Dharmendra Pratap SINGH

Curriculum vitae

Unité de Dynamique et Structure des Matériaux Moléculaires EA 4476 (UDSMM),
Université du Littoral Côte d'Opale (ULCO)
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• EDUCATION

2016	Ph.D. (Liquid Crystal Nanocomposites) Department of Physics, University of Lucknow, India
2008	Master (Optoelectronics) Department of Physics, University of Lucknow, India

• CURRENT POSITION(S)

2021 – Present Associate Professor
Unité de Dynamique et Structure des Matériaux Moléculaires (UDSMM), Université du Littoral Côte d'Opale (ULCO), Calais, France

2019 –Present Director
Industrial engineering 1st year, Engineering School, ULCO, Longuenesse, France

2018 –2021 Assistant Professor
UDSMM, ULCO, Calais, France

• PREVIOUS POSITIONS

2021	Visiting Professor University of Wurtzburg, Germany
2020 –2022	Visiting Researcher Ghent University, Belgium
2018	Postdoctoral Fellow (Thermoelectric liquids for energy and photothermal measurement) Unité de Dynamique et Structure des Matériaux Moléculaires, Université du Littoral Côte d'Opale, Dunkerque, France
2017	Postdoctoral Fellow (Graphene-nematic hybrid materials for photovoltaic applications) Unité de Dynamique et Structure des Matériaux Moléculaires, Université du Littoral Côte d'Opale, Calais, France

• FELLOWSHIPS AND AWARDS

2022 – 2025	Individual Research Bonus grant, ULCO/CNU, Section 63, France
2022	Research Quality Bonus by ULCO for developing instrumentation
2017	Young Scientist Award in Physical Sciences by Indian Science Congress Association (ISCA), India
2016	International Travel Grant by Department of Science & Technology (DST), India
2015	3rd Best Paper Research Award, Korean Information Display Society (KIDS), South Korea
2013	3rd Best Paper Research Award, SPIE, Cambridge University, United Kingdom
2013	International Travel Grant by Council of Scientific and Industrial Research (CSIR), India
2013–2015	Senior Research Fellowship (SRF) by Council of Scientific and Industrial Research (CSIR), India
2009–2012	Junior and Senior Research Fellowship by Department of Science & Technology (DST), India

• SCIENTIFIC PROJECTS

2022 – 2024	Principal Investigator of Project Samuel de Champlain with Prof. Rafik NACCACHE (Concordia University) and Prof. Federico ROSEI (INRS) Canada Project: Non-toxic Quantum dots-based hybrid Solar Cells: Control over the recombination rate and carrier multiplication by introducing a columnar mesogenic layer
2022 – 2024	Principal Investigator of Project PHC Galilée 2022 with Prof. Luciano DE SIO, Università degli Studi di Roma "La Sapienza", Italy Project: Photo-thermal therapy of melanoma cancer cells via antibody functionalized biomass-derived carbon nanodots
2021 – 2023	Principal Investigator of Project PHC PROCORE 2021 with Prof. Abhishek K. SRIVASTAVA, The Hong Kong University of Science and Technology, Hong Kong

Project: Fabrication and characterization of photo-aligned molecular motor/columnar mesogens based multifunctional devices for plastic electronics

2021– 2022 Responsible of Project BQR, ULCO
Project: Composites of carbon nanofibers and organic semiconductors for energy harvesting

2020 – 2022 Principal Investigator of Project PHC STAR 2021 with Prof. Young-ki KIM, Pohang University of Science and Technology, South Korea
Project: Bio-synthesis of 3D functional Carbon nanomaterial/ Mesogenic composites and their use in real time Arsenic, Fluoride & Chloride detection in polluted water and soil

2020 Principal Investigator of Project IRENE "EQUIPEMENTS PHARE 2020"
Project: New perspectives for energy storage using columnar liquid crystal materials associated with MXenes

2020 Principal Investigator of Project I-SITE ULNE with Prof. Kristiaan NEYTS, Ghent University, Belgium
Project: Improvement of the efficiency of photovoltaic converters and development of a new generation of organic light-emitting diodes by developing a methodology for the photoalignment of discotic mesogens

- **SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS**

2018 – 2022 Number of Postdocs: 0, Number of Ph.D.: 04 (01 joint Ph.D. with Tunesia), Number of Master/Engineering Students: 04 (out of which 01 winner of Charpak Fellowship from University of Mumbai, India, 01 under Samuel De Champlain project with Canada)

2022 – 2025 Ph.D. thesis-Mamadou BARRY: Synthesis and characterization of new MXene derivatives for energy storage and conversion

2020 – 2023 Ph.D. thesis-Vincent PIGNIER: New perspectives for energy storage using columnar liquid crystal materials associated with lithium.

2018 – 2021 Ph.D. thesis-Asmita SHAH: Organic materials based on discotic liquid crystals for application in flexible photovoltaic devices.

- **TEACHING ACTIVITIES**

2020 – Present Teaching position – Electronic systems, Industrial electronics, Sensors, Energy materials, Research methodology, Ecole d'Ingénieurs du Littoral Côte d'Opale (EILCO), Calais and Longuenesse, France

2018 – Present EILCO Tutor for monitoring engineering students, (08 students), during their internships at industries, EILCO, France

- **ORGANISATION OF SCIENTIFIC MEETINGS**

2021 Member of organizing committee of ISyDMA'6 conference and chair-person of ISSAME 2021 summer school organized by UDSMM, ULCO France

2021 Member of organizing committee of CFCL, organized by UDSMM, ULCO France

- **INSTITUTIONAL RESPONSIBILITIES**

2021 – Present Co-Responsible of the International Collaboration, Technological and Environmental Changes, ULCO

2020– Present Member of the Board of Research, Technological and Environmental Changes, ULCO

- **COMMISSIONS OF TRUST/MEMBERSHIPS OF EVALUATION BOARD**

2021 Member of the selection committee for Assistant Professor, CNU section 28, ULCO, France

2021 Member of the selection committee for ATER position, CNU section 63, ULCO, France

2021 –2022 Scientific Evaluation of projects for Sapienza Università di Roma, Italy; National Science Centre, Poland; and Dutch Research Council, Netherlands

2021–Present Editorial Board Member

2016–Present Reviewer for 28 international journals from Nature, RSC, ACS, Wiley, Springer, Elsevier, IOP, AIP, APS, MDPI, OSA

2021 Editorial Board Member of Frontier of Physics: Recent Development in Crystal growth and Engineering, Frontier of Physics: Discotic liquid crystals: From design and synthesis to applications

2021 – Present International Scientific Advisory Board member, Graphic Era University, Dehradun, Manipal University, Jaipur, and Gorakhpur University, India.

- **MEMBERSHIPS OF SCIENTIFIC SOCIETIES**

2021 Affiliate Member, Royal Society of Chemistry [RSC_710974], UK

2020 Life-time Member, International Liquid Crystal Society [ILCS_13223], USA

2010 Life-time Member, Indian Liquid Crystal Society [L-371], India

2010 Life-time Member, Indian Science Congress [L 23872], India

- **MAJOR COLLABORATIONS**
  - Prof. Sandeep Kumar, Raman Research Institute, India
  - Prof. Noel A. Clark, University of Colorado Boulder, USA
  - Prof. Luciano De Sio, Università degli Studi di Roma "La Sapienza", Italy (Partner in PROGRAMME PHC GALILÉE)
  - Prof. Abhishek Kumar Srivastava, The Hong Kong University of Science and Technology, Hong Kong (Partner in PHC PROCORE)
  - Prof. Kristiaan Neyts, Ghent University, Belgium (I-SITE ULNE, 2020)
  - Prof. Matthias Lehmann, University of Würzburg, Germany (Partner in PROCOPE-2020)
  - Prof. Young-Ki Kim, Pohang University of Science and Technology, South Korea (Partner in PHC Star)
  - Prof. Rafik Naccache, Concordia University, Canada (Partner in project Samuel-De Champlain)
  - Prof. Federico Rosei, INRS, Canada (Partner in project Samuel-De Champlain)
  - Prof. Thomas Nann, University of Newcastle, Australia
  - Prof. Santanu K. Pal, IISER, Mohali, India
  - Dr. Daniel Budaszewski, Warsaw University of Technology, Pologne (Partner in project FOTECH)

- **5 MOST RELEVANT PUBLICATIONS**

1. I. Bala, N. Singh, R. A. K. Yadav, J. De, S. P. Gupta, **D. P. Singh**, D. K. Dubey, J-H Jou, R. Douali, and S. K. Pal: *Room Temperature Perylene Based Columnar Liquid Crystals as Solid-State Fluorescent Emitters in Solution-Processable Organic Light-Emitting Diodes,* **J. Mater. Chem. C,** 8 ***(2020)*** 12485-12494.

   (*In this work, organic light-emitting diodes with green emission were prepared using perylene-based discotic liquid crystals. The electron mobility and external quantum efficiency of OLEDs were found to be 0.014 $cm^2/V.s$ and 6.5%, respectively*.)

2. P. Mahesh, A. Shah, K. Swamynathan, **D. P. Singh**, R. Douali, and S. Kumar*: Carbon dots dispersed hexabutyloxytriphenylene discotic mesogens: Structural, morphological and charge transport behavior*, **J. Mater. Chem. C,** 8 ***(2020)*** 9252-9261.

   (Organic semiconductors suffer from poor conductivity. To cope with this problem, C-dots were dispersed in hexabutyloxytriphenylene discotic liquid crystal to enhance the conductivity. We have successfully enhanced the conductivity by 1000 times.)

3. A. Shah, B. Duponchel, A. Gowda, S. Kumar, C. Legrand, R. Douali, and **D. P. Singh**: *Charge transport in phenazine-fused triphenylene discotic mesogens doped with CdS nanowires and their current-voltage characteristics for ITO-DLC-Au heterojunction*, **New Journal of Chemistry,** 44 ***(2020)*** 14872.

   (This work is focused on the charge transport of phenazine-fused triphenylene discotic liquid crystal/CdS nanowire composite. In general, the open-circuit voltage (V_{oc}) of organic photovoltaics drops by 0.0023 V/°C. If the charge carrier mobility would increase with increasing temperature, it could compensate for this drop in V_{oc}. We have discussed it in this work.)

4. **D. P. Singh**, B. Duponchel, Y. Lin, J.-F. Blach, H. Khemakhem C. Legrand, and R. Douali: *Orientation of 4-n-octyl-4'-cyanobiphenyl molecules on graphene oxide surface via electron-phonon coupling*, **J. Mater. Chem. C,** 7 ***(2019)*** 2734-2743.

   (In this work, the interaction of cyanobiphenyl liquid crystal and graphene oxide is reported. The factor affecting the global orientation and the role of electron-phonon coupling is discussed in this paper.)

5. I. Bala, W.-Y. Yang, S. P. Gupta, J. De, R. A. K. Yadav, **D. P. Singh**, D. K. Dubey, J.-H. Jou, R. Douali and S. K. Pal: *Room temperature Discotic Liquid Crystalline Triphenylene-Pentalkynylbenzene dyads as an emitter in blue OLEDs and their Charge transfer complexes with ambipolar charge transport behaviour,* **J. Mater. Chem. C,** 7 ***(2019)*** 5724-5738.

   (*In this work, organic light-emitting diodes with blue emission were prepared using triphenylene-based discotic liquid crystals. The electron mobility and external quantum efficiency of OLEDs were found in the order of 10^{-3} $cm^2/V.s$ and 2.1 %, respectively*.)

   - Total Number of Publications : 80 (Journal articles: 77; Conference proceedings: 03)
   - Number of Book Chapters : 04
   - Citations: 1520; H-index: 20; I-10 index: 57
   - Researchgate Profile: https://www.researchgate.net/profile/Dharmendra_Singh4?ev=hdr_xprf
   - ORCID Profile: orcid.org/0000-0001-6949-6110
   - Google Scholar: https://scholar.google.com/citations?user=IfGbhOoAAAAJ&hl=en