

# Curriculum Vitae

**Young Researcher and Teacher with an Aptitude for Creative Idea and Problem**

**Solving Mind. Excellent Team Skills and Strong Communication Abilities**

**Name:** Subham Bhattacharjee

**Gender:** Male

**Date of Birth:** 17-03-1986

**Nationality:** Indian

**Email:** [sbpb2012@gmail.com](mailto:sbpb2012@gmail.com)

**Phone:** +91 8910444030 (M)

**Key Skills:** *Fabrication of polymer thin film by rotational molding, Multi-step organic synthesis, Polymer synthesis and characterization, Strong communication and written skills, Strong analytical skills, Ability to work independently, Ability to do journal and patent search and analysis, Strong and demonstrated formulation development skill, Have passion, enthusiasm and optimistic work attitude*




## *Current Position*

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**February, 2016-present:** Research Scientist (Postdoc), Department of Chemical Engineering and Chemistry, Eindhoven University of Technology, The Netherlands.

**Supervisor:** [Prof. Dr. R. P. \(Rint\) Sijbesma](#)

### **Research Topics:**

-  Design, syntheses and application of nanoporous polymer membrane based on polymerizable discotic liquid crystals.
-  Probing interfacial damage in composites with mechanofluorescence.
-  Covalent adaptable networks for improved sintering in selective laser sintering (SLS) processes.

## *Previous Research Background & Education*

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August 2014-January 2016      **Research Associate (Postdoc)**, Organic Chemistry, Indian Institute of Science (IISc), India

**Supervisor:** [Prof. Dr. Santanu Bhattacharya](#)

2009-2014      **Ph.D.**, Organic Chemistry, Indian Institute of Science (IISc), India

**Thesis:**“*Design, Syntheses and Applications of Novel Two-Component Gels and Soft-Nanocomposites*”

Supervisor: **Prof. Dr. Santanu Bhattacharya**

2007-2009

**M.Sc., Organic Chemistry**, University of North Bengal, India

2004-2007

**B.Sc., Chemistry**, Raiganj University College, University of North Bengal, India


### *Research Expertise*

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#### **CHEMISTRY/CHEMICAL ENGINEERING**


 **Polymer Chemistry:**Design and multi-step synthesis of :

- Polymerizable discotic liquid crystals, their polymerization in the liquid crystalline phase, removal of template to fabricate **nanoporous polymer** thin film and subsequent investigation of their potential applications;
- Mechanophore-functionalized filler particle in polymer matrix to probe **interfacial damage with mechanofluorescence**;
- Polymer compositions based on covalent adaptable networks (CAN) to **improve the sintering** and hence extend the range of materials suitable for SLS.


 **Supramolecular Chemistry:**Exploring a diverse range of non-covalent interactions such as:

- **Hydrogen bonding**
- **Halogen bonding**
- **Metal ion coordination**
- **Electrostatic**
- **Charge transfer**

in addition to  $\pi$ - $\pi$  and Van der Waals interactions to furnish a diverse class of organo- and hydro-gelators and subsequent investigation of their potential applications.

 **Instrument handled:** NMR spectroscopy, FT-IR spectroscopy, Mass spectrometry and elemental analysis, UV/Vis, Fluorescence and Raman spectroscopy, Circular Dichroism spectroscopy, Differential Scanning Calorimetry (DSC), Atomic Force Microscopy (AFM), Transmission Electron Microscopy (TEM), Polarized Optical Microscopy (POM), Fluorescence Microscopy, Veeco Optical Profilers, Malvern Zetasizer, Rheometer, Powder X-ray Diffractometer (PXRD), Single Crystal X-ray Diffractometer.

#### **THEORETICAL CALCULATIONS**

 **Density functional theory (DFT):** To determine the optimum geometry, preferred conformation, HOMO-LUMO energy levels of synthesized molecules (*Gaussian 03, ChemCraft 1.6*).

## OTHER RELEVANT SKILLS

- ✚ **Computer:** Well-versed in software used for scientific writing, presentation, data analysis (Origin, Sigma plot, GraphPad Prism, Office Excel, TextPad, etc), database searching (Pubmed, Scifinder and Reaxys), graphic handling (Paint, Photoshop, Office picture manager, Blender 2.75, Chemdraw) and Movie/Video (Web Enhanced Object) making/editing.
- ✚ Experience in scientific writing including manuscripts in peer reviewed journals as well as patents.

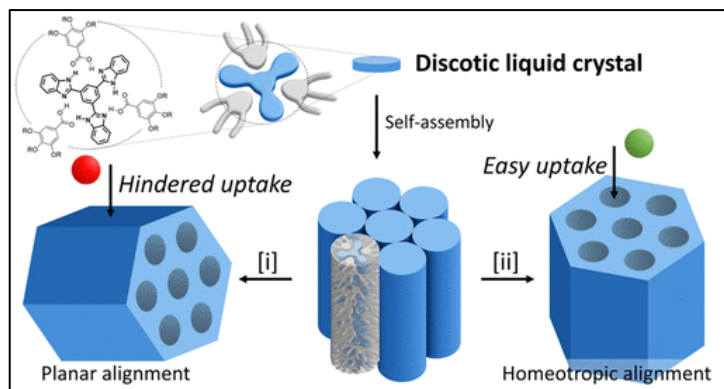
## Research Publications

1. Nilanjan Dey, Subham Bhattacharjee and Santanu Bhattacharya\*, **Addressing Multiple Ions Using Single Optical Probe: Multi- Color Response via Mutually Independent Sensing Pathways.** *Chem. Select*, 2020, 5, 452-462.
2. Bappa Maiti, Subham Bhattacharjee and Santanu Bhattacharya\*, **Palladium-induced transformation of nematic liquid crystals to robust metallogel comprising self-assembled nanowires.** *Chem. Commun.*, 2019, 55, 12651-12654.
3. Indre Urbanaviciute, Xiao Meng, Michal Biler, Yingfen Wei, Tim D. Cornelissen, Subham Bhattacharjee, Mathieu Linares and Martijn Kemerink\*, **Negative piezoelectric effect in an organic supramolecular ferroelectric.** *Mater. Horiz.*, 2019, 6, 1688-1698.
4. Bappa Maiti, Subham Bhattacharjee and Santanu Bhattacharya\*, **Perfluoroarene Induces a Pentapeptidic Hydrotrope into a pH-Tolerant Hydrogel Capable of Naked Eye Sensing of  $\text{Ca}^{2+}$  Ion.** *Nanoscale*, 2019, 11, 2223-2230.
5. Subham Bhattacharjee, Jody A. M. Lugger and Rint P. Sijbesma\*, **Pore size dependent cation adsorption in a nanoporous polymer film derived from a plastic columnar phase.** *Chem. Commun.*, 2018, 54, 9521-9524.

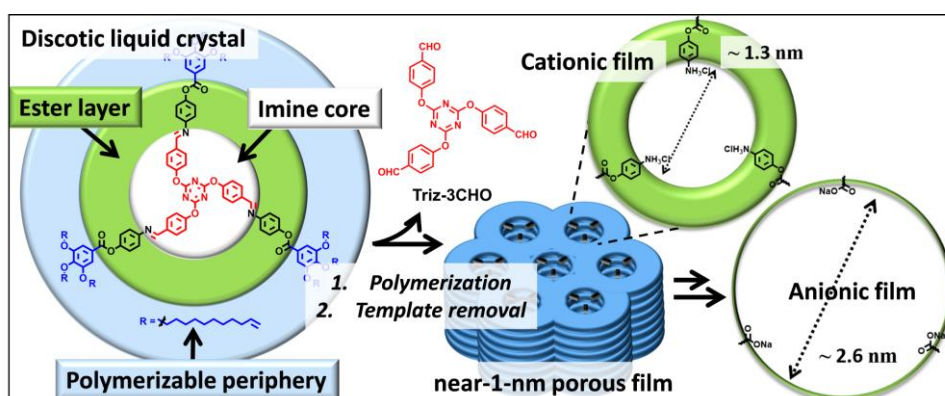


6. Indre Urbanaviciute, Subham Bhattacharjee, Michal Biler, Jody A. M. Lugger, Tim D. Cornelissen, Patrick Norman, Mathieu Linares, Rint P. Sijbesma and Martijn Kemerink. **Suppressing depolarization by tail substitution in an organic supramolecular ferroelectric.** *Phys. Chem. Chem. Phys.*, 2019, 21, 2069-2079.

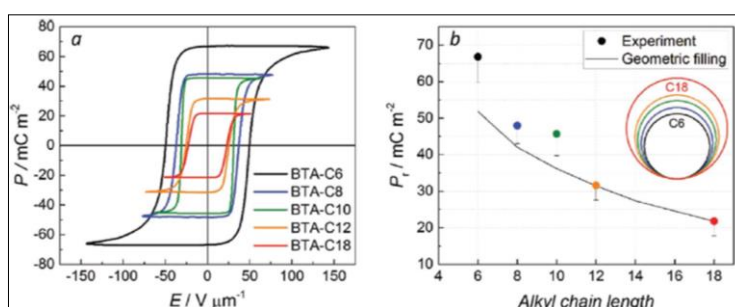
7. Jody A. M. Lugger, D. J. Mulder, **Subham Bhattacharjee**, Rint P. Sijbesma\*, **Homeotropic Self-Alignment of Discotic Liquid Crystals for Nanoporous Polymer Films**. *ACS Nano*, 2018, 12, 7, 6714–6724.



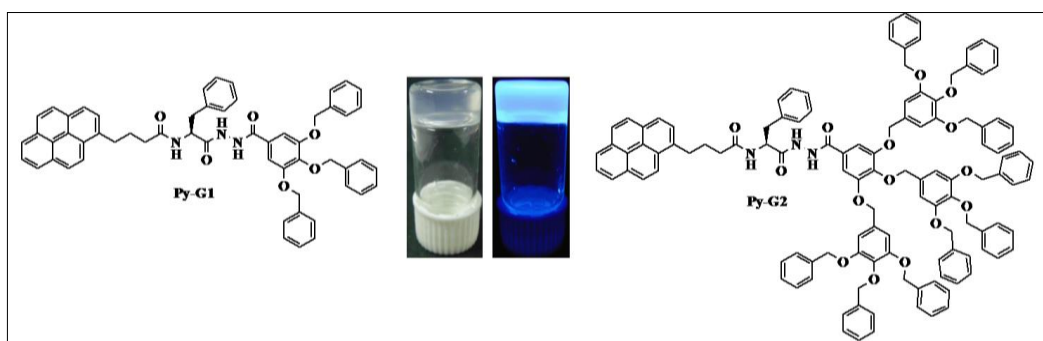
8. **Subham Bhattacharjee**, Jody A. M. Lugger, Rint P. Sijbesma\*, **Tailoring Pore Size and Chemical Interior of near 1 nm Sized Pores in a Nanoporous Polymer Based on a Discotic Liquid Crystal**. *Macromolecules*, 2017, 50, 2777–2783.



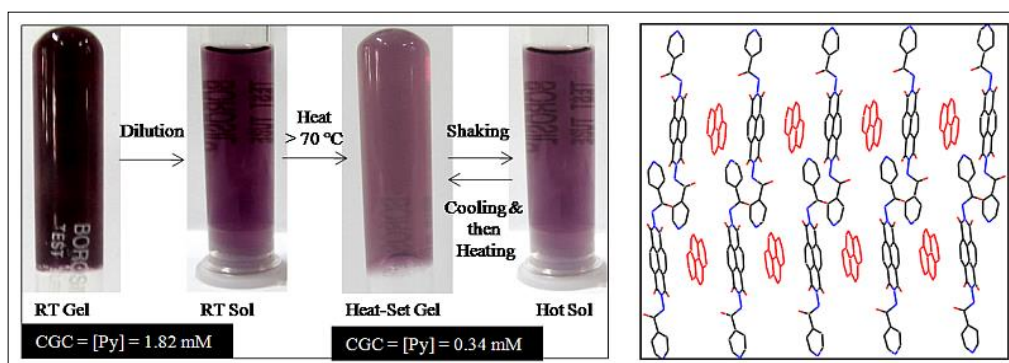
9. Indre Urbanaviciute, Xiao Meng, Tim D. Cornelissen, Andrey V. Gorbunov, **Subham Bhattacharjee**, Rint P. Sijbesma and Martijn Kemerink\*, **Tuning the Ferroelectric Properties of Trialkylbenzene-1,3,5-tricarboxamide (BTA)**. *Adv. Electron. Mater.*, 2017, 3, 1600530.



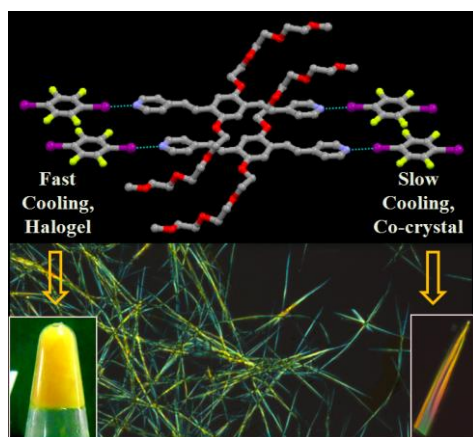
10. Subham Bhattacharjee, Bappa Maiti, Dipen Biswakarma and Santanu Bhattacharya\*, **Gelation of Novel Pyrene-Cored Chiral Dendrimers: Dendritic Effect in Gelation and Shear Thinning Behavior.** *Macromol. Symp.*, 2016, 369, 14-18.



11. Subham Bhattacharjee, Bappa Maiti and Santanu Bhattacharya\*, **First report of charge-transfer induced heat-set hydrogel. Structural insights and remarkable properties.** *Nanoscale*, 2016, 8, 11224-11233.



12. Subham Bhattacharjee and Santanu Bhattacharya\*, **The Remarkable Role of C—I⋯N Halogen-Bonding in Thixotropic 'Halo'gel Formation.** *Langmuir*, 2015, 57, 6973-6988.

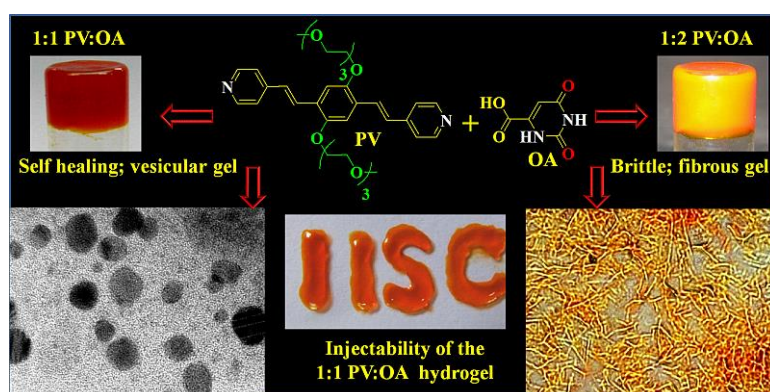




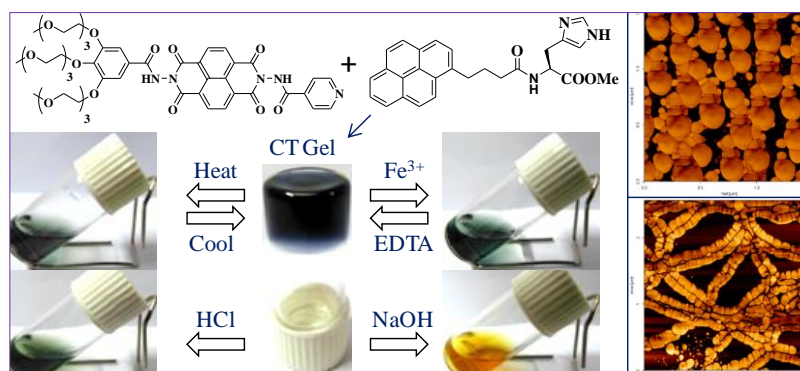
13. Subham Bhattacharjee and Santanu Bhattacharya\*, **Role of synergistic  $\pi$ - $\pi$  stacking and  $X-H\cdots Cl$  ( $X = C, N, O$ ) H-bonding interactions in gelation and gel phase crystallization.** *Chem. Commun.*, 2015, 51, 7019-7022.



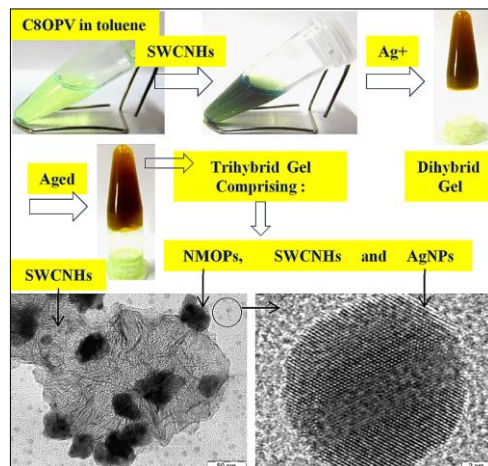
14. Subham Bhattacharjee and Santanu Bhattacharya\*, **Orotic acid as a useful supramolecular synthon for the fabrication of an OPV based hydrogel: stoichiometry dependent injectable behavior.** *Chem. Commun.*, 2015, 51, 6765-6768.



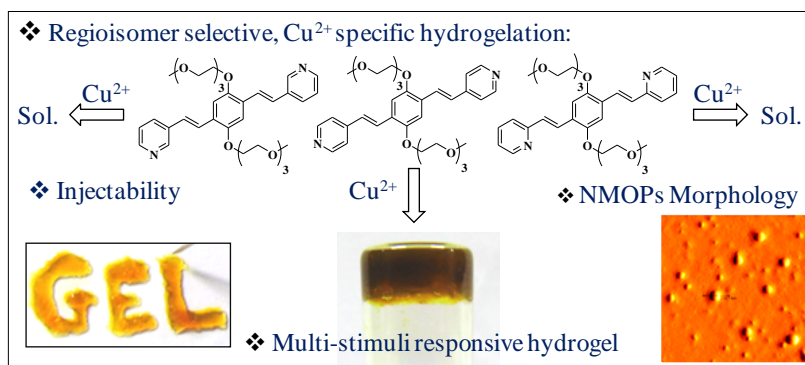
15. Subham Bhattacharjee and Santanu Bhattacharya\*, **Charge Transfer Induces Formation of Stimuli-Responsive, Chiral, Cohesive Vesicles-on-a-String that Eventually Turn into a Hydrogel.** *Chem. Asian J.* 2015, 10, 572-580.



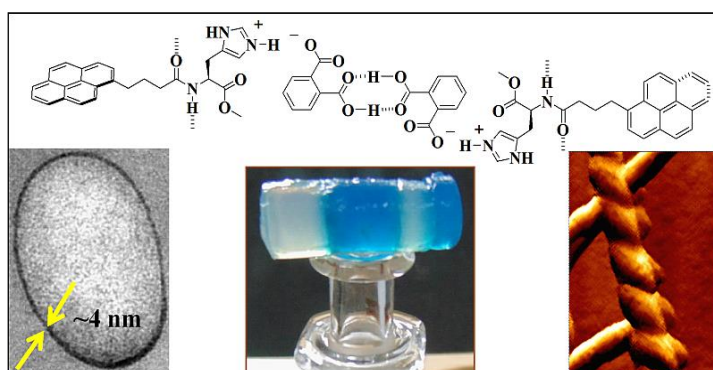
**16. Subham Bhattacharjee, Suman K. Samanta, Parikshit Moitra, K. Pramoda, Ram Kumar, Santanu Bhattacharya\* and C. N. R. Rao\*, Nanocomposite Made of an Oligo(*p*-phenylenevinylene)-Based Trihybrid Thixotropic Metallo(organo)gel Comprising Nanoscale Metal–Organic Particles, Carbon Nanohorns, and Silver Nanoparticles. *Chem. Eur. J.* 2015, 21, 5467-5476.**



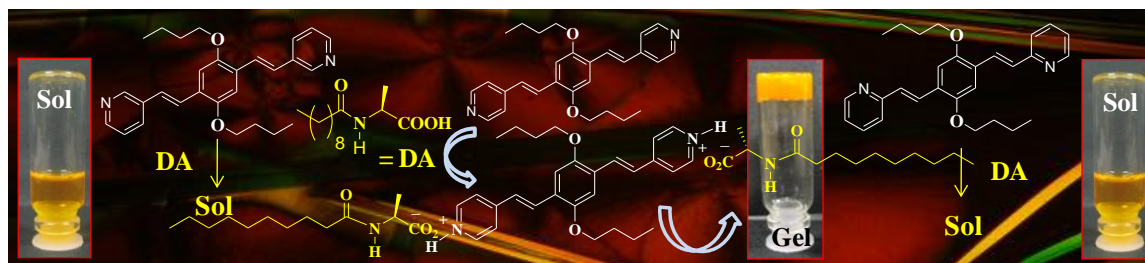
**17. Subham Bhattacharjee and Santanu Bhattacharya\*, Pyridylenevinylene based  $\text{Cu}^{2+}$ -specific, injectable metallo(hydro)gel: thixotropy and nanoscale metal–organic particles. *Chem. Commun.*, 2014, 50, 11690-11693.**



**18. Subham Bhattacharjee and Santanu Bhattacharya\*, Phthalate mediated hydrogelation of a pyrene based system: a novel scaffold for shape-persistent, self-healing luminescent soft material. *J. Mater. Chem. A*, 2014, 2, 17889-17898.**



**19. Subham Bhattacharjee, Sougata Datta and Santanu Bhattacharya\***, **Remarkable Regioisomer Control in the Hydrogel Formation from a Two-Component Mixture of Pyridine-End Oligo(*p*-phenylenevinylene)s and *N*-Decanoyl-L-alanine**. *Chem. Eur. J.*, 2013, 19, 16672-16681.



## Patents

- 1. Subham Bhattacharjee, Deepa Bhagat and Santanu Bhattacharya\***, **Nanogels, Methods and Devices Thereof, For Managing *Holtrichia Consanguinea***. Indian Patent granted. Application No. **201641024309 A**. Award Date: 19/01/2018.
- 2. Subham Bhattacharjee, Deepa Bhagat, Dipen Biswakarma and Santanu Bhattacharya\***, **A Reusable Charge-Transfer Based Agrogel**. Indian Patent filed. Application No. **201741016464**.
- 3. Subham Bhattacharjee, Deepa Bhagat and Santanu Bhattacharya\***, **Nanogels, Methods and Devices Thereof, For Managing *Holtrichia Consanguinea***. Patent filed. Application No. **PCT/IN2017/050290**.

## Conference Presentation

- ✚ International Conference on Molecular Systems Engineering (ICMSE), University of **Basel**, Switzerland, 26-29 August **2017**.
- ✚ International Symposium on Macrocyclic & Supramolecular Chemistry (ISMSC) in conjunction with ISACS: Challenges in Organic Materials & Supramolecular Chemistry, University of **Cambridge**, UK, 2-6 July **2017**.
- ✚ Indo-US Symposium on Bio-inspired Supramolecular and Polymer Assembly, The Travancore Heritage, **Kerala**, India, December 15-17, **2013**.
- ✚ Indo-US Symposium on Molecular Materials, Indian Institute of Science, **Bangalore**, India, July 15-17, **2013**.
- ✚ Indo-US Workshop on “Advanced and Nano-Structured Materials” Kanada Hall, JNCASR, **Bangalore**, India, January 21-22, **2013**.
- ✚ IISc-Centenary Conference, Indian Institute of Science, **Bangalore**, India, December 13-16, **2012**.



### *Awards, Fellowship & Positions*

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- + Inspire Faculty Award in Chemistry on January 2018 call by Department of Science & Technology (DST), India.
- + Junior and Senior Research Associate Fellowship, IISc, August, **2014** to January 2016.
- + Junior and Senior Research Fellowship, *Council of Scientific and Industrial Research* (CSIR), Govt. of INDIA, during Ph.D.**2009-2014**.
- + **All India Rank 10** in Graduate Aptitude Test of Engineering (GATE) in Chemistry (Percentile score 99.86) in the year **2009**.
- + Post-Graduate Merit Scholarship for university rank holder during M.Sc. (**2007-2009**) for securing the highest marks in B.Sc. in the North Bengal University, Siliguri, India (**2007**).
- + **Gold Medal** award for securing the highest marks in B.Sc. in the North Bengal University, Siliguri, India (**2007**).