journals, He enjoys teaching/mentoring students, fostering collaborations, and presenting complex ideas to diverse audiences.

Education

CSIR-National Chemical Laboratory, India Ph.D., Chemical Science, Advisor: Dr. Jayaraj Nithyanandhan Thesis: "NIR Active Squaraine Dyes for Dye-sensitized Solar Cells"	2012-2018
Hemwati Nandan Bahuguna Garhwal University, Srinagar, India MSc, Chemistry (1 st division)	2009-2011
Hemwati Nandan Bahuguna Garhwal University, Srinagar, India BSc, Physics, Chemistry, and Mathematics (1 st division)	2006-2009

Research Interests

- Design and synthesis of photo-responsive organic molecules/polymers
- Applications of organic molecules/polymers in organic optoelectronic devices such as Dye-Sensitized Solar Cells, Organic solar cells, and Organic field-effect transistors.
- Development of chromogenic/fluorogenic sensors for chemosensing, mechanical sensing, and biosensing.

Professional Experience

Assistant Professor, College of Technology Sardar Vallabhbhai Patel University of Agriculture and Technology	2024- Present
Postdoctoral Researcher, École normale supérieure, Paris-Saclay, France	2022-2023
<ul style="list-style-type: none">• Design and development of mechanochromic and photochromic polymers	

**Postdoctoral Researcher,
Ben-Gurion University of the Negev, Israel**

2019-2022

- Development of novel polydiacetylenes-based polymers and studied their electronic and optical properties

**Senior research fellow,
CSIR-National Chemical Laboratory, India**
Advisor: **Dr. Jayaraj Nithyanandhan**

2014-2018

- Design and synthesis of organic dyes and molecules for dye-sensitized solar cells
- Investigating the structure-property relationship of the dyes/molecules
- Investigated photophysical, electrochemical, and photovoltaic properties of dyes

**Junior research fellow,
CSIR-National Chemical Laboratory, India**

2012-2014

- Designed and synthesized novel organic photolabile triggers
- Investigated photochemical properties of novel photo-triggers under various reaction conditions

Publications

1. Kadamannil, N. N.; Shames, A. I.; **Bisht, R.**; Biswas, S.; Shauloff, N.; Lee, H.; Kim, J.-M.; Jelinek, R. Light-Induced Self-Assembled Polydiacetylene/Carbon Dot Functional “Honeycomb.” ACS Appl. Mater. Interfaces 2024. <https://doi.org/10.1021/acsami.4c03368>
2. Biswas, S., Shauloff, N., **Bisht, R.**, and Jelinek, R.* Anthraquinone-Functionalized Polydiacetylene Supercapacitors. *Advanced Sustainable Systems*, **2023**, 2300035 ([link](#))
3. Shauloff, N., **Bisht, R.**, Turkulets, Y., Manikandan, R., Morag, A., Lehrer, A., Baraban, J., Shalish, I., and Jelinek, R.* Multispectral and Circular Polarization-Sensitive Carbon Dot-Polydiacetylene Capacitive Photodetector. *Small* **2022**, 2206519 ([link](#))
4. Singh A.K., Sudhakar V., Javaregowda B.H., **Bisht R.**, Krishnamoorthy K.* and Nithyanandhan J.* Modular TiO₂ -Squaraine Dyes/Electrolyte Interface for Enhanced Voc and Jsc of the Dye-Sensitized Solar Cell Devices. *ChemPhotoChem* **2023**, 7, e202200171([link](#))
5. **Bisht, R.**; Dhyani, V.; Jelinek, R.* Aggregation-Dependent Chromism and Photopolymerization of Aminoanthraquinone-Substituted Diacetylenes. *Advanced Optical Materials*, **2020**, 2001497 ([link](#))
6. Singh, A.K.; Maibam, A.; Javaregowda, B.; **Bisht, R.**; Kudlu A.; Krishnamurthy S.; Krishnamoorthy K.; Nithyanandhan, J.* Unsymmetrical Squaraine Dyes for Dye-Sensitized Solar Cells: Position of Anchoring Group Controls the Orientation and Self-Assembly of Sensitizers on TiO₂ Surface and Modulate Its Flat Band Potential. *J. Phys. Chem. C*, **2020**, 124, 18436–1845([link](#))
7. **Bisht, R.**; Mele Kavungathodi, M. F.; Nithyanandhan, J.* Indenoquinoline Based Unsymmetrical Squaraine Dyes for Near-Infrared Absorption: Investigating the Steric and Electronic Effects in Dye-Sensitized Solar Cells. *Chemistry – A European Journal*, **2018**, 24, 16368–16378 ([link](#))

8. **Bisht, R.;** Sudhakar V., Mele Kavungathodi, M. F.; Karjule, N.; Nithyanandhan, J.* Fused Fluorenylindolenine Donor based Unsymmetrical Squaraine Dyes for Dye-sensitized Solar Cells. *ACS Appl. Mater. Interfaces*, **2018**, 10, 26335–26347 ([link](#))
9. **Bisht, R.;** Singh S.; Krishnamoorthy K.; Nithyanandhan, J.* Modulated Photochemical Reactivities of O-Acetylated (3',5'-Dimethoxyphenyl)heteroaryl Acyloin Derivatives Under Direct Irradiation And Photo-induced Electron Transfer Conditions. *Photochem. Photobiol. Sci.*, **2018**, 17, 835-845 ([link](#))
10. **Bisht, R.;** Mele Kavungathodi, M. F.; Singh, A. K.; Nithyanandhan, J.* Panchromatic Sensitizer for Dye-Sensitized Solar Cells: Unsymmetrical Squaraine Dyes Incorporating Benzodithiophene π -Spacer with Alkyl Chains to Extend Conjugation, Control the Dye Assembly on TiO₂, and Retard Charge Recombination. *J. Org. Chem.*, **2017**, 82, 1920–1930 ([link](#))
11. Thangaraj, M.; Bhojgude, S. S.; **Bisht, R.;** Gonnade, R. G.; and Biju, A. T.* Diels–Alder Reaction of Tropones with Arynes: Synthesis of Functionalized Benzobicyclo[3.2.2]nonatrienones. *J. Org. Chem.*, **2014**, 79, 4757–4762 ([link](#))

Conferences/Symposium Presentations

- **Bisht, R.,** Poggi, B., Métivier, R., and Allain, C. Naphthopyran doped mechanochromic polymers for mechanical strain/stress sensors. Poster at **Web Conference PhotOnline'2023**, , Gif-sur-yvette, France. 1-2 Feb 2023
- **Bisht, R.,** Poggi, B., Métivier, R., and Allain, C. Naphthopyran doped mechanochromic polymers for mechanical strain/stress sensors. Poster at **10ème journées scientifiques du LabEx CHARMMAT**, Gif-sur-yvette, France. 1-2 December 2022
- **Bisht, R. and Jelinek, R.** Solvent controlled chromism and photopolymerization of anthraquinone appended diacetylene. *Poster* at the **85th Meeting of the Israel Chemical Society, 2020, Jerusalem, Israel.** 18-19th February 2020
- **Bisht, R. and Nithyanandhan, J.** NIR Active Squaraine Dyes for Dye-Sensitized Solar Cells: Modulating Aggregation and Electronic Properties of the Dyes. *Oral presentation* at **Divisional Symposium**, at CSIR-National Chemical Laboratory, Pune, India. 30th November 2017
- **Bisht, R., M. K., M. F., Singh, A. K., and Nithyanandhan, J.,** "Squaraine Dyes Incorporating Benzodithiophene π -spacer With Alkyl Chains to Extend Conjugation and Retard Charge Recombination" *Poster* at **National Science Day**, at CSIR-National Chemical Laboratory, Pune, India. 23th-28th February 2017
- **Bisht, R., Sil, MC. Kubandiran, K., and Nithyanandhan J.** Extended Benzoin-based Phototriggers: Efforts towards Photochemical Processing for Organic Electronics. *Poster* at **17th CRSI National Symposium in Chemistry and 9th CRSI-RSC Symposium**, at CSIR-National Chemical Laboratory, Pune, India. 6th-8th February 2015

- **Bisht, R., Sil, MC. Kubandiran, K. and Nithyanandhan J.** Processing Small Molecules for Organic Electronics by Photoactivation. *Poster* at **2nd TAPSUN Conference** at CSIR-CLRI, Chennai, India. 13th -14th September 2013

Awards And Achievements

- Awarded Kreitman Post-doctoral fellowship by Kreitman Foundation, Israel, 2019
- Awarded Junior Research Fellowship by CSIR for pursuing a Ph.D., in 2012
- Qualified Graduate Aptitude Test in Engineering (GATE) in chemistry (CY), 2012
- Qualified National Eligibility Test conducted by CSIR-UGC, India 2011