



## Introduction

Established in 1950, CSIR-National Chemical Laboratory, Pune is one of India's leading R&D institutions in chemical sciences and engineering. Since its inception, NCL has been providing breakthrough solutions for the welfare of society and industry. In this endeavour, research scholars have played a pivotal role. Currently, about 500 graduate students are pursuing research towards doctoral degree under different themes and areas. More information can be viewed at "[http://academic.ncl.res.in/information\\_glance](http://academic.ncl.res.in/information_glance)". This booklet aims at tabulating the research pursued by scholars at CSIR-NCL.

It gives us immense pleasure to showcase the pool of talent in terms of research scholars in different disciplines at CSIR-NCL. This booklet introduces our research scholars and their research summary spanning across different divisions at NCL namely organic chemistry, physical and materials

chemistry, polymer science and engineering, biochemical sciences, plant tissue culture, catalysis and chemical engineering and process development. These research scholars are on the verge of completion of their thesis and are ready reckoner for hiring process in the relevant industry/academia.

We believe that a glance over this booklet can give a holistic flavour of R&D problems tackled at NCL and make industry/ academia reachable to the scholars at NCL.

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## Message from Prof. Ashwini Kumar Nangia

### Director, CSIR-National Chemical Laboratory



It is indeed an honour and privilege for me to write a few introductory words on the booklet prepared by NCL-TEC on the profile of PhD students and research scholars. Compared to a decade ago when PhD students were job seekers after completing their degree, today they have the opportunity and ecosystem to become job providers. The entrepreneurship and innovation model is being adopted by an increasing number of PhDs after graduation in USA, UK-EU, as well as in India. The setting up of venture and incubation centres at institutes, universities and research laboratories is a clear indication of the growth and size of the emerging possibilities. The interdisciplinary nature of the profile of research scholars at CSIR-NCL is ideally suited to make groups who can become future founders of innovation ventures. I am confident that NCL-TEC is starting at the right time to enable the next generation of research scholars to start thinking about “what after PhD” at an early stage of their career. I wish the students and the new initiative good luck in their sincere efforts.

Best Wishes  
Prof. Ashwini Kumar Nangia

## Message from Dr. V. Premnath

### Director, Venture Center and Head, NCL Innovations



I am delighted to see this much-needed booklet of profiles of senior PhD scholars from National Chemical Laboratory (NCL). This information booklet will help introduce graduating PhD scholars and their research backgrounds to leaders of industry (both small and big) and research institutions so that they can identify relevant talent for their own organisations and draw upon the enormous talent resident in the NCL. What is even more important is that this booklet is an initiative of the student-led club, NCL Technology and Entrepreneurship Club. This therefore is also a testament of the initiative and proactive efforts of the students of the NCL.

The students of NCL have a proud history and legacy. NCL has been consistently one of the top few research organisations in the country. Most recently, NCL was honoured as the highest rated research organisation in Natural Sciences in India (Clarivate Analytics, India Research Excellence Citation Award 2017 in the area of Natural Sciences). NCL has been the national leader in patenting activities for many years now and a key contributor to CSIR receiving the National IP Award. NCL has provided thought leadership to several fields in India and made significant contributions to key industries like pharmaceuticals, petrochemicals, polymers and

agro-biotechnology. The contributions of NCL's PhD students to this history of success cannot be understated. The vibrancy of NCL comes from these young people (both PhD students and project staff) who bring enormous energy and creativity to the organisation. NCL's illustrious alumni today are spread throughout industry and academia.

I wish this initiative all success. I hope students find fulfilling career opportunities. I hope industry and research organisations find their future leaders amongst NCL students.

Best Wishes  
Dr. V. Premnath

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# Reema Mohan Banarjee

## Disease Biology

M.Pharm in Pharma. Biotechnology (Bharati Vidyapeeth University-2010)  
Ph.D in Biological Sciences (AcSIR, CSIR-NCL Pune, Thesis submitted 2018)

### Research Summary

- Synthesized and characterized different post-translational modifications of plasma proteins *in vitro*
- Studied the effect of different modified proteins on the proteome of vascular endothelial cells in culture using quantitative mass spectrometry
- Assessed the alteration in endothelial cell function in response to modified proteins at phenotypic, proteomic and transcriptomic levels and its possible role in development of vascular complications like atherosclerosis

Biochemical Sciences Division

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### Research Interests

Target discovery, Product/Assay development, Analytical R&D

### Skills

Animal cell culture, Mass spectrometry, Proteomics, Molecular biology

### Interested in

Research positions in industry or in academia

### Experience

- Project Assistant II at CSIR-National Chemical Laboratory, Pune (2010-2011)



# Meghana C. Athalye

## Biological Sciences



Biological Sciences

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### **Research Interests**

Cell Biology, Disease & Therapeutics

### **Skills**

Cell & Molecular Biology, Microbiology,  
Biochemistry, Analytical techniques

### **Interested in**

Research & Managerial duties in Medicine  
/ Pharmaceuticals / Diagnostics /  
Biotechnology

M.Sc. in Bioanalytical Sciences (University of Mumbai, India, 2009)  
Ph.D. in Biological Sciences (AcSIR, CSIR-NCL Pune, 2012 – Present)  
MBA (online) (University of Illinois, Urbana Champaign, USA, 2018 - Present)

### **Research Summary**

- Biochemical studies on Reactive Oxygen Species in Mycobacteria and its physiological role during infection.

### **Experience**

- Visiting faculty at Modern College of Arts, Science and Commerce, Pune, India
- Graduate Teaching Assistant at Wayne State University, Detroit, USA
- Research Intern at National Institute of Research in Reproductive Health (NIRRH), Mumbai, India
- Intern at ITC Hotel Grand Central Sheraton and Towers, Mumbai, India.

# Vishwanathgouda Maralingannavar



Chemical Engineering and Process  
Development

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<https://www.linkedin.com/in/vishwanathnm/>

## Research Interests

Upstream bioprocessing, Cell line  
development

## Skills

Mammalian cell culture, bioreactor culture,  
<sup>13</sup>C metabolic tracer analysis, biochemical  
assays, protein glycan profiling

## Interested in

Research positions in industry

## Cell Culture Bioprocessing

B.E. in Biotechnology (BVB College of Engineering, Hubballi — 2012)

PhD in Biological Sciences (AcSIR, CSIR-NCL Pune, 2014 – Present)

## Research Summary

- Assessed phenotypic responses of Chinese hamster ovary (CHO) cells to adaptation (>50 days) in phosphate, glucose or glutamine limitation
- Characterized metabolic responses (by measuring nutrient consumption and metabolite excretion rates, enzymatic assays, metabolic fluxes) to explain observed phenotypic responses
- Shown that in situ pH management – using base releasing hydrogels – can allow shake flasks to mimic culture performance of CHO cells in bench scale bioreactor in terms of growth, metabolism and product titer
- Increased volumetric plasmid yield in *E. coli* by four fold by combination of in-situ pH management and continuous glucose release

## Experience

Project assistant (National Chemical Laboratory, Pune 2012–14)

# Arati Balkrishna Deshmukh



Biochemical Sciences Division

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## **Research Interests**

Molecular pathogenesis of diseases, cell biology, biopharmaceuticals

## **Skills**

Cell Culture, Proteomics, Mass spectrometry, Bioinformatics

## **Interested in**

Research positions in industry/  
in academia

## **Proteomics and Mass Spectrometry**

M.Sc. in Biotechnology (University of Pune, 2010)

Ph.D. in Biological Sciences (AcSIR, CSIR-NCL Pune, 2018)

## **Research Summary**

- Investigated role of methylglyoxal (MG) in promoting insulin resistance
- Analyzed effect of MG at global proteomic and metabolic level
- Research work earned 6 scientific publications and deposition to online repository
- Optimized and established cell culture and proteomics protocols, trained fellow lab-mates



# Rubina Kazi

## Disease Biology and Aging Research

M.Sc in Biotechnology (University of Pune-2010)

Ph.D in Biological Sciences (AcSIR, CSIR-NCL Pune, Thesis submitted 2018)

### Research Summary

- Screened drug molecules for anti-glycation activity *in vitro*
- Developed yeast as a model system to study glycation induced aging using microbial culture and cell based assays
- Studied the effect of glycation inhibitors on yeast aging at proteomic level using mass spectrometry and western blotting
- Performed transcriptional profiling of yeast in presence of glycation inhibitors using microarray and RT-PCR

Biochemical Sciences Division

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### Research Interests

Target discovery, Product/Assay development, Analytical R&D

### Skills

Microbial and animal cell culture, Mass spectrometry, Proteomics, Molecular biology

### Interested in

Research positions in industry & academia



Biochemical Sciences Division

[ameyabenz@gmail.com](mailto:ameyabenz@gmail.com)

### **Research Interests**

Protein Biochemistry, Process development

### **Skills**

Cloning, Protein purification, Structural and biophysical analysis

### **Interested in**

Research positions in industry/  
in academia

# Ameya Dipak Bendre

## Macromolecular Crystallography, Protein Chemistry

B.Sc in Chemistry with Voc. Biotechnology

M.Sc in Biochemistry (Dept. of Chemistry, University of Pune -2011)

PhD in Biological Sciences (AcSIR, CSIR-NCL Pune, Thesis submitted)

### **Research Summary**

- Determined X-ray crystal structure of trypsin inhibitor
- Structure available at RCSB PDB (Id: 5XOZ)
- Biochemical and biophysical analysis of protein
- Protein purification: Natural source and recombinant
- *In silico* characterization: Docking and simulation

### **Experience**

- Quality control at Chaeron Pokphand Pvt. Ltd.

# Shridhar H. Thorat

## Crystal Engineering

M.Sc in Organic Chemistry (University of Pune-2011)

PhD in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2012 - Present)

### Research Summary

- Polymorphism study of anti-cancer drugs
- Co-crystal/salts study on anti-cancer drugs
- Polymorphism and co-crystallization of high energy materials
- Synthesis and characterization of solid state reactions at molten condition by green approach.



Center for Materials Characterization

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### Research Interests

Polymorphism, Co-crystal Study

### Skills

Single crystal X-ray/PXRD Analysis

### Interested in

Research positions in industry

# Janampelli Sagar

## Heterogeneous Catalysis and Biomass Valorization



Inorganic and Catalysis Division

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[www.linkedin.com/in/sagar-janampelli-0b98279a/](http://www.linkedin.com/in/sagar-janampelli-0b98279a/)

### Research Interests

Heterogeneous Catalysis

### Skills

Well versed in novel catalysts design, synthesis, characterization and screening their applications for biomass valorization to value added products.

### Interested in

Research positions in industry/in academia

M.Sc in Organic Chemistry (Osmania University-2013)  
Ph.D. in Chemistry (AcSIR, CSIR-NCL Pune, 2014 - Present)

### Research Summary

- Design and synthesis of various supported bimetallic catalysts
- Catalytic Deoxygenation of Vegetable oils/Fatty acids to Diesel-range hydrocarbons over bimetallic catalysts
- Developed a novel catalysts which works at moderate conditions to yield green diesel from triglycerides with high selectivity and good atom economy
- Optimized the operating conditions for green diesel production from nonedible vegetable oils

### Experience

3 years teaching experience.



# Arun V. Nikam

## Flow Chemistry

M.Sc in Applied Chemistry (Shivaji University-2010)  
PhD in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2018)

### Research Summary

- Developed microwave-assisted continuous flow reactor to synthesis nanomaterials, polymers and organic intermediate
- Develop novel synthesis route of preparation of API particles, bimetallic/alloy nanocatalyst for hydrogenation and hydrogen generation
- Studied nucleation and growth events to develop nanomaterial with controlled size, shape and composition

### Experience

- Project Assistant at Catalysis Division CSIR-NCL , Pune (6 months)

Chemical Engineering & Process  
Development Division

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### Research Interests

Flow chemistry, Nanomaterial, Polymer, and  
API.

### Skills

Scale-up technology, Analytical techniques

### Interested in

Research positions in industry





Chemical Engineering and Process  
Development

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65831920/](http://www.linkedin.com/in/gayatri-gera-65831920/)

### **Research Interests**

Industrial biotechnology, wastewater treatment  
and membrane technology

### **Skills**

Process developer (end to end), good presenter  
and teaching

### **Interested in**

Research positions in industry as well as  
in academia

# Gayatri S. Gera

## Wastewater Treatment using Microalgae

B.Tech in Chemical Engineering (College of Engineering and Technology,  
Akola, India, 2005)

M.Tech in Chemical Engineering (Dr. Babasaheb Ambedkar Technological  
University, Lonere, India, 2007)

Ph.D in Biological Sciences (AcSIR, CSIR-NCL Pune, 2011-2018)

### **Research Summary**

- Successfully developed the technology for the treatment of sewage water by using microalgae coupled with the membrane technology.

### **Experience**

- Worked in Research and Development division of Matrix-Praj Industries as a Technical Research associate (Oct. 2007-Mar. 2011)



# Aniket U. Thosar

## Electrochemical Engineering

B.Tech. in Pharmaceutical Sciences and Technology (ICT, Mumbai, 2010-2014)  
Ph.D. in Engineering Sciences (AcSIR, CSIR-NCL Pune, 2014 – Present)

Chemical Engineering and Process  
Development

[aniket050692@gmail.com](mailto:aniket050692@gmail.com)

### Research Interests

Fuel cells, Renewable energy, Mathematical  
modelling of physical systems

### Skills

Mathematical modelling using analytical  
methods as well as numerical tools  
(MATLAB, COMSOL)

### Interested in

Research program in the renewable energy  
sector

### Research Summary

- Developed an analytical theory (supported by three-dimensional numerical simulation) that relates all the material, geometric and operating parameters in an operational proton exchange membrane fuel cell to its performance.
- Designed and implemented an experimental program to validate the theory.

### Experience

- Internship at COMSOL Multiphysics, Bangalore (May – September 2015)

# Suhas Hanmant Shinde



Chemical Engineering and Process  
Development  
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9a552436/](http://www.linkedin.com/in/suhas-shinde-9a552436/)

## Research Interests

Catalysis, Organic transformations

## Skills

Catalyst preparation, characterization and their  
applications for chemical transformation

## Interested in

Research positions in industry

## Catalysis, Transformations of Bioderived platforms molecules

M.Sc in Organic Chemistry (Savitribai Phule Pune University, 2009)

PhD in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2013 - Present)

## Research Summary

- Prepared several heterogeneous catalysts (Mixed oxide catalyst, Nobel/non-noble metal supported catalyst) and characterised by sophisticated advanced techniques.
- Evaluated catalysts for one-pot cascade/integrated reactions (e.g. transfer hydrogenation + etherification, dehydration + esterification/Hydroxyalkylation-alkylation/Friedel-Crafts alkylation/aldol condensation reaction).
- Catalyst designed for self-etherification of 5-(hydroxymethyl) furfural.
- Designed biphasic solvent system for hydroxyalkylation-alkylation and for clean isolation products.

## Experience

- Research Associate at Innovassynth Technologies (I) LTD, Khopoli, Maharashtra, India (6 months).
- Scientist, Group M-8 at Innovassynth Technologies (I) LTD, Khopoli, Maharashtra, India (2 year 2 months).



Chemical Engineering and Process  
Development

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690318128](http://www.linkedin.com/in/vineeta-soni-690318128)

### **Research Interests**

Organometallics, Synthesis, C-H activation,  
Catalysis

### **Skills**

Synthesis, Handling air and moisture sensitive  
reactions, Teaching

### **Interested in**

Research positions in industry / in academia

# Vineeta Soni

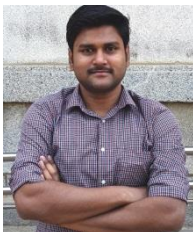
## Organometallic Synthesis and Homogeneous Catalysis

MSc in Chemistry (University of Rajasthan -2012)

PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2012 – 2018)

### **Research Summary**

- Developed Unified strategies for the regioselective C–H bond alkylation of indoles using a monodentate chelate auxiliary.
- Nickel-catalyzed C(sp<sup>2</sup>)–H/C(sp<sup>3</sup>)–H oxidative coupling of indoles with toluene derivatives in the presence of 2-iodobutane as an oxidant, which proceeds *via* a unique strategy.
- Nickel-catalyzed regioselective difluoroalkylation of indoles *via* in-situ generated nickel catalyst system without the assistance of a directing group.
- Metal-free approach for the regioselective C-3 acetoxylation of *N*-substituted indoles with PhI(OAc)<sub>2</sub> under mild reaction conditions. All these results have been published in the reputed journals.



Organic Chemistry Division

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### Research Interests

Organic Synthesis and Asymmetric Catalysis

### Skills

Organic synthetic techniques, expertise in modern analytical techniques (NMR, FT-IR, GC/MS, LC/MS, HPLC etc.)

### Interested in

Research positions in academia or industry

# Santigopal Mondal

## Organic Synthesis and Asymmetric Catalysis

M.Sc in Chemistry (IIT Delhi, 2011-2013)

PhD in Organic Chemistry (AcSIR, CSIR-NCL Pune, 2013 - 2018)

### Research Summary

- Strong knowledge in various Carbon-Carbon and Carbon-Heteroatom bond-forming reactions.
- Developed an enantioselective synthesis of cyclopentenes and cyclopentane-fused  $\beta$ -lactones via N-Heterocyclic Carbene organocatalysis. (*Chem. Commun.* 2014, 50, 14539; *J. Org. Chem.* 2017, 82, 9223)
- Demonstrated the synthesis of functionalized  $\beta$ -lactones by dynamic kinetic resolution of ketoacids (*ACS Catal.* 2017, 7, 3995).
- Developed the synthesis of pyrazolone-fused spiro-cyclohexadienols using secondary amine-organocatalysis (*Org. Lett.* 2017, 19, 4367).



# Brijesh M. Sharma

## Organic Synthesis

M.Sc in Chemistry (University of Mumbai -2011)

PhD in Chemistry (AcSIR, CSIR-NCL Pune, June-2018)

### Research Summary

- Synthesis of Active Pharmaceutical Ingredients (APIs)
- Development of Lewis Acid and Transition metal catalyzed highly selective C–C bond-forming reactions.
- Total synthesis of biologically active natural products such as, Aculeatins F and *epi*-F, (*R*)- and (*S*)-5-hexadecanolide and a formal synthesis of solenopsin.
- Total synthesis of 10, and 14-membered lactones such as Seimatopolide B, Sch725674 and C-4-*epi*-Sch725674, formal synthesis of ( $\pm$ )-Physovenine.
- Experience to use standard Schlenk line techniques for handling air-sensitive compounds and Pyrophoric chemicals like *t*-BuLi.

Organic Chemistry Division

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### Research Interests

Total Synthesis, Flow Synthesis

### Skills

NMR Spectroscopy, Teaching

### Interested in

Research positions in industry

# Ekta Sangtani

## Chemical Crystallography

M.Sc in Chemistry (M. D. S. University, Ajmer, Rajasthan -2012)  
PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2013 - Present)



Organic Chemistry Division

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### Research Interests

Pharmaceutical cocrystals, Polymorphs, Solid state chemistry

### Skills

X-Ray Crystallography (SC-XRD, PXRD)

### Interested in

Research positions in industry

### Research Summary

- Synthesised cocrystals and colour cocrystal polymorphs of furosemide and justified the reason behind their different colour appearance.
- Prepared cocrystals of API's (active pharmaceutical ingredients) to improve their physicochemical properties including their solubility, bioavailability, hygroscopicity, tabelatibility and stability.



# Garima Jaiswal

## Heterogeneous catalysis

B.Sc in Chemistry (Banaras Hindu University -2011)

M.Sc in Chemistry (IIT Delhi -2013)

PhD in Chemistry (AcSIR, CSIR- NCL Pune, 2013 - Present)

### Research Summary

- Design and development of new catalytic materials based on first-row transition metals (Mn, Fe, Co) and their applications in dehydrogenation and related reactions.
- Discovered first iron based heterogeneous catalyst for the acceptorless dehydrogenation of N-heterocycles, Diols, amines and alcohols with the liberation of dihydrogen, which got highlighted in Indian Science Wire, The Hindu Businessline, Vigyanprasar, Synfacts, NRDC (Invention & Intelligence) and Firstpost.
- Discovered the first cobalt based nanocatalyst for chemoselective transfer hydrogenation of alkynes to Z-alkenes.
- Discovered first manganese based heterogeneous catalyst for the Mn-catalyzed chemoselective transfer hydrogenation of nitroarenes using ammonia-borane as a transfer hydrogenating source with mechanistic illustration.

Organic Chemistry Division

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### Research Interests

Heterogeneous catalysis, Nanomaterial synthesis, Dehydrogenation related reactions

### Skills

PXRD, TEM, SEM, TGA, XPS, EPR,  
Schlenk line handling, nanomaterial synthesis

### Interested in

Research positions in industry and  
in academia





# Eswara Kumar Aratikatla

## Organic Chemistry

M.Sc. in Organic Chemistry (Andhra University Campus-2010)

Ph.D. in Organic Chemistry (AcSIR, CSIR-NCL Pune, 2012 - Present)

Organic Chemistry Division

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### Research Interests

Natural products, Synthesis of biologically active molecules.

### Skills

Organic Chemistry

### Interested in

Antimalarial natural products, Medicinal and pharmaceutical chemistry.

### Research Summary

- Designed and synthesized a library of artemisinin based hybrid molecules as novel antimalarial agents (provisional patented).
- Three hybrid molecules showed excellent parasiticidal activities against *P. falciparum* malaria in **nM** range with 100% parasite clearance than the currently used artemisinin based drugs.
- Developed chiral pool approach for the synthesis of antiepileptic drug (*R*)-Lacosamide from *L*-Serine with 54% overall yield and 100% *ee* (Awarded 1<sup>st</sup> prize poster in XI-JNOST 2015 by RSC).
- Synthesized antiplasmodial natural product syncarpamide and its analogs (55 analogs).

### Experience

- Research Chemist in Laxai Avanti Life Sciences, R&D, Hyderabad, May-2010 to Nov-2011 (1.6 years).



## Dr. Preeti Jain

### Physical Chemistry, Green Chemistry, Ionic Liquids

M.Sc in Chemistry (Gold Medalist, University of Rajasthan, Jaipur -2012)  
PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2017)

Physical & Materials Chemistry Division

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#### Research Interests

Green Chemistry, Ionic Liquids, Tuning the Physico-chemical properties of Designer Solvents "Ionic Liquids"

#### Skills

Spectroscopy, Calorimetry, Analytical Chemistry, Electrochemistry

#### Interested in

Research positions in industry

#### Research Summary

- Synthesis, characterisation and tailoring the physico-chemical properties of various protic and aprotic ionic liquids were the main aspects of doctoral work.
- The concentration-dependent distribution of ionic liquids between biphasic systems and their hydrophobicity were measured.
- Various ion-ion and ion-solvent interactions were demonstrated through enthalpic measurements using Isothermal Titration Calorimeter (ITC) and conductivity.
- A highly reactive intermediate *i.e.* "carbene" were generated from ionic liquids electrochemically by using cyclic voltammetry.

#### Experience

Research Associate at CSIR-National Chemical Laboratory, Pune (8 Months)



# Varchaswal Kashyap

## Electrochemistry

B.Sc. (Hons.) in Chemistry (Banaras Hindu University, 2007 – 2010)  
M.Sc. in Chemistry (Banaras Hindu University, 2010 – 2012)  
PhD in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2014 – Present)

Physical and Materials Chemistry  
Division  
[Varchaswal@gmail.com](mailto:Varchaswal@gmail.com)

### Research Interests

Fuel Cells & Metal-air Batteries

### Skills

Material Characterizations,  
Electrochemical analysis

### Interested in

Research positions in industry/  
in academia

## Research Summary

- Developed primary Zinc-air battery with Pt free electrocatalyst.
- Developed a rechargeable Zinc-air battery with Pt free electrocatalyst
- Studied various electrocatalysts for faradaic reactions.
- Explored noble metal free electrocatalysts for PEMFC and AMFC

# Yuvraj Dangat



Physical Chemistry

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## Research Interests

computational chemistry, computational material science and computational biology

## Skills

High performance computing

## Interested in

Application of quantum chemistry in industry.

## Computational Chemistry

M.Sc in Chemistry (University of Pune -2010)

PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2015 - 2017)

## Research Summary

- Provided mechanistic insights in metal based and main group complexes based chemical transformations employing Density Functional Theory (DFT)
- Industrially important hydroformylation reaction
- The Ru-catalyzed carbonyl-directed C-H activation reaction
- The activation of carbon monoxide on boron based complex
- The activation of  $N_2O$  on silicon based complex
- Investigation of reaction mechanism for iodine catalyzed reaction
- Published a book chapter on the hindered rotor corrections for entropy for alkyl radicals

## Experience

- Post-Doctoral Fellow at IIT-Bombay. (April 2018 to Present)



# Mohitosh Bhadra

## Heterogeneous Catalysis

M.Sc. in Chemistry (Indian Institute of Technology, Bombay-2013)  
PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2014 - Present)

Physical and Material Chemistry Division

[mohitosh.bhadra@gmail.com](mailto:mohitosh.bhadra@gmail.com)

### Research Interests

Homogeneous Catalysis, Design and Synthesis of Porous Heterogeneous Catalyst (COF), C-H Activation, Photo-catalytic Hydrogen Evolution Reaction

### Skills

NMR, IR, UV-Vis, PXRD, SC-XRD, GC, GC-MS, TGA, BET, HPLC, SEM, TEM

### Interested in

Research positions in industry

### Research Summary

- Design and synthesis of chemically stable nitrogenous porous crystalline covalent organic frameworks for heterogeneous catalysis and gas uptake property study
- *In situ* synthesis of metal nanoparticles in stable covalent organic frameworks for heterogeneous tandem catalysis
- Metal coordinated covalent organic frameworks synthesis via pre-synthetic approach and applied as a heterogeneous catalyst for C-H activation reaction
- Synthesis of nitrogen rich chemically stable porous covalent organic frameworks as heterogeneous catalyst for photo-catalytic organic transformation and photo-catalytic hydrogen evolution reaction

### Experience

- Research Associate under the supervision of Prof. Debabrata Maiti in homogeneous catalysis (C-H activation) at Indian Institute of Technology, Bombay.

# Mrityunjay Kumar Tiwari



Physical and Materials Chemistry

[tiwari084@gmail.com](mailto:tiwari084@gmail.com)

## Research Interests

Materials science, drug designing, polymer chemistry

## Skills

Computational chemistry and teaching

## Interested in

Research/teaching positions in industry/academia

## Theoretical and Computational Chemistry

B.Sc. in Chemistry (Banaras Hindu University - 2007)

M.Sc. in Chemistry (Indian Institute of Technology Bombay - 2009)

Ph.D. in Chemistry (AcSIR, CSIR-NCL Pune, 2011 - Present)

## Research Summary

- Proposed methods to compute electrostatic force of binding for determining the strength of electrostatic dominated noncovalent bonds as a more general method.
- Employed this approach in the rational design of new systems of diverse binding strength and in explaining diverse chemical problems of high relevance.
- Working on a method for the effective and efficient computation of electronic influence of non-reactive environment on reaction barriers while employing full quantum chemical calculations.
- Worked also on studying the conformational landscape of peptides in water and in the vicinity of carbon nanosurfaces, small molecules activation by reported and theoretically designed catalysts, deducing reaction mechanism of important chemical reactions.



# Rajesh Bisht

## Dye-sensitized Solar Cells and Photochemistry

M.Sc in Chemistry (HNB Garhwal University, Uttarakhand, 2009-2011)  
PhD in Chemical Science (AcSIR, CSIR-NCL Pune, 2012 - 2018)

Physical and Materials Chemistry

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### Research Interests

Synthesis of conjugated molecules for optoelectronics and photoactivation

### Skills

Organic synthesis, Photochemistry, Absorption and emission spectroscopy, NMR and mass spectroscopy, Cyclic voltammetry

### Interested in

Research positions in industry/  
in academia

### Research Summary

- Design and synthesis of squaraine based dyes for dye-sensitized solar cells (DSSC).
- Investigating the photophysical, electrochemical and photovoltaic properties of organic dyes for the solar cells application.
- Exploring the effect of increasing conjugation and inclusion of alkyl chains on electronic and steric properties of squaraine dyes, with a particular focus on studying the aggregation behaviour of squaraine dyes on  $\text{TiO}_2$ .
- Synthesis of benzoin type photo-triggers with extended conjugation.
- The study of photochemical behaviour of extended benzoin type photo-triggers in various conditions.

# Arun Dadwal

## Synthesis of spinel ferrite nanoparticles and their heat transfer applications (Thermal conductivity)

M.Sc in Chemistry (Punjab University-2011)

PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2014 - Present)



Physical and Material Chemistry Division

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### Research Interests

Solid-state chemistry, Magnetism, Material synthesis and applications

### Skills

Physical Chemistry, Solid-state chemistry, Teaching

### Interested in

Research positions in academia

### Research Summary

- Synthesized monodispersed Spinel Ferrite nanoparticles ( $\text{Fe}_3\text{O}_4$ ,  $\text{CoFe}_2\text{O}_4$ ) by using facile co-precipitation method.
- Characterized Spinel Ferrite nanoparticles by XRD, TEM, and studied their magnetic properties by using SQUID-VSM.
- Synthesized the highly stable, different fatty acid, coated magnetite nanofluids (Ferrofluids).
- Studying the thermal conductivity applications of Magnetite nanofluids for heat transfer applications.
- Carried out studies for understanding the role of various factors on the thermal conductivity of magnetite nanofluids by changing various parameters viz. particle size, particle distribution, amount and conformation of the surfactants.





# Pragati Sharma

## Computational Chemistry

M.Sc in Chemistry (Banasthali University, 2010)  
PhD in Chemistry (AcSIR, CSIR-NCL Pune, 2013-2018)

### Research Summary

- Force field development and validation of force fields of polymeric materials
- Calculation of density,  $T_g$ , viscosity, structural properties of polymers
- Analysis of CO<sub>2</sub> capture properties of Polyethyleneimine
- Development of advanced CO<sub>2</sub> capture membranes

### Experience

- Teaching experience of 2 years in Aditya Birla group.

Physical & Material Chemistry

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### Research Interests

Computational polymer chemistry,  
Polymer physics,  
Bio-physical chemistry

### Skills

MD simulations, C programming, Teaching

### Interested in

Research positions in industry/  
in academia



# Pravin N. Shinde

## Materials Chemistry

M.Sc. in Chemistry (Shivaji University, Kolhapur. 2009)

Ph.D. Chemical Sciences (AcSIR, CSIR-NCL Pune, Thesis Submitted, June 2018)

### Research Summary

- Synthesis, size and morphology control of metal, metal oxide nanomaterials.
- Synthesis and surface chemical modifications of mesoporous silica nanoparticles by using silane grafting and “click” chemistry for sorption and drug delivery applications.
- Design and synthesis of theranostic system based on core-shell architecture with magnetic nanoparticles cores for MRI contrast and porous silica shell for delivery.

Physical and Materials Chemistry  
Division

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### Research Interests

Nanomaterials, porous materials, surface  
chemical modifications, drug delivery,  
theranostics

### Skills

Materials synthesis, Spectroscopy,  
Microscopy, Chromatography, X-ray  
Diffraction

### Interested in

Research positions in industry



# Kiran Kaithakkal Jathavedan

## Soft Matter

B.Tech in Polymer Engineering (Mahatma Gandhi University, Kottayam- 2007)

M.Tech in Polymer Technology (Cochin University of Science and Technology, Kochi- 2011)

PhD in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2012 - Present)

## Research Summary

- Investigation of the phase behavior of neutral and ionic microgels using scattering, rheology and microscopy techniques.
- Effect of polymer morphology in the dynamics of Poly(N-isopropyl acrylamide) microgels.
- Electric field driven assembly of ionic microgels.

## Experience

- Patent Analyst at Thomson Reuters Pvt Ltd, Hyderabad (Aug 2007- May 2008)
- Research Fellow at Amrita School of Engineering, Coimbatore (June 2008- Aug 2009)

Polymer Science & Engineering Division

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### Research Interests

Light scattering, Soft matter Rheology,  
Confocal Microscopy of colloids

### Skills

DLS, Rheology, Confocal Microscopy

### Interested in

Research positions in industry



# Sandeep Kumar Sharma

## Polymer Chemistry

M.Sc in Organic Chemistry (University of Rajasthan -2012)  
PhD in Chemical Science (AcSIR, CSIR-NCL Pune, 2013 - Present)

### Research summary

- Studied the supra-molecular donor-acceptor polymers and their applications for various electronic devices like solar cell, organic field effect transistor (OFET) etc.
- Synthesized multi-functional monomers and study their structure property relationship.
- Synthesized new n-type polymer composites for energy storage applications.
- Interested to learn and explore new areas of polymer chemistry and functional materials.

Polymer Science & Engineering Division

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### Research Interests

Polymer syntheses, Organic solar cell, Energy Storage

### Skills

Polymer Chemistry, Teaching

### Interested in

Research positions in industry or in academia

### Experience

- One year Teaching Experience



# Bhawana Pandey

## Polymer Science

M.Sc in Organic Chemistry (University of Rajasthan-2012)  
Ph.D in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2018)

### Research Summary

- Synthesis of biocompatible and biomimetic carbohydrate and phosphate functionalized amino acid monomers and amphiphilic block copolymers (polypeptides).
- Self-assembly of amphiphilic block copolypeptides into soft nanostructures materials with stimuli-responsive properties for bimolecular recognition and targeted/controlled drug delivery applications.
- Synthesis of mesoporous materials (MSN, SBA-15) and their applications.
- Biocompatible artificial and natural polymer based hybrid 3D scaffolds using ice templating techniques for drug delivery and tissue engineering application.

Polymer Science and Engineering Division

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### Research Interests

Polypeptide synthesis, Hybrid materials  
Biomedical applications

### Skills

Synthetic, Analytical, Teaching

### Interested in

Research positions in industry

# Indravadan A. Parmar

## Water Soluble Stimuli Responsive Associating Polymers

M.Sc in Organic Chemistry (M. S. University of Baroda-2009)  
PhD in Chemistry (Savitribai Phule Pune University- 2018)



Polymer Science and Engineering  
Division

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### Research Interests

Associating polymers, Hydrogel, Polymer  
Chemistry, Rheology, Polymer Physics

### Skills

Synthesis of Polymers and Small  
Organic/Inorganic Molecules, Rheology,  
Light Scattering, Spectroscopy, Teaching

### Interested in

Research positions in industry

### Research Summary

- Synthesized hydrophobically modified associating copolymer (HMCP) viz. Poly (acrylic acid-*co-N*, *N*-dimethyl acrylamide-*co-n*-dodecyl acrylamide), and investigated its aqueous solution properties using rheology, light scattering, and fluorescence spectroscopy. An aqueous solution of HMCP showed unusual reversible gelation upon cooling and/or applied shear.

### Experience

- Worked with Module Innovations, start up at innovation park-NCL, to develop affordable and innovative diagnostic devices for rapid microbial detection



Polymer Science & Engineering

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[www.linkedin.com/in/sameerhuprikar/](http://www.linkedin.com/in/sameerhuprikar/)

### **Research Interests**

Suspensions and Gels, Polymer and Composite materials & processing, Polymer applications in medical devices and fuel cells

### **Skills**

Polymer processing, testing, suspension rheology, imaging and analysis

### **Interested in**

Open to both Industry and Academia

# Sameer S Huprikar

## Rheology and Microstructure of Capillary Force Induced Gels

B.E in Polymer Engineering (Savitribai Phule Pune University, Pune)

MSE in Plastics Engineering (University of Massachusetts, Lowell, MA, USA)

PhD in Engineering Sciences (AcSIR, CSIR-NCL Pune, 2012 - Present)

### **Research Summary**

Exploring ternary immiscible liquid/liquid/particle based non Brownian suspension systems. Addition of the secondary liquid leads to formation of particle networks in the suspensions even at low particle loadings. This induces a yield stress in the Newtonian suspension. These are being studied using rheology and imaging of a model density and refractive index matched Polymethyl Methacrylate (PMMA) based suspension system. The system is also being studied using X-Ray tomography to correlate microstructure with the yielding behaviour of the suspensions.

### **Experience**

- Product development intern- Haartz Inc., Acton, MA, USA
- Technical Associate intern- Bemis Associates, Shirley, MA USA
- Teaching and Research Assistant- Department of Plastics Engineering, University of Massachusetts, Lowell, MA, USA



# Swechchha Pandey

## Organometallic Chemistry

M.Sc in Organic Chemistry (Banaras Hindu University -2012)  
PhD in Chemical Sciences (AcSIR, CSIR-NCL Pune, 2013-2018)

### Research Summary

- Carried out research on isomerizing hydroformylation of plant oil derived substrates to potential AB type monomers
- Developed an efficient methodology for Iron catalyzed hydroformylation of olefins under milder conditions
- Developed an unprecedented understanding of mechanistic investigations in field of Iron catalyzed hydroformylation
- Iron catalyzed asymmetric hydroformylation of olefins

Polymer Science & Engineering

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### Research Interests

Homogenous catalysis, organometallic chemistry, Metal catalyzed polymerization, renewables

### Skills

Organic Synthesis, Spectroscopy

### Interested in

Research positions in industry/  
in academia



# Ramendra Pandey

## Transport and Separation Processes



Polymer Science and Engineering  
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### Research Interests

Renewable Energy, Waste-to-Wealth,  
Membrane Technology

### Skills

Membrane development, Process design,  
MATLAB, Ansys, Autodesk Inventor

### Interested in

Research and management positions in  
industry

B.Tech in Industrial Biotechnology (SASTRA University, 2012)  
M.Tech in Renewable Energy (Class rank 1), (AcSIR, CSIR-SERC, 2014)  
Ph.D in Engineering Sciences (AcSIR, CSIR-NCL Pune, 2014 – Present)

### Research Summary

- Responsible for commercial scale indigenization of membrane humidifiers
- Investigated the physics of membrane based gas humidification through mathematical modelling
- Provided insights into water management in open-cathode PEM fuel cells
- Responsible for developing novel humidification technique for PEM fuel cells

### Experience

- Quick Hire Scientist (T) at CSIR-Structural Engineering Research Center, Chennai, 2012 – 2015.

NCL Technology and Entrepreneurship club (NCL-TEC) is a club driven by research scholars and associates at NCL that aims to provide a common platform/forum for people with a shared interest in technology and translating it into products and services useful to people. The Club focuses on various aspects of technology, innovation and entrepreneurship. The club plans and organizes lectures, workshops and other events for the mutual benefit of the club members.

Visit <http://www.venturecenter.co.in/ncltec/index.php> for more information.

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